

# 2021 IRC - Part 2 Handout

Wisdom and Associates, Inc.

## Chapter 3 - Building Planning

### Emergency Escape & Rescue Openings (R310.1)

- Minimum one emergency escape per basement, habitable attic, and every sleeping room
- Emergency escape must open into public way, court or yard 36" in width
- Exception: Basements housing only mechanical equipment less than 200 SF
- Exception: Egress in sleeping rooms in basement not required with approved sprinkler system if:
  1. One means of egress and one emergency escape opening, or:
  2. Two means of egress (means of egress = hinged door, emergency escape opening = egress window)
- **Basement:** a story not above grade plane (Grade plane: A reference plane representing the average of the finished ground level adjoining the building at all exterior walls)
- **Habitable Attic:** a finished or unfinished area, not considered a story, complying with all of the following requirements:
  1. The occupiable floor area is not less than 70 square feet, in accordance with Section R304.
  2. The occupiable floor area has a ceiling height in accordance with Section R305.
  3. The occupiable space is enclosed by the roof assembly above, knee walls (if applicable) on the sides and the floor-ceiling assembly below.

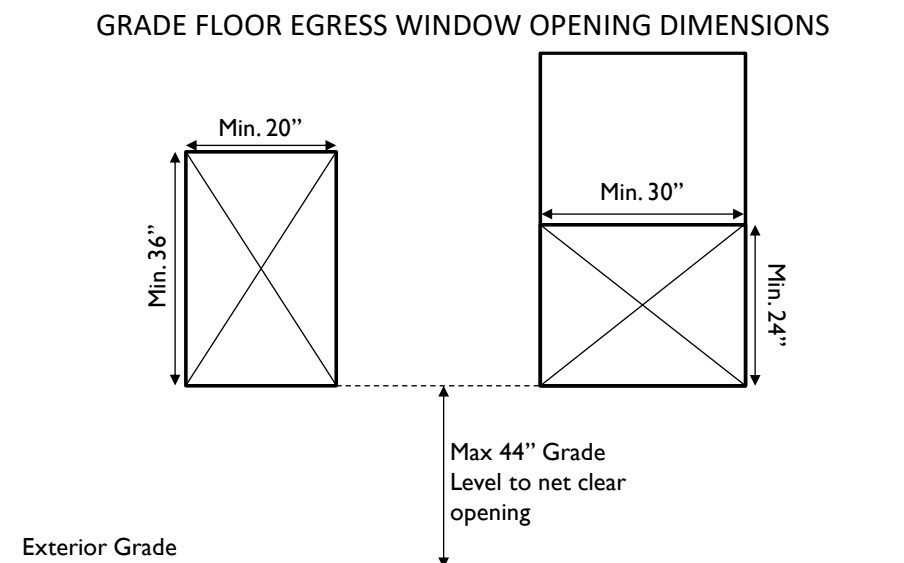
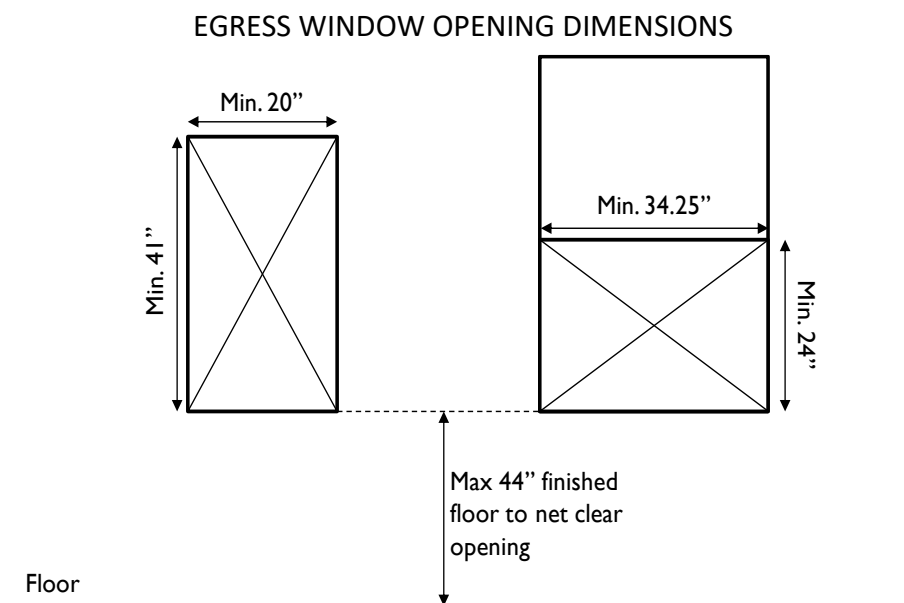
### Operational Constraints (R310.1.1)

- Egress must be operable from inside the room, operable without keys, tools, or special knowledge
- Fall prevention devices that meet ASTM F 2090 allowed if less than 70 inches above floor level

## Chapter 3 - Building Planning

### Minimum Opening Area (R310.2)

- Egress window net clear opening dimensions:
- Minimum 5.7 square feet
- Minimum 20" width
- Minimum 24" height
- Exception: Grade floor or below grade openings minimum 5.0 square feet. (*Grade floor opening: A window or other opening located such that the sill height of the opening is not more than 44 inches above or below the finished ground level adjacent to the opening*)
- Net clear opening the result of normal operation of the opening
- Not greater than 44 inches from floor to bottom of the clear opening



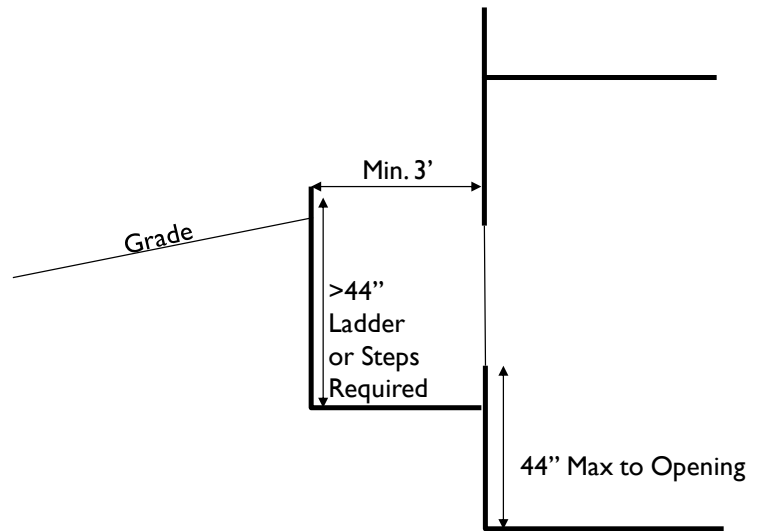
## Chapter 3 - Building Planning

### Area Wells (R310.4)

- Minimum 9 SF
- Minimum 3 feet in each dimension
- Window must be able to open fully

### Window Wells - Ladder (R310.4.2)

- Well depth greater than 44" requires a ladder or steps
- Ladder Minimum 12" width
- Minimum 3" off of wall
- Maximum 18" rung spacing
- Ladder may project up to 6" into required 3' well dimension



### Window Wells - Steps (R310.4.2.2)

- Well depth greater than 44" – steps permitted
- Inside width of 12 inches
- Minimum tread depth of 5 inches
- Maximum riser height of 18 inches
- Alaska Amendment - Window wells shall be designed to minimize the potential of the well becoming filled with snow and/or standing water which impedes operation of the egress fenestration.

