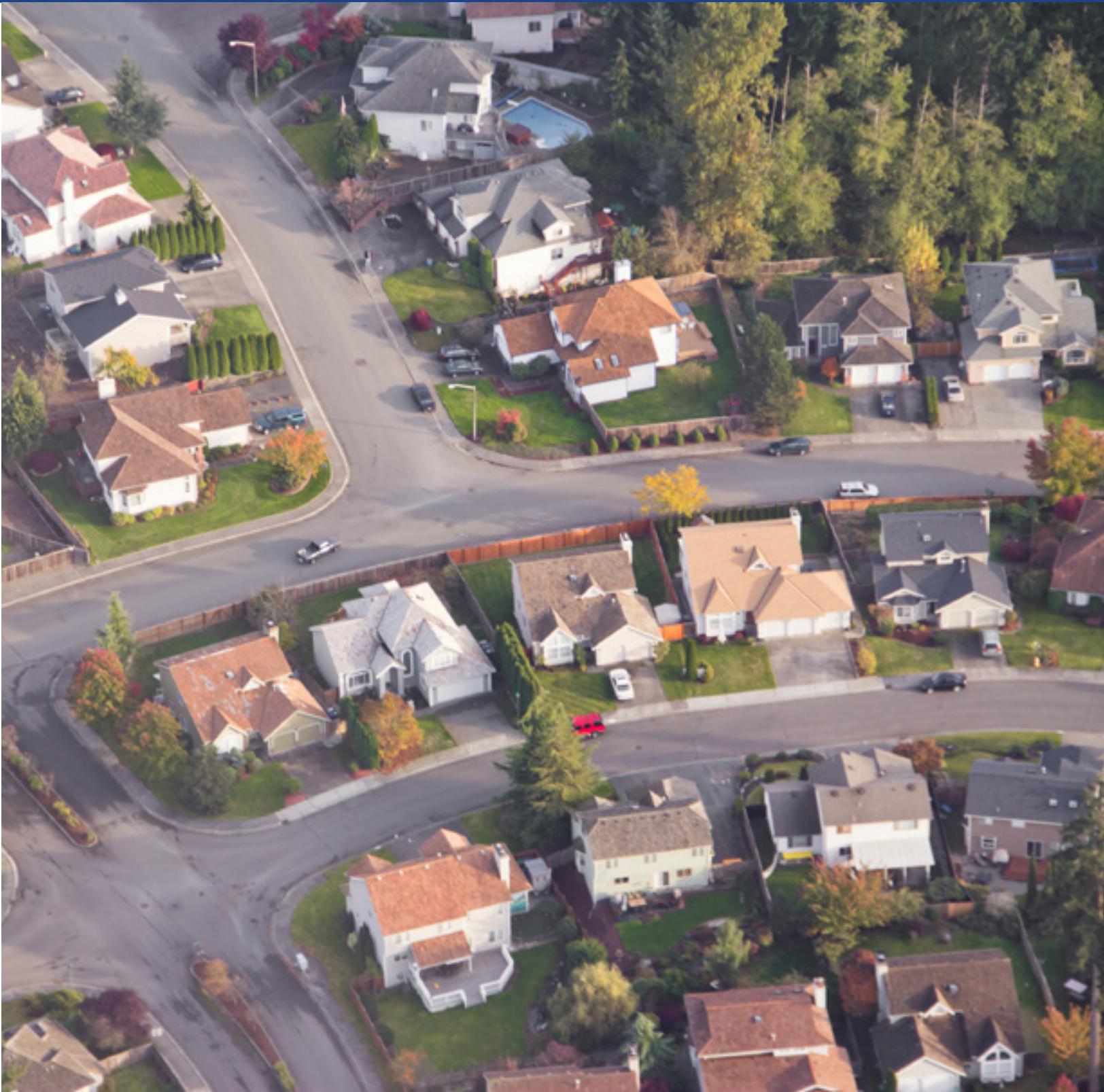


NYStretch Energy Code–2020

# Comparison to 2020 Energy Conservation Construction Code of NYS



The following is a summary of the differences between the 2020 NYStretch Energy Code (NYStretch), the 2020 NYS Energy Code (ECCCNYS-2020), and ASHRAE 90.1 2016. It is not intended to be a replacement for the actual language in the NYStretch Code or the NYS Energy Code. One should always refer to the NYS Energy Code when determining compliance as amended by the 2020 NYStretch Code language.

