1

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.

WE ARE MASS SAVE®:
BERKSHIRE GAS
EVERSOURCE
Liberty
nationalgrid
Unitil

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Presented by:

PSD

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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.

PSD

4

Energy Code Technical Support Program

Today's Presenter

Bill Footer
Energy Efficiency Program Manager

5

5

Energy Code Technical Support Program

Today's Presenter

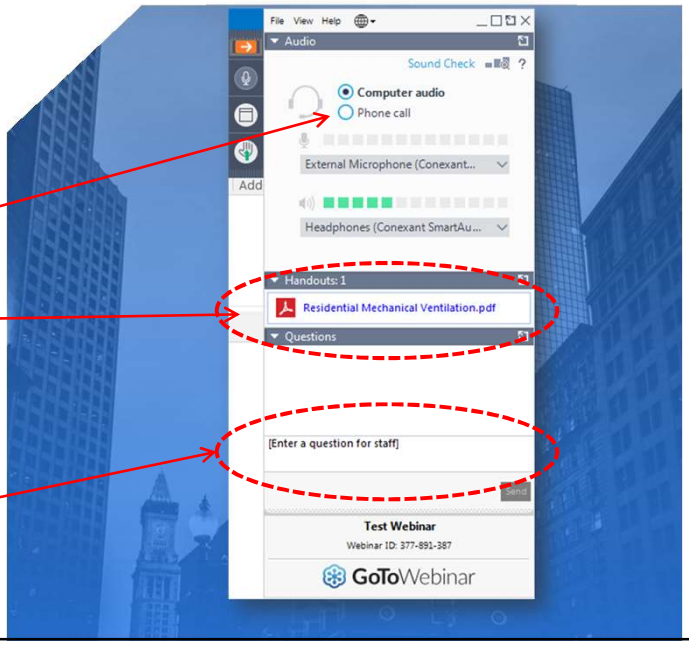
Art Pakatar
Senior Manager, Energy Codes Division

6

6

Audio Settings:

- **If you can't hear anything right now or you're having trouble with your audio…**
  - You may select "Phone call" in the Audio portion of the control panel. Dial the number and enter the access code.
- Handouts
- Recordings:
  - This training will be recorded
- Polls
  - You may have to exit "Full Screen Mode" for Polls
- Questions



7

Continuing Education

This webinar is approved for:

- 1-hour CSL CEU
- 1-hour AIA LU/HSW
- 1-hour CO CEU

Everyone will receive a certificate of attendance via email

8

- Introduction
- Massachusetts Energy Code
- Chapter 5 [RE]Overview
- Residential Alterations
- Repairs
- Compliance Paths
- Solar Ready and EV Ready
- Examples
- Summary/Closing

9

Learning Outcomes

Gain insight into the implementation of the Energy and Stretch Code for Minor Modifications

Utilize the suitable compliance paths according to the nature of the project

Obtain insight into the implementation of the Energy and Stretch Code for Level 3 alterations

