

Energy Efficiency Provisions of the State Building Code

As part of the Green Communities Act of 2008, Massachusetts is required to update its building code every three years to be consistent with the most recent version of the International Energy Conservation Code (IECC). This ensures that **new buildings are designed and constructed with energy efficiency in mind**. In 2009, Massachusetts became the first state to adopt an above-code appendix to the "base" building energy code-the "Stretch Code". The Stretch Code, which emphasizes energy performance, as opposed to prescriptive requirements, is designed to result in **cost-effective construction that is more energy efficient than that built to the "base" energy code**. The Stretch Code is typically updated every few years, with the most recent update to take effect in 2023.

The Stretch Energy Code (Stretch Code) regulations have since 2009 been published in MA 780CMR chapters 115.aa and previously 780 CMR 110.aa under the jurisdiction of the Board of Building Regulations and Standards. The Climate Act of 2021 moved the authority for the Stretch Code promulgation to the Department of Energy Resources (DOER) and at the same time **required the development of a new Municipal Opt-in Specialized energy code** (Specialized Code). The statute requires that the Specialized Code is formulated to ensure **new construction that is consistent with Massachusetts greenhouse gas limits** and sub-limits set every five years from 2025 to 2050. The updated Stretch Code is divided into two chapters, following the format of the IECC and appear as new regulations in 225 CMR 22.00 and 225 CMR 23.00.

The Specialized Code includes additional requirements that form an Appendix to each of the chapters of the Stretch Code.

- CMR 22.00 covers Residential low-rise construction, Appendix RC includes provisions for the Specialized Code in residential construction, and

- CMR 23.00 covers Commercial and all other construction (including most multi-family), Appendix CC includes provisions for the Specialized Code for commercial construction.

Therefore, current energy code options are as follows:

- **Current Base Energy Code** = IECC 2018 with MA amendments (to be updated in 2023)
- **Updated Stretch Code** = IECC 2021 with MA amendments + Stretch Code amendments

Base Code (IECC 2021)	Stretch Code (2023 update)	Specialized Code ("Net-Zero")
<ul style="list-style-type: none"> • New construction in towns & cities not a green community • 52 communities <p>Expected from BBRS: July 2023</p>	<ul style="list-style-type: none"> • New construction in towns & cities that are a green or stretch community • 299 communities <p>Residential: Jan 2023 Commercial: July 2023</p>	<ul style="list-style-type: none"> • New Construction in towns & cities that vote to opt-in to this code • Effective date: Typically 6-11 months after Town/City vote

Current Energy Code Options

- **Specialized Code** = IECC 2021 with MA amendments + Stretch Code amendments + Specialized Code appendices



Stretch Energy and Municipal Opt-In Specialized Building Code Frequently Asked Questions

1. What are the building energy code options for cities and towns in Massachusetts?

Massachusetts cities and towns now have 3 related choices of stringency of building energy code. These are the 'Base code' the 'Stretch code' and the 'Specialized code'. The minimum or 'base' energy code is the latest version of the national model code – the International Energy Conservation Code (IECC) with some amendments for Massachusetts. The base code is part of the building codes governed by the state Board of Building Regulations and Standards (BBRS). In 2023 the base code is being updated from the 2018 IECC to the 2021 IECC, and MA amendments adding wiring for electric vehicles and maintaining solar ready roof requirements.

2. What is the Stretch code?

The 'Stretch code' is a more energy efficient alternative to the base code. The 2023 update is the 3rd major update to the 2009 original Stretch code. The Stretch code increases the energy efficiency requirements for all new residential and commercial buildings, as well as for additions and renovations that require building permits. Municipalities started adopting the Stretch code in 2009; as of January 2023, 300 out of 351 Massachusetts cities and towns have adopted it. The Stretch code is now published and maintained by the Department of Energy Resources.

3. What is the Specialized code?

The Specialized code is required by statute ([MGL 25A Section 6](#)) to help achieve MA GHG emission limits and building sector_sub-limits set every five years from 2025 to 2050. As a result, all compliance pathways under the Specialized code are designed to ensure new construction that is consistent with a net-zero Massachusetts economy in 2050, primarily through a combination of energy efficiency, that it in turn enables reduced heating loads, and efficient electrification. Use of fossil fuels such as gas and propane or biomass is permitted but comes with additional requirements for on-site solar generation and pre-wiring for future electrification of any fossil fuel using equipment.

