



# CITY OF BULLHEAD CITY

## 2018 International Residential Code (IRC)

### (EXCERPTS)

This list has been compiled in order to outline the most common type of Residential code related questions. All requirements for a specific project type may not be listed. It is the applicant's responsibility to verify specific conditions of approval. If you have questions contact Building staff for clarification prior to submittal at 928-763-0124. Additional Zoning restrictions may apply, contact Zoning staff at 928-763-0123.

Design loads: Ultimate Design Wind Speed: 115mph; Basic Wind Speed: 90mph; Wind Exposure C; Ground Snow Load: NA; Seismic Design Category: B.

Information applies to basic one and two-family Light Frame Wood Construction only. See the IRC/IBC for all other conditions. Design by an AZ licensed registrant may be required for your project.

Code sections are referenced. A read only copy of the International Residential Code can be found on line at: <https://codes.iccsafe.org/content/IRC2018P7>

1. FOUNDATION FOOTING SIZE: IRC Table R403.1(1), Section R403.1.4  
(20 psf roof load, 1500 psf soil)
  - One- and two-story slab-on-grade: minimum 12 inches wide, 6 inches thickness, minimum 12 inches below undisturbed ground surface.
  - One-story with crawl space: minimum 12 inches wide, 6 inches thickness, minimum 12 inches below undisturbed ground surface.
  - Two-story with crawl space: minimum 16 inches wide, 6 inches thickness, minimum 12 inches below undisturbed ground surface.
  - Three-story, basement, masonry, etc. provide design by an AZ licensed registrant.
2. FOOTING REINFORCEMENT: R403.1.3.5.3  
(2) #4 Rebar; Located at top and bottom of footing; Minimum 3" concrete cover.
3. CONCRETE: IRC Table R402.2  
Minimum specified compressive strength of concrete 2500psi, at 28 days.
4. FOUNDATION ANCHORAGE: IRC Section R403.1.6
  - Exterior and bearing wall locations: Anchor bolts shall be not less than 1/2 inch in diameter x 10 inches long, embedded at least 7 inches, spaced no more than 6 feet apart. A nut and washer shall be tightened on each bolt to the plate. There shall be not fewer than 2 bolts per plate section with one bolt located not more than 12 inches or less than seven bolt diameters from each end of the plate section.
  - Interior non-bearing and not a braced wall: Shall be positively anchored with approved fasteners.
5. FOOTINGS ON OR ADJACENT TO SLOPES: IRC Section R403.1.7  
The placement of buildings and structures on or adjacent to slopes steeper than one unit vertical in three units horizontal shall conform to Sections R403.1.7.1 through R403.1.7.4.
  - Descending Slope: height of slope / 3, maximum of 40' required.
  - Ascending Slope: height of slope / 2, maximum of 15' required.
6. FOUNDATION DAMPPROOFING: IRC Section R406  
Foundation walls enclosing a basement below finished grade shall be damp proofed on the outside by approved methods and materials.
7. UNDER FLOOR VENTILATION:  
IRC Section R408.1. Under floor areas must be provided with openings having a net area of not less than 1 square foot for each 150 square feet of under floor area. Openings shall be located within three feet of corners and shall provide cross-ventilation. Ventilation openings are not required when the ground surface is covered with an approved vapor retarder material; the space is supplied with conditioned air.
8. PROTECTION OF WOOD AGAINST DECAY:  
IRC Section R317.1.2. All wood in contact with the ground, embedded in concrete in direct contact with the ground or embedded in concrete exposed to the weather that supports permanent structures intended for human occupancy shall be approved pressure-preservative-treated wood suitable for ground contact use.
9. COLUMNS AND POSTS: IRC Section R407, R317  
Wood columns shall be protected against decay as set forth in Section R317.1.4.

10. GIRDERS ENTERING MASONRY OR CONCRETE WALLS: IRC Section R317.1  
Ends of wood girders entering concrete or masonry wall shall be provided with a 1/2 inch airspace on tops, sides and ends unless approved wood of natural resistance to decay or treated wood is used.
11. POST-BEAM FASTENING: IRC Section R502.9.  
Where posts and beam or girder construction is used to support floor framing, positive connections shall be provided to ensure against uplift and lateral displacement.
12. RETAINING WALLS: IRC Section R404.4. (amended)  
Retaining walls, not part of a building, shall be constructed per the City of Bullhead City's standard retaining wall details or shall be designed by an Arizona licensed registrant.
13. UNDER-FLOOR SPACE VENTILATION: IRC Section R408  
Crawl spaces shall have ventilation not less than 1 square foot for each 150 square feet, unless there is a Class I vapor barrier. Then, not less than 1 square foot for each 1500 square feet. One opening shall be within 3 feet of each corner of the building. Openings shall have an approved cover material with maximum 1/4 inch openings.
14. UNDERFLOOR ACCESS: IRC Section R408.4  
Under floor areas shall be supplied with an access opening. Floor- 18 inches x 24 inches or Wall- 16 inches x 24 inches. Opening shall be unobstructed by pipes, ducts or similar construction. Larger openings are required if mechanical appliances are underfloor, see Section M1305.1.3.
15. UNDERFLOOR CLEARANCE: IRC Section R317.1(1)  
Preservative-treated wood is required when wood joists or the bottom of a wood structural floor are closer than 18 inches or wood girders are closer than 12 inches to the exposed ground in crawl spaces or unexcavated area located within the periphery of the building foundation. Additional underfloor clearance is required if mechanical appliances are underfloor, see Section M1305.1.3.
16. DRAINAGE: IRC Section R401.3.  
Lots shall be graded to drain surface water away from foundation walls. The grade shall fall not fewer than 6 inches within the first 10 feet. Where lot lines, walls, slopes or other physical barriers prohibit 6 inches of fall within 10 feet, drains or swales shall be constructed to ensure drainage away from the structure. Impervious surfaces within 10 feet of the building foundation shall be sloped not less than 2 percent away from the building.
17. LUMBER GRADING: IRC Section R602.1, R802.1  
All wood used in construction shall conform to the applicable standards or grading rules of the IRC and shall be identified by a grade mark.

