NC State Building Codes Amendments

(adopted September 2017 through June 2018, Effective 1/1/2019)
(adopted September 2018 through June 2019, Effective 1/1/2020)
(adopted September 2019 through June 2020, Effective 1/1/2021)
(Note: some amendments may indicate earlier effective dates)
(Note: includes identified NC Errata)

The North Carolina Codes are available at www.iccsafe.org/NCDOI for purchase online. Soft-bound copies are available for walk-in purchase only at the following location.

NC Department of Insurance, 325 North Salisbury Street, Raleigh, NC 27603 919-647-0029 (call for availability)

The following pages represent a summary of the Building Code Council adopted amendments that have been approved by the Rules Review Commission.

2018 NC Building, Energy Conservation, Existing Building, Fire, Fuel Gas, Mechanical, Plumbing, Residential Codes (based on the 2015 International Codes) effective 1/1/2019

2017 NC Electrical Code (based on the 2017 NEC) effective 6/12/2018

These amendments revise, delete or add to the adopted NC Code.
2018 NC Administrative Code
106.3.1 Information required. (171212 Item B-7)

106.3 Permit Application.

106.3.1 Information required. A permit application shall be filed with the Inspection Department on a form furnished for that purpose. The Inspection Department shall make available a list of information that must be submitted with the building permit application, including a complete building code summary (see Appendix A of the Administrative Code and Policies). The Inspection Department’s building code summary shall be in the exact format as, and contain only the information in, Appendix B of the Administrative Code and Policies. The Inspection Department shall only modify its building code summary as set forth in section 103.5 Modifications, or as necessary to reflect any changes by the Office of State Fire Marshal to Appendix B that have been approved by the Building Code Council.

The delayed effective date of this Rule is January 1, 2019.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.
107.6 Inspections of component or element. Acceptance of inspection of a component or element by a NC registered architect or engineer will require completion of the “Design Professional Inspection Form” found in Appendix G.
# APPENDIX G

## DESIGN PROFESSIONAL INSPECTION FORM

**Record of the Inspection of a Component or Element by a NC Licensed Architect or Engineer**

### Project Information:

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### Responsible Licensed NC Architect or NC Engineer

<table>
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<tr>
<td>Firm Name:</td>
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<td>Phone Numbers:</td>
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<td>Email Address:</td>
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<td>Mailing Address:</td>
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</table>

### Applicable Code:


Describe Element/Component/Type of Inspection: *

*(subgrade form/letter may also be required)*

### Attestation/Signature:

By signing below, I certify that the component and/or element of the building as identified on this form has been inspected by me or someone under my direct supervision per G.S. 160D-11-6 and is in compliance with the Code or other proposal of the architect or engineer for the project. This inspection is in compliance with all of the requirements of the above referenced code. Attach any additional documents if needed.

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Licensed Architect or Engineer

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**Inspection Department disclaimer:**

Upon the receipt of a signed written document as required by G.S. 160D-11-6, Code Enforcement shall be discharged and released from any liabilities, duties and responsibilities imposed by this article or in

May 22, 2020
common law from any claim arising out of or attributed to the component or element in the construction of the building for which the signed written document was submitted. Be aware that this inspection will be noted in all inspection records including the Certificate of Occupancy or Certificate of Compliance. This inspection does not address any local ordinances or zoning requirements.

The delayed effective date of this Rule is January 1, 2021.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.
101.2 Scope. The provisions of this code shall apply to the construction, alteration, relocation, enlargement, replacement, repair, equipment, use and occupancy, location, maintenance, removal and demolition of every building or structure or any appurtenances connected or attached to such buildings or structures.

Exceptions: If any of the following apply the building or structure is exempt from the provisions of this code:
1. Detached one- and two-family dwellings and multiple single-family dwellings (townhouses) not more than three stories above grade plane in height with a separate means of egress, and their accessory structures not more than three stories above grade plane in height, shall comply with the International Residential Code.
2. Farm buildings located outside of the buildings rules jurisdiction of any municipality.

Exception: All buildings used for sleeping purposes shall conform to the provisions of the technical codes.

2. Farm buildings not used for:
a. Sleeping purposes; or
b. Storage of hazardous materials in excess of those listed in Tables 307.1(1) and 307.1(2) within the building rules jurisdiction of any municipality.

3. The design construction, location, installation or operation of equipment for storing, handling and transporting liquefied petroleum gases for fuel purposes up to the outlet of the first stage pressure regulator, anhydrous ammonia or other liquid fertilizer.

4. The design construction, location, installation or operation of equipment or facilities of a public utility, as defined in N.C.G.S. 62-3, or electric or telephone membership corporation, including without limitation poles, towers and other structures supporting electric or communication lines from the distribution network up to the meter location.

Note: All buildings owned and operated by a public utility or an electric or telephone membership corporation shall meet the provisions of this code.

5. The storage and handling of substances governed by the Hazardous Chemicals Right to Know Act in N.C.G.S. Chapter 95, Article 18.

SECTION 202 DEFINITIONS
FARM BUILDING. Any building not used for sleeping purposes that is not accessed by the general public and is used primarily for a farm purpose. Farm purposes includes structures or buildings for equipment, storage and processing of agricultural products or commodities such as: crops, fruits, vegetables, ornamental or flowering plants, dairy, timber, livestock, poultry and all other such forms of agricultural products by the specific farm on which the structure or building is located. Farm purposes do not include structures or buildings for uses such as education facilities, research facilities, or aircraft hangers.

The delayed effective date of this Rule is January 1, 2019.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.

(Note: The remainder is part of the 2018 Code adoption package.)
2018 NC Building Code

ERRATA – correct as shown

TEMPORARY OVERFLOW SHELTER. A shelter that provides Temporary Overflow accommodations from an approved homeless shelter in accordance with Section 427.
TABLE 504.4<sup>a,b</sup>
ALLOWABLE NUMBER OF STORIES ABOVE GRADE PLANE

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**Note:** UL = Unlimited; NP = Not Permitted; NS = Buildings not equipped throughout with an automatic sprinkler system; S = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1; S13R = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.2.

a. See Chapters 4 and 5 for specific exceptions to the allowable height in this chapter.
b. See Section 903.2 for the minimum thresholds for protection by an *automatic sprinkler system* for specific occupancies.
c. New Group H occupancies are required to be protected by an *automatic sprinkler system* in accordance with Section 903.2.5.
d. The NS value is only for use in evaluation of existing building height in accordance with the *International Existing Building Code*.
e. New Group I-1 and I-3 occupancies are required to be protected by an *automatic sprinkler system* in accordance with Section 903.2.6. For new Group I-1 occupancies, Condition 1, see Exception 1 of Section 903.2.6.
f. New and existing Group I-2 occupancies are required to be protected by an *automatic sprinkler system* in accordance with Section 903.2.6 and Section 1103.5 of the *International Fire Code*.
g. For new Group I-4 occupancies, see Exceptions 2 and 3 of Section 903.2.6.
h. New Group R occupancies are required to be protected by an *automatic sprinkler system* in accordance with Section 903.2.8.
i. See Table C102.1 in Appendix C for Group U agricultural buildings.

The delayed effective date of this Rule is January 1, 2021.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.
TABLE 508.4
REQUIRED SEPARATION OF OCCUPANCIES (HOURS)

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S = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
NS = Buildings not equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
N = No separation requirement.
NP = Not permitted.
a. See Section 420.
b. The required separation from areas used only for private or pleasure vehicles shall be reduced by 1 hour but not to less than 1 hour.
c. See Section 406.3.4.
d. Separation is not required between occupancies of the same classification unless fire area separation is required.
e. See Section 422.2 for ambulatory care facilities.
f. A-1, A-2, A-3, A-4 & A-5 must be separated by the designated fire-resistance rating unless they are to be nonseparated mixed use.
g. R-1, R-2, R-3 & R-4 must be separated by the designated fire-resistance rating unless they are to be nonseparated mixed use.
510.2 Horizontal building separation allowance. A building shall be considered as separate and distinct buildings for the purpose of determining area limitation, continuity of fire walls, limitations of number of stories and the type of construction where all of the following conditions are met:

1. The buildings are separated with a horizontal assembly having a fire-resistance rating of not less than 3 hours.
2. The building below the horizontal assembly is Type IA construction.
3. Shaft, stairway, ramp and escalator enclosures through the horizontal assembly shall have not less than 2-hour fire-resistance rating with opening protectives in accordance with Section 716.5. **Exception:** Where the enclosure walls below the horizontal assembly have not less than a 3-hour fire-resistance rating with opening protectives in accordance with Section 716.5, the enclosure walls extending above the horizontal assembly shall be permitted to have 1-hour fire-resistance rating, provided:
   1. The building above the horizontal assembly is not required to be Type I construction; and
   2. The enclosure connects fewer than four stories; and
   3. The enclosure opening protectives above the horizontal assembly have a fire-resistance rating of not less than 1 hour.
4. The building or buildings above the horizontal assembly shall be permitted to have multiple Group A occupancy uses, each with an occupant load of less than 300, or Group B, M, R or S occupancies.
5. The building below the horizontal assembly shall be protected throughout by an approved automatic sprinkler system in accordance with Section 903.3.1.1, and shall be permitted to be any occupancy allowed by this code except Group H.
6. The maximum building height in feet (mm) shall not exceed the limits set forth in Section 504.3 for the building having the smaller allowable height as measured from the grade plane.
Table 602 Fire-Resistance Rating Requirements for Exterior Walls Based on Fire Separation Distance. (180911 Item B-13)

TABLE 602
FIRE-RESISTANCE RATING REQUIREMENTS FOR EXTERIOR WALLS BASED ON FIRE SEPARATION DISTANCE\textsuperscript{a,d,g}

<table>
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<tr>
<th>FIRE SEPARATION DISTANCE = X (feet)</th>
<th>TYPE OF CONSTRUCTION</th>
<th>OCCUPANCY GROUP H\textsuperscript{e}</th>
<th>OCCUPANCY GROUP F-1, M, S\textsuperscript{f}</th>
<th>OCCUPANCY GROUP A, B, E, F-2, I, R\textsuperscript{i,j}, S-2, U\textsuperscript{h}</th>
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<td>5 \leq X &lt; 10</td>
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<td>10 \leq X &lt; 30</td>
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<td>1\textsuperscript{c}</td>
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<td>IIB, VB</td>
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<td>Others</td>
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For SI: 1 foot = 304.8 mm.

a. Load-bearing exterior walls shall also comply with the fire-resistance rating requirements of Table 601.
b. See Section 706.1.1 for party walls.
c. Open parking garages complying with Section 406 shall not be required to have a fire-resistance rating.
d. The fire-resistance rating of an exterior wall is determined based upon the fire separation distance of the exterior wall and the story in which the wall is located.
e. For special requirements for Group H occupancies, see Section 415.6.
f. For special requirements for Group S aircraft hangars, see Section 412.4.1.
g. Where Table 705.8 permits nonbearing exterior walls with unlimited area of unprotected openings, the required fire-resistance rating for the exterior walls is 0 hours.
h. For a building containing only a Group U occupancy private garage or carport, the exterior wall shall not be required to have a fire-resistance rating where the fire separation distance is 5 feet (1523 mm) or greater.
i. For Group R-3 detached one- and two-family dwellings of any construction type and not more than three stories above grade plane in height with a separate means of egress, a fire separation distance of 5 feet or less shall be 1-hour fire-resistant rated and shall be 0-hour fire-resistant rated for distances greater than 5 feet.
j. For Group R-3 attached one- and two-family dwellings of any construction type separated with fire walls complying with Section 706, containing no other occupancy classification, and not more than three stories above grade plane in height with a separate means of egress, a fire separation distance of 5 feet or less shall be 1-hour fire-resistant rated and shall be 0-hour fire-resistant rated for distances greater than 5 feet.

The delayed effective date of this Rule is January 1, 2021.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.
714.4.2 Membrane penetrations.
Penetrations of membranes that are part of a horizontal assembly shall comply with Section 714.4.1.1 or 714.4.1.2. Where floor/ceiling assemblies are required to have a fire-resistance rating, recessed fixtures shall be installed such that the required fire resistance will not be reduced.

Exceptions:
7. The ceiling membrane of 1- and 2-hour fire-resistance-rated horizontal assemblies is permitted to be interrupted with the double wood top plate of a wall assembly that is sheathed with Type X gypsum wallboard, provided that all penetrating items through the double top plate are protected in accordance with Section 714.4.1.1 or 714.4.1.2 and the ceiling membrane is tight to the top plate. For 2-hour fire-resistance-rated horizontal assemblies the wall assembly must be sheathed with Type X gypsum wallboard.

The delayed effective date of this Rule is January 1, 2021.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.
2018 NC Building Code
901.1 Scope. (161213 Item B-6)

901.1 Scope. The provisions of this chapter shall specify where fire protection systems are required and shall apply to the design, installation, inspection, operation, testing and maintenance of all fire protection systems.

901.1 Scope. The provisions of the International Building Code shall specify where fire protection systems are required. The provisions of the International Fire Code shall determine the design, installation, inspection, operation, testing and maintenance of all fire protection systems.

The delayed effective date of this Rule for the 2018 NC Building Code is January 1, 2019. The Statutory authority for Rule-making is G. S. 143-136; 143-138.

(Note: Also printed in 2018 Fire Prevention Code, Section 901.1.)
903.2.8 Group R. An automatic sprinkler system installed in accordance with Section 903.3 shall be provided throughout all buildings with a Group R fire area, except as provided for in Section 903.2.8.5.

Exceptions:

1. An automatic sprinkler system is not required in new adult and child day care facilities located in existing Group R-3 and R-4 occupancies.
2. An automatic sprinkler system is not required in temporary overflow shelters.
3. An automatic sprinkler system is not required in camping units located within a campground where all of the following conditions exist.
   3.1. The camping unit is limited to one story in height.
   3.2. The camping unit is less than 400 square feet (37 m2) in area.
   3.3. The camping unit does not have a kitchen.
4. An automatic sprinkler system is not required in an open air camp cabin that complies with the following:
   4.1. The open air camp cabin shall have at least two remote unimpeded exits. Lighted exit signs shall not be required.
   4.2. The open air camp cabin shall not be required to have plumbing or electrical systems, but if the cabin has these systems, then the provisions of the code otherwise applicable to those systems shall apply.
   4.3. Smoke alarms and portable fire extinguishers may be required as otherwise provided in the code.
5. An automatic sprinkler system is not required in the following Group R-3 buildings not more than three stories above grade plane in height with a separate means of egress:
   5.1. Detached one- and two-family dwellings.
   5.2. Attached one- and two-family dwellings separated with fire walls complying with Section 706 and containing no other occupancy classification.

The delayed effective date of this Rule is January 1, 2021.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.
905.3.1 Height. Class III standpipe systems shall be installed throughout buildings where the floor level of the highest story is located more than 30 feet (9144 mm) above the lowest level of the fire department vehicle access, or where the floor level of the lowest story is located more than 30 feet (9144 mm) below the lowest level of fire department vehicle access, any of the following exist:

1. Four or more stories are above or below grade plane.
2. The floor level of the highest story is located more than 30 feet (9144 mm) above the lowest level of the fire department vehicle access.
3. The floor level of the lowest story is located more than 30 feet (9144 mm) below the highest level of fire department vehicle access.

Exceptions:
1. Class I standpipes are allowed in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.
2. Class I standpipes are allowed in Group B and E occupancies.
3. Class I manual standpipes are allowed in open parking garages where the highest floor is located not more than 150 feet (45720 mm) above the lowest level of fire department vehicle access.
4. Class I manual dry standpipes are allowed in open parking garages that are subject to freezing temperatures, provided that the hose connections are located as required for Class II standpipes in accordance with Section 905.5.
5. Class I standpipes are allowed in basements equipped throughout with an automatic sprinkler system.
6. Class I standpipes are allowed in buildings where occupant-use hose lines will not be utilized by trained personnel or the fire department.

