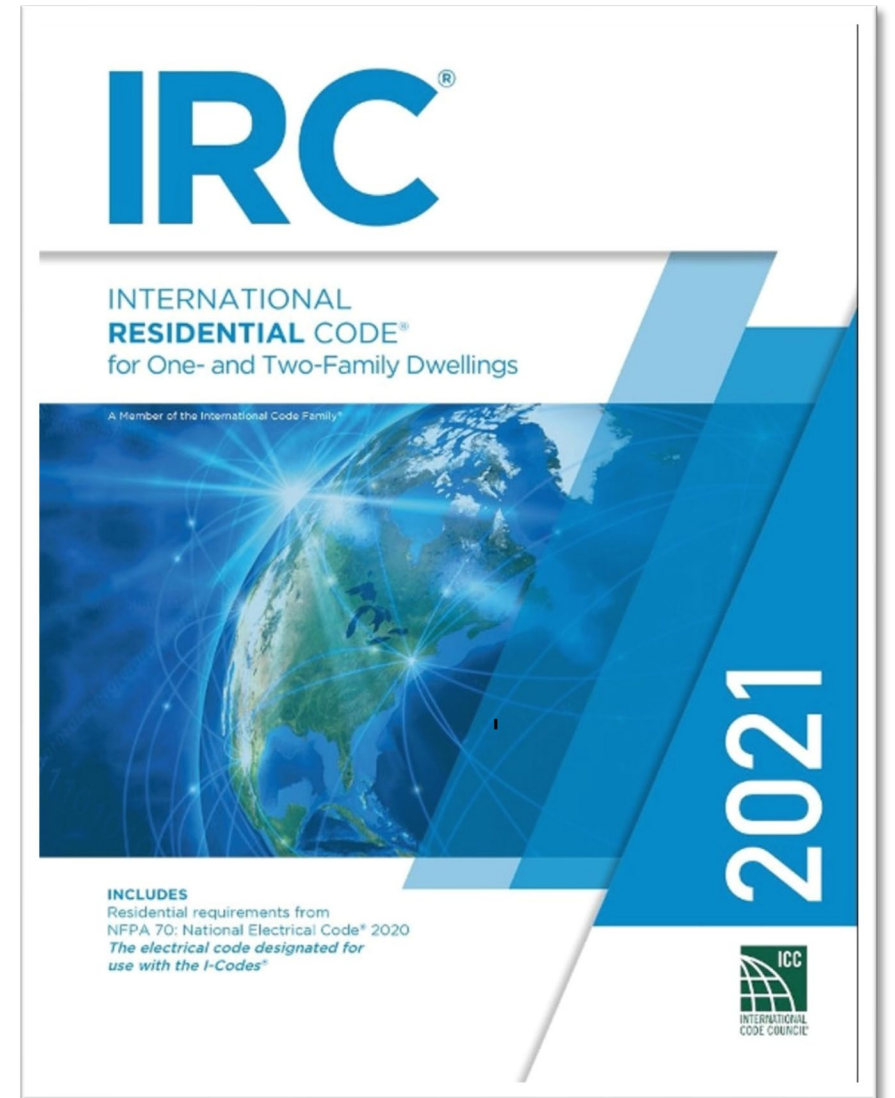




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# 2021 IRC SIGNIFICANT CHANGES



# Appendices

- Wherever the IRC references Chapters 34-43, replace the reference with National Electric Code (NEC) currently adopted by the County. Wherever the IRC references P2904, replace with National Fire Protection Association (NFPA) 13D standard
- Section R102.5. Appendices. Adopt following appendices as part of IRC to address less common or emerging topics that would benefit from incorporation in the code.
  - AF – Radon Control Methods
  - AK – Sound Transmission
  - AO – Automatic Vehicular Gates
  - AQ – Tiny Houses
  - AR – Light Straw-Clay Construction
  - AS – Strawbale Construction
  - AT – Solar-Ready Provisions
  - AU - Cob Construction (Monolithic Adobe) and
  - AW – 3-D Printed Building Construction, Appendices AE and AJ with modifications
  - Appendix AJ with modifications to encourage the continued safe use of existing buildings and ensure that new work conforms to the to the code.
    - Amendments on slide #21