Learn how the code accommodates repairs to existing buildings

10

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 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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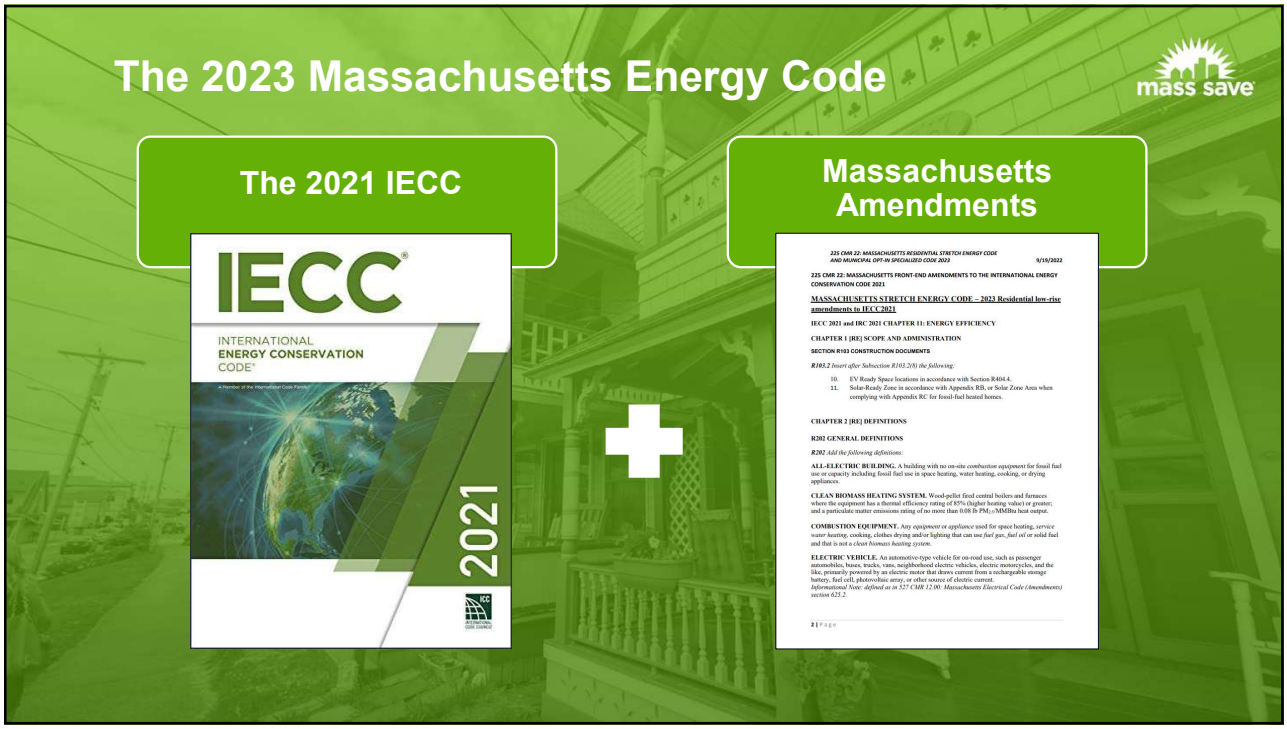
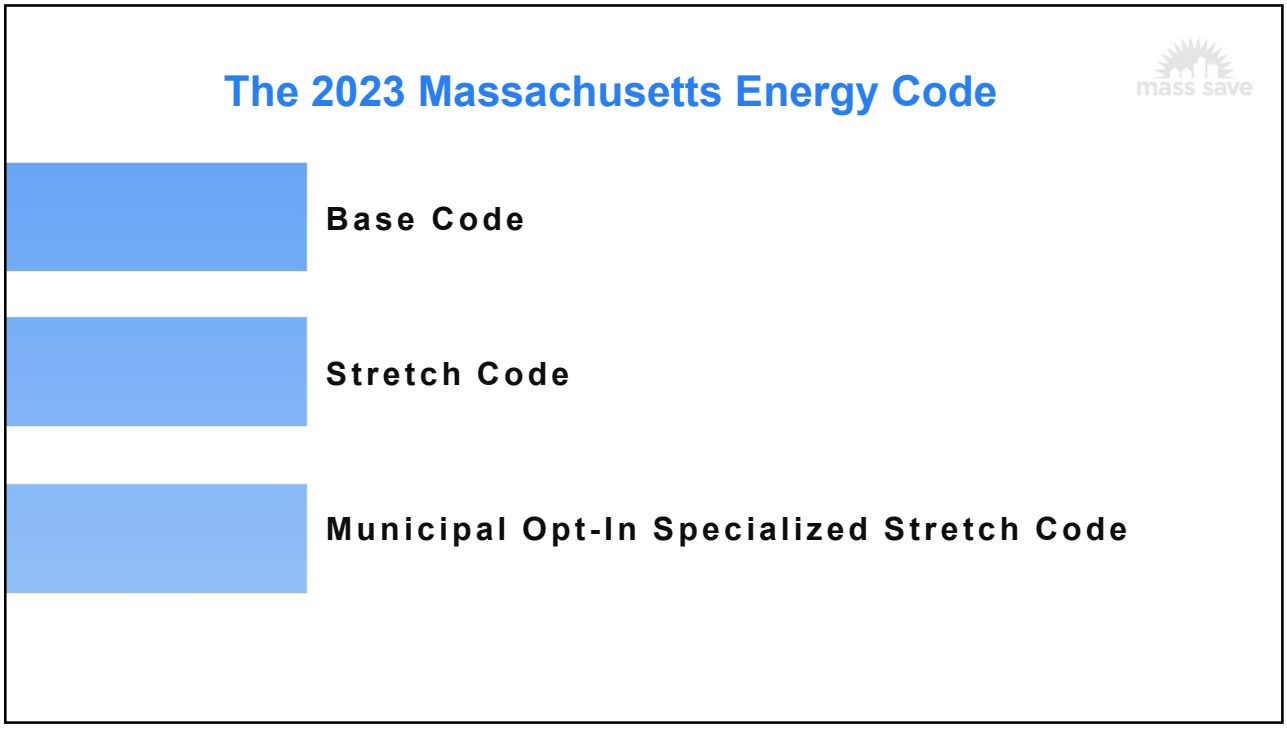

The 2023 Massachusetts Energy Code
mass save
The 2021 IECC
IECC
INTERNATIONAL
ENERGY CONSERVATION
CODE
2021
Massachusetts Amendments
225 CMR 22: MASSACHUSETTS RESIDENTIAL STRETCH ENERGY CODE AND MUNICIPAL OPT-IN SPECIALIZED CODE 2023
9/19/2022
225 CMR 22: MASSACHUSETTS FRONT-END AMENDMENTS TO THE INTERNATIONAL ENERGY CONSERVATION CODE 2021
MASSACHUSETTS STRETCH ENERGY CODE – 2023 Residential low-rise amendments to IECC 2021
IECC 2021 and IRC 2021 CHAPTER 11: ENERGY EFFICIENCY
CHAPTER 1 [RE] SCOPE AND ADMINISTRATION
SECTION R103 CONSTRUCTION DOCUMENTS
R103.2 Insert after Subsection R103.2(8) the following:
10. EV Ready Space locations in accordance with Section R404.4.
11. Solar-Ready Zone in accordance with Appendix RB, or Solar Zone Area when complying with Appendix RC for fossil-fuel heated homes.
CHAPTER 2 [RE] DEFINITIONS
R202 GENERAL DEFINITIONS
R202 Add the following definitions:
ALL-ELECTRIC BUILDING. A building with no on-site combustion equipment for fossil fuel use or capacity including fossil fuel use in space heating, water heating, cooking, or drying appliances.
CLEAN BIOMASS HEATING SYSTEM. Wood-pellet fired central boilers and furnaces where the equipment has a thermal efficiency rating of 85% (higher heating value) or greater; and a particulate matter emissions rating of no more than 0.08 lb PM2.5/MMBtu heat output.
COMBUSTION EQUIPMENT. Any equipment or appliance used for space heating, service water heating, cooking, clothes drying and/or lighting that can use fuel gas, fuel oil or solid fuel and that is not a clean biomass heating system.
ELECTRIC VEHICLE. An automotive-type vehicle for on-road use, such as passenger automobiles, buses, trucks, vans, neighborhood electric vehicles, electric motorcycles, and the like, primarily powered by an electric motor that draws current from a rechargeable storage battery, fuel cell, photovoltaic array, or other source of electric current.
Informational Note: defined as in 527 CMR 12.00: Massachusetts Electrical Code (Amendments) section 625.2.
2 | Page

13


The 2023 Massachusetts Energy Code
mass save
Base Code
Stretch Code
Municipal Opt-In Specialized Stretch Code

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MA Stretch Energy Code

The residential Stretch Energy Code…

- Is developed by the MA Department of Energy Resources (DOER)
- Results in greater energy savings than the Base Energy Code
- Requires new homes and large additions and alterations to receive a HERS Rating or Passive House certification
- Requires compliance with 2021 IECC "mandatory" provisions (Passive House excluded)
- Is adopted at the level of the local jurisdiction

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Energy Conservation Code 2021 of Massachusetts (Residential Provisions)

mass save

- Chapter 1 [RE] Scope and Administration
- Chapter 2 [RE] Definitions
- Chapter 3 [RE] General Requirements
- Chapter 4 [RE] Residential Energy Efficiency

General | Building Thermal Envelope | Systems | Electric Power & Lighting

- Chapter 5 [RE] Existing Buildings

16

Poll Question #2

Residential Alterations are covered under Chapter 5 of the Massachusetts Energy Code.