18. WOOD & EARTH SEPARATION: IRC Section R317.1 (5)  
Wood siding, sheathing and wall framing on the exterior of a building having a clearance of less than 6 inches from the ground or less than 2 inches measured vertically from concrete steps, porch slabs, patio slabs and similar horizontal surfaces exposed to the weather.
19. WOOD FLOOR FRAMING DETAILS: IRC Section R502.  
Beams and girders supported by concrete or masonry shall have not less than 3 inches of bearing. Floor joists shall be supported laterally at the ends and at each support by solid blocking not less than 2 inches nominal in thickness or by attachment to a full-depth header, band or rim joist, or to an adjoining stud or shall be otherwise provided with lateral support to prevent rotation. Joist framing from opposite sides of a beam or partition shall be lapped at least 3 inches.
20. BEARING PARTITIONS: IRC Section R502.6  
The ends of each joist, beam or girder shall have not less than 1 1/2 inches of bearing on wood or metal, have not less than 3 inches of bearing on masonry or concrete or be supported by approved joist hangers. Alternatively, the ends of joists shall be supported on a 1-inch by 4-inch ribbon strip and shall be nailed to the adjacent stud. The bearing on masonry or concrete shall be direct, or a sill plate of 2-inch-minimum nominal thickness shall be provided under the joist, beam or girder. The sill plate shall provide a minimum nominal bearing area of 48 square inches.
21. WALL FRAMING: IRC Section R602  
Stud size, height and spacing shall meet the requirements of R602.3.1 and Tables R602.3(5) & (6). Typically, 2x4 or 2x6, at 16 or 24 inches on center, and not exceeding 10 feet in height without design by a registrant. Studs shall be placed with their wide dimension perpendicular to the wall. Bearing and exterior walls shall have double top plates that overlap at corners and partitions. End joints in double top plates shall be offset at least 24 inches. The minimum length of any cripple wall stud shall not be less than 14 inches unless sheathed on at least one side with a wood structural panel or the cripple wall shall be constructed of solid blocking.
22. WALL BRACING: IRC Section R602.10  
Buildings shall be braced in accordance with the prescriptive sections of R602.10 or shall be designed by an Arizona licensed registrant. (See page 8.)
23. HEADERS: IRC Section R602.7  
Headers shall be sized per the applicable header tables R602.7(1), (2) or (3) or be designed by an Arizona licensed registrant. All openings more than 4 feet wide shall be provided with headers consisting of either two pieces of 2 inch framing lumber placed on edge and securely fastened together or 4 inch lumber. Each end of the header shall have at least 1 1/2 inches of bearing for the full width. Headers shall be designed to support the loads specified by the IRC.

24. FIREBLOCKING: IRC Section R302.11

Fire-blocking and draft-stopping shall be installed to cut off all concealed draft openings (both vertical and horizontal) and shall form an effective barrier between floors, between a top story and a roof or attic space, and shall subdivide attic spaces, concealed roof spaces and floor-ceiling assemblies. Fire blocking shall be provided every 10 feet both vertically and horizontally, in concealed spaces of stud walls and partitions and at the ceiling and floor levels, including soffits, drop ceilings, cove ceilings, stair stringers, around vents, pipes, ducts, chimneys and fireplaces, and similar openings which afford a passage for fire at ceiling and floor levels.

25. DRAFTSTOPPING: IRC Section R302.12

In combustible construction where there is usable space both above and below the concealed space of a floor-ceiling assembly, draftstops shall be installed so that the area of the concealed space does not exceed 1,000 square feet. Draftstopping shall divide the concealed space into approximately equal areas. Where the assembly is enclosed by a floor membrane above and a ceiling membrane below, draftstopping shall be provided in floor-ceiling assemblies under the following circumstances: 1. Ceiling is suspended under the floor framing. 2. Floor framing is constructed of truss-type open-web or perforated members.

26. WEATHER RESISTIVE BARRIERS: IRC Section R703

All weather-exposed surfaces shall have a weather-resistive barrier to protect the interior wall covering. The felt or paper shall be applied horizontally with the upper layer lapped over the lower layer not less than 2 inches. Where vertical joints occur, felt or paper shall be lapped not less than 6 inches. (See Section R703.1.1 for Exceptions)

27. EXTERIOR WALL COVERINGS: IRC Section R703

Exterior walls shall provide the building with a weather-resistive exterior wall envelope. The exterior wall envelope shall be designed and constructed in such a manner as to prevent the accumulation of water within the wall assembly by providing a water resistive barrier behind the exterior cladding as required by IRC R703.2.

28. ROOF FRAMING - TRUSSES: IRC Section R802.10

Trusses shall be designed by an Arizona licensed registrant. The truss packet shall include a truss layout sheet, engineering data per R802.10.1 for each truss and installation specifications. Trusses for buildings designed by a registrant must also be approved by the building registrant prior to submittal to the City. Roof trusses shall be supported laterally at points of bearing by solid blocking to prevent rotation and lateral displacement. Trusses shall be provided with a hurricane clip at ends to prevent uplift.

29. ROOF FRAMING - RAFTERS: IRC Section R802.4

Rafters shall be sized based on Tables R802.4.1(1) through (8). Rafters shall be framed directly opposite each other at the ridge with a collar tie, gusset plate or ridge strap. The ridge board shall be at least 1 inch nominal thickness, and all

valley or hip rafters shall be at least 2 inches nominal thickness. Structural members that support rafters and ceiling joist, such as ridge beams, hips, and valleys, shall be designed as beams when the roof pitch is less than 3:12.

30. RAFTER COLLAR TIES: IRC Section R802.4.6

Rafter ties shall be placed not more than 4 feet on center. Roof rafters and ceiling joists shall be supported laterally at points of bearing by solid blocking to prevent rotation.

31. CEILING JOISTS: IRC Section R802.5

Ceiling joists shall be sized based per Tables R802.5.1(1) and (2) and connected per R802.5.2.

