NOTICE OF RULE MAKING PROCEEDINGS AND PUBLIC HEARING

NORTH CAROLINA BUILDING CODE COUNCIL

Notice of Rule-making Proceedings *is hereby given by NC Building Code Council in accordance with G.S. 150B-21.5(d).*

Citation to Existing Rule Affected by this Rule-Making: *North Carolina, Fire, Building, Mechanical, Existing Building, Residential, and Energy Codes amendments.*

Authority for Rule-making: *G.S. 143-136; 143-138.*

Reason for Proposed Action: *To incorporate changes in the NC State Building Codes as a result of rulemaking petitions filed with the NC Building Code Council and to incorporate changes proposed by the Council.*

Public Hearing: *Tuesday, December 8, 2020, 9:00AM, Albemarle Building, 325 North Salisbury Street, Raleigh, NC 27603, 2nd Floor Training Room 240. Comments on both the proposed rule and any fiscal impact will be accepted. Comments on both the proposed rule and any fiscal impact will be accepted.*

Comment Procedures: *Written comments may be sent to Carl Martin, Acting Secretary, NC Building Code Council, NC Department of Insurance, 1202 Mail Service Center, Raleigh, NC 27699-1202. Comments on both the proposed rule and any fiscal impact will be accepted. Comment period expires on January 15, 2021.*

Link to Agency Notice:

https://www.ncosfm.gov/codes/building-code-council-bcc/bcc-hearing-notices

https://www.ncosfm.gov/codes/building-code-council-bcc/bcc-hearing-notices

Statement of Subject Matter:

1. Request from Colin Triming representing the NC Fire Code Revisions Committee to amend the 2018 N.C. Fire Code and Building Code, Section 1010.1.9.7.

[BE] 1010.1.9.7 Delayed egress. Delayed egress locking systems, shall be permitted to be installed on doors serving ~~any occupancy except Group A, E and H~~ the following occupancies in buildings that are equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or an

approved automatic smoke or heat detection system installed in accordance with Section 907**:** ~~The locking system shall be installed and operated in accordance with all of the following:~~

1. Group B, F, I, M, R, S and U occupancies.

2. Group E classrooms with an occupant load of less than 50.

Exception: Delayed egress locking systems shall be permitted to be installed on exit or exit access doors, other than the main exit or exit access door, serving a courtroom in buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.

~~1. The delay electronics of the delayed egress locking system shall deactivate upon actuation of the *automatic sprinkler system* or automatic fire detection system, allowing immediate, free egress.~~

~~2. The delay electronics of the delayed egress locking system shall deactivate upon loss of power controlling the lock or lock mechanism, allowing immediate free egress.~~

~~3. The delayed egress locking system shall have the capability of being deactivated at the fire command center and other approved locations. If a fire command center is not required by the *International Building Code*, the door locks shall have the capability of being unlocked by a signal from a location approved by the local fire code official.~~

~~4. An attempt to egress shall initiate an irreversible process that shall allow such egress in not more than 15 seconds when a physical effort to exit is applied to the egress side door hardware for not more than 3 seconds. Initiation of the irreversible process shall activate an audible signal in the vicinity of the door. Once the delay electronics have been deactivated, rearming the delay electronics shall be by manual means only.~~

~~**Exception:** Where *approved*, a delay of not more than 30 seconds is permitted on a delayed egress door.~~

~~5. The egress path from any point shall not pass through more than one delayed egress locking system.~~

~~**Exception:** In Group I-2 or I-3 occupancies, the egress path from any point in the building shall not pass through more than two delayed egress locking systems provided the combined delay does not exceed 30 seconds.~~

~~6. A sign shall be provided on the door and shall be located above and within 12 inches (305 mm) of the door exit hardware:~~

~~6.1. For doors that swing in the direction of egress, the sign shall read: PUSH UNTIL ALARM SOUNDS. DOOR CAN BE OPENED IN 15 [30] SECONDS.~~