## I. Differences between NYStretch and ECCCNYS-2020: Residential Buildings

### Compliance Path Options – ONE of FOUR can be used:

1. **Prescriptive and REScheck™** – R401 through R404 (Specific Prescriptive R-value or U-factor) and mandatory requirements; regardless of compliance path, REScheck™ software most often used: or
2. **Passive House** – R401 through R404 and Passive House compliance, or
3. **ERI Path** – (R406), or
4. **Simulated Performance Path** – (R405) and mandatory provisions of R401 through R404. Building energy < 80% of the standard reference design

**Table R402.1.2** – Envelope (U-factor Table R402.1.4 changed accordingly. Prescriptive, e.g., can be traded.)

Climate Zone 4	Fen U-Factor	SkyLt U-Factor	SHGC	Ceiling R-Val	Wood Wall R-Value	Mass Wall R-Value	Floor R-Val	Bsmt Wall R-value	Slab R-Value/Depth	Crawl Sp Wall R-Value
Stretch Code	0.27	0.50	.04	49	21 or 20+5 or 13+10	15/20	30 <sup>a</sup>	15/19	10, 4 ft.	15/19
Energy Code	0.32	0.55	0.4	49	20 or 13+5	8/13	19	10/13	10, 2 ft.	10/13

Climate Zone 5	Fen U-Factor	SkyLt U-Factor	SHGC	Ceiling R-Val	Wood Wall R-Value	Mass Wall R-Value	Floor R-Val	Bsmt Wall R-value	Slab R-Value/Depth	Crawl Sp Wall R-Value
Stretch Code	0.27	0.50	NR	49	21 or 20+5 or 13+10	15/20	30 <sup>a</sup>	15/19	10, 4 ft.	15/19
Energy Code	0.30	0.55	NR	49	20 or 13+5	13/17	30 <sup>a</sup>	15/19	10, 2 ft.	15/19

Climate Zone 6	Fen U-Factor	SkyLt U-Factor	SHGC	Ceiling R-Val	Wood Wall R-Value	Mass Wall R-Value	Floor R-Val	Bsmt Wall R-value	Slab R-Value/Depth	Crawl Sp Wall R-Value
Stretch Code	0.27	0.50	NR	49	21 or 20+5 or 13+10	15/20	30 <sup>a</sup>	15/19	10, 4 ft.	15/19
Energy Code	0.30	0.55	NR	49	20+5 or 13+10	15/20	30 <sup>a</sup>	15/19	10, 4 ft.	15/19
Option 2	.28	0.55	NR	60	23 cav.	19/21	30 <sup>a</sup>	15/19	10, 4 ft.	15/19

<sup>a</sup>Alternatively, insulation sufficient to fill the framing cavity and providing not less than an R-value of R-19.

