

Commercial Energy Code

Where should the U-factor for windows come from?

NCBPA Question: The current code does not list where the U-factor for window should come from. Some windows list the u-factor from the Manufacturer and from NFRC. A lot of manufacturer's data is based on the U-factor of the glazing, not the glazing and the window frame. Which will the code official be checking? Refer to C303.1.3 . Also refer to the definitions for Fenestration, Field -Fabricated, and also Fenestration, Site-Built. Also, the U-factor definition does not list if the U-factor must be calculated with the frame system selected for code compliance with table C402.4.

NCDOI Response: It is with the frame. Are you seeing this for “packaged windows” (frame is shipped with it) or is this more the case for Site-Built or Field Fabricated fenestration? **(NCBPA Response: Packaged windows with two different U-factors listed on the label)** I can see why a glass manufacturer would just give a value for their glazing because they may not know the overall assembly it is going in to. If they do not have all the data, Section C303.1.3 requires the use of default tables C303.1.3() or C303.1.3(2).

NCBPA Recommendation: Use the U-factor label found on the window frame that give the U-factor for the entire window assembly evaluating the glazing and the frame components together in accordance with NFRC.

When is commissioning required for HVAC replacements?

NCBPA Question: Is commissioning on commercial projects required when only a partial system HVAC is replaced or part of the duct work replaced? Or just entirely new HVAC systems? What about changing out controls do they have to be commissioned?

NCDOI Response: See “Follow-up Question #2” in this [published web interpretation](#).

- “If the space being altered exceeds 10,000 SF, the systems within said space being altered are required to meet the requirements of C408.1. It is understood there may be systems that are unaffected in an alteration; those items can be so noted. If the space being altered is less than 10,000 SF, then the commissioning requirements of C408.1 are not invoked by code.”

NCBPA Recommendation: Refer to square footage requirements above for when commissioning is required during HVAC replacements.

Existing Building Siding Replacement and Continuous Insulation

NCBPA Question: If an existing building with siding is having the siding replaced and the exterior wall system is exposed to identify that no continuous insulation is installed, will the building code require that continuous insulation is added prior to replacing the exterior siding?

NCDOI Response: No, assuming the wall was compliant with the code under which it was built.

NCBPA Recommendation: Continuous insulation is not required to be added prior to replacing the exterior siding during a renovation.

Change in Occupancy Clarification

NCBPA Question: C500.1 states:

**SECTION C505
CHANGE OF OCCUPANCY OR USE**

C505.1 General. New work performed in spaces undergoing a change in occupancy shall comply with the requirements of this code. Unaltered portions of the existing building or building supply system shall not be required to comply with this code.

Please provide an interpretation for this section as multiple jurisdictions and code officials are requiring updates to existing systems and component to meet the new energy requirements for projects that are not planning to alter.

This issue was brought up in several of the classes (Raleigh, Charlotte and Wilmington). Several architects mentioned that the jurisdictions do not always have documentation on the occupancy of a building. One example is if a building is sold in an older area of town (i.e. old warehouse but renovation work was done by the previous owner) and was previously used as a restaurant, but the building code jurisdiction does not have permits or drawings on file any longer for that building (over 7 years in Charlotte) the architects have been told that any work in said restaurant would be

considered change of occupancy and subject to the energy code for the entire building. The example from the Wilmington class was the same issue but with an office space and the code jurisdiction said they had no record of what the previous occupancy had been.

NCDOI Response: This is an administrative/training issue. In almost every situation I have dealt with, the root issue here is there was work done without a permit, so the occupancy classification on the tax records is what they have to go by and not what the building may look like it last use was. I don't think that gets affected by the records retention law. When work was done without permits, it really becomes a legal issue, and the jurisdictions has to consider the legal ramifications of this situation.

When you say “..subject to the energy code for the entire building..” I like your choice of words, because there is a huge difference between “..subject to..” which includes all the exceptions and allowances of the existing building code, and saying “must comply with everything in the book”.

Subject to.. sounds harsh, but it really is the proper wording I believe, because it is very broad and certainly allows the exceptions and allowances available, especially in existing buildings.

NCBPA Recommendation: Incorporate this topic into training materials with code officials, architects and others.

F, S and U Exemptions Originated in 2017's SB131

NCBPA Question: Does this exemption mean that no version of the NCECC is required at all, or does it mean that only the 2012 NCECC and new codes going forward are exempted, meaning that the 2009 NCECC would be required as a backstop for these types of buildings?

- 101.2 Scope. This code applies to residential and commercial buildings. Exception: Per G.S. 143-138 (b18), no energy conservation code provisions shall apply to any structure for which the primary occupancy classification is Group F, S, or U pursuant to Chapter 3 of the 2012 North Carolina Building Code. This exclusion shall apply to the entire building area.
- NCDOI's original interpretation is [here](#).

NCDOI Response: My interpretation is that our NC code language (C101.2, Exception 2), that was written to carry out the statute language (G.S. 143-138 (b18)), does not have any backstops in it. Similar, but prior legislation (HB 201) that addressed the energy code for existing buildings under the 2012 code exempted the requirements of the 2012 code, but required them to use the code that was in effect prior to the 2012 code. In that situation, it was clear that the statute was using the 2009 code as the backstop. However, I don't see the same requirement for SB 131, so I am left with reading the code language as not requiring any backstop for building occupancies exempted in C101.2, Exception 2. The requirements, if any, are to be determined by the owner/permit holder/design professional.

