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2023 Commercial Stretch Code Part 1: Overview

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What is Mass Save®?

- Mass Save® is an initiative sponsored by Massachusetts' gas and electric Program Administrators and energy efficiency service providers, including
  - The Berkshire Gas Company
  - Cape Light Compact
  - Eversource Energy
  - Liberty Utilities
  - National Grid
  - Unitil
- The Sponsors of Mass Save work closely with the Massachusetts Department of Energy Resources to provide a wide range of services, incentives, trainings, and information promoting energy efficiency that help residents and businesses manage energy use and related costs.

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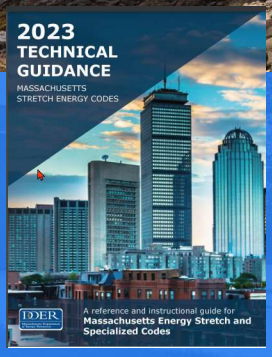
Massachusetts Department of Energy Resources (DOER)

Some of the content of this course is sourced from 2023 Technical Guidance provided by Massachusetts Department of Energy Resources.



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Presented by:

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Moving Energy Efficiency Forward

We combine building science with technology to help utility companies, program implementers, and building performance professionals achieve energy savings.

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Today's Presenter

Bill Footer
Energy Efficiency Program Manager

6

Today's Presenter

Art Pakatar
Senior Manager, Energy Codes Division

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Continuing Education

This webinar is approved for:

- 1-hour CSL CEU
- 1 AIA LU | HSW
- 1 CO CEU
- 1 BPI CEU

Everyone will receive a certificate of attendance via email

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- Introduction
- Massachusetts Energy Code
- 2023 Commercial Stretch Energy Code Requirements
- Commercial Energy Efficiency
- Compliance Pathways
- Existing Buildings
- Appendix CB Solar Ready
- EV Ready
- Municipal Opt-In Specialized Stretch Code
- Summary

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Learning Outcomes

Understand the nuances of the new Commercial Stretch Code.

Gain knowledge of the different compliance pathways and new performance requirements under the Commercial Stretch Code.

Comprehend the impact of thermal bridging on the overall Building Thermal Envelope.

Understand how the Commercial Stretch Code applies to existing buildings and addresses additions, alterations, and changes in use.

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Poll Question #1

Which of the following best describes your field of work?

A. Builder
B. Architect
C. Code Official
D. HERS Rater
E. Passive House Consultant

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2023 Massachusetts Commercial Energy Code

Base Code (IECC 2021)	Stretch Code (2023 update)	Specialized Code ("Net-Zero")
• New construction in towns & cities not a green community • 52 communities Expected from BBRS: July 2023	• New construction in towns & cities that are a green or stretch community • 299 communities Residential: Jan 2023 Commercial: July 2023	• 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

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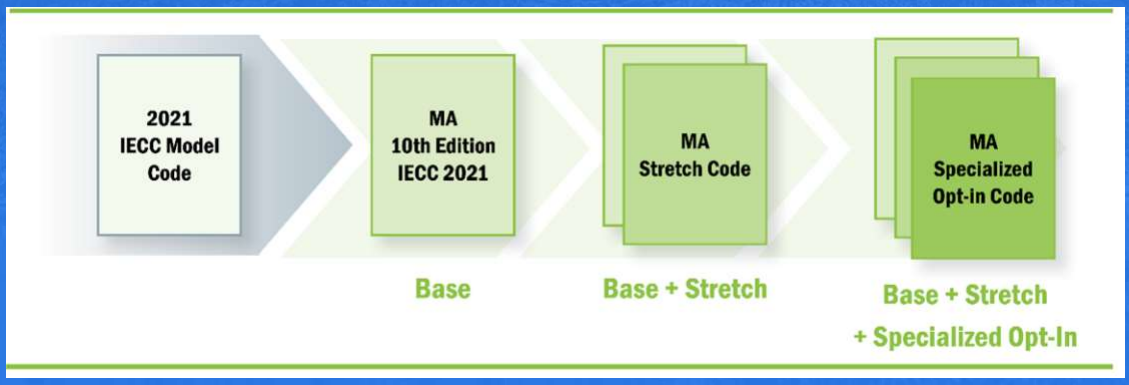
The 2023 Massachusetts Energy Code



Courtesy of DOER: 2023 Technical Guidance, Massachusetts Stretch Energy Codes

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Code Adoption Timeline

Jan 1, 2023

- **Residential update (>4 stories)** HERS 52/55/58

July 1, 2023

- **Commercial and Multi-family update**

July 1, 2024

- **Residential & Multi-family update** HERS 42/45 or TEDI or Passive house options

Stretch code updates in 2023

HERS rating levels lowered – July 2024

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MA Base Energy Code

The Base Energy Code is…

- The default statewide energy code
- Based on the 2021 IECC* (Currently based on 2018 IECC)
- Provides a base level of energy savings
- Found in ***Chapter 13: Energy Efficiency Amendments*** of the MA State Building Code (CMR 780)

* Anticipated Early 2024

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The 2023 Massachusetts Energy Code

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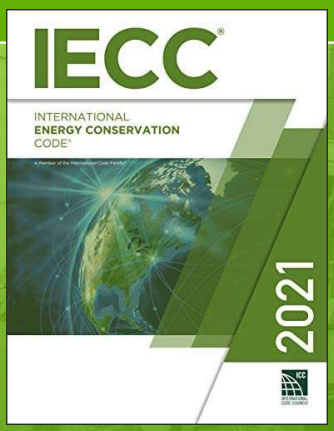
The 2021 IECC



Massachusetts Amendments

225 CMR 23: MASSACHUSETTS COMMERCIAL STRETCH ENERGY CODE AND MUNICIPAL OPT-IN SPECIALIZED CODE 2023

Massachusetts Stretch Code and Specialized Code for Commercial buildings

(Note: please see 225 CMR 22.00 for low-rise Residential construction)

The Massachusetts Stretch energy code (Stretch Code) first became available for municipal adoption in 2009 as Appendix 110.aa and then 115.aa as part of the building code in 780 CMR. In 2021 the Massachusetts legislature passed new legislation moving authority for updates to the Stretch Code to the Department of Energy Resources and 225 CMR.

This code takes effect on July 1, 2023 and is designed to align with the forthcoming MA 10th edition building code promulgated under 780 CMR. Building permit applications for projects received on or after July 1, 2023 in Stretch Code communities shall comply with this code.

As with the 10th edition building code, this energy code is based on modified versions of the 2021 code books as published by the International Code Council (ICC). Specifically, the 2021 International Energy Conservation Code (IECC 2021) as amended.

This section (225 CMR 23) covers all buildings except for low-rise residential buildings which are covered by 225 CMR 22. 225 CMR 22 and 23 in combination form the Stretch Code – and must be adopted together and not in part.

Municipalities may also elect to adopt the combination of Appendix RC of 225 CMR 22 (Low rise residential) and Appendix CC of 225 CMR 23 (all other buildings) which together form the Municipal Opt-in Specialized code (Specialized Code).