## Provisions in NYStretch that are not in NYS Energy Code

- **R402.2.2 Ceilings without attic spaces (cathedralized)**. – In the NYStretch Code, minimum insulation R-value is R-38 uncompressed out over exterior walls rather than R-30. As in the NYS Energy Code, this reduction in R-value is limited to 500 sf or 20% of insulated roof area, whichever is less.
- **Table R402.4.1.1 Insulation installation** – NYStretch Code requires open wall visual inspection to ensure the quality of the insulation installation. This requirement asks for more attention to openings around tub/showers, registers, and Recessed Lighting.
- **R403.3 Ducts** – Ducts in new buildings must be located in conditioned space. Buried ducts can be considered in conditioned space as in the NYS Energy Code, and must be installed/buried as prescribed by the NYS Energy Code. In both NYStretch and the NYS Energy Code, duct leakage testing must be performed where ducts are buried in attic insulation. The threshold is less than or equal to 1.5 cfm per 100 sf conditioned floor area for leakage to outdoors.
- **R403.3.8 Duct sizing** – NYStretch Code specifically requires that ducts must be sized in accordance with ACCA Manual D (**mandatory**).
- **R403.5.4 Drain water heat recovery units** – Drain water heat recovery units must have a minimum efficiency of 40% if installed for equal flow or a minimum efficiency of 52% if installed for unequal flow. Requirements are given for vertical and sloped drain water heat recovery units.
- **R403.5.5 Supply of hot water** – NYStretch Code requires one of the following: 1) maximum allowable pipe length between water heater and fixture; 2) maximum allowable pipe volume between water heater and fixture; 3) drain-water heat recovery; or 4) recirculation system.
- **R403.6.2 Balanced whole house mechanical ventilation** – NYStretch Code requires HRV or ERV in Climate Zones 5 and 6 in every dwelling unit (**mandatory**). In Climate Zone 4, a central fan integrated system with simultaneous supply and exhaust is an option.
- **R403.6.3 Verification of ventilation** – NYStretch Code requires verification of ventilation air flow by approved agency, tested to ACCA HVAC Quality Installation Verification Protocols.
- **R404.1 Lighting** – NYStretch Code requires 90% high-efficacy lighting, with lamps at a minimum of 65 lumens per watt and luminaires at minimum of 45 lumens/watt (**mandatory**).
- **R404.2 Electrical power packages. (Mandatory for newly constructed buildings.) NYStretch Code requires:**
  - A solar-ready zone for newly constructed detached one- and two-family homes and townhomes that have more than 1400 sf of conditioned floor area according to Appendix RA of the NYS Energy Code. The solar-ready zone applies to buildings with at least 600 sf roof area between 110 degrees and 270 degrees of true north. Exceptions are given for buildings shaded more than 70% of daylight hours annually and for those where an on-site renewable energy system is permanently installed. Reserved electric panel space, roof-load calculation and electrical pathway from roof to panel is required.
  - Electric vehicle charging capability for one- and two-family detached homes and townhomes. 208V/240V outlet for each dwelling unit or panel space and conduit for future installation of outlet. For common parking areas, the code requires 1) panel capacity and conduit for future installation of 208/240V outlets for 5% of spaces, but with a minimum of at least one space or 2) 208/240V outlets for 5% of parking spaces with a minimum of at least one space.
- **R404.2 ERI path** – NYStretch requires an ERI of 50 PLUS the NYS Energy Code (as amended) mandatory requirements and R403.5.3; NYS Energy Code requires ERI of 62 – Climate Zone 4, 61 for Zones 5 and 6.
- **R408 Passive House** – An optional compliance path in NYStretch; allows use of either PHIUS or PHI approved software along with ECCCNYS-2020 prescriptive AND mandatory requirements. Dwelling unit MUST score a maximum of 9.5 kbtuh/ft<sup>2</sup>/yr and be blower-door tested to meet air leakage or infiltration rates defined by the passive house entities and NYStretch.

## II. Differences between NYStretch and ECCCNY-2020: Commercial Buildings

### Compliance Path Options:

1. **ASHRAE 90.1 2016 Prescriptive Path** – (Sections 5 through 10, as amended by NYStretch) plus section C408 (commissioning) of the NYS Energy Code (as amended by NYStretch) and Appendix CC if mandated by local ordinance (Additional power distribution system packages), or
2. **ASHRAE 90.1 2016 Energy Cost Budget Method** – (Section 11, as amended by NYStretch) plus Section C408 (commissioning) of the NYS Energy Code (as amended by NYStretch), and Appendix CC if mandated by local ordinance (additional power distribution system packages), or
3. **ASHRAE 90.1 2016 Appendix G, Performance Rating Method** – (as amended by NYStretch) Section C408 (commissioning) of the NYS Energy Code (as amended by NYStretch), and Appendix CC if mandated by local ordinance (additional power distribution system packages), or
4. **2020 Energy Conservation Construction Code (NYS Energy Code), Prescriptive Path** – (Sections C402 through C406 and C408, as amended by NYStretch) and Appendix CC if mandated by local ordinance (additional power distribution system packages).