# Work Exempt from Permit

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

- Retaining Walls that are not over 36 inches in retained height unless supporting a surcharge, crossing a lot line, located in problem soils, or part of a tiered retaining wall system.
- Item 5: Sidewalks, driveways and on grade patios located in rear yards
- Item 7: Prefabricated ~~swimming~~ pools that are less than ~~24 inches~~ 18 inches deep
- Item 8: Add “Children’s playhouses, treehouses, and open roofed pergolas that are no higher than 8’ above grade or other similar structures” after first word.
- Delete Item 9 and replace with Retractable awnings and retractable canopies
- Item 10: Delete the words “Decks not exceeding 200 square feet in area, that are not more than 30” above grade at any point” and replace with “Decks where the joists bear completely on grade, supporting no other structures”.
- Add Item 11: Replacing windows and doors without changing the size of openings and without reducing the net clear opening dimensions.
- Add Item 12: Replacing roof covering(s) and sheathing materials with-in kind materials.
- Add Item 13: Replacing siding materials with ‘in kind’ materials.
- Add Item 14: Interior and Exterior Non-Structural Waterproofing repairs of existing below grade structures. Delete Electrical and Plumbing subsections.



# Climatic and Geographic Design Criteria

Table R301.2(1)

<u>GROUND SNOW LOAD</u>	<u>WIND DESIGN</u>				<u>SEISMIC DESIGN CATEGORY</u>	<u>SUBJECT TO DAMAGE FROM</u>			<u>ICE BARRIER UNDERLAYMENT REQUIRED</u>	<u>FLOOD HAZARDS</u>	<u>AIR FREEZING INDEX</u>	<u>MEAN ANNUAL TEMP</u>
	<u>Ultimate Speed (mph)</u>	<u>Topographic effects</u>	<u>Special wind region</u>	<u>Windborne debris zone</u>		<u>Weathering</u>	<u>Frost line depth</u>	<u>Termite</u>				
30	115	No			B	Severe	30" (762mm)	Moderate to Heavy	Yes	Yes <sup>a</sup>	300	55°F
<b>MANUAL J DESIGN CRITERIA</b>												
<u>Elevation</u>		<u>Altitude correction factor</u>	<u>Coincident wet bulb</u>	<u>Indoor winter design relative humidity</u>	<u>Indoor winter design dry- bulb temperature</u>	<u>Outdoor winter design dry-bulb temperature</u>	<u>Heating temperature difference</u>					
451 ft		N/A	76°F	52%	72°F	19°F	53°F					
<u>Latitude</u>		<u>Daily range</u>	<u>Indoor summer design relative humidity</u>	<u>Summer design grains</u>	<u>Indoor summer design dry-bulb temperature</u>	<u>Outdoor summer design dry-bulb temperature</u>	<u>Cooling temperature difference</u>					
39°N		M	68%		75°F	89°F	14°F					

a) July 18, 1975, (b) The more stringent water surface elevations of the latest effective map of: February 29, 2006 with ongoing amendments, (c) FEMA “Flood Insurance Rate Maps” and “Flood Boundary and Floodway maps”; approved engineered floodplain studies by DPS, or the M-NCPPC maps. Effective September 29, 2006, (c) FEMA Flood Panels Numbers Effective September 29, 2006



# R301.2 Wind Design Speeds

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- Table R301.2.1(1)
  - Coordinate IRC with ASCE 7-16 load standard
  - Pressure Coefficients have increased
  - Roof zone sizes also modified
  - Table R301.2.1(2) allows reductions in Exposure B
  - Nailing patterns affected – new fasteners tabulated Table R602.3(1)



# R301.3 Story Height

For wood wall framing, the story height shall not exceed 11 feet 7 inches (3531 mm) and the laterally unsupported bearing wall stud height permitted by Table R602.3(5).

**Exception:** A story height not exceeding 13 feet 7 inches is permitted provided that the maximum wall stud clear height does not exceed 12 feet the wall studs are in accordance with Exception 3 of Section R602.3.1 or an engineered design is provided for the wall framing members, and wall bracing for the building is in accordance with Section R602.10. Studs shall be laterally supported at the top and bottom plate in accordance with Section R602.3.



# R302.5 Dwelling-garage opening & penetration protection

- **R302.5.1 Opening Protection.**

Openings from a private garage directly into a room used for sleeping purposes shall not be permitted. Other openings between the garage and residence shall be equipped with solid wood doors not less than  $1\frac{3}{8}$  inches in thickness, solid or honeycomb-core steel doors not less than  $1\frac{3}{8}$  inches thick, or 20-minute fire-rated doors.

- Doors shall be self-latching and equipped with a self-closing or automatic-closing device.



A modern kitchen with white cabinets, a stainless steel oven, and a range hood. The kitchen features a clean, minimalist design with open shelving displaying various kitchen items and plants. The floor is made of dark grey tiles.