In determining the lowest level of fire department vehicle access, it shall not be required to consider either of the following:

1. Recessed loading docks for four vehicles or less.
2. Conditions where topography makes access from the fire department vehicle to the building impractical or impossible.

The delayed effective date of this Rule is January 1, 2021.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.
2018 NC Building Code
915 Carbon Monoxide Alarm and Detection Systems. (180612 Item B-5)

915.1.1 Where required. Carbon monoxide detection shall be provided in Group A-2, I-1, I-2, I-4 and R occupancies and in classrooms in Group E occupancies in the locations specified in Section 915.2 where any of the conditions in Sections 915.1.2 through 915.1.6 exist.

915.1.2 Fuel-burning appliances and fuel-burning fireplaces. Carbon monoxide detection shall be provided in Group A-2 occupancies, dwelling units, sleeping units and classrooms that contain a fuel-burning appliance or a fuel-burning fireplace.

915.1.3 Forced air furnaces. Carbon monoxide detection shall be provided in Group A-2 occupancies, dwelling units, sleeping units and classrooms served by a fuel-burning, forced air furnace.

915.4.1 Power source. Carbon monoxide alarms shall receive their primary power from the building wiring where such wiring is served from a commercial source, and when primary power is interrupted, shall receive power from a battery. Wiring shall be permanent and without a disconnecting switch other than that required for overcurrent protection.

Exceptions:
1. Where installed in buildings without commercial power, battery-powered carbon monoxide alarms shall be an acceptable alternative.
2. In A-2 occupancies the carbon monoxide detector shall be permitted to be battery-powered.

The delayed effective date of this Rule is January 1, 2020.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.

[Note: This Rule will also be printed in the 2018 NC Fire Code, 915 Carbon Monoxide Alarm and Detection Systems.]
1009.7.2 Separation.

(no change to subsection)

Exceptions:

1. Areas for assisted rescue that are located 10 feet (3048 mm) or more from the exterior face of a building are not required to be separated from the building by fire-resistance rated walls or protected openings.

2. The fire-resistance rating and opening protectives are not required in the exterior wall where the building is equipped throughout with an automatic sprinkler system installed in accordance with section 903.3.1.1 or 903.3.1.2.

The delayed effective date of this Rule is January 1, 2020.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.

[Note: This Rule will also be printed in the 2018 NC Fire Code, 1009.7.2 Separation.]
2018 NC Building Code
1010.1.9.11 Stairway doors. (180313 Item B-10)

[BE] 1010.1.9.11 Stairway doors.
Interior stairway means of egress doors shall be openable from both sides without the use of a key or special knowledge or effort.

Exceptions:
1. Stairway discharge doors shall be openable from the egress side and shall only be locked from the opposite side.

2. This section shall not apply to doors arranged in accordance with Section 403.5.3 of the International Building Code.

3. In stairways serving not more than four stories, doors are permitted to be locked from the side opposite the egress side, provided they are openable from the egress side and capable of being unlocked simultaneously without unlatching upon a signal from the fire command center, if present, or a signal by emergency personnel from a single location inside the main entrance to the building.

3. Stairway exit doors are permitted to be locked from the side opposite the egress side, provided that they are openable from the egress side and capable of being unlocked simultaneously without unlatching upon a signal from the fire command center, if present, or a signal by emergency personnel from a single location inside the main entrance to the building and upon activation of the fire alarm if present.

4. Stairway exit doors shall be openable from the egress side and shall only be locked from the opposite side in Group B, F, M and S occupancies where the only interior access to the tenant space is from a single exit stairway where permitted in Section 1006.3.2.

5. Stairway exit doors shall be openable from the egress side and shall only be locked from the opposite side in Group R-2 occupancies where the only interior access to the dwelling unit is from a single exit stairway where permitted in Section 1006.3.2.

6. In other than high-rise, stairways serving floors above a 3 hour horizontal building separation, doors are permitted to be locked from the side opposite the egress side, provided they are openable from the egress side and capable of being unlocked simultaneously without unlatching upon activation of the building fire alarm system.

The delayed effective date of this Rule is January 1, 2020.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.

[Note: This Rule will also be printed in the 2018 NC Fire Prevention Code, 1010.1.9.11 Stairway doors.]
The table remains unchanged; only footnote f is affected

f. Exit access corridors are not required to be rated on any single tenant floor or in any single tenant space, if 1-hour fire-resistance-rated floor/ceiling assemblies are provided in multistory buildings and fire partitions are provided between other tenant spaces on the same floor. The structure supporting such floor/ceiling assemblies and fire partitions is not required to be rated in Types IIB, IIIB and VB construction.
2018 NC Building Code
1107.6.2.2.1 Type A units. (161213 Item B-11)
(See also 190910 Item B-2 below for further amendment to this section)

1107.6.2.2.1 Type A units.
In Group R-2 occupancies containing 14 or more dwelling units or sleeping units, at least 5 percent but not less than one of the units shall be a Type A unit. For a site with more than 100 units, at least 2 percent of the number of units exceeding 100 shall be Type A units. All Group R-2 units on a site shall be considered to determine the total number of units and the required number of Type A units. Type A units shall be dispersed among the various classes of units. Bedrooms in monasteries and convents shall be counted as sleeping units for the purpose of determining the number of units. Where the sleeping units are grouped into suites, only one sleeping unit in each suite shall count towards the number of required Type A unit

Exceptions:
1. The number of Type A units is permitted to be reduced in accordance with Section 1107.7.
2. Existing structures on a site shall not contribute to the total number of units on a site.

The delayed effective date of this Rule is January 1, 2019.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.

(Note: The remainder is part of the 2018 Code adoption package.)
(Note: Also “more than 15” correlation with 2018 Existing Building Code adoption package, 806.1.8.)
1107.6.2.2.1 Type A Units. In Group R-2 occupancies containing more than 45 dwelling units or sleeping units, at least 5 percent but not less than one of the units shall be a Type A unit. All Group R-2 units on a site shall be considered to determine the total number of units and the required number of Type A units. Type A units shall be dispersed among the various classes of units. Bedrooms in monasteries and convents shall be counted as sleeping units for the purpose of determining the number of units. Where the sleeping units are grouped into suites, only one sleeping unit in each suite shall count towards the number of required Type A units.

Exceptions:
1. The number of Type A units is permitted to be reduced in accordance with Section 1107.7.
2. Existing structures on a site shall not contribute to the total number of units on a site.
3. For a site with more than 100 units, at least 2 percent of the number of units exceeding 100 shall be Type A units.

The delayed effective date of this Rule is January 1, 2021.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.
1301.1.1 Criteria. Buildings shall be designed and constructed in accordance with the *International Energy Conservation Code*.  
**Exception:** Per G.S. 143-138 (b18), no energy conservation code provisions shall apply to any structure for which the primary occupancy classification is Group F, S, or U. This exclusion shall apply to the entire building area.

The delayed effective date of this Rule is January 1, 2019.  
The Statutory authority for Rule-making is G. S. 143-136; 143-138.
2018 NC Building Code
1705.4 Masonry construction. (180612 Item B-2)

1705.4 Masonry construction.
Exception: Special inspections and tests shall not be required for:
4. Non-load bearing masonry partition walls and screens as determined and designated as such by the registered design professional in or added to the construction documents.

The delayed effective date of this Rule is January 1, 2020.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.
Table 2902.1 MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES

| q. | For business occupant loads of 25 or fewer, drinking fountains shall not be required. |

The delayed effective date of this Rule is January 1, 2020.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.

[Note: This Rule will also be printed in the 2018 NC Plumbing Code, Table 403.1 MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES.]

<table>
<thead>
<tr>
<th>Building Code</th>
<th>Code Authority</th>
<th>Table</th>
<th>q.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018 NC Building Code</td>
<td>Table 2902.1 MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES. (180911 Item B-19)</td>
<td>Table 2902.1 MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES</td>
<td>q.</td>
</tr>
<tr>
<td>Business (See Sections 2902.2, 2902.3, and 2902.3.2.2)</td>
<td>Buildings for the transaction of business, professional services, other services involving merchandise, office buildings, banks, light industrial and similar uses</td>
<td>1 per 25 for the first 50 and 1 per 50 for the remainder exceeding 50</td>
<td>1 per 40 for the first 80 and 1 per 80 for the remainder exceeding 80</td>
</tr>
<tr>
<td>-</td>
<td>1 per 100</td>
<td>1 service sink</td>
<td></td>
</tr>
</tbody>
</table>
### 2018 NC Building Code

**ERRATA** – line up the columns for “water closets, lavatories, drinking fountains” as shown

#### TABLE 2902.1
MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES\(^a\,^b\)

<table>
<thead>
<tr>
<th>NO.</th>
<th>CLASSIFICATION</th>
<th>OCCUPANCY</th>
<th>DESCRIPTION</th>
<th>WATER CLOSETS (URINALS: SEE SECTION 419.2)</th>
<th>LAVATORIES</th>
<th>BATHTUBS/SHOWERS</th>
<th>DRINKING FOUNTAIN (SEE SECTION 410)</th>
<th>OTHER</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Educational</td>
<td>E(^b)</td>
<td>K–8</td>
<td>1 per 25</td>
<td>1 per 60</td>
<td>—</td>
<td>1 per 100</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>9–12</td>
<td>1 per 30</td>
<td>1 per 100</td>
<td>—</td>
<td>1 per 100</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Teacher/staff</td>
<td>1 per 30</td>
<td>1 per 25</td>
<td>—</td>
<td>1 per 100</td>
<td>—</td>
</tr>
</tbody>
</table>
2018 NC Building Code
2902.1.1 Fixture calculations. (170912 Item B-2)

2902.1.1 Fixture calculations.
To determine the occupant load of each sex, the total occupant load shall be divided in half. To determine the required number of fixtures, the fixture ratio or ratios for each fixture type shall be applied to the occupant load of each sex in accordance with Table 403.1. Fractional numbers resulting from applying the fixture ratios of Table 403.1 shall be rounded up to the next whole number. For calculations involving multiple occupancies, such fractional numbers for each occupancy shall first be summed and then rounded up to the next whole number.

Exceptions:
1. The total occupant load shall not be required to be divided in half where approved statistical data indicates a distribution of the sexes of other than 50 percent of each sex.
2. In buildings that contain dwellings or sleeping units that have a pool dedicated to the residents, a percentage reduction of the total required fixtures provided for a pool and pool deck without bleachers and grandstands may be taken equal to the percentage of total residential units whose entries fall within a 500 foot horizontal travel distance of the pool deck. In multi-story structures, the residential units located not more than one story above or below the pool and pool deck may be included in the percentage. Travel from the pool to the required toilet facilities shall be on an accessible route.

The delayed effective date of this Rule is January 1, 2019.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.

(Note: Also printed in 2018 Plumbing Code, Section 403.1.1, Exception 2.)
312.1 General.
Buildings and structures of an accessory character and miscellaneous structures not classified in any specific occupancy shall be constructed, equipped and maintained to conform to the requirements of this code commensurate with the fire and life hazard incidental to their occupancy. Group U shall include, but not be limited to, the following:

Agricultural buildings
Aircraft hangars, accessory to a one- or two-family residence (see Section 412.5)
Barns
Carports
Fences and ground signs more than 6 feet (1829 mm) in height
Grain silos, accessory to a residential occupancy
Greenhouses
Livestock shelters
Photovoltaic panel system (mounted at grade)
Private garages
Retaining walls
Sheds
Stables
Tanks
Towers

SECTION H101 GENERAL

H101.2 Signs exempt from permits. The following signs are exempt from the requirements to obtain a permit before erection:
1. Nonilluminated wall signs.
2. Temporary signs.
3. Signs erected by transportation authorities.
4. Projecting signs not exceeding 6 square feet (0.56 m²).
5. The changing of moveable parts of an approved sign that is designed for such changes, or the repainting or repositioning of display matter shall not be deemed an alteration.
6. Ground signs less than 6 feet (1829 mm) in height above finished grade.

SECTION H109 GROUND SIGNS

H109.2 Required Clearance. The bottom coping of every ground sign shall be not less than 3 feet (914 mm) above the ground or street level, which space can be filled with platform decorative trim or light wooden construction.
Exception: Signs that have a solid base of masonry, steel or similar material, commonly known as monument signs.

The delayed effective date of this Rule is January 1, 2020.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.
2017 NC Electrical Code
210.8 Ground-Fault Circuit-Interrupter Protection for Personnel. (180612 Item B-10)

210.8 Ground-Fault Circuit-Interrupter Protection for Personnel.

(A) Dwelling Units. All 125-volt, single-phase, 15- and 20-ampere receptacles installed in the locations specified in 210.8 (A)(1) through (10) shall have ground-fault circuit-interrupter protection for personnel.

(1) Bathrooms

(2) Garages, and also accessory buildings that have a floor located at or below grade level not intended as habitable rooms and limited to storage areas, work areas, and areas of similar use

Exception No. 1 to (2): Receptacles that are not readily accessible.

Exception No. 2 to (2): A single receptacle or a duplex receptacle for two appliances located within dedicated space for each appliance that, in normal use, is not easily moved from one place to another and that is cord-and-plug connected in accordance with 400.10(A)(6), (A)(7), or (A)(8).

Receptacles installed under the exceptions to 210.8(A)(2) shall not be considered as meeting the requirements of 210.52(G)

The delayed effective date of this Rule is January 1, 2020.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.
2017 NC Electrical Code
210.8(B) Other Than Dwelling Units. (190312 Item B-6)

210.8(B) Other Than Dwelling Units. All single-phase receptacles rated 150 volts to ground or less, 50 amperes or less and three phase receptacles rated 150 volts to ground or less, 100 amperes or less installed in the following locations shall have ground-fault circuit-interrupter protection for personnel.