### Prescriptive Path

**TABLE C402.1.4** – Comparison ECCCNY-2020/NYStretch, U-factor Method ALSO used for ASHRAE 90.1 Prescriptive Path  
**OPAQUE THERMAL ENVELOPE ASSEMBLY MAXIMUM REQUIREMENTS, U-FACTOR METHOD<sup>a, b</sup>**

Climate Zone	4		5		6	
	All Other	Group R	All Other	Group R	All Other	Group R
<b>Roofs</b>						
Insulation Entirely above Roof Deck	U-0.032/ U-0.030	U-0.032/ U-0.030	U-0.032/ U-0.030	U-0.032/ U-0.030	U-0.032/ U-0.029	U-0.032/ U-0.029
Metal Buildings	U-0.035	U-0.035	U-0.035	U-0.035	U-0.031/ U-0.028	U-0.031/ U-0.026
Attic and Other	U-0.027/ U-0.020	U-0.027/ U-0.020	U-0.027/ U-0.020	U-0.021/ U-0.020	U-0.021/ U-0.019	U-0.021/ U-0.019
<b>Walls, Above Grade</b>						
Mass <sup>e</sup>	U-0.104/ U-0.099	U-0.090/ U-0.086	U-0.90/ U-0.086	U-0.080/ U-0.076	U-0.080/ U-0.076	U-0.071/ U-0.067
Metal Buildings	U-0.052/ U-0.048	U-0.052/ U-0.048	U-0.052/ U-0.048	U-0.052/ U-0.048	U-0.052/ U-0.048	U-0.052/ U-0.048
Metal Framed	U-0.064/ U-0.061	U-0.064/ U-0.061	U-0.064/ U-0.052	U-0.064/ U-0.052	U-0.064/ U-0.047	U-0.064/ U-0.044
Wood Framed and Other <sup>c</sup>	U-0.064/ U-0.061	U-0.064/ U-0.061	U-0.064/ U-0.048	U-0.064/ U-0.048	U-0.051/ U-0.048	U-0.051/ U-0.046
<b>Walls, Below Grade</b>						
Below-Grade Wall <sup>c</sup>	C-0.119	C-0.119/ C-0.092	C-0.119	C-0.119/ C-0.092	C-0.119/ C-0.092	C-0.119/ C-0.063

# Comparison to 2020 Energy Conservation Construction Code of NYS



Climate Zone	4		5		6	
	All Other	Group R	All Other	Group R	All Other	Group R
<b>Floors</b>						
<b>Mass<sup>d</sup></b>	U-0.076/ U-0.057	U-0.074/ U-0.051	U-0.074/ U-0.057	U-0.064/ U-0.051	U-0.064/ U-0.051	U-0.064/ U-0.051
<b>Joist/Framing</b>	U-0.033	U-0.033	U-0.033	U-0.033	U-0.033/ U-0.027	U-0.033/ U-0.027
<b>Slab-on-Grade Floors</b>						
<b>Unheated Slabs</b>	F-0.54/ F-0.52	F-0.54/ F-0.52	F-0.54/ F-0.52	F-0.54/ F-0.51	F-0.54/ F-0.51	F-0.54/ F-0.434
<b>Heated Slabs</b>	F-0.86 0.64/ F-0.63	F-0.86 0.64/ F-0.63	F-0.79 0.64/ F-0.63	F-0.79 0.64/ F-0.63	F-0.79 0.55/ F-0.63	F-0.69 0.55/ F-0.63
<b>Opaque Doors</b>						
<b>Swinging Door</b>	U-0.061/ U-0.050	U-0.061/ U-0.050	U-0.037	U-0.037	U-0.037	U-0.037
<b>Garage Door &lt; 14% Glazing</b>	U-0.031	U-0.031	U-0.031	U-0.031	U-0.031	U-0.031

For SI: 1 inch = 25.4 mm, 1 pound per square foot = 4.88 kg/m<sup>2</sup>, 1 pound per cubic foot = 16 kg/3 ci = Continuous insulation, NR = No Requirement, LS = Liner System.

