Chapter 3 in the 2013 RCO

For dwelling units:

- Structural Integrity –
  - Loads
    - Dead loads, Live loads, Flood, Snow, Wind and Seismic loads
  - Decay & Insect protection
  - Flood resistance, storm shelters; post frame structures
- Fire Safety
  - Fire Resistance of components, openings & materials
    - Within a dwelling, Between dwellings, Fireblocking & draftstopping, Foam plastics
- Life Safety
  - Egress
    - Doors, Emergency escape & rescue, Stairs, Handrails, Guards (fall protection)
  - Protection systems
    - Fire sprinklers, Smoke alarms, Carbon Monoxide alarms; Glazing
  - Site address
- Livability –
  - light; ventilation; heating; sanitation; minimum room size/ceiling height; bathroom spaces; environmental comfort; usability (including elevators); Garage & carports
301.1 Application

Requires all buildings to safely support/resist all imposed loads. Building load transfer & load resisting systems must transfer loads through the foundation system to soil.

- Design/Construction must provide a complete load path from point of origin through the load-resisting elements to the foundation.
- Prescribes actual construction details and requirements

301.1.1 Alternative Provisions

- The alternative prescriptive framing methods of the following standards may be used for design and construction when design complies with the OBC:
  - WFCM - Wood Frame Construction Manual by AF&PA
  - AISI S230 - Standard for Cold-Formed Steel Framing – Prescriptive Method for 1- and 2-Family Dwellings
301.1.2 Construction Systems

- The requirements of this code are based on:
  - Platform and balloon-frame construction for light-frame buildings
  - Balloon-frame systems for concrete and masonry buildings and light-frame buildings.
- Other systems may be used if equivalent details are provided to ensure force transfer, continuity & deformation compatibility.

Construction Systems

- Are dwellings that are constructed using post-frame methods equivalent to the platform and balloon-frame construction methods of the RCO?
- What standard is used to design and determine compliance?

301.1.3 Engineered Design

- When a building or conventional system containing structural elements not in compliance with the code, then the elements must be designed per accepted engineering practice
  - Only applies to the nonconforming portion of the system.
Engineered Design

• What constitutes “accepted engineering practice”?
  – Not defined in the RCO
  – Generally means that the analysis is based on accepted principles and standards which is nationally recognized
  – The Building Official must determine if the analysis is in accordance with “accepted engineering practice”

301.2 Climatic and Geographic Design Criteria

• Buildings are to be constructed per requirements in this section, PLUS
• Per additional criteria in Table 301.2(1)

Table 301.2(1) Climatic and Geographic Design Criteria
Table 301.2(1), continued…

<table>
<thead>
<tr>
<th>Table 301.2(1) Climatic and Geographic Design Criteria</th>
</tr>
</thead>
</table>
| **Ground Snow Load** – 20 psf for western Ohio; 25 psf for parts of eastern and central Ohio; an area east of Cleveland requires consultation with the local building department for site specific snow loads (Figure R301.2(5)). Contrast with OBC 1608 which allows local ordinance to specify snow load based on historical data.

- Wind Speed – All of Ohio is subject to 3-second gust of 90 mph
  - Must use Section 301.2.1.4 for Exposure Category (varies from site to site)
- Topographic Effects - Has been deleted from RCO...must use Exposure Categories
• Seismic Design Category – All of Ohio is located with SDC A or B.
  – The building designer may choose (but not required) to design to a stricter SDC Category
  • Structure must be built per approved construction documents.

---

Table 301.2(1) Climatic and Geographic Design Criteria

<table>
<thead>
<tr>
<th>Location</th>
<th>Heating Degree Days (Base 65°F)</th>
<th>Heating Design Temperatures</th>
<th>Heating Degree North Latitude</th>
</tr>
</thead>
<tbody>
<tr>
<td>Akron</td>
<td>4,677</td>
<td>0°F</td>
<td>41°12′</td>
</tr>
<tr>
<td>Columbus</td>
<td>4,654</td>
<td>0°F</td>
<td>41°19′</td>
</tr>
<tr>
<td>Cincinnati</td>
<td>4,605</td>
<td>0°F</td>
<td>41°16′</td>
</tr>
<tr>
<td>Dayton</td>
<td>4,615</td>
<td>0°F</td>
<td>41°18′</td>
</tr>
<tr>
<td>Columbus</td>
<td>4,605</td>
<td>0°F</td>
<td>41°19′</td>
</tr>
<tr>
<td>Sandusky</td>
<td>4,601</td>
<td>0°F</td>
<td>41°18′</td>
</tr>
<tr>
<td>Toledo</td>
<td>4,683</td>
<td>0°F</td>
<td>41°18′</td>
</tr>
<tr>
<td>Youngstown</td>
<td>4,652</td>
<td>0°F</td>
<td>41°18′</td>
</tr>
</tbody>
</table>

---

• Subject to Damage from:  
  – Weathering – All of Ohio is Severe  
  – Frost Line Depth – Varies from 30" to 48" and must be specified by each local jurisdiction via ordinance based on evidence  
  – Termite – All of Ohio is Moderate to Severe

---

Table 301.2(1) Climatic and Geographic Design Criteria

• Winter Design Temperature
• Ice Barrier Underlayment
  – Is required in all of Ohio
  – Requirements described in Section 905.2.7.1

• Flood Hazards
  – Local jurisdiction must enter appropriate dates and panel numbers

Table 301.2(1) Climatic and Geographic Design Criteria

<table>
<thead>
<tr>
<th></th>
<th>Category</th>
<th>Climate Zone</th>
<th>Table 301.2(1)</th>
<th>Table 301.2(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ice Barrier</td>
<td>South</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Underlayment</td>
<td>North</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>West</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Flood Hazards
Local jurisdiction must enter appropriate dates and panel numbers.

Table 301.2(1) Climatic and Geographic Design Criteria

<table>
<thead>
<tr>
<th></th>
<th>Category</th>
<th>Climate Zone</th>
<th>Table 301.2(1)</th>
<th>Table 301.2(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ice Barrier</td>
<td>South</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Underlayment</td>
<td>North</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>West</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Flood Hazards
Local jurisdiction must enter appropriate dates and panel numbers.

Table 301.2(1) Climatic and Geographic Design Criteria

- Flood Hazards – Date of the FEMA FIRM map for the jurisdiction, if applicable
- Air Freezing Index – Ranges from 1000 in southern & eastern Ohio to 1500 in northwest Ohio (cumulative degree days below 32°F – Figure R403.3(2) or Table 403.3(2))
- Mean Annual Temp. - Ranges from 50°F to 52°F from North to South (from the National Climate Data Center www.ncdc.noaa.gov/fpsf.html)
Structural Design

- 301.2.1 Wind Limitations
- 301.2.2 Seismic Provisions
- 301.2.3 Snow Loads
- 301.2.4 Floodplain Construction

301.2.1.4 Exposure Category

- Exposure A: Large city centers
- Exposure B: Urban and suburban areas, wood areas or other terrain with many closely spaced obstructions having the size of single-family dwellings or larger. This exposure shall be assumed in the design unless the site meets the definition of another exposure type.
- Exposure C: Open with scattered obstructions or undulations generally less than 30 ft. in height extending for 1,500 ft. in any direction.
  - Within Exposure B terrain, but located directly adjacent to open areas of Exposure C for a distance of more than 600 ft.
- Exposure D: Flat, unobstructed areas exposed to wind flowing over open water for at least 1 mile.

301.2.1.5 Topographic Wind Effects

- This section and its subsection 301.2.1.5.1 (Simplified topographic wind speed method) are deleted.
301.2.2 Seismic Provisions

- Ohio is established as SDC A or B
- Seismic provisions for SDC C or greater do not apply
  - If a building is designed to SDC C or greater, and the construction documents are approved, installation in the field must follow the approved construction documents

301.2.3 Snow Loads

- The provisions of the RCO is limited to ground snow loads up to 70 psf
- Structures subject to ground snow loads exceeding 70 psf must be designed in accordance with accepted engineering practice

301.2.4 Floodplain Construction

- Any portion of a building or structure constructed in flood hazard areas (including A or V Zones) must be designed and constructed per Section 322.
  - Any portion of a building or structure located within identified floodways must be designed and constructed per ASCE 24.
### 301.3 Story Height

- Section 301.3 defines story height and wall height limits.
  - Wood Wall Framing: See Table 602.3(5) for allowable laterally unsupported bearing wall stud heights (Stud height of 10 feet, plus max. 16" floor framing height)
    - Exception: Can be 12 feet for bracing provided appropriate multiplying factors are provided to the required bracing.
  - Steel Wall Framing: Stud height of 10 feet, plus max. 16" floor framing height
  - Masonry Wall: Max clear height of 12 feet, plus max. 16" floor framing height
    - Additional 8 feet permitted for gable end wall

### 301.3 Story Height

- Individual walls or studs can exceed these limits as permitted in Chapter 6, provided the story heights are not exceeded.
- Floor framing height can exceed 16" provided the story height does not exceed 11'-7".
- Engineered Design must be provided if wall framing members exceed the limits of Chapter 6.
- Engineered Design in accordance with the OBC must be provided if the story height limits are exceeded.

