

BUILDING CODE

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ADDITIONAL CODE REQUIREMENTS

2021 International Residential Code

Per Delaware State Fire Marshal: Voluntary installation of a fire suppression system in a residential dwelling, will require Fire Marshal approval and inspections.

- R302 FIRE-RESISTANT CONSTRUCTION:** Construction, projections, openings & penetrations of exterior walls of dwellings & accessory buildings shall comply with Table R302.1(1).
- R302.2 TOWNHOUSES:** Walls separating townhouse units shall be constructed in accordance with sections R302.2.1 through 302.2.5
- R302.5 DWELLING/GARAGE OPENING/PENETRATION PROTECTION (garage door to house separation):** self-closing, self-latching, solid wood doors/steel doors $\geq 1\frac{3}{8}$ inches in thickness or 20-minute fire-rated doors. Openings into non-sleeping rooms only.
- R302.6 DWELLING/GARAGE FIRE SEPARATION:** from the residence and attics: $\geq \frac{1}{2}$ -inch gypsum board applied to the garage side; habitable rooms above the garage: $\frac{5}{8}$ -inch Type X gypsum board; garages located less than 3 feet from a dwelling unit on the same lot: $\geq \frac{1}{2}$ -inch gypsum board applied to the interior side of exterior walls
- R302.7 UNDER-STAIR PROTECTION:** Enclosed accessible space under stairs shall be protected with $\frac{1}{2}$ -inch gypsum board.
- R302.11 FIREBLOCK:** fireblocking shall be provided to cut off all concealed draft openings (both vertical & horizontal) to form an effective fire barrier between stories & the roof space.
- R302.12 DRAFTSTOPPING:** In combustible construction where there is usable space both above and below the concealed space of a floor/ceiling assembly, draftstops shall be installed.
- R302.13 FIRE PROTECTION OF FLOORS:** $\frac{1}{2}$ " drywall or $\frac{5}{8}$ " wood structural panel membrane, on the underside of the floor joists; Exceptions: **1.** floor protected by an automatic sprinkler system, **2.** floor over a crawl space not intended for storage or fuel-fired or electric heating appliances, **3.** Portions of floor assemblies can be unprotected when: total area of the unprotected portions ≤ 80 sf. or fire blocking installed along the perimeter of the unprotected portion or wood floors using dimension lumber or structural composite lumber ≥ 2 " X 10".
- R303.3 BATHROOMS (fans):** Bathrooms, water closet compartments and other similar rooms shall be provided with aggregate glazing area in windows of not less than 3 sf. one-half of which must be openable. **Exception:** The glazed areas shall not be required where artificial light and a local exhaust system are provided. Exhaust air from the space shall be exhausted directly to the outdoors.
- R303.7 STAIRWAY ILLUMINATION:** All interior & exterior stairways shall be provided with a means to illuminate the stairs, landings and treads; exterior stairways: artificial light source located in the immediate vicinity of the top landing; exterior stairways (access to a basement from the outside): artificial light source located in the immediate vicinity of the bottom stairway landing.
- R305.1 CEILING HEIGHT:** Minimum ceiling height of 7 feet. Rooms with sloped ceilings: minimum ceiling height of 7 feet for at least 50% of the floor area and no floor area with less than 5 feet. Bathrooms: minimum ceiling height of 6 feet 8 inches per Figure R307.1.
- R308.4 GLAZING HAZARDOUS LOCATIONS:**
- 1. IN DOORS:** all fixed and operable panels of swinging, sliding and bifold doors.
 - 2. ADJACENT TO DOORS:** individual fixed or operable panel adjacent to a door where the exposed edge of the glazing is less than 60" above the floor or walking surface and it meets either of the following: 1. Glazing is within 24" of either side of the door in the plane of the door in a closed position. 2. Glazing is on a wall less than 180 degrees from the plane of the door in a closed position AND with 24" of the hinge side of an in-swing door. SEE EXCEPTIONS
 - 3. IN WINDOWS:** Glazing in an individual fixed or operable panel that meets ALL of the following: a: individual pane is larger than 9 square feet, b: bottom edge of the glazing is less than 18" above the floor, c: top edge of glazing is more than 36" above the floor, d: One or more walking surfaces are within 36", (a horizontal straight line) of the glazing.
 - 4. IN GUARDS & RAILINGS:** structural baluster panels and nonstructural in-fill panels.

