



APPENDIX C CODE CHANGE PROPOSAL NORTH CAROLINA BUILDING CODE COUNCIL

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Petition for Rule Making

Item Number _____

Granted by BCC _____
Denied by BCC _____

Adopted by BCC _____
Disapproved by BCC _____

Approved by RRC _____
Objection by RRC _____

PROPONENT: Ben Edwards _____ PHONE: (828)351-9631
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North Carolina State Building Code, Volume NCRC and NCECC 2018_ - Section Multiple see note_

CHECK ONE: Revise section to read as follows: Delete section and substitute the following:
 Add new section to read as follows: Delete section without substitution:

LINE THROUGH MATERIAL TO BE DELETED

UNDERLINE MATERIAL TO BE ADDED

This is an omnibus change proposal to update rated energy compliance using the new ANSI/RESNET/ICC Standard 301-2019 in all sections affected and to maintain code coordination and usability: NCRC N1106.2 (NCECC R406.2); NCRC N1106.3 (NCECC R406.3); NCRC N1106.6.1 (NCECC R406.6.1); NCRC N1106.7.1 (NCECC R406.7.1); NCRC Chapter 44 (NCECC Chapter 6) Referenced Standards
(See attached)

Will this proposal change the cost of construction? Decrease Increase No *
Will this proposal increase to the cost of a dwelling by \$80 or more? Yes No *
Will this proposal affect the Local or State funds? Local State No *
Will this proposal cause a substantial economic impact (≥\$1,000,000)? Yes No *

- Non-Substantial – Provide an economic analysis including benefit/cost estimates.
- Substantial – The economic analysis must also include 2-alternatives, time value of money and risk analysis.
- Pursuant to §143-138(a1)(2) a cost-benefit analysis is required for all proposed amendments to the NC Energy Conservation Code. The Building Code Council shall also require same for the NC Residential Code, Chapter 11.

REASON:

This proposal is an opportunity for the Council to integrate the new ANSI/RESNET/ICC 301-2019 standard. This reconciliation is not simple, but it is urgent. (See attached and <https://www.resnet.us/articles/ansiresneticc-301-2019-and-ansiresneticc-380-2019-are-resnet-and-ansi-approved/>)

Signature:  Date: 01/27/2021 _____

BCC CODE CHANGES
FORM 11/26/19

Attachment to Edwards 301-2019 Update Proposal

Summary/Reason: To ensure builders, raters, building owners, and code officials are protected, the Building Code Council must consider the new 301-2019 standard properly, including, but not limited to, changes in scope, ventilation, and water distribution. Currently, in the national model code, IECC 2021, the ERI score does not align with a RESNET 301-2019 HERS score, creating conflicts, delays, and additional cost of construction, if implemented as written. An adopted, but flawed proposal at NC BCC worsens the problem, creating an unenforceable and unusable compliance path. The framework proposed here allows NC BCC to develop further the needed language for resolving these issues, so our designers and builders will have access to the new rating standard. Due to potential changes to this proposal in committee, the existing requirements, and the final the cost analysis, this *will not* be a quick fix, so it must be started immediately. Note that additional commentary is included with the proposed changes in **an alternate font**. Only marked language is changed.

The new 301-2019 can be found at:

http://www.resnet.us/wp-content/uploads/archive/resblog/2019/01/ANSIRESNETICC301-2019_vf1.23.19.pdf

Though the cutoff date has been extended to April 1, 2021, HERS (not ERI) raters will be prohibited from using the 2014 version of the standard going forward. This update needs to be done correctly to maintain continuity in the residential construction sector.

Cost Analysis: At present, failure to update and reference Standard 301 properly will cause confusion, delays, and possible litigation, with unknowable added costs to residential construction in North Carolina. In continuing coordination with RESNET, the NC BCC Energy Committee will determine what additional language is needed to reconcile a HERS rating (what most builders get) with an ERI compliance rating (currently a different index). There are additional changes in the 2019 version of Standard 301 that affect construction and operation costs. These will inform the final cost analysis, as determined by Committee decisions. At present, unmodified, this proposal is estimated to provide net-savings on all R-occupancies, according to the professional judgement of the proponent and RESNET members who developed the new version. Note that this proposal does not add cost above an existing rating. Again, Committee action likely will affect the final cost analysis more than the currently proposed changes in the standard.