### Design Loads

- 301.4 Dead Load
- 301.5 Live Load
- 301.6 Roof Load
- 301.7 Deflection
- 301.8 Nominal Sizes
301.4 Dead Load

- Dead load is the actual weights of materials and construction and load of fixed service equipment.

301.5 Live Load

- Balconies = 40psf
- Habitable attics and attics served with fixed stairs = 30psf

301.6 Roof Loads

- 301.6 Roof Load – Roof shall be designed per Table 301.6 OR the snow load per Table R301.2(1) WHICHER IS GREATER.
- All of Ohio is or exceeds 20 psf snow load; therefore, Table R301.6 does not apply in Ohio.
301.7 Allowable Deflections

<table>
<thead>
<tr>
<th>TABLE No. 7</th>
<th>ALLOWABLE DEFLECTION OF STRUCTURAL MEMBERS No. 7</th>
<th>ALLOWABLE DEFLECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Member Type</td>
<td>Structural Member</td>
<td>Deflection</td>
</tr>
<tr>
<td>Beam</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>Lintel</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>Wall, solid</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>Panel</td>
<td>1.000</td>
<td></td>
</tr>
</tbody>
</table>

Note: 1.1. span length, 2. span length

302.1 Exterior Walls
Construction, projections, openings of dwellings and accessory buildings shall comply with table:

<table>
<thead>
<tr>
<th>TABLE No. 1</th>
<th>EXTERIOR WALLS</th>
<th>MINIMUM FIRE RESISTANCE RATING</th>
<th>MINIMUM FIRE SEPARATION DISTANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>With</td>
<td></td>
<td>DOUBLE</td>
<td></td>
</tr>
<tr>
<td>(Fire-resistant)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Not fire-resistant)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Projections</td>
<td></td>
<td>1 hour on the materials</td>
<td>2 hours to 1 hour</td>
</tr>
<tr>
<td>(Fire-resistant)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Not fire-resistant)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Openings in walls</td>
<td></td>
<td>0 inches</td>
<td>2 feet</td>
</tr>
<tr>
<td>Closed</td>
<td></td>
<td>0 inches</td>
<td>5 feet</td>
</tr>
<tr>
<td>Opened</td>
<td></td>
<td>3 feet</td>
<td>5 feet</td>
</tr>
<tr>
<td>Penetrations</td>
<td></td>
<td>Comply with Section 302-4</td>
<td>2 feet</td>
</tr>
</tbody>
</table>

For No. 1, Notes No. 4 each
N/A = Not Applicable.
302.1 Exterior Walls

Where referenced in this code, an occupied space on an adjoining property may be included in the required fire separation distance, provided that the property is dedicated or deeded so as to preclude, for the life of the structure, the erection of another building or structure.

Exceptions to Table 302.1

• 302.1 Exterior Walls
  – Exceptions
    1. Construction, projections, openings perpendicular to the line used to determine the fire separation distance.
    2. Walls of dwellings and accessory structures located on the same lot.
    3. Walls of structures exempted from approval per Section 102.10, except that projects beyond the exterior wall must not extend over the lot line.
    4. Detached garages located within 2' of a lot line may have a roof eave projection not exceeding 4'.
    5. Foundation vents in compliance with this code are permitted.
302.1 Exterior Walls
Required to be 1-hour if the wall is located within 3 feet of property line.

Exception:
Garages which are 2' from the line can have a max. 4" projection. Underside of projection must also be 1-hour and.

302.2 Multiple Dwelling Separation (>2)
- 310.1 of OBC, R-3 occupancy designs qualifying for use of RCO:
  - Independent means of egress for each unit
  - No more than one unit over another
  - Fire separation in accordance with this section
  - Administered through OBC Chapter 1
**Dwelling Unit Separations**

When using the RCO for R-3 designs, the following apply:

1. Fire separation between a group of two units must comply with 302.3 (1 hr.)
2. Fire separation between a two unit group and other dwelling units must comply with 302.2 (2 hr. or two 1 hr.)

---

**302.2 and 302.3 Dwelling Separation**

All separating assemblies must be tested in accordance with ASTM E119 or UL 263

OR

Common two-hour wall may not have any plumbing or mechanical equipment, ducts or vents in the cavity and must be rated for fire exposure from both sides.

---

**Dwelling Separation**

All separating assemblies must be tested in accordance with ASTM E119 or UL 263

Construction supporting rated assemblies must have equal or greater fire-resistant ratings.
Dwelling Unit Separations

R-3 Separations

Two 1 hr. walls or one 2 hr. wall

Grade level access for upper units

Grade level access for lower units

R-3: CAN USE RCO

Dwelling Unit Separations

R-3 Separations

Grade level access for all upper units

Grade level access for lower units

R-3: BUT CANNOT USE RCO

Separation Details

302.2.2 Parapets

- Required for townhouses
- Must be the same rating as the separation wall
- Must extend 30" above the lowest roof on either side
- Where roof elevations are offset by at least 30", the fire rating of the separation from the top of the lower roof to the bottom of the lower roof may be 1 hr. rated.
Separation Details

302.2 Parapets
Exception: Parapets need not extend above the roof if:
– The roof covering is Class C minimum
– The decking is non-combustible or FRTW for a distance of 4' from the
  wall on each side or 5/8” type X gypsum is attached to the bottom of
  the deck for a distance of 4' on each side.

![Separation Details](image)

Separation Details

302.2.3 Parapet Construction (see Fig. 302.2.2(1))
• Must have the same fire resistance rating as that required for
  the supporting wall or walls.
• On any side adjacent to a roof surface, the parapet must have
  noncombustible facing for the uppermost 18 inches including
  counter-flashing and coping materials).
• Where the roof slopes toward a parapet at slopes > 2:12
  • Parapet must extend to the same height as any portion of the roof
    within a distance of 3 feet
  • In no case shall the height be less than 30 inches.

Separation Details

302.2.4 Structural independence
• Each individual dwelling unit must be structurally
  independent

Exceptions:
1. Foundations supporting exterior walls or common walls
2. Structural roof and wall sheathing from each unit may fasten to the
   common wall framing
3. Nonstructural wall and roof coverings
4. Flashing at termination of roof covering over common wall.
5. Dwelling units separated by a common 2-hour fire-resistance rated
   wall per Section 302.2
6. Dwelling units stacked vertically.
Rated Penetrations 302.4

- Assemblies required to be rated by sections 302.2 or 302.3 must be protected in accordance with 302.4.1 
  & 302.4.2 (see fig. 302.4.1)
  - Through penetrations
  - Fire resistance rated assemblies
  - Penetration firestop systems ...
  - Membrane penetrations

Garage/Dwelling Assemblies 302.5

- Openings
  - None allowed between garage and sleeping areas
  - Openings to other rooms limited to:
    - Solid wood doors
    - Steel doors
    - 20 minute rated doors
- Ducts and Other Penetrations
  - Ducts min. 26 ga. with no garage openings
  - 302.5.3 misprint ...309.2 should be 302.6 penetrations protected in accordance with 302.11(4)
- Separation
  - In accordance with Table 302.6 (see Fig 302.5.2)