R308.4**GLAZING HAZARDOUS LOCATIONS cont'd.**

5. **WET SURFACES:** (applies to single glazing and all panes in multiple glazing) any walls, enclosures or fences containing or adjacent hot tubs, spas, whirlpools, saunas, steam rooms, bathtubs, showers and indoor or outdoor swimming pools where the bottom exposed edge of the glazing is less than 60 inches above any standing or walking surface (Exception: Glazing that is more than 60" measured horizontally from the water's edge).
6. **ADJACENT STAIRS & RAMPS (& landings):** bottom exposed edge of the glazing is less than 36" above the adjacent walking surface. Exceptions: a. When a rail is installed on the accessible side(s) of the glazing 34" – 38" above the walking surface, be capable of withstanding a horizontal load of 50 pounds per linear foot without contacting the glass and be $\geq 1\frac{1}{2}$ " in cross sectional height. b. Glazing >36" measured from the walking surface.
7. **ADJACENT TO BOTTOM STAIR LANDING:** glazing is less than 36" above the landing and within a 60-inch horizontal arc less than 180 degrees from the bottom tread nosing. Exception: The glazing is protected by a guard complying with Section R312 and the plane of the glass is more than 18" from the guard.

R309.1

GARAGE (FLOOR SLOPE): sloped to move liquids to a drain or the garage door.

R310**EMERGENCY ESCAPE & RESCUE OPENINGS:**

1. **Basements, habitable attics and every sleeping room:** at least one operable opening that opens directly into a public way, or yard opening to a public way; floor to clear opening height: ≤ 44 "; net clear opening: 5.7 sf (grade floor: 5 sf if within 44" of grade); clear opening height: minimum 24"; clear opening width: minimum 20". **Exception:** Storm shelters and basements used only to house mechanical equipment and not exceeding total floor area of 200 sf.
2. **Basement window well:** shall be 9 sf, a minimum of 36" X 36", & allow window to open fully.
3. **Under decks and porches:** allowed when window can be fully opened & provides a path ≥ 36 " in height to a yard or court.
4. **Bars, grilles, covers, screens:** are permitted, must provide the minimum net clear opening, and be releasable or removable from the inside without the use of a key, tool, etc.

R311

EGRESS: provide a continuous and unobstructed path of vertical and horizontal egress travel without travel through a garage.

1. **Egress Door:** **At least one egress door**, be side-hinged, a minimum clear width of 32", clear height ≥ 78 " & openable from inside without the use of a key, special knowledge or effort.
2. **Floors & landings at exterior doors:** a landing or floor required on each side of each exterior door; minimum landing: 3'x3'
3. **Other Exterior Doors other than the required egress door:** **Exception:** A landing is not required where a stairway of two or fewer risers is located on the exterior side of the door, provided the door does not swing over the stairway.
4. **Habitable levels, attics and basements without an egress door:** provide egress by a ramp or a stairway.
5. **Exterior landings, decks, balconies & stairs:** positively anchored to the primary structure or be self-supporting; no toenailing.
6. **Hallways:** minimum width $\geq 3'$.
7. **Stairways / steps:**
 - a. **Width:** ≥ 36 " at all points; clear width at or below one installed handrail: $\geq 31\frac{1}{2}$ "; clear width at or below installed handrails on both sides: ≥ 27 ".
 - b. **Headroom:** $\geq 6' 8$ ".
 - c. **Vertical rise:** $\leq 12' 7$ " between floor levels or landings.
 - d. **Risers:** maximum $7\frac{3}{4}$ ". The greatest riser height within any flight of stairs shall not exceed the smallest by more than $3/8$ ".
 - e. **Treads:** Minimum tread depth is 10". The greatest tread depth within any flight of stairs shall not exceed the smallest by more than $3/8$ ".
 - f. **Landings for stairways:** a floor or landing is required at the top and bottom of each stairway. Exception: A floor or landing is not required at the top of an interior flight of stairs, including stairs in an enclosed garage, provided a door does not swing over the stairs.
 - g. **Handrails:** Handrails shall be provided on at least one side of each continuous run of treads or flight with four or more risers. Maximum diameter: $3\frac{1}{4}$ ". **Wood/plastic composites** to be installed per manufacturer specs.
 - h. **Spiral Stairways:** ≥ 26 " clear width at & below the handrail; tread depth: $\geq 7\frac{1}{2}$ " at 12" from the narrow edge and treads are to be identical; riser: $\leq 9\frac{1}{2}$ "; headroom: $\geq 6' 6$ ".
8. **Ramps:** maximum slope of 1 in 12 (8.3% slope). Exception: Where it is technically infeasible to comply because of site constraints, ramps may have a maximum slope of 1 in 8 eight (12.5% slope). **Ramp landings:** minimum 3' x 3' at the following areas: 1. At the top and bottom of ramps. 2. Where doors open onto ramps. 3. Where ramps change direction. **Ramp handrails:** least one side of all ramps exceeding a slope of 1 in 12 (8.3 % slope) and on both sides of open-sided walking surfaces if over 30" from floor or grade below.