# R303 Light, Ventilation and Heating

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## R303.1 Habitable Rooms

### Exception 2:

For Kitchens, the glazed areas need not be openable where the opening is not required by Section 310 and a local exhaust system is installed in accordance with Section M1505.



# R310.1 - Emergency escape & rescue opening required

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- Emergency escape and rescue openings shall open directly into a public way, or to a yard or court having a **minimum width of 36** inches that opens to a public way.



# Alterations or Repairs of Existing Basements

## R310.7.1 - Existing emergency escape & rescue openings

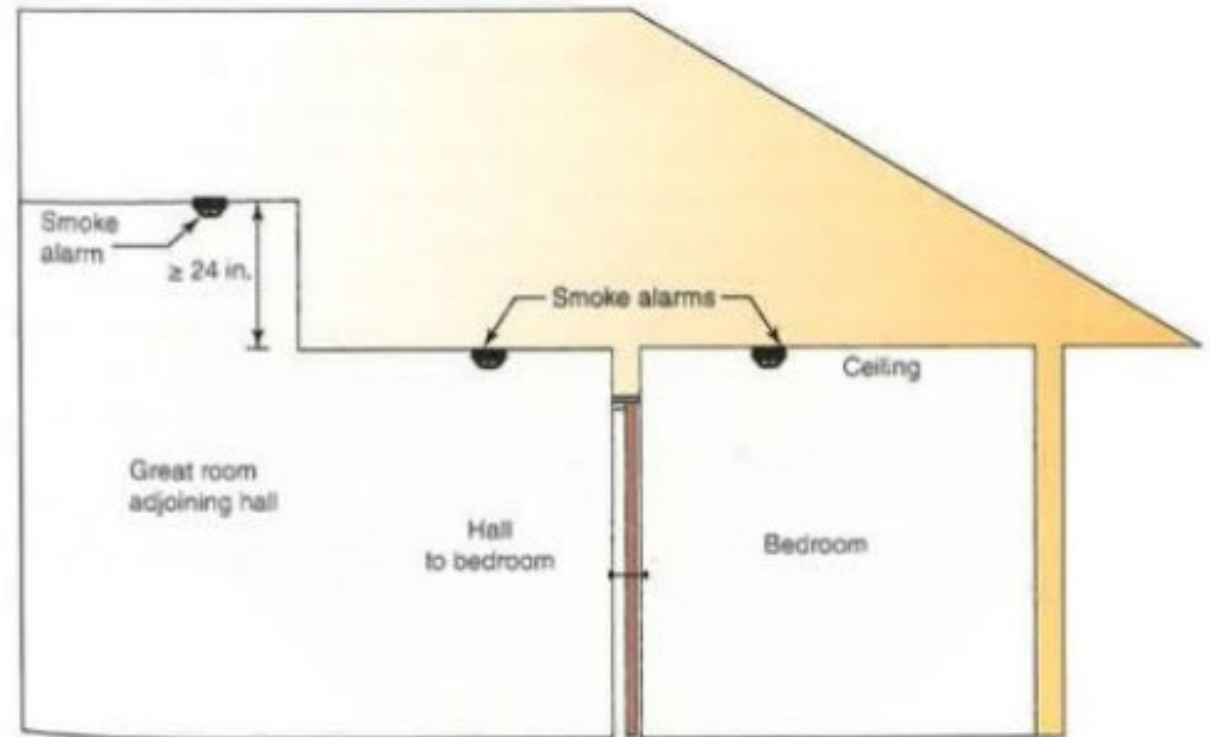
- Where a change of use and occupancy would require an emergency escape and rescue opening in accordance with Section 310.1, operable windows serving as the emergency escape and rescue opening shall comply with the following:
  - 1.) An existing operable window shall provide a minimum net clear opening of **5** square feet with a minimum net clear opening height of 22 inches and a minimum net clear opening width of 20 inches

2/28/2025



# R314.3 - Smoke Alarm Location

- Smoke alarms shall be installed in the following locations:
- 5.) In the hallway and in the room open to the hallway in dwelling units where the ceiling height of a room open to a hallway serving bedrooms exceeds that of the hallway by 24 inches or more.



# When are Sprinklers Required?

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Add: **R313.4. Automatic sprinkler system for reconstruction.** An approved automatic fire sprinkler system must be installed

- When 50 percent or more of the gross floor area of the existing building, excluding basements, is demolished or if 50 percent or more of the existing exterior walls above foundation walls calculated in linear feet by each story are demolished.
- An existing wood or cold-formed wall is defined as unaltered bottom plate, top plate, studs and sheathing.



