REQUEST FOR TECHNICAL CHANGE

AGENCY: Building Code Council

RULE CITATION: NC Building Code, Table 602

DEADLINE FOR RECEIPT: Thursday, November 7, 2019

***PLEASE NOTE:** This request may extend to several pages. Please be sure you have reached the end of the document.*

The Rules Review Commission staff has completed its review of this Rule prior to the Commission's next meeting. The Commission has not yet reviewed this Rule and therefore there has not been a determination as to whether the Rule will be approved. You may call our office to inquire concerning the staff recommendation.

In reviewing this Rule, the staff recommends the following technical changes be made:

In (i) and (j), I know that "stories above grade" is a defined term in the Code, so that is why the phrase is italicized. However, I do not think "three" should be italicized.

Please insert a comma after "egress" in (i) and (j).

Please retype the rule accordingly and resubmit it to our office at 1711 New Hope Church Road, Raleigh, North Carolina 27609.

Amanda J. Reeder
Commission Counsel
Date submitted to agency: October 24, 2019

REQUEST FOR TECHNICAL CHANGE

AGENCY: Building Code Council

RULE CITATION: NC Building Code, 714.4.2

DEADLINE FOR RECEIPT: Thursday, November 7, 2019

The Rules Review Commission staff has completed its review of this Rule prior to the Commission's next meeting. The Commission has not yet reviewed this Rule and therefore there has not been a determination as to whether the Rule will be approved. You may call our office to inquire concerning the staff recommendation.

In reviewing this Rule, the staff recommends the following technical changes be made:

In Exception 7:

Please be sure when you publish this that "fire-resistance-rated horizontal assemblies" is italicized, as it is in the current Building Code on lines 1 and 4 through 5.

Please insert a comma after "assembly" on the second line.

Please insert a comma after "assemblies" on the fifth line.

Please retype the rule accordingly and resubmit it to our office at 1711 New Hope Church Road, Raleigh, North Carolina 27609.

Amanda J. Reeder
Commission Counsel
Date submitted to agency: October 24, 2019

REQUEST FOR TECHNICAL CHANGE

AGENCY: Building Code Council

RULE CITATION: NC Building Code, 903.2.8

DEADLINE FOR RECEIPT: Thursday, November 7, 2019

The Rules Review Commission staff has completed its review of this Rule prior to the Commission's next meeting. The Commission has not yet reviewed this Rule and therefore there has not been a determination as to whether the Rule will be approved. You may call our office to inquire concerning the staff recommendation.

In reviewing this Rule, the staff recommends the following technical changes be made:

When you publish this, please be sure to include all of the existing language in Exception 2.

Please be sure when you publish this that 3.1 and 3.3 end with periods.

In 5.2, shouldn't "dwellings" be italicized?

Please retype the rule accordingly and resubmit it to our office at 1711 New Hope Church Road, Raleigh, North Carolina 27609.

Amanda J. Reeder
Commission Counsel
Date submitted to agency: October 24, 2019

REQUEST FOR TECHNICAL CHANGE

AGENCY: Building Code Council

RULE CITATION: NC Residential Code, R703.8.2.1

DEADLINE FOR RECEIPT: Thursday, November 7, 2019

The Rules Review Commission staff has completed its review of this Rule prior to the Commission's next meeting. The Commission has not yet reviewed this Rule and therefore there has not been a determination as to whether the Rule will be approved. You may call our office to inquire concerning the staff recommendation.

In reviewing this Rule, the staff recommends the following technical changes be made:

In the new language, what is "firmly attached"? Who determines this? Based upon what?

Please retype the rule accordingly and resubmit it to our office at 1711 New Hope Church Road, Raleigh, North Carolina 27609.

Amanda J. Reeder
Commission Counsel
Date submitted to agency: October 24, 2019

REQUEST FOR TECHNICAL CHANGE

AGENCY: Building Code Council

RULE CITATION: NC Residential Code, N1106.2

DEADLINE FOR RECEIPT: Thursday, November 7, 2019

The Rules Review Commission staff has completed its review of this Rule prior to the Commission's next meeting. The Commission has not yet reviewed this Rule and therefore there has not been a determination as to whether the Rule will be approved. You may call our office to inquire concerning the staff recommendation.

