MA Stretch Code Update & New Specialized Code

DOER Overview
November 2, 2022
Maggie McCarey, Paul Ormond & Ian Finlayson
Agenda

• Three levels of code (base, stretch, municipal opt-in)

• **Stretch code**: Timeline  
  • Key modifications in the updated Stretch Code

• **Specialized code**: Timeline & adoption process  
  • Key modifications in the new Specialized code

• Resources, Next Steps, your Questions
Base, Stretch, and Specialized – 3 Options

**Base Code (IECC 2021)**
- New construction in towns & cities not a green community
- **52 communities**
  
  Expected from BBRS: 
  July 2023

**Stretch Code (2023 update)**
- New construction in towns & cities that are a green or stretch community
- **299 communities**

  Residential: Jan 2023
  Commercial: July 2023

**Specialized Code (“Net-Zero”)**
- New Construction in towns & cities that vote to opt-in to this code
- **Effective date:** Typically 6-11 months after Town/City vote
Two hundred ninety-nine (299) municipalities have adopted the Board of Building Regulations and Standards (BBRS) Stretch Code, as of November 16 2021.
Timeline: Stretch code update

Jan 1, 2023
- Residential Low-rise update

July 1, 2023
- Commercial and Multi-family update

July 1, 2024
- Residential HERS 42/45 phase-in

Stretch code updates in 2023

HERS rating levels lowered – July 2024
STRETCH CODE
RESIDENTIAL
LOW RISE
What changes on January 1, 2023?

Only Residential Low-Rise: 1 & 2 family and Town-houses

• New construction
  ➢ Slightly lower HERS ratings
  ➢ Energy Star 3.1 no longer an option for these homes

• Large Additions & Level III Alterations (Over 1,000 sf)
  ➢ Required to meet HERS rating

New requirements for New construction:

• EV ready wiring: 1x 240volt, 50-amp circuit per home
• Heat/Energy recovery ventilation
Residential low-rise: New Construction

<table>
<thead>
<tr>
<th>On-site Clean Energy application</th>
<th>Max. HERS index (before solar credit)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2017-2022</td>
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<tr>
<td>Mixed-fuel</td>
<td>HERS 55</td>
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<tr>
<td>Mixed-fuel &amp; Solar</td>
<td>HERS 60</td>
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<tr>
<td>All-Electric</td>
<td>HERS 60</td>
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<tr>
<td>All-Electric &amp; Solar</td>
<td>HERS 65</td>
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- Energy Star 3.1 option goes away
- Passive House option updates from Phius2018 to Phius2021 or PHI
# Residential low-rise: Large Additions & Level III Alterations >1,000 sf

## Additions, Level III Alterations and Change of Use - Over 1,000 sf

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<td>HERS 75</td>
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</table>
Increased Incentives for builders & developers

• All-electric homes are generally cheaper to build
  Heat Pump replaces both Central A/C + Furnace

• Mass Save 1-4unit all-electric incentives
  $15,000 for HERS 45
  $25,000 for HERS 35 / Passive House

• Federal IRA:
  45L tax credit: $2,500 or $5,000/home (aligned with HERS)
  179D tax credit: up to $6/sqft for commercial & multi-family

https://www.masssave.com/saving/residential-rebates/all-electric-home
Key Changes to Commercial Stretch Code

**Current Stretch Code**

- Site energy reduction
  - 10% reduction
- Buildings over 100,000-sf
  - No add’tns, alt’ns

**New Stretch Code**

- Heating and cooling demand reduction
  - up to 90% reductions
- all building sizes
  - Includes add’tns, alt’ns
New Provisions for Demand Reduction

Quality envelop + air-leakage testing

Ventilation energy recovery

Mitigating thermal bridges

Result: Better Buildings

The old way

The new way

- Less equipment
- Improved durability
- Easier electrification
- More comfort
- Enhanced resilience
Our 2021 study team (below) found that reducing energy demand:

- Lowered LCC for all building types
- Lowered first cost for some building types

https://www.mass.gov/lists/stretch-energy-code-development-support-documentation
What about the grid?