~~6.2. For doors that swing in the opposite direction of egress, the sign shall read: PULL UNTIL ALARM SOUNDS. DOOR CAN BE OPENED IN 15 [30] SECONDS.~~

~~6.3. The sign shall comply with the visual character requirements in ICC A117.1.~~

~~**Exception:** Where *approved*, in Group I occupancies, the installation of a sign is not required where care recipients who, because of clinical needs, require restraint or containment as part of the function of the treatment area.~~

~~7. Emergency lighting shall be provided on the egress side of the door.~~

~~8. The delayed egress locking system units shall be *listed* in accordance with UL 294.~~

[BE] 1010.1.9.7.1 Delayed egress locking system. The delayed egress locking system shall be installed and operated in accordance with all of the following:

1. The delay electronics of the delayed egress locking system shall deactivate upon actuation of the *automatic sprinkler system* or automatic fire detection system, allowing immediate, free egress.

2. The delay electronics of the delayed egress locking system shall deactivate upon loss of power controlling the lock or lock mechanism, allowing immediate free egress.

3. The delayed egress locking system shall have the capability of being deactivated at the fire command center and other approved locations.

4. An attempt to egress shall initiate an irreversible process that shall allow such egress in not more than 15 seconds when a physical effort to exit is applied to the egress side door hardware for not more than 3 seconds. Initiation of the irreversible process shall activate an audible signal in the vicinity of the door. Once the delay electronics have been deactivated, rearming the delay electronics shall be by manual means only.

Exception: Where *approved*, a delay of not more than 30 seconds is permitted on a delayed egress door.

5. The egress path from any point shall not pass through more than one delayed egress locking system.

Exceptions:

1. In Group I-2 or I-3 occupancies, the egress path from any point in the building shall not pass through not more than two delayed egress locking systems provided that the combined delay does not exceed 30 seconds.

2. In GroupI-1 or I-4 occupancies, the egress path from any point in the building shall pass through not more than two delayed egress locking systems provided that the combined delay does not exceed 30 seconds and the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

6. A sign shall be provided on the door and shall be located above and within 12 inches (305 mm) of the door exit hardware:

6.1. For doors that swing in the direction of egress, the sign shall read:

PUSH UNTIL ALARM SOUNDS. DOOR CAN BE OPENED IN 15 [30] SECONDS.

6.2. For doors that swing in the opposite direction of egress, the sign shall read:

PULL UNTIL ALARM SOUNDS. DOOR CAN BE OPENED IN 15 [30] SECONDS.

6.3. The sign shall comply with the visual character requirements in ICC A117.1.

Exception: Where *approved*, in Group I occupancies, the installation of a sign is not required where care recipients who, because of clinical needs, require restraint or containment as part of the function of the treatment area.

7. Emergency lighting shall be provided on the egress side of the door.

8. The delayed egress locking system units shall be *listed* in accordance with UL294.

Motion/Second/Approved – The request was granted. The proposed effective date of this rule is March 1, 2021 (earliest through RRC), unless the BCC assigns a delayed effective date (January 1, 2022).
Reason Given – The purpose of this amendment is to bring forward 2018 IFC/IBC wording for Delayed Egress doors which includes allowance for them to be used for Group E classrooms with an occupant load <50 and also an exception for courtrooms.
Fiscal Statement – This rule is anticipated to provide equivalent compliance with no net decrease/increase in cost. This rule is not expected to either have a substantial economic impact or increase local and state funds. A fiscal note has not been prepared.

2. Request from Kerry Sutton representing American Concrete Institute (ACI), Dave Tepke representing ACI Carolinas, Mark LeMay representing International Concrete Repair Institute (ICRI), Bill Brickey representing ICRI Carolinas Chapter, Keith Kesner representing CVM, and Tim Cook representing SKA Consulting Engineering to add the 2018 N.C. Existing Building Code, Section 606.1.1 and add a reference standard to Chapter 16.