The delayed effective date of this Rule is January 1, 2021.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.
2017 NC Electrical Code
Table 300.5 Minimum Cover Requirements. (180612 Item B-11)

(SEE ATTACHED TABLE 300.5)

The delayed effective date of this Rule is January 1, 2020.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.
Table 300.5 Minimum Cover Requirements, 0 to 1000 Volts, Nominal, Burial in Millimeters (Inches)

<table>
<thead>
<tr>
<th>Location of Wiring Method or Circuit</th>
<th>Column 1 Direct Burial Cables or Conductors (mm in.)</th>
<th>Column 2 Rigid Metal Conduit or Intermediate Metal Conduit (mm in.)</th>
<th>Column 3 Nonmetallic Raceways Listed for Direct Burial Without Concrete Encasement or Other Approved Raceways (mm in.)</th>
<th>Column 4 Residential Branch Circuits Rated 120/240 Volts or Less with GFCI Protection and Maximum Overcurrent Protection of 20 or 25 Amperes (mm in.)</th>
<th>Column 5 Circuits for Control or Irrigation and Landscape Lighting Limited to Not More Than 30 Volts and Installed with Type UF or in Other Identified Cable or Raceway (mm in.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>All locations not specified-below</td>
<td>600 24</td>
<td>150 6</td>
<td>450 18</td>
<td>300 12</td>
<td>150 6</td>
</tr>
<tr>
<td>In trench below 50 mm (2 in.) thick concrete or equivalent</td>
<td>450 18</td>
<td>150 6</td>
<td>300 12</td>
<td>150 6</td>
<td>150 6</td>
</tr>
<tr>
<td>Under a building</td>
<td>0 0 (in raceway or Type MC or Type MI cable identified for direct burial)</td>
<td>0 0</td>
<td>0 0 (in raceway or Type MC or Type MI cable identified for direct burial)</td>
<td>0 0 (in raceway or Type MC or Type MI cable identified for direct burial)</td>
<td>0 0 (in raceway or Type MC or Type MI cable identified for direct burial)</td>
</tr>
<tr>
<td>Under minimum of 102 mm (4 in.) thick concrete exterior slab with no vehicular traffic and the slab extending not less than 152 mm (6 in.) beyond the underground installation</td>
<td>450 18</td>
<td>100 4</td>
<td>100 4</td>
<td>150 6</td>
<td>150 6</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(direct burial)</td>
<td>(direct burial)</td>
<td>(direct burial)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>100 4</td>
<td>100 4</td>
<td>100 4</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(in raceway)</td>
<td>(in raceway)</td>
<td>(in raceway)</td>
</tr>
<tr>
<td>Under streets, highways, mads, alleys, driveways, and parking lots</td>
<td>600 24</td>
<td>600 24</td>
<td>600 24</td>
<td>600 24</td>
<td>600 24</td>
</tr>
<tr>
<td>One- and two-family dwelling driveways and outdoor parking areas, and used only for dwelling-related purposes</td>
<td>450 18</td>
<td>450 18</td>
<td>450 18</td>
<td>300 12</td>
<td>450 18</td>
</tr>
<tr>
<td>In or under airport runways, including adjacent areas where trespassing prohibited</td>
<td>450 18</td>
<td>450 18</td>
<td>450 18</td>
<td>450 18</td>
<td>450 18</td>
</tr>
</tbody>
</table>

Notes:
1. Cover is defined as the straight line distance in millimeters (inches) measured between a point on the top surfaces of any direct-buried conductor, cable, conduit, or other raceway and the top surface of finished grade, concrete, or similar cover.
2. Raceways approved for burial only where concrete encased shall require concrete envelope not less than 50 mm (2 in.) thick.
3. Lesser depths shall be permitted where cables and conductors rise for terminations or splices or where access is otherwise required.
4. Where one of the wiring method types listed in Columns 1 through 3 is used for one of the circuit types in Columns 4 and 5, the shallowest depth of burial shall be permitted.
5. Where solid rock prevents compliance with the cover depths specified in this table, the wiring shall be installed in metal or nonmetallic raceway permitted for direct burial. The raceways shall be covered by a minimum of 50 mm (2 in.) of concrete extending down to rock.

2017 Edition NATIONAL ELECTRICAL CODE 70-145

May 22, 2020
320.23 In Accessible Attics. Type AC cables in accessible attics or roof spaces shall be installed as specified in 320.23(A) and (B).

(A) Cabled Run Across the Top of Floor Joists. Where run across the top of floor joists, or within 2.1 m (7 ft) of the floor or floor joists across the face of ceiling rafters or studding, the cable shall be protected by guard strips that are at least as high as the cable, unless the cables are physically considered outside any floored area. Where this space is not accessible by permanent stairs or ladders, protection shall only be required within 1.8 m (6 ft) of the nearest edge of the scuttle hole or attic entrance where cables are run across the top of floor (ceiling) joists.

1. Where this space is accessible by permanent stairs or ladders, protection shall be required in the area directly over a permanent [floor not exceeding 2.1 m (7 ft) vertically from the floor], or where run across the top of floor joists.
2. Where this space is not accessible by permanent stairs or ladders, protection shall be required within 1.8 m (6 ft) horizontally of the nearest edge of the scuttle hole or attic entrance where run across the top of any flooring, or flooring or ceiling joists. Protection is not required where run across the face of overhead roofing trusts or rafters.

Exception: For the purpose of this section, pull-down type stairs are not to be considered as permanent stairs or ladders.

The delayed effective date of this Rule is January 1, 2019.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.

Where a receptacle outlet is located in any areas specified in 210.12(A) or (B), a replacement receptacle at this outlet shall be one of the following:

(1) A listed outlet branch circuit type arc fault circuit interrupter receptacle
(2) A receptacle protected by a listed outlet branch circuit type arc fault circuit interrupter type receptacle
(3) A receptacle protected by a listed combination type arc fault circuit interrupter type circuit breaker

Exception No. 1: Arc fault circuit interrupter protection shall not be required where all of the following apply:
(1) The replacement complies with 406.4(D)(2)(b).
(2) It is impracticable to provide an equipment grounding conductor as provided by 250.130(C).
(3) A listed combination type arc fault circuit interrupter circuit breaker is not commercially available.
(4) GFCI/AFCI dual function receptacles are not commercially available.

Exception No. 2: Section 210.12(B), Exception shall not apply to replacement of receptacles.

The delayed effective date of this Rule is January 1, 2021.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.
410.2 Definition.

**Closet Storage Space.** The volume bounded by the sides and back closet walls and planes extending from the closet floor vertically to a height of 1.8 m (6 ft) or to the highest clothes-hanging rod and parallel to the walls at a horizontal distance of 600 mm (24 in.) from the sides and back of the closet walls, respectively, and continuing vertically to the closet ceiling parallel to the walls at a horizontal distance of 300 mm (12 in.) or the width of the shelf, whichever is greater; for a closet that permits access to both sides of a hanging rod, this space includes the volume below the highest rod extending 300 mm (12 in.) on either side of the rod on a plane horizontal to the floor extending the entire length of the rod. See Figure 410.2.

**Exception:** Where a shelf is not present in the area of wall above the closet’s entrance opening or doorway extending from the top of such opening or doorway vertically to the ceiling, including the area of ceiling extending perpendicular from the area of wall directly above the closet’s entrance opening or doorway to a horizontal distance of 300 mm (12 in.), shall not be defined as closet storage space. See Figure 410.2 Exception.

The delayed effective date of this Rule is January 1, 2020.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.
2017 NC Electrical Code
410.16 Luminaires in Clothes Closets. (180313 Item B-8)

410.16 Luminaires in Clothes Closets.

(C) Location. The minimum clearance between luminaires installed in clothes closets and the nearest point of a closet storage space shall be as follows:
(1) 300 mm (12 in.) for surface-mounted incandescent or LED luminaires with a completely enclosed light source installed on the wall above the door or on the ceiling.
(2) 150 mm (6 in.) for surface-mounted fluorescent luminaires installed on the wall above the door or on the ceiling.
(3) 150 mm (6 in.) for recessed incandescent or LED luminaires with a completely enclosed light source installed in the wall or the ceiling.
(4) 150 mm (6 in.) for recessed fluorescent luminaires installed in the wall or the ceiling.
(5) Surface-mounted fluorescent or LED luminaires shall be permitted to be installed within the closet storage space where identified for this use.
(6) LED luminaires with a completely enclosed light source or fluorescent luminaires shall be permitted to be installed within the area defined in 410.2 Exception.

The delayed effective date of this Rule is January 1, 2020.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.
680.21(C)(2) Motors GFCI Protection

(C) GFCI Protection. Outlets supplying pool pump motors connected to single-phase, 120-volt through 240-volt branch circuits, whether by receptacle or by direct connection, shall be provided with ground-fault circuit-interrupter protection for personnel.

(2) Existing Pool Pump Motor Branch Circuit and Overcurrent Protection. All existing single-phase, 120-volt through 240-volt branch circuits and overcurrent devices that supply power to a pool pump motor by direct connection or outlet shall comply with the provisions of 680.21(C) when the branch circuits or overcurrent devices are altered, installed, modified, relocated, repaired, or replaced.

The delayed effective date of this Rule is June 12, 2018 for the 2017 edition.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.
2017 NC Electrical Code
695.2 Definitions. (190312 Item B-16)

Reliable Source of Power. A source of power that possesses all of the following characteristics:
(1) The electric utility supplying the power has not conducted any intentional shut downs longer than 10 continuous hours in the year prior to the plan submittal and is verified in writing by that electric utility.
(2) The source of power is not supplied by overhead conductors within 60 feet of the building(s) equipped with fire pump(s).
(3) Only the disconnect switches and overcurrent protection devices permitted in Article 695 and NFPA 20-2013 section 9.3.2 are installed in the normal source of power to the fire pump controller.

The delayed effective date of this Rule is January 1, 2021.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.
2017 NC Electrical Code
695.3 Power Source(s) for Electric Motor-Driven Fire Pumps. (190312 Item B-15)

**695.3 Power Source(s) for Electric Motor-Driven Fire Pumps.**
Electric motor-driven fire pumps shall have a reliable source of power.
*Informational Note: See Sections 9.3.2 and A.9.3.2 from NFPA 20-2013, Standard for the Installation of Stationary Pumps for Fire Protection, for guidance on the determination of power source reliability.*

The delayed effective date of this Rule is January 1, 2021.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.
C101.2 Scope.

This code applies to commercial buildings and the buildings’ sites and associated systems and equipment. **Exceptions:**

1. Energy expended in support of process energy applications does not invoke energy conservation code requirements or building thermal envelope requirements unless otherwise required in specific sections of this code.

2. Per G.S. 143-138 (b18), no energy conservation code provisions shall apply to any structure for which the primary occupancy classification is Group F, S, or U pursuant to Chapter 3 of the 2018 North Carolina Building Code. This exclusion shall apply to the entire building area.

The delayed effective date of this Rule is January 1, 2019.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.
R101.2 Scope.
This code applies to *residential buildings* and the buildings sites and associated systems and equipment. 

Exception:
1. In accordance with N.C.G.S. 143-138 (b19), no energy conservation code provisions shall apply to detached and attached garages located on the same lot as a dwelling.

The delayed effective date of this Rule is January 1, 2020.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.
2018 NC Energy Conservation Code
R402.1.2, R402.1.4, R&U-Value Tables. (170613 Item B-13)

The Agency withdrew this item due to RRC February 15, 2018 objection.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.
R403.3.3 Duct leakage (Perspective) and duct testing (Mandatory). Duct testing and duct leakage shall be verified by compliance with either Section 403.3.3.1 or 403.3.3.2. Duct testing shall be performed and reported by the permit holder, a NC licensed general contractor, a NC licensed HVAC contractor, a NC licensed Home Inspector, a registered design professional, a certified BPI Envelope Professional or a certified HERS rater. A single point depressurization, not temperature corrected, test is sufficient to comply with this provision, provided that the duct testing fan assembly(s) has been certified by the manufacturer to be capable of conducting tests in accordance with ASTM E1554-07.

The duct leakage information, including duct leakage test selected and result, tester name, date and contact information, shall be included on the certificate described in Section 401.3.

For the Test Criteria, the report shall be produced in the following manner: perform the HVAC system air leakage test and record the CFM25. Calculate the total square feet of Conditioned Floor Area (CFA) served by that system. Multiply CFM25 by 100, divide the result by the CFA and record the result. If the result is less than or equal to 5 CFM25/100SF for the "Total duct leakage" test or less than or equal to 4CFM25/100SF for the "Duct leakage to the outside" test, then the HVAC system air tightness is acceptable. Appendix 3C contains optional sample worksheets for duct testing for the permit holder’s use only.

Exceptions to testing requirements:

1. Duct systems or portions thereof inside the building thermal envelope shall not be required to be leak tested.
2. Installation of a partial system as part of replacement, renovation or addition does not require a duct leakage test.
3. Duct systems (complete) serving areas of 750 sq. ft. or less shall not need to be required to be leak tested.

The delayed effective date of this Rule is January 1, 2019.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.

(Note: Also printed in the 2018 NC Residential Code N1103.3.3.)
(Note: The remainder is part of the 2018 Code adoption package.)
R406 Energy Rating Index. (161213 Item B.3.3)

SECTION R406
ENERGY RATING INDEX COMPLIANCE ALTERNATIVE

R406.1 Scope. This section establishes criteria for compliance using an Energy Rating Index (ERI) analysis.

R406.2 Mandatory requirements. Compliance with this section requires that the mandatory provisions identified in Sections R401.2 through R404 labeled as “mandatory” and Section R403.5.3 be met. The building .2 thermal envelope shall be greater than or equal to levels of efficiency and Solar Heat Gain Coefficient in Table 402.1.1 or 402.1.3 of the 2009 International Energy Conservation Code 2012 NC Energy Conservation Code. Minimum standards associated with compliance shall be the ANSI RESNET ICC Standard 301-2014 “Standard for the Calculation and Labeling of the Energy Performance of Low-Rise Residential Buildings using an Energy Rating Index.” A North Carolina licensed design professional or certified HERS rater is required to perform the analysis if required by North Carolina licensure laws.

Exception: Supply and return ducts not completely inside the building thermal envelope shall be insulated to a minimum of R-6. Supply and return ducts in unconditioned space and outdoors shall be insulated to a minimum R-8. Supply ducts inside semi-conditioned space shall be insulated to a minimum R-4; return ducts inside conditioned and semi-conditioned space are not required to be insulated. Ducts located inside conditioned space are not required to be insulated other than as may be necessary for preventing the formation of condensation on the exterior of cooling ducts.

R406.5 Verification by approved agency. Verification of compliance with Section R406 shall be performed by the licensed design professional or certified HERS rater and the compliance documentation shall be provided to the code official. The code official shall inspect according to the requirements of Section R406.6.2 completed by an approved third party.

The delayed effective date of this Rule is January 1, 2019.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.

(Note: All other strikethroughs/underlines are part of the 2018 Code adoption package.)
(Note: certified HERS rater = RESNET Certified Home Energy Rater)
2018 NC Existing Building Code
101.12 Energy conservation. (170613 Item B-7)

101.12 Energy conservation
Per G.S. 143-138 (b18), no energy conservation code provisions shall apply to any structure for which the primary occupancy classification is Group F, S, or U. This exclusion shall apply to the entire building area.

The delayed effective date of this Rule is January 1, 2019.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.
2018 NC Existing Building Code
101.12 Energy conservation exceptions. (180911 Item B-18)

101.12 Energy conservation exceptions.
The following exceptions apply to energy conservation code provisions in existing buildings in accordance with NC General Statutes:

1. In accordance with N.C.G.S. 143-138 (b18), no energy conservation code provisions shall apply to any structure for which the primary occupancy classification is Group F, S, or U. This exclusion shall apply to the entire building area.
2. In accordance with the N.C.G.S. 143-138 (b19), for residential buildings, no energy conservation code provisions shall apply to detached and attached garages located on the same lot as a dwelling.

The delayed effective date of this Rule is January 1, 2020.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.
2018 NC Existing Building Code
403.11, 804.4.3, 1104.2 Carbon Monoxide alarms. (180911 Item B-14)

**403.11 Carbon Monoxide alarms.** Individual sleeping units and individual dwelling units in Group R and I occupancies and classrooms in Group E occupancies and Group A-2 occupancies that contain a fuel-burning appliance or a fuel-burning fireplace shall be provided with carbon monoxide alarms in accordance with Section 915 of the *North Carolina Building Code*, except that the carbon monoxide alarms shall be allowed to be solely battery operated.

**804.4.3 Carbon Monoxide alarms.** Individual sleeping units and individual dwelling units in Group R and I occupancies and classrooms in Group E occupancies and Group A-2 occupancies that contain a fuel-burning appliance or a fuel burning fireplace shall be provided with carbon monoxide alarms in accordance with Section 915 of the *North Carolina Building Code*, except that the carbon monoxide alarms shall be allowed to be solely battery operated.

**1104.2 Carbon Monoxide alarms in existing portions of a building.** Where an *addition* is made to a building or structure of a Group A-2, I-1, I-2, I-4 or R occupancies, or classrooms are added in Group E occupancies, the *existing building* shall be provided with carbon monoxide alarms in accordance with Section 915 of the *North Carolina Building Code* or Section R315 of the *North Carolina Residential Code*, except the carbon monoxide alarms shall be allowed to be solely battery operated.

The delayed effective date of this Rule is January 1, 2020.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.
May 22, 2020

2018 NC Fire Code
102.13 Exceptions, Chapter 2 Definitions, Farm Building. (161213 Item B-8)

CHAPTER 1 CHANGES

102.13 Exception to applicability.
The provisions of this code shall not apply to the following:

1. Occupancy of one- and two-family dwellings.

2. Farm buildings located outside the building rules jurisdiction of any municipality.
   Exception: All buildings used for sleeping purposes shall conform to the provisions of the technical codes.