### Bars, Grilles, & Covers (R310.4)

- Egress cover allowed
- Must be releasable from interior
- Removable by force not greater than required for normal operation of the egress window/door

### Replacement Windows (R310.5)

- Replacement windows exempt from normal egress requirements if largest standard size that will fit the pre existing opening, and the window is the same or greater opening style

### Dwelling Additions (R310.7)

- Additions with sleeping rooms must have egress
- New basements must have egress, unless there is a sleeping room with egress already
- Operable window complying with existing emergency escape window codes
- Change in occupancy (adding a sleeping room or finishing a basement) or basement addition, a smaller egress window is permitted:
- Net clear area of 4 square feet
- Minimum opening height of 22 inches
- Minimum opening width of 20 inches

## Chapter 3 - Building Planning

### Means of Egress (R311.1)

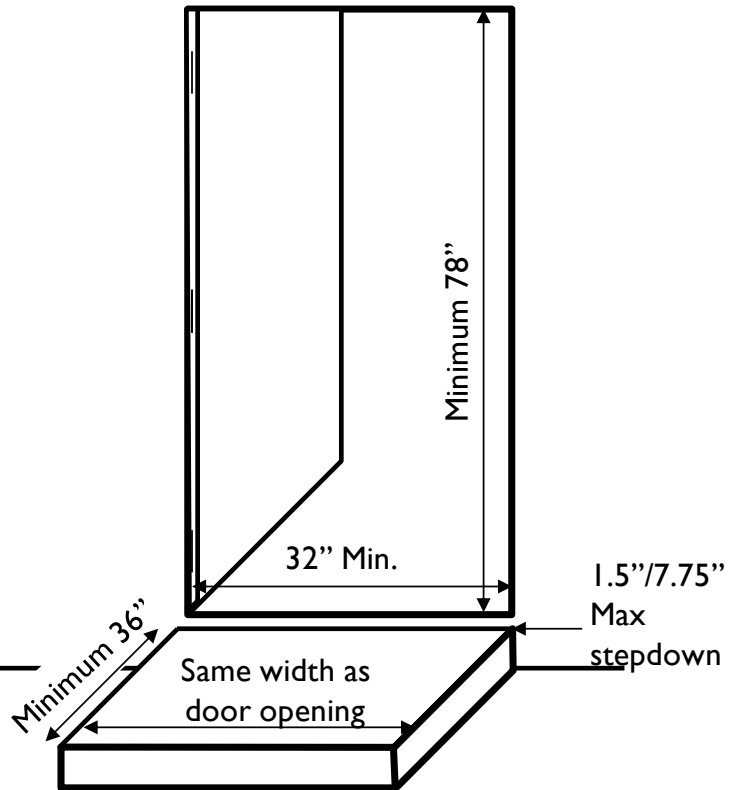
- Exterior door egress from all portions of a building without traveling through a garage
- Egress door must open into public way, yard or court

### Required Egress Door (R311.2)

- One side-hinge door required (not in garage)
- Minimum 32" width
- Minimum 78" height
- Readily openable from inside
- Landing at exterior side

### Landings at Exterior Doors (R311.3)

- Landing or floor required on each side of exterior door
- Exception: doors other than required egress door and 2 steps or less
- Landings must be at least as wide as the door served
- Minimum 36" in direction of travel
- Exception: Balconies less than 60 SF
- Landings/floors less than 1.5" below top of threshold
- Exception: Up to 7.75" below top if door does not swing over



### Attachment (R311.5)

- Landings, decks, balconies, stairs must be positively anchored to the structure, unless free-standing
- Cannot use just toenails or nails subject to withdrawal

### Hallways (R311.6)

- Minimum hallway width not less than 3 feet

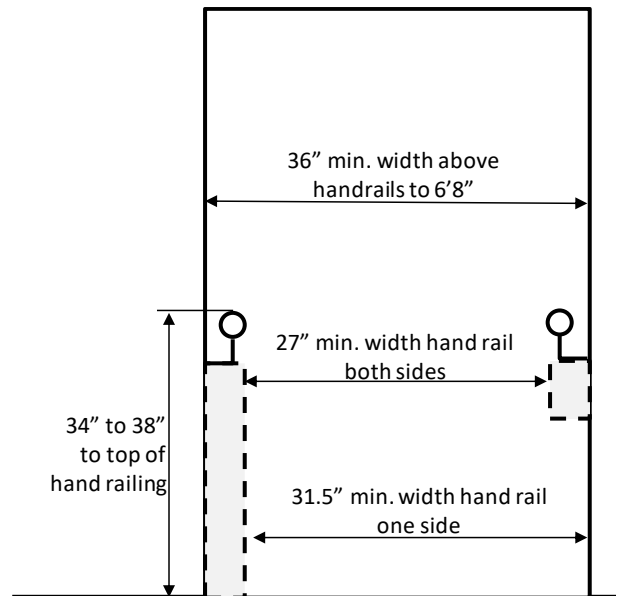
### Stairways (R311.7)

- Stairways not required to comply with code:
- Stairways not within or attached to a building, porch, or deck
- Stairways leading to non habitable attics
- Stairways leading to crawlspaces

## Chapter 3 - Building Planning

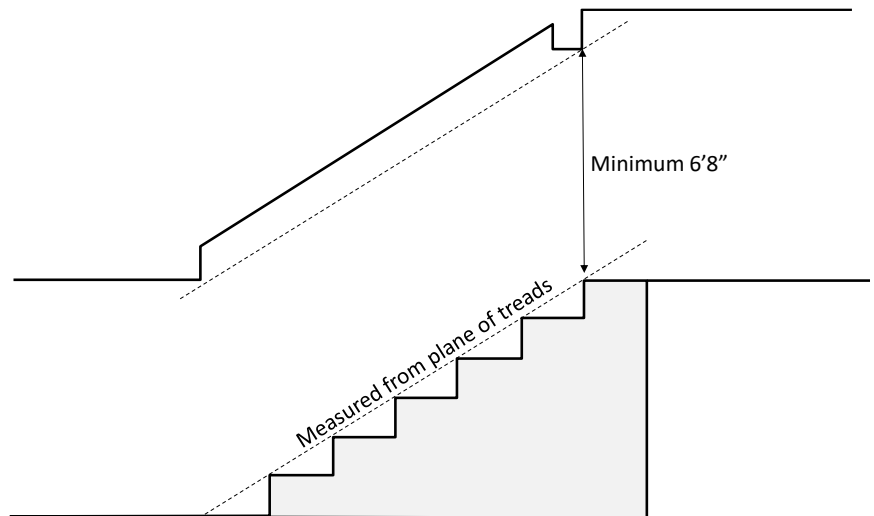
### Stairways (R311.7.1)

- Minimum 36" width above handrails to minimum headroom height
- Handrails project a maximum of 4.5"
- Handrail on one side, minimum 31.5" width at or below handrail
- Handrail on both sides, minimum 27" width at or below handrail
- Exception: Spiral stairways



### Headroom (R311.7.2)

- Minimum 6'8", measured from tread nosing or landing floor surface
- Exceptions:
  1. Tread nosings from flight above can project 4-3/4"
  2. Spiral stairs



### Vertical Rise (R311.7.3)

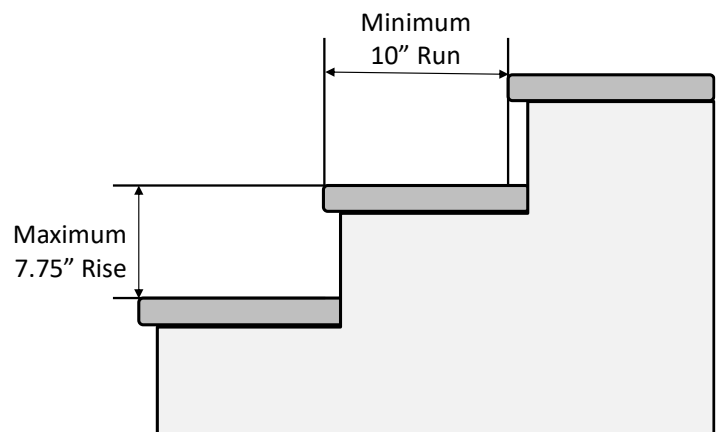
- Maximum 12 feet 7 inches between floor levels or landings (19 treads @ 7-3/4" rise)

### Risers (R311.7.5.1)

- Max 7-3/4" rise
- Max 3/8" variance between treads
- Open risers must be guarded if more than 30" above floor or grade below
- Exception: Spiral stairs