In reviewing this Rule, the staff recommends the following technical changes be made:

Table N1106.2.1: Why do you need Footnote e? As this is all new language, what are you deleting?

In Footnotes i and n, I do not see where these are within the Table. Where are these used? Should the footnote for the Mass Wall column be i instead of l, like it is in Table R406.2.1 in the Energy Conservation Code?

In Footnote l, what is "adequate clearance"? Who will determine this, and based upon what?

In Footnotes p and q, since "air-impermeable insulation" is defined in the Code, should the phrase be italicized?

Table N1106.2.2: In Footnote a, what is an "approved source"? Approved by whom? Are you relying in part upon the definition of "approved" in the Code?

And please insert a comma after "calculation"

In Footnote b, consider inserting a comma after "4"

In Footnote e, since "air-impermeable insulation" is defined in the Code, should the phrase be italicized?

Please retype the rule accordingly and resubmit it to our office at 1711 New Hope Church Road, Raleigh, North Carolina 27609.

Amanda J. Reeder
Commission Counsel
Date submitted to agency: October 24, 2019

REQUEST FOR TECHNICAL CHANGE

AGENCY: Building Code Council

RULE CITATION: NC Residential Code, Chapter 44

DEADLINE FOR RECEIPT: Thursday, November 7, 2019

The Rules Review Commission staff has completed its review of this Rule prior to the Commission's next meeting. The Commission has not yet reviewed this Rule and therefore there has not been a determination as to whether the Rule will be approved. You may call our office to inquire concerning the staff recommendation.

In reviewing this Rule, the staff recommends the following technical changes be made:

I do not see that you published this proposed amendment in the May 15, 2019 Register. Did you mean to submit the change proposed to Section 2 of this Code, as published on Page 2172 of that Register?

Please retype the rule accordingly and resubmit it to our office at 1711 New Hope Church Road, Raleigh, North Carolina 27609.

Amanda J. Reeder
Commission Counsel
Date submitted to agency: October 24, 2019

REQUEST FOR TECHNICAL CHANGE

AGENCY: Building Code Council

RULE CITATION: NC Residential Code, P2603.5

DEADLINE FOR RECEIPT: Thursday, November 7, 2019

The Rules Review Commission staff has completed its review of this Rule prior to the Commission's next meeting. The Commission has not yet reviewed this Rule and therefore there has not been a determination as to whether the Rule will be approved. You may call our office to inquire concerning the staff recommendation.

In reviewing this Rule, the staff recommends the following technical changes be made:

Since you are deleting "soil" please remove the comma after "water"

What is "adequate" provision here? Who decides this? Does your regulated public know?

Please retype the rule accordingly and resubmit it to our office at 1711 New Hope Church Road, Raleigh, North Carolina 27609.

Amanda J. Reeder
Commission Counsel
Date submitted to agency: October 24, 2019

REQUEST FOR TECHNICAL CHANGE

AGENCY: Building Code Council

RULE CITATION: NC Plumbing Code, 305.4

DEADLINE FOR RECEIPT: Thursday, November 7, 2019

The Rules Review Commission staff has completed its review of this Rule prior to the Commission's next meeting. The Commission has not yet reviewed this Rule and therefore there has not been a determination as to whether the Rule will be approved. You may call our office to inquire concerning the staff recommendation.

In reviewing this Rule, the staff recommends the following technical changes be made:

I am only asking – this language differs slightly from the Residential Code, P2603.5, as that states "In other cases," before "water…" Should this language be the same between the two? Also, here it is "R6.5" and in the Residential Code, it is "R-6.5" Shouldn't these be the same in both rules?

Since you are deleting "soil" please remove the comma after "water"

What is "adequate" provision here? Who decides this? Does your regulated public know?

Please retype the rule accordingly and resubmit it to our office at 1711 New Hope Church Road, Raleigh, North Carolina 27609.

Amanda J. Reeder
Commission Counsel
Date submitted to agency: October 24, 2019

REQUEST FOR TECHNICAL CHANGE

AGENCY: Building Code Council

RULE CITATION: NC Energy Conservation Code, R202

DEADLINE FOR RECEIPT: Thursday, November 7, 2019

The Rules Review Commission staff has completed its review of this Rule prior to the Commission's next meeting. The Commission has not yet reviewed this Rule and therefore there has not been a determination as to whether the Rule will be approved. You may call our office to inquire concerning the staff recommendation.

