



# Building Standards and Codes

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## TECHNICAL BULLETIN

**Code Effective Date:** October 3, 2016

**Source Document:** 19NYCRR 1240—State Energy Conservation Construction Code<sup>1</sup>

**Topic:** Section C402 Building Envelope Requirements, C402.2.2 Roof assembly.

This document provides clarification of the requirements of the State Energy Conservation Construction Code as it pertains to sloped roof insulation and the reduction in roof insulation thickness to accommodate roof appurtenances in flat and low sloped roofs of Commercial Buildings. Several questions have arisen related to the application of Section C402.2.2 of the 2015 International Energy Conservation Code (2015 IECC), which allows some exceptions for when the insulation thickness varies 1 inch or less. It is commonly misunderstood that because of this code section, any variation of thickness greater than 1 inch does not meet the Code. This is not true due to other available compliance options, which are outlined below.

### **Background:**

The State Energy Conservation Construction Code contains several different paths to show compliance with the code. 19 NYCRR §1240.4 (a) states in part: *“Except as otherwise provided in section 1240.6 of this Part, the construction of all new commercial buildings; all additions to, alterations of, and/or renovations of existing commercial buildings; and all additions to, alterations of, and/or renovations of building systems in existing commercial buildings shall comply with the requirements of the 2015 IECC commercial provisions (as amended).”* Section C101.5 below outlines the various compliance paths contained within the 2015 IECC.

### **Applicable Code Sections:**

Sections C101.5 and C101.5.1 of Chapter 1 of the 2015 IECC as amended by Part 1, Item 1.5 of the 2016 Supplement to the New York State Energy Conservation Construction Code state:

**C101.5 Compliance.** Residential buildings shall meet the 2015 IECC Residential Provisions (as amended<sup>2</sup>). Commercial buildings shall meet the 2015 IECC Commercial Provisions (as amended). To the extent permitted by the 2015 IECC Commercial Provisions (as amended), commercial buildings may comply with ASHRAE 90.1-2013 (as amended) in lieu of complying with the 2015 IECC Commercial Provisions (as amended).

**C101.5.1 Compliance software.** Compliance with the 2015 IECC Commercial Provisions (as amended) or, if applicable, with ASHRAE 90.1-2013 (as amended) can be demonstrated through the use of:

<sup>1</sup> The 2015 International Energy Conservation Code (second printing: May 2015) (2015 IECC), the 2016 Supplement to the New York State Energy Conservation Construction Code (revised August 2016) and ANSI/ASHRAE/IES Standard 90.1-2013, *Energy Standard for Buildings Except Low-Rise Residential Buildings* (July 2014 printing) (ASHRAE 90.1-2013), are all publications incorporated by reference in 19 NYCRR Part 1240.

<sup>2</sup> “as amended” is defined as “as amended by the 2016 Supplement to the New York State Energy Conservation Construction Code”.

- (1) computer software that is developed by the United States Department of Energy (such as COMcheck) specifically for the 2015 IECC Commercial Provisions (as amended) or, if applicable, specifically for ASHRAE 90.1- 2013 (as amended), or
- (2) other software that shall have been expressly approved in writing by the New York Secretary of State as acceptable for demonstrating compliance with the 2015 IECC Commercial Provisions (as amended) or, if applicable, for demonstrating compliance with ASHRAE 90.1-2013 (as amended).

Section C401.2 of the 2015 IECC states:

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

1. The requirements of ANSI/ASHRAE/IESNA 90.1.
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 Sections C402.5, C403.2, C404, C405.2, C405.3, C405.4, C405.6 and C407. The building energy cost shall be equal to or less than 85 percent of the standard reference design building.

Section C402.1 of the 2015 IECC states in part:

C402.1 General (Prescriptive). Building thermal envelope assemblies for buildings that are intended to comply with the code on a prescriptive basis, in accordance with the compliance path described in Item 2 of Section C401.2, shall comply with the following:

1. The opaque portions of the building thermal envelope shall comply with the specific insulation requirements of Section C402.2 and the thermal requirements of either the *R*-value-based method of Section C402.1.3; the *U*-, *C* and *F*-factor-based method of Section C402.1.4; or the component performance alternative of Section C402.1.5.
2. Roof solar reflectance and thermal emittance shall comply with Section C402.3.
3. Fenestration in building envelope assemblies shall comply with Section C402.4.
4. Air leakage of building envelope assemblies shall comply with Section C402.5.

**Discussion/Conclusion:**

The 2015 IECC, Section C402.1(1) points to the specific requirements of C402.2 and the thermal requirements of EITHER;

- C402.1.3 Insulation component R-value-based method **OR**
- C402.1.4 Assembly U-factor, C-factor, or F-factor-based method **OR**
- the component performance alternative of Section C402.1.5.

Although C402.1(1) directs you to C402.2 no matter which thermal requirement method is chosen, only the specific requirements of C402.2 as they apply to each thermal requirement method are required. The requirements of C402.2.2 Roof Assembly are specific to the R-value method only, and are therefore not applicable to all the methods noted above.

By choosing a compliance method other than the R-value method, the thickness variation limitation of C402.2.2 is therefore not applicable. For example, the C402.1.4 Assembly U-factor method allows averaging of the roof insulation by U value (rather than "R" value) of the entire roof assembly and does not limit it to insulation thickness that varies 1 inch or less.

Further compliance options are allowable under ASHRAE 90.1-2013, or by utilization of the compliance software COMCheck, or similar software as noted in the 2016 Supplement to the New York State Energy Conservation Construction Code Section C101.5.1 above. These methods also do not have a requirement limiting insulation thickness variation.

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