32. FRAMING AROUND OPENINGS: IRC Section R802.9.

Openings in roof and ceiling framing shall be framed with header and trimmer joists. Approved hangers shall be used for the header joist to trimmer joist connections where the header joist span exceeds 6 feet.

33. LATERAL SUPPORT: IRC Section R802.8

Roof framing rafters and ceiling joists shall be provided with lateral support to prevent rotation and lateral displacement at bearing points.

34. ROOF COVERING MATERIALS AND APPLICATION: IRC Section 905.1

Roof coverings shall be applied in accordance with the applicable provisions of this section and the manufacturer's installation instructions.

35. ATTIC VENTILATION: IRC Section R806

The minimum net free ventilation area shall be 1/150 of the area being vented. Enclosed rafter spaces formed where ceilings are applied directly to the underside of roof rafters shall have cross ventilation for each separate space. 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.

36. ATTIC ACCESS: IRC Section R807.1

Attics with a minimum area of 30 square feet and a vertical height of 30 inches must be provided with minimum access openings of not less than 22 inches x 30 inches.

37. ACCESS HATCHES AND DOORS: IRC Section 1102.2.4

Access doors from conditioned spaces to unconditioned spaces such as attics and crawl spaces shall be weather-stripped and insulated to a level equivalent to the insulation on the surrounding surfaces.

38. PREMISES IDENTIFICATION: IRC Section R319.

The address identification shall be legible and placed on the building in a position that is visible from the street or road fronting the property. Address identification

characters shall contrast with their background. Each character shall be not less than 4 inches in height with a stroke width of not less than 0.5 inch. Where the building address cannot be viewed from the public way, a monument, pole or other sign or means shall also be used to identify the structure. Address identification shall be maintained.

39. REQUIRED HEATING: IRC Section R303.10

Every dwelling unit shall be provided with heating facilities capable of maintaining a room temperature of not less than 68°F at a point 3 feet above the floor and 2 feet from exterior walls in habitable rooms at the design temperature.

40. GYPSUM WALLBOARD: IRC Section R702.3

Use of water-resistant gypsum backing board shall be permitted on ceilings. Water-resistant gypsum board shall not be installed over a Class I or II vapor retarder in a shower or tub compartment. Cut or exposed edges, including those at wall intersections, shall be sealed as recommended by the manufacturer. Water-resistant gypsum backing board shall not be used where there will be direct exposure to water, or in areas subject to continuous high humidity. Materials used as backers for wall tile in tub and shower areas and wall panels in shower areas shall be of materials listed in Table R702.4.2 and installed in accordance with the manufacturer's recommendations.

41. GYPSUM WALLBOARD NAILING: IRC Section R702.3.5.1

Fasteners for attaching gypsum board to wood framing shall penetrate the wood not less than 5/8 inch and 3/8 inch for steel. Spacing for fasteners shall be as required by Table R702.3.5.

42. ROOM VENTILATION: IRC Section 303.1

All habitable rooms shall be provided with natural ventilation through openable windows, doors, louvers, or other approved openings to the outside air. Such openings shall be provided with ready access or shall otherwise be readily controllable by the building occupants. The openable area to the outdoors shall be not less than 4 percent of the floor area being ventilated. (Exceptions may apply.)

43. BATHROOM VENTILATION & GLAZING: IRC Section 303.3

Bathrooms, water closet compartments and other similar rooms shall be provided with aggregate glazing area in windows of not less than 3 square feet, one-half of which shall be openable. (Exceptions may apply.)

44. EXHAUST DUCTS: IRC Section 1501.1. The air removed by every mechanical exhaust system shall be discharged to the outdoors in accordance with Section M1504.3. Air shall not be exhausted into an attic, soffit, ridge vent or crawl space.

45. EGRESS WINDOWS: IRC Section R310.

Basements, habitable attics and every sleeping room shall have not less than one operable emergency escape and rescue opening. Where basements contain one or more sleeping rooms, an emergency escape and rescue opening shall be required in each sleeping room. Emergency escape and rescue openings shall

open directly into a public way, or to a yard or court that opens to a public way. Emergency escape and rescue openings shall have a net clear opening of not less than 5.7 square feet. The net clear opening dimensions required by this section shall be obtained by the normal operation of the emergency escape and rescue opening from the inside. The net clear height of the opening shall be not less than 24 inches and the net clear width shall be not less than 20 inches. Where a window is provided as the emergency escape and rescue opening, it shall have a sill height of not more than 44 inches above the floor; where the sill height is below grade, it shall be provided with a window well in accordance with Section R310.2.3. The horizontal area of the window well shall be not less than 9 square feet, with a horizontal projection and width of not less than 36 inches. The area of the window well shall allow the emergency escape and rescue opening to be fully opened. Window wells with a vertical depth greater than 44 inches shall be equipped with a permanently affixed ladder or steps usable with the window in the fully open position.

46. SMOKE ALARMS: IRC Section R314

A smoke alarm shall be installed in each sleeping room, outside each separate sleeping area in the immediate vicinity of the bedrooms, and on each story of the dwelling. Required smoke alarms shall receive their primary power from the building wiring and shall be equipped with a battery backup. Smoke alarm shall be audible in all areas. When an addition, alteration or repair occurs and a permit is required, smoke detectors shall be installed as required for new construction. (Exception: Work involving the exterior surfaces of dwellings, such as the replacement of roofing or siding, the addition or replacement of windows or doors, or the addition of a porch or deck and Installation, alteration or repairs of plumbing or mechanical systems.)

47. LIGHT: IRC Section R303.1

Habitable rooms shall have an aggregate glazing area of not less than 8 percent of the floor area of such rooms. Natural ventilation shall be through windows, skylights, doors, louvers or other approved openings to the outdoor air. (Exceptions may apply.)

48. SAFETY GLAZING: IRC Section R308

All glass located in an area which the IRC considers hazardous must be safety glazed: (Exceptions may apply.)

1. Glazing in doors.
2. Glazing within 24" of either side of a door.
3. Glazing in a fixed or operable panel where pane is larger than 9 sqft, bottom edge less than 18" above the floor, top edge is more than 36" above the floor, within 36" of a walking surface.
4. Glazing in guards and railings.
5. Glazing adjacent to hot tubs, spas, whirlpools, saunas, steam rooms, bathtubs, showers, swimming pools where bottom edge is less than 60 inches above a standing or walking surface.
6. Glazing adjacent to stairs, stair landings and ramps.