For communities that have adopted the Stretch Code, the following 225 CMR 23 amendments to the IECC 2021 apply together with 225 CMR 22 for low-rise residential buildings.

For communities that adopt the Specialized Code, the following 225 CMR 23 amendments apply in combination with Appendix CC, along with 225 CMR 22 and Appendix RC for low-rise residential buildings.

In both the Stretch Code and the Specialized Code these amendments to the IECC 2021 replace Chapter 13 – Energy Efficiency of 780 CMR in the Base energy code.

Please remember that the Massachusetts amendments posted online are *unofficial versions* that are made available for convenience. Official versions of the Massachusetts amendments may be purchased from the State House Bookstore at www.sec.state.ma.us/spr/ and the IECC 2021 can be purchased from the ICC at www.iccsafe.org

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Commercial Code Application

All buildings other than:

- ✓ Detached one- and two-family dwellings,
- ✓ Townhouses
- ✓ Group R-2, R-3, R-4 buildings three stories or less in above grade height.

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Commercial Provisions

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- Chapter 1 [CE] Scope and Administration
- Chapter 2 [CE] Definitions
- Chapter 3 [CE] General Requirements
- Chapter 4 [CE] Commercial Energy Efficiency
  - General
  - Building Thermal Envelope
  - Systems
  - Electric Power & Lighting
- Chapter 5 [CE] Existing Buildings

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Poll Question #2

The current MA Base Energy Code is based on:

A. 2009 IECC
B. 2015 IECC
C. 2018 IECC
D. 2021 IECC

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2023 Commercial Stretch Code Overview

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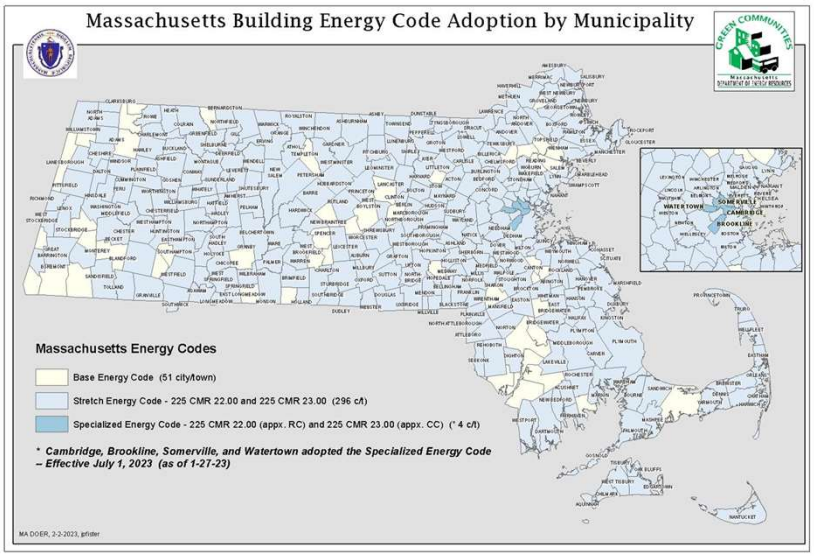
Stretch Code Communities



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Specialized Opt-In Code

- ✓ IECC 2021 w/ MA Amendments
- ✓ Stretch Code Amendments
- ✓ Specialized Code Appendices

- ✓ 17 Communities have voted to adopt.
- ✓ Effective in 4 communities July 1, 2023
- ✓ Next Round January 1, 2024

Photo Reference: "Mapping Our Way Through the Massachusetts Energy Codes in 2023, June 1, 2023, Lauren Gunther, https://www.dimellashaffer.com/blog/mapping-our-way-through-the-massachusetts-energy-codes-in-2023/

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Current Stretch Code

Mandates site energy reduction

10% reduction

Buildings over 100,000-sf
No change for additions, alterations

Replaced with

New Stretch Code

Focus on heating and cooling demand reduction

Major heating reductions

all building sizes
Includes additions, alterations

Courtesy of DOER: 2023 Technical Guidance, Massachusetts Stretch Energy Codes

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Poll Question # 3

The Opt-in Specialized Code is an overlay code of both the Stretch Code and the 2021 IECC

A. TRUE

B. FALSE

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Stretch Code Requirements

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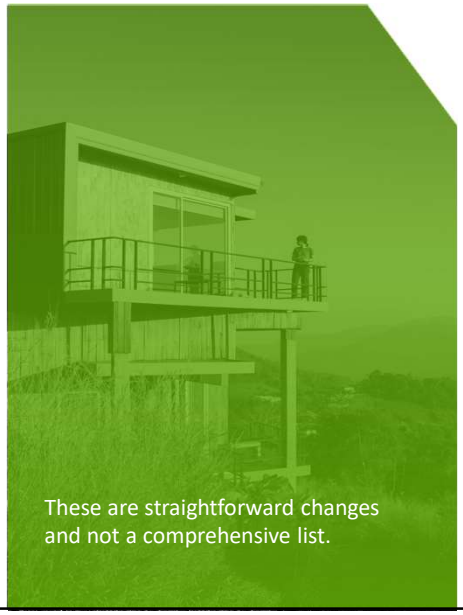

Summary of Minor Code Changes

Code Section	Summary of Measure
C103.2	Adds documentation requirements for Solar Ready, EV Ready Spaces, ventilation rate for Relative Performance (see Additional Information for more guidance), and Mixed-Fuel systems' plans for electrification for the Specialized Code. Clarification of COMcheck submittal documentation.
C202	Adds definitions for All-Electric Building, Automatic Load Management System, Class 3 Exhaust, Class 4 Exhaust, Clean Biomass Heating System, Combustion Equipment, Glazed Wall System, Dedicated Outdoor Air System, Electric Vehicle, Electric Vehicle Ready Parking Space, Enthalpy Recovery Ratio, Exempt Exhaust, Fuel Gas, Fuel Oil, Mixed-Fuel Building, Other Exhaust, Sensible Energy Recovery Ratio, Spandrel Section, Thermal Bridge
C402.2.4.1	Insulation Installation, Delete C402.2.4.1 Exception
C402.2.8	New section listing specifications for fireplaces.
C402.4	Lowers fixed and operable U-factors and makes performance documentation explicit for all fenestration.
C402.6	Approved Calculation Software Tools, Allows MA Stretch COMcheck
C405.2	Lowers existing threshold requiring controls in daylight zones to 100W.
Appendix CB	Solar-Ready Zone – Commercial, included without modification

Simple code measures that don't require further explanation. Refer to code for specific requirements.