A. True

B. False

17

Chapter 5 Overview

(Residential Provisions)

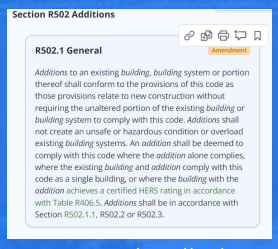


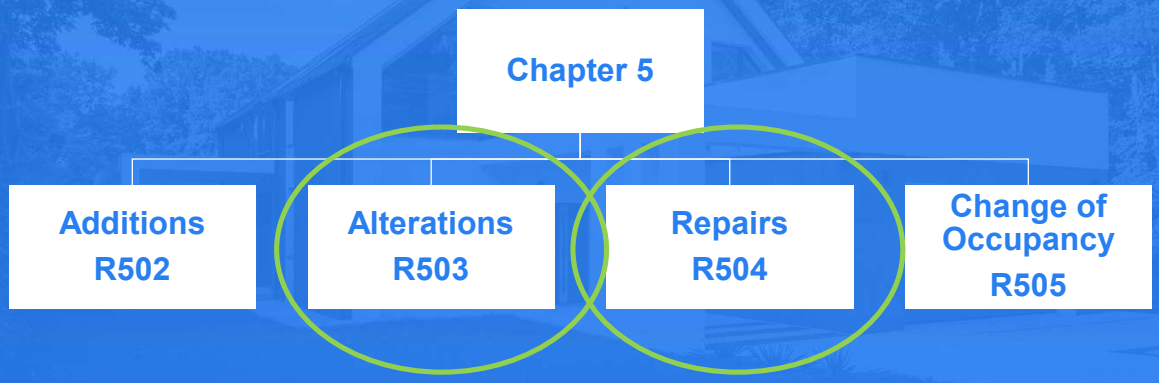
Image: Upcodes.com

Image: Johns Manville

18

Chapter 5 of the 2021 IECC

The provisions for existing buildings are found in IECC Chapter 5



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Existing Buildings

R501.1.1 General

- Unaltered portions of the existing building or system shall not be required to comply
- This code shall not be used to require the removal, alteration or abandonment of, nor prevent the continued use of an existing building
  - *Provided it was legal when it was built*

20

New and Replacement Materials

- Materials required for any modifications, renovations, repairs, or change of use, or relocated buildings must comply with the corresponding section of Chapter 5 is required.
- Like materials to be used for Repair provided it is safe to do so
- Hazardous materials are prohibited where code for new construction would disallow their use in buildings with similar
  - Occupancy
  - Purpose,
  - Location.

21

Existing Building Compliance

- For any modifications, renovations, repairs, or change of use, or relocated buildings compliance with the corresponding section of Chapter 5 is required.

22

Maintenance

- ❑ Buildings and structures must be kept in a safe and sanitary condition
- ❑ All systems and component required by code must be maintained to comply with the code at time of installation
- ❑ The provisions of Chapter 5 should not be used as a justification for removing energy conservation, fire protection and safety systems and devices in existing structures

23

Historic Buildings

R501.6 Energy code does not apply ***provided***:

- A report is submitted to the code official demonstrating that compliance with a provision would threaten, degrade or destroy the historic form, fabric or function of the building
- The report must be signed by one of the following:
  - Owner
  - Registered design professional
  - Rep of the State Historic Preservation Office or historic preservation AHJ

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Definitions

Image Source : PSD

Chapter 2 Definition:

ALTERATION. Any construction, retrofit or renovation to an existing structure other than repair or addition. Also, a change in a building, electrical, gas, mechanical or plumbing system that involves an extension, addition or change to the arrangement, type or purpose of the original installation.

Image Source : PSD

26

Types of Alterations:

Image Source : ICC

Minor Alteration:

Less than 1,000 sq ft of conditioned floor area
Less than 100% of the existing conditioned floor area

Major Alteration:

- ✓ Level 3 Alteration per IEBC – work area exceeds 50% of building area
- ✓ IRC Extensive Alteration – total area of all work areas exceeds 50% of dwelling unit
- ✓ > 1000 sq ft or 100% of conditioned floor area

Image Source : ICC

27

Poll Question #3

Multiple answers: In which of the following cases should insulation be installed?

A. Alteration exposing framing cavity in the wall, but the cavity is filled with insulation
B. Alteration exposing framing cavity in the wall, but the cavity has no insulation
C. Unconditioned basement converted to conditioned basement
D. None of the above

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Section R503 Alterations

New Building Thermal Envelope assemblies that are part of the alteration shall comply as if new construction

Except:

- Storm windows,
- Existing insulation,
- Exposed ceiling, wall or floor cavities,
- Cavities that are not exposed,
- Roof recover,
- Roofs w/o cavity
- insulation or where sheathing or insulation is exposed during reroofing shall be insulated either above below the sheathing

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AS0

Section R503 Alterations

Replacement Fenestration

If existing fenestration is replaced, the new fenestration must meet the code required U-Factor of 0.30 and SHGC of .40

- Applies regardless of existing frame being replaced or not
- Fenestration also includes doors, so a replacement door should also meet the requirement