49. CLOTHES DRYERS: IRC Section M1502

Exhaust ducts shall terminate on the outside of the building. Exhaust ducts shall be in accordance with the dryer manufacturer's installation instructions. If the manufacturer's instructions do not specify the duct shall have a smooth interior finish, shall be constructed of metal not less than 0.0157 inch in thickness, shall be 4 inches in diameter, the maximum duct length shall be 35 feet, the exhaust duct shall terminate not less than 3 feet in any direction from openings into buildings. Exhaust duct terminations shall be equipped with a backdraft damper. Screens shall not be installed at the duct termination.

50. DOMESTIC COOKING EXHAUST EQUIPMENT: IRC Section M1503.

Domestic cooking exhaust equipment shall be listed and labeled and installed per the manufacturer's installation instructions. If the manufacturer's instructions do not specify it shall be installed with a clearance of not less than 1/4 inch between the hood and the underside of combustible material and cabinets. A clearance of not less than 24 inches shall be maintained between the cooking surface and combustible material and cabinets. The hood width shall be not less than the width of the unit and shall extend over the entire unit.

51. ACCESS TO WATER CLOSET: IRC Section P2705.1(5)

Water closets, lavatories and bidets. A water closet, lavatory or bidet shall not be set closer than 15 inches from its center to any side wall, partition or vanity or closer than 30 inches center-to-center between adjacent fixtures. There shall be a clearance of not less than 21 inches in front of a water closet, lavatory or bidet to any wall, fixture or door.

52. SHOWER AREAS: IRC Section P2708

Shower compartments shall have not less than 900 square inches of interior cross-sectional area. Shower compartments shall be not less than 30 inches interior dimensions continued to a height of not less than 70 inches above the shower drain outlet. Hinged shower doors shall open outward. The shower compartment access and egress opening shall have a clear and unobstructed finished width of not less than 22 inches. (Exceptions may apply.)

53. MASONRY FIREPLACES AND CHIMNEYS: IRC Section R1001 - R1003

Footings shall be constructed of concrete not less than 12 inches thick and shall extend not less than 6 inches beyond the face of the foundation or support wall on all sides. Footings shall be not less than 12 inches below finished grade. When masonry chimneys are built within a structure, a 2-inch clearance to combustibles is required. When the chimney is placed on the exterior of the structure, a 1 inch clearance is allowed. Table R1001.1 summary, Figure R1001.1 details.

54. FACTORY BUILT FIREPLACES AND CHIMNEYS: IRC Sections R1004, R1005

Factory-built fireplaces (UL 127) and chimneys (UL 103) shall be listed and labeled and installed in accordance with the manufacturer's installation instructions.

55. CHIMNEY TERMINATION: IRC Section R1003.9

Must terminate at least 2 feet above any part of building within 10 feet but shall be not less than 3 feet above the point where the chimney passes through the roof.

56. HEARTHES; HEARTH EXTENSIONS: IRC Section R1001.9, R1001.10

Masonry fireplace hearths and hearth extensions shall be constructed of concrete or masonry, supported by noncombustible materials, and reinforced to carry their own weight and all imposed loads. Combustible material shall not remain against the underside of hearths and hearth extensions after construction. The minimum thickness of fireplace hearths shall be 4 inches. The minimum thickness of hearth extensions shall be 2 inches. Hearth extensions shall extend not less than 16 inches in front of and not less than 8 inches beyond each side of the fireplace opening. Where the fireplace opening is 6 square feet or larger, the hearth extension shall extend not less than 20 inches in front of and not less than 12 inches beyond each side of the fireplace opening.

57. COMBUSTION AIR: IRC Section G2407

Gas fueled appliances shall be provided with combustion air in accordance with the appliance manufacturer's installation instructions. Combustion air is to be calculated using one of the approved methods in sections G2407.5 through G2407.9.

58. WATER HEATER LOCATIONS: IRC M2005.2

Fuel-fired water heaters shall not be installed in a room used as a storage closet. Water heaters located in a bedroom or bathroom shall be installed in a sealed enclosure so that combustion air will not be taken from the living space. Installation of direct-vent water heaters within an enclosure is not required.

59. APPLIANCES LOCATED IN GARAGE: IRC M1307.3, G2408.2, G2408.3

Appliances and water heaters installed in garages shall be guarded from damage when located in the normal vehicle path. When such equipment generates a glow, spark or flame capable of igniting flammable vapors, it shall be installed with sources of ignition at least 18 inches above the floor (domestic clothes dryer exempt).

60. WATER HEATERS DISCHARGE PIPING: IRC P2804.6.1

The discharge piping serving a pressure relief valve, temperature relief valve or combination valve shall: 1. Not be directly connected to the drainage system. 2. Discharge through an *air gap* located in the same room as the water heater. 3. Not be smaller than the diameter of the outlet of the valve served and shall discharge full size to the *air gap*. 4. Serve a single relief device and shall not connect to piping serving any other relief device or equipment. 5. Discharge to the floor, to the pan serving the water heater or storage tank, to a waste receptor or to the outdoors. 6. Discharge in a manner that does not cause personal injury or structural damage. 7. Discharge to a termination point that is readily observable by the building occupants. 8. Not be trapped. 9. Be installed to flow by gravity. 10. Terminate not more than 6 inches and not less than two times the

discharge pipe diameter above the floor or waste receptor flood level rim. 11. Not have a threaded connection at the end of the piping. 12. Not have valves or tee fittings. 13. Be constructed of those materials indicated in Section P2906.5 or materials tested, rated and *approved* for such use in accordance with ASME A112.4.1. 14. Be one nominal size larger than the size of the relief-valve outlet, where the relief-valve discharge piping is installed with insert fittings. The outlet end of such tubing shall be fastened in place.

