

# Energy Code Updates & Their Impact on Residential Design



**Residential Design Committee**

*April 6, 2023*

# Two New Energy Codes!

## 2023 Residential Stretch Energy Code

**225 CMR 22 - Residential Low-rise Construction Stretch Energy Code**

## Municipal Opt-In Specialized Code

**225 CMR 22 Appendix RC – Residential Low-rise Construction Specialized Code**

Updated  
Stretch  
Energy  
Code = 2021  
IECC + 225 CMR 22

Municipal  
Opt-In  
Specialized  
Code = 2021  
IECC + 225 CMR 22 + 225 CMR 22  
Appendix RC

# Stretch Energy Code

## NEW STUFF!

- **Revised Maximum Energy Rating Index (i.e Lower HERS Scores)**
- **All-Electric Incentive/Fossil Fuel Disincentive**
- Compliance Pathways: *Passive House* is in – *Energy Star* is Out
- **EV Parking Space Requirements**
- **New Minimum R-Values & Fenestration Requirements**
- Mechanical Ventilation: HRV or ERV required
- 100% LED Lighting Inside and Out
- **Major Additions & Alterations Mandate Stretch Code Requirements**

*TABLE R406.5*

MAXIMUM ENERGY RATING INDEX

Clean Energy Application	New construction until June 30, 2024	New construction permits after July 1, 2024	Major alterations, additions, or Change of use
<b><i>Mixed-Fuel Building</i></b>	52	42	52
<i>With Solar Electric Generation</i>	55	42	55
<b><i>All-Electric Building</i></b>	55	45	55
<i>With Solar Electric Generation</i>	58	45	58

# TABLE R404.4

## EV READY PARKING SPACE REQUIREMENTS

Type of Building	Number of parking spaces
1 & 2 family dwellings and town homes	At least 1 50-amp branch circuit per dwelling unit to provide for AC Level II charging
All other R-use buildings	At least 20% of spaces served with a 40-amp, 208/240-volt circuit with a minimum capacity of 9.6 kVA

**R404.4 Wiring for Electric Vehicle Ready Parking Spaces (“EV Ready Spaces”).** EV Ready Spaces shall be provided in accordance with Table R404.4. The dedicated branch circuit shall be identified as “EV READY” in the service panel or subpanel directory, and the termination location shall be marked as “EV READY”. The circuit shall terminate in a NEMA receptacle or a Society of Automotive Engineers (SAE) Standard SAE J1772 electrical connector for EVSE servicing Electric Vehicles, located within 6 feet (1828 mm) of each EV ready space. Conductors and outlets for EVSE shall be sized and installed in accordance with the MA electrical code.

# Insulation minimum *R*-Values and Fenestration Requirements by Component

OLD

Climate Zone	Fenestration U-Factor	Skylight U-Factor	Glazed Fenestration SHGC	Ceiling R-Value	Wood Frame Wall R-Value	Mass Wall R-Value	Floor R-Value	Basement Wall R-Value	Slab R-Value & Depth	Crawl Space Wall R-Value
5	.30	.55	NR	49	20 or 13&5ci	13/17	30	15/19	10, 4 ft	15/19

NEW

Climate Zone	Fenestration U-Factor	Skylight U-Factor	Glazed Fenestration SHGC	Ceiling R-Value	Wood Frame Wall R-Value	Mass Wall R-Value	Floor R-Value	Basement Wall R-Value	Slab R-Value & Depth	Crawl Space Wall R-Value
<b>5A</b>	.30	.55	<b>0.40</b>	<b>60</b>	<b>30 or 20&amp;5ci or 13&amp;10ci or 0&amp;20ci</b>	13/17	30	<b>15ci or 19 or 13&amp;5ci</b>	<b>10ci, 4 ft</b>	<b>15ci or 19 or 13&amp;5ci</b>

# EXISTING BUILDINGS: Alterations, Additions and Changes of Use (Section R503.1.5)

- **Additions**

- *Changed to mandate stretch code for large additions*

- Small additions (<1,000-sf): continue to follow base code

- Large additions ( $\geq 1,000$ -sf or 100% increase in conditioned floor area): require HERS 52 if using fossil fuel and HERS 55 if all-electric

- **Alterations**

- *Changed to require substantial renovations to meet HERS 52 if using fossil fuel and HERS 55 if all-electric*

- Level 3 Alterations (over 50% of the home is renovated and reconfigured)

- Substantial Improvements (improvements that cost more than 50% of the value of the existing home)



# Municipal Opt-In Specialized Code

## APPENDIX RC

### MASSACHUSETTS MUNICIPAL OPT-IN SPECIALIZED STRETCH CODE 2023 RESIDENTIAL LOW-RISE BUILDING PROVISIONS

*The provisions contained in this appendix together with referenced sections from the Stretch energy code constitute the Specialized opt-in code for residential low-rise buildings.*