Fire & Smoke Risk General Provisions

- Under-stairs 302.7
  - Enclosed area surfaces minimum % Gypsum
- Foam Plastics 316
- Flame spread index & Smoke-developed index
  - Walls, ceilings, trim 302.9
  - Insulation 302.10
  - Limits, testing...validation
- Fireblocking
  - Required in wood frame (see figs. 302.11(1-13)
    - Gypsum, wood & fibrous panel, soffits, dropped ceilings, spaces around bathtubs, top & bottom of stair: doors, pipe access, chimneys, etc.
  - Materials 302.11, 7 options
  - Insulation
    - Ratts for horizontal run
    - Using insulation — 3" thick, tightly packed around pipes, etc.
    - Insulation 302.11
    - Maintained
- Draftstopping 302.12 – combustible construction
  - When connected area exceeds 1000 sq ft with usable space above or below, draftstopping (1/2" gyp, 3/8 plywood) dividing space in half is required
  - Combustible insulation clearance of 5” required adjacent to heat producing devices – 302.13
Fire Resistance Determination

• 302.14 Fire resistance can be verified for compliance by:
  – test results of materials, components or assemblies to ASTM 119 or UL 263
  – OBC Section 721 – Calculated fire resistance

• Equivalent fire resistive values can be derived for components not required to be rated by using OBC section 721 and Resource A

SECTION 303
Light, Ventilation & Heating

SECTION 304
Minimum Room sizes
SECTION 305
Ceiling Height

SECTION 306
Sanitation

SECTION 307
Toilet Bath & Shower Spaces
308.1 Identification

• Each pane of glazing installed in hazardous locations must be provided with a manufacturer’s designation specifying:
  – Who applied the designation
  – Type of glass
  – Safety glazing standard with which it complies
• Identification must be visible at time of final inspection
• Must be etched, sandblasted, embossed, or of a type that cannot be removed without being destroyed.
• A label is permitted in lieu of the manufacturer’s designation.

308.1 Identification, continued...

• Exceptions:
  1. Non-Tempered Glass: Building official may approve the use of a certificate, affidavit or other evidence confirming compliance with this code for glass without the manufacturer’s designation.
  2. Tempered Glass: Permitted to be identified by the manufacturer with a removable paper designation only when it is spandrel glass.
• 308.1.1 Identification of Multiple Assemblies
  – Only one pane is required to be identified when all of the individual panes do not exceed 1 sq.ft. in exposed area.
  – Must be identified per 308.1
  – All other pane in the assembly must be labeled “CPSC 16 CFR 1201” or “ANSI Z97.1” as appropriate.
308.2 Louvered Windows or Jalousies

- Regular, float, wired or patterned glass in jalousies and louvered windows must be no thinner than nominal 3/16 inch and no longer than 48 inches.
- Exposed glass edges must be smooth.
  - 308.2.1 Wire Glass Prohibited
    - Wired glass with wire exposed on longitudinal edges shall not be used in jalousies or louvered windows.

308.3 Human Impact Loads

- Individual glazed areas, including glass mirrors in areas identified as hazardous, must meet the testing requirements of Section 308.3.1
  - Exceptions:
    1. Louvered windows and jalousies complying with Section 308.2.
    2. Mirrors and other glass panels mounted or hung on a surface that provides a continuous backing support.
    3. Glass unit masonry complying with Section 610.

308.3.1 Impact Test

- Glazing in doors or enclosures for hot tubs, whirlpools, saunas, steam rooms, bathtubs and showers must be tested per CPSC 16 CFR 1201 and comply with test criteria for Category I or II as indicated in Table 308.3.1(1)
308.3.1 Impact Test

- Glazing in any other location are permitted to be tested per ANSI Z97.1 and comply with the text criteria for Class A or B as indicated in Table 308.3.1(2).

### Table 308.3.1(2)

<table>
<thead>
<tr>
<th>EXPOSED SURFACE AREA OR DIAMETER OF OPENING</th>
<th>CLASS A REQUIREMENT</th>
<th>CLASS B REQUIREMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-impact resistant</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>Impact resistant</td>
<td>□</td>
<td>□</td>
</tr>
</tbody>
</table>

For all | Exceptional | □ | □ |

- For all | Exceptional | □ | □ |

- This is permitted only by the exception to Section 308.3.1.

308.4 Hazardous Locations

- The following is considered specific hazardous locations for the purposes of glazing:
  1. Glazing in all fixed and operable panels of swinging, sliding and bifold doors
    - Exceptions:
    - Glazed openings of a size through which a 3 inch diameter sphere is unable to pass.
    - Decorative glazing
  2. Glazing in an individual fixed or operable panel adjacent to a door where:
    - The nearest vertical edge is within a 24-inch arc of the door in a closed position;
    - The bottom edge of glazing with ≤60 inches above the floor/walking surface
    - Exceptions:
      1. Decorative glazing
      2. When there is an intervening wall or other permanent barrier between the door and the glazing
      3. Glazing in walls on the latch side of and perpendicular to the plane of the door in a closed position
      4. Glazing adjacent to a door where the access through the door is to a closet or storage area 3 feet or less in depth
      5. Glazing adjacent to the fixed panel of patio doors.
308.4 Hazardous Locations

• The following is considered specific hazardous locations for the purposes of glazing:

   3. Glazing in an individual fixed or operable panel that meets all of the following conditions:
      1. The exposed area of an individual pane exceeds 9 sq.ft.; and,
      2. The bottom edge of glazing is less than 18" above the floor; and,
      3. The top edge of the glazing is more than 36" above the floor; and
      4. One or more walking surfaces are within 36 inches, measured horizontally and in a straight line, of the glazing.

   Exceptions:
   1. Decorative glazing
   2. When a horizontal rail is installed on the accessible side(s) of the glazing 34" to 38" above the walking surface
      – Must be capable of withstanding a horizontal load of 50plf without contacting the glass, and
      – Be a minimum of 1.5" in cross sectional height.
   3. Outboard panes in insulating glass units and other multiple glazed panels when the bottom edge of the glass is 25 feet or more above grade, a roof, walking surfaces or other horizontal (within 45 degrees of horizontal) surface adjacent to the glass exterior.
308.4 Hazardous Locations

• The following is considered specific hazardous locations for the purposes of glazing:
  4. All glazing in railings regardless of area or height above a walking surface.
  5. Glazing in enclosures for walls facing hot tubs, whirlpools, saunas, steam rooms, bathtubs and showers where the bottom of the exposed edge of the glazing is less than 60 inches measured vertically above any standing or walking surface
     — Exception:
     • Glazing more that is more than 60 inches, measured horizontally and in a straight line, from the waters edge of a hot tub, whirlpool or bathtub.

Glazing used in any railing, regardless of height, must be tempered.
Is Glazing permitted around this tub permitted?
308.4 Hazardous Locations

- The following is considered specific hazardous locations for the purposes of glazing:
  6. Glazing in walls and fences adjacent to indoor and outdoor swimming pools, hot tubs and spas where the bottom edge of the glazing is less than 60 inches above a walking surface and within 60 inches, measured horizontally and in a straight line, of the waters edge. This applies to single glazing and all panes in multiple glazing.

- The following is considered specific hazardous locations for the purposes of glazing:
  7. Glazing adjacent to stairs, landings and ramps within 36 inches horizontally of a walking surface when the exposed surface of the glazing is less than 60 inches above the plane of the adjacent walking surface

  Exceptions:
  1. When a horizontal rail is installed on the accessible side(s) of the glazing 34” to 36” above the walking surface
     - Must be capable of withstanding a horizontal load of 50plf without contacting the glazing, and
     - Be a minimum of 1.5” in cross sectional height.
  2. The side of the stairway has a guardrail or handrail, including balusters or in-fill panels, complying with Sections 311.7.6 & 312 and the plane of the glazing is more than 18 inches from the railing, or
  3. When a solid wall or panel extends from the plane of the adjacent walking surface to 34 to 36 inches above the walking surface and the construction at the top of that wall or panel is capable of withstand the same horizontal load as a guard.
Where is the 36" dimensioned measured from at the top of a stair?
308.4 Hazardous Locations

The following is considered specific hazardous locations for the purposes of glazing:

8. Glazing adjacent to stairways within 60 inches horizontally of the bottom tread of a stairway in any direction when the exposed surface of the glazing is less than 60 inches above the nose of the tread.