In reviewing this Rule, the staff recommends the following technical changes be made:

What ASTM standards do you want to use here? I ask because you published ASTM E217 and E283 in the Register. But you are now proposing to add E2178. I note that while ASTM E283 is included in Chapter 6 of this Code, there is no inclusion of either E217 nor E2178. But there is a E1827, which addresses airtightness.

Please retype the rule accordingly and resubmit it to our office at 1711 New Hope Church Road, Raleigh, North Carolina 27609.

Amanda J. Reeder
Commission Counsel
Date submitted to agency: October 24, 2019

REQUEST FOR TECHNICAL CHANGE

AGENCY: Building Code Council

RULE CITATION: NC Energy Conservation Code, R406.2

DEADLINE FOR RECEIPT: Thursday, November 7, 2019

The Rules Review Commission staff has completed its review of this Rule prior to the Commission's next meeting. The Commission has not yet reviewed this Rule and therefore there has not been a determination as to whether the Rule will be approved. You may call our office to inquire concerning the staff recommendation.

In reviewing this Rule, the staff recommends the following technical changes be made:

Table 406.2.1: Why do you need Footnote e? As this is all new language, what are you deleting?

In Footnote n, I do not see where these are within the Table. Where is it used?

In Footnote l, what is "adequate clearance"? Who will determine this, and based upon what?

In Footnotes p and q, since "air-impermeable insulation" is defined in the Code, should the phrase be italicized?

Table R406.2.2: In Footnote a, what is an "approved source"? Approved by whom? Are you relying in part upon the definition of "approved" in the Code?

In Footnote b, consider inserting a comma after "4"

In Footnote e, since "air-impermeable insulation" is defined in the Code, should the phrase be italicized?

Please retype the rule accordingly and resubmit it to our office at 1711 New Hope Church Road, Raleigh, North Carolina 27609.

Amanda J. Reeder
Commission Counsel
Date submitted to agency: October 24, 2019

REQUEST FOR TECHNICAL CHANGE

AGENCY: Building Code Council

RULE CITATION: NC Energy Conservation Code, Chapter 6

DEADLINE FOR RECEIPT: Thursday, November 7, 2019

The Rules Review Commission staff has completed its review of this Rule prior to the Commission's next meeting. The Commission has not yet reviewed this Rule and therefore there has not been a determination as to whether the Rule will be approved. You may call our office to inquire concerning the staff recommendation.

In reviewing this Rule, the staff recommends the following technical changes be made:

I do not see that you published this proposed amendment in the May 15, 2019 Register. Was it published in a different Register?

Please retype the rule accordingly and resubmit it to our office at 1711 New Hope Church Road, Raleigh, North Carolina 27609.

Amanda J. Reeder
Commission Counsel
Date submitted to agency: October 24, 2019

REQUEST FOR TECHNICAL CHANGE

AGENCY: Building Code Council

RULE CITATION: NC Fire Prevention Code, 903.2.8

DEADLINE FOR RECEIPT: Thursday, November 7, 2019

The Rules Review Commission staff has completed its review of this Rule prior to the Commission's next meeting. The Commission has not yet reviewed this Rule and therefore there has not been a determination as to whether the Rule will be approved. You may call our office to inquire concerning the staff recommendation.

In reviewing this Rule, the staff recommends the following technical changes be made:

When you publish this, please be sure to include all of the existing language in Exception 2.

Please be sure when you publish this that 3.1 and 3.3 end with periods.

In 5.2, shouldn't "dwellings" be italicized?

Please retype the rule accordingly and resubmit it to our office at 1711 New Hope Church Road, Raleigh, North Carolina 27609.

Amanda J. Reeder
Commission Counsel
Date submitted to agency: October 24, 2019

2018 NC Building Code
714.4.2 Membrane penetration. (190312 Item B-2)

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.

2017 NC Electrical Code
406.4(D)(4) Arc-Fault Circuit Interrupters Protection. (190312 Item B-4)

~~**406.4(D)(4)** Arc-Fault Circuit Interrupters Protection.~~

~~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.

