

CHAPTER C3

GENERAL REQUIREMENTS

SECTION ECC C301

CLIMATE ZONES

C301.1 General. For projects in the City of New York, *Climate Zone 4A* shall be used in determining the applicable requirements from Chapter C4.

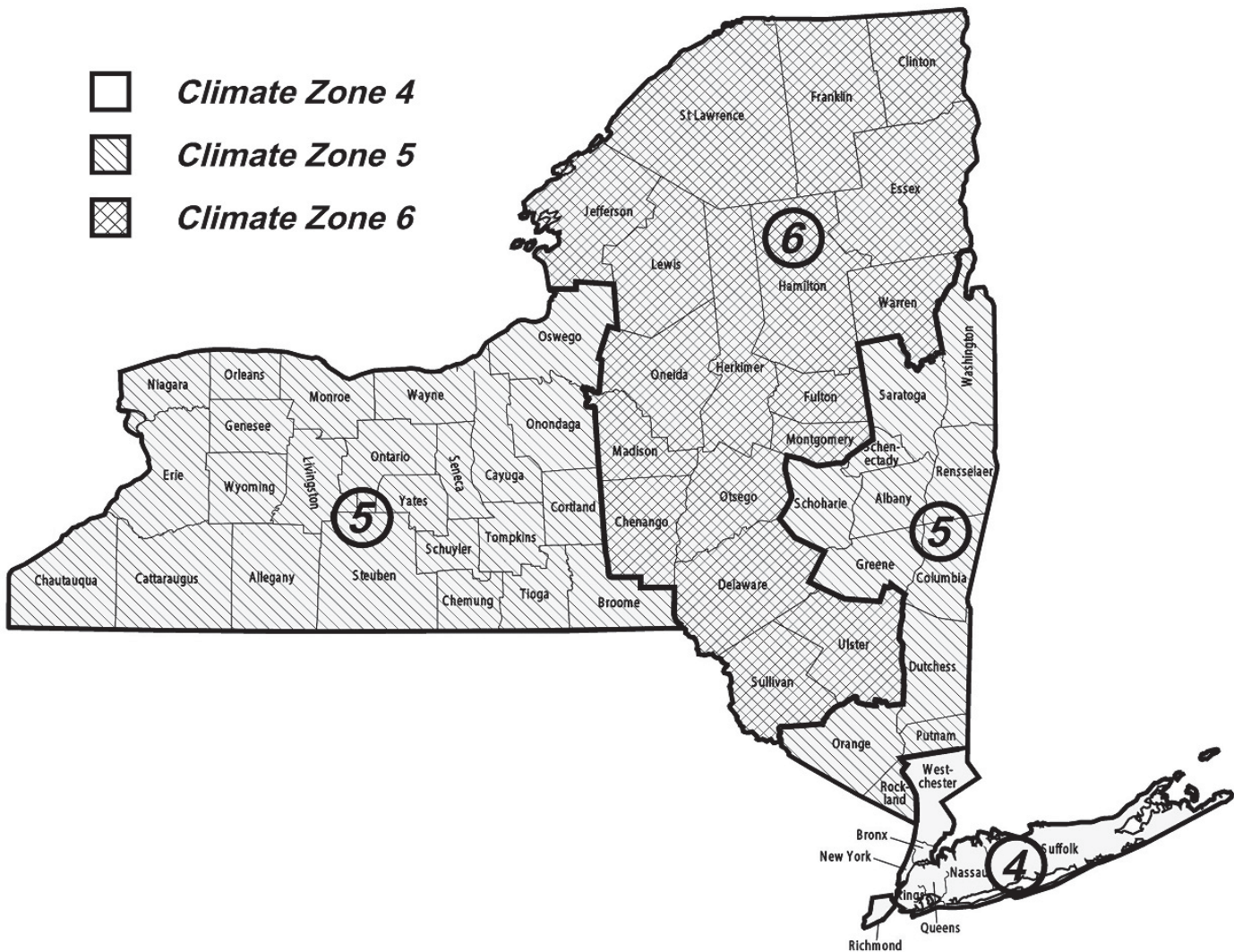


FIGURE C301.1
CLIMATE ZONES

TABLE C301.1(1)
NEW YORK STATE CLIMATE ZONES BY COUNTY

CLIMATE ZONE 4	CLIMATE ZONE 5				CLIMATE ZONE 6	
Bronx Kings Nassau New York Queens Richmond Suffolk Westchester	Albany Allegany Broome Cattaraugus Cayuga Chautauqua Chemung Columbia Cortland	Dutchess Erie Genesee Greene Livingston Monroe Niagara Onondaga Ontario	Orange Orleans Oswego Putnam Rensselaer Rockland Saratoga Schenectady Schoharie	Schuyler Seneca Steuben Tioga Tompkins Washington Wayne Wyoming Yates	Chenango Clinton Delaware Essex Franklin Fulton Hamilton Herkimer Jefferson	Lewis Madison Montgomery Oneida Otsego St. Lawrence Sullivan Ulster Warren

TABLE C301.1(2)
THERMAL CLIMATE ZONE DEFINITIONS

ZONE NUMBER	THERMAL CRITERIA	
	IP Units	SI Units
4	$CDD50^{\circ}F \leq 6,300$ AND $3,600 < HDD65^{\circ}F \leq 5,400$	$CDD10^{\circ}C < 3500$ AND $2000 < HDD18^{\circ}C \leq 3000$
5	$CDD50^{\circ}F < 6,300$ AND $5,400 < HDD65^{\circ}F \leq 7,200$	$CDD10^{\circ}C < 3500$ AND $3000 < HDD18^{\circ}C \leq 4000$
6	$7,200 < HDD65^{\circ}F \leq 9,000$	$4000 < HDD18^{\circ}C \leq 5000$

For SI: $^{\circ}C = [(^{\circ}F) - 32]/1.8$.

SECTION ECC C302 DESIGN CONDITIONS

C302.1 Interior design conditions. The interior design temperatures used for heating and cooling load calculations shall be a maximum of 72°F (22°C) for heating and minimum of 75°F (24°C) for cooling.

SECTION ECC C303 MATERIALS, SYSTEMS AND EQUIPMENT

C303.1 Identification. Materials, systems and equipment shall be identified in a manner that will allow a determination of compliance with the applicable provisions of this code.