Courtesy of DOER: 2023 Technical Guidance, Massachusetts Stretch Energy Codes

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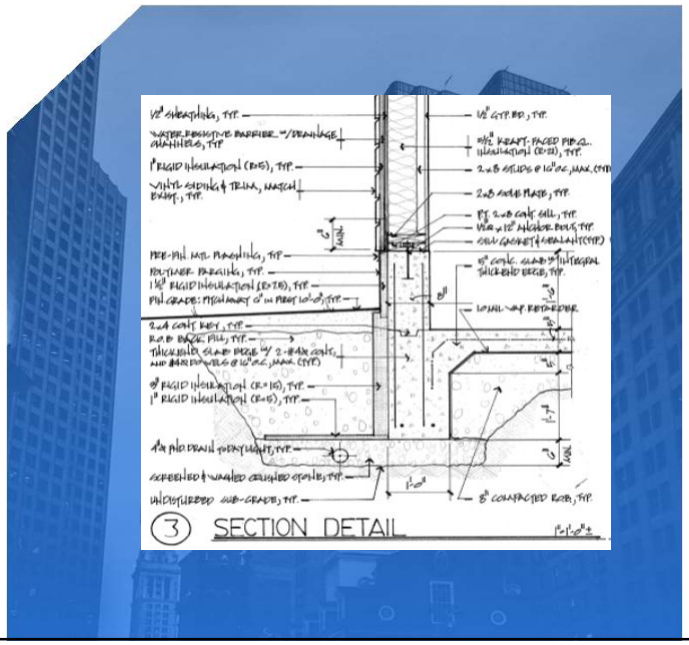
Construction Documents

New Requirements to be included on Construction Documents (CDs)

- Solar Ready Roof Zone or Potential Solar Zone Area
- EV Ready Spaces
- Relative Performance Pathway ventilation documentation, schedules, and calculations
- For Opt-in Communities – electric HVAC retrofit design



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COMcheck Required

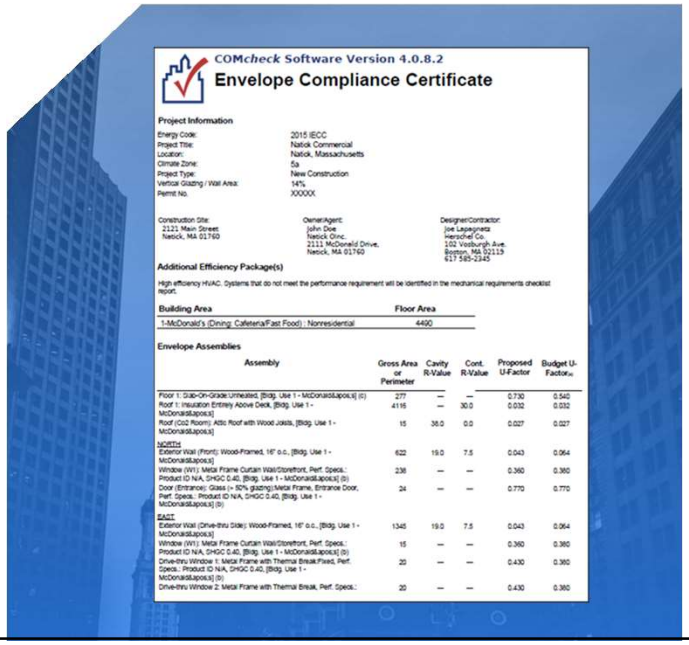
ALL Permits Shall Include Completed COM*check including:*

- Envelope Compliance Certificate
- Lighting Compliance Certificate
- Mechanical Compliance Certificates
- Plan Review/Inspection Checklist

Exception:
Projects documenting compliance following Section C407.2 (ASHRAE 90.1 Appendix G) shall follow applicable reporting requirements.

COMcheck-Web™
COMcheck-Web simplifies commercial and high-rise residential energy code compliance.

https://energycode.pnl.gov/COMcheckWeb/


COMcheck Software Version 4.0.8.2
Envelope Compliance Certificate

Project Information

Energy Code:	2015 IECC
Project Title:	Natick Commercial
Location:	Natick, Massachusetts
Climate Zone:	5a
Project Type:	New Construction
Vertical Glazing / Wall Area:	14%
Permit No.	XXXXX

Construction Site:
2121 Main Street
Natick, MA 01760

Owner/Agent:
John Doe
Natick Clinc.
2111 McDonald Drive,
Natick, MA 01760

Designer/Contractor:
Joe Lepagnetz
Herschel Co.
102 Vosburgh Ave.
Boston, MA 02119
617 585-2345

Additional Efficiency Package(s)

High efficiency HVAC. Systems that do not meet the performance requirement will be identified in the mechanical requirements checklist report.

Building Area	Floor Area
1-McDonald's (Dining: Cafeteria/Fast Food) : Nonresidential	4400

Envelope Assemblies

Assembly	Gross Area or Perimeter	Cavity R-Value	Cont. R-Value	Proposed U-Factor	Budget U-Factor
Floor 1: Slab-On-Grade:Unheated, [Bldg. Use 1 - McDonaldsApos;s] (I)	277	—	—	0.730	0.540
Roof 1: Insulation Entirely Above Deck, [Bldg. Use 1 - McDonaldsApos;s]	4116	—	30.0	0.032	0.032
Roof (Co2 Room): Attic Roof with Wood Joists, [Bldg. Use 1 - McDonaldsApos;s]	15	38.0	0.0	0.027	0.027
NORTH					
Exterior Wall (Front): Wood-Framed, 16" o.c., [Bldg. Use 1 - McDonaldsApos;s]	622	19.0	7.5	0.043	0.064
Window (W1): Metal Frame Curtain Wall/Storefront, Perf. Specs.: Product ID N/A, SHGC 0.40, [Bldg. Use 1 - McDonaldsApos;s] (B)	238	—	—	0.360	0.360
Door (Entrance): Glass (> 50% glazing):Metal Frame, Entrance Door, Perf. Specs.: Product ID N/A, SHGC 0.40, [Bldg. Use 1 - McDonaldsApos;s] (B)	24	—	—	0.770	0.770
EAST					
Exterior Wall (Drive-thru Side): Wood-Framed, 16" o.c., [Bldg. Use 1 - McDonaldsApos;s]	1345	19.0	7.5	0.043	0.064
Window (W1): Metal Frame Curtain Wall/Storefront, Perf. Specs.: Product ID N/A, SHGC 0.40, [Bldg. Use 1 - McDonaldsApos;s] (B)	15	—	—	0.360	0.360
Drive-thru Window 1: Metal Frame with Thermal Break,Fixed, Perf. Specs.: Product ID N/A, SHGC 0.40, [Bldg. Use 1 - McDonaldsApos;s] (B)	20	—	—	0.430	0.360
Drive-thru Window 2: Metal Frame with Thermal Break, Perf. Specs.:	20	—	—	0.430	0.360

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Definitions

- Chapter 2 as always includes definitions of terms/words related to the scope applicable to this code.
- Helps maintain the context in which the terms are being used.
- Some new definitions in the version include:
  - Dedicated Outdoor Air System (DOAS)
  - Thermal Bridge
  - Spandrel Section
  - Tenant Fit Out Zone
  - Enthalpy Recovery Ratio
  - Sensible Energy Recovery Ratio
  - Automatic Load Management System (ALMS)
  - Thermal Distribution Efficiency

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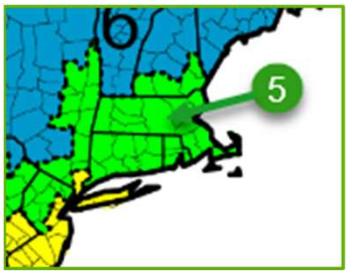
Climate Zone

All of MA is in CZ 5A



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Slide 30

AS0 @Art Pakatar, the outlining seems to be distracting. Maybe a different slide image? The outlining seems to be out of place
Adam Smith, 2023-06-30T12:56:33.605

AP0 0 Fixed
Arthur Pakatar, 2023-06-30T13:20:29.502

AS0 1 [@Arthur Pakatar] looks much better
Adam Smith, 2023-06-30T13:25:53.158

Poll Question # 4

Which of the following is a new requirement to be depicted on the Construction Documents submitted for permitting?