606.1.1 Repairs to structural concrete. Repairs to structural concrete elements shall comply with ACI 562 and this code.
Exception: Where seismic design governs. ACI 562 shall not be used for evaluation and design.

Add new referenced standard to Chapter 16 as follows:
ACI 562-19: Code Requirements for Assessment, Repair, and Rehabilitation of Existing Concrete Structures ……. 606.1.1

Motion/Second/Approved – The request was granted. The proposed effective date of this rule is March 1, 2021 (earliest through RRC), unless the BCC assigns a delayed effective date (January 1, 2022).
Reason Given – The purpose of this amendment is to provide ACI 562-19 as a manual for repair of structural concrete.
Fiscal Statement – This rule is anticipated to provide equivalent compliance with a slight decrease in cost. This rule is not expected to either have a substantial economic impact or increase local and state funds. A fiscal note has not been prepared.

3. Request from Bridget Herring to amend the 2018 N.C. Residential Code, Section N1101.13.

N1101.13 (R401.2) Compliance

Projects shall comply with one of the following:

1. Section N1101.14 through N1104.

2. Section N1105 and the provisions of Section N1101.14 labeled "Mandatory."

3. An energy rating index (ERI) approach in Section N1106.

4. ~~North Carolina specific~~ REScheck keyed to the 2018 IECC shall be permitted to demonstrate compliance with this code. Envelope requirements may not be traded off against the use of high efficiency heating or cooling equipment. No tradeoff calculations are needed for required termite inspection and treatment gaps.

Motion/Second/Granted – The request was granted. The proposed effective date of this rule is March 1, 2021 (earliest through RRC), unless the BCC assigns a delayed effective date (January 1, 2022).

Reason Given – The purpose of this amendment is to replace an outdated REScheck and to bring the NCRC in line with the current NC Energy Conservation Code.

Fiscal Statement – This rule is anticipated to provide equivalent compliance with no net decrease/increase in cost. This rule is not expected to either have a substantial economic impact or increase local and state funds. A fiscal note has not been prepared.

4. Request from Robert Privott representing the NC Home Builders Association and Jeff Tiller to amend the 2018 N.C. Residential Code, Chapter 44.

Add new referenced standard to Chapter 44 as follows:

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 ……..…….N1102.4.6, Table N1106.2.1, Table N1106.2.2

Motion/Second/Granted – The request was granted. The proposed effective date of this rule is March 1, 2021 (earliest through RRC), unless the BCC assigns a delayed effective date (January 1, 2022).

Reason Given – The purpose of this amendment is to support an additional amendment that adds a definition for AIR-IMPERMIABLE INSULAITON.

Fiscal Statement – This rule is anticipated to provide equivalent compliance with no net decrease/increase in cost. This rule is not expected to either have a substantial economic impact or increase local and state funds. A fiscal note has not been prepared.

5. Request from Robert Privott representing N.C. Home Builders Association and Jeff Tiller to amend the 2018 N.C. Residential Code, Chapter 2 Definitions.

AIR-IMPERMEABLE INSULATION. An insulation having an air permanence equal to or less than 0.02 L/s-m2 at 75 Pa pressure differential tested according to ASTM E2178 or E283 at the thickness applied.

Motion/Second/Granted – The request was granted. The proposed effective date of this rule is March 1, 2021 (earliest through RRC), unless the BCC assigns a delayed effective date (January 1, 2022).

Reason Given – The purpose of this amendment is to support an additional amendment addressing spray foam insulation in attics.

Fiscal Statement – This rule is anticipated to provide equivalent compliance with no net decrease/increase in cost. This rule is not expected to either have a substantial economic impact or increase local and state funds. A fiscal note has not been prepared.