### Treads (R311.7.5.2)

- Minimum 10" run
- Max 3/8" variance between treads



## Chapter 3 - Building Planning

### Winders (R311.7.5.2)

- Winding treads minimum 6" width
- Minimum 10" width 12" from inside edge of tread

### Nosings (R311.7.5.3)

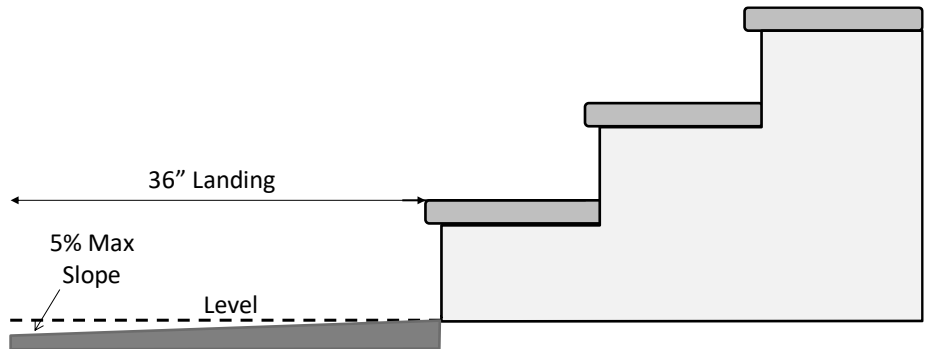
- Nosing required treads to prevent injury and lessen maintenance
- Exception: solid risers greater than 11 inches in depth

### Landings (R311.7.6)

- Landings or floor required at top and bottom of each stairway
- Minimum 36" in length, but not less than the width of the stair served
- Exception: Landing not required at the top of interior stairs including garages if door does not swing over stairs.

### Stairway Walking Surface (R311.7.7)

- Treads and landings maximum 1 in 48 horizontal slope
- 1 in 20 horizontal slope permitted for bottom landings, steps, patios to drain water

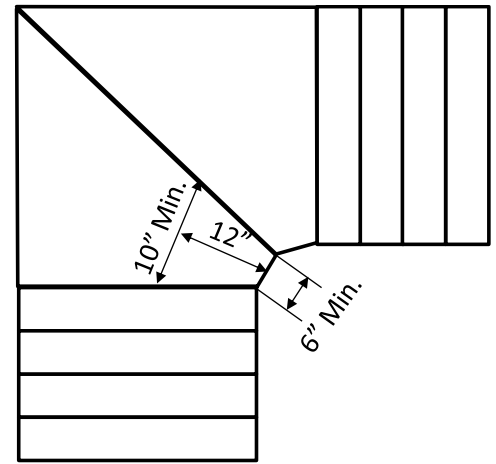


### Handrails (R311.7.8)

- Required with 4 or more risers
- Continuous on at least one side
- 34" - 38" vertically from the tread nosing
- Exception: handrail height may exceed 38" at the start of flight as part of a guard railing

### Continuity (R311.7.8.2)

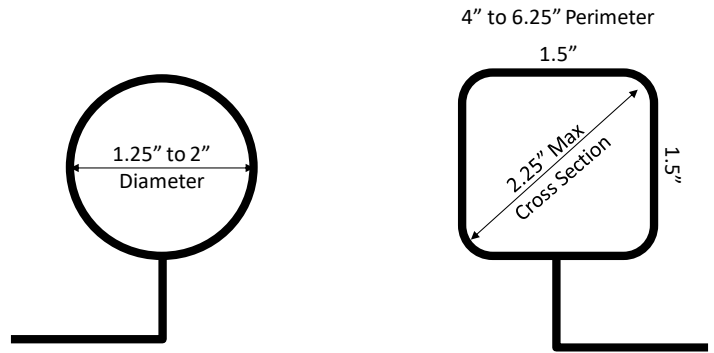
- Must be continuous from a point over the lowest riser to top riser
- Handrail ends must return to wall, guard walking surface, or post
- Minimum 1.5" clearance between wall and handrail
- Exception:
  1. Handrails can be interrupted by a newel post at a turn
  2. Volute, turnout, starting easing allowed over lowest tread and over the top landing



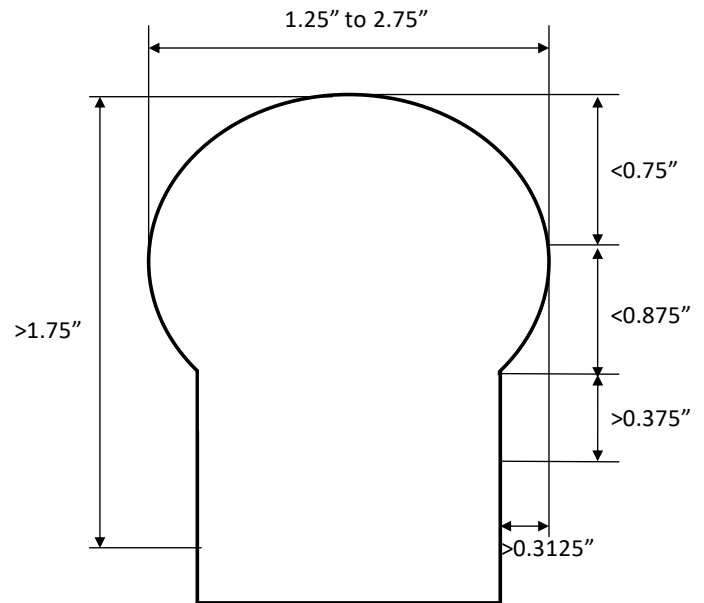
## Chapter 3 - Building Planning

### Grip Size (R311.7.8.3)

- **Type 1 Handrails:**
- Circular cross section - outside diameter between 1.25" and 2"
- Not circular - Perimeter between 4" and 6-1/4", cross section not more than 2-1/4"

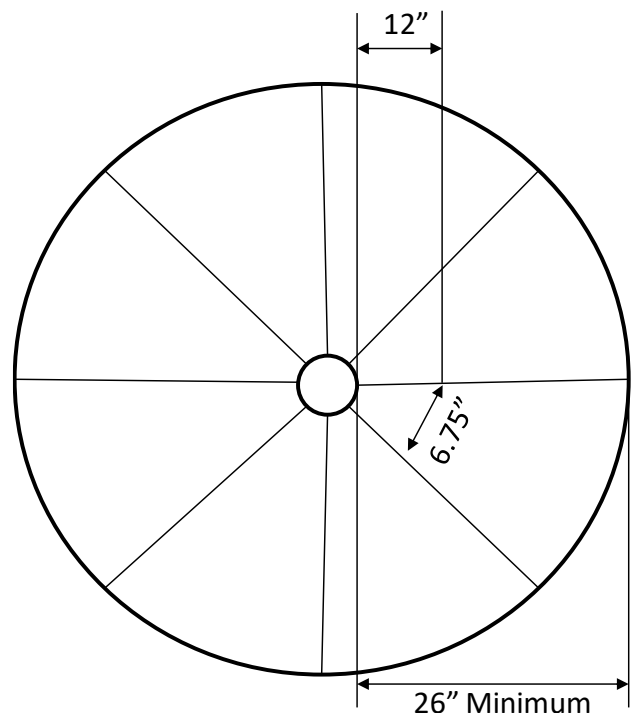


- **Type II Handrails:**
- Perimeter greater than 6-1/4", graspable recess on both sides
- Graspable recess begins within 3/4" of the top, 5/16" depth within 7/8" below widest part
- Recess of 3/8" to at least 1-3/4" below top of rail