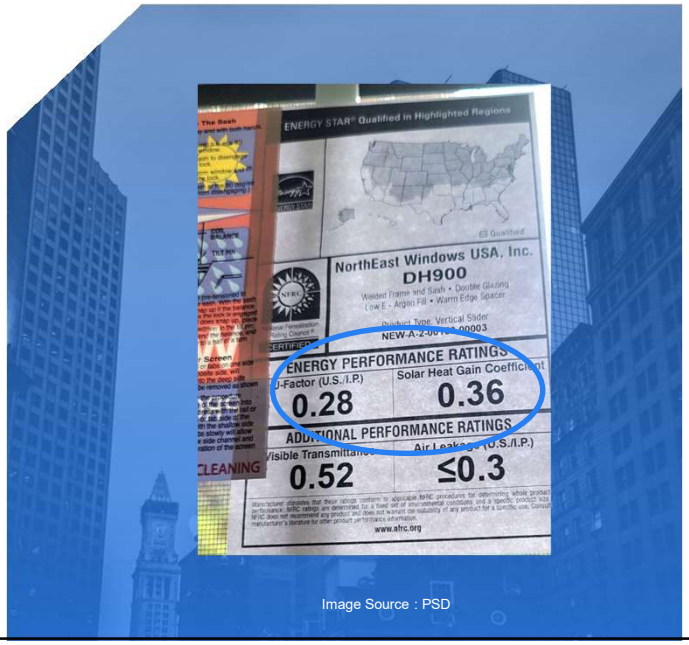

Image Source : PSD

30

Slide 30

AS0 [@Arthur Pakatar] does this need to have a source?
Adam Smith, 2023-06-12T20:18:41.980

AP0 0 Yup - PSD. Thanks I will fix that
Arthur Pakatar, 2023-06-12T20:35:01.804

AP0 1 Yup - PSD. Thanks I will fix that
Arthur Pakatar, 2023-06-12T20:35:27.013

AP0 2 Yup - PSD. Thanks I will fix that
Arthur Pakatar, 2023-06-12T20:35:50.999

AP0 3 Yup - PSD. Thanks I will fix that
Arthur Pakatar, 2023-06-12T20:36:18.225

AS0

Section R503 Alterations

Heating & Cooling Systems

New heating and cooling systems that are part of the alteration need to comply with:

- Controls
- Duct insulation
- Duct sealing
- Duct testing
- Duct leakage

Exception to duct leakage testing:

Where ducts from an existing heating and cooling system are extended.

31

Section R503 Alterations

Service Hot Water Systems

New service hot water systems that are part of the alteration need to meet requirements of a new system in “new construction”

32

Slide 31

AS0 [@Arthur Pakatar] - Does this need to be sourced or is it ours?
Adam Smith, 2023-06-12T20:21:06.452

SECTION R503 ALTERATIONS

Energy Code Technical Support Program

New lighting included in the Alteration shall comply as if new construction - 100% High Efficacy

Exception:

- If less than 10% of fixtures are replaced do not have to be upgraded

If

- Installed interior lighting power is not increased.

High-efficacy light sources:

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

Image Source: PSD Consulting

33

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Residential Repairs

Section R504

34

Definitions

Chapter 2 Definition:

REPAIR. The reconstruction or renewal of any part of an existing building for the purpose of its maintenance or to correct damage.

35

Section R504 Repairs

- Repairs are to follow the requirements for Maintenance (R501.3)
- Required to keep building in a safe and sanitary condition.
- Non-damaged components requiring modification to complete repair are part of repair
- Ordinary repairs/maintenance do not require permits.
- Maintenance or repair does not require pre-existing nonconforming energy or fire safety components to be upgraded to current code.

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SECTION R504 REPAIRS

Energy Code Technical Support Program

Some types or repairs recognized by code:

- Glass-only Replacements
- Roof Repairs
- Lighting Repairs –
  - Bulb only
  - Ballast

Image Source: PSD Consulting

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Compliance Paths

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Compliance Paths

mass save

- Section R503 Alterations
  - Prescriptive Compliance
    - Building Envelope
    - Heating & Cooling Systems
    - Service Hot Water Systems
    - Lighting
  - HERS Index
    - Entire Dwelling Unit

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Prescriptive Compliance

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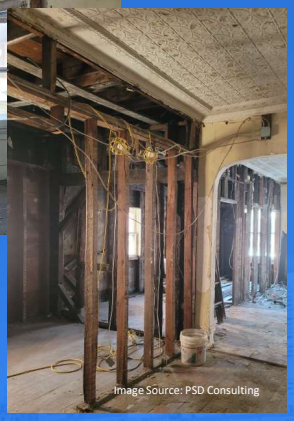
MINOR ALTERATIONS:

- ✓ New work complies with current code
- ✓ Existing untouched components can stay as is



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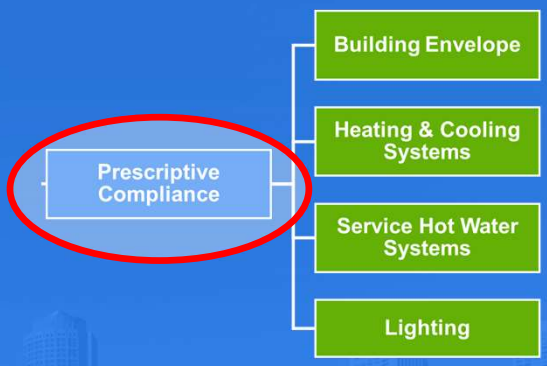
Prescriptive Compliance

New work in alterations follow sections:

- R503.1.1 Building Envelope
- R503.1.1.1 Replacement Fenestration
- R503.1.2 Heating and Cooling Systems
- R503.1.3 Service Hot Water Systems
- R503.1.4 Lighting

- These section direct the user to the pertinent section in Chapter 4 for new construction