6. Request from Julius Ballanco representing JB Engineering and Code Consulting, P.C. to amend the 2018 Residential Code, Chapter 44

CHAPTER 44

REFERENCED STANDARDS

~~**ANCE**~~

~~UL/CSA/ANCE 60335-2-40—2012 Standard for Household and Similar Electrical Appliances, Part 2: Particular Requirements for Motor-compressors M1403.1~~

ASHRAE

~~34—2013~~2019 Designation and Safety Classification of Refrigerants …… M1411.1

CSA

CSA C22.2 No. 60335-2-40-2019 ~~UL/CSA/ANCE 60335-2-40—2012~~ Standard for Household and Similar Electrical Appliances, Part 2-40: Particular Requirements for Motor-compressors Electrical Heat Pumps, Air-Conditioners and Dehumidifiers - 3rd Edition …… M1402.1, M1403.1

UL

1995 – 2011~~2015~~ Heating and Cooling Equipment …….. M1402.1, M1403.1, M1407.1

~~UL/CSA/ANCE~~ 60335-2-40-~~2012~~ 2019 Standard for Household and Similar Electrical Appliances, Part 2-40: Particular Requirements for Motor-compressors Electrical Heat Pumps, Air-Conditioners and Dehumidifiers – 3rd Edition ……..……. M1402.1, M1403.1

Motion/Second/Granted – The request was granted. The proposed effective date of this rule is March 1, 2021 (earliest through RRC), unless the BCC assigns a delayed effective date (January 1, 2022).

Reason Given – The purpose of this amendment is to transition to standards that will be used by manufacturers.

Fiscal Statement – This rule is anticipated to provide equivalent compliance with no net decrease/increase in cost. This rule is not expected to either have a substantial economic impact or increase local and state funds. A fiscal note has not been prepared.

7. Request from Julius Ballanco representing JB Engineering and Code Consulting, P.C./Daikin U.S. to amend the 2018 Residential Code, Section M1402.1.

M1402.1 (918.1) General.
Oil-fired central furnaces shall conform to ANSI/UL 727. Electric furnaces shall conform to UL 1995 or UL/CSA 60335-2-40. Solid fuel furnaces shall be tested in accordance with UL 391.

Motion/Second/Granted – The request was granted. The proposed effective date of this rule is March 1, 2021 (earliest through RRC), unless the BCC assigns a delayed effective date (January 1, 2022).
Reason Given – The purpose of this amendment is to transition to standards that will be used by manufacturers.
Fiscal Statement – This rule is anticipated to provide equivalent compliance with no net decrease/increase in cost. This rule is not expected to either have a substantial economic impact or increase local and state funds. A fiscal note has not been prepared.

8. Request from Julius Ballanco representing JB Engineering and Code Consulting, P.C./Daikin U.S. to amend the 2018 Residential Code, Section M1403.1.

M1403.1 (918.2) Heat pumps. Electric heat pumps shall be listed and labeled in accordance with UL 1995 or UL/CSA~~/ANCE~~ 60335-2-40.

Motion/Second/Granted – The request was granted. The proposed effective date of this rule is March 1, 2021 (earliest through RRC), unless the BCC assigns a delayed effective date (January 1, 2022).
Reason Given – The purpose of this amendment is to transition to standards that will be used by manufacturers.
Fiscal Statement – This rule is anticipated to provide equivalent compliance with no net decrease/increase in cost. This rule is not expected to either have a substantial economic impact or increase local and state funds. A fiscal note has not been prepared.

9. Request from Julius Ballanco representing JB Engineering and Code Consulting, P.C./Daikin U.S. to amend the 2018 Mechanical Code, Chapter 15.