### Spiral Stairways (R311.8.2)

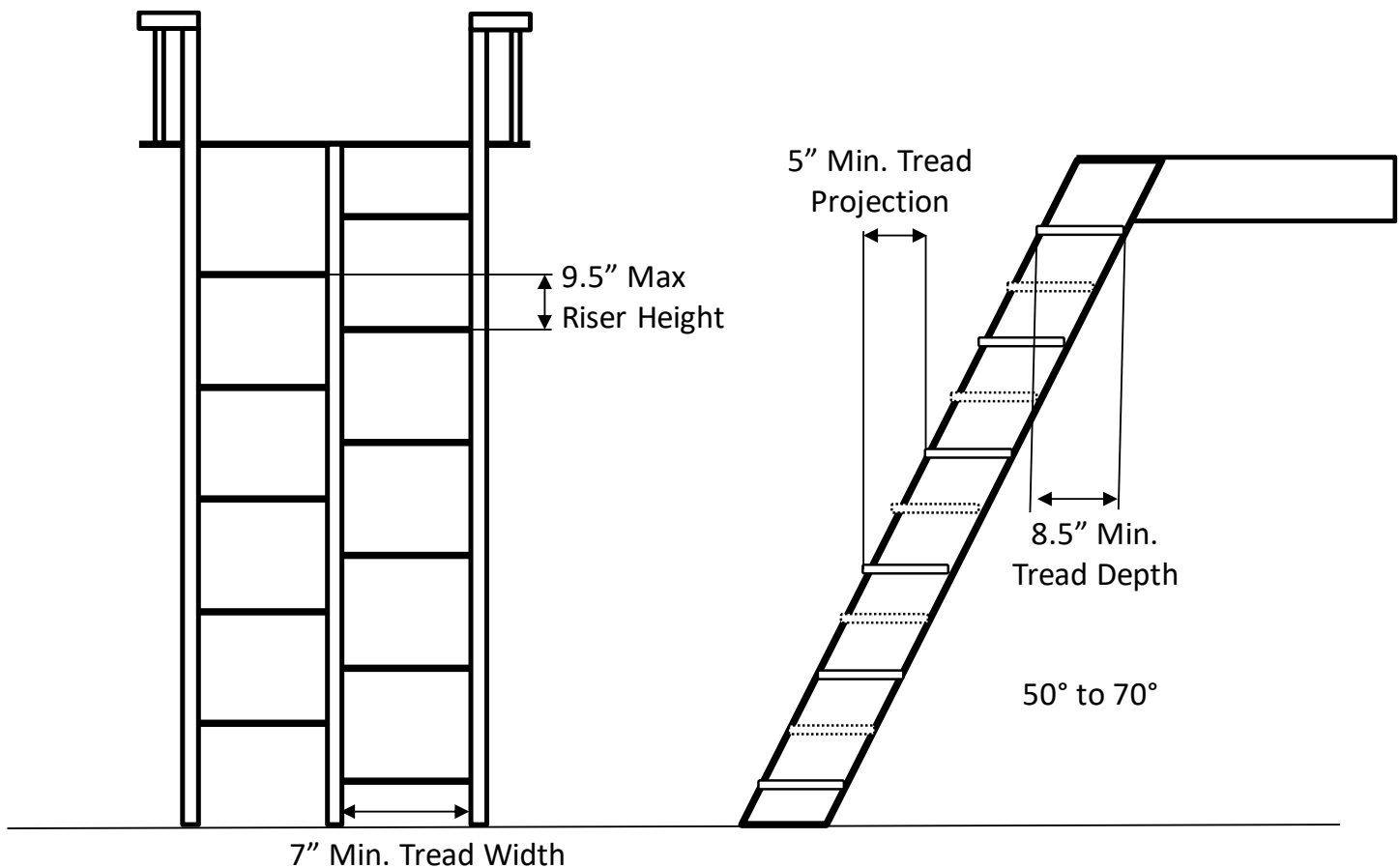
- Width at or below the handrail not less than 26"
- Minimum 6.75" tread depth 12" from inside edge
- Max 9.5" rise
- Minimum 6'6" headroom



## Chapter 3 - Building Planning

### Alternating Tread Devices (R311.7.11)

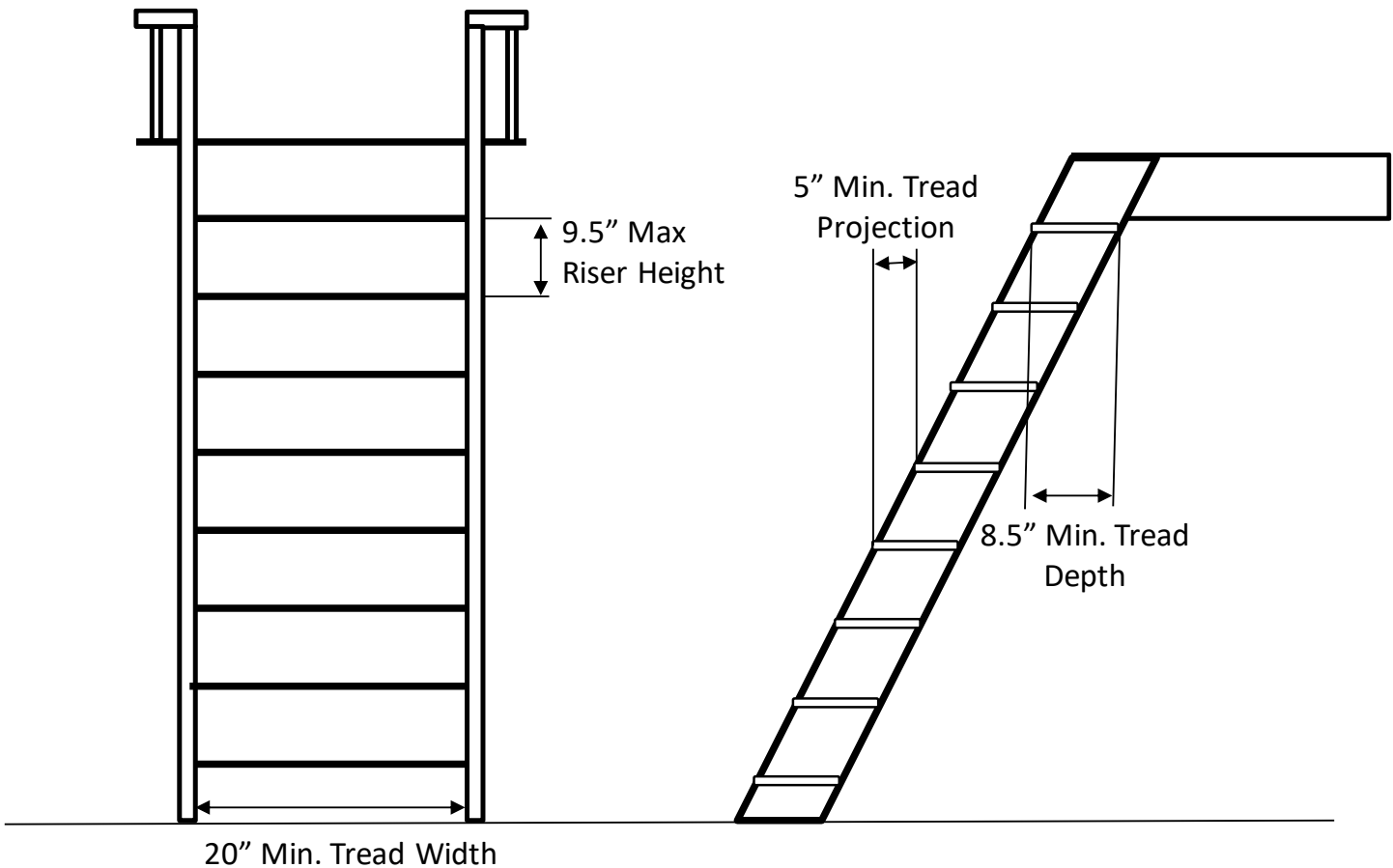
- Cannot be used for egress (separate means of egress required at each floor level and space requiring egress)
- Minimum width below handrails is 20"
- Exception: Allowed as an egress for lofts & mezzanines less than 200 SF that do not provide exclusive access to a kitchen or bathroom
- Minimum 5" tread depth (measured nosing to nosing)
- Minimum 8.5" run
- Minimum 7" tread width
- Maximum 9.5" riser height
- Initial tread begins at floor level
- Handrails required on both sides
- Handrails 30" to 34" above nosing of treads



