

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)

(Note: some amendments may indicate earlier effective dates)

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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.

2017 NC Electrical Code

320.23(A) Cables Run Across the Top of Floor Joists. (171212 Item B-1)

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.~~

(A) Cables Run Across the Top of Floor Joists. The cable shall be protected by guard strips that are at least as high as the cable where one of the following applies:

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.

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.

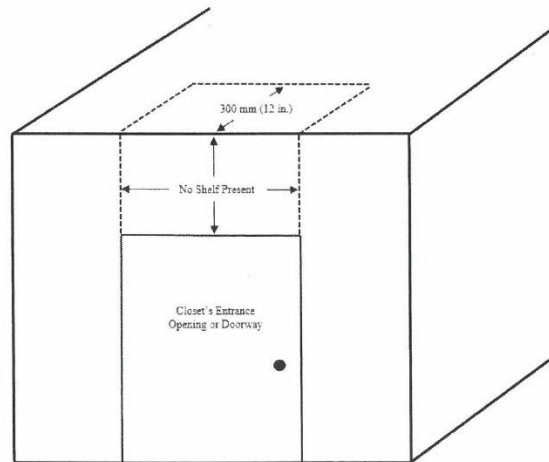


Figure 410.2 Exception Closet Storage Space Exception

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

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.

2017 NC Electrical Code
680.21(C)(2) Motors GFCI Protection. (170613 Item B-16)

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.

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.

2018 NC Building Code

101.2 Scope, 202 Definitions, Farm Building. (161213 Item B-7)

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 *dwelling*s and multiple single-family *dwelling*s (*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

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.)

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.]

2018 NC Building Code
1107.6.2.2.1 Type A units. (161213 Item B-11)

1107.6.2.2.1 Type A units.

In Group R-2 occupancies containing ~~41 or more~~ **than 15** *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.)

2018 NC Building Code
1301.1.1 Criteria. (170613 Item B-6)

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

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

TABLE 2902.1
MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES^{a, b}

NO.	CLASSIFI- CATION	OCCUPANCY	DESCRIPTION	WATER CLOSETS (URINALS: SEE SECTION 419.2)		LAVATORIES	BATHTUBS/ SHOWERS	DRINKING FOUNTAIN (SEE SECTION 410)	OTHER
3	Educational	E ^b	<u>K-8</u> <u>9-12</u> Teacher/staff	<u>1 per 25</u> <u>1 per 30</u> <u>1 per 30</u>	<u>1 per 25</u> <u>1 per 25</u> <u>1 per 25</u>	<u>1 per 60</u> <u>1 per 100</u> <u>1 per 100</u>	—	<u>1 per 100</u>	—

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 feet 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.)

2018 NC Energy Conservation Code
C101.2 Scope. (170613 Item B-8)

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.

R402.1.2 Insulation and fenestration criteria.

The *building thermal envelope* shall meet the requirements of Table R402.1.2, based on the climate zone specified in Chapter 3.

**TABLE R402.1.2
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT^a**

CLIMATE ZONE	FENESTRATION U-FACTOR ^{b, j}	SKYLIGHT U-FACTOR ^b	GLAZED FENESTRATION SHGC ^{b, k}	CEILING R-VALUE ^m	WOOD FRAME WALL R-VALUE	MASS WALL R-VALUE ⁱ	FLOOR R-VALUE	BASEMENT WALL R-VALUE ^{c, o}	SLAB R-VALUE & DEPTH ^d	CRAWL SPACE WALL R-VALUE ^c
3	0.35	0.55 0.65	0.30	30 38 or 30ci ^l	13 15 or 38 or 13+2.5 ^h	5/13 or 5/10ei 5/10	19	10 5/13 ^f	0	5/13
4	0.35	0.55 0.60	0.30	38 or 30ci ^l	15 or 13+2.5 ^h	5/13 or 5/10ei 5/10	19	10 /13 15	10 ^d	10/13 15
5	0.35	0.55 0.60	NR	38 or 30ci ^l	19 ⁿ or 13+5 ^h Or 15+3 ^h	13/17 or 13/12.5ei	30 ^g	10/13 15	10 ^d	10 /13 19

For SI: 1 foot = 304.8 mm.