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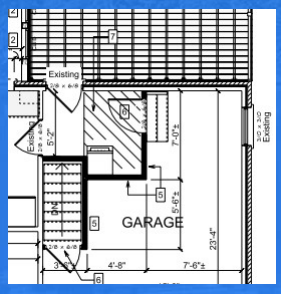
Alterations – Prescriptive Compliance

Envelope



2	Install New Window, Dbl Insul. Glazing, Low E, U=.29 min, Top of Window and Location Determined in the Field. Provided (2) 2x8's Min.
3	New Door (Size Noted). Door style and finish TBD
4	Provide new (2) 1-3.4" x 11-7/8" LVL Flush Beam w/ (4) 2x4 Posts each side. Hang Existing Ceiling Joists w/ Simpson LUS26Z or Equal
5	Provide new 2x4 Wd Framed Wall, Studs @ 16" o/c; Single Bottom Plate; Dbl. Top Plate., R-15 Fiberglass Insulation w/ Vapor Barrier; 1/2" Gyp Bd. on interior Side; 1/2" Type X Gyp Bd on Garage Side; Taped, Sanded and Painted.
6	New C Label, Metal Insulated Door/Frame with Self Closing Hinges. Sizes per Plan
7	Build new Raised Floor. 2x6 Floor Joists @ 16" o/c; 3/4" T&G OSB Subfloor (Match Adjacent); Perimter of Platform to be supported by 2x4 stub wall w/ PT Bot. Plate on Sill Sealer, Wall to be Insulated w/ R-15 Insulation. Wall to be finished on Garage Side w/ 1/2" Type X Gyp Bd., Taped, Sanded and Painted
8	New Bathroom Fixtures per layout. Refer to Supplier's Layouts.
9	New Exhaust Fans Vented to Exterior per Code.
10	New Smoked Detectors/Carbon Monoxide Alarm per Code. System to be Interconnected and have battery

The alteration must meet:

- R402.1 General requirements (prescriptive R-values)
- R402.2 Specific insulation requirements (e.g. attic hatches and doors)
- R402.3.1 – R402.3.5 Maximum area-weighted fenestration U-factor and SHGC
- R402.4 Air leakage requirements

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Changes to Prescriptive Values for Climate Zone 5

	2018 IECC	2021 IECC
FENESTRATION U-FACTOR	0.30	0.30
SKYLIGHT U-FACTOR	0.55	0.55
GLAZED FENESTRATION SHGC	NR	**0.40**
CEILING R-VALUE	49	**60**
WOOD FRAME WALL R-VALUE	20 or 13+5	**30 or 20+5ci or 13+10ci or 0+20ci**
MASS WALL R-VALUE	13/17	13/17
FLOOR R-VALUE	30	30
BASEMENT WALL R-VALUE	15/19	**15ci or 19 or 13+5ci**
SLAB R-VALUE & DEPTH	10, 2ft.	**10ci and 4'**
CRAWL SPACE WALL R-VALUE	15/19	**15ci or 19 or13+5ci**

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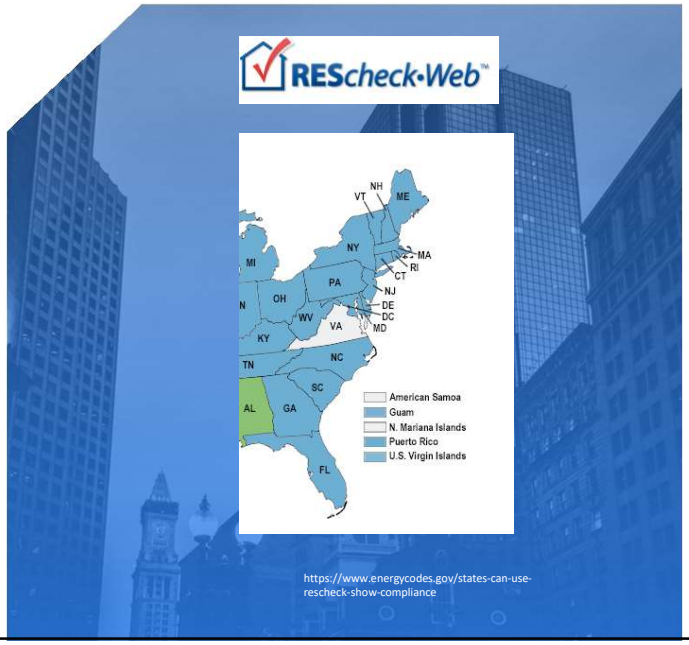
Prescriptive Compliance – Total UA Alternative

- The UA Alternative allows tradeoff of insulation values from Table R402.1.2
- Uses REScheck-Web software to calculate the total UA of the project.
- Compliance is where the proposed UA of the project is less than or equal to the total UA derived from using the values in the Table.
- Considers exemptions for existing systems.



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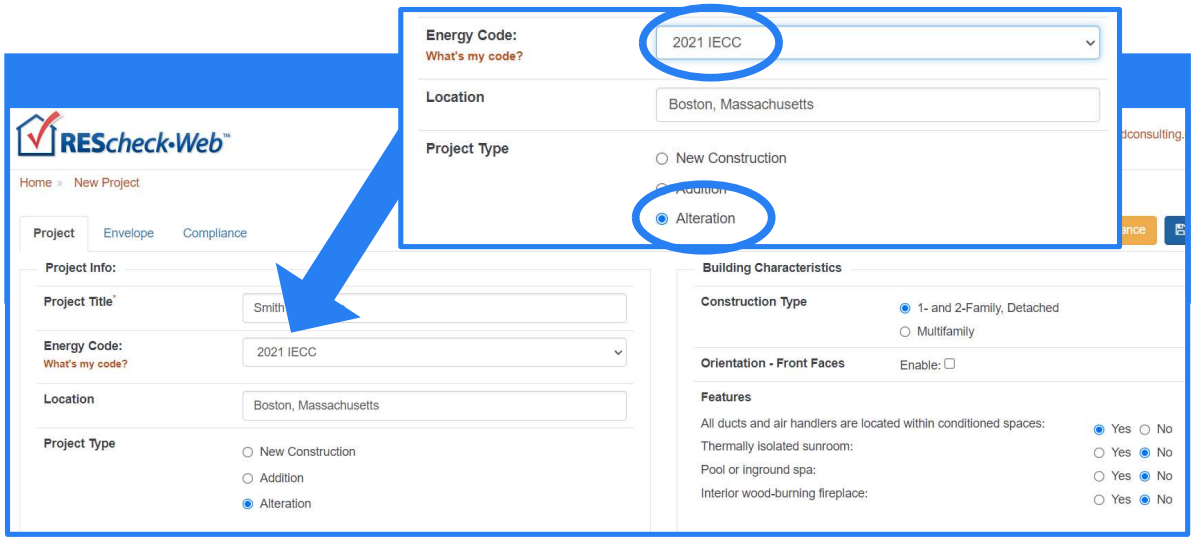
REScheck – Alterations