- <sup>a</sup> Where assembly U-factors, C-factors, and F-factors are established in ANSI/ASHRAE/IESNA 90.1 Appendix A, such opaque assemblies shall be a compliance alternative where those values meet the criteria of this table, and provided that the construction, excluding the cladding system on walls, complies with the appropriate construction details from ANSI/ASHRAE/ISNEA 90.1 Appendix A.
- <sup>b</sup> Where U-factors have been established by testing in accordance with ASTM C1363, such opaque assemblies shall be a compliance alternative where those values meet the criteria of this table. The R-value of continuous insulation can be added to or subtracted from the original tested design.
- <sup>c</sup> Where heated slabs are below grade, below-grade walls shall comply with the U-factor requirements for above-grade mass walls.
- <sup>d</sup> "Mass floors" shall be in accordance with Section C402.2.3.
- <sup>e</sup> "Mass walls" shall be in accordance with Section C402.2.2.

**TABLE C402.1.3** – Comparison ECCCNY-2020 versus NYStretch Table CB 102.2 (Also used for ASHRAE 90.1-2016; MUST be adopted specifically by the jurisdiction)

**OPAQUE THERMAL ENVELOPE INSULATION COMPONENT MINIMUM REQUIREMENTS, R-VALUE METHOD<sup>a, h</sup>**

Climate Zone	4 Except Marine		5		6	
	All Other	Group R	All Other	Group R	All Other	Group R
<b>Roofs</b>						
Insulation Entirely above Roof Deck	R-30ci/ R-33ci	R-30ci/ R-33ci	R-30ci/ R-33ci	R-30ci/ R-33ci	R-30ci/ R-33ci	R-30ci/ R-33ci
Metal Buildings <sup>b</sup>	R-9.5 + R-11 LS	R-9.5 + R-11 LS	R-9.5 + R-11 LS	R-9.5 + R-11 LS	R-9.5 + R-11 LS/ R-30 + R-11 LS	R-9.5 + R-11 LS/ R-30 + R-11 LS
Attic and Other	R-38/ R-53	R-38/ R-53	R-38/ R-53	R-49/ R-53	R-49/ R-53	R-49/ R-53
<b>Walls, Above Grade</b>						
Mass <sup>e</sup>	R-9.5ci/ R-11.4ci	R-11.4ci/ R-13.3ci	R-11.4ci/ R-13.3ci	R-13.3ci/ R-15.2ci	R-13.3ci/ R-15.2ci	R-12.5ci
Metal Buildings	R-13 + R-13ci	R-13 + R-13ci/ R-13 + R-19.5ci	R-13 + R-13ci/ R-13 + R-19.5ci	R-13 + R-13ci/ R-13 + R-19.5ci	R-13 + R-13ci/ R-13 + R-19.5ci	R-13 + R-13ci/ R-13 + R-19.5ci
Metal Framed	R-13 + R-7.5ci/ R-13 + R-8.5ci	R-13 + R-7.5ci/ R-13 + R-8.5ci	R-13 + R-7.5ci/ R-13 + R-11ci	R-13 + R-7.5ci/ R-13 + R-11ci	R-13 + R-7.5ci/ R-13 + R-13.5ci	R-13 + R-7.5ci/ R-13 + R-14.5ci
Wood Framed and Other	R-13 + R-3.8ci or R-20/ R-13 + R-4.5ci or R-19 + R-1.5ci	R-13 + R-3.8ci or R-20/ R-13 + R-4.5ci or R-19 + R-1.5ci	R-13 + R-3.8ci or R-20/ R-13 + R-9ci or R-19 + R-5ci	R-13 + R-7.5ci or R-20 + R-3.8ci/ R-13 + R-9ci or R-19 + R-5ci	R-13 + R-7.5ci or R-20 + R-3.8ci/ R-13 + R-9ci or R-19 + R-5ci	R-13 + R-7.5ci or R-20 + R-3.8ci/ R-13 + R-9.5ci or R-19 + R-6ci
<b>Walls, Below Grade</b>						
Below-Grade Wall <sup>c</sup>	R-7.5ci	R-7.5ci/ R-10ci	R-7.5ci	R-7.5ci/ R-10ci	R-7.5ci/ R-10ci	R-7.5ci/ R-15ci
<b>Floors</b>						
Mass <sup>d</sup>	R-10c/ R-15ci	R-10.4c/ R-16.7ci	R-10c/ R-15ci	R-12.5c/ R-16.7ci	R-12.5c/ R-16.7ci	R-12.5c/ R-16.7ci
Joist/Framing <sup>e</sup>	R-30	R-30	R-30	R-30	R-30/ R-38	R-30/ R-38

