Residential Construction Code Requirements

Below are several of the code requirements to look for in residential construction from the 2009 IRC code as amended by MUBEC. This list may be updated as sections are added but will never be all inclusive of all building code requirements.

Exterior

- 6" distance from soil to wood siding/trim. (R317.1, #5)
- House numbers plainly visible legible from the street or road fronting the property minimum 4" and of contrasting color. (R319)
- The grade at the foundation falls away from the building a minimum of 6" within the first 10'. Minimum slope 5% where less than 6" fall in 10'. Swales (if using) minimum 2% slope. (R401.3 & exception)
- Chimney terminations are 2' above any roof/structure within 10' and not less than 3' above the highest point where the chimney passes through the roof. (R1003.9)
- If installed, spark arresters installed on top of chimney comply with (R1003.9.1)

Decks, stairs and walkways

- Bottom of footings are minimum 4' below grade for frost protection. (Table R301.2.(1) – local Jurisdiction, (R403.1.4)
- Where deck is >30" vertical above the grade plane within 36" horizontal distance, a guard is installed. *Insect screening is not a guard* (R312.1)
- All deck material treated or naturally resistant to decay. Cuts, notches, and holes are treated with preservative. (R317.1, R317.1.1, R317.1.5 & R317.2)
- Fasteners and hardware for pressure preservative treated wood shall be of hot-dipped galvanized steel, stainless steel, silicon bronze, zinc coated (other than nails) or copper. (R317.3, R317.3.1 and manufacturer's requirements)
- Ledger for decks bolted/lagged to structure with minimum 3/8" bolts/lags, a minimum 16"o.c. (R502.2.1)
- Attached deck is positively attached and supports both lateral and live loads (40lb/sq.ft. minimum) (R301.5, R502.2.2)
- Deck lateral connections require 1,500 lb. minimum hold-down tension devices, installed in not less than two locations per deck, installed and connected to interior joists (IRC figure R502.2.2.3)
- Cantilevers blocked at bearing end (Table R502.3.3(2), note "e")
- 6'8" minimum headroom at stairways measured vertically from the nose of the treads, landings or platforms. (R311.7.2)
- All stairs are provided with illumination, and light switch at each floor level of 6 or more risers. (R311.7.8 & R303.6)
- Stair nosing ¾" – 1 ¼" required when solid risers are installed except when the tread depth is 11" minimum. (R311.7.4.3)
- Open risers don"t allow passage of 4" sphere, except stairs with a rise of 30" or less. (R311.7.4.3)
- Radius of curvature at the leading edge of the tread is not over 9/16". (R311.7.4.3)

- The greatest nosing projection doesn‟t exceed the smallest by >3/8”. (R311.7.4.3)
- Stair riser maximum 7 3/4", treads minimum 10". (R311.7.4)
- Stair riser/tread maximum dimension doesn‟t exceed smallest by >3/8". (R311.7.4)
- Guards don‟t allow passage of 4" sphere. (R312.3)
- Guards installed at the sides of stairs don‟t allow the passage of 4 3/8” sphere.
- Triangle formed by riser, tread and bottom element of guardrail doesn‟t allow passage of 6” sphere. (R312.3)
- Guards adjacent to floor surfaces over 30” from adjacent floor or grade are a minimum 36" height to the top of the guard. (R312.1)
- Open sides of stairs with a total rise of 30” above the floor or grade below have guards minimum 34” in height when measured vertically from the stair nosing to the top of the guard. (R312.1 & R312.2 exceptions 1 & 2)
- Handrails and guards capable of withstanding 200 lbs. applied in any direction at any point on the rail. (IBC 1607.7.1.1)
- Handrail at stairs with 4 or more risers. (R311.7.7)
- Handrail minimum 34" to maximum 38" above nose of tread to top of handrail. (R311.7.7.1)
- Type I handrails with circular cross sections 1 1/4” - 2" diameter. (R311.7.7.3)
- Type I handrails with noncircular cross sections have a perimeter dimension of 4” – 6 ¼” with a maximum cross section of 2 ¼”. (R311.7.7.3)
- Type II handrails with perimeters greater than 6 ¼” require a graspable finger recess area on both sides of the profile. The minimum & maximum width above the recess is 1 ¼” – 2 ¾”. (See section for details.) (R311.7.7.3)
- Handrail returns to wall, maximum 4 1/2" off wall with minimum 1 1/2" clear space from inside of rail to wall. (R311.7.1, R311.7.7.2)
- Glazing at stairs/walkways is safety glass when located within 36" horizontally and 60" vertically from walking surface. (See section for exceptions) (R308)
- Glazing adjacent to stairways within 60” horizontally of the bottom tread of stairway in any direction when the exposed surface of the glass is less than 60” above the nose of the tread. (R308.4 exception #8)
- The floor landing at the exit door not more than 1.5” lower than the top of the threshold. (R311.3.1)
- Exterior doors have landings, minimum 36"x 36", or per size of door opening. The floor or landing at the exit door shall not be more than 1.5” lower than the top of the threshold. Floors or landing at doors other than the exit door don‟t have to meet this requirement. May step down 7 3/4" below door opening unless the door swings over the landing. Where a stairway of two of fewer risers is located on the exterior side of a door, other than the required exit door, a landing is not required for the exterior side of the door. (R311.3)

