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Office of the State Fire Marshal - Engineering Division
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Options for Commercial Building Energy Code Compliance[i]

Code: 2018 Energy Conservation Code **Date:** Jan 13, 2020
Section: C401.2

Question:
What are my options for energy code compliance for commercial buildings[ii]?

Answer:
The code paths acceptable for conforming to the 2018 NC Energy Code is written in section C401.2. It is reprinted below for convenience. Following the reprint, there are clarifications on each item, including the reasons why a NC-Specific ComCheck is not available.

C401.2 Application. Commercial buildings shall comply with one of the following:

1. The requirements of ANSI/ASHRAE/IESNA 90.1-2013[iii]
2. The requirements of Sections C402 through C405. In addition, commercial buildings shall comply with Section C406 and tenant spaces shall comply with Section C406.1.1.
3. The requirements of Section s C402.5, C403.2, C404, C405.2, C405.3, C405.5, C405.6 and C407. The building energy cost shall be equal to or less than 85 percent of the standard reference design building.

And, although not numbered, the fourth option is:

North Carolina specific ComCheck or ASHRAE 90.1-2013 ComCheck shall be permitted to demonstrate compliance with this code.

Clarifications for Item #1
If this pathway is chosen, it must be followed for both the thermal envelope and the trade-related items such as mechanical, electrical, and service water heating. One ***cannot*** use the thermal envelope requirements of ASHRAE 90.1-2013 and then the trade-related items (mechanical, electrical, service water heating) of the 2018 NC Energy Code.

Clarifications for Item #2
Sections C402 – C405 are what is called the prescriptive path. This may be the easiest and most straightforward method of compliance. This pathway includes the R-factor Table of C402.1.3, and the U-Factor Table C402.1.4. These tables are set up for element-by-element requirements. If one wishes to perform trade-offs between elements and stay within the prescriptive pathway, Section C402.1.5 must be used.

Clarifications for Item #3

This is the computer simulation, or performance path. There are mandatory minimum requirements that need to be met, and the Table for the inputs is Table C407.5.1(1).

Clarifications for the Fourth, (unnumbered) item, North Carolina Specific ComCheck:
There is not going to be a NC-specific ComCheck developed by US DOE[iv] for the 2018 NC code cycle, and the 2012 ComCheck is no longer a valid option with the adoption of the 2018 Code. However, there is an ASHRAE 90.1-2013 ComCheck available, and it is a valid compliance path. When using the ASHRAE 90.1-2013 standard, the entire standard needs to be used, including the thermal envelope and the trades, such as mechanical, electrical, service water heating, etc.

Acceptable Alternate Methods[v]
Also, designers have asked if the use of 2015 IECC (Commercial) ComCheck is a valid alternate method. The answer is "yes". Although not quite as stringent as the code-prescribed ASHRAE 90.1-2013, research by PNNL[vi] showed it is within 1% of the results of the prescribed standard. When discussed with the Ad Hoc committee, the response was this is adequate. If using the 2015 IECC standard in ComCheck, the entire standard needs to be used, including the thermal envelope and the mechanical, electrical, service water heating requirements, etc.

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[i] The language in this interpretation is largely extracted from the February 19, 2019 Engineering Newsletter posted on the NC DOI website.

[ii] The code has various exceptions for certain buildings occupancies, refer to the written code for those exemptions. Some buildings are exempt by Statute; refer to the building code statute for those possible exceptions. NCGS 143-138. This interpretation is not an all-inclusive list of all possible pathways of code compliance.

[iii]The year is not shown in the first item in the code book; it is the 2013 version

[iv] Federal Register link concerning ResCheck and ComCheck priorities:
https://www.govinfo.gov/content/pkg/FR-2014-03-18/pdf/2014-05952.pdf

[v] These pathways were vetted by the ad hoc committee, and deemed acceptable. They should be accepted as alternate methods.

[vi] Excerpt from PNNL
https://www.pnnl.gov/main/publications/external/technical_reports/PNNL-24269Rev1.pdf

On a national average basis for all prototypes combined, the 2015 IECC and Standard 90.1-2013 are within 1% for both energy use and energy costs. The 2015 IECC has a national weighted EUI of 54.5 B.3 kBtu/ft²-yr while the corresponding number for Standard 90.1-2013 is 54.1 kBtu/ft²-yr. Likewise, the ECIs are very close between the 2015 IECC (1.31 $/ft²-yr) and Standard 90.1-2013 (1.30 $/ft²-yr).