A. Solar Ready Zone
B. Thermal Boundary
C. Air Barrier
D. Ventilation documentation, schedules, and calculations

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Commercial Energy Efficiency

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Compliance Pathways

Prescriptive Compliance

Nonresidential buildings ≤20,000 sf

Targeted Performance Compliance

Dormitories, fire stations, libraries, offices, schools, police stations, post offices and town halls over 20,000 sf and having average ventilation at full occupancy of 0.5 cfm/sf or less

Relative Performance Compliance

Buildings not required to use Targeted Performance are permitted to use this path

Certified Performance - Passive House

All buildings or spaces are permitted to use Passive House compliance

Certified Performance - HERS Compliance

All Group R buildings and Group R spaces in buildings with multiple dwelling units are permitted to use HERS compliance

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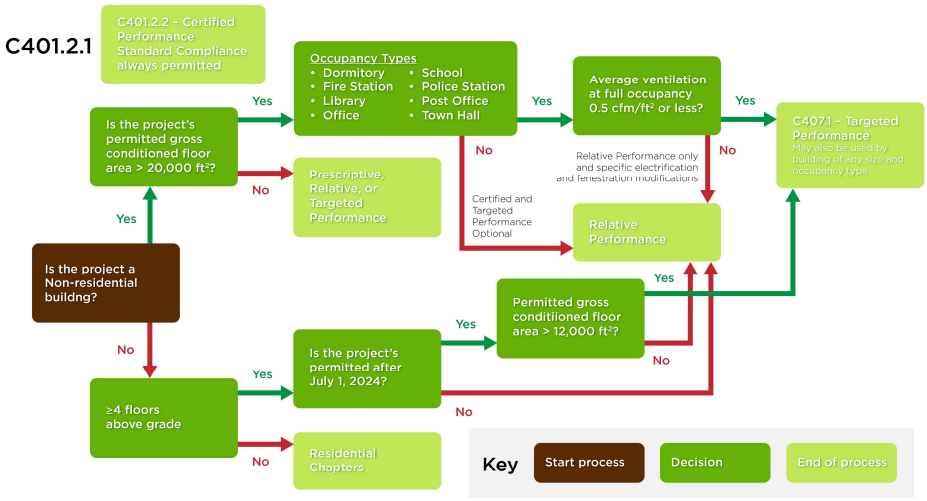
Compliance Path Flow Chart



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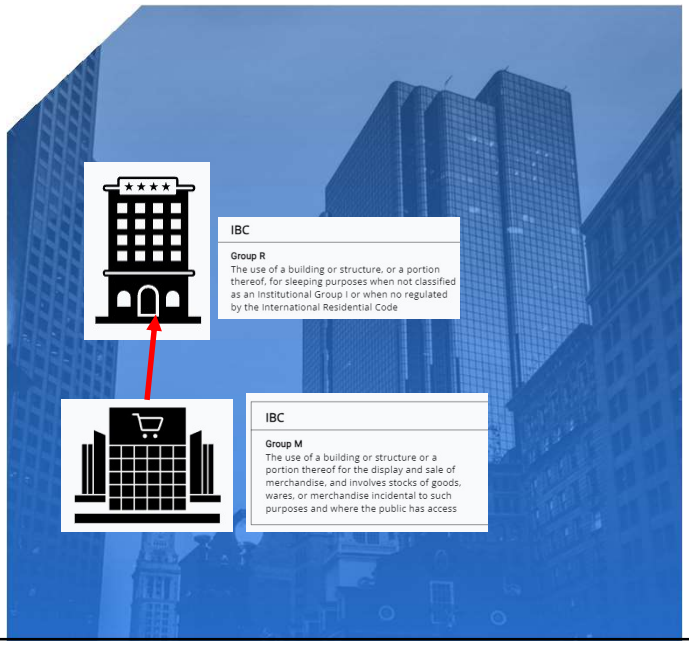
Mixed Use Buildings

- Where there are 2 or more uses within a building each use shall separately and independently show compliance
- Where different compliance paths are required – each use shall follow the appropriate patch



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Thermal Envelope Certificate

The 2021 IECC requires a permanent thermal envelope certificate to be posted in the furnace or utility room including

Information required includes:

- R-Values for the envelope components
- U-factors and SHGCs of fenestration
- Results from any building envelope air leakage testing performed on the building

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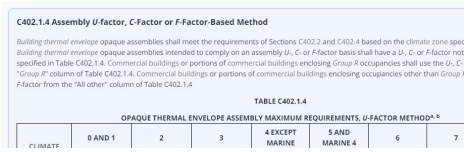
Building Envelope Thermal Requirements

- Insulation R-Value is no longer permitted.
- Vertical assemblies must meet an area-weighted U-factor
- COMcheck –Web is approved for Prescriptive Compliance
- Thermal Bridging mitigation is required – more on that later
- Table C402.1.4 – Assembly U-Factors



C402.1.4 Assembly *U*-factor, *C*-Factor or *F*-Factor-Based Method

Building thermal envelope opaque assemblies shall meet the requirements of Sections C402.2 and C402.4 based on the climate zone spec
Building thermal envelope opaque assemblies intended to comply on an assembly U_a-, C_a- or F_a-factor basis shall have a U_a-, C_a- or F_a-factor not
specified in Table C402.1.4. Commercial buildings or portions of commercial buildings enclosing *Group R* occupancies shall use the U_a-, C_a-
"*Group R*" column of Table C402.1.4. Commercial buildings or portions of commercial buildings enclosing occupancies other than *Group*
F-factor from the "All other" column of Table C402.1.4

TABLE C402.1.4

OPAQUE THERMAL ENVELOPE ASSEMBLY MAXIMUM REQUIREMENTS, *U*-FACTOR METHOD[a, b]

CLIMATE	0 AND 1	2	3	4 EXCEPT MARINE	5 AND MARINE 4	6	7

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Component Performance Alternative

- This section allows for more flexible glazing limits.
- Differentiates between low glazed and high glazed wall systems
- Tradeoffs between roof/floors and walls/windows are not allowed.
- “Intra-vertical” tradeoffs are allowed
- Thermal Bridging still must be addressed – more on that later
- Provides U-factor area-weighting for Prescriptive Compliance
- Prepares inputs for Appendix G calculations

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Air Leakage- Thermal Envelope (C402.5)

- ✓ Air Leakage Testing is Mandatory
- ✓ All Prescriptive and Performance Compliance pathways require compliance
- ✓ Two testing options:
  - Whole-building
  - Dwelling units
- ✓ Max. Allowance: 0.35cfm/SF @ 75Pa
- ✓ Group R and I buildings can be compartmentalized.