Concrete Floors (On Ground R506)

- Concrete slab-on-ground floors shall be a minimum 3.5 inches (89 mm) thick (for expansive soils, see Section R403.1.8). The specified compressive strength of concrete shall be as set forth in Section R402.2. (R506.1)

- Fill material shall be free of vegetation and foreign material. The fill shall be compacted to assure uniform support of the slab, and except where *approved*, the fill depths shall not exceed 24 inches (610 mm) for clean sand or gravel and 8 inches (203 mm) for earth. (R506.2.1)
- A 4-inch-thick (102 mm) base course consisting of clean graded sand, gravel, crushed stone or crushed blast-furnace slag passing a 2-inch (51 mm) sieve shall be placed on the prepared subgrade when the slab is below *grade*. (R506.2.2)
    - **Exception:** A base course is not required when the concrete slab is installed on well-drained or sand-gravel mixture soils classified as Group I according to the United Soil Classification System in accordance with Table R405.1.
- **Vapor retarder.** A 6 mil (0.006 inch; 152 μm) polyethylene or *approved* vapor retarder with joints lapped not less than 6 inches (152 mm) shall be placed between the concrete floor slab and the base course or the prepared subgrade where no base course exists. (R506.2.3)
    - **Exception:** The vapor retarder may be omitted:
    - 1. From detached garages, utility buildings and other unheated *accessory structures*.
    - 2. For unheated storage rooms having an area of less than 70 square feet (6.5 m^2) and carports.
    - 3. From driveways, walks, patios and other flatwork not likely to be enclosed and heated at a later date.
    - 4. Where *approved* by the *building official*, based on local site conditions.
- **Reinforcement support.** Where provided in slabs on ground, reinforcement shall be supported to remain in place from the center to upper one third of the slab for the duration of the concrete placement. (R506.2.4)

Basements and Crawl space

- See Concrete Floors (On Ground R506)
- Basements have at least one Emergency Escape and Rescue opening compliant with (R310) <u>Exception;</u> where the basement is used only to house mechanical equipment, total floor area is no greater than 200 square feet and the dwelling is sprinkled.
- Interior posts at basements or cellars must be pressure treated unless 8” above grade and protected by an impervious moisture barrier. (R317.1)
- Where required, flood resistant construction in flood hazard areas (treated/water resistant materials, flood vents, etc.) (R322)
- Venting at crawl as shown on plan, with on opening within 3’ of each corner and minimum 1sq.ft. / 150sq.ft. (R408.1, R408.2)
- Crawl through floor access 18” x 24”. (R408.4)
- Crawl openings through a perimeter wall 16” x 24”. (R408.4)
- Remove all debris from the crawl space. (R408.5)
- ***Delete*** Section (R313.2) in its entirety.