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REScheck – Alterations

Exceptions

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Component: Wall 2

Alteration Detail:
- No exemptions apply to this assembly
- Alteration exposes a framing cavity but the cavity is completely filled with insulation
- Alteration does not expose a framing cavity

Component: Window 1

Alteration Detail:
- Alteration only replaces glazing (i.e., glass units) in the existing sash or frame
- Alteration ONLY installs window film on single-pane existing glazing.
- Alteration only installs storm windows over existing glazing
- No exemptions apply to this assembly

Component: Floor 1

Alteration Detail:
- No exemptions apply to this assembly
- Alteration exposes a framing cavity but the cavity is completely filled with insulation
- Alteration does not expose a framing cavity

Component: my Ceiling

Alteration Detail:
- No exemptions apply to this assembly
- Alteration involves reroofing where neither sheathing nor insulation is exposed
- Alteration exposes a framing cavity but the cavity is completely filled with insulation
- Alteration does not expose a framing cavity

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REScheck – Alterations

Generated by RES*check-Web* Software

Compliance Certificate

Project A Sample Project

Energy Code:	**2021 IECC**
Location:	**Boston, Massachusetts**
Construction Type:	**Single family**
Project Type:	**Alteration**
Orientation:	**Bldg. faces 180 deg. from North**
Climate Zone:	**5 (5641 HDD)**
Permit Date:	
Permit Number:	

Construction Site:
123 Main St.
Dogtown, WA 99352

Owner/Agent:
R. Franklin
321 W. Tenth
Dogtown, WA 99532
509.888.7777

Designer/Contractor:
Anne Hatchet
Acme Home Designers
555 Paire Ridge
Dogtown, WA 99532
509.888.999

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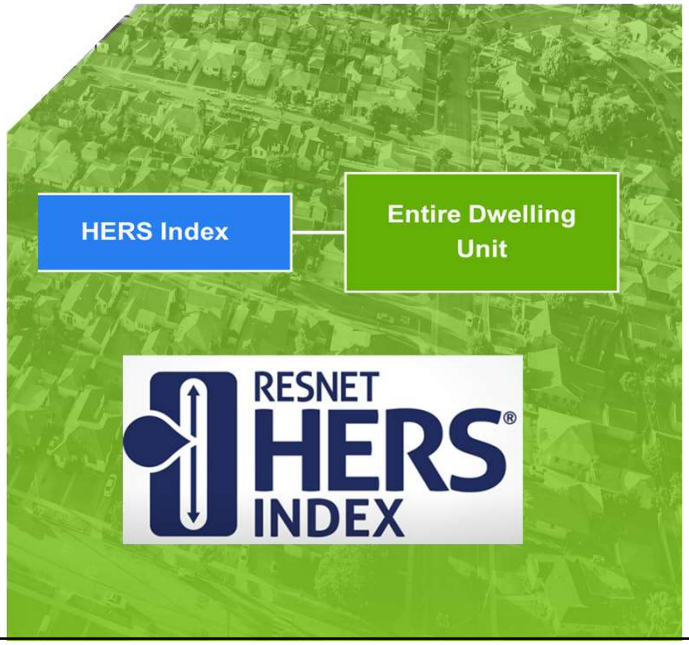
HERS Compliance

- Required for "Level 3 Alterations"
- The entire dwelling unit is included in the rating
- Rating per Table R406.5



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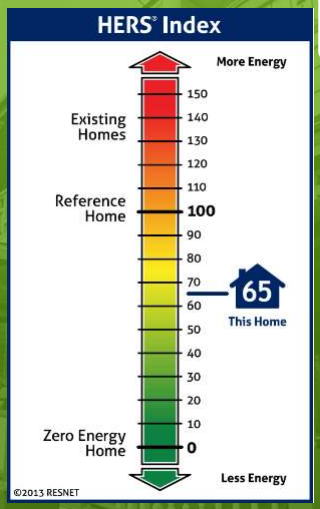
HERS Index

A certified Home Energy Rater assesses the energy efficiency of a home, assigning it a relative performance score. The lower the number, the more energy efficient the home. A typical home built to 2006 energy efficiency standards scores 100 on the HERS® Index.

- A home with a HERS® Index Score of 70 is 30% more energy efficient than a standard new home
- A home with a HERS® Index Score of 130 is 30% less energy efficient than a standard home



Some Variables Included In A HERS Rating

- All exterior walls (both above and below grade)
- Floors over unconditioned spaces (like garages or cellars)
- Ceilings and roofs
- Attics, foundations and crawlspaces
- Windows and doors, vents and ductwork
- HVAC systems, water heating system, and your thermostat

RESNET HERS® INDEX

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Level 3 Alterations –
Maximum Energy Rating Index (Table 406.5)

Clean Energy Application	New Construction Starts January 1, 2023, until June 30, 2024	New Construction Permits After July 1, 2024	Major Alterations, Additions, and Changes. Starts January 1, 2023
Mixed-Fuel Building	52	42	52
Solar Electric Generation*	55	42	55
All-Electric Building	55	45	55
Solar Electric* and All-Electric Building	58	45	58

**Solar Electric Generation = Solar photovoltaic array rated at 4kW or higher*

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Clean Energy Options –R406.5.1

Existing buildings 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:

1. 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.
2. 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.