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C402.7 Derating and Thermal Bridging

New section – include exterior insulation layers.

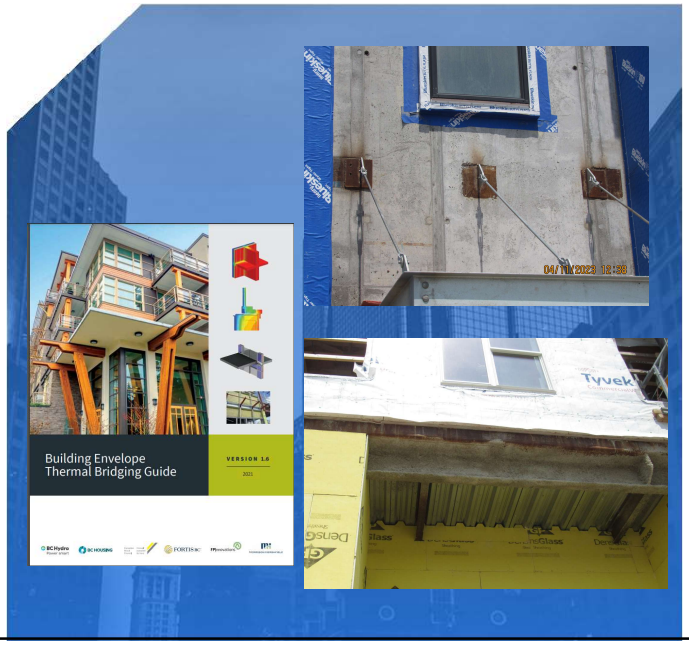
Also addressed opaque portions of glazed wall systems

Required for all Prescriptive and Performance paths.

Must include method and selections on CDs

Reference: "Building Envelope Thermal Bridging Guide by BC Hydro/BS Housing Research Center)

Look for upcoming course on Thermal Bridging and Derating



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Lighting for Dwelling Units

- 90% (min) High Efficacy lighting is required in all permanently installed lighting
- Exceptions Appliance lighting

High-efficacy light sources:

- Lamps with at least 65 lumens per watt
- Luminaires with at least 45 lumens per watt

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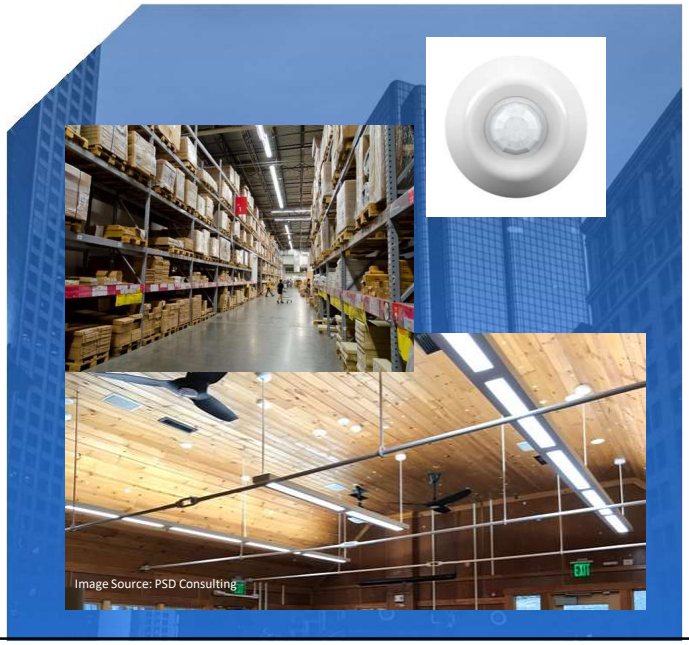
Occupancy Censor Controls

Required areas added:

- Corridors
- Warehouse Storage Areas
- Must incorporate a manual off switch



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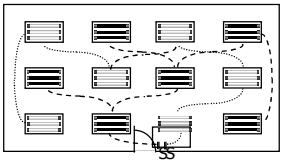
Light-reduction Controls- C405.2.3

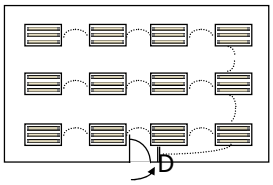
Light Reduction Controls must allow the occupant to reduce connected lighting load

- By not less than 50%
- In a reasonably uniform illumination pattern

Alternating Luminaires

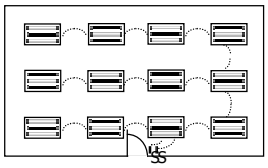


Dimming



Dimmer Switch

Alternating Lamps



Exception: Light Reduction Control **Not** required in daylight zones with daylight responsive controls complying with C405.2.3

Image: DOE

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C405.11 Automatic Receptacle Control

50% of all 125V 15-and 200amp receptacles installed in:

- Offices
- Conference Rooms
- Rooms used for printing
- Breakrooms
- Classrooms
- Workstations

25% of branch circuit feeder to modular workstations not shown on CDs

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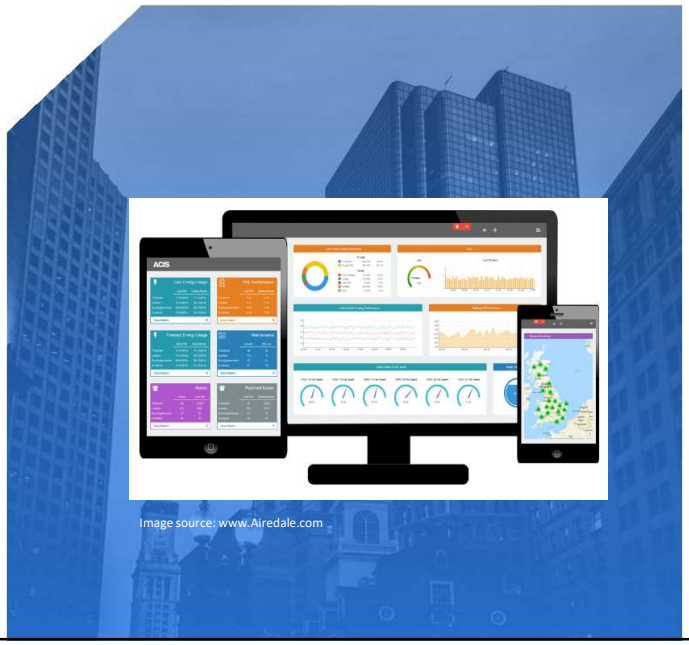
C405.12
Energy Monitoring

Required in new buildings w/ CFA of ≥25,000 sf

Systems must:

- Measure
- Monitor
- Record
- Report consumption data



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C406 Additional Efficiency Requirements

1. C406.1 -New Buildings are required to achieve a min. of 15 credits
2. C406.2 - Tenant Spaces are required to achieve a min. of 10 credits

Credits based on Table C406.1

TABLE C406.1(1)

ADDITIONAL ENERGY EFFICIENCY CREDITS FOR GROUP B OCCUPANCIES

SECTION	CLIMATE ZONE															
	0A & 1A	0B & 1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
C406.2.2: 5% cooling efficiency improvement	6	6	5	5	4	4	3	3	3	2	2	2	1	2	2	2	1
C406.2.3: Renewable space heating	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	15	1	1	2	2	NA	1

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Poll Question # 5

Air Leakage Testing is Required in all buildings except those over 50,000 sq.ft.