  Insert (IRC) (R501.3) Fire protection of floors, Floor assemblies, not required elsewhere in this code to be fire resistance rated, shall be provided with a ½ inch gypsum wallboard membrane, 5/8 inch wood structural panel membrane, or equivalent on the underside of the floor framing member.

Exceptions:

1. Floor assemblies located directly over a space protected by an automatic sprinkler system in accordance with Section ~~P2904,~~ NFPA 13D, or other approved equivalent sprinkler system.

2. Floor assemblies located directly over a crawl space not intended for storage or fuel-fired appliances.

3. Portions of floor assemblies can be unprotected when complying with the following:

3.1 The aggregate area of the unprotected portions shall not exceed 80 square feet per story.

3.2 Fire blocking in accordance with Section R302.11.1 shall be installed along the perimeter of the unprotected portion to separate the unprotected portion from the remainder of the floor assembly.

4. Wood floor assemblies using dimension lumber or structural composite lumber equal to or greater than 2-inch by 10-inch nominal dimension, or other approved floor assemblies demonstrating equivalent fire performance.

Attached Garages

- ☐ See Concrete Floors (On Ground R506)
- ☐ Ducts in garages which penetrate the walls or ceilings separating the dwelling from the garage shall be constructed of a minimum No. 26 gage sheet metal and can have no openings into the garage. (R302.5.2)
- ☐ Openings directly into a room used for sleeping purposes is not permitted (R302.5.1)
- ☐ 1 3/8" solid wood door, 1 3/8" solid or honeycomb steel door or any 20-minute fire-rated door between house and garage. (R302.5.1)
- ☐ Other penetrations through garage walls and ceilings are filled with approved material to resist free passage of flame and smoke. (R302.5.3, R302.11 #4) *Note: Per R302.11 #4, the approved material does <u>NOT</u> have to comply with ASTME-E-136 and therefore <u>CAN</u> be of combustible material. This section includes both through and membrane penetrations; these penetrations are <u>NOT</u> required to be rated, rating is only required by R302.4. Example; a plastic pvc drain pipe can pass into or through the separation wall without a fire collar; only the area around the pipe must be filled and the filling does not have to be noncombustible.*
- ☐ Single family garages are separated from the residence and its attic area by not less than ½" gypsum board applied to the garage side *(Note: Only ½" required on the garage ceiling including when the attic of the dwelling extends over the garage)*. Garages beneath habitable rooms shall be separated from all habitable rooms above by not less than 5/8" type x gypsum board or equivalent *(Note: This separation is not required to be rated unless it is an extension of a required rated*

assembly such as a two family fire-resistant wall assembly). Structures supporting a floor/ceiling assembly are protected by minimum ½" gypsum board or equal. (R302.6) There is no specific requirement to mud and tape the seams but all seams and gaps must be fire-blocked or treated with an approved material designed to resist the free passage of flame and products of combustion (R302.11, R302.11 #4); *Note: mudded and tapped joints, caulking or any sealant will satisfy the requirement. Per R302.11 #4, the approved material does NOT have to comply with ASTME-E-136 and therefore CAN be of combustible material.*

- ☐ The floor is noncombustible material and slopes to a drain or the vehicle entry door (R309.1)
- ☐ Carports not open on at least two sides will be inspected as garages and all fire separation requirements will apply. The floor of a ground level carport may be any noncombustible material or asphalt and must slope to a drain or the vehicle entry door. (R309.2)

Attics

- ☐ Habitable attics have at least one Emergency Escape and Rescue opening compliant with (R310) and Means of Egress compliant with (R311) *Note: The Habitable Attic is an area that can be finished and used for living space without being called a Story. To be considered a living space it must meet requirements such as minimum headroom heights per section R305, a minimum square footage of 70 sq. ft., emergency escape and rescue access, means of egress, smoke detection, etc. If the attic will only be used for storage, regardless of its size, it does not have to be designed with any features required for a Habitable Attic including egress.*
- ☐ Unobstructed 22" x 30" or larger attic accesses required to areas exceeding 30 square feet and which have a vertical height of 30" or greater located in hallways or other readily accessible location. (R807.1)
- ☐ Accesses located in hallways or other readily accessible location. (R807.1)