   Exceptions:
   1. The side of the stairway has a guardrail or handrail, including balusters or in-fill panels, complying with Sections 311.7.6 & 312 and the plane of the glazing is more than 18 inches from the railing;
   2. When a solid wall or panel extends from the plane of the adjacent walking surface to 34 to 36 inches above the walking surface and the construction at the top of that wall or panel is capable of withstanding the same horizontal load as a guard.
Safety Glazing Required Near Stairs

The 2004 IRC calls for safety glazing when glazing is adjacent to stairways, landings or unprotected enclosed stairways. The IRC requires that the glass has a deflection factor less than one inch for glass to be considered safety glazing. It is often a good idea to add extra safety glazing at the top and bottom of each stair, even if it is not a part of the building exit or the final exit. Such glazing must resist deflection and provide a safe environment for egress. It is also recommended that safety glazing be installed around the perimeter of the stairwell to enhance the safety of the structure. It is also recommended that safety glazing be installed around the perimeter of the stairwell to enhance the safety of the structure.
308.5 Site Built Windows

- Must comply with Section 2404 of the OBC
  - Details the requirements for:
    - Identification
    - Glass Supports
    - Framing
    - Design Loads

308.6 Skylights and Sloped Glazing

- 308.6.2 Permitted Materials
  - Laminated glass
    - Min. 0.015-inch polyvinyl butyral interior layer for glass panels 16 sq.ft. or less in area when the highest point of glass is located no more than 12 feet above a walking surface or accessible area.
    - Min. 0.030-inch when larger than 16 sq.ft. or higher than 12 feet above a walking surface or accessible area.
  - Fully Tempered Glass
  - Heat-Strengthened Glass
  - Wired Glass
  - Approved Rigid Plastics
308.6 Skylights and Sloped Glazing

- Screens
  - Required when fully tempered or heat-strengthened glass is used (except as detailed in Section 308.6.5)
  - Required when the inboard plane of multiple glazed skylights is fully tempered, heat-strengthened or wired glass (except as detailed in Section 308.6.5)
  - Screen and its fastenings must:
    - Be capable of supporting twice the weight of the glazing
    - Be firmly and substantially fastened to the framing members
    - Have a mesh opening of no more than 1"x1"

308.6 Skylights and Sloped Glazing

- 308.6.5 Screens not required
  - Not required for fully tempered or inboard glazing when either of the following conditions are met:
    1. Glass area is no more than 16 sq.ft. The highest point is no more than 12 feet above a walking surface, the nominal glass thickness is not more than 3/16", and (for multiple glazing only) the other panes fully tempered, laminated or wired glass.
    2. Glass area is greater than 16 sq.ft. and sloped 30° or less from vertical, and highest point of glass is not more than 10 feet above a walking surface.

308.6 Skylights and Sloped Glazing

- 308.6.6 Glass in Greenhouses
  - Any glazing material is permitted to be installed without screening in the sloped areas of the greenhouse provided that the height at the ridge does not exceed 20 feet from grade.

- 308.6.8 Curbs and Skylights
  - When installed in a roof with a pitch flatter than 3/12, unit skylight must be mounted on a curb extending at least 4 inches above the place of the roof unless otherwise specified in the manufacturer’s installation instructions.
308.6 Skylights and Sloped Glazing

- 308.6.9 Testing and Labeling
  - Unit skylights must be tested by an approved independent laboratory
  - Must be labeled
  - Must indicate compliance with AAMA/WDMA/CSA 101/I.S.2/A440.

SECTION 309
Garages & Carports

SECTION 310
Emergency Escape & Rescue Openings
Means of Egress

• 311.1 Means of Egress
  – All dwellings must be provided with a means of egress per this section.
  – Must be a continuous and unobstructed path of vertical and horizontal egress travel from all portions of the dwelling to the exterior of the dwelling at the required egress door without requiring travel through a garage.

• 311.2 Egress Door
  – At least one egress door must be provided for each dwelling unit
  – Must be side-hinged
  – Must provide a clear opening width of 32” when measured between the face of the door (opened 90°) and stop
  – Must provide a clear opening height of 78” measured from top of threshold to bottom of stop
  – Must be readily openable from the inside of the dwelling without the use of a key or special knowledge/effort
  – Other doors are not required to meet these requirements
Means of Egress

• 311.2.1 Garage Access Doors
  – Garages must have at least one side-hinged door not less than 7'-6" x 6'-8"
  – Door between the garage and dwelling may be used to meet this requirement.

311.3 Floors and Landings at Exterior Doors

• Landing or floor is required on each side of each exterior door
  – Width must match width of door served
  – Must have a minimum 36” dimension in the direction of travel
  – May be sloped up to 2%

• Exception:
  – Exterior balconies <60 sq.ft. and only accessible from a door are permitted to have a landing less than 36”.

311.3.1 Floor Elevations at the Required Egress Doors

• Landings or floors at the required egress door must not be more than 1.5” lower than the top of the threshold.
  – Exception:
    • May be located no more than 8.25” below the top of the threshold provided the door does not swing over the landing or floor
  • When exterior landings or floors serving the required egress door are not at grade, they must have an access to grade by means of a ramp (Section 311.8) or a stairway (Section 311.7).
311.3.2 Floor Elevations for Other Exterior Doors

- Landings or floors serving exterior doors, other than the required egress door, may be located no more than 8.25” below the top of the threshold
  - Exception:
    - A landing is not required where a stairway of two or fewer risers is located on the exterior side of the door, provided the door does not swing over the stairway.
- 311.1.3 Storm and screen doors are permitted to swing over all exterior stairs and landings

Vertical Egress & Construction

- 311.4 Vertical Egress
  - Egress from finished levels, including attics and basements not provided with an egress door, must be by a ramp (Section 311.8) or stairway (Section 311.7)
- 311.5 Construction
  - 311.5.1 Attachment
    - Exterior landings, decks, balconies, stairs and similar facilities must be positively anchored to the primary structure to resist vertical and lateral forces, or be designed as self-supporting.
    - Attachment cannot rely on toenails or nails subject to withdrawal

311.6 Hallway

- Must be at least 3 feet wide.
311.7 Stairways

• 311.7.1 Width
  – Must not be less than 36” in clear width at all points between the permitted guardrail height and required headroom.
  – Handrails may project no more than 4.5” on either side of the stairway.
  – Exception:
    • The width of spiral stairways complying with Section 311.7.9.1

311.7.2 Headroom

• Minimum 6’-8” measured vertically from the sloped line adjoining the tread nosing or from the floor surface of the landing/platform on that portion of the stairway
• Exception:
  – Where the nosing of treads at the side of a flight extend under the edge of a stair opening, the floor opening may project horizontally into the required headroom a maximum of 4.75”

311.7.3 Walkline

• For winder treads:
  – Shall be concentric to the curved direction of travel through the turn
  – Must be located 12 inches from the side where the winders are narrower.
  – The 12 inch dimension must be measured from the widest point of the clear stair width at the walking surface of the winder.
  – If winders are adjacent within the flight, the point of the widest clear stair width of the adjacent winders must be used.
Walkline

12' Walkline measured from the widest point of the clear stair width at any point.

3' - 0" minimum.

311.7.4 Stair Treads and Risers

- All dimensions and dimensioned surfaces must be exclusive of carpets, rugs or runners.

Stair geometry is determined by measuring to hard surfaces exclusive of carpeting.

311.7.4.1 Riser Height

311.7.4.2 Tread Depth

311.7.4.3 Profile

Stair Geometry

A nosing is required where the tread of the step below is less than 11".

Closed risers not required when the total rise of the stairs is 30 inches or less.
311.7.5 Landings for Stairways

- There shall be a floor or landing at the top and bottom of each stairway
  - Exception:
    - Not required at the top of an interior flight of stairs, including stairs in an enclosed garage, provided a door does not swing over a landing
    - Maximum 12’ vertical rise between floor levels or landings
    - The width of each landing must be at least the width of the stairway.
    - Each landing must be at least 36” measured in the direction of travel.
311.7.7 Handrails

- Required on at least one side of a stairway that has four of more risers.
- Must be located between 34” to 38” above the tread nosing or finished surface of a ramp.
  - Exceptions
    - The use of a volute, turnout or starting easing shall be allowed over the lowest tread
    - Handrail fittings or bendings used to provide continuous transitions between flights or at the start of a new flight may exceed the maximum height.

Handrails

- 311.7.7.2 Continuity
  - Handrails must be continuous for the full length of the flight
  - Must start at the point directly above the lowest tread and end at the point directly above the highest tread of a flight
  - Handrail ends must be returned into a wall or terminate in newel posts or safety terminals.
  - Must have a space at least 1.5” between the handrail and wall
    - May not project more than 4.5” into the required 36” stairway width.
Handrails

- 311.7.7.2 Continuity
- Exceptions:
  - May be interrupted by a newel post at a turn
  - The use of a volute, turnout, starting easing or starting newel is allowed over the lowest tread.
  - Two or more separate rails are considered continuous if the termination of the rails occur over a single tread and positioned within 4 inches of each other.