C303.1.1 Building thermal envelope insulation. An *R-value* identification mark shall be applied by the manufacturer to each piece of *building thermal envelope* insulation 12 inches (305 mm) or greater in width. Alternatively, the insulation installers shall provide a certification listing the type, manufacturer and *R-value* of insulation installed in each element of the *building thermal envelope*. For blown-in or sprayed fiberglass and cellulose insulation, the initial installed thickness, settled thickness, settled *R-value*, installed density, coverage area and number of bags installed shall be indicated on the certification. For sprayed polyurethane foam (SPF) insulation, the installed thickness of the areas covered and *R-value* of installed thickness shall be indicated on the certification. For insulated siding, the *R-value* shall be *labeled* on the product's package and shall be indicated on the certification. The insulation installer shall sign, date and post the certification in a conspicuous location on the job site.

Exception: For roof insulation installed above the deck, the R-value shall be labeled as required by the material standards specified in the *New York City Building Code*.

C303.1.1.1 Blown-in or sprayed roof/ceiling insulation. The thickness of blown-in or sprayed fiberglass and cellulose roof/ceiling insulation shall be written in inches (mm) on markers and one or more of such markers shall be installed for every 300 square feet (28 m²) of attic area throughout the attic space. The markers shall be affixed to the trusses or joists and marked with the minimum initial installed thickness with numbers not less than 1 inch (25 mm) in height. Each marker shall face the attic access opening. Spray polyurethane foam thickness and installed *R-value* shall be indicated on certification provided by the insulation installer.

C303.1.2 Insulation mark installation. Insulating materials shall be installed such that the manufacturer's *R-value* mark is readily observable upon inspection. For insulation materials that are installed without an observable manufacturer's *R-value* mark, such as blown or draped products, an insulation certificate complying with Section C303.1.1 shall be left immediately after installation by the installer, in a conspicuous location within the *building*, to certify the installed *R-value* of the insulation material.