# R326.3 - Story above grade plane

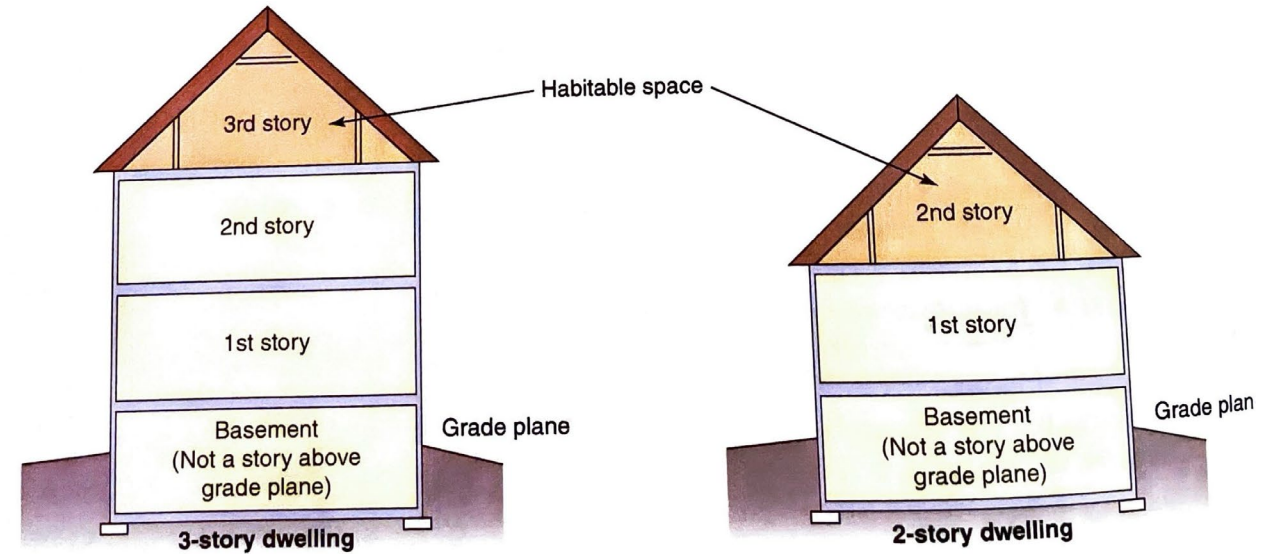
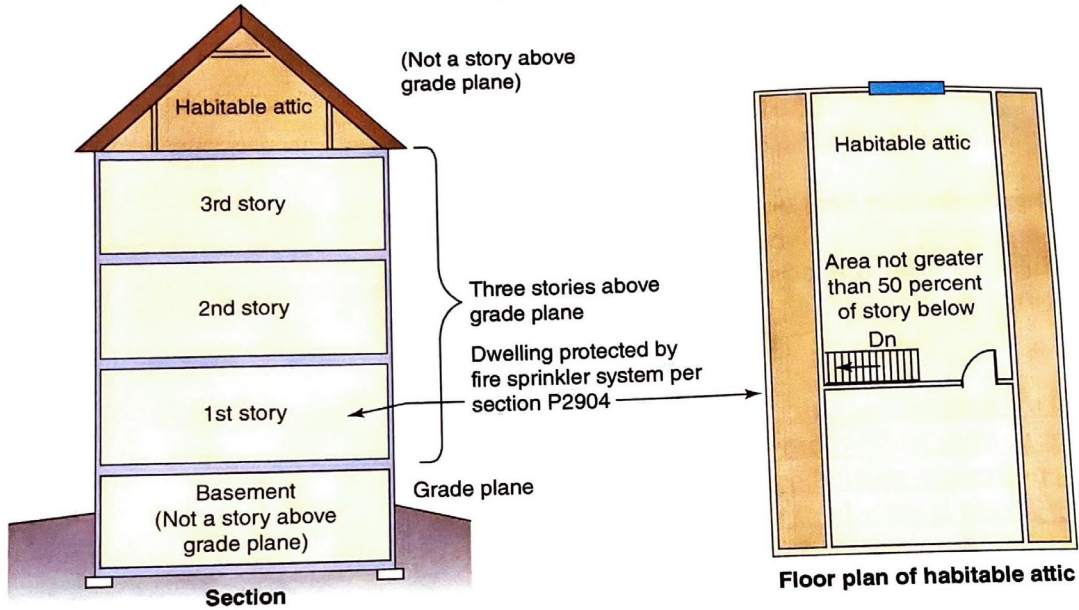
➤ **A habitable attic shall be considered a story above grade plane.**

- **Exceptions:** A habitable attic shall not be considered to be a story above grade plane provided that the habitable attic meets all the following:
  - **1.** The aggregate area of the habitable attic is either of the following:
    - **1.1.** Not greater than one-third of the floor area of the story below.
    - **1.2.** Not greater than one-half of the floor area of the story below where the habitable attic is located within a dwelling unit equipped with a fire sprinkler system.