2. Farm buildings not used for:
   a. Sleeping purposes, or
   b. Storage of hazardous materials in excess of those listed in Tables 5003.1(1) and 5003.1(2) within the building rules jurisdiction of any municipality.

3. The design, construction, location, installation or operation of equipment for storing, handling, and transporting liquefied petroleum gases for fuel purposes up to the first stage regulator, liquefied natural gases, and anhydrous ammonia or other liquid fertilizers.

4. The design, construction, location, installation or operation of equipment or facilities of a public utility, as defined in N.C.G.S 62-3, or an electric or telephone membership corporation, including without limitation poles, towers and other structures supporting electric or communication lines from the distribution network up to the meter location.
   Exception: All buildings owned and operated by a public utility or an electric or telephone membership corporation shall meet the provisions of the code.


6. Open burning pursuant to N.C.G.S. 106 - 940 through 106 - 950 under the jurisdiction of the North Carolina Department of Agriculture and Consumer Services.

CHAPTER 2 CHANGES

FARM BUILDING. Any building not used for sleeping purposes that is not accessed by the general public and is used primarily for a farm purpose. Farm purposes includes structures or buildings for equipment, storage and processing of agricultural products or commodities such as: crops, fruits, vegetables, ornamental or flowering plants, dairy, timber, livestock, poultry and all other such forms of agricultural products by the specific farm on which the structure or building is located. Farm purposes do not include structures or buildings for uses such as education facilities, research facilities, or aircraft hangars.

The delayed effective date of this Rule is January 1, 2019.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.

(Note: The remainder is part of the 2018 Code adoption package.)
2018 NC Fire Code
314.4 Vehicles. (180313 Item B-9)

**314.4 Vehicles.** Liquid- or gas-fueled vehicles, boats or other motorcraft shall not be located indoors except as follows:

1. Batteries are disconnected.  
   Exception: Alternative-fueled vehicles in which manufacturer prohibits the disconnection of power supply.

2. Fuel in fuel tanks does not exceed one-quarter tank or 5 gallons (19L) (whichever is least).  
   Exception: Diesel-fueled vehicles, the maximum fuel amount permitted shall be 20 gallons.

3. Fuel tanks and fill openings are closed and sealed to prevent tampering and the release of vapors.

4. Vehicles, boats or other motorcraft equipment are not fueled or defueled within the building.

The delayed effective date of this Rule is January 1, 2020.  
The Statutory authority for Rule-making is G. S. 143-136; 143-138.
319.1.11 Accessibility. For temporary overflow emergency shelters, compliance with the North Carolina Building Code, Chapter 11 and Section 1009 is not required provided that the local jurisdiction has other shelter facilities that are accessible by the disabled.
SECTION 321
TEMPORARY SLEEPING UNITS FOR DISASTER RELIEF WORKERS

321.1 General.
This section shall apply to temporary use of existing buildings for purposes of providing sleeping units for volunteer disaster relief workers supporting a disaster declaration issued by the Governor of North Carolina. Existing buildings shall be permitted to provide temporary sleeping facilities for disaster relief workers provided that all the provisions of this section are met and approved by the local code officials.

Facilities complying with 321 shall not require compliance with other provisions of this code or the Building Code.

Exception: Buildings containing the following occupancies or uses shall not be used for temporary sleeping units for disaster relief workers:
1. Group F
2. Group H
3. Group S-1 vehicle repair garage
4. Group S-1 bulk tire storage
5. Woodworking operations

321.2 Permit required.
An operational permit as designated in 105.6.49 shall be required.

321.3 Short-Term Occupancy.
Short-term occupancies meeting the requirements of this section shall be permitted in existing buildings that have a current certificate of occupancy and connected electrical service. Use of a building or portion thereof for a short-term occupancy shall not exceed two days within 30 consecutive days.

321.3.1 Fire alarm and detection systems. Functioning smoke detection as required for the existing building or single station battery operated smoke alarms where no system exists shall be provided throughout the sleeping room, exit access corridors, and stairs serving the sleeping units per 907.2.11. Carbon monoxide detection devices shall be provided as required by 915.1.4 when fuel fired appliances are present.

321.3.2 Ventilation and temperature control. Heating, cooling, and ventilation must be provided by equipment installed and approved for such use. Use of portable space heaters shall be prohibited.

321.3.3 Plumbing fixtures. Plumbing fixtures shall be provided as required for Group R-2 by the NC Plumbing Code, Section 403 for the number of disaster relief workers occupying the building. Temporary facilities are permitted as approved by the local code official.

321.3.4 Accessibility. Sleeping units for temporary disaster relief workers complying with the NC Building Code, Chapter 11 and Section 1009 are not required provided that the building owner or supporting organization has other sleeping facilities that are accessible by the disabled within the same jurisdiction as the temporary sleeping units.

321.4 Long-term Occupancy. Long-term occupancies meeting the requirements of this section and 321.3 shall be permitted in existing buildings that have a current certificate of occupancy and connected electrical service. Long-term occupancies are for periods exceeding Short-term occupancy as designated in Section 321.3 with a maximum of 180 consecutive calendar days. The local fire official may extend the initial time period up to an additional 180-day period as often as needed if the building owner or his or her designee provides documentation satisfactory to the local fire official that an extension of time is necessary to
support local disaster relief efforts and the fire official verifies that the building remains in compliance with this section.

321.4.1 Occupant load and age. The maximum number of disaster relief workers permitted in the occupancy is 20 ambulatory individuals. The disaster relief workers must be 18 years of age or older.

Exception: Occupants may be less than 18 years of age if the sleeping unit meets all of the following conditions:
1. Is intended to serve disaster relief worker families with children and their parents or other legal guardian; and
2. Is equipped with smoke alarms meeting applicable code provisions for such devices in all sleeping areas.

321.4.2 Staff. The sleeping units must be staffed by a minimum of two individuals of 21 years of age or older trained in accordance with Chapter 4 of the NC Fire Code and at least one trained individual shall be awake to monitor the sleeping room and restrooms throughout the time the facility is occupied by the disaster relief workers.

321.4.3 Fire alarm and detection systems. Functioning smoke detection as required for the existing building or single station smoke alarms where no system exists shall be provided throughout the sleeping room, exit access corridors, and stairs serving the sleeping units per 907.2.11.

Carbon monoxide detection devices shall be provided as required by 915.1.4 when fuel fired appliances are present.

Building owner or his or her designee shall submit documentation illustrating that the smoke alarm is approved and that all emergency batteries have been tested and are operational.

321.4.4 Fire extinguishers. There must be an adequate number of fire extinguishers to serve the sleeping units as determined by the local fire code official. Travel distance to an approved fire extinguisher shall not exceed 50 feet. Minimum rating of extinguishers shall be 3A-40BC.

321.4.5 Automatic sprinkler system. No fire protection sprinkler system is required per 903.2.8. Exception #6. Any existing fire sprinkler system shall be operational.

Exception: Sprinkler system required by 321.4.7.

321.4.6 Means of egress. There shall be a minimum of two separate code compliant means of egress serving the sleeping units. An evacuation route approved by the local fire code official shall be posted and be in compliance with Sections 401, 403, 404, and 406 of the NC Fire Code.

321.4.6.1 Illumination. The disaster relief workers sleeping rooms and exit access corridors and stairs shall have unswitched illumination and emergency powered illumination with a duration of not less than 90-minutes.

321.4.7 Location of sleeping units. Sleeping units above or below the level of exit discharge are required to have a fire sprinkler system complying with 903.3 or an automatic smoke detection system complying with 907.2.8.2.

321.4.8 Occupant restrictions.
1. No smoking shall be permitted in the facility.
2. Candles, incense and similar open-flame-producing items shall not be allowed within the sleeping units or areas immediately adjacent to the sleeping units.
3. No temporary cooking equipment shall be permitted in the facility.

105.6.49 Temporary sleeping units for disaster relief workers (mandatory permit). An operational permit is required for operation of long-term temporary sleeping units for disaster relief workers.
The delayed effective date of this Rule is January 1, 2021.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.
2018 NC Fire Code
404.2.3 Lockdown plans. (180612 Item B-9)

404.2.3 Lockdown plans. Where facilities develop a lock down plan, it shall be in accordance with Sections 404.2.3.1 through 404.2.3.3.

404.2.3.1 Lockdown plans contents. Lockdown plans shall be approved by the fire code official and shall include the following:
1. Initiation. The plan shall include instructions for reporting an emergency that requires a lockdown.
2. Accountability. The plan shall include accountability procedures for staff to report the presence or absence of occupants.
3. Recall. The plan shall include a prearranged signal for returning to normal activity.
4. Communications and coordination. The plan shall include an approved means of two way communication between a central location and each secured area.

404.2.3 Lockdown plans. Lockdown plans shall only be permitted where such plans are approved by the fire code official and are in compliance with Sections 404.2.3.1 and 404.2.3.2.

404.2.3.1 Lockdown plan contents. Lockdown plans shall include the following:

1. Identification of individuals authorized to issue a lockdown order.
2. Security measures used during normal operations, when the building is occupied, that could adversely affect egress or fire department operations.
3. A description of identified emergency and security threats addressed by the plan, including specific lockdown procedures to be implemented for each threat condition.

4. Means and methods of initiating a lockdown plan for each threat, including:
   4.1. The means of notifying occupants of a lockdown event, which shall be distinct from the fire alarm signal.
   4.2. Identification of each door or other access point that will be secured.
   4.3. A description of the means or methods used to secure doors and other access points.
   4.4. A description of how locking means and methods are in compliance with the requirements of this code for egress and accessibility.

5. Procedures for reporting to the fire department any lockdown condition affecting egress or fire department operations.
6. Procedures for determining and reporting the presence or absence of occupants to emergency response agencies during a lockdown.
7. Means for providing two-way communication between a central location and each area subject to being secured during a lockdown.
8. Identification of the prearranged signal for terminating the lockdown.
9. Identification of individuals authorized to issue a lockdown termination order.
10. Procedures for unlocking doors and verifying that the means of egress has been returned to normal operations upon termination of the lockdown.
11. Training procedures and frequency of lockdown plan drills.

404.2.3.2 Drills. Lockdown plan drills shall be conducted in accordance with the approved plan. Such drills shall not be substituted for fire and evacuation drills required by Section 405.2.

The effective date of this Rule is May 1, 2019.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.
505.1.1 Suite/Room identification. Where numerical addresses are posted to identify suites or rooms within buildings, the first digit of the suite or room number shall match the floor number signage.

The delayed effective date of this Rule is January 1, 2021.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.
2018 NC Fire Code
901.1 Scope. (161213 Item B-6)

901.1 Scope. The provisions of this chapter shall specify where fire protection systems are required and shall apply to the design, installation, inspection, operation, testing and maintenance of all fire protection systems.

901.1 Scope. The provisions of the International Building Code shall specify where fire protection systems are required. The provisions of the International Fire Code shall determine the design, installation, inspection, operation, testing and maintenance of all fire protection systems.

The delayed effective date of this Rule for the 2018 NC Fire Prevention Code is January 1, 2019.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.

(Note: Also printed in 2018 Building Code, Section 901.1.)
2018 NC Fire Code
903.2.8 Group R. (180911 Item B-13)
(Also see Errata and 190910 Item B-14 below)

903.2.8 Group R. An automatic sprinkler system installed in accordance with Section 903.3 shall be provided throughout all buildings with a Group R fire area.

Exceptions:

1. An automatic sprinkler system is not required in new adult and child day care facilities located in existing Group R-3 and R-4 occupancies.
2. An automatic sprinkler system is not required in temporary overflow shelters.
3. An automatic sprinkler system is not required in camping units located within a campground where all of the following conditions exist:
   3.1. The camping unit is limited to one story in height.
   3.2. The camping unit is less than 400 square feet (37 m2) in area.
   3.3. The camping unit does not have a kitchen.
4. An automatic sprinkler system is not required in an open air camp cabin that complies with the following:
   4.1. The open air camp cabin shall have at least two remote unimpeded exits. Lighted exit signs shall not be required.
   4.2. The open air camp cabin shall not be required to have plumbing or electrical systems, but if the cabin has these systems, then the provisions of the code otherwise applicable to those systems shall apply.
   4.3. Smoke detectors and portable fire extinguishers shall be installed as required by other sections of this code.
5. An automatic sprinkler system is not required in the following Group R-3 buildings not more than three stories above grade plane in height with a separate means of egress:
   5.1. Detached one- and two-family dwellings.
   5.2. Attached one- and two-family dwellings separated with fire walls complying with NC Building Code, Section 706 and containing no other occupancy classification.

The delayed effective date of this Rule is January 1, 2021.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.
ERRATA – correct terminology as shown
(Also see 190910 Item B-14 below)

903.2.8 Group R. An automatic sprinkler system installed in accordance with Section 903.3 shall be provided throughout all buildings with a Group R fire area.

(no change to exceptions 1-3 and 5)

4. An automatic sprinkler system is not required in an open air camp cabin that complies with the following:
4.1. The open air camp cabin shall have at least two remote unimpeded exits. Lighted exit signs shall not be required.
4.2. The open air camp cabin shall not be required to have plumbing or electrical systems, but if the cabin has these systems, then the provisions of the code otherwise applicable to those systems shall apply.
4.3. Smoke alarms and portable fire extinguishers shall be installed as required by other sections of this code.
903.2.8 Group R. An automatic sprinkler system installed in accordance with Section 903.3 shall be provided throughout all buildings with a Group R fire area, except as provided for in Section 903.2.8.5.

Exceptions:
1. An automatic sprinkler system is not required in new adult and child day care facilities located in existing Group R-3 and R-4 occupancies.
2. An automatic sprinkler system is not required in temporary overflow shelters.
3. An automatic sprinkler system is not required in camping units located within a campground where all of the following conditions exist.
   3.1. The camping unit is limited to one story in height.
   3.2. The camping unit is less than 400 square feet (37 m²) in area.
   3.3. The camping unit does not have a kitchen.
4. An automatic sprinkler system is not required in an open air camp cabin that complies with the following:
   4.1. The open air camp cabin shall have at least two remote unimpeded exits. Lighted exit signs shall not be required.
   4.2. The open air camp cabin shall not be required to have plumbing or electrical systems, but if the cabin has these systems, then the provisions of the code otherwise applicable to those systems shall apply.
   4.3. Smoke alarms and portable fire extinguishers may be required as otherwise provided in the code.
5. An automatic sprinkler system is not required in the following Group R-3 buildings not more than three stories above grade plane in height with a separate means of egress:
   5.1. Detached one- and two-family dwellings.
   5.2. Attached one- and two-family dwellings separated with fire walls complying with Section 706 and containing no other occupancy classification.
6. Temporary sleeping units for disaster relief workers as allowed by Section 321.4.5.

The delayed effective date of this Rule is January 1, 2021.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.
2018 NC Fire Code
903.4.1 Monitoring. (161213 Item B-12)

903.4.1 Monitoring. Alarm, supervisory and trouble signals shall be distinctly different and shall be automatically transmitted to an approved supervising station, where approved by the fire code official, shall be an audible signal at a constantly attended location.

Exceptions:
1. Underground key or hub valves in roadway boxes provided by the municipality or public utility are not required to be monitored.
2. Backflow prevention device test valves located in limited area sprinkler system supply piping shall be locked in the open position. In occupancies required to be equipped with a fire alarm system, the backflow preventer valves shall be electrically supervised by a tamper switch installed in accordance with NFPA 72 and separately annunciated.
3. A group R-2 building sprinklered in accordance with NFPA 13R where sprinklers are provided for porches, balconies, corridors and stairs that are open and attached and installed supervised in accordance with Section 903.4. At a minimum an approved audible alarm device shall be provided on every sprinklered R-2 building in accordance with Section 903.4.2 of the North Carolina Fire Code. No on-site supervision is required at a constantly attended location.