Clean Energy Application	Major Alterations, Additions, and Changes. Starts January 1, 2023
Mixed-Fuel Building	52
Solar Electric Generation*	55
All-Electric Building	55
Solar Electric* and All-Electric Building	58

If both are included the project can offset an additional 3 points

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Energy Rating Index – Mandatory Requirements

Formerly Listed as Mandatory Requirements

Now in One Table

Section	Title
	General
R401.3	Certificate
	Building Thermal Envelope
R402.1.1	Vapor retarder
R402.2.3	Eave Baffle
R402.2.4.1	Access hatches and doors
R402.2.10.1	Crawl space wall insulation installation
R402.4.1.1	Installation
R402.4.1.2	Testing
	Mechanical
R403.1	Controls
R403.3	Ducts (except R403.3.2, R403.3.3, and R403.3.6)
R403.4	Mechanical system piping insulation
R403.5.1	Heated water circulation and temperature maintenance systems
R403.5.3	Drain water heat recovery units
R403.6.1	**Heat or energy recovery ventilation (HRV/ERV)**
R403.7	Equipment sizing and efficiency rating
R403.8	System serving multiple dwelling units
R403.9	Snow and ice melt systems
R403.10	Energy consumption of pools and spas
R403.11	Portable spas
R403.12	Residential pools and permanent residential spas
	Electrical Power and Lighting Systems
R404.1	Lighting equipment

Image Source: Upcodes.com

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Energy Rating Index: Documentation for Permit Application

Prior to the issuance of a building permit:

- A **HERS compliance report** which includes a HERS index score of 52 or lower, or otherwise complies via renewable trade-offs
- A **description of energy features**
- A statement that the rating index score is **"based on plans"**

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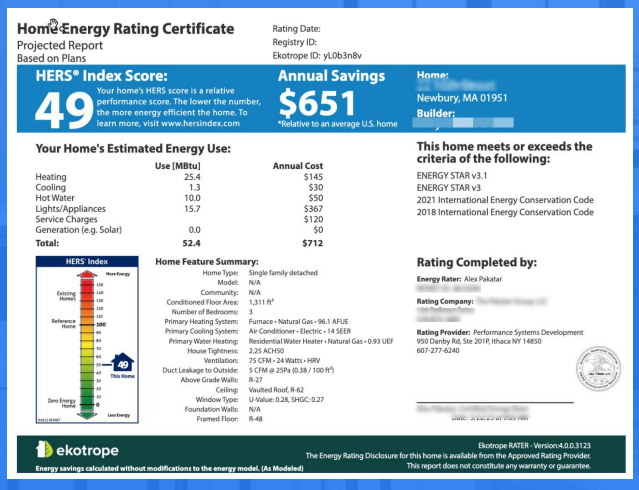
R406.6.2 Documentation for Permit Application Energy Rating Index



Home Energy Rating Certificate
Projected Report
Based on Plans

Rating Date:
Registry ID:
Ekotrope ID: yL0b3n8v

HERS® Index Score: 49
Your home's HERS score is a relative performance score. The lower the number, the more energy efficient the home. To learn more, visit www.hersindex.com

Annual Savings $651
*Relative to an average U.S. home

Home:
Newbury, MA 01951
Builder:

Your Home's Estimated Energy Use:

	Use [MBtu]	Annual Cost
Heating	25.4	$145
Cooling	1.3	$30
Hot Water	10.0	$50
Lights/Appliances	15.7	$367
Service Charges		$120
Generation (e.g. Solar)	0.0	$0
Total:	**52.4**	**$712**

This home meets or exceeds the criteria of the following:
ENERGY STAR v3.1
ENERGY STAR v3
2021 International Energy Conservation Code
2018 International Energy Conservation Code

HERS Index

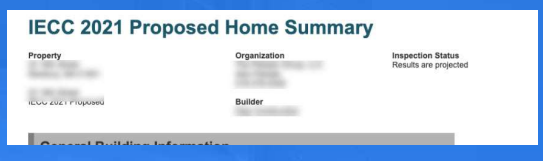
Home Feature Summary:

Home Type:	Single family detached
Model:	N/A
Community:	N/A
Conditioned Floor Area:	1,311 ft²
Number of Bedrooms:	3
Primary Heating System:	Furnace • Natural Gas • 96.1 AFUE
Primary Cooling System:	Air Conditioner • Electric • 14 SEER
Primary Water Heating:	Residential Water Heater • Natural Gas • 0.93 UEF
House Tightness:	2.25 ACH50
Ventilation:	75 CFM • 24 Watts • HRV
Duct Leakage to Outside:	5 CFM @ 25Pa (0.38 / 100 ft²)
Above Grade Walls:	R-27
Ceiling:	Vaulted Roof, R-62
Window Type:	U-Value: 0.28, SHGC: 0.27
Foundation Walls:	N/A
Framed Floor:	R-48

Rating Completed by:
Energy Rater: Alex Pakatar
Rating Company:
Rating Provider: Performance Systems Development
950 Danby Rd, Ste 201F, Ithaca NY 14850
607-277-6240

ekotrope
Ekotrope RATER - Version:4.0.0.3123
The Energy Rating Disclosure for this home is available from the Approved Rating Provider.
This report does not constitute any warranty or guarantee.
Energy savings calculated without modifications to the energy model. (As Modeled)