2018 NC Fire Prevention Code
505.1.1 Suite/Room identification. (190312 Item B-5)

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.

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.

210.8(B) Other Than Dwelling Units.

Compliance with this section requires that the provisions identified in Sections R401 through R404 labeled as "mandatory" be met. The building thermal envelope shall be greater than or equal to levels of efficiency and Solar Heat Gain Coefficient in Table R406.2.1 or Table R406.2.2. ~~Table 402.1.1 or 402.1.3 of the 2012 North Carolina 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 *registered design professional* or certified *HERS rater* is required to perform the analysis if required by North Carolina Licensure laws.

Exception: 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.

TABLE R406.2.1
MINIMUM INSULATION AND FENESTRATION REQUIREMENTS FOR ENERGY RATING INDEX COMPLIANCE[a]

	FENESTRATION VALUES			R-VALUES FOR								
CLIMATE ZONE	FENESTRATION U-FACTOR[b,j]	SKYLIGHT U-FACYTOR[b]	GLAZED FENESTRATION SHGC[b,k]	CEILING[m]	UNVENTED ENCLOSED RAFTER ASSEMBLIES AIR-IMPERMIABLE[p]	UNVENTED ENCLOSED RAFTER ASSEMBLIES AIR-PERMIABLE/ IMPERMIABLE[p]	WOOD FRAME WALL	MASS WALL[i]	FLOOR	BASEMENT WALL[c,o]	SLAB[d]	CRAWL SPACE WALL[c]
3	0.35	0.65	0.3	30	20	20+5[q]	13	5/10	19	10/13[f]	0	5/13
4	0.35	0.6	0.3	38 or 30ci[l]	20	20+15[q]	15, 13+2.5[h]	5/10	19	10/13	10	10/13
5	0.35	0.6	NR	38 or 30ci[l]	25	15+20[q]	19[n], 13+5[h], or 15+3[h]	13/17	30[g]	10/13	10	10/13

For SI: 1 foot = 304.8 mm.

a. *R*-values are minimums. *U*-factors and SHGC are maximums.
b. The fenestration *U*-factor column excludes skylights. The SHGC column applies to all glazed fenestration.
c. "10/13" means R-10 continuous insulated sheathing on the interior or exterior of the home or R-13 cavity insulation at the interior of the basement wall or crawl space wall.
d. For monolithic slabs, insulation shall be applied from the inspection gap downward to the bottom of the footing or a maximum of 18 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 R2) R-5 shall be added to the required slab edge *R*-values for heated slabs.
e. Deleted.
f. Basement wall insulation is not required in warm humid locations as defined by Figure R301.1 and Table R301.1.
g. Or insulation sufficient to fill the framing cavity, R-19 minimum.
h. 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.
i. The second *R*-value applies when more than half the insulation is on the interior of the mass wall.
j. In addition to the exemption in 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 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 either to 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 normal 2 x 6 framing cavity is deemed to comply. Fiberglass batts rated R-19 or higher compressed and installed in a 2 x 4 wall are 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.
p. The air-impermeable insulation shall meet the requirements of the definition in section R202. Air-impermeable insulation shall be installed in direct contact with the underside of the structural roof sheathing. For one- and two-family dwellings and townhouses, the insulation installation shall meet the requirements of R806.5 of the North Carolina Residential Code. For residential buildings other than one- and two-family dwellings and townhouses, the insulation installation shall meet the installation requirements of 1203.3 of the North Carolina Building Code.
q. The value for air-permeable insulation is shown first and that for air-impermeable insulation second. Thus R-20 + R-5 indicates that the minimum value for air-permeable insulation is R-20, and the minimum value for air-impermeable insulation is R-5. Air-impermeable insulation shall be installed in direct contact with the underside of the structural roof sheathing. The air-permeable insulation shall be installed directly under the air-impermeable insulation.