Climate Zone	4		5		6	
	All Other	Group R	All Other	Group R	All Other	Group R
<b>Slab-on-Grade Floors</b>						
<b>Unheated Slabs</b>	R-10 for 12" below/ R-15 for 24" below	R-10 for 24" below/ R-15 for 24" below	R-15 for 24" below			
<b>Heated Slabs<sup>a</sup></b>	R-15 for 24" below + R-5 full slab/ R-20 for 48" below + R-5 full slab	R-15 for 24" below + R-5 full slab/ R-20 for 48" below + R-5 full slab	R-15 for 36" below + R-5 full slab/ R-20 for 48" below + R-5 full slab	R-15 for 36" below + R-5 full slab/ R-20 for 48" below + R-5 full slab	R-15 for 36" below + R-5 full slab/ R-20 for 48" below + R-5 full slab	R-15 for 36" below + R-5 full slab
<b>Opaque Doors</b>						
<b>Non-Swinging</b>	R-4.75	R-4.75	R-4.75	R-4.75	R-4.75	R-4.75

For Sl: 1 inch = 25.4 mm, 1 pound per square foot = 4.88 kg/m<sup>2</sup>, 1 pound per cubic foot = 16 kg/m<sup>3</sup>. ci = Continuous insulation, NR = No Requirement, LS = Liner System.

<sup>a</sup> Assembly descriptions can be found in ANSI/ASHRAE/IESNA Appendix A.

<sup>b</sup> Where using R-value compliance method, a thermal spacer block shall be provided, otherwise use the U-factor compliance method in Table C402.1.4.

<sup>c</sup> Where heated slabs are below grade, below-grade walls shall comply with the exterior insulation requirements for heated slabs.

<sup>d</sup> "Mass floors" shall be in accordance with Section C402.2.3.

<sup>e</sup> Steel floor joist systems shall be insulated to R-38.

<sup>f</sup> "Mass walls" shall be in accordance with Section C402.2.2.

<sup>g</sup> The first value is for perimeter insulation and the second value is for slab insulation. Perimeter insulation is not required to extend below the bottom of the slab.

<sup>h</sup> Not applicable to garage doors. See Table C402.1.4.

## Provisions in NYStretch that are not in NYS Energy Code

- **C402.1.4.2 Thermal Resistance of Mechanical Equipment Penetrations (mandatory)** – When the area of mechanical equipment penetrations exceeds 1% of the opaque above-grade wall area, this shall be considered a separate wall assembly with a default U-factor of 0.5.
- **C402.2.8 Continuous Insulation (mandatory)** – Balconies or parapets that penetrate building thermal envelope must be 1) insulated with continuous insulation having R-value of at least R-3 or 2) incorporate a minimum R-3 thermal break where building envelope is penetrated.
- **C402.5 Air Leakage (mandatory) and C402.5.9 Air Barrier Testing**
  - New buildings between 25,000 sf and 50,000 sf and < 75ft high shall be tested by blower door and have leakage rates < 0.40 cfm/sf @ 75 pascals. These buildings must also comply with NYS Energy Code requirements pertaining to air intakes, exhausts, stairways, and shafts; loading dock weather-seals; and vestibules (C402.5.5, C402.5.6, and C402.5.7).
  - Other new buildings may demonstrate compliance according to the above provisions or by complying with the prescriptive requirements in Sections C402.5.1 through 402.5.8 and C408.4 (see below for description).
- **C403.7.4 Energy Recovery Ventilation (mandatory) (previously C403.2.7)** – Energy recovery ventilation is mandatory when ventilation air flows exceed certain amounts. The NYS Energy Code and NYStretch requirements are the same. NYStretch modified one exception to identify conditions with multiple exhaust fans or outlets.
- **C403.8.1 Allowable Fan HP (mandatory) (previously C403.2.12.1)** – Small differences regarding fan-power limitation between NYS Energy Code and NYStretch, plus additional exceptions in NYStretch.