## Chapter 3 - Building Planning

### Ships Ladders (R311.7.12)

- A steep stairway where the treads do not alternate
- Same egress, tread, and hand railing requirements as an alternating tread device



### Ramps (R311.8.1)

- 1 in 12 maximum slope at required egress door
- 1 in 8 maximum slope at all other doors
- Exception: Technically infeasible to do so, 1 in 8 allowed

### Ramps - Landings(R311.8.2)

- Landings required:
- Top and bottom of ramps
- Where doors open onto ramp
- Where ramp changes direction

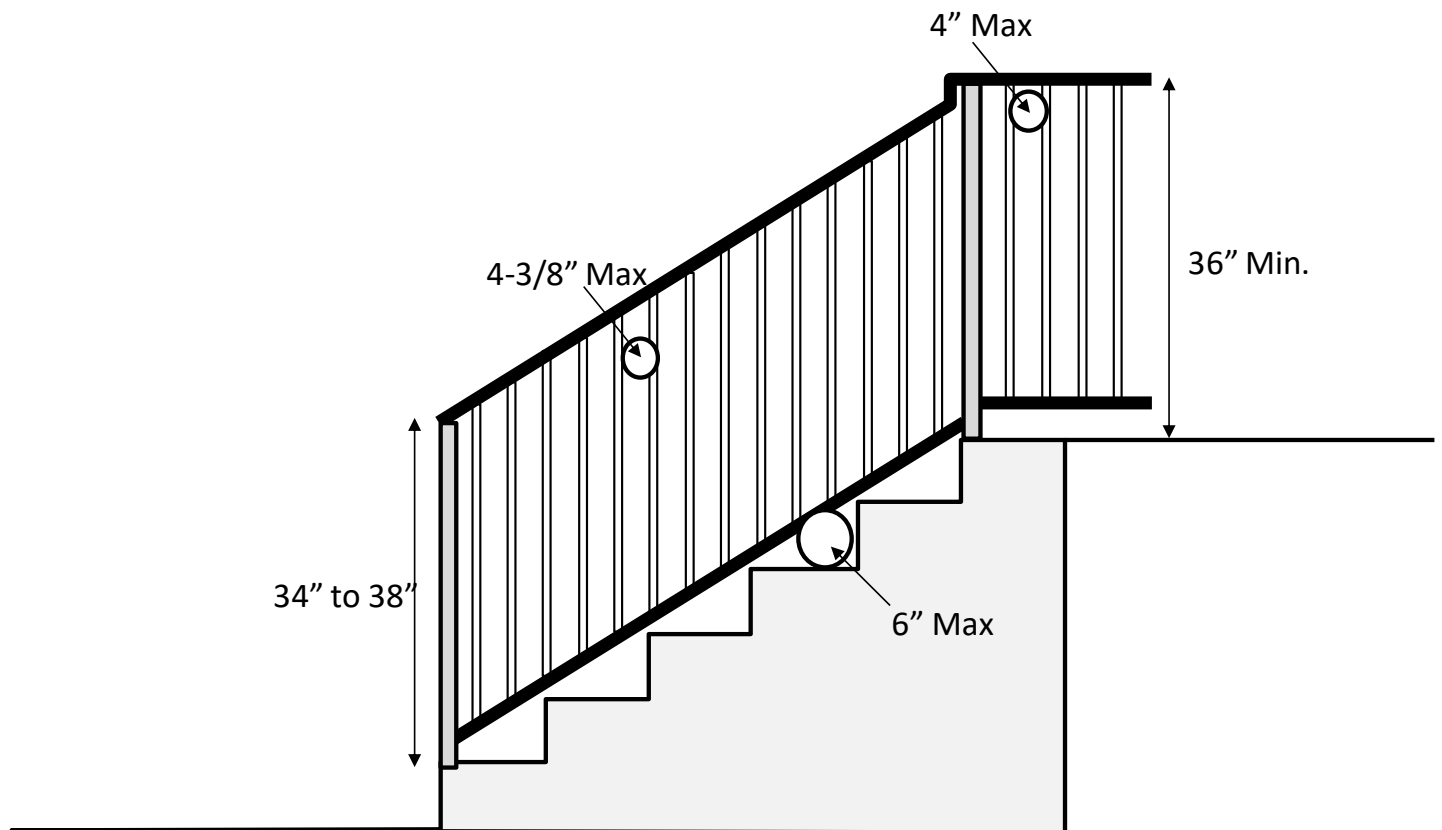
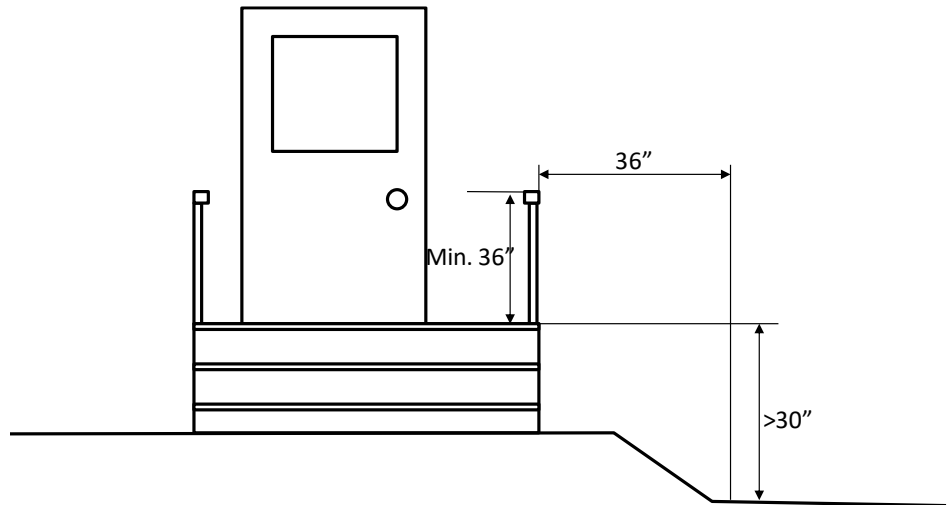
### Ramps - Handrails (R311.8.3)

- Handrail height between 34" and 38"
- Must be continuous
- Terminate in newel post or safety terminal or returns
- 1.5" space between wall and hand rail

## Chapter 3 - Building Planning

### Guards (R312.1-3)

- Open side(s) of floors, stairs, ramps, landings more than 30" above floor or grade level
- At any point within 36" horizontally of the open side
- Minimum 36" guard height
- Minimum 34" guard height from nosing of stair treads
- 34" to 38" where top of guard serves as a stair handrail
- Not allow the passage of a 4" sphere
- 4-3/8" sphere for stair guards
- 6" sphere for triangular stair opening at treads



## Chapter 3 - Building Planning

### Window Fall Protection (R312.2.1)

- Fall protection for windows required [where bottom of clear opening](#) is less than 24" above the floor and more than 72" above grade level
- Open area will not pass a 4" sphere

### Smoke Alarms (R314.3)

- Required in each sleeping area
- Outside each separate sleeping area in immediate vicinity
- On each additional story
- Not required on split levels less than one story where there is not an intervening door
- Not less than 3 feet horizontally from the door or opening to a bathroom that contains a tub or shower
- Ionization alarms at least 20 feet horizontally from permanent cooking appliances
- Ionization alarms with alarm silencing at least 10 feet horizontally from a permanent cooking appliance
- Photoelectric alarms at least 6 feet horizontally from a permanent cooking appliance
- ["Helps Reduce Cooking Nuisance Alarms"](#) not installed less than 6 feet from permanent cooking appliances

### Smoke Alarms - Interconnection (R314.4)

- Smoke alarms must be interconnected
- Wired or wireless
- Must be connected to building power and battery backup

### Carbon Monoxide Alarms (R315.1)

- Required in dwellings with fuel fired appliances or attached garages
- Installed outside each separate sleeping area
- Installed in each bedroom where a fuel fired appliance is located in the bedroom or adjoining bathroom
- Interconnected where more than one
- Exceptions for retrofit or repair:
  1. Exterior work
  2. Installation, alteration or repair of plumbing work
  3. Installation, alteration or repair of mechanical systems [that are not fuel fired.](#)