*When adopted by the local municipality, the provisions in this appendix are mandatory in combination with the IECC2021 with Massachusetts Stretch code amendments.*

# Requirements by Residential Building Size & Fuel

The Residential low-rise Specialized Code offers 3 pathways to demonstrate energy code compliance with varying sets of additional requirements over and above the updated Stretch code:

1. **Zero Energy pathway:** (Section RC102)
2. **All-Electric pathway:** (Section RC103)
3. **Mixed-Fuel pathway:** (Sections RC104 and RC105)

New homes up to 4,000 sf in size may follow any of the three pathways. **New homes over 4,000 sf in size shall follow either pathway 1 or pathway 2.**

**Buildings with any combustion equipment designed for fossil fuel use are termed 'mixed-fuel' buildings.**

# Specialized Stretch Code (Net Zero) - Residential

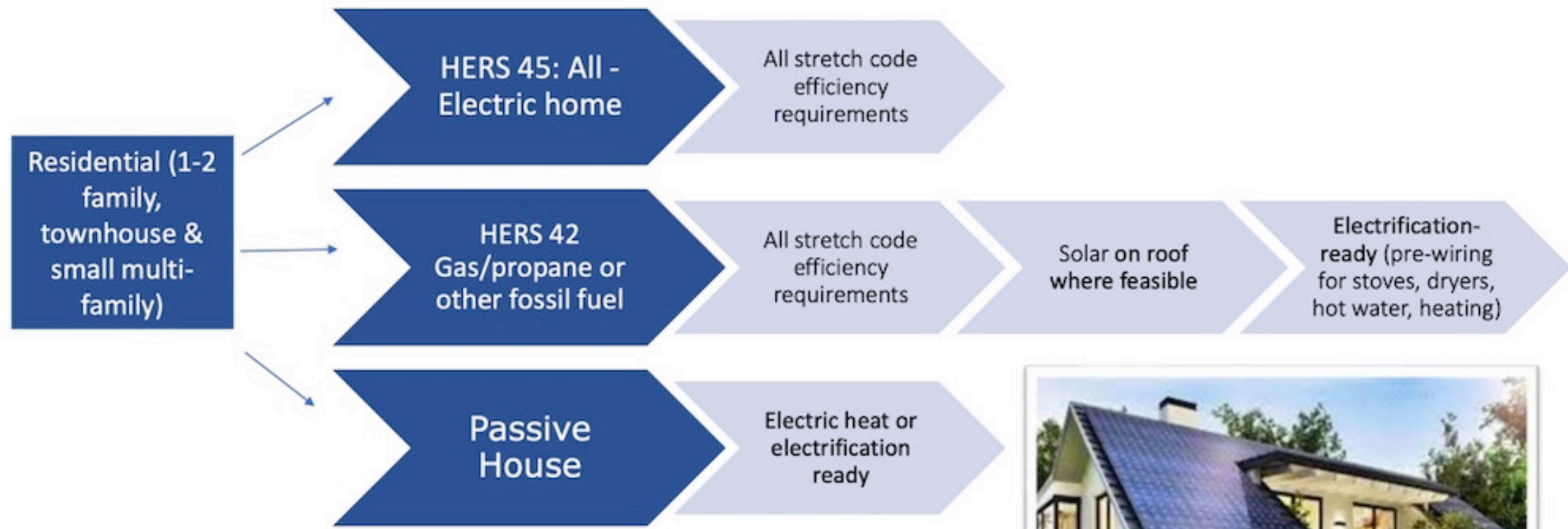


TABLE 2: Residential Specialized code requirements summary by building/dwelling unit size

Building Size	Fuel Type	Minimum Efficiency	Electrification	Min. EV wiring	Renewable Generation
Dwelling units up to 4,000 sf	All Electric	HERS 45 or Phius CORE or PHI	Full	1 parking space	Optional
Dwelling units up to 4,000 sf	Mixed-fuel	HERS 42 or Phius CORE or PHI	Pre-wiring	1 parking space	Solar PV (except shaded sites)
Dwelling units > 4,000 sf	All Electric	HERS 45 or Phius CORE or PHI	Full	1 parking space	Optional
Dwelling units > 4,000 sf	Mixed-fuel	HERS 0 or Phius ZERO	Pre-wiring	1 parking space	Solar PV or other renewables
Multi-family >12,000 sf	All Electric	Phius CORE or PHI	Full	20% of spaces	Optional
Multi-family >12,000 sf	Mixed-fuel	Phius CORE or PHI	Pre-wiring	20% of spaces	Optional

# Residential Design Impacts of New Codes

- Structural Considerations
  - Framing is impacted by New Minimum R-Values
- Orientation of building
  - Solar-Ready Zone or On-Site Power Considerations
- Fenestration Considerations
  - Quantity, Orientation, and U-Values Impact HERS Score
- Additions & Alterations: Triggers
  - Addition Square-Footage
  - Scope of Alterations
  - Project Phasing

# QUESTIONS?



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