- R312** **GUARDS:** required along open-sided walking surfaces (including porches, balconies, stairs, ramps and landings) over 30" from floor or grade below; guard height: $\geq 36"$; Height Exceptions: 1. Guards on the open sides of stairs: $\geq 34"$; 2. top of guard also serves as a handrail on the open sides of stairs: guard shall be 34" – 38". Opening limitations: 4" sphere cannot pass through. See exceptions.
- R312.2** **WINDOW FALL PROTECTION:** Window fall protection shall be provided where the lowest clear opening of an operable window is a minimum of 24" from the finished floor and is over 72" from the exterior finished grade or surface below. The window opening control device must not allow a 4" diameter sphere to pass. After releasing the window opening control device, the window fully opens. Window fall prevention devices must comply with ASTM F 2090.
- R313** **AUTOMATIC FIRE SPRINKLER SYSTEM:** An automatic residential fire sprinkler system shall be installed in dwellings with 4 or more stories.
- R314** **SMOKE ALARMS:** hardwired to electric with battery backup & interconnected unless wireless alarms are installed and all alarms sound upon activation of one alarm. 1. Installation locations: 1. In each sleeping room. 2. Outside each separate sleeping area in the immediate vicinity of bedrooms. 3. On each additional story including basements & habitable attics (not in crawlspaces & uninhabitable attics). Split level dwellings have an exception. 4. Not less than 3' horizontally from the door or opening of bathroom containing a bathtub or shower. 5. In the hallway and room open to the hallways where the ceiling height of a room opening to a hallway serving a bedroom exceeds that of the hallway by 24". 2. Installation near permanently installed cooking appliance: 1. Ionization smoke alarms not less than 20' horizontally. 2. Ionization smoke alarms with an alarm-silencing switch not less than 10' horizontally. 3. Photoelectric smoke alarms not less than 6'. 4. Alarms marked "helps reduce cooking nuisance alarms" not less than 6' horizontally. 3. Alterations, repairs or additions: be equipped with smoke alarms as required for new dwellings. Exceptions: 1. Work involving exterior work: (replacement of roofing / siding, addition / replacement of windows / doors, addition of a porch / deck). 2. Installation, alteration or repairs to the plumbing / mechanical systems. 3. Interconnection in existing areas are not required where alterations / 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 which could provide access for interconnection.
- R315** **CARBON MONOXIDE ALARMS:** New construction & existing dwellings requiring a building permit: carbon monoxide alarms shall be installed outside of each separate sleeping area in the immediate vicinity of the bedrooms when the home has fuel-fired appliance and/or an attached garage. Where a fuel burning appliance is located within a bedroom or its attached bathroom, a carbon monoxide alarm shall be installed within the bedroom. (Monitored carbon monoxide detection systems are permitted.)
- R318.1** **PROTECTION AGAINST SUBTERRANEAN TERMITES:** provide one or more methods of protection per R318.
- R401.3** **FOUNDATION GRADE (slope):** 6" minimum fall from foundation within 10' of foundation.
- R403.1** **FOOTINGS:** in undisturbed soil or engineered fill; 24" minimum to bottom of footer from final grade; rebar not required; continuous spread footer minimum size: 12" wide and 6" deep (turned-down footer with monolithic slab: 12" wide)
- R403.1.6** **FOUNDATION ANCHORAGE (anchor bolts):** $\geq \frac{1}{2}"$ anchor bolt (with washer & nut) spaced 6' O.C. and no less than 2 bolts per plate with one bolt no more than 12" from each end of the plate section.
- R406.2** **CONCRETE & MASONRY FOUNDATION WATERPROOFING:** exterior foundation walls below grade (basements) shall be waterproofed with code approved materials and coatings.
- R407.3** **COLUMNS (wood, steel attachment):** Wood columns size: $\geq 4" \times 4"$; Steel columns size: $\geq 3"$ diameter; protect from decay or corrosion; restrain from lateral displacement.
- R408.2** **VENTILATION (under floor):** openings shall be ≥ 1 sf for each 150 sf of under-floor space area unless ground is covered by Class 1 vapor retarder then openings shall be ≥ 1 sf for each 1,500 sf; one ventilation opening shall be within 3' of each corner of the building.
- R408.3** **UNVENTED CRAWLSPACE (conditioned):** Exposed earth is covered with a continuous Class I vapor retarder, taped & sealed joints, attached & sealed to stem wall or insulation AND a continuously operated mechanical exhaust ventilation, a conditioned air supply, a plenum (in existing structures) or dehumidifier (sized by manufacturer specs) is installed.
- R408.4** **UNDER FLOOR ACCESS (foundation):** through floor: minimum size 18" X 24"; through perimeter wall: minimum size 16" X 24"
- R502.3.3** **CANTILEVERS:** in accordance with Table R502.3.3(1) or Table R502.3.3(2).
- R506** **SLAB-ON-GROUND:** min. 3.5" thick and all vegetation, top soil & foreign material removed.
- R506.2.3** **VAPOR RETARDER:** Min. 10-mil placed between slab and base or subgrade (only required for slabs of conditioned space)
- R507** **DECKS:** positively anchored to the primary structure or self-supporting; no toenailing; LEDGERS and BAND BOARDS: flashed, minimum p.t. 2" \times 8" with $\frac{1}{2}"$ diameter lag screws and bolts—staggered pattern per Table R507.9.1.3(1); WOOD/PLASTIC COMPOSITES install per the manufacturer's instructions; CANTILEVERED DECKS: constructed to resist uplift.
- R703.1** **EXTERIOR COVERING (including housewrap):** exterior wall envelope shall be weather-resistant & include flashing.