The delayed effective date of this Rule is January 1, 2019.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.

(Note: Also correlation with 2018 Building Code adoption package, 903.4.1.)
2018 NC Fire Code
905.3.1 Height. (190910 Item B-3)

905.3.1 Height. Class III standpipe systems shall be installed throughout buildings where the floor level of the highest story is located more than 30 feet (9144 mm) above the lowest level of the fire department vehicle access, or where the floor level of the lowest story is located more than 30 feet (9144 mm) below the heights level of fire department vehicle access, any of the following exist:
1. Four or more stories are above or below grade plane.
2. The floor level of the highest story is located more than 30 feet (9144 mm) above the lowest level of the fire department vehicle access.
3. The floor level of the lowest story is located more than 30 feet (9144 mm) below the highest level of fire department vehicle access.

Exceptions:
1. Class I standpipes are allowed in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.
2. Class I standpipes are allowed in Group B and E occupancies.
3. Class I manual standpipes are allowed in open parking garages where the highest floor is located not more than 150 feet (45720 mm) above the lowest level of fire department vehicle access.
4. Class I manual dry standpipes are allowed in open parking garages that are subject to freezing temperatures, provided that the hose connections are located as required for Class II standpipes in accordance with Section 905.5.
5. Class I standpipes are allowed in basements equipped throughout with an automatic sprinkler system.
6. Class I standpipes are allowed in buildings where occupant-use hose lines will not be utilized by trained personnel or the fire department.

§ 7. In determining the lowest level of fire department vehicle access, it shall not be required to consider either of the following:
§ 7.1 Recessed loading docks for four vehicles or less.
§ 7.2 Conditions where topography makes access from the fire department vehicle to the building impractical or impossible.

The delayed effective date of this Rule is January 1, 2021.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.
2018 NC Fire Code

ERRATA – Chapter 11 does not exist.

907.9 Where required in existing buildings and structures. **Deleted.**

2018 NC Fire Code

ERRATA – corrected reference as shown

**909.20.7 Manual smoke removal.** Where manually operated panels or windows are required by Section 403.4.6 403.4.7 of the *North Carolina Building Code*, they shall be maintained in an operable condition and identified in an approved manner.

2018 NC Fire Code

ERRATA – correct references as shown

**914.3.1 Automatic sprinkler system.** Buildings and structures shall be equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 and a secondary water supply where required by Section 914.3.2.
2018 NC Fire Code
915 Carbon Monoxide Alarm and Detection Systems. (180612 Item B-5)

915.1.1 Where required. Carbon monoxide detection shall be provided in Group A-2, I-1, I-2, I-4 and R occupancies and in classrooms in Group E occupancies in the locations specified in Section 915.2 where any of the conditions in Sections 915.1.2 through 915.1.6 exist.

915.1.2 Fuel-burning appliances and fuel-burning fireplaces. Carbon monoxide detection shall be provided in Group A-2 occupancies, dwelling units, sleeping units and classrooms that contain a fuel-burning appliance or a fuel-burning fireplace.

915.1.3 Forced air furnaces. Carbon monoxide detection shall be provided in Group A-2 occupancies, dwelling units, sleeping units and classrooms served by a fuel-burning, forced air furnace.

915.4.1 Power source. Carbon monoxide alarms shall receive their primary power from the building wiring where such wiring is served from a commercial source, and when primary power is interrupted, shall receive power from a battery. Wiring shall be permanent and without a disconnecting switch other than that required for overcurrent protection.

Exceptions:
1. Where installed in buildings without commercial power, battery-powered carbon monoxide alarms shall be an acceptable alternative.
2. In A-2 occupancies the carbon monoxide detector shall be permitted to be battery-powered.

The delayed effective date of this Rule is January 1, 2020.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.

[Note: This Rule will also be printed in the 2018 NC Building Code, 915 Carbon Monoxide Alarm and Detection Systems.]
1009.7.2 Separation.

(no change to subsection)

Exceptions:

1. Areas for assisted rescue that are located 10 feet (3048 mm) or more from the exterior face of a building are not required to be separated from the building by fire-resistance rated walls or protected openings.

2. The fire-resistance rating and opening protectives are not required in the exterior wall where the building is equipped throughout with an automatic sprinkler system installed in accordance with section 903.3.1.1 or 903.3.1.2.

The delayed effective date of this Rule is January 1, 2020.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.

[Note: This Rule will also be printed in the 2018 NC Building Code, 1009.7.2 Separation.]
CHAPTER 1 CHANGES

105.6.45 Temporary membrane structures and tents (mandatory permit). An operational permit is required to operate an air-supported temporary membrane structure, or a temporary stage canopy having an area in excess of 400 square feet (37 m²), or a tent having an area in excess of 400-800 square feet (37-74 m²).

Exceptions:
1. Tents used exclusively for recreational camping purposes.
2. Tents open on all sides, which comply with all of the following:
   2.1. Individual tents having a maximum size of 700-1800 square feet (65-167 m²).
   2.2. The aggregate area of multiple tents placed side by side without a fire break clearance of not less than 12 feet (3658 mm) shall not exceed 700-1800 square feet (65-167 m²) total.
   2.3. A minimum clearance of 12 feet (3658 mm) to structures and other tents shall be provided.
3. Funeral tents and curtains or extensions attached thereto, when used for funeral services.

ERRATA: Coordinated 105.7.18 with 105.6.45.

105.7.18 Temporary membrane structures and tents. A construction permit is required to erect an air-supported temporary membrane structure, or a temporary stage canopy having an area in excess of 400 square feet (37 m²), or a tent having an area in excess of 400-800 square feet (37-74 m²).

Exceptions:
1. Tents used exclusively for recreational camping purposes.
2. Funeral tents and curtains or extensions attached thereto, when used for funeral services.
3. Tents open on all sides, which comply with all of the following:
   3.1. Individual tents having a maximum size of 200-1800 square feet (65-167 m²).
   3.2. The aggregate area of multiple tents placed side by side without a fire break clearance of not less than 12 feet (3658 mm) shall not exceed 200-1800 square feet (65-167 m²) total.
   3.3. A minimum clearance of 12 feet (3658 mm) to structures and other tents shall be provided.

CHAPTER 31 CHANGES

3103.2 Approval required. Tents and membrane structures having an area in excess of 400 square feet (37 m²) shall not be erected, operated or maintained for any purpose without first obtaining a permit and approval from the fire code official.

ERRATA: Exceptions are listed under 3103.2.2.

3103.2.1 Membrane Structures. Membrane structures having an area in excess of 400 square feet (37 m²)

3103.2.2 Tents. Tents having an area in excess of 800 square feet (74 m²).

Exceptions:
1. Tents used exclusively for recreational camping purposes.
2. Tents open on all sides without sidewalls, drops or other physical obstructions on 75 percent or more of the perimeter that comply with all of the following:
   2.1. Individual tents having a maximum size of 200-1800 square feet (65-167 m²).
2.2. The aggregate area of multiple tents placed side by side without a fire break clearance of 12 feet (3658 mm), not exceeding 200 1800 square feet (65 167 m²) total.
2.3. A minimum clearance of 12 feet (3658 mm) to all structures and other tents.

3. Funeral tents and curtains or extensions attached thereto, when used for funeral services.

3103.5 Use period. Temporary tents A temporary tent, air-supported, air-inflated or tensioned membrane structure shall not be erected for a period of more than 180 consecutive days within a 12-month period on a single premises.

The delayed effective date of this Rule is January 1, 2019.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.

(Note: The remainder is part of the 2018 Code adoption package.)
3406.1 Required access.
New tire storage yards shall be provided with fire apparatus access roads in accordance with Section 503 and Section 3406.2. Existing tire storage yards shall be provided with fire apparatus access roads where required in Chapter 11, Section 3406.1.

3406.1.1 Existing tire storage yards. Existing tire storage yards in excess of 150,000 cubic feet shall be provided with fire apparatus access roads in accordance with Section 3406.1.1.1 and 3406.1.1.2.

3406.1.1.1 Access to piles. Access roadways shall be within 150 feet (45 720 mm) of any point in the storage yard where storage piles are located not less than 20 feet (6096 mm) from any other storage pile.

3406.1.1.2 Location within piles. Fire apparatus access roads shall be located within all pile clearances identified in Section 3405.4 and within all fire breaks required in Section 3405.5.

The delayed effective date of this Rule is January 1, 2019.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.
2018 NC Fuel Gas Code
311 Carbon Monoxide Alarms. (180612 Item B-7)

311.4.1.1 Where required. Carbon monoxide detection shall be provided in Group A-2, I-1, I-2, I-4 and R occupancies and in classrooms in Group E occupancies in the locations specified in Section 311.4.2 where any of the conditions in Sections 311.4.1.2 through 311.4.1.6 exist.

311.4.1.2 Fuel-burning appliances and fuel-burning fireplaces. Carbon monoxide shall be provided in Group A-2 occupancies, dwelling units, sleeping units and classrooms that contain a fuel-burning appliance or a fuel-burning fireplace.

311.4.1.3 Forced air furnaces. Carbon monoxide detection shall be provided in Group A-2 occupancies, dwelling units, sleeping units and classrooms served by a fuel-burning, forced air furnace.

311.4.4.1 Power source. Carbon monoxide alarms shall receive their primary power from the building where such wiring is served from a commercial source, and when primary power is interrupted, shall receive power from a battery. Wiring shall be permanent and without a disconnecting switch other than that required for overcurrent protection.

Exceptions:
1. Where installed in buildings without commercial power, battery-powered carbon monoxide alarms shall be an acceptable alternative.
2. In A-2 occupancies the carbon monoxide detector shall be permitted to be battery-powered.

The delayed effective date of this Rule is January 1, 2020.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.
2018 NC Mechanical Code
306.5 Equipment and appliances on roofs or elevated structures. (171212 Item B-5)

306.5 Equipment and appliances on roofs or elevated structures. Where equipment or appliances requiring periodic maintenance are installed on, located on, or suspended from an elevated structure or the roof of a building such that personnel will have to climb higher than 16 feet (4877 mm) above grade or finished floor to access such equipment or appliances, an interior or exterior means of access shall be provided. Such access shall not require climbing over obstructions greater than 30 inches (762 mm) in height or walking on roofs having a slope greater than 4 units vertical in 12 units horizontal (33-percent slope). Such access shall not require the use of portable ladders. Where access involves climbing over parapet walls, the height shall be measured to the top of the parapet wall.

Exception: Where permanent means of access is technically infeasible, wall-mounted equipment and appliance maintenance, replacement and repairs that are over 16 feet can be serviced by motorized equipment upon approval. The owner/tenant shall provide a maintenance service and cleaning schedule contract that shall be renewed annually.

Permanent ladders installed to provide the required access shall comply with the following……

The delayed effective date of this Rule is January 1, 2019.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.
313.4.1.2 Fuel-burning appliances and fuel-burning fireplaces. Carbon monoxide shall be provided in Group A-2 occupancies, dwelling units, sleeping units and classrooms that contain a fuel-burning appliance or a fuel-burning fireplace.

313.4.1.3 Forced air furnaces. Carbon monoxide detection shall be provided in Group A-2 occupancies, dwelling units, sleeping units and classrooms served by a fuel-burning, forced air furnace.

313.4.1.1 Where required. Carbon monoxide detection shall be provided in Group A-2, I-1, I-2, I-4 and R occupancies and in classrooms in Group E occupancies in the locations specified in Section 313.4.2 where any of the conditions in Sections 313.4.1.2 through 313.4.1.6 exist.

313.4.4.1 Power source. Carbon monoxide alarms shall receive their primary power from the building wiring where such wiring is served from a commercial source, and when primary power is interrupted, shall receive power from a battery. Wiring shall be permanent and without a disconnecting switch other than that required for overcurrent protection.

Exceptions:
1. Where installed in buildings without commercial power, battery-powered carbon monoxide alarms shall be an acceptable alternative.
2. In A-2 occupancies the carbon monoxide detector shall be permitted to be battery-powered.

The delayed effective date of this Rule is January 1, 2020.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.
2018 NC Plumbing Code
202 GENERAL DEFINITIONS. (170613 Item B-14)

SECTION 202 GENERAL DEFINITIONS
Water service pipe. The pipe from the water main or other source of potable water supply, or from the meter when the meter is at the public right of way, to the water distribution system of the building served. The water service pipe shall terminate 5 feet (1524 mm) outside the foundation wall.

The delayed effective date of this Rule is January 1, 2019.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.
2018 NC Plumbing Code
305.4 Freezing. (190312 Item B-11)

305.4 Freezing. Water pipes installed in a wall exposed to the exterior shall be located on the heated side of the wall insulation. Water, soil, and condensate waste pipes shall not be installed outside of a building, in unconditioned attics, unconditioned utility rooms, or in any other place subjected to freezing temperatures unless adequate provision is made to protect such pipes from freezing by a minimum of R-6.5 insulation determined at 75°F (24°C) in accordance with ASTM C177 or heat or both.

Exterior water supply system piping shall be installed not less than 6 inches (152 mm) below the frost line and not less than 12 inches (305 mm) below grade.

Note: These provisions are minimum requirements, which have been found suitable for normal weather conditions. Abnormally low temperatures for extended periods may require additional provisions to prevent freezing.

The delayed effective date of this Rule is January 1, 2021.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.
306.2.4 Tracer wire. For plastic sewer piping, an insulated copper tracer wire or other approved conductor shall be installed adjacent to and over the full length of the piping. Access shall be provided to the tracer wire or the tracer wire shall terminate at the cleanout between the building drain and building sewer. The tracer wire size shall be not less than 14 AWG and the insulation type shall be listed for direct burial.

The delayed effective date of this Rule is January 1, 2021.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.
Table 403.1 MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>B</td>
<td>Buildings for the transaction of business, professional services, other services involving merchandise, office buildings, banks, light industrial and similar uses</td>
<td>1 per 25 for the first 50 and 1 per 50 for the remainder exceeding 50</td>
<td>1 per 40 for the first 80 and 1 per 80 for the remainder exceeding 80</td>
</tr>
</tbody>
</table>

q. For business occupant loads of 25 or fewer, drinking fountains shall not be required.

The delayed effective date of this Rule is January 1, 2020.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.

[Note: This Rule will also be printed in the 2018 NC Building Code, Table 2902.1 MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES.]
403.1.1 Fixture calculations. (170912 Item B-2)

403.1.1 Fixture calculations.
To determine the occupant load of each sex, the total occupant load shall be divided in half. To determine the required number of fixtures, the fixture ratio or ratios for each fixture type shall be applied to the occupant load of each sex in accordance with Table 403.1. Fractional numbers resulting from applying the fixture ratios of Table 403.1 shall be rounded up to the next whole number. For calculations involving multiple occupancies, such fractional numbers for each occupancy shall first be summed and then rounded up to the next whole number.

Exceptions:
1. The total occupant load shall not be required to be divided in half where approved statistical data indicates a distribution of the sexes of other than 50 percent of each sex.
2. In buildings that contain dwellings or sleeping units that have a pool dedicated to the residents, a percentage reduction of the total required fixtures provided for a pool and pool deck without bleachers and grandstands may be taken equal to the percentage of total residential units whose entries fall within a 500 foot horizontal travel distance of the pool deck. In multi-story structures, the residential units located not more than one story above or below the pool and pool deck may be included in the percentage. Travel from the pool to the required toilet facilities shall be on an accessible route.

The delayed effective date of this Rule is January 1, 2019.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.