Exception: For roof insulation installed above the deck, the R-value shall be labeled as specified by the material standards in the *New York City Building Code*.

C303.1.3 Fenestration product rating. Fenestration product rating. U-factors, solar heat gain coefficient (SHGC), and visible transmittance (VT) of fenestration products shall be determined as follows:

1. For windows, doors and skylights, U-factor, SHGC and VT ratings shall be determined by a third party recognized by ANSI, ILAC MRA in accordance with NFRC 100 and NFRC 200.
2. Where required for garage doors and rolling doors, U-factor ratings shall be determined in accordance with either NFRC 100 or ANSI/DASMA 105.

U-factors, SHGC and VT shall be determined by accredited, independent laboratory, and certified by the manufacturer by a label affixed to the product or a label certificate specific to the products in the project.

Manufactured products or shop fabricated units lacking an affixed label shall be assigned a default U-factor from Table C303.1.3(1) or C303.1.3(2). Products lacking a label indicating SHGC or VT shall be assigned a default SHGC or VT from Table C303.1.3(3).

Where labeled or default values are not indicated, a signed and dated certificate showing compliance through modeling performed using Lawrence Berkley National Labs WINDOW/THERM software at the sizes and Boundary conditions prescribed in NFRC - 100/200 shall be provided. The simulation shall be performed by a third-party recognized by ANSI, ILAC MRA. For Tubular Daylighting Devices, VT_{annual} shall be measured and rated in accordance with NFRC 203.

Air infiltration rate shall be demonstrated by testing to ASTM E283, the test shall be conducted at an independent third-party laboratory recognized by ANSI, ILAC MRA, and shall be less than 5 years old.

TABLE C303.1.3(1)
DEFAULT GLAZED WINDOW, GLASS DOOR AND SKYLIGHT U-FACTORS

FRAME TYPE	WINDOW AND GLASS DOOR		SKYLIGHT	
	Single	Double	Single	Double
Metal	1.20	0.80	2.00	1.30
Metal with thermal break	1.10	0.65	1.90	1.10
Nonmetal or metal clad	0.95	0.55	1.75	1.05
Glass block	0.60			

TABLE C303.1.3(2)
DEFAULT OPAQUE DOOR U-FACTORS

DOOR TYPE	OPAQUE U-FACTOR
Uninsulated metal	1.20
Insulated metal (rolling)	0.90
Insulated metal (other)	0.60
Wood	0.50
Insulated, nonmetal edge, max 45% glazing, any glazing double pane	0.35

TABLE C303.1.3(3)
DEFAULT GLAZED FENESTRATION SHGC AND VT

	SINGLE GLAZED		DOUBLE GLAZED		GLAZED BLOCK
	Clear	Tinted	Clear	Tinted	
SHGC	0.8	0.7	0.7	0.6	0.6
VT	0.6	0.3	0.6	0.3	0.6

C303.1.4 Insulation product rating. The thermal resistance (*R-value*) of insulation shall be determined in accordance with the US Federal Trade Commission *R-value* rule (CFR Title 16, Part 460) in units of $h \times ft^2 \times ^\circ F/Btu$ at a mean temperature of 75°F (24°C).

C303.1.4.1 Insulated siding. The thermal resistance (*R-value*) of insulated siding shall be determined in accordance with ASTM C1363. Installation for testing shall be in accordance with the manufacturer's instructions.

C303.1.5 Spandrel Panels. U-factors of opaque assemblies within fenestration framing systems shall be determined in accordance with NFRC 100. U-factors shall be determined by an accredited, independent laboratory. Spandrel panels lacking a calculation shall be assigned a default U-factor from Table C303.1.5.