- R703.4** **FLASHING:** Approved corrosion-resistant flashing shall be applied shingle-fashion in a manner to prevent entry of water into the wall cavity or penetration of water to the building structural framing components. **sill wrap:** flashings shall be installed per manufacturer instructions at all exterior window and door openings.
- R703.8** **STONE & MASONRY VENEER:** installed per IRC chapter 7, Table R703.3(1) and Figure R703.8(1) & R703.8(2)
- R703.10.1** **PANEL SIDING:** Fiber-cement panels shall comply with the requirements of ASTM C 1186, Type A, minimum Grade II and manufacturer's installation instructions.
- R703.11** **VINYL SIDING:** install per manufacturer's installation instructions.
- R801.3** **ROOF DRAINAGE:** gutters & downspouts required for water drainage from foundations.
- R802.5.2** **CEILING JOIST & RAFTER CONNECTIONS:** ceiling joists or rafter ties are required at every rafter. Collar ties or ridge straps are required to be in the top third of the attic space, a minimum of 1"x4", & spaced not more than 48" on center. Cathedral ceilings (no ceiling joists or rafter ties) must have the wall or ridge beam carry the full roof load. Walls need to be supported by a continuous foundation and/or beams & girders. The ridge beam must be able to support the full load of the rafters.
- R802.11** **ROOF TIE-DOWN (hurricane ties):** rafters / trusses shall be attached to supporting walls & capable of resisting roof uplift.
- R806.2** **ROOF VENTILATION:** minimum: $\frac{1}{150}$ of the area of the vented space. Exception: minimum $\frac{1}{300}$ of the vented space providing at least one of the following: 1. Class I or II vapor retarder is installed on the warm-in-winter side of the ceiling 2. At least 40% and not more than 50% of the required ventilating area is provided with ventilators.
- R807** **ATTIC ACCESS:** minimum 22" X 30" attic access opening to attic areas that are more than 30 sf and a height of ≥ 30 ".
- R905.2** **ASPHALT SHINGLES:** slopes: $\geq 2:12$; install per manufacturer.
- R905.4** **METAL ROOFING:** panels: install per manufacturer specifications; metal roof shingles: install on $\geq 3:12$ pitch per IRC and manufacturer's installation instructions.
- R905.5** **MINERAL-SURFACE ROLL ROOFING:** install on $\geq 3:12$ pitch per IRC and manufacturer's installation instructions.
- R905.10.1** **METAL ROOF PANELS:** Metal roof panel roof coverings shall be applied to solid or spaced sheathing, except where the roof covering is specifically designed to be applied to space supports. The manufacturer's installation instructions govern.
- R1004/R1005** **FACTORY-BUILT FIREPLACES / CHIMNEYS:** per IRC and manufacturer's installation instructions.
- Section 73-28** **SITE ADDRESS (911 address):** Numbers/letters to be light reflective & contrasting color to the background. Numbers/letters to be 3" on a mailbox and 4" on a structure. See County Code section 73-28 for more information.