TABLE R406.2.2
EQUIVALENT U-FACTORS FOR TABLE R406.2.1[a]

CLIMATE ZONE	FENESTRA-TION[d]	SKYLIGHT	CEILING	UNVENTED ENCLOSED RAFTER ASSEMBLIES AIR-IMPERMIABLE[e]	UNVENTED ENCLOSED RAFTER ASSEMBLIES AIR-PERMIABLE/ IMPERMIABLE[e]	FRAME WALL	MASS WALL[b]	FLOOR	BASE-MENT WALL[c]	CRAWL SPACE WALL[c]
3	0.35	0.65	0.0350	0.05	0.04[f]	0.082	0.141	0.047	0.059	0.136
4	0.35	0.60	0.0300	0.05	0.029[f]	0.077	0.141	0.047	0.059	0.065
5	0.35	0.60	0.0300	0.04	0.029[f]	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 R303.1 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 substitute maximum U-value requirement and maximum SHGC requirement, as applicable.
e. The air-impermeable insulation shall meet the requirements of the definition in section R202. Air-impermeable insulation shall be installed in direct contact with the underside of the structural roof sheathing. For one- and two-family dwellings and townhouses, the insulation installation shall meet the requirements of R806.5 of the North Carolina Residential Code.
f. For air-permeable/impermeable applications, Table R406.2.1 shall be followed for minimum insulation values.

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

N1106.2 (R406.2) Mandatory requirements.

Compliance with this section requires that the provisions identified in Sections N1101.14 through N1104 labeled as "mandatory" be met. The building thermal envelope shall be greater than or equal to levels of efficiency and Solar Heat Gain Coefficient in Table N1106.2.1 or Table N1106.2.2. ~~Table 402.1.1 or 402.1.3 of the 2012 North Carolina Energy Conservation Code.~~ Minimum standards associated with compliance shall be the ANSI RESNET ICC 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 *registered design professional* or certified *HERS rater* is required to perform the analysis if required by North Carolina licensure laws.

Exception: 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.

TABLE N1106.2.1
MINIMUM INSULATION AND FENESTRATION REQUIREMENTS FOR ENERGY RATING INDEX COMPLIANCE[a]

	FENESTRATION VALUES			R-VALUES FOR								
CLIMATE ZONE	FENESTRATION U-FACTOR[b,j]	SKYLIGHT U-FACYTOR[b]	GLAZED FENESTRATION SHGC[b,k]	CEILING[m]	UNVENTED ENCLOSED RAFTER ASSEMBLIES AIR-IMPERMIABLE[p]	UNVENTED ENCLOSED RAFTER ASSEMBLIES AIR-PERMIABLE/ IMPERMIABLE[p]	WOOD FRAME WALL	MASS WALL[i]	FLOOR	BASEMENT WALL[c,o]	SLAB[d]	CRAWL SPACE WALL[c]
3	0.35	0.65	0.3	30	20	20+5[q]	13	5/10	19	10/13[f]	0	5/13
4	0.35	0.6	0.3	38 or 30ci[l]	20	20+15[q]	15, 13+2.5[h]	5/10	19	10/13	10	10/13
5	0.35	0.6	NR	38 or 30ci[l]	25	15+20[q]	19[n], 13+5[h], or 15+3[h]	13/17	30[g]	10/13	10	10/13

For SI: 1 foot = 304.8 mm.

a. *R*-values are minimums. *U*-factors and SHGC are maximums.
b. The fenestration *U*-factor column excludes skylights. The SHGC column applies to all glazed fenestration.
c. "10/13" means R-10 continuous insulated sheathing on the interior or exterior of the home or R-13 cavity insulation at the interior of the basement wall or crawl space wall.
d. For monolithic slabs, insulation shall be applied from the inspection gap downward to the bottom of the footing or a maximum of 18 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.
e. Deleted.
f. Basement wall insulation is not required in warm-humid locations as defined by Figure N1101.7 and Table N1101.7.
g. Or insulation sufficient to fill the framing cavity, R-19 minimum.
h. 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 the exterior, structural sheathing shall be supplemented with insulated sheathing of at least R-2.
i. The second *R*-value applies when more than half the insulation is on the interior of the mass wall.
j. In addition to the exemption in 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 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 either to 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 normal 2 x 6 framing cavity is deemed to comply. Fiberglass batts rated R-19 or higher compressed and installed in a 2 x 4 wall are 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.
p. The air-impermeable insulation shall meet the requirements of the definition in section R202. Air-impermeable insulation shall be installed in direct contact with the underside of the structural roof sheathing.The insulation installation shall meet the requirements of R806.5.
q. The value for air-permeable insulation is shown first and that for air-impermeable insulation second. Thus R-20 + R-5 indicates that the minimum value for air-permeable insulation is R-20, and the minimum value for air-impermeable insulation is R-5. Air-impermeable insulation shall be installed in direct contact with the underside of the structural roof sheathing. The air-permeable insulation shall be installed directly under the air-impermeable insulation.