### Foam Plastic - Interior (R316.4)

- Must be covered with approved thermal barrier
- ½" gypsum board
- 23/32" wood structural panel
- Other tested material

## Chapter 3 - Building Planning

### Foam Plastic - Attics (R316.5.3)

- Covered by the following materials if accessible by scuttle, entered for maintenance and repair only
- 1.5" mineral fiber insulation
- ¼" wood structural panels
- 3/8" particle board
- ¼" hardboard
- 3/8" gypsum board
- 0.016" corrosion resistant steel
- 1.5" cellulose
- ¼" fiber cement board

### Foam Plastic - Crawlspace (R316.5.4)

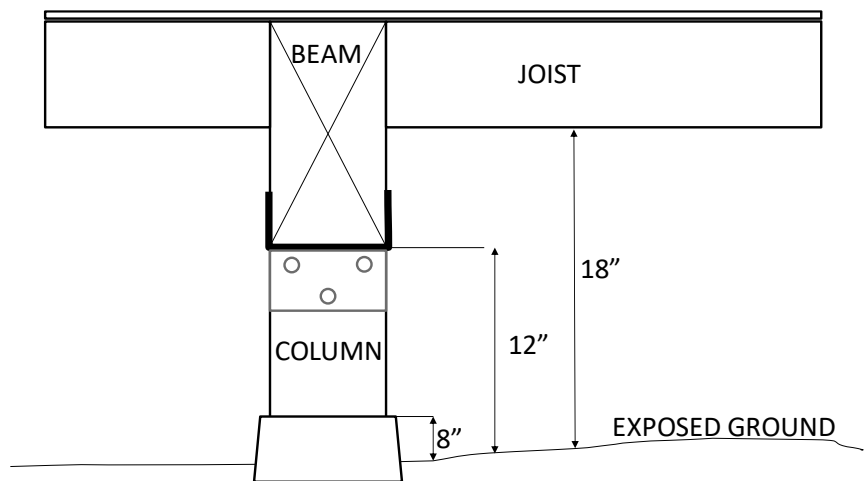
- Covered by the following materials if accessible by scuttle, entered for maintenance and repair only
- 1.5" mineral fiber insulation
- ¼" wood structural panels
- 3/8" particle board
- ¼" hardboard
- 3/8" gypsum board
- 0.016" corrosion resistant steel
- A crawlspace is defined as any underfloor space that is not basement (Basement – Story below grade-plane with a habitable ceiling height and finished floor)

### Foam Plastic - Rim Joist (R316.5.11)

- Up to 3-1/4" sprayed in the perimeter rim joist without needed covered
- 0.5 to 2.0 pcf

### Decay Protection (R317.1)

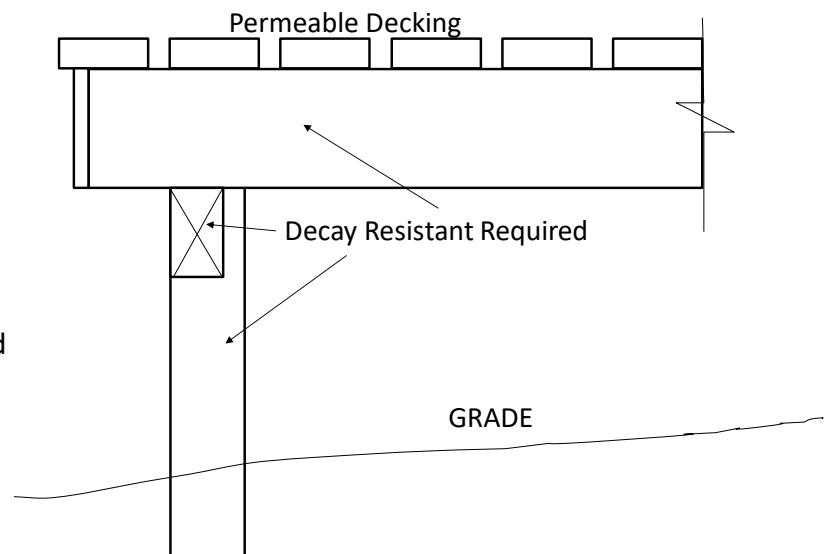
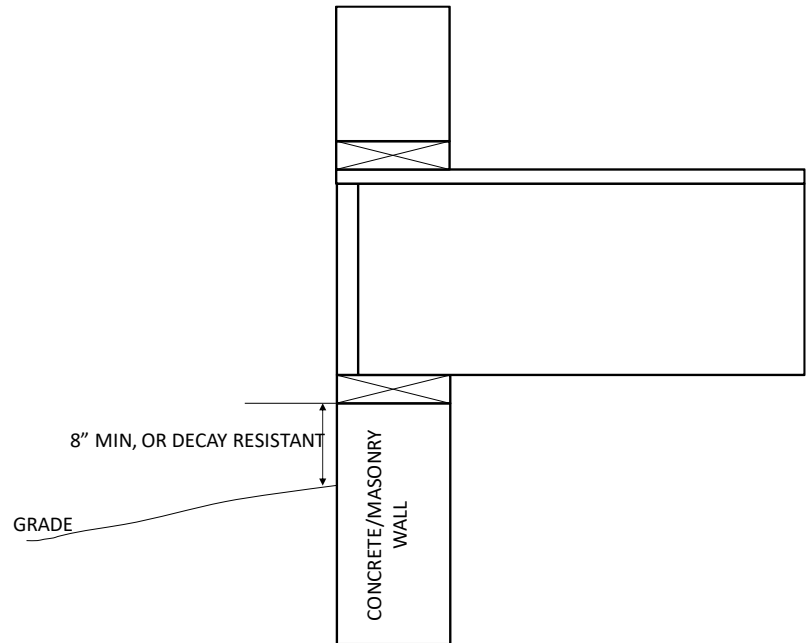
- Pressure treated or naturally durable wood required in all of the following locations:
  - Alaska Amendment - ~~naturally durable wood~~
1. Wood joists or wood structural floors closer than 18"
  - Wood girders closer than 12" to exposed ground
  - Wood column closer than 8" to exposed ground



## Chapter 3 - Building Planning

### Decay Protection (R317.1)

2. Wood framing members **including columns** that rest **directly** on concrete or masonry exterior foundation walls less than 8" from exposed ground
3. Sills and sleepers on concrete or masonry slab in direct contact with the ground unless separated by an impervious moisture barrier
4. The ends of wood girders entering concrete or masonry walls with less than ½" clearance on top, sides, and ends
5. Wood siding, sheathing, and wall framing less than 6" from ground or 2" from concrete, porch, or patio slabs
6. Wood structural members supporting moisture-permeable floors or roofs exposed to weather, such as concrete or masonry slabs, unless separated by an impervious moisture barrier
7. Wood furring strips or framing members attached to concrete or masonry walls below grade unless approved vapor retarder installed between concrete or masonry and wood
8. **Portions of wood structural members that form the structural supports of buildings, balconies, porches etc. exposed to the weather without adequate protection from a roof, eave, overhang or other covering**  
**Exception: Sawn lumber in regions where weather exposure does not cause decay.**
9. **Wood columns in contact with basement floor slabs unless 1 inch above concrete floor and separated by moisture barrier**



## Chapter 3 - Building Planning

### Ground Contact (R317.1.2)

- Decay resistant required:
- All wood in contact with ground
- Embedded in concrete in direct contact with ground
- Embedded in concrete exposed to weather
- Exception: Submerged in fresh water or below groundwater level

### Treated Wood Fasteners (R317.3.1)

- Pressure treated wood requires hot-dipped galvanized, stainless, bronze, or copper
- Exception: ½" or greater steel bolts