A. TRUE
B. FALSE

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Compliance Paths

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SCENARIO	PATHWAY NAME	WHAT CODE and SOFTWARE
Less than 20,000-sf	Prescriptive	Based on IECC2021, No modeling, can use COMcheck Web MA Stretch version
Over 20,000-sf and residential, office, dorm, fire station, library, school, police station, post office, or town hall	"Targeted" performance	TEDI path – can use Equest (or other) model – show heating/cooling demand below limits
More than 20,000-sf and not use above, or any use for high ventilation building	"Relative" performance	ASHRAE 90.1 Appendix G - can use Equest (or other) model – show EUI improvement over baseline
Passivehouse	Passivehouse	Passivehouse Certified - can use WUFI or PHPP models, and certify with PHIUS or PHI
HERS (Group R Buildings)	HERS	HERS Certified, work with HERS rater – can use Ekotrope or REMrate

Courtesy of DOER: 2023 Technical Guidance, Massachusetts Stretch Energy Codes

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- C402 • Building Envelope Requirements
- C403 • Building Mechanical Systems
- C404 • Service Water Heating
- C405 • Electrical Power and Lighting Systems
- C406 • Additional Efficiency Requirements
- C408 • Maintenance Information and system commissioning

C403-C406 + C408 Prescriptive

Prescriptive Compliance

Courtesy of DOER: 2023 Technical Guidance, Massachusetts Stretch Energy Codes

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Total Building Performance Certification Method

- Has been replaced
- Four Stretch Code Performance-based compliance options
  - Targeted Performance Simulation
  - ASHRAE 90.1 2019 Appendix G
  - Passive House
  - HERS

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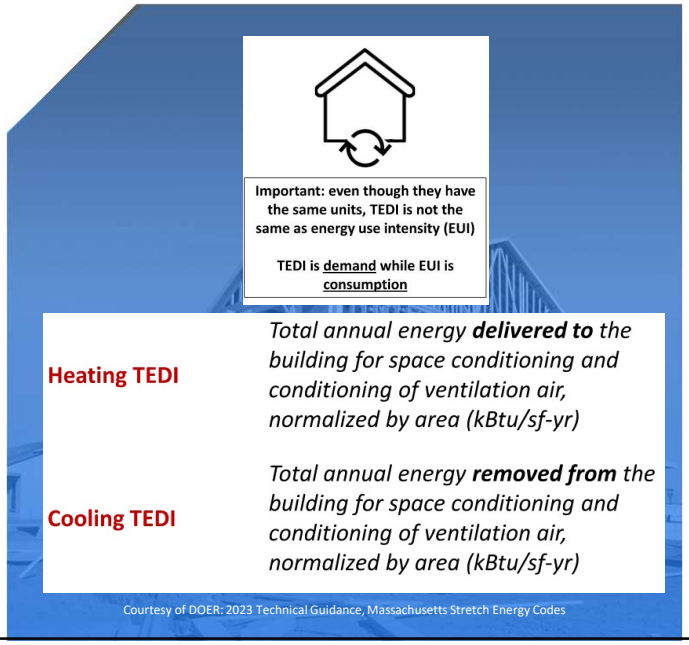
Targeted Performance Pathway (TEDI)

- Stretch Code now directly regulated heating and cooling demand for:
- Office
- Municipal buildings
- Schools
- Residential Buildings



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Slide 51

AS0 [@Arthur Pakatar] I changed this from the hand drawn one and added the stock arrow and parentheses.
Adam Smith, 2023-06-30T13:29:22.274

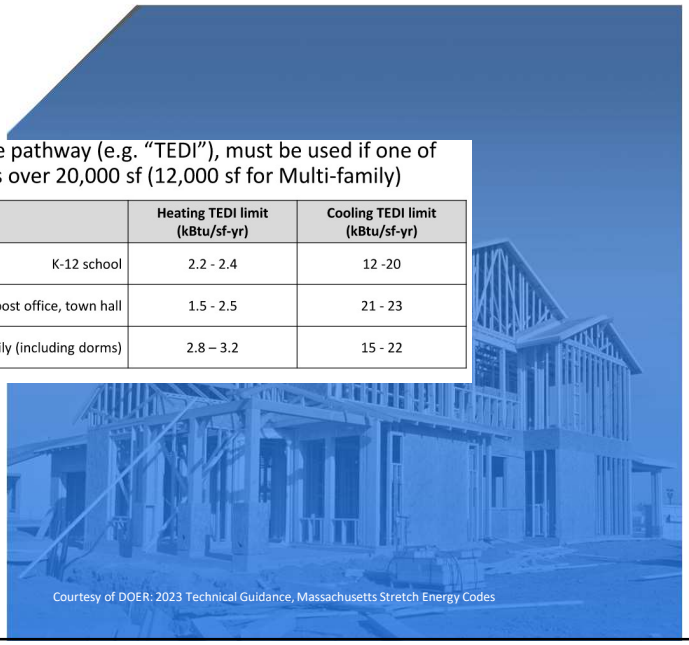
TEDI continued …

- "Targeted" performance pathway (e.g. "TEDI"), must be used if one of the building use types is over 20,000 sf (12,000 sf for Multi-family)

Building type	Heating TEDI limit (kBtu/sf-yr)	Cooling TEDI limit (kBtu/sf-yr)
K-12 school	2.2 - 2.4	12 -20
Office, fire & police station, library, post office, town hall	1.5 - 2.5	21 - 23
Multi-family (including dorms)	2.8 – 3.2	15 - 22

The same models currently used for stretch code compliance also produce TEDI information

IES EnergyPlus eQUEST



Courtesy of DOER: 2023 Technical Guidance, Massachusetts Stretch Energy Codes

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Relative Performance Pathway (ASHRAE 90.1 Appendix G)

- ❑ Relative Performance Pathway (aka ASHRAE Appendix G):
  - ✓ Ventilated to >0.5 cfm/sf OR
  - ✓ A building occupancy or type other than listed for Targeted Compliance
- ❑ Can show site energy use reduction per Table 4.2.1.1 of ASHRAE 2019
- ❑ Must size heat pumps for 25% of peak space heating when RPP is used due to high ventilation rate.

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Timeline: Stretch Code Update for Multi-family

Until June 30, 2023

- **9th Edition Stretch code**
- HERS 55-65
- Energy Star 3.1
- Phius+ 2018
- PHI Classic
- ASHRAE 90.1-2013 if 5+ stories

July 1, 2023

- **Stretch Commercial update**
- HERS 52/55/58
- TEDI
- Phius Core 2021
- PHI Classic
- ASHRAE 90.1-2019

July 1, 2024

- **Stretch Residential phase-in**
- HERS 42/45
- TEDI
- Phius Core 2021
- PHI Classic

Commercial Stretch updates July 1, 2023

ASHRAE & HERS changes on July 1, 2024

Courtesy of DOER: 2023 Technical Guidance, Massachusetts Stretch Energy Codes

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Poll Question # 6

The project consists of a Dormitory, 35,000 sq. ft. of conditioned floor area. What is the appropriate compliance path?