- R-values are minimums. U-factors and SHGC are maximums. When insulation is installed in a cavity which is less than the label or design thickness of the insulation, the installed R-value of the insulation shall not be less than the R-value specified in the table.
- The fenestration U-factor column excludes skylights. The SHGC column applies to all glazed fenestration.
- "10/15-13" means R-10 continuous insulated sheathing on the interior or exterior of the home or R-15 cavity insulation at the interior of the basement wall or crawl space wall.
- For monolithic slabs, insulation shall be applied from the inspection gap downward to the bottom of the footing or a maximum of 24 inches below grade whichever is less. For floating slabs, insulation shall extend to the bottom of the foundation wall or 24 inches, whichever is less. (See Appendix 2) R-5 shall be added to the required slab edge R-values for heated slabs
- Deleted.
- Basement wall insulation is not required in warm-humid locations as defined by Figure R301.1 and Table R301.1.
- Or insulation sufficient to fill the framing cavity, R-19 minimum.
- The first value is cavity insulation, the second value is continuous insulation, so "13+5" means R-13 cavity insulation plus R-5 continuous insulation. If structural sheathing covers 25 percent or less of the exterior, insulating sheathing is not required where structural sheathing is used. If structural sheathing covers more than 25 percent of exterior, structural sheathing shall be supplemented with insulated sheathing of at least R-2.
- The second R-value applies when more than half the insulation is on the interior of the mass wall.
- In addition to the exemption in Section R402.3.3, a maximum of two glazed fenestration product assemblies having a U-factor no greater than 0.55 shall be permitted to be substituted for minimum code compliant fenestration product assemblies without penalty.

- k. In addition to the exemption in Section R402.3.3, a maximum of two glazed fenestration product assemblies having a SHGC no greater than 0.70 shall be permitted to be substituted for minimum code compliant fenestration product assemblies without penalty.
- l. R-30 shall be deemed to satisfy the ceiling insulation requirement wherever the full height of uncompressed R-30 insulation extends over the wall top plate at the eaves. Otherwise R-38 insulation is required where adequate clearance exists or insulation must extend to either the insulation baffle or within 1" of the attic roof deck.
- m. Table value required except for roof edge where the space is limited by the pitch of the roof, there the insulation must fill the space up to the air baffle.
- n. R -19 fiberglass batts compressed and installed in a nominal 2 x 6 framing cavity is deemed to comply. Fiberglass batts rated R-19 or higher compressed and installed in a 2x4 wall is not deemed to comply.
- o. Basement wall meeting the minimum mass wall specific heat content requirement may use the mass wall R-value as the minimum requirement.

R402.1.4 U-factor alternative.

An assembly with a *U*-factor equal to or less than that specified in Table R402.1.4 shall be permitted as an alternative to the *R*-value in Table R402.1.2.

**TABLE R402.1.4
EQUIVALENT U-FACTORS^a**

CLIMATE ZONE	FENESTRATION U-FACTOR ^d	SKYLIGHT U-FACTOR	CEILING U-FACTOR	FRAME WALL U-FACTOR	MASS WALL U-FACTOR ^b	FLOOR U-FACTOR	BASEMENT WALL U-FACTOR	CRAWL SPACE WALL U-FACTOR
3	0.35	0.55 0.65	0.030 0.035	0.077 0.082	0.141	0.047	0.059 ^c 0.094 ^e	0.136
4	0.35	0.55 0.60	0.030	0.077	0.141	0.047	0.059	0.065
5	0.35	0.55 0.60	0.030	0.061	0.082	0.033	0.059	0.065