### Mezzanines (R325)

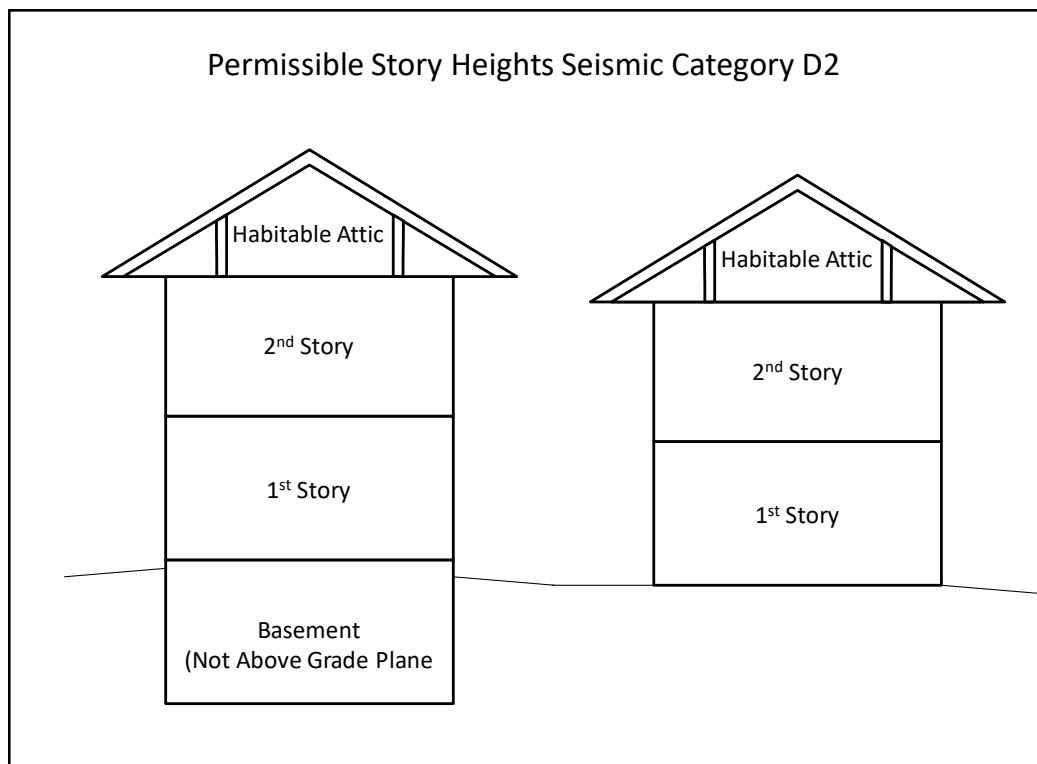
- Intermediate area between the floor and ceiling of a story
- Permitted to be 1/3 of floor area
- Must have egress
- Must not encroach on 7' ceiling heights above or below
- Must be open

### Habitable Attics (R326)

- Minimum room areas & ceiling heights apply
- Means of egress required

Not an additional story:

- 1/3 the floor area below
- Enclosed by roof assembly and knee walls
- Does not extend past floor below
- When above a third story, sprinklers required



## Chapter 4 - Foundations

### Drainage (R401.3)

- Grade away from building 6 inches over 10 feet (5%)
- Impervious surfaces (concrete, asphalt) sloped 2%

| Load Bearing Values of Soils                                                              |                    |
|-------------------------------------------------------------------------------------------|--------------------|
| Material Classification                                                                   | Load Bearing Value |
| Crystalline Bedrock                                                                       | 12,000             |
| Sedimentary and foliated rock                                                             | 4,000              |
| Sandy gravel and/or gravel (GW and GP)                                                    | 3,000              |
| Sand, silty sand, clayey sand, silty gravel and clayey gravel (SW, SP, SM, SC, GM and GC) | 2,000              |
| Clay, sandy, silty clay, clayey silt, silt and sandy siltclay (CL, ML, MH and CH)         | 1,500              |

| Properties of Soils According To The Unified Soil Classification System |            |                                                                                                                    |                          |                       |                                   |
|-------------------------------------------------------------------------|------------|--------------------------------------------------------------------------------------------------------------------|--------------------------|-----------------------|-----------------------------------|
| Soil Group                                                              | USC Symbol | Description                                                                                                        | Drainage Characteristics | Frost Heave Potential | Volume Change Expansion Potential |
| Group 1                                                                 | GW         | Well graded gravels, grave sand mixtures, little or no fines                                                       | Good                     | Low                   | Low                               |
|                                                                         | GP         | Poorly graded gravels or gravel sand mixtures, little or no fines                                                  | Good                     | Low                   | Low                               |
|                                                                         | SW         | Well graded sands, gravelly sands, little or no fines                                                              | Good                     | Low                   | Low                               |
|                                                                         | SP         | Poorly graded sands or gravelly sands, little or no fines                                                          | Good                     | Low                   | Low                               |
|                                                                         | GM         | Silty gravels, gravel sand silt mixtures                                                                           | Good                     | Medium                | Low                               |
|                                                                         | SM         | Silty sand, sand silt mixtures                                                                                     | Good                     | Medium                | Low                               |
| Group 2                                                                 | GC         | Clayey gravels, gravel sand clay mixtures                                                                          | Medium                   | Medium                | Low                               |
|                                                                         | SC         | Clayey sands, sandy clay mixture                                                                                   | Medium                   | Medium                | Low                               |
|                                                                         | ML         | Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity | Medium                   | High                  | Low                               |
|                                                                         | CL         | Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays                  | Medium                   | Medium                | Medium to Low                     |
| Group 3                                                                 | CH         | Inorganic clays of high plasticity, fat clays                                                                      | Poor                     | Medium                | High                              |
|                                                                         | MH         | Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts                                | Poor                     | High                  | High                              |
| Group 4                                                                 | OL         | Organic silts and organic silty clays of low pasticity                                                             | Poor                     | Medium                | Medium                            |
|                                                                         | OH         | Organic clays or medium to high pasticity, organic silts                                                           | Unsatisfactory           | Medium                | High                              |
|                                                                         | Pt         | Peat and other highly organic soils                                                                                | Unsatisfactory           | Medium                | High                              |

## Chapter 4 - Foundations

### Concrete Footing Width (R403.1)

- Significant change in footing width requirements, based on foundation type

| <b>Minimum Footing Widths - Light Frame Construction – 50 PSF Snow Load</b> |                                    |             |             |             |             |             |
|-----------------------------------------------------------------------------|------------------------------------|-------------|-------------|-------------|-------------|-------------|
| <b>Story &amp; Type of Structure</b>                                        | <b>Load Bearing Value of Soils</b> |             |             |             |             |             |
|                                                                             | <b>1500</b>                        | <b>2000</b> | <b>2500</b> | <b>3000</b> | <b>3500</b> | <b>4000</b> |
| 1 story slab on grade                                                       | 12X6                               | 12X6        | 12X6        | 12X6        | 12X6        | 12X6        |
| 1 story w/ crawlspace                                                       | 14X6                               | 12X6        | 12X6        | 12X6        | 12X6        | 12X6        |
| 1 story w/ basement                                                         | 18X6                               | 13X6        | 12X6        | 12X6        | 12X6        | 12X6        |
| 2 story slab on grade                                                       | 15X6                               | 13X6        | 12X6        | 12X6        | 12X6        | 12X6        |
| 2 story w/ crawlspace                                                       | 17X6                               | 13X6        | 12X6        | 12X6        | 12X6        | 12X6        |
| 2 story w/ basement                                                         | 21X7                               | 15X6        | 12X6        | 12X6        | 12X6        | 12X6        |
| 3 story slab on grade                                                       | 18X6                               | 13X6        | 12X6        | 12X6        | 12X6        | 12X6        |
| 3 story /w crawlspace                                                       | 20X7                               | 15X6        | 12X6        | 12X6        | 12X6        | 12X6        |
| 3 story w/ basement                                                         | 24X8                               | 18X6        | 14X6        | 12X6        | 12X6        | 12X6        |

