

# MASSACHUSETTS Energy Code Technical Support



## 2021 IECC Changes and New Massachusetts Amendments – Residential Buildings<sup>1,2</sup>

Code Section	Topic	Description of Change
<b>Chapter 1 – Scope and Administration</b>		
<b>R103.2</b>	<b>Information on Construction Documents</b>	Requires solar ready zone to be shown when complying with Appendix RC and Solar Zone Area to be shown when complying with Appendix RC (when homes re-heated with fossil fuels)
<b>Chapter 2 – Definitions</b>		
<b>R202</b>	<b>General Definitions – New Definitions</b>	All-Electric Building, Cavity Insulation, Combustible Equipment, Continuous Burning Pilot, Dimmer, Dwelling Unit Enclosure Area, Electric Vehicle Ready Charging Space, Enthalpy Recovery Ratio, High-Efficacy Light Sources, Insulating Sheathing, Mixed-Fuel Building, Occupant Sensor Control, On-Site Renewable Energy, Potential Solar Zone Area, Renewable Energy Certificate, Renewable Energy Resources, and Thermal Distribution Efficiency (TDE)
<b>Chapter 3 – General Requirements</b>		
<b>Table R303.1.3 (3)</b>	<b>Default Glazed Fenestration SHGC and VT</b>	Added table with default SHGC and VT values
<b>R303.1.5</b>	<b>Air-Impermeable Insulation</b>	This new section defines the properties required for an insulation to be considered air-impermeable
<b>Chapter 4 – Residential Energy Efficiency</b>		
<b>R401.2.1</b>	<b>Compliance Paths</b>	Allowed Performance compliance paths have been revised. Allowable compliance paths are: Prescriptive, ERI (HERS) Certification, and Passive House Certification
<b>R401.2.5</b>	<b>Additional Energy Efficiency</b>	Two additional energy packages must be implemented for prescriptive compliance; for all-electric buildings must include heat pumps, high efficient electric or solar water
<b>R401.3</b>	<b>Certificate</b>	Revised requirements for permanent certificate to include solar information, ERI, Code edition and compliance path used

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Table R402.1.2	<b>Assembly and Fenestration U-Factors</b>	Table has been retitled and refers to U-factors for the entire assembly; some values have changed
Table R402.1.3	<b>Assembly and Fenestration R-Factors</b>	Table has been retitled and refers to R-values (insulation only); some values have changed. Notable changes in Wood Frame R-Values, NOTE: be certain to refer to latest version of published code
R402.2.3	<b>Eave Baffle</b>	Added language requiring baffles to extend to outside the top plate and requiring baffles in each bay
R402.2.7	<b>Floors</b>	Section provides options for insulation installation in floors to comply including new options to help with ducts in floors
R402.2.8	<b>Basement Walls</b>	Allows for exception when the basement is unconditioned, and the ceiling is insulated
R402.2.11	<b>Masonry Veneer</b>	Insulation is not required on the horizontal portion of a foundation that supports a masonry veneer
R402.2.12	<b>Sunroom and Heated Garage Insulation</b>	Adds “Heated Garages” to this section and sets insulation requirements
Table R402.4.1.1	<b>Air Barrier and Insulation Installation</b>	This table addresses requirements for air barrier construction and insulation installation. The table has some additions and modification to add specificity to certain components or systems
R402.4.1.2	<b>Testing</b>	Now allows for compliance using area of the dwelling unit enclosure as an alternate to the standard using volume of conditioned space. Also exempts heated garages from testing (allows visual verification)
R402.4.6	<b>Electrical and Communication Outlet Boxes</b>	New section setting requirements for sealed boxes in the building thermal envelope
R402.5	<b>Maximum Fenestration U-factor and SHGC</b>	Maximum SHGC of 0.40 is now required
R403.3.2	<b>Ducts Located in Conditioned Space</b>	To be considered to be in conditioned space ducts: in exterior walls shall have min. of R-10 insulation between sheathing and ducts; in floors over unconditioned space must be separated by min. R-19 insulated between the duct and the unconditioned space.