# Habitable Attics - Story above grade plane



Dwellings meeting the IRC limit of 3 stories above grade plane.

**MONTGOMERY COUNTY  
GUIDELINES FOR RESIDENTIAL RETAINING WALLS  
4 FEET IN RETAINED HEIGHT OR LESS**

# R404.4 Retaining Walls

- Retaining walls over 48 inches in retained height or over 36 inches in retained height that resist a surcharge, shall be designed in accordance with accepted engineering practice to ensure stability against overturning, sliding, excessive foundation pressure and water uplift.
- Retaining walls shall be designed for a safety factor of 1.5 against lateral sliding and overturning.
- This section shall not apply to foundation walls supporting buildings.



**CONTENTS**

1. General Requirements and Limitations.....	2
2. Definitions.....	2
3. Regulations.....	3
4. How to apply.....	3
5. What to Submit.....	3
6. Permit Process.....	4
7. Public Utilities.....	4
8. Inspections.....	4
9. Timber Retaining Walls.....	5
10.Reinforced Masonry Retaining Walls.....	7
11.Reinforced Concrete Retaining Walls.....	12



# R 507.3 Deck Footings

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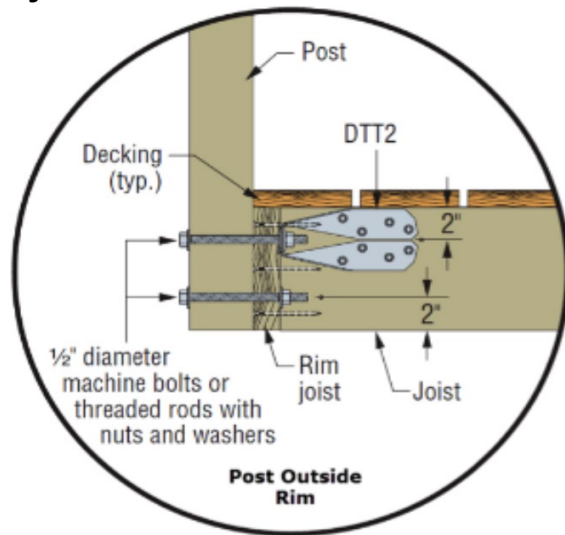
- **Exceptions:**
  1. Footings shall not be required for free standing decks consisting of joists directly supported on grade over their entire length
  2. Footings shall not be required for free-standing decks that meet **all** of the following criteria:
    - 2.1 The joists bear directly on precast concrete pier blocks at grade without support by beams or posts.
    - 2.2 The area of the deck does not exceed 200 square feet.
    - 2.3 The walking surface is not more than 20 inches above grade at any point within 36 inches measured horizontally from the edge.





# R507.10.1 - Exterior Guards - Support of guards

Where guards are supported on deck framing, guard loads shall be transferred to the deck framing with a continuous load path to the deck joists.

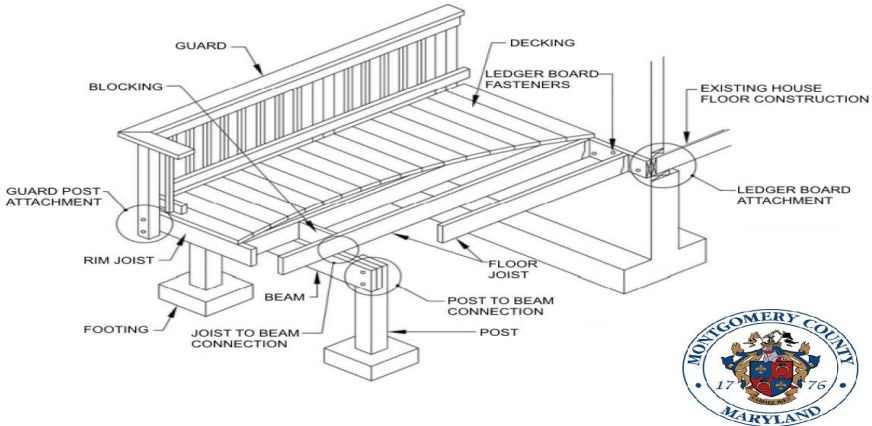


# MOCO Deck Details



MONTGOMERY COUNTY DEPARTMENT OF PERMITTING SERVICES  
 2425 Reedie Dr. 7th Floor  
 Wheaton, MD 20902  
<https://www.montgomerycountymd.gov/DPS/index.html>