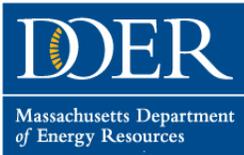
4. What is the anticipated cost of building under the Stretch energy code?

Designed and constructed in accordance to Stretch code standards, low-rise residential buildings built with all electric heating and cooling (via heat pumps) will typically cost less to build and operate than those built with fossil fuel heating. One reason for this is that heat pumps can be used for both heating and central air conditioning, whereas fossil fuel heated new homes typically require a separate air conditioning system.

DOER has commissioned studies to analyze the change in construction costs related to building to the Stretch code for several sizes and types of residences, and they generally indicate the construction and operating costs are lower under the Stretch code standards with fully electric heating and cooling via heat pumps. These case studies are available on DOER's website here:

<https://www.mass.gov/doc/residential-stretch-code-costs-and-benefits-case-studies/download>

Analysis of various types of common commercial buildings are also available on the DOER website,



though these don't include an analysis of Mass Save or federal building incentives.

5. How do the base and Stretch codes differ?

The base energy code is currently based on amendments to the IECC2018 national model code but will update to the IECC2021 model code as part of a larger update to the building code as it moves from the 9th edition to the 10th edition. The timing is uncertain but expected at some point in 2023. **The base energy code in both the 9th and 10th editions provides two options** residential builders may use to meet energy efficiency requirements:

- **Prescriptive Method**, installing elements with specific energy efficiency levels (e.g., windows, or wall & roof insulation, furnace, etc.), or
- **Performance-based Method**, building to ensure the home performs to a specific level of efficiency, typically measured through a **HERS** (Home Energy Rating System) **or Passive House** analysis, including both of the design plans and the actual built home once construction is completed. The builder can decide how to design the house to reach the performance target.

The Stretch code requires that builders use the **performance-based method**. Measuring the home in this way brings in a 3rd party energy expert who verifies it is designed and built to perform as expected, which is **an important protection for the homeowner and for any future buyer**. Some builders in non-Stretch code communities voluntarily choose to use the performance-based method required by the Stretch code because it can often provide greater flexibility.

6. How is the Specialized code different from the Stretch code?

The Specialized code has accelerated adoption of more efficient HERS rating thresholds (HERS 42 and 45) and provides three paths for low rise residential compliance, including a zero-energy pathway (with solar PV). It also requires new homes over 4,000 sq ft to follow the all-electric or zero energy pathway. Solar PV is required for any new construction utilizing fossil fuels for heating. The Specialized code for multi-family housing 4 stories and above phases in Passive House standards by January 2024.

7. Where can I find and read more about the Stretch code and Specialized code?

The Stretch and Specialized codes are new regulations in [225 CMR 22.00](#) and [225 CMR 23.00](#). CMR 22.00 covers Residential low-rise construction and CMR 23.00 covers Commercial and all other construction (including most multi-family).

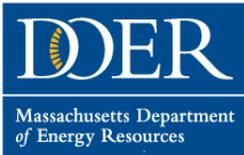
8. What building types does the Stretch energy code and Specialized code apply to?

The Stretch code applies to both residential and commercial new construction, as well as certain renovations and additions. The Specialized code applies only to new residential and commercial new construction.

9. What categories do multi-family residential buildings fall into?

Multi-family building with central heating and cooling are considered commercial buildings. Those that are townhouses and have separate heating and cooling are considered to be low-rise residential buildings.

10. How does the Stretch code apply to historic buildings?



The rules for historic buildings are contained in IECC 2021 C501.5, and state that provisions relating to the repair, alteration, restoration and movement of structures, and change of occupancy are not mandatory for historic buildings provided a report has been submitted to the code official and signed by a registered design professional or representative of the State Historic Preservation Office of the historic preservation authority having jurisdiction, demonstrating that compliance with the provision would threaten, degrade, or destroy the historic form, fabric or function of the building.

11. What is a HERS rating?

HERS stands for 'Home Energy Rating System,' and is a national standard that uses information on the design of the energy systems in a home to calculate, via computer modeling, the average energy needs of that home and give it a rating score. The HERS Index was developed by the non-profit Residential Energy Services Network (RESNET) for the mortgage industry and is utilized by the Federal Internal Revenue Service (IRS) and the LEED for Homes program. On the HERS 2006 index scale smaller numbers are better, with 0 representing a net zero energy home, and 100 represents a home built according to meet the national model energy code in 2006 (the IECC 2004 with 2005 amendments). A HERS rating of 52 means that the home uses about 48% less energy than the same size home built to the 2004/2005 IECC code requirements.