Our 2021 study team (below) found the following:

- The same or lower peak electric use for most building types
- Modest peak electric increases in residential
- Across Massachusetts: about 5% increase in peak electric
- Key is demand reduction, which is key priority in new code

https://www.mass.gov/lists/stretch-energy-code-development-support-documentation

What happens to the grid when we “electrify everything”
Thermal Energy Demand Intensity (TEDI)

Stretch code now directly regulates heating and cooling demand for office, muni buildings, schools, and residential buildings:

**Heating TEDI**

Total annual energy *delivered to the building* for space conditioning and conditioning of ventilation air, normalized by area (kBtu/sf-yr)

**Cooling TEDI**

Total annual energy *removed from the building* for space conditioning and conditioning of ventilation air, normalized by area (kBtu/sf-yr)

Important: even though they have the same units, TEDI is not the same as energy use intensity (EUI). TEDI is demand while EUI is consumption.
### TEDI Limits – by Building Size and Type

<table>
<thead>
<tr>
<th>Building type</th>
<th>Heating TEDI limit (kBtu/sf-yr)</th>
<th>Cooling TEDI limit (kBtu/sf-yr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>K-12 school</td>
<td>2.2 - 2.4</td>
<td>12 - 20</td>
</tr>
<tr>
<td>Office, fire &amp; police station, library, post office, town hall</td>
<td>1.5 - 2.5</td>
<td>21 - 23</td>
</tr>
<tr>
<td>Multi-family</td>
<td>2.8 – 3.2</td>
<td>15 - 22</td>
</tr>
</tbody>
</table>

*The same models currently used for stretch code compliance also produce TEDI information.*
Other Key Modifications

**Envelope backstop**

Add'l stringency

**Tenant spaces**

Treated like new construction

**Electrification of space heating**

Highly ventilated: partial
Highly glazed: full

**Mixed-use**

Treat each use independently

**EV ready parking**

Wire 20% of new Business & Residential spaces
Wire 10% of spaces for other uses
Additions and alterations are explicitly exempted from the current stretch code. Starting in July 2023, the new stretch code will require:

<table>
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<th>Scenario</th>
<th>Stretch Code Requirement</th>
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<tbody>
<tr>
<td>Additions up to 100% of existing building size; or, up to 20,000-sf</td>
<td>Follow stretch code prescriptively</td>
</tr>
<tr>
<td>Additions which exceed either of above</td>
<td>Treat addition like new construction</td>
</tr>
<tr>
<td>Alteration of existing building</td>
<td>Altered portions: follow stretch code prescriptively</td>
</tr>
<tr>
<td></td>
<td>Unaltered portions: no updates required</td>
</tr>
<tr>
<td>Change of use</td>
<td>Follow stretch code prescriptively</td>
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</tbody>
</table>
Timeline: Stretch code update

Jan 1, 2023
- Residential Low-rise update
  - HERS 52-58 new homes / multi-family
  - HERS 52-58 for some Large Renovations & Additions
- Heat recovery ventilation
- EV ready wiring

July 1, 2023
- Commercial and Multi-family update
  - TEDI for office, schools, multi-family
  - Thermal bridging
  - Air leakage testing
  - Heat recovery ventilation
  - Large renovations & additions

July 1, 2024
- Residential HERS phase-in:
  - HERS 42 for mixed fuel
  - HERS 45 for all-electric

Stretch code updates in 2023
HERS rating levels lowered – July 2024
Specialized Code
Net zero in 2050
Adoption Process: Similar to the Stretch code

- Warrant article
- Town Meeting Bylaw vote or City Council vote

Timeline: Published in State Register – Dec 2022

- Town meeting / city council vote
- Effective date: Jan 1, or July 1
- recommend 6-12 months
Specialized Code: Low Rise Residential

Builds on Stretch Code with 3 paths:

- **All-Electric**: HERS 45
  Or Passive House

- **Mixed Fuel**: HERS 42 + Solar install + Wired for Electric
  Or Passive House + Wired for Electric

- **Zero Energy**: HERS 0 (HERS 42 + Solar)
  Or Passive House (Phius Zero)

New homes over 4,000 sf must use **All-Electric or Zero Energy**

Additions & Alterations – same as Stretch code
Specialized Code
Multi-Family
Passive House

• **January 2023**: Passive House required for 5 stories or less, if over 12,000 sf

• 6+ Stories choose TEDI or HERS 42/45 or ASHRAE App. G

• **January 2024**: Passive House required for all Residential over 12,000 sf
Specialized Code - Commercial

Commercial Building Types (except Multi-family)

- **All-Electric**: All Stretch code efficiency requirements
- **Passive House & Stretch code requirements**: Electrification-ready (pre-wiring)
- **Gas or other fossil fuel**: All stretch code efficiency requirements, Electrification-ready (pre-wiring), Solar on-site where feasible

Solar on-site where feasible
Solar PV

• Required:
  • Using Fossil fuels
  • Using Net Zero path

• Optional:
  • All-electric building

• Exceptions for shaded sites can reduce min. size
Stay in touch

Sign up for DOER energy code email updates: https://app.e2ma.net/app2/audience/signup/1965182/1356542/


Contact your local Green Communities Coordinator
https://www.mass.gov/service-details/contact-gc-coordinator

Energy Code Training  (free via Mass Save®)

Contractor Training
Questions?

Contact DOER:

Stretchcode@mass.gov

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Ian Finlayson