A. Prescriptive

B. Targeting Performance

C. Relative Performance

D. ASHRAE 90.1, 2016 Appendix G

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Existing Buildings

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Existing Buildings – Chapter [CE] 5

Controls:

- Alteration
- Repair
- Addition
- Change of Occupancy

Of Existing Buildings/Structures

Intent is to allow existing buildings to continue as is – as long as lawfully constructed

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Appendix CB Solar-Ready Zone Commercial

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Appendix CB

Appendix CB – Solar-Ready Zone – Commercial

- ❑ Adopted Unamended from 2021 IECC Appendix CB
- ❑ Ability to plan ahead
- ❑ Solar-ready zones and roof load documentation helps solar contractors with future installs
- ❑ Easy identification of unobstructed areas
- ❑ Easy identification of pathway to run conduits and wiring

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CB101 Scope

CB101.1 General

- These provisions shall be applicable to new construction, not additions.

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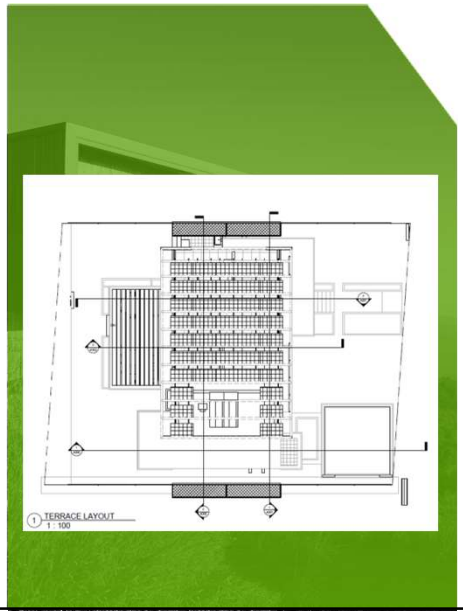

Appendix CB: Solar-Ready Provisions

New in 2021:

Applies to all Commercial and Multifamily Buildings (>3 stories)

- Solar-Ready Zone – roofs of buildings 5 stories and less in height above the grade plane and oriented between 110 degrees and 270 degrees of true north or have low slope roofs
- Solar-Ready Zone Area – Total area shall not be less that 40% of the gross roof area. Can be a single area or several smaller areas. Each area must be at least 5’ in width.
- Obstructions – The Solar ready zone shall be free from obstructions including pipes, vents, ducts, equipment, skylights and roof-mounted equipment. Objects may include taller portions of the building, parapets, chimneys, antennas, signage, trees and roof plantings

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Appendix CB: Solar-Ready Provisions

- Roof Loads and Documentation – Structural design loads shall be indicated on the CDs. A dead load of 5 PSF shall be included in the gravity load calculations.
- Interconnection Pathway – CDs shall delineate pathways for routing of conduit or piping the solare-ready zone to the electric service panel
- Electric Energy Storage System-Ready Area – the floor area share not be less than 2' x 4'. The locations and layout shall be depicted on the CDs
- Electric Service Reserved Space – the main electric service panel shall have a reserved space to allow installation of a dual-pole breaker
- Construction Documentation Certificate – a permanent certificate showing the solar-ready zone, the structural loading, the interconnection pathway is to be posted by the electrical distribution panel

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Poll Question # 8

Renovations of an existing building requires identification of a solar ready zone

A. TRUE.
B. FALSE

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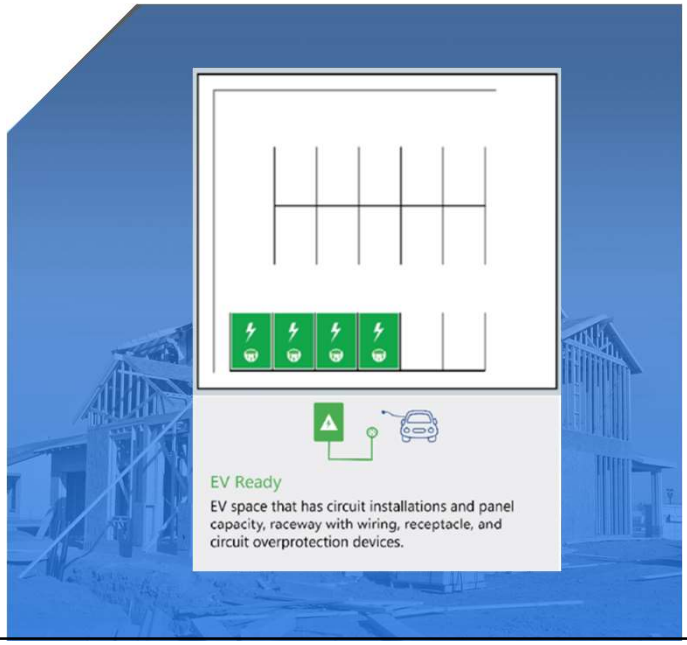
EV Ready Parking Spaces

("EV Ready Spaces")

EV Ready Spaces shall be provided in accordance with Table C405.13

- AC Level II spaces
- 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, outlet or a Society of Automotive Engineers (SAE) standard J1772 electrical connector.



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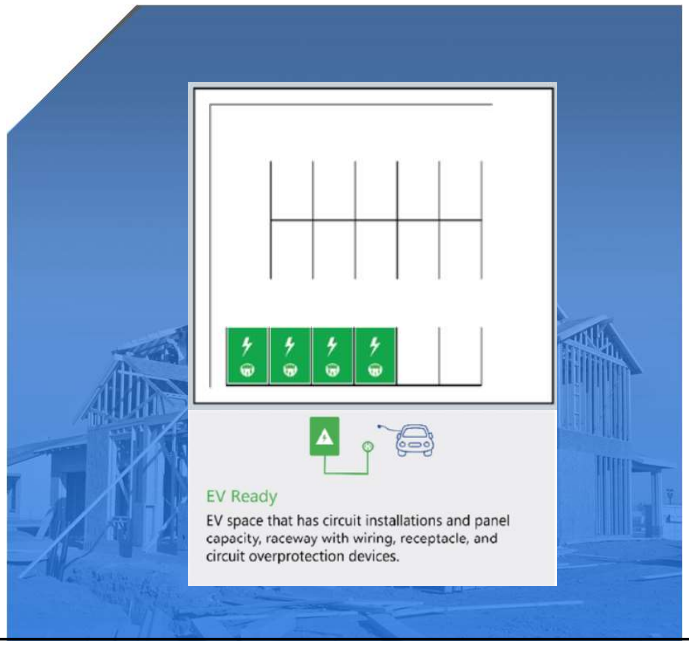
EV Ready Parking Spaces

- Automatic Load Management System (ALMS) can be used to service multiple spaces using a higher amperage circuit
- CDs to show details and calculations
- EV Spaces are required for a compliance paths.