12. Do I have to get a HERS rating?

New low-rise residential buildings constructed under the Stretch code will have to get a HERS rating. The HERS performance-based approach provides a very good way to ensure that homes are not only well designed but also well built. As part of the HERS rating the home will be tested for air leakage, and under both the base and the Stretch code homes with heating and cooling ducts may also have those tested for leakage. The HERS rater, builder and building inspector can have confidence that the completed homes really are energy efficient.

Standards and Training:

13. What training and materials are available on the Stretch and Specialized codes

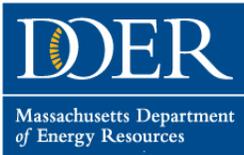
The Mass Save program provides training for code officials, builders, and design professionals. Visit their website at <https://www.masssave.com/en/learn/partners/energy-code-training-and-events> for scheduling.

DOER also provides technical experts to perform public outreach in municipalities that are considering a vote on the Stretch and/or the Specialized Stretch code. Those interested in this assistance should reach out to their regional Green Communities Coordinator

Process:

14. What is the process for adoption of the Stretch and Specialized energy codes?

Towns and cities in Massachusetts can choose to remain on the base energy code, adopt the Stretch energy code, or adopt the Specialized energy code as their mandatory energy code requirement. A municipality would remain on the base energy code unless and until it adopts the Stretch code or Specialized code through its appropriate public process.



15. How would a town or city adopt the Stretch and Specialized energy codes?

The Stretch code and Specialized code regulations may be adopted by any municipality in the commonwealth, by decision of its governing body. In a city having a Plan D or Plan E charter the governing body shall be the city manager and the city council, and in any other city the mayor and city council. In towns the governing body shall be Town Meeting.

In order to be adopted, the regulations must be considered at an appropriate municipal public hearing, subject to the municipality's existing public notice provisions. Cities are advised to adopt the Stretch and Specialized energy codes by general ordinance and towns are advised to adopt the codes as a general bylaw. Current Stretch code communities wishing to adopt the Specialized code may choose to amend their existing ordinance or bylaw to refer to the new regulations. Municipalities should consult with their counsels on appropriate language.

Please note, once the Stretch and Specialized code is adopted by a municipality, all future editions, amendments and modifications are automatically adopted unless the municipality rescinds adoption of the code itself. A community must adopt the Stretch and Specialized code "as is," without applying any amendments or conditions.

Also note, according to the Attorney General's office:

Pursuant to G.L. c.40, S 32, neither general nor zoning by-laws take effect unless the town has first satisfied the posting/publishing requirements of that statute. Once this statutory duty is fulfilled, general by-laws and amendments take effect on the date that these posting and publishing requirements are satisfied unless a later effective date is prescribed in the by-law ...

DOER recommends that the warrant article, the motion and the by-law/ordinance explicitly specifies an effective date so that everyone (building officials, builders, homeowners, voters) is fully aware of when the Stretch and Specialized energy codes take effect. **It is further recommended that municipalities choose either July 1 or January 1 as the effective date.**

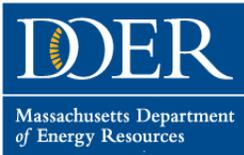
Enforcement/Requirements:

16. How would the Stretch code be implemented and enforced?

Once the Stretch or Specialized energy code is adopted by a town or city, it supplements the previous energy code language and becomes the binding energy code language for building projects in that municipality. Implementation and enforcement of the code is similar to existing code, where the developer is responsible for submitting documentation of compliance to the building inspector for review, and the building inspector conducts a site review.

17. What is the role of a building code official and a HERS rater for residential projects?

Residential low-rise buildings meeting the Stretch code through a HERS rating require independent certification by a HERS rater. Their work will produce a report detailing the energy systems in the building and will provide a HERS index score. In this way the local inspector retains their oversight role but the additional energy requirements are intended to not place a significant additional burden on their time.



18. How do I find a HERS rater?

HERS raters work with the residential builder/developer/design team and should be included in the team from the outset. Lists of HERS raters working in Massachusetts are available on the [Mass Save website](#), and from the [Northeast HERS Alliance](#).

19. What training and certification do HERS raters undergo?

HERS raters are typically experienced building professionals, who in addition take a week or two week long intensive training course in residential energy efficiency. After completing the training, learning how to use HERS rating software, and passing a test, new raters must also complete at least 5 ratings with an experienced HERS rater before being able to independently award ratings. In addition to this initial training and certification, HERS raters must be affiliated with a certified HERS provider which is responsible for ongoing code education and quality assurance oversight of the HERS rater’s work. The HERS providers also carry liability insurance and allow builders to request a review from a second HERS rater in the rare case of disputes.