C101.2 Scope. This code applies to *commercial buildings* and the buildings' sites and associated systems and equipment.

Exceptions:

1. Energy expended in support of *process energy* applications does not invoke energy conservation code requirements or building thermal envelope requirements unless otherwise required in specific sections of this code.
2. Per N.C.G.S. 143-138 (b18), **no energy conservation code provisions shall apply** to any structure for which the primary occupancy classification is Group F, S, or U pursuant to Chapter 3 of the 2018 *North Carolina Building Code*. This exclusion shall apply to the entire building area.

NCBPA Recommendation: There are NO energy code requirements at all for F, S and U buildings, unless the owner, permit holder or design professional requires compliance with the energy code.

Residential Energy Code

Is there a renewable energy sizing minimum for the ERI table?

NCBPA Question: For the residential code Energy Rating Index tables, should the “with renewables” table be used for a home with any size of approved renewable energy system connected to the utility service? Or, is there a minimum size required?

NCDOI Response: This is North Carolina Specific, so I cannot rely on any commentary. I am going to say it applies to any size of renewable energy system. Obviously there are situations where it is just not worth taking credit for the system, as it would put you into the harder-to-reach category. I checked the 2018 ICC language and they use the same table, but still have stipulations in the footnote “a” that are similar to what we have. I could dig through the ad hoc committees notes to see what their rationale was.

NCBPA Recommendation: Any size of renewable energy system used on a new home requires use of the Renewables table for ERI values.

MAXIMUM ENERGY RATING INDEX Without calculation of on-site renewable energy

Climate Zone	Jan 1, 2019 – Dec 31, 2022	Jan 1, 2023 and forward
3	65	61
4	67	63
5	67	63

MAXIMUM ENERGY RATING INDEX Including calculation of on-site renewable energy

Climate Zone	Jan 1, 2019 – Dec 31, 2022	Jan 1, 2023 and forward
3	51	47
4	54	50
5	55	51

2018 ICC

TABLE R406.4
MAXIMUM ENERGY RATING INDEX

CLIMATE ZONE	ENERGY RATING INDEX ^a
1	57
2	57
3	57
4	62
5	61
6	61
7	58
8	58

^aWhere on-site renewable energy is included for compliance using the ERI analysis of Section R406.4, the building shall meet the mandatory requirements of Section R406.2, and the building thermal envelope shall be greater than or equal to the levels of efficiency and SHGC in Table R402.1.2 or Table R402.1.4 of the 2015 International Energy Conservation Code.

What are the taping and sheathing requirements of a zip wall system?

NCBPA Question: Clarification requested for the residential thermal envelope requirements R402.4.1 exemption 2. “wall sheathing joints where wall sheathing is fully glued to framing.” Does this include the zip wall system where the seams are taped?

- R402.4.1 Item 5: Seal exterior house wrap material joints and seams in accordance with manufacturer’s instructions or, if house wrap joints are not sealed, seal exterior sheathing and exposed band joist joints including perimeter joints and edges of these materials. Exceptions:
 - Spray foam in building thermal envelope wall systems.
 - Wall sheathing joints where wall sheathing is fully glued to framing.

NCDOI Response: It does not meet Exception 2, but it meets the main sentence in R402.4.1 Item 5. The Exceptions 1 and 2 apply to Item 5.

NCBPA Recommendation: Zip wall system with tape meets the requirements of Item 5.

Roles of the Registered Design Professional and a HERS Rater for Compliance Paths

NCBPA Question: What are the related roles of the Registered Design Professional and a HERS Rater for each of the performance-based compliance paths?

NCDOI Response:

- My understanding is Section 405 requires a registered design professional. This could be either a Registered Architect or Professional Engineer, provided that they are trained and competent within their field. Licensed professionals can have other people doing work, but they must be under the licensee’s responsible charge. I’d defer to the Licensing boards to define that, but of course it is not supposed to be a rubber stamp.
- In the case of the ERI method, the Engineering licensing Board did rule that a professional engineer was not required to do the analysis. This same question was not asked of the Section 405 method.
- In our administrative Code, section 204.3.5 addresses when a design professional is required. Under this section, there is a long list of exceptions. Questions concerning this could be addressed to the respective boards.

NCBPA Recommendation: The [Section 405 “Simulated Performance Alternative” pathway](#) requires a Registered Design Professional to perform the analysis as required by North Carolina licensure laws. The Registered Design Professional can be a Registered Architect or Professional Engineer, provided that they are trained and competent within their field. Licensed professionals can have other people, such as HERS Raters, performing the analysis on their behalf. If they do so, the HERS Rater must be working under the licensee’s responsible charge and obtain proper signatures/stamps for compliance verification of the section 405 method. This method is currently used in cases where insulation or other measures do not meet the UA Compliance method.

The [Section 406 Energy Rating Index \(ERI\) compliance pathway](#) does not require a Registered Design Professional, by rule of the Engineering Licensing Board. Certified HERS Raters in good standing are able to perform this pathway.

204.3.5.1 Registered design professional. The registered design professional shall be a registered architect, licensed professional engineer or NICET Level III sprinkler designer legally registered or licensed under the laws of this state.

NCBPA Action Item: NCBPA to ask the North Carolina Board of Architecture and North Carolina Board of Examiners for Engineers and Land Surveyors for a new exception in Section 402.3.5 that allows HERS Raters to perform this analysis without the oversight of a Registered Architect or Professional Engineer.