61. MANUFACTURERS SPECS: The installer shall leave the manufacturer's installation and operating instructions attached to the appliance.
62. PROTECTION OF POTABLE WATER: IRC P2902  
A potable water supply system shall be designed and installed as to prevent contamination from nonpotable liquids, solids or gases being introduced into the potable water supply. Connections shall not be made to a potable water supply in a manner that could contaminate the water supply or provide a cross connection between the supply and a source of contamination except where approved backflow prevention assemblies, backflow prevention devices or other means or methods are installed to protect the potable water supply
63. TRAP SEAL PROTECTION: IRC P3201.2.1  
Traps seals of emergency floor drain traps and traps subject to evaporation shall be protected by one of the methods in sections P3201.2.1.1 through P3201.2.1.4: 1. A portable water-supplied trap seal primer. 2. A reclaimed or graywater-supplied trap seal primer valve. 3. A wastewater-supplied trap primer device. 4. A barrier-type trap seal protection device.
64. GARAGE / DWELLING DOOR: IRC Section R302.5.1  
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 in thickness, solid or honeycomb-core steel doors not less than 1 3/8 inches thick, or 20-minute fire-rated doors, equipped with a self-closing or automatic-closing device.
65. GARAGE / DWELLING FIRE SEPARATION: IRC Section R302.6, Table R302.6  
The garage shall be separated from the residence and its attic area by not less than 1/2 inch gypsum board applied to the garage side. Garages beneath habitable rooms shall be separated from all habitable rooms above by not less than 5/8 inch Type X gypsum board or equivalent. Where the separation is a floor-ceiling assembly, the structure supporting the separation shall also be protected by not less than 1/2 inch gypsum board or equivalent.
66. TWO- FAMILY DWELLING UNIT SEPARATION: IRC Section R302.3  
Dwelling units in two-family dwellings shall be separated from each other by wall and floor assemblies having not less than a 1-hour fire-resistance rating where tested in accordance with ASTM E119, UL 263 or Section 703.3 of the International Building Code. Fire-resistance-rated floor/ceiling and wall assemblies shall extend to and be tight against the exterior wall, and wall

assemblies shall extend from the foundation to the underside of the roof sheathing. (Exceptions may apply.)

67. FIRE-RESISTANCE OF EXTERIOR WALLS: IRC Section R302, Table R302.1(1) amended  
Minimum 1-hour fire-resistive construction required within 3 feet of property lines, openings not permitted less than 3 feet of property lines.
68. FLOOR AREA: IRC Section R304, R304.2  
Habitable rooms shall have a floor area of not less than 70 square feet, excluding kitchens. Habitable rooms shall be not less than 7 feet in any horizontal dimension, excluding kitchens.
69. CEILING HEIGHTS: IRC Section R305  
Habitable space, hallways and portions of basements containing these spaces shall have a ceiling height of not less than 7 feet Bathrooms, toilet rooms and laundry rooms shall have a ceiling height of not less than 6 feet 8 inches. (Exceptions may apply.)
70. LANDINGS: IRC Section R311.3  
There shall be a landing or floor on each side of each exterior door. The width of each landing shall be not less than the door served. Landings shall have a dimension of not less than 36 inches measured in the direction of travel. The slope at exterior landings shall not exceed 1/4 unit vertical in 12 units horizontal (2 percent). Landings or finished floors at the required egress door shall be not more than 1 1/2 inches lower than the top of the threshold. The landing or floor on the exterior side shall be not more than 7 3/4 inches below the top of the threshold provided that the door does not swing over the landing or floor. Doors other than the required egress door shall be provided with landings or floors not more than 7 3/4 inches below the top of the threshold. A top landing is not required where a stairway of not more than two risers is located on the exterior side of the door, provided that the door does not swing over the stairway. Storm and screen doors shall be permitted to swing over exterior stairs and landings.
71. STAIRWAY WIDTH: IRC Section R311.7.1  
Stairways shall not be less than 36 inches in width.
72. STAIR RISE & RUN: IRC Section R311.7.5.1- R311.7.5.2  
Private stairways may be constructed with a 7-3/4 inch maximum rise and a 10-inch minimum run. The largest tread run may not exceed the smallest by more than 3/8 inch. The greatest riser height may not exceed the smallest by more than 3/8 inch.
73. HEADROOM: IRC Section R311.7.2  
Every stairway shall have a headroom clearance of not less than 6 feet 8 inches. (Exceptions may apply.)

74. WINDING STAIRWAYS: IRC Section R311.7.5.2.1

Winder treads shall have a tread depth of not less than 10 inches measured between the vertical planes of the foremost projection of adjacent treads at the intersections with the walkline. Winder treads shall have a tread depth of not less than 6 inches at any point within the clear width of the stair. Within any flight of stairs, the largest winder tread depth at the walkline shall not exceed the smallest winder tread by more than 3/8 inch. Consistently shaped winders at the walkline shall be allowed within the same flight of stairs as rectangular treads and shall not be required to be within 3/8 inch of the rectangular tread depth.

75. SPIRAL STAIRWAYS: IRC Section R311.7.10.1

The clear width at and below the handrails at spiral stairways shall be not less than 26 inches and the walkline radius shall be not greater than 24 1/2 inches. Each tread shall have a depth of not less than 6 3/4 inches at the walkline. Treads shall be identical, and the rise shall be not more than 9 1/2 inches. Headroom shall be not less than 6 feet 6 inches.

76. UNDER-STAIR PROTECTION: IRC Section R302.7

Enclosed space under stairs that is accessed by a door or access panel shall have walls, under-stair surface and any soffits protected on the enclosed side with 1/2 inch gypsum board.

77. HANDRAILS: IRC Section R311.7.8

All stairways with 4 or more risers shall have at least one handrail. Handrail height, measured vertically from the sloped plane adjoining the tread nosing, or finish surface of ramp slope, shall be not less than 34 inches and not more than 38 inches. The handgrip portion of the handrail shall not be less than 1 1/4 inches or more than 2 inches in cross-sectional dimension. Handrails shall not project more than 4 1/2 inches on either side of the stairway. Handrails adjacent to a wall shall have a space of not less than 1 1/2 inches between the wall and the handrails. Handrails shall be continuous for the full length of the flight, from a point directly above the top riser of the flight to a point directly above the lowest riser of the flight. Handrail ends shall be returned or shall terminate in newel posts or safety terminals. (Exceptions may apply.)