20. If my community has already adopted Stretch energy code, do we need to vote for it again?

No

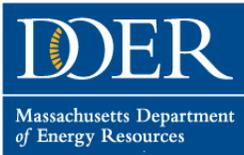
Residential Building Questions:

R1. How do I meet the residential Stretch code for new 1 and 2 family homes and townhouses?

For new residential homes including multi-family homes of 3 stories or less, builders can choose to either meet Home Energy Rating Scores (HERS) certification or Passive House certification. Starting January 1, 2023, the maximum allowed HERS Index Score for residential low-rise construction ranges from 52 (for residences heated with fossil fuels) to 58 (for all-electric residences with on-site solar PV). HERS Index scores will be reduced to 42 and 45 starting July 1, 2024. Please review to Table 1 below:

TABLE 1: CHANGES TO MAXIMUM HERS INDEX

On-site Clean Energy Application	Maximum HERS Index score (before renewable energy credit)		
	New construction		Extensive Alterations, Additions and Change of use
	Updated Stretch Code July 1, 2024	Updated Stretch Code Jan. 1, 2023 <i>(Same as 10th edition base code)</i>	Updated Stretch Code (Jan. 1, 2023)
None (Fossil fuels)	42	52	52
Solar		55	55



All-Electric	45	55	55
Solar & All-Electric		58	58

The 2023 Stretch Code maintains differential HERS ratings among new construction heating with fossil fuels, all-electric, and/or including onsite solar; after a phase-in period until July 1, 2024, which will require HERS 45 for all-electric homes and HERS 42 for homes with any use of fossil fuels.

The 2023 Stretch Code also updates HERS requirements for extensive alterations, additions and change of use for existing homes. Additional detail on alterations, additions and change of use can be found in the section below.

Builders wanting to achieve code compliance via Passive House certification will use the most recent Passive House Institute US (Phius) standards.

The updated Stretch code requires at least one space per home and a minimum of 20% of spaces in a new multi-family parking lot be provided with electric wiring to allow for **future EV charging**.

Existing buildings: Alterations, Additions and Changes of use:

The 2023 Stretch Code clarifies when alterations to existing homes trigger compliance with different requirements. The requirements are as follows:

- **Additions over 1,000 square feet (sf)** must follow the HERS Pathway and meet the HERS requirements for Additions in Table 1 above. Additions under 1,000 square feet will continue to follow Base Energy Code.
- **Additions that exceed 100% of the conditioned floor area of the existing dwelling unit** (ie. more than double the size of the house) must follow the HERS Pathway and meet the HERS requirements for Additions in Table 1 above.
- **Level 3 Alterations** (over 50% of the home is renovated and reconfigured) as defined in the International Existing Building Code (IEBC 2021) or change of use **exceeding 1,000 sf or exceeding 100% of the existing conditioned floor area**, must meet the HERS requirements in Table 1 above. Level 1 and Level 2 alterations will continue to follow the Base Energy Code.

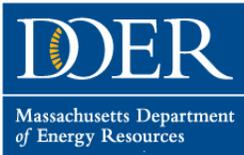
R2. When is a HERS Rating required for an addition?

A HERS Rating is required where the total added conditioned floor area is greater than 1,000 square feet or the addition exceeds 100% of the existing dwelling unit conditioned floor area.

R3. If multiple additions are made to the same dwelling unit and each is under 1,000 square feet, but the total adds up to more than 1,000 square feet, is a HERS Rating required?

Yes, the floor area of multiple additions should be treated cumulatively. When two or more additions add up to greater than 1,000 square feet, a HERS Rating is required.

R4. Is the floor area trigger for when a HERS Rating is required for additions based on conditioned



floor area?

Yes, only conditioned floor area is included when determining whether the addition requires a HERS Rating.

R5. Can a HERS Rating be performed on an addition?

It depends. HERS Ratings may only be performed on dwelling units, so if the addition contains areas for living, sleeping, eating, cooking, and sanitation, a HERS Rating may be performed on the addition. If the addition is not a dwelling unit, the HERS Rating must be performed on the existing home plus the addition.

R6. Is a blower door test required for additions that trigger the requirement for a HERS Rating?

Yes. Blower door testing is a required element of a HERS Rating.