The cost statement from DOI staff – that the previous analysis of Energy Rating Index compliance using ANSI/RESNET/ICC 301-2014 (with Appendix B-2015) is sufficient – is technically flawed, but was allowed for the previous ERI proposal noted above (NC Register 35:04, pg. 342, #20). It is being used here as the standing interpretation until overturned. The fiscal statement for this proposal is:

“A detailed fiscal note and analysis was provided when The NC Building Code Council adopted the ERI path and thereby the ANSI/RESNET/ICC 301 Standard for the Calculation and Labeling of Energy Performance of Low-Rise Residential Buildings using an Energy Rating Index into the code. Both the 2018 NC Residential and Energy Conservation Code already permit 1 and 2 family dwellings to demonstrate compliance through the Energy Rating Index (ERI) path using ANSI/RESNET/ICC 301. The target ERI scores that have been proposed are consistent with those currently in place in NC. The same software that is currently being used when the ERI path is chosen can still be used when selecting this independent path of using ANSI/RESNET/ICC 301. Therefore, adopting the standard with the same prescribed ERI target numbers as a stand-alone compliance path, would not increase the cost of construction or implementation.” - NC DOI staff, *re* D-23, Privott, 2020

As such, at this time relative to the existing code and the technically incorrect standing interpretation this proposal does not (1) change the cost of construction, (2) increase to the cost of a dwelling by \$80 or more, or (3) cause a substantial economic impact, though the proponent disagrees with this standing interpretation.

Proposed Changes:

NCRC N1106.2 (NCECC R406.2)

[...] The building thermal envelope shall be greater than or equal to the efficiency and Solar Heat Gain Coefficient components shall have performance characteristics equal to or better than the requirements in [...] 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” ANSI/RESNET/ICC 301-2019 Standard for the Calculation and Labeling of the Energy Performance of Dwelling and Sleeping Units using an Energy Rating Index. [...]

There are 2 changes: (1) The existing “greater than” language is correct only for R-values, not U-factors and SHGCs also in the tables; the proposed language is intended to add clarity only. (2) The updated standard is referenced with its full designation and title.

NCRC N1106.3 (NCECC R406.3)

The Energy Rating Index (ERI) shall be a numerical integer [...] and a *residential building or dwelling unit* that uses [...] The ERI shall consider all energy used in the *residential building or dwelling unit*.

The new version of Standard 301 specifically does not provide whole-building ratings, only for *dwelling units*. If a *dwelling unit* is a single-family home, the rating functionally would be for the whole *residential building*. This change in scope should be discussed by the Energy Committee and full Council.

NCRC N1106.6.1 (NCECC R406.6.1)

Compliance software tools for this section shall be in compliance with ANSI RESNET ICC 301-2014 approved and capable of calculating the ERI as described in Section 406.3 (N1106.3) and capable of the following:

1. Automatic generation of the *ERI reference design* using only the input for the *rated design*, with no ability for the user to modify the *ERI reference design* characteristics directly.
2. 8,760-hour annual simulation with hourly schedules for occupancy, lighting power, equipment power, and thermostat setpoints.
3. Sizing equipment in accordance with Section 403.7 (N1103.7), modeling at least 10 thermal zones, thermal mass effects, and corrections for HVAC part-load performance, efficiency, and capacity.
4. Creating lists of component characteristics and performance ratings for the *ERI reference* and *rated designs*.

Neither the ICC nor RESNET regulates ERI software. The changes above are an attempt to simplify the full list of requirements needed to perform a HERS/ERI calculation. The requirements reflect ASHRAE 90.2 Normative Appendix A – a standard that uses 301 as the calculation engine for residential ratings – and the current state of RESNET’s efforts to standardize ratings.