78. GUARDS: IRC Section R312.

Guards shall be provided for those portions of open-sided walking surfaces, including stairs, ramps and landings, that are located more than 30 inches measured vertically to the floor or grade below at any point within 36 inches horizontally to the edge of the open side. Insect screening shall not be considered as a guard. Required guards at open-sided walking surfaces, including stairs, porches, balconies or landings, shall be not less than 36 inches in height as measured vertically above the adjacent walking surface or the line connecting the nosings. Guards on the open sides of stairs shall have a height of not less than 34 inches measured vertically from a line connecting the nosings. Required guards shall not have openings from the walking surface to the required guard height that allow passage of a sphere 4 inches in diameter. (Exceptions may apply.)

79. SERVICE DISCONNECTING MEANS: IRC Section E3601.6.2

The service disconnecting means shall be installed at a readily accessible location either outside of a building or inside nearest the point of entrance of the service conductors. Service disconnecting means shall not be installed in bathrooms. Each occupant shall have access to the disconnect serving the dwelling unit in which they reside.

80. WORKING SPACE AND CLEARANCES: IRC Section E3405.1

Service and sub panels shall have a clear working space provided in front not less than 30 inches wide, 36 inches deep, and 6 feet 6 inches high.

81. GROUNDING ELECTRODE SYSTEM: IRC Section E3607

The premises wiring system shall be grounded at the service with a grounding electrode conductor connected to a grounding electrode system as required by this code.

82. PROTECTION FROM PHYSICAL DAMAGE: IRC Section E3802, E3803

Cables shall be installed as required by Section E3802 for above ground installations and E3803 for below ground installations.

83. RECEPTACLE OUTLETS: IRC Section E3901.2

In every kitchen, family room, dining room, living room, parlor, library, den, sun room, bedroom, recreation room, or similar room or area of dwelling units, receptacle outlets shall be installed in accordance with the general provisions specified in Sections E3901.2.1 through E3901.2.3.

84. LIGHTING OUTLETS: IRC Section E3903.2

At least one wall switch-controlled lighting outlet shall be installed in every habitable room, kitchen and bathroom. (Exceptions may apply.)

85. GROUND-FAULT CIRCUIT-INTERRUPTER: IRC Section E3902

Ground-fault circuit-interrupter location shall be as required by this section.

86. ARC-FAULT CIRCUIT INTERRUPTER: IRC Section E3902.16 amended

All branch circuits that supply 125-volt, single-phase, 15- and 20-ampere outlets installed in dwelling unit bedrooms shall be protected by a combination type arc-fault circuit interrupter listed and installed to provide protection of the entire branch circuit. (Exceptions may apply.)

## Bracing R602.10:

IRC adopted: Wind 115mph ultimate, default wind exposure C, seismic B.

BWP = Braced Wall Panel

BWL = Braced Wall Line

**Buildings shall be braced in accordance with the prescriptive sections of R602.10 or shall be designed by an Arizona licensed registrant.**

- Braced wall line offset R602.10.1.2: Maximum 4' on each side of the braced wall line. Angled R602.10.1.4: Maximum diagonal length of 8'.
- Parallel spacing between braced wall lines Table R602.10.1.3: Maximum 60'.
- Minimum number of braced wall panels per wall line R602.10.2.3: Line length 16' or less, minimum of two BWP any length or one minimum 48" width. Line length greater than 16', minimum of two BWP.
- Required total length of braced wall panels per wall line R602.10.3: Table R602.10.3(1) and adjustment factors in Table R602.10.3(2).
- Braced Wall Panel Locations R602.10.2: A braced wall panel is required within 10' of each end of a braced wall line. There cannot be more than 20' between the edge of the braced wall panels.
- Wind Table R602.10.3(1) – The City uses the table wall line spacing values.
- Wind Adjustment Table R602.10.3(2) – The City only allows use of Exposure B values if the building is in a suburban area; Exposure C values with 1.20 adjustment factor if building is in an open terrain area.
- The City will not perform any "linear interpolation" calculations. We use the table values. The designer must submit calculations with plans if they want us to apply adjustments.
- Bracing methods Table R602.10.4: see table.
- Minimum length of BWP by type and stud height Table R602.10.5: see table (cheat sheet below)

**Exposure B** as defined in the WFCM and ASCE7-10 is as follows: "Urban and suburban areas, wooded areas, or other terrain with numerous closely spaced obstructions having the size of single family dwellings or larger."

**Exposure C** as defined in the WFCM and ASCE7-10 is as follows: "Open terrain with scattered obstructions including surface undulations or other irregularities having height generally less than 30 feet extending more than 1500 feet from the building site in any quadrant. Exposure C extends into adjacent Exposure B type terrain in the downwind direction for the distance of 1500 feet or 10 times the height of the building or structure, whichever is greater. This category includes open country and grasslands, and open water exposure for less than 1 mile."

### Braced Wall Panels:

Per Table R602.10.5

Single story (for other option and multi-story see table)

(Stud Height = BWP Required Minimum Width)

**LIB** - Let in Bracing, 8'Height=55"Width, 9'Height=62"Width, 10'Height=69"Width. (counts as actual width)

**WSP** - Wood Structural Panels, 8'Height=48"Width, 9'Height=48"Width, 10'Height=48"Width. (counts as actual width)

**GB** – Gypsum Board, 8'Height=48"Width, 9'Height=48"Width, 10'Height=48"Width. (double sided counts as actual width, single sided ½ actual width)

**HPS** – Hardboard Panel Siding, 8'Height=48"Width, 9'Height=48"Width, 10'Height=48"Width. (counts as actual width)

**ABW** - alternate braced wall panel with hold-downs, 8'Height=28"Width, 9'Height=32"Width, 10'Height=34"Width. (counts as 48" width)