## C405 Lighting Controls (prescriptive)

1. Adds corridors and dining areas to locations where occupancy sensors are required (**C405.2.1**).
2. Adds occupancy sensor controls to dim lighting at building exits when unoccupied (**C405.2.1.4**).
3. Requires daylight responsive controls in spaces with more than 100 watts (versus 150 watts) of general lighting (**C405.2.3**).
4. Exterior lighting – unless controlled from within a dwelling unit, exterior lighting must be reduced by at least 50% during certain times of day (**C405.2.6**).
5. Parking lot lighting – reduced by at least 50% when no activity detected for at least 15 minutes (**C405.2.6.5**).
6. Interior lighting – allowances for both building area method and space-by-space method there are more stringent by about 10–20% (**Tables C405.3.2[1 and 2]**).
7. Exterior lighting – allowances for some areas that are slightly more stringent (**Table C405.4.2[2]**).

**C405.8.1.1 Power Conversion System for Elevators (prescriptive)** – Elevators with rise of more than 75ft are required to have power conversion system. Motor shall have Class IE2 efficiency rating or alternative that has equal or better efficiency. Potential energy released during motion shall be recovered and supplied to building electrical system.

**C405.9 Commercial Kitchen Equipment (prescriptive)** – Efficiency requirements for fryers, hot food holding cabinets, steam cookers, dishwashers, ovens.

**C405.10 Electric Vehicle Charging Capability (prescriptive)** – Parking garages and lots with more than 10 spaces must provide panel capacity and conduit for 208/240V outlets for at least 5% of parking spaces with a minimum of two or provide the outlets for 5% of spaces with a minimum of two spaces.

**C405.11 Solar-Ready Zone (mandatory)** – Requires compliance with Appendix CA. Provide designated roof space for future PV or solar thermal system on buildings that are five stories or less and oriented between 110 and 270 degrees of true north. There are some exceptions such as an on-site renewable energy system, a building shaded more than 70% of daylight hours, or a licensed design professional who certifies requirements for extensive rooftop equipment, vegetation, skylights, or other obstruction. Requirements include a plan in design for and electrical conduit to roof from electrical panel, along with panel space for the PV interface and roof-load calculations.

**C405.12 Whole Building Energy and C405.13 Whole Building Electrical Monitoring (prescriptive)** – Monitoring energy use for all energy sources in new buildings except for buildings <25,000 sf; Group R buildings with <10,000 sf of common area; and fuel use for on-site emergency equipment.

## C406.1 Additional Energy Efficiency Packages

- On-site Renewable Energy option is now part of Appendix CC “Additional power distribution system packages.”

## C407 Total Building Performance Method of Compliance

- Must comply with ASHRAE 90.1 2016 Compliance Path – Section 11 or Appendix G

## C408.2 Commissioning this section is required when one of following conditions is met:

1. Building greater than 25,000 sf
2. Mechanical system capacity > 480,000 Btu/h
3. Combined water and space heating > 600,000 Btu/h

Includes more specific requirements/details for commissioning mechanical, renewable energy, and water heating systems. HVAC systems must be balanced in accordance with ANSI/ASHRAE 111, “Testing, Adjusting, and Balancing of Building HVAC Systems.”

**C408.4 Air Barrier Commissioning** – Registered design professional or approved agent shall provide documentation of air barrier components and field inspection reports.

## C502 and C503 Existing Buildings/Additions

- Commissioning required for new HVAC, water heating systems, and air barriers in additions.

## Appendices

- Optional adoption by local jurisdiction or township
  - Appendix CB: Prescriptive R-value tables
  - Appendix CC: Additional Power Distribution System Packages