R7. Is a blower door test required for additions that do not trigger the requirement for a HERS Rating and are allowed to follow the prescriptive path?

In most cases, blower door testing is not required because passing the test would require performing work on the existing building. IECC Chapter 5 states that additions must comply as they relate to new construction “without requiring the unaltered portion of the existing building or building system to comply.” However, where feasible and practical, a code official could require testing of the addition alone.

R8. If an alteration meets the definition of a Level 3 alteration under the IEBC or an extensive alteration under IRC Appendix AJ, but does not exceed 1,000 square feet or 100% of the existing floor area, is a HERS Rating required? Likewise, if an alteration does not meet the definition of a Level 3 alteration, but exceeds 1,000 square feet or 100% of the existing floor area, is a HERS Rating required?

No. A HERS Rating is only required for alterations that meet the definition of a Level 3 alteration under the IEBC or an extensive alteration under IRC Appendix AJ **and** exceed 1,000 square feet or 100% of the existing floor area.

R9. Is the floor area trigger for when a HERS Rating is required for alterations based on conditioned floor area?

Yes, only conditioned floor area is included when determining whether the alteration requires a HERS Rating.

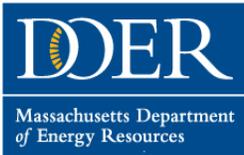
R10. Is a blower door test required for alterations that trigger the requirement for a HERS Rating?

Yes. Blower door testing is a required element of a HERS Rating.

R11. Is a blower door test required for alterations that do not trigger the requirement for a HERS Rating and therefore are allowed to follow the prescriptive path?

In most cases, blower door testing is not required because passing the test would require performing work on the existing building.

R12. Is EV readiness required for alterations?



No. EV readiness is only required for new construction.

R13 Is solar readiness required for alterations?

No. Solar readiness is not required for alterations. The solar-ready provisions apply only to new construction as Section R503 – Alterations makes no reference to Appendix RB Solar Ready Provisions. In addition, Appendix RB states that, “these provisions shall be applicable for new construction, except additions under 1,000 sq ft.”

R14. How much more does it cost to build to the Stretch code, and how does this compare to the energy savings?

It depends on how the new homes are heated. DOER compared costs for residential construction for four building types: 1) Large single homes (4,000 sq. ft.); 2) Small single family homes (2,100 sq. ft.); 3) 3-bedroom townhouses (2,100 sq. ft.); and 4) six-unit multifamily buildings (1,400 sq. ft per unit). The analysis compared construction costs between base code (HERS 52) and Stretch code (HERS 42) heated with natural gas and electric heat pumps. Including tax credits and Mass Save incentives, it is less expensive to build and operate Stretch code homes heated and cooled with heat pumps than those heated with natural gas built under the base code.

Costs and (savings) for residential construction under Stretch code (42 HERS) vs. base code (52 HERS)				
Size	Gas heat		Electric heat	
	Builder costs (savings)	Resident annual costs (savings)	Builder costs (savings)	Resident annual costs (savings)
4,000 sq. ft.	\$3,184	(\$302)	(\$20,062)	(\$548)
2,100 sq. ft.	\$7,907	\$496	(\$28,597)	(\$1,053)
Townhouse	\$62	(\$11)	(\$11,492)	(\$316)
Multi family	\$2,277	(\$14)	(\$15,690)	(\$683)

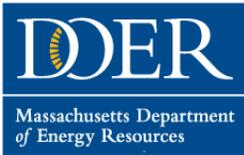
For more information on the residential cost studies, visit <https://www.mass.gov/doc/residential-stretch-code-costs-and-benefits-case-studies/download>

R15.. What are the Specialized code requirements for new residential construction?

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**
2. **All-Electric pathway**
3. **Mixed-Fuel pathway**

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.** Table 2 below summarizes the low-rise residential



Specialized Code requirements by home size and fuel use. All buildings are required to install wiring for electric vehicle (EV) charging in a minimum of 20% of new parking spaces, and one space per home in one- and two-family homes. Buildings with any combustion equipment designed for fossil fuel use are termed ‘mixed fuel’ buildings.