- a. Nonfenestration *U*-factors shall be obtained from measurement, calculation or an approved source.
- b. When more than half the insulation is on the interior, the mass wall *U*-factors shall be a maximum of 0.07 in Climate Zone 3, 0.07 in Climate Zone 4, and 0.054 in Climate Zone 5.
- c. Basement wall *U*-factor of 0.360 in warm-humid locations as defined by Figure R301.1 and Table R301.1.
- d. A maximum of two glazed fenestration product assemblies having a *U*-factor no greater than 0.55 and a SHGC no greater than 0.70 shall be permitted to be substituted for minimum code compliant fenestration product assemblies without penalty. When applying this note and using the REScheck "UA Trade-off" compliance method to allow continued use of the software, the applicable fenestration products shall be modeled as meeting the *U*-factor of 0.35 and the SHGC of 0.30, as applicable, but the fenestration products actual *U*-factor and actual SHGC shall be noted in the comments section of the software for documentation of application of this note to the applicable products. Compliance for these substitute products shall be verified compared to the allowed substituted maximum *U*-value requirement and maximum SHGC requirement, as applicable.

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 Energy Conservation Code
403.3.3 Duct leakage. (161213 Item B-3.1)

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.)

2018 NC Energy Conservation Code
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~~ R401 through R404 labeled as “mandatory” ~~and Section R403.5.3~~ be met. The building thermal envelope shall be greater than or equal to levels of efficiency and Solar Heat Gain Coefficient in Table 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.

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.

5. The Storage and Handling of Hazardous Chemicals Right to Know Act. North Carolina *N.C.G.S* 95-173 through 95-218.

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 Prevention 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.

2018 NC Fire Prevention 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 Prevention 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.)

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.

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 ~~700~~ 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 ~~700~~ 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*.

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 ~~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 12 feet (3658 mm), not exceeding ~~700~~ 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 ~~structures~~ 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.)

2018 NC Fire Prevention Code
3406.1 Tire Storage. (161213 Item B-10)

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 3406.1.1.

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 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.

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

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 feet 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
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.

2018 NC Plumbing Code

ERRATA – line added back for “3” inches with “12” dfu

**TABLE 912.3
WET VENT SIZE**

WET VENT PIPE SIZE (inches)	DRAINAGE FIXTURE UNIT LOAD (dfu)
1-1/2	1
2	4
2-1/2	6
3	12
4	32

2018 NC Residential Code
R202 DEFINITIONS. (170613 Item B-10)

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.

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.

N1102.1.2 Insulation and fenestration criteria.

The *building thermal envelope* shall meet the requirements of Table N1102.1.2, based on the climate zone specified in N1101.7.

**TABLE N1102.1.2
 INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT^a**

CLIMATE ZONE	FENESTRATION U-FACTOR ^{b, j}	SKYLIGHT U-FACTOR ^b	GLAZED FENESTRATION SHGC ^{b, k}	CEILING R-VALUE ^m	WOOD FRAME WALL R-VALUE	MASS WALL R-VALUE ⁱ	FLOOR R-VALUE	BASEMENT WALL R-VALUE ^{c, o}	SLAB R-VALUE & DEPTH ^d	CRAWL SPACE WALL R-VALUE ^c
3	0.35	0.55 0.65	0.30	30 38 or 30ci ^l	13 45 or 13+2.5 ^h	5/13 or 5/10ei	19	10 5/13 ^f	0	5/13
4	0.35	0.55 0.60	0.30	38 or 30ci ^l	15 or 13+2.5 ^h	5/13 or 5/10ei	19	10 /13 45	10 ^d	10/13 45
5	0.35	0.55 0.60	NR	38 or 30ci ^l	19 ⁿ or 13+5 ^h Or 15+3 ^h	13/17 or 13/12.5ei	30 ^g	10/13 45	10 ^d	10 /13 19

For SI: 1 foot = 304.8 mm.