**MONTGOMERY COUNTY RESIDENTIAL TYPICAL DECK DETAILS**  
 Based on the 2021 International Residential Code



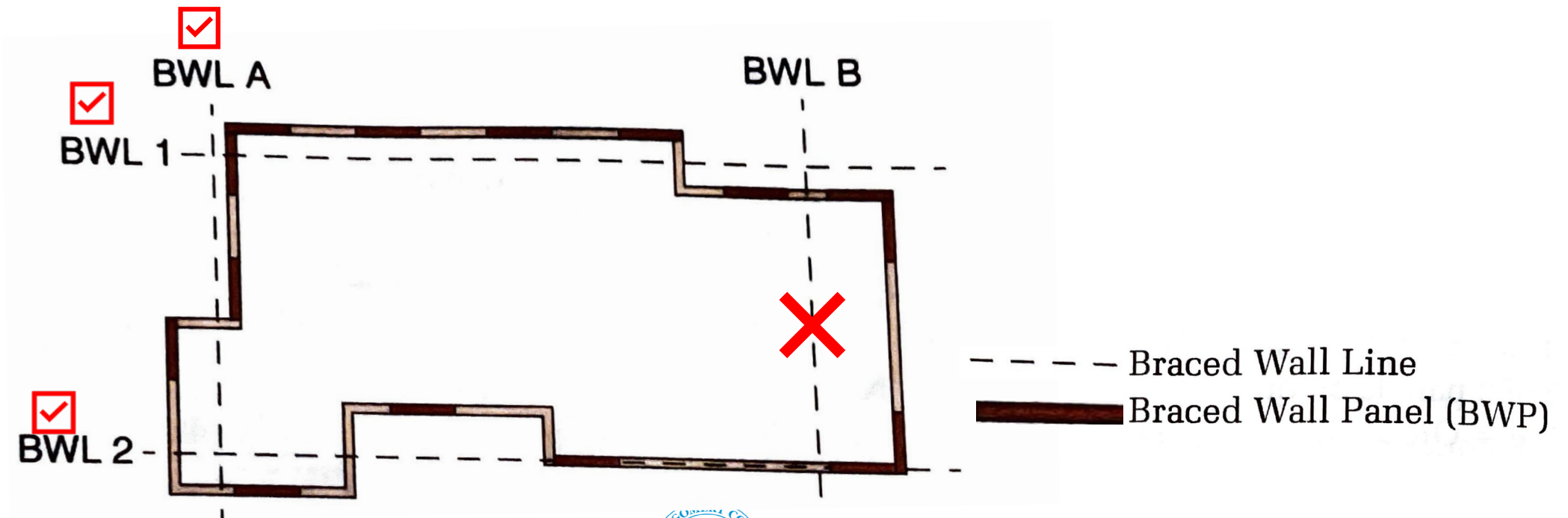
**CONTENTS**

1. General Requirements and Limitations.....	2	9. Ledger Attachment .....	10
2. Framing Plans and Sections .....	4	10. Ledger Board Fasteners .....	12
3. Footings .....	6	11. Deck Lateral Loads .....	13
4. Posts .....	6	12. Framing at Chimney or Bay Window....	14
5. Beam .....	7	13. Decking .....	14
6. Post to Beam Connection.....	7	14. Guardrail .....	15
7. Joist .....	9	15. Stairway .....	17
8. Floor Joist to Beam Connection.....	9	16. Deck Worksheet .....	20



# R602.10.1.2 Location of Braced Wall Lines

- Each braced wall line shall be located such that no more than two-thirds of the required braced wall panel length is located to one side of the braced wall line. Braced wall panels shall be permitted to be offset not more than 4 ft from the designated braced wall line location.