TABLE C303.1.5
DEFAULT EFFECTIVE U-FACTORS FOR SPANDREL PANELS^a

RATED R-VALUE OF INSULATION BETWEEN FRAMING MEMBERS		None	R-4	R-7	R-10	R-15	R-20	R-25	R-30
Frame Type	Spandrel Panel	Default U-factor							
Aluminum without thermal break ^b	Single glass pane, stone, or metal panel	U-0.445	U-0.285	U-0.259	U-0.247	U-0.236	U-0.230	U-0.226	U-0.224
	Double glazing with no low-e coatings	U-0.356	U-0.273	U-0.254	U-0.244	U-0.234	U-0.229	U-0.226	U-0.223
	Triple glazing or double glazing with low-e glass	U-0.313	U-0.263	U-0.249	U-0.241	U-0.233	U-0.228	U-0.225	U-0.223
Aluminum with thermal break ^c	Single glass pane, stone, or metal panel	U-0.429	U-0.243	U-0.212	U-0.197	U-0.184	U-0.176	U-0.172	U-0.169
	Double glazing with no low-e coatings	U-0.328	U-0.228	U-0.205	U-0.193	U-0.182	U-0.175	U-0.171	U-0.168
	Triple glazing or double glazing with low-e glass	U-0.277	U-0.217	U-0.199	U-0.189	U-0.180	U-0.174	U-0.170	U-0.167
Structural glazing ^d	Single glass pane, stone, or metal panel	U-0.428	U-0.217	U-0.180	U-0.161	U-0.145	U-0.136	U-0.130	U-0.126
	Double glazing with no low-e coatings	U-0.316	U-0.199	U-0.172	U-0.157	U-0.143	U-0.135	U-0.129	U-0.126
	Triple glazing or double glazing with low-e glass	U-0.257	U-0.186	U-0.165	U-0.152	U-0.140	U-0.133	U-0.128	U-0.125
No framing or insulation is continuous ^e	Single glass pane, stone, or metal panel	U-0.445	U-0.160	U-0.108	U-0.082	U-0.058	U-0.045	U-0.037	U-0.031
	Double glazing with no low-e coatings	U-0.356	U-0.147	U-0.102	U-0.078	U-0.056	U-0.044	U-0.036	U-0.030
	Triple glazing or double glazing with low-e glass	U-0.313	U-0.139	U-0.098	U-0.076	U-0.055	U-0.043	U-0.035	U-0.030

- a. Extrapolation outside of the table and interpolation between values in the table shall not be permitted. Assemblies with distance between framing less than 30 inches (762 mm), or not included in the default table, shall have a *U*-factor determined by testing in compliance with ASTM C1363 or modeling in compliance with ANSI/NFRC 100. Spandrel panel assemblies in the table do not include metal backpans. For designs with metal backpans, multiply the *U*-factor by 1.20. *U*-factors for spandrel panels include a 3/4 in. air gap and 5/8 in. gypsum board with R-value of 0.56 for the interior finish. The gypsum board is assumed to span between the window sill and a channel at the floor.
- b. This frame type shall be used for systems that do not contain a non-metallic element that separates the metal exposed to the exterior from the metal that is exposed to the interior condition.
- c. This frame type shall be used for systems where a urethane or other non-metallic element separates the metal exposed to the exterior from the metal that is exposed to the interior condition.
- d. This frame type shall be used for systems that have no exposed mullion on the exterior.
- e. This frame type shall be used for systems where there is no framing, or the insulation is continuous across and uninterrupted by the framing (also known as mullion wrap).

C303.2 Installation. Materials, systems and equipment shall be installed in accordance with (i) the manufacturer's instructions and (ii) the applicable provisions of the New York City Construction Codes.

C303.2.1 Protection of exposed foundation insulation. Insulation applied to the exterior of basement walls, *crawl space walls* and the perimeter of slab-on-grade floors shall have a rigid, opaque and weather-resistant protective covering to prevent the degradation of the insulation's thermal performance. The protective covering shall cover the exposed exterior insulation and extend not less than 6 inches (153 mm) below grade.

C303.2.2 Multiple layers of continuous insulation board. Where two or more layers of continuous insulation board are used in a construction assembly, the continuous insulation boards shall be installed in accordance with Section C303.2. Where the continuous insulation board manufacturer's instructions do not address installation of two or more layers, the edge joints between each layer of continuous insulation boards shall be staggered.