| <b>Minimum Footing Widths - Light Frame Construction – 70 PSF Snow Load</b> |                                    |             |             |             |             |             |
|-----------------------------------------------------------------------------|------------------------------------|-------------|-------------|-------------|-------------|-------------|
| <b>Story &amp; Type of Structure</b>                                        | <b>Load Bearing Value of Soils</b> |             |             |             |             |             |
|                                                                             | <b>1500</b>                        | <b>2000</b> | <b>2500</b> | <b>3000</b> | <b>3500</b> | <b>4000</b> |
| 1 story slab on grade                                                       | 14X6                               | 12X6        | 12X6        | 12X6        | 12X6        | 12X6        |
| 1 story w/ crawlspace                                                       | 16X6                               | 12X6        | 12X6        | 12X6        | 12X6        | 12X6        |
| 1 story w/ basement                                                         | 19X6                               | 14X6        | 12X6        | 12X6        | 12X6        | 12X6        |
| 2 story slab on grade                                                       | 17X6                               | 13X6        | 12X6        | 12X6        | 12X6        | 12X6        |
| 2 story w/ crawlspace                                                       | 19X6                               | 14X6        | 12X6        | 12X6        | 12X6        | 12X6        |
| 2 story w/ basement                                                         | 22X7                               | 17X6        | 13X6        | 12X6        | 12X6        | 12X6        |
| 3 story slab on grade                                                       | 20X7                               | 15X6        | 12X6        | 12X6        | 12X6        | 12X6        |
| 3 story /w crawlspace                                                       | 22X7                               | 16X6        | 13X6        | 12X6        | 12X6        | 12X6        |
| 3 story w/ basement                                                         | 24X8                               | 19X6        | 15X6        | 13X6        | 12X6        | 12X6        |

Where the building width perpendicular to the wall footing is greater than 32 feet, the footing width shall be increased by 2 inches and footing depth shall be increased by 1 inch for every 4 feet of increase in building width.

Where the building width perpendicular to the wall footing is less than 32 feet, a 2-inch decrease in footing width and 1-inch decrease in footing depth is permitted for every 4 feet of decrease in building width provided that the minimum width is 12 inches and minimum depth is 6 inches.

## Chapter 4 - Foundations

### Concrete Footing Minimum Size (R403.1.1)

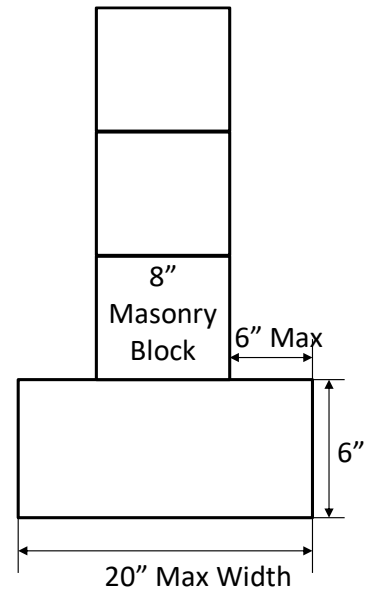
- Footing projection minimum 2"
- Footing projection can't exceed footing thickness

### Continuous Footings D0, D1, D2 (R403.1.1)

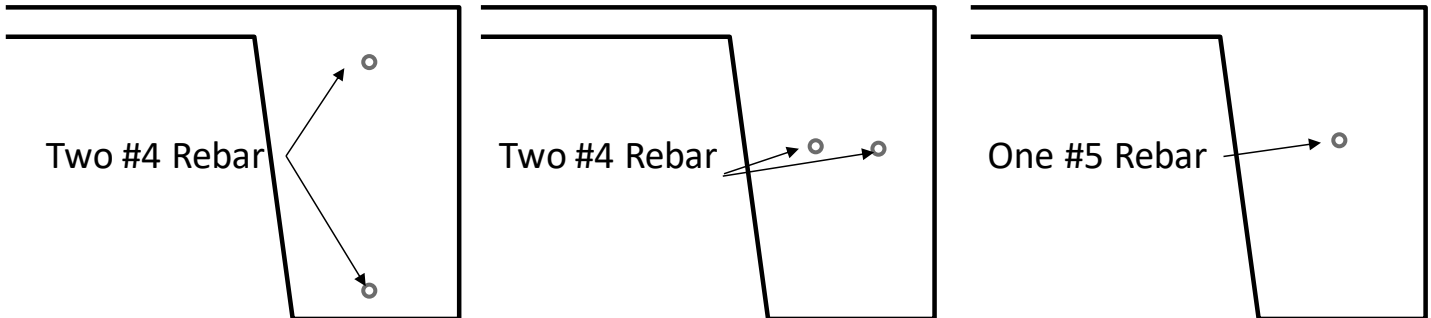
- Continuous, solid concrete or masonry footings required at:
- All exterior walls
- Interior braced wall line footings for single story buildings greater than 50 feet in plan dimension
- All interior braced wall lines for two story buildings

### Minimum Footing Reinforcement Concrete D0, D1, D2 (R403.1.1-3)

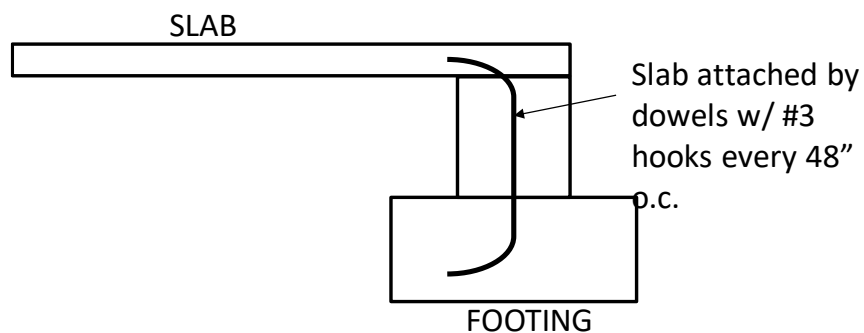
- Concrete footings, minimum one #4 bar 3-4" from the bottom of the footing
- Monoslabs, minimum one #4 bar in the top and bottom, or one #5 or two #4 in the middle third of the footing



### MONOSLAB FOOTING REINFORCEMENT



### NON - MONOSLAB FOOTING REINFORCEMENT



### Interior Slab Footings D0, D1, D2 (R403.1.3.4)

- Minimum 12" depth from top of slab for braced wall lines

### Minimum Footing Depth (R403.1.4)

- Minimum 12" below undisturbed ground, below the frost line
- Frost protected shallow foundation
- Exceptions: Solid rock, accessory structures, detached decks, permafrost

## Chapter 4 - Foundations

### Footing Slope (R403.1)

- Top surface level, bottom surface less than 10% slope, or stepped

### Frost Protected Shallow Foundations (R403.3)

- Footing depth above the frost line
- Protected by insulation
- Building must be continuously heated

### Frost Protected Shallow Foundation Insulation Protection (R403.3.2)

- Exterior foam protected against damage less than 12" below grade
- Cement board, treated plywood, other approved materials

| Minimum Insulation Requirements for FPSF in Heated Buildings |                             |                               |            |                                  |    |    |                       |
|--------------------------------------------------------------|-----------------------------|-------------------------------|------------|----------------------------------|----|----|-----------------------|
| Air Freezing Index                                           | Vertical Insulation R-Value | Horizontal Insulation R-Value |            | Horizontal Insulation Dimensions |    |    | Minimum Footing Depth |
|                                                              |                             | Along Walls                   | At Corners | A                                | B  | C  |                       |
| 1500                                                         | 4.5                         | NR                            | NR         | NR                               | NR | NR | 12                    |
| 2000                                                         | 5.6                         | NR                            | NR         | NR                               | NR | NR | 14                    |
| 2500                                                         | 6.7                         | 1.7                           | 4.9        | 12                               | 24 | 40 | 16                    |
| 3000                                                         | 7.8                         | 6.5                           | 8.6        | 12                               | 24 | 40 | 16                    |
| 3500                                                         | 9.0                         | 8.0                           | 11.2       | 24                               | 30 | 60 | 16                    |
| 4000                                                         | 10.1                        | 10.5                          | 13.1       | 24                               | 36 | 60 | 16                    |
| 4500                                                         | 12.0                        | 12.0                          | 15.0       | 36                               | 48 | 60 | 16                    |