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EV Ready Spaces

Table C405.13 EV Ready Space Requirements

Occupancy Classification Group	Minimum percentage of EV-Ready Spaces	EV Charging Performance Requirements
Group R and Group B	At least 20% of spaces	40-amp dedicated branch circuit or larger branch circuit with ALMS in accordance with Table C405.13.1
All other Occupancies	At least 10% of spaces	40-amp dedicated branch circuit or larger branch circuit with ALMS in accordance with Table C405.13.1

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Poll Question # 9

Automatic Load Management System (ALMS) can be used to service multiple spaces using a higher amperage circuit.

A. TRUE
B. FALSE

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Appendix CC Massachusetts Municipal Opt-In Specialized Stretch Code 2023

mass save

225 CMR 23: MASSACHUSETTS COMMERCIAL STRETCH ENERGY CODE AND MUNICIPAL OPT-IN SPECIALIZED CODE 2023

APPENDIX CC - MASSACHUSETTS MUNICIPAL OPT-IN SPECIALIZED ENERGY CODE 2023

COMMERCIAL BUILDING PROVISIONS

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance. The provisions contained in this appendix together with referenced sections from the Stretch energy code constitute the Specialized opt-in code for commercial buildings, and may be adopted by a city or town together with the Residential Specialized code Appendix RC as their stretch energy code. When adopted by the local municipality, the provisions in this appendix are mandatory in combination with the IECC2021 with Massachusetts Stretch code amendments.

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Municipal Specialized Opt-In Code

The Specialized Stretch Code…

- Includes net-zero building performance standards
- Is designed to achieve MA GHG emissions limits
- Requires compliance with the Stretch Code
- Requires pre-wiring for future electrification of space and water heating for buildings with fossil fuels
- Is adopted at the local level but is NOT required for participation in Green Communities

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Compliance

New Buildings Shall Demonstrate Compliance:

- **Zero Energy Pathway**
- **All-Electric Pathway**
- **Mixed Fuel Pathway**

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Summary/Closing

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Commercial Overview Summary

- The new commercial provisions of the Stretch Code has some significant changes
- R-value tables have been deleted and replaced with U-factors
- Thermal bridging and derating of wall assemblies must be considered when designing and verify new construction projects.
- Targeted Performance compliance pathway is new and applies to specific building types and ventilation allowance.
- Targeted Performance uses TEDI to measure effective efficiency and compliance
- Relative Performance compliance pathway is for highly ventilated buildings and those not targeted for TEDI. This method utilizes the EUI to measure efficiency.
- Passive House is an approved compliance pathway for commercial buildings
- Air leakage testing of commercial building is required.

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Mass Save Incentive Programs

mass save

Residential Rebates and Incentives

Rebates for appliances, heating systems and more.

www.masssave.com/en/residential/rebates-and-incentives

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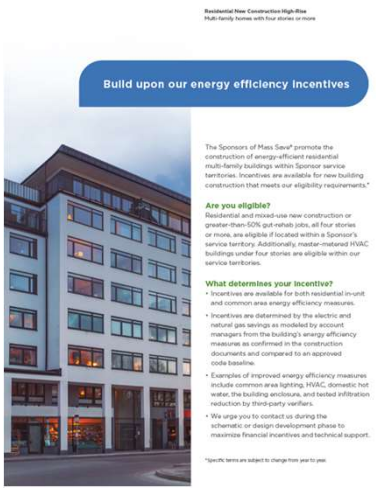
High-Rise Path Overview

Eligibility

- 4+ stories and 5+ units with residential-metered heat
- All multi-family with commercially-metered heat
- New construction and ≥ 50% rehab projects
- Must register prior to construction start

Enrollment process

- Work with a dedicated ICF Account Manager
- Verification completed utilizing architect and/or engineer approved submittals


Residential New Construction High-Rise
Multi-family homes with four stories or more

Build upon our energy efficiency incentives

The Sponsors of Mass Save® promote the construction of energy-efficient residential multi-family buildings within Sponsor service territories. Incentives are available for new building construction that meets our eligibility requirements.*

Are you eligible?
Residential and mixed-use new construction or greater-than-50% gut-rehab jobs, all four stories or more, are eligible if located within a Sponsor's service territory. Additionally, master-metered HVAC buildings under four stories are eligible within our service territories.

What determines your incentive?
- Incentives are available for both residential in-unit and common area energy efficiency measures.
- Incentives are determined by the electric and natural gas savings as modeled by account managers from the building's energy efficiency measures as confirmed in the construction documents and compared to an approved code baseline.
- Examples of improved energy efficiency measures include common area lighting, HVAC, domestic hot water, the building enclosure, and tested infiltration reduction by third-party verifiers.
- We urge you to contact us during the schematic or design development phase to maximize financial incentives and technical support.

*Specific terms are subject to change from year to year.

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Available Incentives

- Provides incentives for both residential in-unit and common area energy savings.
- Building Envelope
- Domestic Hot Water Production
- HVAC Systems
- Motors & Drives
- Lighting & Controls
- Plumbing Fixtures
- And more

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Passive House

- Multifamily PH projects of 5+ units
- New Construction
- Residential / Commercial Energy Code
- Commercial and residential HVAC & DHW configurations
- Verification completed utilizing 3rd Party Verifier and architect and/or engineer approved submittals


Residential New Construction Passive House
Multi-family buildings with five units or more

Take energy efficiency to a new level with Passive House.

Passive House building techniques address energy usage and resiliency, resulting in significant and long-lasting primary energy savings compared to homes built to conventional building codes. The Sponsors of Mass Save® provide technical support in the form of feasibility studies and energy modeling as well as financial incentives to cover the incremental cost of building to, or exceeding, Passive House standards. We structured our offerings to reduce the risk a developer may perceive in pursuing Passive House standards by providing incentive payments aligned with the feasibility, design, and construction phases.

Eligibility and requirements for participation

The Mass Save Passive House incentive offer is available to projects that enroll during the early stages of design, prior to reaching 100% schematic design. Eligible projects are multi-family projects with five or more units that are pursuing Passive House certification and agree to monitor and provide the Sponsors with whole-building gas and electric consumption as well as on-site generation production.

A Passive House consultant certified through either the Passive House Institute (PHI) or Passive House Institute US (PHIUS) needs to be hired to conduct a feasibility study and to serve as consultant to the project throughout the design and certification process. A project is eligible to receive post-construction incentives only if it achieves at least pre-certification. If pre-certification is not achieved, the project is eligible to receive the standard Mass Save Residential New Construction incentives.

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Energy Code Support

Questions about the energy code?

Energy Code Support Hotline:

855-757-9717

Energy Code Support Email:

energycodesma@psdconsulting.com

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Thanks!

Massachusetts Energy Code Technical Support Program

WE ARE MASS SAVE®:

BERKSHIRE GAS An AVANGRID Company | Cape Light Compact | EVERSOURCE | Liberty | nationalgrid | Unitil

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