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

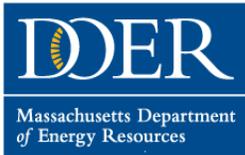
Building Size	Fuel Type	Minimum Efficiency	Electrification	Min. EV wiring	Renewable Generation
Dwelling units up to 4,000 sf	All Electric	HERS 45 or Phius CORE or PHI	Full	1 parking space	Optional
Dwelling units up to 4,000 sf	Mixed-fuel	HERS 42 or Phius CORE or PHI	Pre-wiring	1 parking space	Solar PV (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

All Electric building performance standard

All electric buildings are defined in the updated Stretch Code and comply with the 2050 net-zero emissions performance standard by meeting the minimum efficiency standards of either HERS 45 or the Passive house pathway and using either air source or ground source heat pumps for primary space heating and heat pump or solar thermal water heating, as well as all electric appliances. All electric buildings are not required to install on-site solar panels but roofs must be solar-ready in accordance with the base and Stretch code requirements.

Mixed Fuel Pathway

New low-rise buildings **under 4,000 sf** using fossil fuels for any on-site use including space heating, water heating, cooking or drying must meet **minimum efficiency requirements of HER 42 or the Passive House pathway**. In order to demonstrate alignment with the 2050 net-zero emissions mandate, all homes or units using fossil fuels for space heating, water heating, cooking, or drying must install sufficient electrical service, space and wiring to allow for future conversion to all electric buildings.



These mixed-fuel homes and buildings utilizing the HERS pathway are also required to **install solar panels that provide no less than 4kw for single family** and not less than 0.75 W/ft² for multi-family, to mitigate these near-term emissions, with an exemption for shaded sites. Homes and buildings utilizing the Passive House pathway are exempt from additional solar install requirements, but must have solar-ready roofs consistent with both the stretch and base code provisions.

R16. Can I include a gas stove in a new home built under the Specialized Code?

Yes, provided the new home has **under 4,000 square feet** of conditioned space and is designed and built in accordance with the mixed-fuel pathway, which includes pre-wiring for future electrification of all heating, water heating, clothes dryers, and cooking equipment; meets HERS 42; and has onsite solar of not less than 4kW.

New dwelling units with **over 4,000 square feet** of conditioned space may install a gas stove, provided the building is designed using the **zero energy pathway**, meets HERS 0 or PHIUS 0 by including onsite renewables.

R17. How much solar PV would I have to install under the Specialized Code Mixed Fuel Pathway?

One- and two- family dwellings and townhouses are required to install a minimum of 4kW of onsite solar per dwelling unit, unless the potential solar zone area is less than 300 square feet.

R18. Can a home with a fossil fuel backup generator still qualify as “all-electric” to be eligible for the trade-off for clean energy systems (i.e., 3-point increase in maximum HERS Index)?

Yes. Fossil fuel powered backup generators are allowed in all-electric homes.

R19. My homesite is in the woods – do I have to cut down trees to meet the onsite solar requirements?

There are exceptions to the onsite solar requirements:

- Roof area oriented between 110 degrees and 270 degrees of true north of new one-and two-family homes and townhouses is under 600 square feet
- Roof area is in full or partial shade for more than 70 percent of daylight hours annually

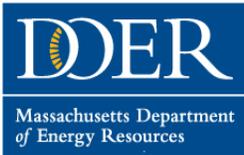
R20. Are there additional requirements for extensive renovations or additions under the Specialized code?

No, extensive renovations and additions follow the requirements under the “regular” Stretch code.

Commercial Building Questions:

C1. What buildings are covered by the commercial Stretch code?

All non-residential buildings are covered by the commercial Stretch code starting July 1, 2023.



C2. What is required for new commercial buildings to comply with the Stretch code?

Depending on the building type, the updated Stretch code includes several code pathways for new construction.

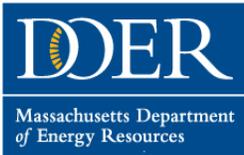
1. TEDI Pathway: Offices, residential, and schools over 20,000-sf are required to use a new Thermal Energy Demand Intensity (TEDI) Pathway. The updated Stretch Code sets forth specific TEDI limits by building type. This uses the same energy software tools as the current ASHRAE 90.1 Appendix G pathway but with significantly more focus on heating, cooling and the building envelope. Building uses adjacent to office and residential use, such as post offices, town hall, and other similar buildings are also covered under this pathway.

2. 10% better than ASHRAE Appendix G: High ventilation buildings such as labs and hospitals can continue to use a 10% better than ASHRAE appendix G pathway or opt to use the TEDI pathway. Multi-family buildings may follow the ASHRAE appendix G pathway until July 1, 2024. The updated Base Code and updated Stretch Code change the underlying ASHRAE standard 90.1 to the more recent 2019 edition.