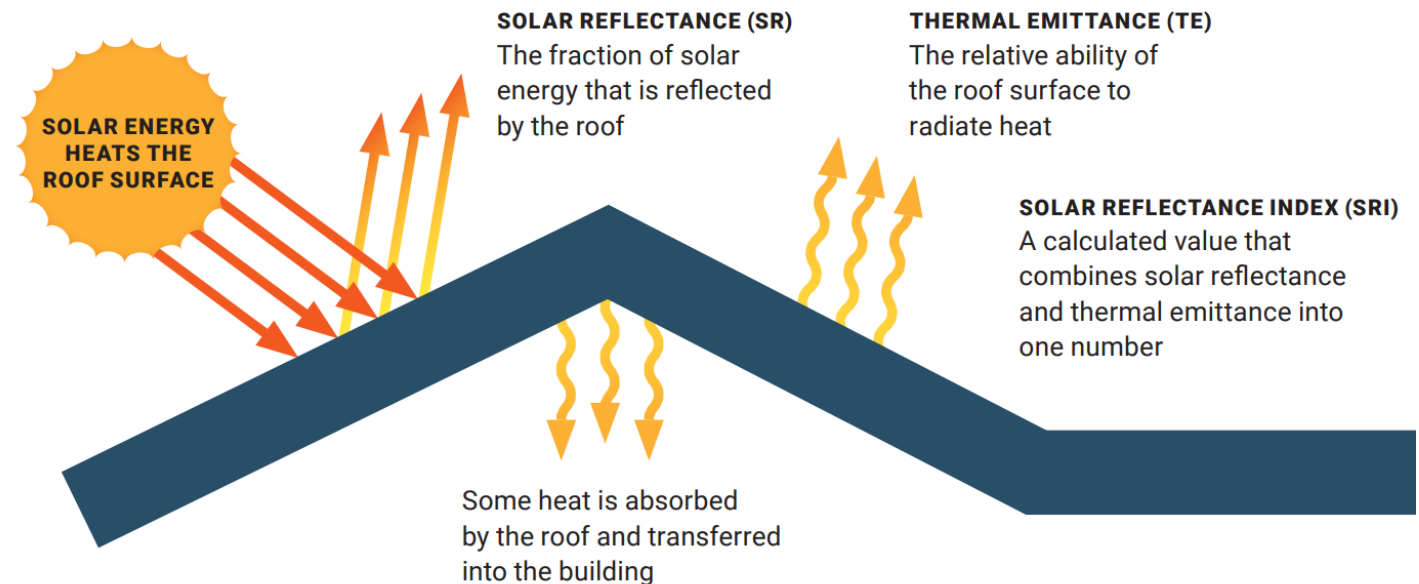


# Cool Roofs Covering

## ➤ R905.1.3. Cool Roofs Coverings

Roof coverings for roof slopes less than or equal to two units vertical in 12 units horizontal for buildings and covered parking shall conform to this section. A minimum of 75 percent of the entire roof surface not used for roof penetrations, renewable energy power systems, harvesting systems for rainwater to be used on-site, or green roofing systems shall be covered with products that comply with one or more of the following:

1. Have a minimum three-year-aged Solar Reflective Index (SRI) of 64.
2. Comply with the criteria for roof products as defined in “Energy Star...Eligibility Criteria”





# Mechanical

- M1401.3 Equipment and appliance sizing – ACCA Manual J & ACCA Manual S
- M1601.1 Duct Design - ACCA Manual D



## Residential Plans Examiner Review Form for HVAC System Design (Loads, Equipment, Ducts)



2425 Reedie Drive, 7<sup>th</sup> Floor, Wheaton, MD 20902  
Phone: 311 in Montgomery County or (240)777-0311  
<http://www.montgomerycountymd.gov/permittingervices>

Contractor \_\_\_\_\_  
Mechanical License # \_\_\_\_\_  
Building Plan # \_\_\_\_\_  
Home Address (Street or Lot#, Block, Subdivision) \_\_\_\_\_

REQUIRED ATTACHMENTS	ATTACHED
Manual J1 Form (and supporting worksheets):	Yes <input type="checkbox"/>
or MJ1AE Form (and supporting worksheets):	Yes <input type="checkbox"/>
OEM performance data (heating, cooling, blower):	Yes <input type="checkbox"/>
Manual D Friction Rate Worksheet:	Yes <input type="checkbox"/>
Manual S Equipment Selection form:	Yes <input type="checkbox"/>
Duct distribution system sketch:	Yes <input type="checkbox"/>

### HVAC LOAD CALCULATION (IRC M1401.3)

#### Design Conditions

**Winter Design Conditions**  
Outdoor temperature \_\_\_\_\_ 19 °F  
Indoor temperature \_\_\_\_\_ 72 °F  
Total heat loss \_\_\_\_\_ Btu

**Summer Design Conditions**  
Outdoor temperature \_\_\_\_\_ 89 °F  
Indoor temperature \_\_\_\_\_ 75 °F  
Grains difference \_\_\_\_\_ Δ Gr @ \_\_\_\_\_ % Rh  
Sensible heat gain \_\_\_\_\_ Btu  
Latent heat gain \_\_\_\_\_ Btu  
Total heat gain \_\_\_\_\_ Btu