Energy

- ☐ Blower Door test or Air Sealing inspection report provided to demonstrate Air Sealing (IECC 402.4.2)
- ☐ Energy Certificate posted on or in electric panel (IECC 401.3)
- ☐ Basement or Crawl space walls insulated to R10/R13 or floor system R30/cavity depth (IECC tbl. 402.1.1)
- ☐ Foam board insulation is protected with an ignition barrier (R316.4) or exempt (R316.5 or 316.6)

Stairs, Guards and Handrails

- ☐ Exterior doors have landings, minimum 36"x 36", or per size of door opening. The floor or landing at the exit door shall not be more than 7 ¾" lower than the top of the threshold provided the door does not swing over the landing exception; storm doors). Where a stairway of two of fewer risers is located on the exterior side of a door, other than the required exit door, a landing is not required for the exterior side of the door. (R311.3)
- ☐ For differing stair types and requirements see (R311.7, R311.7.9)
- ☐ 6'-8" minimum headroom at stairways measured vertically from the nose of the treads, landings or platforms. (R311.7.2)

- Stair riser maximum 7 3/4” treads minimum 10". (R311.7.4)
- Stair riser/tread maximum dimension doesn’t exceed smallest by >3/8". (R311.7.4)
- Stair riser/tread maximum dimension doesn’t exceed smallest by >3/8". (R311.7.4)
- Open risers permitted when opening between treads do not allow passage of 4" sphere. (R311.7.4.3)
- Stair nosing ¾” – 1 ¼” required when solid risers are installed except when the tread depth is 11” minimum. (R311.7.4.3)
- Open risers don’t allow passage of 4” sphere, except stairs with a rise of 30” or less. (R311.7.4.3)
- Radius of curvature at the leading edge of the tread is not over 9/16”. (R311.7.4.3)
- The greatest nosing projection doesn’t exceed the smallest by >3/8”. (R311.7.4.3)
- Handrails and guards capable of withstanding 200 lbs. applied in any direction at any point on the rail. (IBC 1607.7.1.1)
- Handrail at stairs with 4 or more risers. (R311.7.7)
- Handrail minimum 34" to maximum 38" above nose of tread to top of handrail. (R311.7.7.1)
- Handrail returns to wall, maximum 4 1/2" off wall with minimum 1 1/2" clear space from inside of rail to wall. (R311.7.1, R311.7.7.2)
- Type I handrails with circular cross sections 1¼" - 2" diameter. (R311.7.7.3 #1)
- Type I handrails with noncircular cross sections have a perimeter dimension of 4” – 6 ¼” with a maximum cross section of 2 ¼”. (R311.7.7.3 #1)
- Type II handrails with perimeters greater than 6 ¼” require a graspable finger recess area on both sides of the profile. The minimum & maximum width above the recess is 1 ¼” – 2 ¾”. (R311.7.7.3, #2)
- Guards don’t allow passage of 4" sphere. (R312.3)
- Triangle formed by riser, tread and bottom element of guardrail doesn’t allow passage of 6” sphere. (R312.3)
- Guards adjacent to floor surfaces over 30” from adjacent floor or grade are a minimum 36" height to the top of the guard. (R312.1) Exception; open sides of stairs with a total rise of greater than 30” above the floor or grade below shall have guards not less than 34” in height when measured vertically from the stair nosing. (R312.2 #1)
- Guards at sides of stair treads do not allow passage of 4 3/8" sphere. (R312.3, #2)

Smoke Alarms and Carbon Monoxide Alarms

- Smoke alarms are installed in each sleeping area, outside each sleeping area in the immediate vicinity and on each story of the dwelling including basements and habitable attics but not including crawl spaces and uninhabitable attics. (R314.1)
- Smoke alarms are listed and installed in accordance with the provisions of this code and the household fire warning equipment provisions of NFPA 72. (R314.1)
- Smoke alarms are required when interior alterations, repairs or additions requiring a building permit occur. (R314.3.1)
- Alarms are interconnected and hard wired unless the area of work does not result in the 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 the hard wiring. (R314.4)