- R-values are minimums. U-factors and SHGC are maximums. When insulation is installed in a cavity which is less than the label or design thickness of the insulation, the installed R-value of the insulation shall not be less than the R-value specified in the table.
- The fenestration U-factor column excludes skylights. The SHGC column applies to all glazed fenestration.
- "10/45 13" means R-10 continuous insulated sheathing on the interior or exterior of the home or R-45 13 cavity insulation at the interior of the basement wall or crawl space wall. "
- For monolithic slabs, insulation shall be applied from the inspection gap downward to the bottom of the footing or a maximum of 24 inches below grade whichever is less. For floating slabs, insulation shall extend to the bottom of the foundation wall or 24 inches, whichever is less. (See Appendix O) R-5 shall be added to the required slab edge R-values for heated slabs
- Deleted.
- Basement wall insulation is not required in warm-humid locations as defined by Figure N1101.7 and Table N1101.7.
- Or insulation sufficient to fill the framing cavity, R-19 minimum.
- The first value is cavity insulation, the second value is continuous insulation, so "13+5" means R-13 cavity insulation plus R-5 continuous insulation. If structural sheathing covers 25 percent or less of the exterior, insulating sheathing is not required where structural sheathing is used. If structural sheathing covers more than 25 percent of exterior, structural sheathing shall be supplemented with insulated sheathing of at least R-2.
- The second R-value applies when more than half the insulation is on the interior of the mass wall.
- In addition to the exemption in Section N1102.3.3, a maximum of two glazed fenestration product assemblies having a U-factor no greater than 0.55 shall be permitted to be substituted for minimum code compliant fenestration product assemblies without penalty.

- k. In addition to the exemption in Section N1102.3.3, a maximum of two glazed fenestration product assemblies having a SHGC no greater than 0.70 shall be permitted to be substituted for minimum code compliant fenestration product assemblies without penalty.
- l. R-30 shall be deemed to satisfy the ceiling insulation requirement wherever the full height of uncompressed R-30 insulation extends over the wall top plate at the eaves. Otherwise R-38 insulation is required where adequate clearance exists or insulation must extend to either the insulation baffle or within 1" of the attic roof deck.
- m. Table value required except for roof edge where the space is limited by the pitch of the roof, there the insulation must fill the space up to the air baffle.
- n. R -19 fiberglass batts compressed and installed in a nominal 2 x 6 framing cavity is deemed to comply. Fiberglass batts rated R-19 or higher compressed and installed in a 2x4 wall is not deemed to comply.
- o. Basement wall meeting the minimum mass wall specific heat content requirement may use the mass wall R-value as the minimum requirement.

N1102.1.4 U-factor alternative.

An assembly with a *U*-factor equal to or less than that specified in Table N1102.1.4 shall be permitted as an alternative to the *R*-value in Table N1102.1.2.

**TABLE N1102.1.4
EQUIVALENT U-FACTORS^a**

CLIMATE ZONE	FENESTRATION U-FACTOR ^d	SKYLIGHT U-FACTOR	CEILING U-FACTOR	FRAME WALL U-FACTOR	MASS WALL U-FACTOR ^b	FLOOR U-FACTOR	BASEMENT WALL U-FACTOR	CRAWL SPACE WALL U-FACTOR
3	0.35	0.55 0.65	0.030 0.035	0.077 0.082	0.141	0.047	0.059 ^c 0.094 ^e	0.136
4	0.35	0.55 0.60	0.030	0.077	0.141	0.047	0.059	0.065
5	0.35	0.55 0.60	0.030	0.061	0.082	0.033	0.059	0.065