**PFH** - portal frame with hold-downs, minimum widths 8'Height=10'Height=16"Width. (two story=24"Width) (counts as 48" width towards requirement of Table R602.10.3(1), 115 mph wind)

**PFG** - garage only, no hold-downs, minimum widths 8'Height=24"Width, 9'Height=27"Width, 10'Height=30"Width. (only counts as 1.5xWidth)

For Continuous Sheathed Options – see IRC



# Bullhead City Municipal Code

## Chapter 15.14 RESIDENTIAL CODE – Code Amendments

### 15.14.010 International Residential Code.

A read only copy of the International Residential Code can be found on line at:  
<https://codes.iccsafe.org/content/IRC2018P7>

- A. The 2018 Edition of the International Residential Code, copyrighted by International Code Council, Inc., shall be adopted including Appendix A, Appendix B, Appendix C, Appendix G, Appendix H, Appendix J, Appendix K, Appendix M, Appendix N, Appendix O and Appendix P, except as revised as follows:

**Section R101.1 Title.** These regulations shall be known as the Residential Code for One- and Two-family Dwellings of The City of Bullhead City and shall be cited as such and will be referred to herein as "this code."

#### Section R105.2 Work exempt from permit.

##### Building:

(Remain - items 4, 6, 8 and 9)

1. One-story detached accessory structures, used as tool and storage sheds, gazebos, playhouses and similar uses, provided the floor area does not exceed 120 square feet (11.15 m<sup>2</sup>) and contains no electrical, mechanical or plumbing systems.
2. Fences not over 6 feet (1829 mm) in height located outside of the Zoning setback areas
3. Retaining walls that are located outside of the Zoning setback areas when not over 4 feet (1219 mm) in height measured from the bottom of the footing to the top of the wall, unless supporting a surcharge.
5. Sidewalks and driveways. (Does not include portions within the City right-of-way.)
7. Prefabricated swimming pools that contain water less than 18 inches (458 mm) in depth and are less than 8 feet (2438 mm) in width at any point, whether below ground or above ground. (Reference A.R.S. § 36-681)
10. Decks that are not more than 30 inches (762 mm) above grade at any point 36 inches (914 mm) horizontal from the outside edge of the deck, are self-supporting and are not supporting a roof.

#### Section R106.1 Submittal documents.

(Add) Documents prepared by a registered design professional. Not less than one set shall bear an original seal and signature of the registered design professional. An electronic signature, as an option to a permanently legible signature, in accordance with AZ Board of Technical Registration R4-30-304(G), is acceptable for all professional documents.

**Section R108.2 Schedule of permit fees.** The fee policy is established in City Chapter 15.12.010, Section 109.2 Schedule of permit fees.

**Section R108.5 Refunds.** The refund policy is established in City Chapter 15.12.010, Section 109.6 Refunds.

**Section R112 Board of appeals.** The board of appeals policy is established in Section 113 of the 2018 International Building Code.

**Section R113 Violations.** The violations policy is established in Section 114 of the 2018 International Building Code.

**Section R114 Stop work orders.** The stop work order policy is established in Section 115 of the 2018 International Building Code.

Table R301.2(1) Climatic and Geographic Criteria.

Ground Snow Load: Table R301.2(6)	0
Ultimate Design Wind Speed:	115
Basic Design Wind Speed:	90
Tables R301.2(5)A, R301.2(5)B	Exposure C
Topographic Effects:	No
Special Wind Region:	No
Windborne Debris Zone:	No
Climate Zone: IECC	3B Hot-Dry
Seismic Design Category: NEHRP map	B
Weathering: Figure R301.2(4)	Negligible
Frost Line:	0
Termite:	Moderate to heavy
Winter Design Temp: IPC Appendix D	39
Ice Shield Under-layment Required:	No
Flood Hazards:	City municipal code Chapter 15.36 Floodplain Regulations
Air Freezing Index: NCDC Air Freezing Index-USA	NA
Mean Annual Temp:	70
Manual J Design:	Optional
Rainfall, 1-Hour (100 year)	2" per hour

(See table footnotes in IRC code book.)

#### Section R301.2.2.6 Irregular buildings.

##### 2. Lateral support of roofs and floors.

###### Exception:

(Add) 1. Portions of floors that do not support shear walls, braced wall panels above, or roofs shall be permitted to extend not more than 6 feet (1829 mm) beyond a shear wall or braced wall line.

(Add) 2. For open sided patio covers, portions of trussed roofs that extend a maximum of 12' (3658 mm) beyond a shear wall or braced wall line may use the PFH portal frame with hold-downs method per Figure R602.10.6.2 or provide structural design by an Arizona licensed registrant.

**Table R302.1(1) Exterior Walls.**

EXTERIOR WALL ELEMENT		MINIMUM FIRE-RESISTANCE RATING	MINIMUM FIRE SEPARATION DISTANCE
Walls	Fire-resistance rated	1 hour assembly with exposure from both sides	0 feet
	Not fire-resistance rated	0 hours	>= 3 feet
Projections	Not allowed	NA	< 2 feet
	Fire-resistance rated	1 hour on the underside, heavy timber or fire retardant-treated wood.	>= 2 feet to < 3 feet
	Not fire-resistance rated	0 hours	>= 3 feet
Openings in walls	Not allowed	NA	< 3 feet
	Unlimited	0 hours	3 feet
Penetrations	All	Comply with Section R302.4	< 3 feet
		None required	3 feet

(See table footnotes in IRC code book.)

**Section R303.4 Mechanical ventilation.** A dwelling unit may be provided with whole-house mechanical ventilation in accordance with Section M1505.4.

**Section R313.2 One-and two-family dwellings automatic fire sprinkler systems.** An automatic residential fire sprinkler system may be installed in one- and two-family dwellings. (Reference A.R.S. § 9-807)

**Section R322.1 General.**

(Add) 1. The adopted flood hazard map and supporting data are hereby adopted by reference and declared to be part of this section along with Chapter 15.36 Floodplain Regulations of the City code and Section 1612.3 of the International Building Code as amended.

**Section R404.4 Retaining walls.**

Retaining walls shall be constructed per the City of Bullhead City's standard retaining wall details or shall be designed by an Arizona licensed registrant.