Handrails

- 311.7.7.3 Grip Size

Circular

Non-Circular

Max. cross-section of 2-1/4".

Non-circular handrails must have a perimeter of at least 4" but no more than 6-1/4".

Handrails

- 311.7.7.3 Grip Size

Type II Handrail

1-1/4" to 2-3/4"

3/4" or less
7/8" or less
3/8" or more
5/16" or more

NOTE: All types of handrail must have an edge radius of at least 0.01 inches
311.7.9 Special Stairways

- 311.7.9.1 Spiral Staircases
  - Minimum 26" clear width at and below the handrail
  - Minimum 7 ½" tread at the 12-inch walk line
  - Maximum 9 ¾" riser height
  - All treads must be identical
  - Minimum 6'-6" headroom
Special Stairways

- **311.7.9.2 Bulkhead Enclosures**
  - Stairways serving bulkhead enclosures that are not part of the required building egress and provide access from the outside grade level to a basement are exempt from the requirements of Sections 311.3 and 311.7 given:
    - The maximum height from basement finished floor to grade adjacent to the stairway does not exceed 8 feet, and,
    - The grade level opening to the stairways is covered by a bulkhead enclosure with hinged doors or other approved means.

311.8 Ramps

312 GUARDS
312.1 Where Required

- Along open-sided surfaces, including stairs, ramps and landings, that are located more than 30 inches above a floor or grade below at any point within 36 inches horizontally to the edge of the open side
  - Insect screening is not considered a guard

312.2 Height

- Required guard must be at least 36 inches high measured vertically above the adjacent walking surface, fixed seating or the line connecting leading edges of the treads

Height

- 312.2 Minimum 36” Height
  - Exceptions
    - Guards on open side of stairs must have a height of at least 34 inches measured vertically from a line connecting the leading edges of the treads
    - Where the top of the guard also serves as a handrail on the open sides of stairs, the top of the guardrail must be located between 34” and 38” measured vertically from a line connecting the leading edges of the treads.
312.2.3 Opening Limitations

Porches, balconies, or raised floor surfaces located more than 30 inches above the floor or grade below shall have guardrails not less than 36 inches in height.

Open stairway with a total rise of more than 30 inches above the floor or grade below shall have guardrails not less than 34 inches in height measured vertically from the nosing of the treads.

SECTION 313
AUTOMATIC FIRE SPRINKLER SYSTEMS

Automatic Fire Sprinkler Systems

- Fire Sprinklers are not required in:
  - In structures comprised of 1, 2 or 3 Family Dwellings, or
  - In R-3 structure designs qualifying to use the RCO for compliance.
Automatic Fire Sprinkler Systems

- When non-required automatic fire sprinkler systems are specified for installation in structures comprised of 1, 2 or 3 family dwellings, or in R-3 structure designs qualifying to use the RCO for compliance, the design and installation of the system (to the extent of the intended installation, must comply with one of the following:
  - NFPA 13 typically commercial full coverage
  - NFPA 13R typically residential, mostly multi-family
  - NFPA 13D typically single family, domestic supply
  - Section 2904 of this code

SECTION 314
Smoke Alarms

314.1 Smoke Detection and Notification

- All smoke alarms must be listed per UL 217 and installed per this code and the household fire warning equipment provisions of NFPA 72.
314.2 Smoke Detection Systems

- Household fire alarm systems installed per NFPA 72 that include smoke alarms, or combination of smoke detector and audible notification device installed as required by this section is permitted.
  - Must provide the same level of smoke detection and alarm as required by this section for smoke alarms.
  - When installed using a combination of smoke detector and audible notification device(s), it must become a permanent fixture of the occupancy and owned by the homeowner.
  - The system must be maintained per NFPA 72.

- Exception:
  - Where smoke alarms are provided meeting Section 314.4.

314.1 Location

- Smoke alarms must be located in the following locations:
  1. In each sleeping room
  2. Outside each separate sleeping area in the immediate vicinity of the sleeping rooms
  3. On each additional story of the dwelling, including basements and habitable attics
     - Not required in crawl spaces or uninhabitable attics
     - Split levels without intervening door between adjacent levels, the smoke alarm placed on the upper level shall suffice for the adjacent lower level.
     - Lower level must be less than one full story below the upper level.

- When more than one smoke alarm is required in a dwelling, all of the alarms must be interconnected so that the actuation of one alarm will active all of the alarms in the individual unit.

314.2 Location, continued...

- When more than one smoke alarm is required in a dwelling, all of the alarms must be interconnected so that the actuation of one alarm will active all of the alarms in the individual unit.
314.3.1 Alterations, Repairs and Additions

- When alterations or additions requiring an approval are made to the spaces described in Items 1 and 2 of Section 314.3, smoke alarms must be provided in those spaces as required for a new dwelling.
- When one or more sleeping rooms are added or created in an existing dwelling, the new sleeping rooms and the immediate vicinity outside of each sleeping room must have smoke alarms as required for a new dwelling.

314.3.1 Alterations, Repairs and Additions, continued...

- Exceptions
  1. Work involving exterior surfaces of a dwelling, the addition/replacement of windows, or the addition of a porch or deck are exempt from the requirements of this section.
  2. Installation or alteration of plumbing or mechanical systems are exempt from the requirements of this section.
314.4 Power Sources

• Must receive their primary power from the building wiring system when served by a commercial source.
• Must be equipped with a battery back-up system.
• Wiring must be permanent and without a disconnection switch.
• Must be interconnected.

Exceptions:
1. Buildings without commercial power may use alarms that are battery operated.
2. Interconnection and hard-wiring of alarms in existing areas are not required when the alterations/repairs do not result in the removal of interior wall or ceiling finishes exposing the structure, unless there is an attic, crawl space or basement available which could provide access for hard wiring and interconnection without removal of interior finishes.

SECTION 315
Carbon Monoxide Alarms

Carbon Monoxide Alarms

• Carbon monoxide alarms are required in all new construction, as well as existing dwellings where work being performed requires a permit (an approval), (But only:) when the dwelling has an attached garage or fuel-fired appliances.
• Must be installed outside of each sleeping area in the immediate vicinity of the bedrooms.
• Single station carbon monoxide alarms must be listed as complying with UL 2034 and installed per this code and the manufacturer’s installation instructions.
SECTION 316
Foam Plastics

SECTION 317
Protection of Wood and Wood Based Products Against Decay
317.1 Location Required

• The locations listed on the following slides are locations where protection of wood and wood based products from decay must be provided.
• Pressure-treatment must be in accordance with AWPA U1 for the species, product, preservative and end use.
• Preservatives must be listed in Section 4 of AWPA U1
• Visit www.awpa.com/standards/ucs.asp for an excerpt of the AWPA U1 Standard

AWPA U1

<table>
<thead>
<tr>
<th>UC1 INTERIOR/DRY</th>
<th>UC2 INTERIOR/DAMP</th>
</tr>
</thead>
<tbody>
<tr>
<td> Wood and wood based materials used in interior construction not in contact with the ground or foundation. Such products are protected from weather and interior sources of water such as leaking plumbing, condensate, pools and spas. Examples are interior furniture, construction furnishing, and millwork.</td>
<td> Wood and wood based materials used for interior construction that are not in contact with ground, but may be subject to dampness. These products are continuously protected from the weather but may be exposed to occasional sources of moisture. Examples are interior beams, timbers, flooring, framing, millwork and sill plates.</td>
</tr>
</tbody>
</table>
AWPA U1 Categories

• UC3A ABOVE GROUND Protected
  - Wood and wood-based materials used in exterior construction that
    are coated and not in contact with the ground. Such products may
    be exposed to the full effects of weather, such as vertical exterior
    walls or other types of construction that allows water to quickly drain
    from the surface. Examples are coated millwork, siding and trim.

• UC3B ABOVE GROUND Exposed
  - Wood and wood-based materials used in exterior construction and not
    in contact with the ground. Materials do not require an exterior
    coating, but may be finished to achieve a desired aesthetic
    appearance. Materials are used for a variety of applications in either
    horizontal and vertical positions such as decking, sills, walkways,
    railings and fence pickets.
  - Note: Retentions above the minimum specified for materials in this
    use category may be required for products such as crossarms where
    the individual components are difficult to maintain, repair or replace
    and are critical to the performance and safety of the entire system.