TABLE N1106.2.2
EQUIVALENT U-FACTORS FOR TABLE RN1106.2.1[a]

CLIMATE ZONE	FENESTRATION[d]	SKYLIGHT	CEILING	UNVENTED ENCLOSED RAFTER ASSEMBLIES AIR-IMPERMIABLE[e]	UNVENTED ENCLOSED RAFTER ASSEMBLIES AIR-PERMIABLE/ IMPERMIABLE[e]	FRAME WALL	MASS WALL[b]	FLOOR	BASEMENT WALL[c]	CRAWL SPACE WALL[c]
3	0.35	0.65	0.0350	0.05	0.04[f]	0.082	0.141	0.047	0.059	0.136
4	0.35	0.60	0.0300	0.05	0.029[f]	0.077	0.141	0.047	0.059	0.065
5	0.35	0.60	0.0300	0.04	0.029[f]	0.061	0.082	0.033	0.059	0.065

a. Nonfenestration *U*-factors shall be obtained from measurement, calculation or 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 substitute maximum U-value requirement and maximum SHGC requirement, as applicable.
e. The air-impermeable insulation shall meet the requirements of the definition in section R202. Air-impermeable insulation shall be installed in direct contact with the underside of the structural roof sheathing. The insulation installation shall meet the requirements of R806.5.
f. For air-permeable/impermeable applications, Table N1106.2.1 shall be followed for minimum insulation values.

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 Energy Conservation Code
R202 Definitions. (190312 Item B-9)

AIR-IMPERMEABLE INSULATION. An insulation having an air permanence equal to or less than 0.02 L/s-m^2 at 75 Pa pressure differential tested according to ASTM E2178 or E 283.

Chapter 6 – Reference Standards
ASTM
E2178-13 Standard Test Method for Air Permeance of Building Materials …..Table R406.2.1, Table R406.2.2

2018 NC Residential Code
Chapter 44 – Reference Standards

ASTM
E283-04 Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls and Doors Under Specified Pressure Differences Across the Specimen
……..Table N1106.2.1, Table N1106.2.2

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

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 R6.5 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 Plumbing Code
306.2.4 Tracer wire. (190312 Item B-12)

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.

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.

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.

2018 NC Residential Code
R703.8.2.1 Support by steel angle. (190312 Item B-17)

R703.8.2.1 Support by steel angle. A minimum 6-inch by 4-inch by $^{5}/_{16}$-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 $^{7}/_{16}$-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 $^{1}/_{16}$ 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 $^{1}/_{4}$-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 *approve*d 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.

2018 NC Residential Code
R403.1.6 Foundation Anchorage. (190312 Item B-18)

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
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.

2018 NC Residential Code
P2603.5 Freezing. (190312 Item B-21)

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 Fire Prevention Code
903.2.8 Group R. (180911 Item B-13)

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. *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.

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. *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 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.

TABLE 602
FIRE-RESISTANCE RATING REQUIREMENTS FOR EXTERIOR WALLS BASED ON FIRE SEPARATION DISTANCE[a,d,g]

FIRE SEPARATION DISTANCE = X (feet)	TYPE OF CONSTRUCTION	OCCUPANCY GROUP H[e]	OCCUPANCY GROUP F-1, M, S-1[f]	OCCUPANCY GROUP A, B, E, F-2, I, R[i,j], S-2, U[h]
X < 5[b]	All	3	2	1
5 ≤ X < 10	IA Others	3 2	2 1	1 1
10 ≤ X < 30	IA, IB IIB, VB Others	2 1 1	1 0 1	1[c] 0 1[c]
X ≥ 30	All	0	0	0

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.