- a. Nonfenestration *U*-factors shall be obtained from measurement, calculation or an approved source.
- b. When more than half the insulation is on the interior, the mass wall *U*-factors shall be a maximum of 0.07 in Climate Zone 3, 0.07 in Climate Zone 4, and 0.054 in Climate Zone 5.
- c. Basement wall *U*-factor of 0.360 in warm-humid locations as defined by Figure N1101.7 and Table N1101.7.
- d. A maximum of two glazed fenestration product assemblies having a *U*-factor no greater than 0.55 and a SHGC no greater than 0.70 shall be permitted to be substituted for minimum code compliant fenestration product assemblies without penalty. When applying this note and using the REScheck "UA Trade-off" compliance method to allow continued use of the software, the applicable fenestration products shall be modeled as meeting the *U*-factor of 0.35 and the SHGC of 0.30, as applicable, but the fenestration products actual *U*-factor and actual SHGC shall be noted in the comments section of the software for documentation of application of this note to the applicable products. Compliance for these substitute products shall be verified compared to the allowed substituted maximum *U*-value requirement and maximum SHGC requirement, as applicable.

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 Residential Code
N1106 Energy Rating Index. (161213 Item B-3.4)

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~~ N1101 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~~ 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.~~

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)

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~~ 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(e)~~ 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

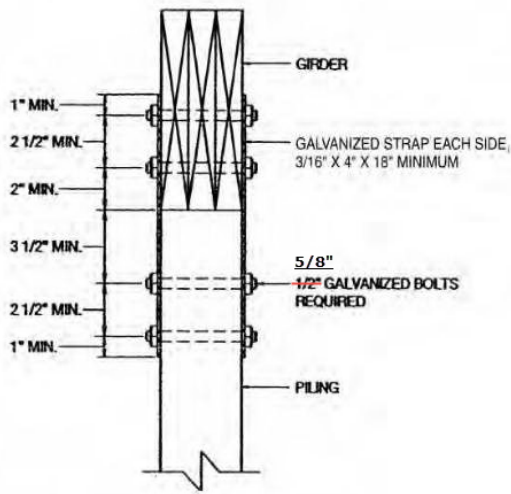
<u>Amount Piling is Notched</u>	<u>Beam/Girder Continuous</u>		<u>Beam/Girder Butt Joint</u>	
	<u>Bolts</u>	<u>Screws</u>	<u>Bolts</u>	<u>Screws</u>
<u>≤ 50%</u>	<u>two 5/8" bolts²</u>	<u>four screws³</u>	<u>four 5/8" bolts²</u>	<u>eight screws³</u>
<u>> 50%¹</u>	<u>two 5/8" bolts²</u>	<u>four screws³</u>	<u>four 5/8" bolts³</u>	<u>eight screws</u>

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.

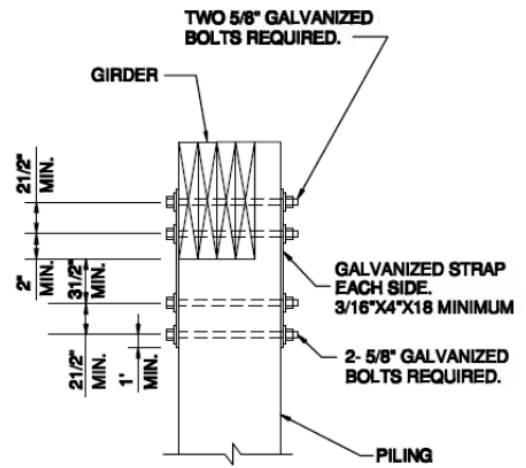
R4603.6.1 Tying at corners. At corners, girders shall be connected to the pile with a minimum 3/16 × 4 × 18-inch (5 × 102 × 467 mm) hot dip galvanized strap bolted with two 5/8 inch (15.9 mm) galvanized through bolts on the exterior and a minimum L4 x 3/16 x 1'-6" (102 × 5 × 467 mm) galvanized steel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

Revise Figures as follows:



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



**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 posts ~~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

<u>Maximum Girder Thickness</u>		
<u>Any</u>	<u>3" (Double 2X)</u>	<u>1-1/2" (Single 2X)</u>
<u>Two 5/8" diameter bolts¹</u>	<u>Four 6" long screws²</u>	<u>Three 4" long screws²</u>

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.