**Section N1101.1 Scope.** This chapter regulates the energy efficiency for the design and construction of buildings regulated by this code and all "R" occupancy buildings regulated by the International Building Code. Three options are provided; the option to be used is to be declared when construction documents are submitted for review.

(Add) Option 1. Buildings may be designed in accordance with the 2018 International Energy Conservation Code, IECC-Residential Provisions as published; or

(Add) Option 2. Buildings may be designed in accordance with Chapter 11 Energy Efficiency of this code as published; or

(Add) Option 3. Building may be designed in accordance with Chapter 11 Energy Efficiency of this code as amended.

**Section N1101.5 (R103.2) Information on construction documents.**

(Delete - items 3 through 8)

**Chapter 11 Energy Efficiency.**

(Replace "Mandatory" with "Optional" in listed sections N1101.14 through N1104.1)

Section N1101.14 (R401.3) Energy efficiency certificate (Optional).

Section N1102.4 (R402.4) Air leakage (Optional).

Section N1103.3.3 (R403.3.3) Duct testing (Optional).

Section N1103.5.1 (R403.5.1) Heated water circulation and temperature maintenance systems (Optional).

Section N1103.6 (R403.6) Mechanical ventilation (Optional).

Section N1103.7 (R403.7) Equipment sizing and efficiency rating (Optional).

Section N1103.10 (R403.10) Pools and permanent spa energy consumption (Optional).

Section N1103.11 (R403.11) Portable spas (Optional).

Section N1103.12 (R403.12) Residential pools and permanent residential spas (Optional).

Section N1104.1 (R404.1) Lighting equipment (Optional).

Section N1104.1.1 (R404.1.1) Lighting equipment (Optional).

**Figure N1101.7 Climate Zones.**

(Add) US States, Arizona, Mohave County, Declared climate zone is 3-Dry(B).

**Table N1102.1.2 Insulation and Fenestration Requirements by Components.**

COMPONENT R-values are <u>minimums</u> . U-factors and SHGC are <u>maximums</u> .	VALUE REQ'D
Climate Zone	3
Fenestration, U-factor <sup>b</sup>	0.32
Skylight, U-factor <sup>b</sup>	0.55
Glazed Fenestration, SHGC <sup>b,e</sup>	0.25
Ceiling, R-value	38
Wood Frame Wall, R-value	20 or 13+5
Mass Wall, R-value <sup>i</sup>	8/13
Floor, R-value	19
Basement Wall, R-value <sup>c</sup>	5/13
Slab, R-value and Depth <sup>d</sup>	0
Crawl Space Wall, R-value <sup>c</sup>	5/13
Supply and Return Ducts, R-value	8
Ducts in Floor Trusses, R-value	6

(See table footnotes in IRC code book.)

**Table N1102.1.4 Equivalent U-Factors.** Declared climate zone is 3.

**Section M1307.3 Elevation of ignition source.**

**Exemption:**

(Add) Domestic clothes dryers shall be exempt from this requirement.

(Delete) **Section M1411.8 Locking access port caps.**

**Section M2003.1 General.**

(Add) Expansion tanks are required for all new construction water heater installations. Expansion tanks are not required for replacement water heater units when an expansion tank was not part of the original installation.

**Section G2415.3 (R404.3) Prohibited locations.**

(Add) Section G2415.3.1 Gas piping in accessory structures. Gas piping systems shall only be installed in structures with permanent foundations. Auger type tie-downs or similar devices shall not be considered permanent foundations.

**Section P2503.5.1 Rough plumbing.**

**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.

**Section P2601 General.**

(Add) Section P2601.4 Plumbing systems in accessory structures. Plumbing systems shall only be installed in structures with permanent foundations. Auger type tie-downs or similar devices shall not be considered permanent foundations.

**Section P2603.5.1 Sewer depth.** Building sewers that connect to private sewage disposal systems shall be regulated by the Mohave County Department of Public Health, Environmental Health Division. Building sewers shall be a minimum of 12 inches (304.8 mm) below grade.

**Section P2906.7 Flexible water connectors.** Flexible water connectors, exposed to continuous pressure, shall conform to ASMEA112.18.6. Access shall be provided to all flexible water connectors. Flexible water connectors used must have metallic fittings when used to supply water to water closets, faucets, or ice makers.

**Section E3401.1 Applicability.**

(Add) Section E3401.1.1 Services above 400 amperes. Electrical plans submitted for services above 400 amperes shall be submitted and sealed by an Arizona licensed registrant. A qualified AZ Registrar of Contractors licensed contractor is required for services above 400 amperes.

**Section E3601.1 Scope.**

(Add) Section E3601.1.1 Electrical systems in accessory structures: Electrical systems shall only be installed in structures with permanent foundations. Auger type tie-downs or similar devices shall not be considered permanent foundations.

**Section E3604.2.1 Above roofs.**

(Add) Per the local electric utility provider conductors shall not be located over roofs. If utility provider permission is obtained in writing the installation is to meet the requirements of this section.

**Section E3608.1 Grounding electrode system.**

(Add) Two means of grounding are required. The primary grounding electrode shall be an 8 foot (2438 mm) long by 5/8 inch (15.88 mm) diameter driven rod. All supplemental grounding systems are open to any type allowed by the IRC or NEC.

**Section E3902.2 Garage and accessory building receptacles.**

(Add) Exception: The required GFCI outlet installed in the ceiling for the garage door opener may be replaced with a single outlet device.

**Section E3902.9 Laundry areas.**

(Add) Exception: The washer/dryer electrical outlet may be non-GFCI protected if the outlet is not readily accessible, and the outlet is no higher than 32 inches from the finished floor.

**Section E3902.10 Kitchen dishwasher branch circuit.**

(Add) Exception: The kitchen dishwasher electrical outlet may be non-GFCI protected.

**Section E3902.16 Arc-fault circuit-interrupter protection.** Branch circuits that supply 120-volt, single-phase, 15- and 20-ampere outlets installed in bedrooms shall be protected by any of the following: (Remain - items 1 through 6 and Exemption)