AWPA U1 Categories

• UC4A GROUND CONTACT General Use
  - Wood and wood-based materials in contact with the ground,
    fresh water, or other situations favorable to deterioration.
    Examples are fence posts, deck posts, guardrail posts, structural
    lumber, timbers and utility poles located in regions of low
    natural potential for wood decay and insect attack.

• UC4B GROUND CONTACT Heavy Duty
  - Wood and wood based materials used in contact with the
    ground either in severe environments, such as horticultural sites,
    in climates with a high potential for deterioration, in critically
    important components such as utility poles, building poles and
    permanent wood foundations, and wood used in salt water
    splash zones. This category includes utility poles used in moist
    temperate climates.

AWPA U1 Categories

• UC4C GROUND CONTACT Extreme Duty
  - Wood and wood based materials used in contact with the
    ground either in very severe environments or climates
    demonstrated to have extremely high potential for
deterioration, in critical structural components such as
land and fresh water piling and foundation piling, and
utility poles located in semi-tropical to tropical
environments.
317.1 Location Required, continued...

1. Wood joists or the bottom of a wood structural floor when closer than 18 inches, or wood girders when closer to 12 inches, to exposed ground in crawl spaces or unexcavated area located within the periphery of the building foundation.

2. All wood floor members resting on concrete or masonry foundation walls and is located less than 8 inches from the exposed ground.

3. Sills and sleepers on a concrete or masonry slab that is in direct contact with the ground, unless separated from such slab by an impervious moisture barrier.

4. The ends of wood girders bearing on exterior masonry or concrete walls having clearances of less than ½" on tops, sides and ends.

5. Wood siding, sheathing and wall framing within 6 inches from the ground, or less than 2 inches measured vertically from concrete steps, porch & patio slabs, and similar horizontal surfaces exposed to the weather.

6. Wood structural members supporting moisture-permeable floors or roofs that are exposed to the weather (i.e. concrete or masonry slabs), unless separated from such floors or slabs by an impervious moisture barrier.

7. Wood furring strips or other wood framing members fastened directly to interior or exterior masonry or concrete walls below grade, except where an approved vapor retarder is placed between the wall and framing members.

317.1.1 Field Treatment - Deleted
317.1.2 Ground Contact

- Pressure-preservative-treated wood must be used when wood is:
  - In contact with ground
  - Embedded in concrete in direct contact with the ground
  - Embedded in concrete that is exposed to the weather and supports permanent structures intended for human occupancy
- Untreated wood may only be used where it is entirely below groundwater level or continuously submerged in fresh water.

317.1.3 Geographical Areas

- In areas where experience has shown a specific need for additional protection, naturally durable or pressure-preservative-treated lumber must be used.
- Structural wood members used to support buildings, balconies or similar appurtenances subject to weather without adequate protection must be used.
- Depending on local experience, such members may include:
  1. Horizontal members (girders, joists and decking)
  2. Vertical members (posts, poles and columns)
  3. Both vertical and horizontal members

317.1.4 Wood Columns

- Wood columns must be naturally decay resistant or pressure-preservative-treated wood.
- Exceptions:
  1. Columns exposed to weather or in basements when supported by concrete piers or metal pedestals project 1 inch above a concrete floor or 6 inches above exposed earth
    - Earth must be covered by an approved impervious moisture barrier
  2. Columns located within an enclosed crawl space or unexcavated areas were supported by a concrete pier or metal pedestal at least 8 inches from the exposed earth
    - Earth must be covered by an approved impervious moisture barrier.
317.1.5 Exposed Glued-Laminated Timbers
• Must be pressure-treated with preservative, or manufactured from naturally durable or preservative-treated wood when any portion of the timber is exposed to weather and not properly protected by a roof or covering.

317.2 Quality Mark
• Lumber and plywood that is required to be pressure-preservative-treated per Section 318.1 must be labeled by an approved inspection agency.
• 317.2.1 Required Information. Quality mark must have the following information:
  1. Identification of the treatment plant.
  2. Type of preservative.
  3. The minimum preservative retention.
  4. End use for which the product was treated.
  5. Standard to which the product was treated.
  6. Identity of the approved inspection agency.
  7. The designation of “Dry,” if applicable.

Example Tag

[Image of a tag with information about product treatment and inspection agency]
317.2 Quality Mark

• 317.2.1 Required Information
• Exception
  – Lumber less than 1 inch nominal thickness, nominal 1x5, 2x4 or lumber less than 3 feet long must have a quality mark that is either stamped on the face of exterior pieces or by end labeling of at least 25% of the pieces in a bundled unit.

317.3 Fasteners and Connectors

• Fasteners and connectors in contact with preservative-treated wood and fire-retardant-treated wood must comply with this section.
• Coating weights for zinc-coated fasteners must comply with ASTM A 153.
  – 317.3.1 Fasteners for preservative-treated wood
  – 317.3.2 Fastenings for wood foundations
  – 317.3.3 Fasteners for fire-retardant-treated wood used in exterior applications or wet/damp locations
  – 317.3.4 Fasteners for fire-retardant-treated wood used in interior applications.

317.3.1 Fasteners for Preservative-Treated Wood.

• Fasteners—must be hot-dipped zinc-coated galvanized steel, stainless steel, silicon bronze or copper
• Connectors—Coating types and weights for connectors in contact with treated wood must follow the connector manufacturer’s recommendations
• In the absence of the manufacturer’s recommendations, a minimum of ASTM A 653 type G185 zinc-coated galvanized steel (or equivalent) must be used.
• Exceptions:
  1. ½ inch diameter or larger steel bolts
  2. Fasteners (other than nails and timber rivets) are allowed to be mechanically deposited zinc coated steel with coating weights per ASTM B 695, Class 55 minimum.
317.3.2 Fastenings for Wood Foundations
• Must follow AF&PA Technical Report No. 7

Fasteners in Fire-Retardant-Treated Wood
• 317.3.3 Exterior or Wet/Damp Locations
  – Must be hot-dipped zinc-coated galvanized steel, stainless steel, silicon bronze or copper.
  – Fasteners (other than nails and timber rivets) are allowed to be mechanically deposited zinc coated steel with coating weights per ASTM B 695, Class 55 minimum.
• 317.3.4 Interior Applications
  – Must follow the manufacturer’s recommendations.
  – In the absence of manufacturer’s recommendations, Section 317.3.3 shall apply.

317.4 Wood/Plastic Composites
• Composites used in exterior deck boards, stair treads, handrails and guardrail systems must bear a label indicating the required performance levels and demonstrating compliance with ASTM D 7032.
• Must be installed per the manufacturer’s instructions.
318.1 Subterranean Termite Control Methods

- Ohio is subject to termite damage per Table 301.2(1)
- One of the following, (or combination of the following) methods or protection must be followed:
  1. Chemical termiticide treatment per Section 318.2.
  2. Termite baiting system installed and maintained per its listing.
  3. Pressure-preservative-treated wood per Section 317.1.
  5. Physical barriers per Section 318.3 and located per Section 318.1.
  6. Cold-formed steel framing per Sections 505.2.1 and 603.2.1.

318.1.1 Quality Mark

- Required pressure-preservative-treated lumber and plywood must have the quality mark of an approved inspection agency.
- 318.1.2 Field Treatment-Deleted.