3. Prescriptive pathway: Small commercial buildings (any building use except multi-family) under 20,000-sf will be able to continue to comply through an updated prescriptive pathway, or can opt to use the TEDI pathway. The prescriptive pathway is being updated in the Base Energy Code, and the updated Stretch Code includes additional amendments to improve efficiency beyond Base Energy Code for small buildings.

4. HERS and Passive House: Multi-family buildings larger than those covered by the residential low-rise code can choose between HERS and Passive House pathways that contain the same energy efficiency requirements as the updated Residential low-rise Stretch Code. The Passive House certification options remain available as an option for all building types.

	Updated Stretch Code July 1, 2023 through June 30, 2024	Updated Stretch Code Beginning July 1, 2024
Targeted Performance	Optional	Optional
HERS	Optional HERS 52/55	Optional HERS 42/45
Passive House	Optional	Optional
Relative Performance	Optional	Not allowed



Mixed-use buildings can use a combination of code pathways as appropriate for different portions of the building or choose a whole-building approach through the TEDI or Passive House pathways.

C3. How are commercial renovations and/or additions handled by the Stretch code?

The updated Stretch Code allows building additions which are less than 20,000-sf to continue to follow Base Energy Code. Additions greater than 20,000-sf will be required to meet applicable Stretch Code requirements for that building type and size. It will also require that any altered walls be brought up to prescriptive Stretch code, although historic buildings remain exempt from these provisions.

In addition, the updated Stretch Code will require buildings of any size which undergo **change of use or occupancy** to follow the new Stretch Code prescriptive pathway but allows for a 10% reduced envelope requirement for change of use compared to true new construction.

C4. What is TEDI?

Thermal Energy Demand Intensity (TEDI) measures the heating and cooling demand of a building in kBtu/sf-yr. **Heating TEDI** is the total annual energy **delivered** to the building for space conditioning and conditioning of ventilation air. **Cooling TEDI** is the total annual energy **removed** from the building for space conditioning and conditioning of ventilation air.

C5. Are there EV parking space requirements?

Yes. The updated Stretch Code raises the minimum number of spaces requiring EV wiring to 20% for business and residential space (from 10% required in the base code), with 10% for all other occupancies.

C6. What are the Specialized code requirements for commercial buildings?

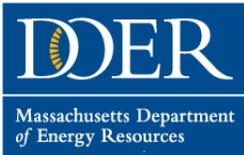
The Specialized Code maintains the **same energy efficiency requirements as the Updated Stretch Code for all building types except multi-family**, including adoption of the ASHRAE 90.1-2019 pathway for high ventilation buildings, TEDI requirements for offices and schools, and a new prescriptive path for small buildings.

Multi-family buildings built to the Commercial Specialized Code must achieve precertification to **Passive House standards** (either from PHI or Phius). These requirements are phased-in for buildings up to 5 stories required to meet Passive House requirements if applying for permits after January 2023, and taller buildings 6 stories and above required to meet Passive House for permit applications beginning in January 2024.

There are three pathways for commercial Specialized code compliance:

1. All Electric Building Performance Standard

This is the simplest compliance pathway under the Specialized Code, requiring the energy efficiency requirements of the Stretch code, and requiring that all space heating, water heating, cooking equipment and drying equipment is powered by electricity and meets minimum efficiency standards.



2. Mixed-Fuel Building Performance Standard

This pathway establishes minimum requirements for new buildings designed with any space heating systems, water heating systems or appliances capable of using fossil fuels such as natural gas, heating oil or propane fuel. While allowing these fossil-fired systems, the Specialized Code requires mitigation of these emissions with the following requirements:

- a) Minimum efficiency requirements for space and water heating, including both fossil fuel and clean biomass boilers and furnaces systems.
- b) Solar development of the available on-site solar potential, specifically through one of 2 options:
 - i. *Not less than 1.5W/ft² for each sq foot of the 3 largest floors (the threshold proposed in solar requirements in the forthcoming IECC2024), or*
 - ii. *not less than 75% of the Potential Solar Zone Area – which includes parking areas and additional roof space.*
- c) Pre-wiring and electrical service provision to the building to allow for future electrification of space and water heating and cooking and drying equipment.

Note: Off-site renewable generation or the purchase of Renewable Energy Credits (RECs), are not an option for compliance with the on-site renewable energy requirements in the Specialized Code.