(Note: Also printed in 2018 Building Code, Section 2902.1.1, Exception 2.)
2018 NC Plumbing Code
410.2 Small occupancies. (180911 Item B-20)

410.2 Small occupancies. Drinking fountains shall not be required for an occupant load of 15 or fewer.

The delayed effective date of this Rule is January 1, 2020.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.
2018 NC Plumbing Code
605.3 Water service pipe. (170613 Item B-15)

605.3 Water service pipe. Water service pipe shall conform to NSF 61 and shall conform to one of the standards listed in Table 605.3. Water service pipe or tubing, installed underground and outside of the structure, shall have a working pressure rating of not less than 160 psi (1100 kPa) at 73.4°F (23°C). Where the water pressure exceeds 160 psi (1100 kPa), piping material shall have a working pressure rating not less than the highest available pressure. Water service piping materials not third-party certified for water distribution shall terminate 5 feet (1524 mm) outside the building at or before the full-open valve located at the entrance to the structure. Ductile iron water service piping shall be cement mortar lined in accordance with AWWA C104.

The delayed effective date of this Rule is January 1, 2019.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.
SECTION 718
CURED IN PLACE PIPING (CIPP)

718.1 General. This section shall govern the replacement, rehabilitation or repair of existing building sewer piping by cured in place piping methods.

718.2 Scope. Cured in Place Piping (CIPP) installations shall conform to the requirements of ASTM F1216 and be installed per the manufacturer's installation instructions.

CHAPTER 15
REFERENCED STANDARDS

ASTM STANDARDS

F1216-09 Standard for Cured in Place Piping (CIPP)……718.1, 718.2

The delayed effective date of this Rule is January 1, 2021.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.
TABLE 912.3
WET VENT SIZE

<table>
<thead>
<tr>
<th>WET VENT PIPE SIZE (inches)</th>
<th>DRAINAGE FIXTURE UNIT LOAD (dfu)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-1/2</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>2-1/2</td>
<td>6</td>
</tr>
<tr>
<td>3</td>
<td>12</td>
</tr>
<tr>
<td>4</td>
<td>32</td>
</tr>
</tbody>
</table>
SECTION 917
SINGLE STACK VENT SYSTEM (SOVENT)

917.1 Design and installation shall be in accordance with the design criteria contained in the Copper Development Association (CDA) Handbook No. 802. Materials shall meet standards and specifications listed in Tables 702.1 and 702.4 for drain, waste and vent pipe and fittings.

917.1 Single-stack vent system permitted. A drainage stack shall serve as a single-stack vent system where sized and installed in accordance with Sections 917.2 through 917.9. The drainage stack and branch piping shall be the vents for the drainage system. The drainage stack shall have a stack vent.

917.2 Stack size. Drainage stacks shall be sized in accordance with Table 917.2. Stacks shall be uniformly sized based on the total connected drainage fixture unit load. The stack vent shall be the same size as the drainage stack. A 3-inch (76 mm) stack shall serve not more than two closets.

TABLE 917.2
SINGLE STACK SIZE

<table>
<thead>
<tr>
<th>STACK SIZE (inches)</th>
<th>MAXIMUM CONNECTED DRAINAGE Fixture UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Stacks less than 75 feet in height</td>
</tr>
<tr>
<td></td>
<td>Stacks 75 feet to less than 160 feet in height</td>
</tr>
<tr>
<td></td>
<td>Stacks 160 feet and greater in height</td>
</tr>
<tr>
<td>3</td>
<td>24</td>
</tr>
<tr>
<td>4</td>
<td>225</td>
</tr>
<tr>
<td>5</td>
<td>480</td>
</tr>
<tr>
<td>6</td>
<td>1,015</td>
</tr>
<tr>
<td>8</td>
<td>2,320</td>
</tr>
<tr>
<td>10</td>
<td>4,500</td>
</tr>
<tr>
<td>12</td>
<td>8,100</td>
</tr>
<tr>
<td>15</td>
<td>13,600</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm

917.3 Branch size. Horizontal branches connecting to a single-stack vent system shall be sized in accordance with Table 710.1(2). Not more than one water closet shall discharge into a 3-inch (76 mm) horizontal branch at a point within a developed length of 18 inches (457 mm) measured horizontally from the stack.

Where a water closet is within 18 inches (457 mm) measured horizontally from the stack and not more than one fixture with a drain size of not more than 1½ inches (38 mm) connects to a 3-inch (76 mm) horizontal branch, the branch drain connection to the stack shall be made with a sanitary tee.

917.4 Length of horizontal branches. The length of horizontal branches shall conform to the requirements of Sections 917.4.1 through 917.4.3.

917.4.1 Water closet connection. Water closet connections shall be not greater than 4 feet (1219 mm) in developed length measured horizontally from the stack.

Exception: Where the connection is made with a sanitary tee, the maximum developed length shall be 8 feet (2438 mm).

917.4.2 Fixture connections. Fixtures other than water closets shall be located not greater than 12 feet (3657 mm) in developed length, measured horizontally from the stack.
917.4.3 **Vertical piping in branch.** The length of vertical piping in a *fixture drain* connecting to a *horizontal branch* shall not be considered in computing the fixture’s distance in *developed length* measured horizontally from the *stack*.

917.5 **Minimum vertical piping size from fixture.** The vertical portion of piping in a *fixture drain* to a *horizontal branch* shall be 2 inches (51 mm). The minimum size of the vertical portion of piping for a water-supplied urinal or standpipe shall be 3 inches (76 mm). The maximum vertical drop shall be 4 feet (1219 mm). *Fixture drains* that are not increased in size or have a vertical drop in excess of 4 feet (1219 mm) shall be individually vented.

917.6 **Additional venting required.** Additional venting shall be provided where more than one water closet discharges to a *horizontal branch* where the distance from a fixture trap to the *stack* exceeds the limits in Section 917.4. Where additional venting is required, the fixture(s) shall be vented by *individual vents*, *common vents*, *wet vents*, *circuit vents*, or a combination waste and vent pipe. The *dry vent* extensions for the additional venting shall connect to a *branch vent*, *vent stack*, *stack vent*, air admittance valve, or shall terminate outdoors.

917.7 **Stack offsets.** Where *fixture drains* are not connected below a horizontal offset in a *stack*, a horizontal offset shall not be required to be vented. Where horizontal *branches* or *fixture drains* are connected below a horizontal offset in a *stack*, the offset shall be vented in accordance with Section 907. Fixture connections shall not be made to a *stack* within 2 feet (610 mm) above or below a horizontal offset.

917.8 **Prohibited lower connections.** Stacks greater than 2 *branch intervals* in height shall not receive the discharge of *horizontal branches* on the lower two floors. There shall not be connections to the *stack* between the lower two floors and a distance of not less than 10 pipe diameters downstream from the base of the single *stack vented system*.

917.9 **Sizing building drains and sewers.** The *building drain* and *building sewer* receiving the discharge of a single *stack vent* system shall be sized in accordance with Table 710.1(1).

The delayed effective date of this Rule is January 1, 2021.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.
2018 NC Plumbing Code
917.1.1 Engineered Single Stack Systems. (190910 Item B-11)

917.1.1 Engineered Single Stack Systems. Engineered single stack systems shall be listed in accordance to the standards of the specific material utilized in the system, designed by a design professional and installed in accordance with the manufacturer’s installation instructions.

The delayed effective date of this Rule is January 1, 2021.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.
SECTION R202 DEFINITIONS

FARM BUILDING. Any building not used for sleeping purposes that is not accessed by the general public and is used primarily for a farm purpose. Farm purposes includes structures or buildings for equipment, storage and processing of agricultural products or commodities such as: crops, fruits, vegetables, ornamental or flowering plants, dairy, timber, livestock, poultry and all other such forms of agricultural products by the specific farm on which the structure or building is located. Farm purposes do not include structures or buildings for uses such as education facilities, research facilities, or aircraft hangers.

The delayed effective date of this Rule is January 1, 2019.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.
Section R202
Definitions

EGRESS ROOF ACCESS WINDOW. A skylight or roof window designed and installed to satisfy the emergency escape and rescue opening requirements in Section R310.2.

LANDING PLATFORM. A landing provided as the top step of a stairway accessing a loft.

LOFT. A floor level located more than 30 inches (762 mm) above the main floor and open to it on at least one side with a ceiling height of less than 6 feet 8 inches (2032 mm), used as a living or sleeping space.

Section R305
Ceiling Height

R305.1 Minimum height. Habitable space, hallways and portions of basements containing these spaces shall have a ceiling height of not less than 7 feet (2134 mm). Bathrooms, toilet rooms and laundry rooms shall have a ceiling height of not less than 6 feet 8 inches (2032 mm).

Exceptions:
1. For rooms with sloped ceilings, the required floor area of the room shall have a ceiling height of not less than 5 feet (1524 mm) and not less than 50 percent of the required floor area shall have a ceiling height of not less than 7 feet (2134 mm).
2. The ceiling height above bathroom and toilet room fixtures shall be such that the fixture is capable of being used for its intended purpose. A shower or tub equipped with a showerhead shall have a ceiling height of not less than 6 feet 8 inches (2032 mm) above an area of not less than 30 inches (762 mm) by 30 inches (762 mm) at the showerhead.
3. Beams, girders, ducts or other obstructions in habitable space shall be permitted to project to within 6 feet 4 inches (1931 mm) of the finished floor.
4. Ceiling heights in lofts are permitted to be less than 6 feet 8 inches.

Section R310
Emergency Escape and Rescue Openings

R310.2.6 Egress roof access window. Egress roof access windows shall be deemed to meet the requirements of Section R310 where installed such that the bottom of the opening is not more than 44 inches (1118 mm) above the floor, provided the egress roof access window complies with the minimum opening area requirements of Section R310.2.1.

Section R328
Lofts

R328.1 Minimum loft area and dimensions. Lofts used as a sleeping or living space shall meet the minimum area and dimension requirements of Sections R328.1.1 through R328.1.4.

R328.1.1 Minimum area. Lofts shall have floor area of not less than 35 square feet (3.25 m²).

R328.1.2 Maximum area. Lofts shall have a floor area not greater than 70 square feet (6.50 m²).

R328.1.3 Minimum dimensions. Lofts shall not be less than 5 feet (1524 mm) in any horizontal dimension.

R328.1.4 Height effect on loft area. Portions of a loft with a sloping ceiling measuring less than 3 feet (914 mm) from the finished floor to the finished ceiling shall not be considered as contributing to the minimum required area for the loft.
**Exception:** Under gable roofs with a minimum slope of 6 units vertical in 12 units horizontal (50-percent slope) portions of a loft with a sloped ceiling measuring less than 16 inches (406 mm) from the finished floor to the finished ceiling shall not be considered as contributing to the minimum required area for the loft.

**R328.2 Loft access.** The access to and primary egress from lofts shall be any type described in Sections R328.2.1 through R328.2.4.

**R328.2.1 Stairways.** Stairways accessing lofts shall comply with this code or with Sections R328.2.1.1 through R328.2.1.5.

**R328.2.1.1 Width.** Stairways accessing a loft shall not be less than 17 inches (432 mm) in clear width at or above the handrail. The minimum below the handrail shall be not less than 20 inches (508 mm).

**R328.2.1.2 Headroom.** The headroom in stairways accessing a loft shall be not less than 6 feet 2 inches (1880 mm), as measured vertically, from a sloped line connecting the tread or landing platform nosings in the middle of their width.

**R328.2.1.3 Treads and Risers.** Risers for stairs accessing a loft shall be not less than 7 inches (178 mm) and not more than 12 inches (305 mm) in height. Tread depth and riser height shall be calculated in accordance with one of the following formulas:
1. The tread depth shall be 20 inches (508 mm) minus 4/3 of the riser height; or
2. The riser height shall be 15 inches (381 mm) minus ¾ of the tread depth.

**R328.2.1.4 Landing platforms.** The top tread and riser of stairways accessing lofts shall be constructed as a landing platform where the loft ceiling height is less than 6 feet 2 inches (1880 mm) where the stairway meets the loft. The landing platform shall be 18 inches to 22 inches (457 to 559 mm) in depth measured from the nosing of the landing platform to the edge of the loft, and 16 to 18 inches (406 to 457 mm) in height measured from the landing platform to the loft floor.

**R328.2.1.5 Handrails.** Handrails shall comply with Section R311.7.8.

**R328.2.1.6 Stairway guards.** Guards at open sides of stairways shall comply with Section R312.1.

**R328.2.2 Ladders.** Ladders accessing lofts shall comply with Sections R328.2.2.1 and R328.2.2.2.

**R328.2.2.1 Size and capacity.** Ladders accessing lofts shall have a rung width of not less than 12 inches (305 mm) and 10 inches (254 mm) to 14 inches (356 mm) spacing between rungs. Ladders shall be capable of supporting a 200 pound (75 kg) load on any rung. Rung spacing shall be uniform within 3/8-inch (9.5 mm).

**R328.2.2.2 Incline.** Ladders shall be installed at 70 to 80 degrees from horizontal.

**R328.2.4 Ships ladders.** Ships ladders accessing lofts shall comply with Sections R311.7.12.1 and R311.7.12.2. The clear width at and below handrails shall be not less than 20 inches (508 mm).

**R328.2.5 Loft Guards.** Loft guards shall be located along the open side of lofts. Loft guards shall not be less than 36 inches (914 mm) in height or one-half of the clear height to the ceiling, whichever is less.

The delayed effective date of this Rule is January 1, 2020.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.
R311.7.8.1 Height. Handrail height, measured vertically from the sloped plane adjoining the tread nosing, or finish surface of ramp slope, shall be not less than 34 inches (864 mm) and not more than 38 inches (965 mm).

Exceptions:

1. The use of a volute, turnout, or starting easing or starting newel shall be allowed over the lowest tread.
2. When handrail fittings or bendings are used to provide continuous transition between flights, the transition from handrail to guard, or used at the start of a flight, the handrail height at the fittings or bendings shall be permitted to exceed the maximum height.

The delayed effective date of this Rule is January 1, 2021.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.
Exceptions:

1. Walls 24 inches (610 mm) total length or shorter connecting offset braced wall panels shall be anchored to the foundation with a minimum of one anchor bolt located in the center third of the plate section and shall be attached to adjacent braced wall panels at corners as shown in Table R602.3(1) and Figure R602.10.3(5).

2. Connection of walls 12 inches (305 mm) total length or shorter connecting offset braced wall panels to the foundation without anchor bolts shall be permitted. The wall shall be attached to adjacent braced wall panels at corners as shown in Table R602.3(1) and Figure R602.10.3(5).

The delayed effective date of this Rule is January 1, 2021.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.
2018 NC Residential Code

**ERRATA** – moved superscript “b” adjacent to “southern pine”

**TABLE R602.7(1)**

**GIRDER SPANS\(^a\) AND HEADER SPANS\(^a\) FOR EXTERIOR BEARING WALLS**

(Maximum spans for Douglas fir-larch, hem-fir, **southern pine\(^b\)** and spruce-pine-fir and required number of jack studs)

b. No. 1 or better grade lumber shall be used for southern pine. Other Tabulated values assume #2 grade lumber.

**TABLE R602.7(2)**

**GIRDER SPANS\(^a\) AND HEADER SPANS\(^a\) FOR INTERIOR BEARING WALLS**

(Maximum spans for Douglas fir-larch, hem-fir, **southern pine\(^b\)** and spruce-pine-fir and required number of jack studs)

b. No. 1 or better grade lumber shall be used for southern pine. Other Tabulated values assume #2 grade lumber.