Chemical Treatment and Barriers

- 318.2 Chemical Termiticide Treatment
  - Must include soil treatment and/or field applied wood treatment.
  - The concentration and application must be in strict accordance with the termiticide label.
- 318.3 Barriers
  - Approved physical barriers (i.e. metal or plastic sheeting or collars specifically designed for termite prevention) must be installed to prevent termite entrance.
  - May only be placed at the top of a foundation wall when it is used in combination with another method of protection.
318.4 Foam Plastic Protection

- Provides requirements for areas designated as “very heavy” in Figure 301.2(6)
  - Ohio is designated as “moderate to heavy”

SECTION 318
Site Address

319 Site Address

- Address or building numbers or building ID must be:
  - in a position plainly legible (recognizable & readable) from the street
  - Method used must be approved
SECTION 320
Accessibility

Accessibility

- 1, 2 & 3 Family Dwelling Structures
  - No mandatory accessibility provisions apply
  - When an accessible feature is intended to be installed or added, the element must be designed and installed in accordance with ICC/ANSI A117.1-2009 (see 320.1)
  - When accessibility is intended inside the dwelling, the criteria is listed in Chapter 10 of the ICC/ANSI A117.1 for Accessible, Type A and Type B units.
Accessibility

• Structures with more than 3 dwellings
  — The ICC/ANSI A117.1-2009 is referenced for design and construction compliance
  — All dwellings must be in compliance with the Type B requirements in ICC A117.1 Chapter 10 unless exempted in 320.4
    • Units in non-elevator buildings when:
      — The living space within a unit is on more than one floor
      — Units on floors other than a grade level floors (units on one floor level must comply)
    • In multi-floor dwellings in buildings with elevators, the floor accessed by the elevator must have certain amenities and comply with the Type B criteria
    • Units in buildings with certain extreme topography
      — Common and public use areas regulated by the OBC

SECTION 321
Elevators & Platform lifts

Elevators & Platform lifts

• Elevators, LULAs and Platform lifts within dwellings and as accessory components, regulated by the Residential Building Official
  — Passenger elevators & LULAs (limited use limited application) must comply with ASME A17.1
  — Platform Lifts must comply with ASME A18.1
  — When intended to be accessible, ICC/ANSI A117.1 applies also
SECTION 322
Flood-Resistant Construction

322 General

• 322.1 Except where approved by the Flood Plain Administrator having jurisdiction, any building or portion thereof constructed in flood hazard areas (including A or V Zones) per Table 301.2(1) must be designed and constructed per Section 322.
  – Buildings or portion thereof located within identified floodways must be designed and constructed per ASCE 24-05 (Flood Resistant and Design Construction)

Structural Systems and Construction

• 322.1.1 Alternative Provisions
  – Alternative for projects in coastal high-hazards (not applicable to Ohio)
• 322.1.2 Structural Systems
  – Must be designed, connected and anchored to resist flotation, collapse or permanent lateral movement due to loads and stresses from flooding equal to the design flood elevation.
• 322.1.3 Flood-Resistant Construction
  – Structures located in areas prone to flooding must be constructed so as to minimum flood damage.
322.1.4 Establishing the Design Flood Elevation

- Used to define areas prone to flooding
- Must be the higher of:
  1. The base flood elevation at the depth of peak elevation of flooding which has a 1 percent (100-year flood) or greater chance of being equaled or exceeded in any year; or,
  2. The elevation of the design flood associated with the area designated on a flood hazard map adopted by the community, or otherwise legally designated.

322.1.4.1 Determination of Design Flood Elevation

- If not specified, the Building Official is authorized to require the applicant to:
  - Obtain and reasonably use data available from a federal, state or other source; or,
  - Determine the design flood elevation per accepted hydrologic and hydraulic engineering practices used to define special flood hazard areas.
    - Must be undertaken by a registered design professional
    - Must document that the technical methods used reflect currently accepted engineering practice.
    - All studies, analyses and computations must be submitted in sufficient detail to allow thorough review and approval.

322.1.4.2 Determination of Impacts

- In riverine flood hazard areas where the design flood elevations are specified but floodways have not been designated:
  - The applicant must demonstrate that the effect of the proposed building or structure (including fill and combined with all other existing or anticipated encroachments) will not increase the design flood elevation more than one foot at any point within the jurisdiction
322.1.5 Lowest Floor

• Shall be the floor of the lowest enclosed area (including basements) but excluding any unfinished flood-resistant enclosure that is used solely for:
  – Vehicle parking
  – Building access
  – Limited storage
• These enclosures shall not be built so as to render the building or structure in violation of this code.

322.1.6 Protection of Mechanical and Electrical Systems

• Must be located at or above the elevation required in Section 322.2.
• If these systems are replaced as a part of substantial improvement, then compliance with this section is required.
• Must not be mounted on or penetrate through walls instead to break away under flood loads.
  – Exception: May be located below the elevation required in Section 322.2, provided that they are designed and installed to prevent water from entering or accumulating within the components and to resist hydrostatic and hydrodynamic loads and stresses during the occurrence of flooding per ASCE 24.
  – Electrical systems may be located below the required elevations provided they conform to the provisions for wet locations.

322.1.7 Protection of Water Supply and Sanitary Sewage Systems

• New and replacement water supply systems must be designed to minimize or eliminate infiltration of flood waters into the system per the Ohio Plumbing Code.
• New and replacement sanitary sewage systems must be designed to minimum or eliminate infiltration of floodwaters into systems and discharges from systems into floodwaters per the Ohio Plumbing Code.
322.1.8 Flood-Resistant Materials

• Building materials used below the required elevation per Section 322.2 must comply with the following:
  1. All wood, including floor sheathing, must be pressure-preservative-treated per AWPA U1 or be decay-resistant heartwood. Preservatives must be listed in Section 4 of AWPA-U1.
  2. Materials and installation methods used for flooring, interior/exterior walls and wall coverings must conform to FEMA/FIA-TB-2.

322.1.10 As-Built Elevation Documentation

• A registered design professional must prepare documentation of the elevations specified in Section 322.2.

• Note: 322.1.9 was deleted.

322.2 Flood Hazard Areas (including A Zones)

• All areas that have been determined to be prone to flooding, but not subject to high velocity wave action, shall be designated as flood hazard areas.
• Flood hazard areas that have been delineated as subject to wave heights between 1.5 feet and 3 feet shall be designated as Coastal A Zones.
• All buildings or structures located in whole or in part of these areas must be designed and constructed per Sections 322.2.1 through 322.2.3.
322.2.1 Elevation Requirements

1. Buildings and structures in flood hazard areas not designated as Coastal A Zones must have the lowest floor areas elevated to or above the design flood elevation.

2. Buildings or structures in Coastal A Zones must have the lowest floors elevated to or above the base flood elevation plus one foot, or to the design flood elevation, whichever is higher.

322.2.1 Elevation Requirements, continued...

3. In areas of shallow flooding (AO Zones), buildings and structures shall have the lowest floor (including basements) elevated at least as high above the highest adjacent grade as the depth number specified in feet on the FIRM, or at least two feet if a depth number is not specified.

4. Basement floors that are below grade on all sides shall be elevated to or above the design flood elevation.

Exception: Enclosed areas below the design base flood elevation, including basement whose floors are not below grade on all sides, shall comply with Section 322.2.2.

322.2.2 Enclosed Area Below Design Flood Elevation

- Enclosed spaces, including crawl spaces, that are below the design flood elevations shall:
  1. Be used solely for parking of vehicles, building access or storage.
  2. Be provided with flood openings that meet the following criteria:
     - Each area must have at least two openings on different walls
     - The total net opening of all openings must be 1sq.in. for each foot of enclosed area

   Otherwise sealed documents must be submitted showing that the designed openings will provide for equalization of hydrostatic flood forces on exterior walls by allowing for the automatic entry and exit of floodwaters as specified in Section 2.6.2.2 of ASCE 24.
322.2.2 Continued....

- 2. Food openings that meet the following criteria, continued...
  - The bottom of the opening must be a maximum one foot above the adjacent ground level
  - Must not be less than three inches in any direction in the plane of the wall.
  - Any louvers, screens or other opening covers must allow the automatic floor of floodwaters into and out of the enclosed area.

322.2.3 Foundation Design and Construction

- All foundation walls must meet Chapter 4.
  - Exception: Unless designed per Section 404:
    1. The unsupported height of 6-inch plain masonry walls shall be no more than 3 feet.
    2. The unsupported height of 8-inch plain masonry walls shall be no more than 4 feet.
    3. The unsupported height of 8-inch reinforced masonry walls shall be no more than 8 feet.
    For the purpose of this exception, unsupported height is the distance from the finished grade of the under-floor space and the top of the wall.

322.3 Coastal High Hazard Areas (including V Zones)

- Describes requirements for construction in areas designated as coastal high-hazard areas.
SECTION 323
Storm Shelters

323 Storm Shelters

- Detached storm shelters and safe rooms within a building used for safe refuge from weather events must comply with the RCO and ICC/NSSA-500 (2008 Standard for the Design and Construction of Storm Shelters)

SECTION 324
Post Frame Accessory Structures
Post Frame - Limitations
1. Residential accessory structures
2. Single Story
3. Solid exterior structural sheathing or metal roof, and solid wall panels
4. No attic storage (attic storage would require engineered design trusses)
5. Maximum building width of 36 feet including overhang
6. Maximum wall height of 16 feet
7. Maximum mean roof height of 20 feet, and
8. Maximum post spacing of 8 feet (unless truss sit directly on post)

Limitations
• “Post and frame structures and portions thereof outside the above structural limitations of this standard shall be accompanied by structural calculations as required by the residential building official or designed under the provisions of section 116.2 of the Residential Code of Ohio (RCO). Post and frame structures shall comply with the structural design requirements of Section 301 of the RCO.”