#### Building Construction Information

**Building**  
Orientation (Front door faces) \_\_\_\_\_  
North, East, West, South, Northeast, Northwest, Southeast, Southwest  
Number of bedrooms \_\_\_\_\_  
Conditioned floor area \_\_\_\_\_ Sq Ft  
Number of occupants \_\_\_\_\_

**Windows**  
Eave overhang depth \_\_\_\_\_ Ft  
Internal shade \_\_\_\_\_  
Blinds, drapes, etc \_\_\_\_\_  
Number of skylights \_\_\_\_\_

### HVAC EQUIPMENT SELECTION (IRC M1401.3)

#### Heating Equipment Data

Equipment type \_\_\_\_\_  
Furnace, Heat pump, Boiler, etc.  
Model \_\_\_\_\_  
Heating output capacity \_\_\_\_\_ Btu  
Heat pumps - capacity at winter design outdoor conditions  
Auxiliary heat output capacity \_\_\_\_\_ Btu

#### Cooling Equipment Data

Equipment type \_\_\_\_\_  
Air Conditioner, Heat pump, etc.  
Model \_\_\_\_\_  
Sensible cooling capacity \_\_\_\_\_ Btu  
Latent cooling capacity \_\_\_\_\_ Btu  
Total cooling capacity \_\_\_\_\_ Btu

#### Blower Data

Heating CFM \_\_\_\_\_ CFM  
Cooling CFM \_\_\_\_\_ CFM

### HVAC DUCT DISTRIBUTION SYSTEM DESIGN (IRC M1601.1)

Design airflow \_\_\_\_\_ CFM  
External Static Pressure (ESP) \_\_\_\_\_ IWC  
Component Pressure Losses (CPL) \_\_\_\_\_ IWC  
Available Static Pressure (ASP) \_\_\_\_\_ IWC  
ASP = ESP - CPL

Longest supply duct: \_\_\_\_\_ Ft  
Longest return duct: \_\_\_\_\_ Ft  
Total Effective Length (TEL) \_\_\_\_\_ Ft  
Friction Rate: \_\_\_\_\_ IWC  
Friction Rate = (ASP × 100) ÷ TEL

Duct Materials Used (circle)  
Trunk Duct: Duct board, Flex, Sheet metal, Lined sheet metal, Other (specify) \_\_\_\_\_  
Branch Duct: Duct board, Flex, Sheet metal, Lined sheet metal, Other (specify) \_\_\_\_\_

I declare the load calculation, equipment selection, and duct system design were rigorously performed based on the building plan listed above, I understand the claims made on these forms will be subject to review and verification.

Contractor's Printed Name \_\_\_\_\_ Date \_\_\_\_\_  
Contractor's Signature \_\_\_\_\_

Reserved for use by County, Town, Municipality, or Authority having jurisdiction.



# Appendix AF Radon Control Methods

## ➤ AF104 Testing

- New construction only
- Testing performed AFTER air tightness test (Blower Door).
- Closed House Conditions must be met.
  - HVAC operating
  - Doors and windows closed for 12 hours prior to start of the test, except for normal in and out.
- Testing performed by a builder, registered design professional or an *approved* third party using a commercially available test kit or continuous monitor. Test must run for 48 hours minimum.
- The results must show a radon level of less than 4.0 pCi/L.
- If Results are greater than 4 pCi/L then house must be remediated and retested.
- Test report shall be provided to the code official/inspector prior to a U&O certificate being issued.
- **Exception: Testing not required if the occupied space is above an unenclosed open space, i.e. a house on stilts.**



# Appendix AJ

- **Alterations**

- **Section AJ109.7 Ceiling height:** Add “and attics” after basements in each occurrence.
- **Add Section AJ109.8.4. Stair treads and risers.** Treads must be 9 inches or greater and risers must not be greater than 8¾ inches.

- **Reconstruction**

- **Add Section AJ110.1.4. Stair width.** The width of existing or replacement stairways serving existing unfinished attics or existing unfinished basements being converted to habitable space must not be less than 32 inches in clear width at all points above the permitted handrail height and below the required headroom height. Handrails must not project more than 4 inches on either side of the stairway and the minimum clear width of the stairway at and below the handrail height, including tread and landings, must not be less than 28 inches where a handrail is installed on one side and 24 inches where handrails are provided on both sides.
- **Add Section AJ110.1.5. Stair headroom.** The minimum headroom in all parts of existing or replacement stairways serving existing unfinished attics or existing unfinished basements being converted to habitable space must not be less than 6 feet 8 inches or 6 feet 4 inches under existing beams, girders, ducts or other obstructions.
- **Add Section AJ110.1.6. Stair treads and risers.** Treads must be 9 inches or greater and risers must not be greater than 8¾ inches.





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24