CHAPTER 15
REFERENCED STANDARDS

ASHRAE 15—~~2013~~2019 Safety Standard for Refrigeration Systems …….. 1101.6, 1105.8, 1108.1
ASHRAE 34—~~2013~~2019 Designation and Safety Classification of Refrigerants …… 202, 1102.2.1, 1103.1
CSA-C22.2 No. 60335-2-40-2019 Household And Similar Electrical Appliances - Safety - Part 2-40: Particular Requirements for Electrical Heat Pumps, Air-Conditioners and Dehumidifiers – 3rd Edition …… 908.1, 918.1, 918.2, 1101.2
UL 1995 – ~~2011~~ 2015 Heating and Cooling Equipment ……. 908.1, 911.1, 918.2, 1101.2
UL 60335-2-40-2019Household And Similar Electrical Appliances - Safety - Part 2-40: Particular Requirements for Electrical Heat Pumps, Air-Conditioners and Dehumidifiers – 3rd Edition …… 908.1, 918.1, 918.2, 1101.2

Motion/Second/Granted – The request was granted. The proposed effective date of this rule is March 1, 2021 (earliest through RRC), unless the BCC assigns a delayed effective date (January 1, 2022).
Reason Given – The purpose of this amendment is to transition to standards that will be used by manufacturers.
Fiscal Statement – This rule is anticipated to provide equivalent compliance with no net decrease/increase in cost. This rule is not expected to either have a substantial economic impact or increase local and state funds. A fiscal note has not been prepared.

10. Request from Julius Ballanco representing JB Engineering and Code Consulting, P.C./Daikin U.S. to amend the 2018 Mechanical Code, Section 908.1.

908.1 General.
A cooling tower used in conjunction with an air-conditioning appliance shall be installed in accordance with the manufacturer's instructions. Factory-built cooling towers shall be listed in accordance with UL 1995 or UL/CSA 60335-2-40.

Motion/Second/Granted – The request was granted. The proposed effective date of this rule is March 1, 2021 (earliest through RRC), unless the BCC assigns a delayed effective date (January 1, 2022).
Reason Given – The purpose of this amendment is to transition to standards that will be used by manufacturers.

Fiscal Statement – This rule is anticipated to provide equivalent compliance with no net decrease/increase in cost. This rule is not expected to either have a substantial economic impact or increase local and state funds. A fiscal note has not been prepared.

11. Request from Julius Ballanco representing JB Engineering and Code Consulting, P.C./Daikin U.S. to amend the 2018 Mechanical Code, Sections 918.1 and 918.2

918.1 Forced-air furnaces.

Oil-fired furnaces shall be tested in accordance with UL 727. Electric furnaces shall be tested in accordance with UL 1995 or UL/CSA 60335-2-40. Solid fuel furnaces shall be tested in accordance with UL 391. Forced-air furnaces shall be installed in accordance with the listings and the manufacturer's instructions.

918.2 Heat pumps.

Electric heat pumps shall be tested in accordance with UL 1995 or UL/CSA 60335-2-40.

Motion/Second/Granted – The request was granted. The proposed effective date of this rule is March 1, 2021 (earliest through RRC), unless the BCC assigns a delayed effective date (January 1, 2022).

Reason Given – The purpose of this amendment is to transition to standards that will be used by manufacturers.

Fiscal Statement – This rule is anticipated to provide equivalent compliance with no net decrease/increase in cost. This rule is not expected to either have a substantial economic impact or increase local and state funds. A fiscal note has not been prepared.

12. Request from Julius Ballanco representing JB Engineering and Code Consulting, P.C./Daikin U.S. to amend the 2018 Mechanical Code, Section 1101.2.

1101.2 Factory-built equipment and appliances.

Listed and labeled self-contained, factory-built equipment and appliances shall be tested in accordance with UL 207, 412, 471, ~~or~~ 1995 or UL/CSA 60335-2-40. Such equipment and appliances are deemed to meet the design, manufacture and factory test requirements of this code if installed in accordance with their listing and the manufacturer's instructions.

Motion/Second/Granted – The request was granted. The proposed effective date of this rule is March 1, 2021 (earliest through RRC), unless the BCC assigns a delayed effective date (January 1, 2022).

Reason Given – The purpose of this amendment is to transition to standards that will be used by manufacturers.

Fiscal Statement – This rule is anticipated to provide equivalent compliance with no net decrease/increase in cost. This rule is not expected to either have a substantial economic impact or increase local and state funds. A fiscal note has not been prepared.