324.2 Definition
• Primary members
  – Wood posts
  – Beams
  – Single span roof trusses or ceiling joist and rafters
• Secondary members
  – Wood roof purlins
  – Wall girts
  – Bracing
  – Sheathing
• Primary members and secondary members where all loads are transmitted from the sheathing and the secondary members to the primary members which transfer all combined loads to the soil through vertical posts bearing on footings embedded in the ground.
• See Figure 324.
324.3 Footings and Foundations

- Must comply with Section 401.
- Shall have poured-in-place concrete footings below all posts.
- Top of footing shall be minimum 48 inches below finished grade.
- Diameters per Table 324.3.

324.4 Columns and wall construction

- Columns must be:
  - (3) ply un-spliced,
  - (3) ply reinforced splice or solid wood
- At least 4x6 nominal
- Comply with treated requirements of Section 317.
- Ends restrained to prevent lateral displacement.
324.4.1 Uplift protection

- Columns must have uplift protection by using one of the following:
  - (2) 2x6x12” treated uplift blocks attached to side of the base of the column

---

324.4.1 Uplift protection

- 12 inch tall concrete collar on top of footing and around post with 2-#5x9 in. rebar placed through the post at 3 in. and 9 in. from bottom of post in opposite directions. Rebar must be 1 ¼” from the soil.

---

324.4.1 Uplift protection

Exact language found in 2013 RCO:

1. Two 2x6x12” uplift protection blocks attached to each side of the base of the column. The column uplift blocks shall be placed horizontally attached per Table 13-1 and comply with Section 13-9.
2. 12 inch tall concrete collar poured on top of footing around the post, with 2-#5x9 inch rebar placed through the post at 3 inches and 9 inches from bottom of post in opposite directions. The rebar ends must be 1 ¼” inches from the soil. See Figure 324.1. Should be “and”.
3. Each base or cop must have an uplift hanger as per Figure 324.
324.4 Column and wall construction

- 324.4.2 Column spacing limited to 8 ft. unless truss sits directly onto post
  - Note: several remaining sections/footnotes limits spacing to 8 ft.
- 324.4.3 Skirt boards must be treated per Section 317 and fastened per Table 324.7
- 324.4.4 Wall girts must be minimum 2x4 nominal and spaced max. 24" o.c.

324.4.5 Load Bearing Beams and Headers

- Beams and headers must comply with Table 502.5(1) (with exceptions)

### Table 502.5(1)

<table>
<thead>
<tr>
<th>Girders and Headers Supporting</th>
<th>Span</th>
<th>20</th>
<th>20</th>
<th>30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roof and Ceiling</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| 2-2×4                          | 3'-9"| 7'-8"| 13'-9"| 2'-0"
| 2-2×8                          | 3'-9"| 7'-8"| 13'-9"| 3'-0"
| 2-2×12                         | 3'-9"| 7'-8"| 13'-9"| 4'-0"
| 3-2×8                          | 4'-6"| 8'-0"| 13'-9"| 3'-0"
| 3-2×12                         | 4'-6"| 8'-0"| 13'-9"| 4'-0"
| 3-2×18                         | 4'-6"| 8'-0"| 13'-9"| 5'-0"
| 4-2×8                          | 5'-3"| 8'-0"| 13'-9"| 4'-0"
| 4-2×12                         | 5'-3"| 8'-0"| 13'-9"| 5'-0"
| 4-2×18                         | 5'-3"| 8'-0"| 13'-9"| 6'-0"

Load Bearing Beams and Headers Exceptions

1. Not required if trusses or ceiling joists/rafters bear directly on the columns
2. "Openings on the gable end walls supporting a door or roof total load not exceeding 5 sq.ft. per lineal feet of wall area that require beams or headers must be sized per Table 324.4.5"

### Table 324.4.5

<table>
<thead>
<tr>
<th>Gable End Header Sizes</th>
<th>Opening Width (Feet)</th>
<th>10</th>
<th>12</th>
<th>16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Header Size (Inches)</td>
<td>2-2x8</td>
<td>2-2x10</td>
<td>2-2x12</td>
<td></td>
</tr>
</tbody>
</table>
324.4.6 Bracing

- Prescribes two ways to provide lateral resistance
  1. Compliance with Section R602.10
  2. Install 2x6 diagonal braces between two adjoining columns at 8 ft. o.c. or multiple spacing totaling a minimum of 8 ft. o.c. where the post spacing design is less than 8' o.c.
     - Placed from top of header or girt to the next adjoining column at the skirt board.
     - Installed on each side of the building
     - Spaced 25' o.c. and within 12" of all ends
     - Fasten per table 324.7
     - Splices of diagonal bracing due to excessive length must lap over two consecutive wall girts.

324.4.7 Beam Attachment to Column

- Beams must be connected to columns by one of the following:
  1. Bolts that are ¼ inch diameter through-bolted to the side of the column
  2. Bolts that are ¼ inch diameter, directly attached to a 3-ply column notch, enclosing the truss or rafter at the top of the column
  3. Other fasteners with minimum shear values per Table 324.4.7

### Table 324.4.7

<table>
<thead>
<tr>
<th>Building Width (length of truss)</th>
<th>Shear or withdrawal (kips)</th>
<th>Total Number of Fasteners</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>20'</td>
<td>25'</td>
</tr>
<tr>
<td>20'</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>25'</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>30'</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>35'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>40'</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **324.4.7.1 Number of fasteners**
  - The minimum number of through bolts or other fasteners with minimum shears or withdraw values per Table 324.4.7.

1. Based upon truss loaded 20 kips per square foot live load, 0.5 kips per square foot dead load, 3.5 kips live load at the bottom chord and no live load on the bottom chord.
2. Based upon wood panels at intervals not exceeding 6 feet.
3. When beams are attached to each other of the column and the fasteners do not extend through both beams such as through bolts, the required number are one-half the amount shown above for each beam.
Continuous vs. Spliced Headers

Do you fasten continuous headers and spliced headers the same way?

<table>
<thead>
<tr>
<th>Header continuous over post</th>
<th>Header splice over post</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Spliced Header over Post

- Header break (must occur on a post)
- Each header must be at least 60° onto the bearing block
- 2x bearing block that matches the width of the post already in contact with bottom of header.

324.5 Roof Purlins

- 324.5 Roof purlins
  - Minimum 4x2 #2SPF laid flat for spans up to 4 feet.
  - Minimum 4x2 #2SPF laid on edge for spans up to 8 feet.

How much of an overlap or overhang should two different pieces of roof purlins have beyond a truss?
324.6 Knee Bracing

- 2x6 Angle Brace required
  - Extend from column to top chord of truss or rafter adjacent to the post at 45 degree angle
  - Vertical distance down from the bottom chord of truss or ceiling joist to point where brace attached to the column per Table 324.6.
  - Trusses or rafters must be spaced such that they align with the column intervals
  - Attachment of knee braces per Table 324.7

<table>
<thead>
<tr>
<th>Table 324.6 Knee Brace Vertical Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wall Height</td>
</tr>
<tr>
<td>8'-6&quot; and 9'-0&quot;</td>
</tr>
<tr>
<td>10'-4&quot; and 11'-0&quot;</td>
</tr>
<tr>
<td>12'-0&quot; and 13'-0&quot;</td>
</tr>
<tr>
<td>14'-0&quot; through 16'-0&quot;</td>
</tr>
</tbody>
</table>

324.7 attachment details

<table>
<thead>
<tr>
<th>TABLE 324.7 STRUCTURE FASTENERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description of Attaching Element</td>
</tr>
<tr>
<td>Column to column</td>
</tr>
<tr>
<td>Floor to column</td>
</tr>
<tr>
<td>Knee brace to column</td>
</tr>
<tr>
<td>Knee brace to top chord of truss or rafter</td>
</tr>
<tr>
<td>Knee brace to bottom chord of truss or rafter</td>
</tr>
<tr>
<td>Roof purlin (truss or rafter with span ≤ 48&quot;)</td>
</tr>
</tbody>
</table>