2018 NC Residential Code

**ERRATA** – added highlighted figures to Tables R602.7(1) and R602.7(2) on pages 127-129.
### Table R602.7(11)

**Girder Spans and Header Spans for Exterior Bearing Walls**

(Maximum spans for Douglas fir-larch, hem-fir, southern pine and spruce-pine-fir and required number of jack studs)

<table>
<thead>
<tr>
<th>Girder and_HEADER Supporting_SIZE</th>
<th>20</th>
<th>28</th>
<th>30</th>
<th>36</th>
<th>40</th>
<th>50</th>
<th>70</th>
</tr>
</thead>
<tbody>
<tr>
<td>Span (in)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-2 x 8</td>
<td>4-6</td>
<td>3-10</td>
<td>3-5</td>
<td>3-0</td>
<td>3-2</td>
<td>2-10</td>
<td>2</td>
</tr>
<tr>
<td>1-2 x 10</td>
<td>5-6</td>
<td>4-11</td>
<td>4-4</td>
<td>4-0</td>
<td>4-2</td>
<td>2-11</td>
<td>2</td>
</tr>
<tr>
<td>1-2 x 15</td>
<td>6-11</td>
<td>5-11</td>
<td>5-4</td>
<td>5-0</td>
<td>4-4</td>
<td>2-11</td>
<td>2</td>
</tr>
<tr>
<td>1-2 x 18</td>
<td>7-11</td>
<td>6-11</td>
<td>6-4</td>
<td>6-0</td>
<td>5-4</td>
<td>2-11</td>
<td>2</td>
</tr>
<tr>
<td>1-2 x 20</td>
<td>8-11</td>
<td>7-11</td>
<td>7-4</td>
<td>7-0</td>
<td>6-4</td>
<td>2-11</td>
<td>2</td>
</tr>
<tr>
<td>1-2 x 22</td>
<td>9-11</td>
<td>8-11</td>
<td>8-4</td>
<td>8-0</td>
<td>7-4</td>
<td>2-11</td>
<td>2</td>
</tr>
<tr>
<td>1-2 x 24</td>
<td>10-11</td>
<td>9-11</td>
<td>9-4</td>
<td>9-0</td>
<td>8-4</td>
<td>2-11</td>
<td>2</td>
</tr>
<tr>
<td>1-2 x 26</td>
<td>11-11</td>
<td>10-11</td>
<td>10-4</td>
<td>10-0</td>
<td>9-4</td>
<td>2-11</td>
<td>2</td>
</tr>
<tr>
<td>1-2 x 28</td>
<td>12-11</td>
<td>11-11</td>
<td>11-4</td>
<td>11-0</td>
<td>10-4</td>
<td>2-11</td>
<td>2</td>
</tr>
<tr>
<td>1-2 x 30</td>
<td>13-11</td>
<td>12-11</td>
<td>12-4</td>
<td>12-0</td>
<td>11-4</td>
<td>2-11</td>
<td>2</td>
</tr>
<tr>
<td>1-2 x 32</td>
<td>14-11</td>
<td>13-11</td>
<td>13-4</td>
<td>13-0</td>
<td>12-4</td>
<td>2-11</td>
<td>2</td>
</tr>
<tr>
<td>1-2 x 34</td>
<td>15-11</td>
<td>14-11</td>
<td>14-4</td>
<td>14-0</td>
<td>13-4</td>
<td>2-11</td>
<td>2</td>
</tr>
<tr>
<td>1-2 x 36</td>
<td>16-11</td>
<td>15-11</td>
<td>15-4</td>
<td>15-0</td>
<td>14-4</td>
<td>2-11</td>
<td>2</td>
</tr>
</tbody>
</table>

**Roof and ceiling**

| Span (in)                         |    |    |    |    |    |    |    |
| 1-2 x 8                           | 4-6| 3-10| 3-5| 3-0| 3-2| 2-10| 2 |
| 1-2 x 10                          | 5-6| 4-11| 4-4| 4-0| 4-2| 2-11| 2 |
| 1-2 x 15                          | 6-11| 5-11| 5-4| 5-0| 4-4| 2-11| 2 |
| 1-2 x 18                          | 7-11| 6-11| 6-4| 6-0| 5-4| 2-11| 2 |
| 1-2 x 20                          | 8-11| 7-11| 7-4| 7-0| 6-4| 2-11| 2 |
| 1-2 x 22                          | 9-11| 8-11| 8-4| 8-0| 7-4| 2-11| 2 |
| 1-2 x 24                          | 10-11| 9-11| 9-4| 9-0| 8-4| 2-11| 2 |
| 1-2 x 26                          | 11-11| 10-11| 10-4| 10-0| 9-4| 2-11| 2 |
| 1-2 x 28                          | 12-11| 11-11| 11-4| 11-0| 10-4| 2-11| 2 |
| 1-2 x 30                          | 13-11| 12-11| 12-4| 12-0| 11-4| 2-11| 2 |
| 1-2 x 32                          | 14-11| 13-11| 13-4| 13-0| 12-4| 2-11| 2 |
| 1-2 x 34                          | 15-11| 14-11| 14-4| 14-0| 13-4| 2-11| 2 |
| 1-2 x 36                          | 16-11| 15-11| 15-4| 15-0| 14-4| 2-11| 2 |

**Roof, ceiling and one counter bearing floor**

| Span (in)                         |    |    |    |    |    |    |    |
| 1-2 x 8                           | 4-6| 3-10| 3-5| 3-0| 3-2| 2-10| 2 |
| 1-2 x 10                          | 5-6| 4-11| 4-4| 4-0| 4-2| 2-11| 2 |
| 1-2 x 15                          | 6-11| 5-11| 5-4| 5-0| 4-4| 2-11| 2 |
| 1-2 x 18                          | 7-11| 6-11| 6-4| 6-0| 5-4| 2-11| 2 |
| 1-2 x 20                          | 8-11| 7-11| 7-4| 7-0| 6-4| 2-11| 2 |
| 1-2 x 22                          | 9-11| 8-11| 8-4| 8-0| 7-4| 2-11| 2 |
| 1-2 x 24                          | 10-11| 9-11| 9-4| 9-0| 8-4| 2-11| 2 |
| 1-2 x 26                          | 11-11| 10-11| 10-4| 10-0| 9-4| 2-11| 2 |
| 1-2 x 28                          | 12-11| 11-11| 11-4| 11-0| 10-4| 2-11| 2 |
| 1-2 x 30                          | 13-11| 12-11| 12-4| 12-0| 11-4| 2-11| 2 |
| 1-2 x 32                          | 14-11| 13-11| 13-4| 13-0| 12-4| 2-11| 2 |
| 1-2 x 34                          | 15-11| 14-11| 14-4| 14-0| 13-4| 2-11| 2 |
| 1-2 x 36                          | 16-11| 15-11| 15-4| 15-0| 14-4| 2-11| 2 |

(continued)
### TABLE R602.7(1)—continued

**GIRDERS AND HEADERS SUPPORTING WALLS FOR EXTERIOR BEARING WALLS**

(Maximum spans for Douglas fir-larch, hem-fir, southern pine and spruce-pine-fir and required number of jack studs)

<table>
<thead>
<tr>
<th>SIZE</th>
<th>GROUND SNOW LOAD (psf)*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Span</td>
</tr>
<tr>
<td>2.2 x 4</td>
<td>2.2</td>
</tr>
<tr>
<td>2.5 x 4</td>
<td>2.5</td>
</tr>
<tr>
<td>2.2 x 8</td>
<td>2.2</td>
</tr>
<tr>
<td>2.5 x 8</td>
<td>2.5</td>
</tr>
<tr>
<td>3.2 x 10</td>
<td>3.2</td>
</tr>
<tr>
<td>3.8 x 10</td>
<td>3.8</td>
</tr>
<tr>
<td>5.1 x 10</td>
<td>5.1</td>
</tr>
<tr>
<td>6.1 x 10</td>
<td>6.1</td>
</tr>
<tr>
<td>6.1 x 12</td>
<td>6.1</td>
</tr>
</tbody>
</table>

*Span = Spans in feet, Nj,F = Number of jack studs required for each end.

For 1 inch = 25.4 mm, 1 pound per square foot = 0.0479 kPa.

- a. Spans are given in feet and inches.
- b. See No. 1 or better grade lumber shall be used for southern pine. Other labeled values assume #2 grade lumber.
- c. Building width is measured perpendicular to the ridge. For widths between those shown, spans are permitted to be interpolated.
- d. Nj = Number of jack studs required to support each end. Where the number of required jack studs equals one, the header is permitted to be supported by an approved framing anchor attached to the full-height wall stud and to the header.
- e. Use 30 psf ground snow load for cases in which ground snow load is less than 30 psf and the roof live load is equal to or less than 20 psf.

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2018 NORTH CAROLINA RESIDENTIAL CODE

May 22, 2020
### WALL CONSTRUCTION

#### TABLE R602.7(2)
GIRDER SPANS* AND HEADER SPANS for INTERIOR BEARING WALLS
(Maximum spans for Douglas fir-larch, hem-fir, southern pine and spruce-pine-fir* and required number of jack studs)

<table>
<thead>
<tr>
<th>HEADERS AND GIRDER SPANS SUPPORTING</th>
<th>SIZE</th>
<th>20</th>
<th>28</th>
<th>35</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>20</td>
<td>28</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Span</td>
<td>Span</td>
<td>Span</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NJ²</td>
<td>NJ⁴</td>
<td>NJ⁴</td>
</tr>
<tr>
<td>One floor only</td>
<td>2-2 x 4</td>
<td>3-3</td>
<td>1</td>
<td>2.8</td>
</tr>
<tr>
<td></td>
<td>2-2 x 6</td>
<td>4-8</td>
<td>1</td>
<td>3-11</td>
</tr>
<tr>
<td></td>
<td>2-2 x 8</td>
<td>5-9</td>
<td>1</td>
<td>5-0</td>
</tr>
<tr>
<td></td>
<td>2-2 x 10</td>
<td>7-0</td>
<td>2</td>
<td>6-1</td>
</tr>
<tr>
<td></td>
<td>2-2 x 12</td>
<td>8-1</td>
<td>2</td>
<td>7-0</td>
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<tr>
<td></td>
<td>3-3 x 10</td>
<td>7-2</td>
<td>1</td>
<td>6-3</td>
</tr>
<tr>
<td></td>
<td>3-3 x 12</td>
<td>8-4</td>
<td>1</td>
<td>7-7</td>
</tr>
<tr>
<td></td>
<td>4-4 x 12</td>
<td>10-2</td>
<td>2</td>
<td>8-10</td>
</tr>
<tr>
<td></td>
<td>4-4 x 10</td>
<td>9-8</td>
<td>1</td>
<td>7-8</td>
</tr>
<tr>
<td></td>
<td>4-4 x 10</td>
<td>10-2</td>
<td>1</td>
<td>8-9</td>
</tr>
<tr>
<td>Two floors</td>
<td>2-2 x 4</td>
<td>3-2</td>
<td>1</td>
<td>1-10</td>
</tr>
<tr>
<td></td>
<td>2-2 x 6</td>
<td>3-2</td>
<td>2</td>
<td>2-9</td>
</tr>
<tr>
<td></td>
<td>2-2 x 8</td>
<td>4-1</td>
<td>2</td>
<td>3-6</td>
</tr>
<tr>
<td></td>
<td>2-2 x 10</td>
<td>4-11</td>
<td>2</td>
<td>4-3</td>
</tr>
<tr>
<td></td>
<td>2-2 x 12</td>
<td>5-9</td>
<td>2</td>
<td>5-0</td>
</tr>
<tr>
<td></td>
<td>3-3 x 8</td>
<td>5-1</td>
<td>2</td>
<td>6-5</td>
</tr>
<tr>
<td></td>
<td>3-3 x 10</td>
<td>8-2</td>
<td>2</td>
<td>8-3</td>
</tr>
<tr>
<td></td>
<td>3-3 x 12</td>
<td>5-1</td>
<td>2</td>
<td>8-3</td>
</tr>
<tr>
<td></td>
<td>4-4 x 8</td>
<td>5-1</td>
<td>1</td>
<td>5-2</td>
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<tr>
<td></td>
<td>4-4 x 10</td>
<td>7-2</td>
<td>2</td>
<td>6-2</td>
</tr>
<tr>
<td></td>
<td>4-4 x 12</td>
<td>6-4</td>
<td>2</td>
<td>7-2</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

- **a.** Spans are given in feet and inches.
- **b.** No. 1 or better grade lumber shall be used for southern pine. Other tabulated values assume No. 2 grade lumber.
- **c.** Building width is measured perpendicular to the ridge. For widths between those shown, spans are permitted to be interpolated.
- **d.** NJ = Number of jack studs required to support each end. Where the number of required jack studs equals one, the header is permitted to be supported by an approved framing anchor attached to the full-height wall stud and to the header.

#### TABLE R602.7(3)
GIRDER AND HEADER SPANS for OPEN PORCHES
(Maximum span for Douglas fir-larch, hem-fir, southern pine and spruce-pine-fir*)

<table>
<thead>
<tr>
<th>SIZE</th>
<th>50</th>
<th>50</th>
<th>70</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>8</td>
<td>14</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>DEPTH OF PORCH (ft)</td>
<td>SUPPORTING FLOOR</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>14</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>10-1</td>
<td>7-7</td>
<td>8-3</td>
<td>6-2</td>
</tr>
<tr>
<td>12-4</td>
<td>9-4</td>
<td>10-1</td>
<td>7-7</td>
</tr>
<tr>
<td>14-1</td>
<td>10-1</td>
<td>11-8</td>
<td>8-10</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa.

- **a.** Spans are given in feet and inches.
- **b.** Tabulated values assume No. 2 grade lumber, wet service and inclining for refractory species. Use 30 psf ground snow load for cases in which ground snow load is less than 30 psf and the roof live load is equal to or less than 20 psf.
- **c.** Porch depth is measured horizontally from building face to centerline of the header. For depths between those shown, spans are permitted to be interpolated.
R703.8.2.1 Support by steel angle. A minimum 6-inch by 4-inch by \(\frac{5}{16}\)-inch (152 mm by 102 mm by 8 mm) steel angle, with the long leg placed vertically, shall be anchored to double 2-inch by 4-inch (51 mm by 102 mm) wood studs at a maximum on-center spacing of 16 inches (406 mm) or shall be anchored to solid double 2x blocking firmly attached between single 2-inch by 4-inch (51 mm by 102 mm) wood studs at a maximum on center spacing of 16 inches (406 mm). Anchorage of the steel angle at every double stud spacing shall be not less than two \(\frac{7}{16}\)-inch-diameter (11 mm) by 4-inch (102 mm) lag screws for wood construction. The steel angle shall have a minimum clearance to underlying construction of \(\frac{1}{16}\) inch (1.6 mm). Not less than two-thirds the width of the masonry veneer thickness shall bear on the steel angle. Flashing and weep holes shall be located in the masonry veneer in accordance with Figure R703.8.2.1. The maximum height of masonry veneer above the steel angle support shall be 12 feet 8 inches (3861 mm). The airspace separating the masonry veneer from the wood backing shall be in accordance with Sections R703.8.4 and R703.8.4.2. The method of support for the masonry veneer on wood construction shall be constructed in accordance with Figure R703.8.2.1.

The maximum slope of the roof construction without stops shall be 7:12. Roof construction with slopes greater than 7:12 but not more than 12:12 shall have stops of a minimum 3-inch by 3-inch by \(\frac{1}{4}\)-inch (76 mm by 76 mm by 6.4 mm) steel plate welded to the angle at 24 inches (610 mm) on center along the angle or as approved by the building official.

The delayed effective date of this Rule is January 1, 2021.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.
N1101.1 Scope. (180911 Item B-17)

This chapter regulates the energy efficiency for the design and construction of buildings regulated by this code.

**Exception:**
1. In accordance with N.C.G.S. 143-138 (b19), no energy conservation code provisions shall apply to detached and attached garages located on the same lot as a dwelling.