NCRC N1106.7.1 (NCECC R406.7.1)

These requirements have been combined with the section above and updated for the new standard.

NCRC Chapter 44 (NCECC Chapter 6) Referenced Standards

Residential Energy Services Network, Inc. (RESNET)

4867 Patina Court

Oceanside, CA 92057

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 ANSI/RESNET/ICC 301-2019 Standard for the Calculation and Labeling of the Energy Performance of Dwelling and Sleeping Units using an Energy Rating Index - including ANSI/RESNET/ICC 301-2019 Addendum A-2019 and Addendum B-2020. [...]

Text not shown is unchanged.

N1106 Amendment Language

N1106.2 (R406.2) Scope.

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 components shall have performance characteristics equal to or better than the requirements in Table 402.1.1 or Table 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*~~ ANSI/RESNET/ICC 301-2019 *Standard for the Calculation and Labeling of the Energy Performance of Dwelling and Sleeping Units 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 a semi-conditioned space shall be insulated to a minimum R-4; return ducts inside conditioned and semi-conditioned spaces are not required to be insulated. Ducts located inside a conditioned space are not required to be insulated other than as may be necessary for preventing the formation of condensation on the exterior or cooling ducts.

N1106.3 (R406.3) Energy rating index.

The Energy Rating Index (ERI) shall be a numerical integer value that is based on a linear scale constructed such that *ERI reference design* has an Index value of 100 and a *residential building or dwelling unit* that uses no net purchased energy has an Index value of 0. Each integer value on the scale shall represent a 1 percent change in the total energy use of the rated design relative to the total energy use of the *ERI reference design*. The ERI shall consider all energy used in the *residential building or dwelling unit*.

N1106.6.1 (R406.6.1) Compliance software tools.

Compliance software tools for this section shall be ~~in compliance with ANSI RESNET ICC 301-2014~~ approved and capable of calculating the ERI as described in Section N1106.3 (406.3) and capable of the following:

1. Automatic generation of the *ERI reference design* using only the input for the *rated design*, with no ability for the user to modify the *ERI reference design* characteristics directly.
2. 8,760-hour annual simulation with hourly schedules for occupancy, lighting power, equipment power, and thermostat setpoints.
3. Sizing equipment in accordance with Section N1103.7 (403.7), modeling at least 10 thermal zones, thermal mass effects, and corrections for HVAC part-load performance, efficiency, and capacity.
4. Creating lists of component characteristics and performance ratings for the *ERI reference* and *rated designs*.

N1106.7.1 (R406.7.1) Minimum capabilities.

~~Calculation procedures used to comply with this section shall be software tools capable of calculating the ERI as described in Section N1106.3 and shall be in compliance with ANSI/RESNET/ICC 301, and the software shall include the following capabilities:~~

- ~~1. Computer generation of the *ERI reference design* using only the input for the *rated design*.
The calculation procedure shall not allow the user to directly modify the building component characteristics of the *ERI reference design*.~~
- ~~2. Calculation of the whole building, as a single zone, sizing for the heating and cooling equipment in the *ERI reference design* residence in accordance with Section N1103.7.~~
- ~~3. Calculations that account for the effects of indoor and outdoor temperatures and part load ratios on the performance of heating, ventilating and air conditioning equipment based on climate and equipment sizing.~~
- ~~4. Printing code official inspection checklist listing each of the rated design component characteristics determined by the analysis to provide compliance, along with their respective performance ratings.~~

Chapter 44 (Chapter 6) Referenced Standards

Residential Energy Services Network, Inc. (RESNET)

4867 Patina Court

Oceanside, CA 92057

N1106 Amendment Language

~~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~~ ANSI/RESNET/ICC 301-2019 Standard for the Calculation and Labeling of the Energy Performance of Dwelling and Sleeping Units using an Energy Rating Index - including ANSI/RESNET/ICC 301-2019 Addendum A-2019 and Addendum B-2020.

~~N1106.2, N1106.6.1, N1106.7.1.~~