13. Request from Robert Privott representing N.C. Home Builders Association and Jeff Tiller to amend the 2018 Energy Code, Section R406.2.

R406.2 Mandatory requirements.

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. T~~able 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[b] U-FACTOR	GLAZED FENESTRATION SHGC[b,k]	CEILING[m]	UNVENTED[p] RAFTER ASSEMBLIES IN ATTICS CONTAINING DUCTWORK, AIR-IMPERMEABLE	UNVENTED[p] RAFTER ASSEMBLIES IN ATTICS CONTAINING DUCTWORK, AIR-PERMIABLE/ IMPERMEABLE	WOOD FRAME WALL	MASS WALL[l]	FLOOR	BASEMENT[c,o] WALL	SLAB[d]	CRAWL SPACE[c] WALL
3	0.35	0.65	0.3	30	20	15-10[q]	13	5/10	19	10/13[f]	0	5/13
4	0.35	0.6	0.3	38 or 30ci[l]	20	15-10[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 nominal 2 × 6 framing cavity is deemed to comply. Fiberglass batts rated R-19 or higher compressed and installed in a 2x4 wall ~~is~~ 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. Exposed rafters shall be covered with R-7 insulation.

q. The value for air-permeable insulation is shown first and that for air-impermeable insulation second. Thus, R-15 + R-10 indicates that the minimum value for air-permeable insulation is R-15, and the minimum value for air-impermeable insulation is R-10. 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. Exposed rafters shall be covered with R-7 insulation.

TABLE R406.2.2

EQUIVALENT U-FACTORS FOR TABLE R406.2.1

CLIMATE ZONE	FENESTRA-TION[d]	SKYLIGHT	CEILING	UNVENTED [e] RAFTER ASSEMBLIES IN ATTICS CONTAINING DUCTWORK, AIR-IMPERMEABLE	UNVENTED [e] RAFTER ASSEMBLIES IN ATTICS CONTAINING DUCTWORK, AIR-PERMIABLE/ IMPERMEABLE	FRAME WALL	MASS WALL [b]	FLOOR	BASE-MENT [d] WALL	CRAWL SPACE[c] WALL
3	0.35	0.65	0.0350	0.05	0.043[f]	0.082	0.141	0.047	0.059	0.136
4	0.35	0.60	0.0300	0.05	0.043[f]	0.077	0.141	0.047	0.059	0.065
5	0.35	0.60	0.0300	0.037	0.034[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 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.

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. Exposed rafters shall be covered with R-7 insulation.

f. For air-permeable/ impermeable applications, Table R406.2.1 shall be followed for minimum insulation values.

Motion/Second/Granted – The request was granted. The proposed effective date of this rule is March 1, 2021 (earliest through RRC), unless the BCC assigns a delayed effective date (January 1, 2022).

Reason Given – The purpose of this amendment is to provide specific insulation requirements for spray foam used in attics of residential construction using the Energy Rating Index compliance method

Fiscal Statement – This rule is anticipated to provide a net initial increase in cost with a net savings over the life of a building. This rule is not expected to either have a substantial economic impact or increase local and state funds. A fiscal note has been prepared and can be viewed at: https://www.ncosfm.gov/codes/building-code-council-bcc/bcc-hearing-notices

14. Request from Robert Privott representing N.C. Home Builders Association and Jeff Tiller to add the 2018 N.C. Energy Code, Chapter 2 Definitions.

AIR-IMPERMEABLE INSULATION. An insulation having an air permanence equal to or less than 0.02 L/s-m2 at 75 Pa pressure differential tested according to ASTM E2178 or E283 at the thickness applied.

Motion/Second/Granted – The request was granted. The proposed effective date of this rule is March 1, 2021 (earliest through RRC), unless the BCC assigns a delayed effective date (January 1, 2022).

Reason Given – The purpose of this amendment is to support an additional amendment addressing spray foam insulation in attics.