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Code Section	Topic	Description of Change
<b>R403.3.5</b>	<b>Duct Testing</b>	Testing for Total Duct Leakage is now required on all duct systems. Except those for an HRV or ERV not integrated with the ducts serving heating or cooling systems
<b>R403.5.2</b>	<b>Hot Water Pipe Insulation</b>	Requires insulation on piping $\geq 3/4$ " located inside the conditioned space
<b>R403.6 / R403.6.1</b>	<b>Mechanical Ventilation</b>	Balanced system (HRV/ERV) is required. Sizing methodology changed to reflect updated ASHRAE 62.2 versions, including HERS Index method and formula that is location specific
<b>R403.6.1.1 / R403.6.1.2</b>	<b>Mechanical Ventilation Efficacy</b>	Sets efficacy limits for HRV/ERV systems based on size providing for a more consistent and measurable mechanical ventilation source
<b>R403.6.3</b>	<b>Testing and Verification</b>	This is a new section. Requires testing and verification of HRV/ERV flow by a HERS Rater, HERS Rating Field Inspector or an application BPI Certified Professional
<b>R404.1</b>	<b>Lighting Equipment</b>	This section increases the amount of high efficacy lighting from 90% to 100%
<b>R404.2</b>	<b>Interior Lighting Controls</b>	This new requirement states all permanently installed lighting fixtures shall be controlled with either a dimmer, an occupant sensor control or other control that is installed or built into the fixture. There are some exceptions for areas where lighting affects safety
<b>R404.3</b>	<b>Exterior Lighting Controls</b>	Where permanent exterior lighting is greater than 30 watts, lighting shall be controlled by a manual switch which permits automatic shut-off actions
<b>R404.4</b>	<b>Wiring for Electric Vehicle Ready Parking Spaces</b>	EV Ready spaces are required by the Stretch Code. A dedicated branch circuit (50 amps) shall be provided and marked as "EV Ready". Receptacle or connector is to be located within 6 ft. of EV Ready Space. At least (1) 50 amp circuit per dwelling unit; $\geq 20\%$ of total spaces in other R-use buildings are to be served with a 40 amp circuit shall be provided

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<b>R406.2</b>	<b>ERI Compliance</b>	ERI Rating Index remains a total performance compliance path. This revision provides specific requirements and new ERI (HERS) rating index requirements for 2023, for post July 2024 and for Major alterations, additions of Change or Use
<b>Table R406.2</b>	<b>Requirements for Energy Rating Index</b>	This table moves the mandatory requirements for ERI path in one location
<b>R406.4</b>	<b>Energy Rating Index</b>	This revision equates the ERI to RESNET HERS Index
<b>Table 406.5</b>	<b>Maximum Energy Rating Index</b>	Table revised to include new ERI (HERS) index values, All-Electric Building, and Solar Electric Buildings for new construction prior to and after July 1, 2024 and for Major alterations, additions or Change of Use. The new index values are more stringent than previous code. Footnote “b” of the table sets minimum insulation values
<b>N/A</b>	<b>Energy Star Homes 3.1 Compliance Path</b>	This revision omitted Energy Star Homes 3.1 Certified Homes as a compliance path
<b>R406.5.1</b>	<b>Trade-Off for Clean Energy Systems</b>	New Construction following Section R406 or existing buildings and additions following IECC chapter 5[RE] may use clean energy trade-offs to increase the maximum allowable HERS rating for each unit separately served by any combination of the following: <ol style="list-style-type: none"> <li>Solar Electric Generation: Solar photovoltaic array rated at 4kW or higher shall offset 3 HERS points for Level 3 alterations, Change of use to Residential R-use categories or for fully attached additions</li> <li>All-Electric Buildings shall offset 3 HERS points for each dwelling unit in new construction, Level 3 alterations, change of use to Residential R-use categories and fully attached additions</li> </ol>
<b>R406.7.3</b>	<b>Renewable Energy Certificate (REC) Documentation</b>	When on-site renewable energy is included in the project, proof of ownership or contract conveying the RECs to the homeowner must be provided.

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<b>Chapter 5 – Existing Buildings</b>		
<b>R502.1</b>	<b>(Additions) General</b>	Change from “does not use more energy than the existing building” to “achieves a certified HERS rating in accordance with Table R406.5”
<b>R502.1.1</b>	<b>Large Additions</b>	Additions to a dwelling unit > 1,000 sq ft or exceeding 100% of the existing conditioned floor area, shall require the <u>dwelling unit</u> to comply with the maximum HERS ratings for alterations, additions or change of use shown in Table R406.5
<b>R502.2</b>	<b>Changes in Space Conditioning</b>	Unconditioned or low-energy spaces that are altered to become conditioned space are required to meet code requirements without exception
<b>R502.3</b>	<b>Building Envelope</b>	Only new envelope assemblies in additions less than 1,000 sq ft can be exempted from insulation installation criteria requirements
<b>R502.3.2</b>	<b>Heating and Cooling Systems</b>	New ducts installed as part of the addition must be installed in accordance with the same requirements as new construction. Ducts from an existing less than 40 feet are exempt from the requirements of a new installation.
<b>R503.1.5</b>	<b>Level 3 Alterations, or Change of Use</b>	Alterations that meet the IEBC definition for Level 3 Alteration or the IRC definition for Extensive Alteration, exceeding 1,000 sq ft or exceeding 100% of the existing conditioned floor area, shall require the dwelling unit to comply with the maximum HERS ratings for alterations, additions or change of use shown in Table R406.5
<b>R505.1.1</b>	<b>Unconditioned Space</b>	Any unconditioned or low-energy space that is altered to become a conditioned space shall comply with Section R502

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