Image Source: PSD Consulting



IECC 2021 Proposed Home Summary

Property	Organization	Inspection Status
		Results are projected
	Builder	

Image Source: PSD Consulting

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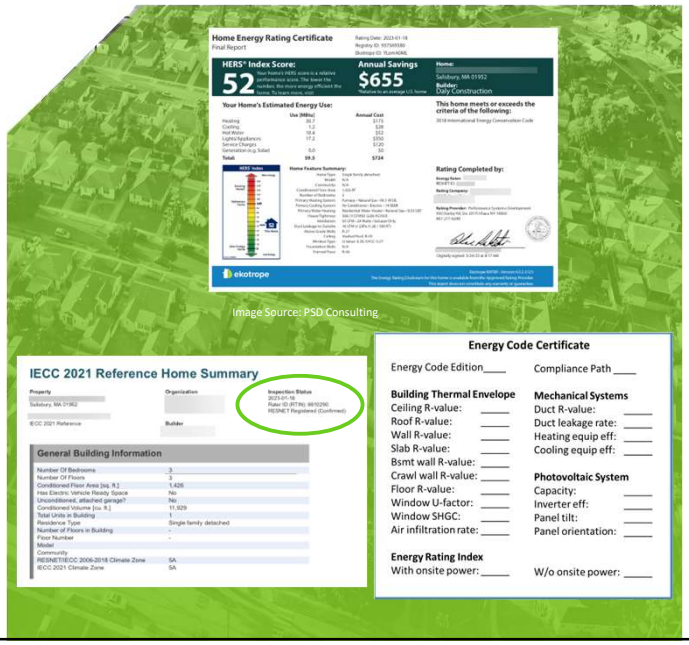
MA Residential Amendments

ERI Documentation – Final

Prior to the issuance of a ***certificate of occupancy***:

1. A *copy of the final certificate* indicating that the HERS rating index score for each unit is verified to be 52 or less or otherwise complies via renewable trade-offs,
2. Completed *IECC 2021 Reference Home Summary (Verified).*
3. A *copy of the certificate*, as required by Section R401.3 for each unit listing the final HERS index score of the dwelling unit



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Solar Ready/EV Ready

Not Applicable to Alterations and Changes of Use

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Examples

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Poll Question #4

Which of the following are true of kitchen remodeling?

A. Exposed framing cavity which has no insulation need not be filled with insulation

B. All replaced lighting systems must be high-efficacy

C. New service hot water piping ¾" or greater should be insulated to R-3

D. None of the above

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Alterations
Kitchen Remodeling Example

A kitchen in an existing home is being remodeled. Including:

- New drywall
- New plumbing with ¾" copper piping
- Replacement of a window
- All new lighting fixtures

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What code requirements apply?

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Alterations
Kitchen Remodeling Example

- Exposed wall cavities must be filled with insulation
- Hot water pipes insulated to R-3
- New window U-factor ≤ 0.30
- 100% of luminaires must be high-efficacy

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Alterations – Reroofing Example

- An existing home is getting a new roof and there is no insulation in the roof cavities.
- The cavities are not exposed during reroofing, but the sheathing is exposed.

What does the energy code require with respect to insulating the roof?

Courtesy of the Department of Energy's Building America Solution Center (http://basc.energy.gov)

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Alterations – Reroofing Example

Section R503.1.1 – If roofs without insulation in the cavity and where the sheathing or insulation is exposed during reroofing shall be insulated above or below the sheathing.

Note: This only applies if the roof is part of the thermal envelope!

Courtesy of the Department of Energy's Building America Solution Center (http://basc.energy.gov)

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Alterations
Basement Remodeling Example

A conditioned basement in an existing home is being remodeled. During remodeling, 2x4 wall cavities were exposed but they were already filled with insulation.

Do the walls have to meet prescriptive minimum R-values (R-15ci or 19 or 13 +5ci)?

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Alterations
Basement Remodeling Example

There is no minimum R-value requirement, provided the cavity is filled with insulation.

Note: If the cavity is only partially filled, the remaining space should be filled with insulation.

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PART 7

Summary/Closing

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Alterations Summary

- Level 3 Alterations: Alterations that meet the IEBC definition for Level 3 Alteration or IRC Extensive Improvement, 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.
- Alterations 1000 square feet and under, follow chapter 5 (prescriptive)for existing buildings
- Solar Ready does not apply to alterations regardless of size
- Alterations 1000 sqft and under do not require a blower door test
- Historical Buildings may still file for exemptions if work would detract from the historical nature of the building
- EV Ready does not apply to existing buildings

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Mass Save Assistance

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Low Rise/Repair & Additions

Incentives for energy efficient building and renovating

- Single Family Homes
- Multi-Family 3 stories and residential-metered heat
- New Construction
- Major Renovations and Large Additions
- Residential Energy Code
- Residential HVAC and DHW Systems only
- On-site testing and verification completed by program-approved HERS Raters
- Incentives for commercially metered buildings/units are not available

Details at: www.masssave.com/en/saving/residential-rebates/new-construction

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Low-Rise/Repairs & Additions

Incentives for energy efficient building and renovating

mass save

Benefits of Working with a HERS Rater

Diagnostic testing
- Blower door and duct leakage tests (pre- and post-tests, ideally)
  - Help with Code compliance documents
- Infrared testing
- Ventilation commissioning
- Quantify savings

Plan analysis
- Drives deeper energy savings
- Improves occupant comfort

Technical guidance and expertise
- Create a comprehensive plan for energy efficiency
- Can act as a liaison between homeowner, builder, architect, and trades

Access to Mass Save incentives
- Can be paid to builder or homeowner

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Low-Rise/Repairs & Additions

Incentives for energy efficient building and renovating

mass save

Renovations and Additions

Gut Renovations and Additions
- Renovations are ideally at least 50% gut projects
- Substantial HVAC changes
- Clear project scope
- Small jobs like kitchen/bath remodels are not a good fit
- Additions should be at least 500 SF

Participants include Builders, Developers & Homeowners

Program-approved HERS Rating companies

Access to Mass Save 0% interest HEAT Loan
- Up to 7 years and $25,000

Process Similar to LR with addition of Preliminary Inspection

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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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