- Carbon monoxide alarms are required for all new dwellings and in existing dwellings when construction requiring a permit occurs and the dwelling contains a fuel fired appliance and/or has an attached garage. The alarm(s) must be installed outside of each sleeping area in the immediate vicinity of the bedrooms. (R315)

Windows and Glazing

- **R612.2 Window sills.** In *dwelling* units, where the opening of an operable window is located more than 72 inches (1829 mm) above the finished *grade* or surface below, the lowest part of the clear opening of the window shall be a minimum of 24 inches (610 mm) above the finished floor of the room in which the window is located. Operable sections of windows shall not permit openings that allow passage of a 4 inch (102 mm) diameter sphere where such openings are located within 24 inches (610 mm) of the finished floor.

Exceptions:

1. Windows whose openings will not allow a 4-inchdiameter (102 mm) sphere to pass through the opening when the opening is in its largest opened position.
2. Openings that are provided with window fall prevention devices that comply with Section R612.3.
3. Openings that are provided with fall prevention devices that comply with ASTM F 2090.
4. Windows that are provided with opening limiting devices that comply with Section R612.4. ***Note: This must be a clearly identified emergency release devise that operates without the need for a key, tool or special knowledge for the window to count as an Emergency Escape and Rescue opening (commentary to R612.2)***

- Bedroom window sill not more than 44" from floor to bottom of window opening. Minimum 5.7sq.ft. Clear opening, 20" minimum width, and 24" minimum height. (R310). *Note: The 5.0sq.ft exception for ground floor windows was removed by MUBEC amendment. All egress windows must be 5.7sq.ft. or larger.*
- Emergency escape and rescue openings must be operational from the inside without the use of keys, tools, or special knowledge. (R310.1.4)
- Safety glazing installed in hazardous locations is marked with type and thickness. Mark is acid etched, sandblasted, ceramic-fired, embossed or made by other permanent means. (R308.1) *Note: A sticker does not satisfy the requirement.*
- Safety glazing is installed at hazardous locations (R308.4)

1. Glazing in swinging doors, fixed and sliding panels of sliding door assemblies, panels in sliding and bifold closet door assemblies, storm doors and all unframed swinging doors.
2. Glazing in fixed or operable panels adjacent to a door where the nearest vertical edge is within a 24” arc of either vertical edge of the door in a closed position and where the bottom exposed edge of the glazing is less than 60” above the walking surface. Except where there is an intervening wall or partition between door and glazing or where the door accesses a closet 3" or less in depth.
3. Glazing in an individual fixed or operable panel, when all of the following apply:
    a. Expose area of an individual pane greater than 9 sq.ft.
    b. Bottom edge less than 18” above the floor.
    c. Top edge greater than 36” above the floor.
    d. One or more walking surfaces within 36” horizontally of the glazing. Exception: Where a protective 1 ½” wide bar is installed on the accessible side of the glazing 34”- 38” above the floor and capable of withstanding a load of 50lbs per linear foot.

4. Glazing in railings regardless of area or height above a walking surface. Includes structural baluster panels and nonstructural in-fill panels.
5. Glazing in doors and enclosures for hot tubs, whirlpools, saunas, steam rooms, bathtubs and showers. Glazing in any portion of a building wall enclosing these compartments where the bottom exposed edge of the glazing is less than 60” above any standing or walking surface.
6. Glazing in walls and fences enclosing indoor and outdoor swimming pools, hot tubs and spas where the bottom edge of the glazing is less than 60” above a walking surface and within 60 “ horizontally of the water’s edge.
7. Glazing adjacent to stairways, landings and ramps within 36” horizontally of a walking surface when the exposed surface of the glass is less than 60” above the plane of the adjacent walking surface. Except where a handrail or guard is installed per IBC Sections 1013 & 1607.7.
8. Glazing adjacent to stairways within 60” horizontally of the bottom tread of a stairway in any direction when the exposed surface of the glass is less than 60” above the nose of the tread. Exception: When the side of stair, landing or ramp has a guard or handrail with balusters or in-fill panels and the plane of the glass is more than 18” from the railing. (R308.4)