The delayed effective date of this Rule is January 1, 2020.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.
2018 NC Residential Code
N1102.1.2, N1102.1.4, R&U-Value Tables. (170613 Item B-13)

The Agency withdrew this item due to RRC February 15, 2018 objection. The Statutory authority for Rule-making is G. S. 143-136; 143-138.
SECTION N1106
ENERGY RATING INDEX COMPLIANCE ALTERNATIVE

N1106.1 Scope. This section establishes criteria for compliance using an Energy Rating Index (ERI) analysis.

N1106.2 Mandatory requirements. Compliance with this section requires that the mandatory provisions identified in Sections N1101.2 through N1104 labeled as “mandatory” and Section N1103.5.3 be met. The building thermal envelope shall be greater than or equal to levels of efficiency and Solar Heat Gain Coefficient in Table 1102.1.1 or 1102.1.3 of the 2009 International Energy Conservation Code. Minimum standards associated with compliance shall be the ANSI RESNET ICC Standard 301-2014 “Standard for the Calculation and Labeling of the Energy Performance of Low-Rise Residential Buildings using an Energy Rating Index.” A North Carolina licensed design professional or certified HERS rater is required to perform the analysis if required by North Carolina licensure laws.

Exception: Supply and return ducts not completely inside the building thermal envelope shall be insulated to a minimum of R-6. Supply and return ducts in unconditioned space and outdoors shall be insulated to a minimum R-8. Supply ducts inside semi-conditioned space shall be insulated to a minimum R-4; return ducts inside conditioned and semi-conditioned space are not required to be insulated. Ducts located inside conditioned space are not required to be insulated other than as may be necessary for preventing the formation of condensation on the exterior of cooling ducts.

N1106.5 Verification by approved agency. Verification of compliance with Section N1106 shall be performed by the licensed design professional or certified HERS rater and the compliance documentation shall be provided to the code official. The code official shall inspect according to the requirements of Section N1106.6.2 completed by an approved third party.

The delayed effective date of this Rule is January 1, 2019.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.

(Note: All other strikethroughs/underlines are part of the 2018 Code adoption package.)
(Note: certified HERS rater = RESNET Certified Home Energy Rater)
2018 NC Residential Code
ERRATA – remove “or pan” from P2503.6 heading as shown below

P2503.6 Shower liner test. (no change to the section requirements)

2018 NC Residential Code – page 503
ERRATA – change Section reference to P2906.4.1

P3002.1 (703.1) Building sewer pipe near the water service. The proximity of a building sewer to a water service shall comply with Section P2906.4.1.

2018 NC Residential Code – page 515
ERRATA – change Section reference to P3110

P3101.2.1 (901.2.1) Venting required. Every trap and trapped fixture shall be vented in accordance with one of the venting methods specified in this chapter. All fixtures discharging downstream from a water closet shall be individually vented except as provided in Section P3110.

2018 NC Residential Code – page 517
ERRATA – change Section references to P3104.2 and P3102.5

P3109.3 (913.3) Stack vent. A stack vent shall be installed for the waste stack. The size of the stack vent shall be not less than the size of the waste stack. Offsets shall be permitted in the stack vent and shall be located not less than 6 inches (152 mm) above the flood level of the highest fixture and shall be in accordance with Section P3104.2. The stack vent shall be permitted to connect with other stack vents and vent stacks in accordance with Section P3102.5.

2018 NC Residential Code – page 521
ERRATA – change Section reference to P2706.1.2 in Exception #3.

P3201.6 (1002.1) Number of fixtures per trap.
Exceptions:
3. Connection of a laundry tray waste line into a standpipe for the automatic clothes-washer drain shall be permitted in accordance with Section P2706.1.2.
ERRATA – Section P2708.2 (417.3) requires 2” minimum trap as shown below.

**TABLE P3201.7**

<table>
<thead>
<tr>
<th>PLUMBING FIXTURE</th>
<th>TRAP SIZE MINIMUM (inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bathtub (with or without shower head and/or whirlpool attachments)</td>
<td>1 1/2</td>
</tr>
<tr>
<td>Bidet</td>
<td>1 1/4</td>
</tr>
<tr>
<td>Clothes washer standpipe</td>
<td>2</td>
</tr>
<tr>
<td>Dishwasher (on separate trap)</td>
<td>1 1/2</td>
</tr>
<tr>
<td>Floor drain</td>
<td>2</td>
</tr>
<tr>
<td>Kitchen sink (one or two traps, with or without dishwasher and food waste disposer)</td>
<td>1 1/2</td>
</tr>
<tr>
<td>Laundry tub (one or more compartments)</td>
<td>1 1/2</td>
</tr>
<tr>
<td>Lavatory</td>
<td>1 1/4</td>
</tr>
<tr>
<td><strong>Shower (based on the total flow rate through showerheads and bodysprays)</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Flow rate:</strong></td>
<td></td>
</tr>
<tr>
<td>5.7 gpm and less</td>
<td>2</td>
</tr>
<tr>
<td>More than 5.7 gpm up to 12.3 gpm</td>
<td>3</td>
</tr>
<tr>
<td>More than 12.3 gpm up to 25.8 gpm</td>
<td>4</td>
</tr>
<tr>
<td>More than 25.8 gpm up to 55.6 gpm</td>
<td></td>
</tr>
</tbody>
</table>
P2603.5 Freezing. Water pipes installed in a wall exposed to the exterior shall be located on the heated side of the wall insulation. In other cases, water, soil and condensate waste pipes shall not be installed outside of a building, in unconditioned attics, unconditioned utility rooms or in any other place subjected to freezing temperatures unless adequate provision is made to protect such pipes from freezing by a minimum of R-6.5 insulation determined at 75°F (24°C) in accordance with ASTM C177 or heat or both.

Exterior water supply system piping shall be installed not less than 6 inches (152 mm) below the frost line and not less than 12 inches (305 mm) below grade.

Note: These provisions are minimum requirements, which have been found suitable for normal weather conditions. Abnormally low temperatures for extended periods may require additional provisions to prevent freezing.

The delayed effective date of this Rule is January 1, 2021.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.
2018 NC Residential Code
P2604.1.4 Tracer wire. (190312 Item B-20)

**P2604.1.4 Tracer wire.** For plastic sewer piping, an insulated copper tracer wire or other approved conductor shall be installed adjacent to and over the full length of the piping. Access shall be provided to the tracer wire or the tracer wire shall terminate at the cleanout between the building drain and building sewer. The tracer wire shall be not less than 14 AWG and the insulation type shall be listed for direct burial.

The delayed effective date of this Rule is January 1, 2021.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.
R4603.6 Tying and bracing of wood piles.

Beams and girders shall fully bear on pilings and butt joints shall occur over pilings. If sills, beams or girders are shall be attached to the piling a minimum of two 5/8-inch (16 mm) galvanized steel bolts per beam member shall be through bolted using either bolts or screws at each piling connection in accordance with Table R4603.6 and Figure R4503.6(a) R4603.6(a). When the piling is notched so that the cross-section is reduced below 50 percent or the girder is top bearing, sills, beams or girders shall be attached using 3/16 × 4 × 18-inch (5 × 102 × 467 mm) hot dip galvanized straps, one each side, bolted with two 5/8 inch (15.9 mm) galvanized through bolts fastened top and bottom with either bolts or screws in accordance with Table R4603.6 and Figure R4603.6(b) and Figure R4503.6(d) R4603.6(c). Where butt joints occur over the piling and screws are used, there shall be two straps on each side of the piling, having a minimum size of 3/16 × 2 × 18 inches (5 × 51 × 467 mm), with four self-drilling screws as described below in each end.

Table R4603.6 Minimum Fastening of Beams and Girders to Pilings

<table>
<thead>
<tr>
<th>Amount Piling is Notched</th>
<th>Beam/Girder Continuous</th>
<th>Beam/Girder Butt Joint</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Bolts</td>
<td>Screws</td>
</tr>
<tr>
<td>≤ 50%</td>
<td>two 5/8” bolts²</td>
<td>four screws³</td>
</tr>
<tr>
<td>&gt; 50%¹</td>
<td>two 5/8” bolts²</td>
<td>four screws³</td>
</tr>
</tbody>
</table>

1. Where piling is notched over 50%, use strap as required in Section 4603.6. Install the specified number of bolts or screws in each end of the strap.
2. Bolts shall be 5/8” diameter hot dipped galvanized through bolts with nuts and washers.
3. Screws shall be 0.270” (6.9 mm) minimum in diameter, hot dipped galvanized to a minimum of A153, Class C, and having a minimum length of 4”, and also shall be long enough to penetrate at least one inch through the remaining pile and into the girder.

R4603.6.1 Tying at corners. At corners, girders shall be connected to the pile with a minimum 3/16 × 4 × 18-inch (5 × 102 × 467 mm) hot dip galvanized strap bolted with two 5/8 inch (15.9 mm) galvanized through bolts on the exterior and a minimum L4 × 3/16 × 1'-6" (102 × 5 × 467 mm) galvanized steel angle bolted with two 5/8 inch (15.9 mm) galvanized through bolts on the interior in accordance with Figure R4603.6(d).

R4603.6.2 Bracing of Pilings. Bracing of pile foundations is required where the clear height from ground to sill, beam or girder exceeds 10 feet (3048 mm) or the dwelling is more than one story above piles. A line of X-bracing is defined as a row of piles with X-bracing provided in at least two bays. A line of X-bracing shall be provided at all exterior pile lines. Where the perimeter lines of X-bracing exceed 40 feet (12 192 mm), an additional line of X-bracing shall be provided near the center of the building. See Figure R4603.6(e). X-bracing shall be with 2 × 10s through bolted with two 3/4-inch (19.1 mm) bolts at each end. The code official is permitted to accept alternate bracing designs if they bear the seal of a registered design professional.

May 22, 2020
Revise Figures as follows:

![Figure R4603.6(b)](image1)

**FIGURE R4603.6(b)**
**TOP MOUNTED GIRDER**

![Figure R4603.6(c)](image2)

**FIGURE R4603.6(c)**
**PILING NOTCHED MORE THAN 50%**

The delayed effective date of this Rule is January 1, 2020.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.
AM105.1 General.
Girders shall bear directly on the support post with the post attached at top to prevent lateral displacement or be connected to the side of the post with two 5/8 inch (16 mm) hot dip galvanized bolts with nut and washer with one of the methods shown in Table AM105.1. Girder support is permitted to be installed in accordance with Figure AM105.1(1) for top mount; Figure AM105.1(2) for side mount and Figure AM105.1(3) for split girders. See Figure AM105.1(4) for cantilevered girders.

Table AM105.1  Girder Connection to Side of Post

<table>
<thead>
<tr>
<th>Maximum Girder Thickness</th>
<th>3” (Double 2X)</th>
<th>1-1/2” (Single 2X)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any</td>
<td>Four 6” long screws&lt;sup&gt;2&lt;/sup&gt;</td>
<td>Three 4” long screws&lt;sup&gt;2&lt;/sup&gt;</td>
</tr>
<tr>
<td>Two 5/8” diameter bolts&lt;sup&gt;1&lt;/sup&gt;</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Bolts shall be hot dip galvanized through bolts with nut and washer

2. Screws shall be hot dipped galvanized self-drilling screw fastener having a minimum diameter of 0.270”, staggered so that the screws are not in a line, and having a minimum edge distance of 1-1/2 inches.

The delayed effective date of this Rule is January 1, 2020.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.
AM109.1 Deck bracing.
Decks shall be braced to provide lateral stability. Lateral stability shall be provided in accordance with one of the methods in Sections AM109.1.1 through AM109.1.5.

AM109.1.1. Lateral bracing not required.
When the deck floor height is less than 4 feet (1219 mm) above finished grade as shown in Figure AM109.1(1) and the deck is attached to the structure in accordance with Section AM104, lateral bracing is not required. Lateral bracing is not required for freestanding decks with a deck floor height 30 inches (762 mm) or less above finished grade.

AM109.1.2. Knee bracing.
4x4 wood knee braces are permitted to be provided on each column in both directions for freestanding decks or parallel to the structure at the exterior column line for attached decks per Figure AM109.1(2). The knee braces shall attach to each post at a point not less than 1/3 of the post length from the top of the post, and the braces shall be angled between 45 degrees (0.79 rad) and 60 degrees (1.05 rad) from the horizontal. Knee braces shall be bolted fastened to the post and the girder/double band in accordance with one 5/8 inch (16 mm) hot dip galvanized bolt with nut and washer at both ends of the brace of the methods shown in Table AM109.1, as shown in Figure AM109.1(2).

<table>
<thead>
<tr>
<th>Fastener</th>
<th>Installation</th>
<th>Minimum Distances</th>
</tr>
</thead>
<tbody>
<tr>
<td>One 5/8” diameter hot dipped galvanized through bolt with nut and washer</td>
<td>Perpendicular to post or girder/band</td>
<td>2-3/16” end distance</td>
</tr>
<tr>
<td>Two hot dipped galvanized (ASTM A153, Class C, minimum) screws having minimum diameter of 0.270” and long enough to achieve 3” penetration into the post or girder/band</td>
<td>Perpendicular to post or girder/band</td>
<td>1” edge distance, 1-1/2” horizontal spacing, minimum 3” end distance</td>
</tr>
</tbody>
</table>

AM109.1.3. Post embedment.
For free standing decks without knee braces or diagonal bracing, lateral stability is permitted to be provided by embedding the post in accordance with Figure AM109.1(3) and Table AM109.2.

<table>
<thead>
<tr>
<th>POST SIZE</th>
<th>MAXIMUM TRIBUTARY AREA</th>
<th>MAXIMUM POST HEIGHT</th>
<th>EMBEDMENT DEPTH</th>
<th>CONCRETE DIAMETER</th>
</tr>
</thead>
<tbody>
<tr>
<td>4” x 4”</td>
<td>48 SF</td>
<td>4’-0”</td>
<td>2’-6”</td>
<td>1’-0”</td>
</tr>
<tr>
<td>6” x 6”</td>
<td>120 SF</td>
<td>6’-0”</td>
<td>3’-6”</td>
<td>1’-8”</td>
</tr>
</tbody>
</table>

2x6 diagonal vertical cross bracing is permitted to be provided in two perpendicular directions for free standing decks or parallel to the structure at the exterior column line for attached decks. The 2x6 bracing shall be attached to the posts with one 5/8 inch (16 mm) hot dip galvanized bolt with nut and washer at each end of each bracing member per Figure AM109.1(4).
AM109.1.5. Piles in coastal regions.
For embedment of piles in coastal regions, see Chapter 46.

The delayed effective date of this Rule is January 1, 2020.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.
AM109.1.4 Cross bracing.

2x6 diagonal vertical cross bracing is permitted to be provided in two perpendicular directions for free standing decks or parallel to the structure at the exterior column line for attached decks. The 2x6 bracing shall be attached to the posts with one of the methods in Table AM109.1.4. 5/8-inch (16 mm) hot dip galvanized bolt with nut and washer at each end of each bracing member in accordance with Figure AM109.1(4).

Table AM109.1.4
FASTENING OF BRACE (CHOOSE ONE)

<table>
<thead>
<tr>
<th>Fastener Type</th>
<th>Diameter (inches)</th>
<th>QTY</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bolt</td>
<td>5/8&quot;a</td>
<td>1</td>
<td>As required</td>
</tr>
<tr>
<td>Screws</td>
<td>0.27&quot;b</td>
<td>2</td>
<td>Long enough to achieve a 1 1/2&quot; thread penetration of structural member opposite head of screw</td>
</tr>
</tbody>
</table>

a. Bolts shall be hot dip galvanized through bolts with nut and washer

b. Screws shall be hot dip galvanized (ASTM A153, Class C, minimum) self drilling screw fastener having a minimum diameter of 0.27", and installed in the center of the post with a minimum of 1” space between screws.

The delayed effective date of this Rule is January 1, 2021.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.