Fiscal Statement – This rule is anticipated to provide equivalent compliance with no net decrease/increase in cost. This rule is not expected to either have a substantial economic impact or increase local and state funds. A fiscal note has not been prepared.

15. Request from Robert Privott representing N.C. Home Builders Association and Jeff Tiller to amend the 2018 N.C. Residential Code, Section N1106.2 Mandatory Requirements.

N1106.2 Mandatory requirements.

Compliance with this section requires that the provisions identified in Sections N1101 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 402.2.3 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 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[b] U-FACTOR	GLAZED FENESTRATION SHGC[b,k]	CEILING[m]	UNVENTED[p] RAFTER ASSEMBLIES IN ATTICS CONTAINING DUCTWORK, AIR-IMPERMEABLE	UNVENTED[p] RAFTER ASSEMBLIES IN ATTICS CONTAINING DUCTWORK, AIR-PERMIABLE/ IMPERMEABLE	WOOD FRAME WALL	MASS WALL[l]	FLOOR	BASEMENT[c,o] WALL	SLAB[d]	CRAWL SPACE[c] WALL
3	0.35	0.65	0.3	30	20	15-10[q]	13	5/10	19	10/13[f]	0	5/13
4	0.35	0.6	0.3	38 or 30ci[l]	20	15-10[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 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 nominal 2 × 6 framing cavity is deemed to comply. Fiberglass batts rated R-19 or higher compressed and installed in a 2x4 wall ~~is~~ 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. Exposed rafters shall be covered with R-7 insulation.

q. The value for air-permeable insulation is shown first and that for air-impermeable insulation second. Thus, R-15 + R-10 indicates that the minimum value for air-permeable insulation is R-15, and the minimum value for air-impermeable insulation is R-10. 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. Exposed rafters shall be covered with R-7 insulation.

TABLE N1106.2.2

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

CLIMATE ZONE	FENESTRA-TION[d]	SKYLIGHT	CEILING	UNVENTED[e] RAFTER ASSEMBLIES IN ATTICS CONTAINING DUCTWORK, AIR-IMPERMEABLE	UNVENTED[e] RAFTER ASSEMBLIES IN ATTICS CONTAINING DUCTWORK, AIR-PERMIABLE/ IMPERMEABLE	FRAME WALL	MASS WALL[b]	FLOOR	BASE-MENT[d] WALL	CRAWL SPACE[c] WALL
3	0.35	0.65	0.0350	0.05	0.043[f]	0.082	0.141	0.047	0.059	0.136
4	0.35	0.60	0.0300	0.05	0.043[f]	0.077	0.141	0.047	0.059	0.065
5	0.35	0.60	0.0300	0.037	0.034[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 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.

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. Exposed rafters shall be covered with R-7 insulation.

f. For air-permeable/ impermeable applications, Table N1106.2.1 shall be followed for minimum insulation values.

Motion/Second/Granted – The request was granted. The proposed effective date of this rule is March 1, 2021 (earliest through RRC), unless the BCC assigns a delayed effective date (January 1, 2022).

Reason Given – The purpose of this amendment is to provide specific insulation requirements for spray foam used in attics of residential construction using the Energy Rating Index compliance method

Fiscal Statement – This rule is anticipated to provide a net initial increase in cost with a net savings over the life of a building. This rule is not expected to either have a substantial economic impact or increase

local and state funds. A fiscal note has been prepared and can be viewed at:
https://www.ncosfm.gov/codes/building-code-council-bcc/bcc-hearing-notices

NOTICE:

Appeals and Interpretations *of the North Carolina State Building Codes are published online at the following link.*

https://www.ncosfm.gov/codes/codes-current-and-past

NOTICE:

Objections and Legislative Review *requests may be made to the NC Office of Administrative Hearings in accordance with G.S. 150B-21.3(b2) after Rules are adopted by the Building Code Council.*

http://www.ncoah.com/rules/