3. Zero Energy Building Performance Standard

This is the most stringent of the 3 pathways in that it requires net zero energy on an annual basis from the 1st year of construction. The Specialized Code amends the IECC commercial appendix CC: Zero Energy Commercial Building Provisions by simplifying the allowable renewable options. As a result, zero energy may be demonstrated only with on-site generation (typically solar PV), and all buildings must meet minimum energy efficiency requirements prior to renewable offsets.

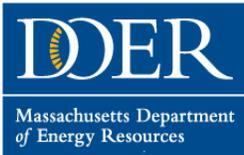
The option to show compliance using HERS 0 or Phius ZERO certification as used in the low- rise residential Specialized Code is also eligible under the Zero Energy pathway for multi-family residential buildings. solar PV), and all buildings must meet minimum energy efficiency requirements prior to renewable offsets.

The option to show compliance using HERS 0 or Phius ZERO certification as used in the low- rise residential Specialized Code is also eligible under the Zero Energy pathway for multi-family residential buildings.

Electric Vehicle Readiness Provisions

EV1. Under the Massachusetts Stretch Code, what does it mean for a parking space to be electric vehicle (EV) ready?

For a parking space to meet the EV Ready Spaces requirement, the space must be equipped with a dedicated electrical circuit. This means there needs to be adequate electric service capacity and wiring with a termination within 6 feet of the space. The dedicated branch circuit must be identified in the



electrical panel or subpanel directory as "EV READY." The circuit must terminate in either a NEMA receptacle (standard outlet) or a Society of Automotive Engineers (SAE) Standard SAE J1772 electrical connector for servicing electric vehicles. The termination must also be marked as "EV READY".

EV2. What if the house does not have a garage, where is the circuit supposed to terminate?

The code requires the circuit to terminate within 6 feet of the parking space, regardless of whether there is a garage. The code does not contain termination requirements beyond the types of allowable termination. If a house does not have a garage, the electrician might consider terminating the circuit with a weatherproof outdoor receptacle on the side of the home, embedded in parking area pavement, or on a post near the space.

EV3. Does EV readiness apply to buildings that have no onsite parking?

In the absence of onsite parking, EV readiness is not required. Exception 1 of R404.4 states that, "In no case shall the number of required EV Ready Spaces be greater than the number of parking spaces installed." Further, exception 2 states that, "This requirement will be considered met if all spaces which are not EV Ready are separated from the premises by a public right-of-way."

EV4. Many lake houses have parking spaces located across the street from the main structure. Is electric vehicle readiness required in these cases?

This requirement will be considered met if all spaces which are not EV Ready are separated from the premises by a public right of way.

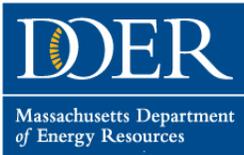
Solar Readiness Provisions

S1. If the building design does not allow for the required solar-ready zone area due to obstacles such as vents, chimneys, and roof-mounted equipment, does the project still need to comply with the solar-ready provisions?

Yes. The stretch code adopts the IECC 2021 Appendix RB without amendments, and the appendix states that solar-ready zones shall be free from obstructions. In addition, a section on shading requires that the solar-ready zone is set back by a certain distance from any object on the building or site that will shade the zone. The code does not provide exceptions for rooftops with obstructions that interfere with the free area required for a solar-ready zone, so in these cases, a redesign is required. Designers should consider this requirement early in the design process.

S2. Is there a minimum solar electric system size for a home to meet the solar-ready provisions?

No. Appendix RB Solar-ready Provisions does not contain any requirements related to solar equipment, and as such, does not specify a minimum solar system capacity in kilowatts. The only size-related requirement is the area in square feet of the designated solar-ready zone. For homes with at least 600 square feet of roof area oriented between 110 and 270 degrees of true north, the solar ready zone must be at least 300 square feet. For townhomes with a total floor area of 2,000 square feet or less, the solar



ready zone must be at least 150 square feet. The solar-ready zone may be split into multiple zones, but individual zone areas must be at least 80 square feet in area and at least 5 feet wide.

However, there are on-site renewable energy requirements for mixed-fuel new construction under the Specialized code.

S3. Do the Solar-ready Provisions require conduit or wiring to be installed from the solar-ready zone to the electrical panel?

No. The Solar-ready Provisions require the construction documents to indicate pathways for routing conduit or plumbing from the solar-ready zone to the electrical panel or service hot water system, but no conduit, wiring, or plumbing are required to be installed. In addition, reserved space in the electrical panel labeled as “for future solar electric” is required, and for flat roofs, a capped roof penetration must be installed.