

2023 Residential Stretch Energy Code *and the* Municipal Opt-In Specialized Code

March 16, 2023



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A BIT ABOUT ME & MY EXPERIENCE

- Teenage Gopher/Slave for Family Building Company
- Residential Building Designer &...
- General Manager for Family Building Company
- Executive Director – HBRA of Central MA
- Certified HERS Rater
- Construction Lending Inspection Services
- Code Consultant
- HBRA of Mass “Code Guy”

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WHERE ARE WE NOW?

- 9th Edition is still our Building Code – This includes the IRC, IBC and IECC, each with Massachusetts Amendments
- Except for the Energy Code in Green Communities (i.e. Stretch Energy Code towns) The Updated Stretch Energy Code went into effect on January 1, 2023
- The 10th Edition has been drafted by the BBRs and is in administrative review. The 10th Edition uses the 2021 I-Codes with Massachusetts Amendments

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WHERE ARE WE HEADED?

- The 10th Edition could go into effect as soon as July 1, 2023, but could be later. We are expecting a 6-month period of concurrency
- The Municipal Opt-in Specialized Code will go into effect in a small number of municipalities on July 1, 2023, with no concurrency
Peoples Republics of: Brookline, Cambridge, Somerville & Watertown
- More municipalities will approve the Specialized Code during town meetings this spring – Likely effective date for those towns will be January 1, 2024

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Because Just 1 Energy Code Isn't Enough... WE NOW HAVE 3 ENERGY CODES!

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 Expected from BBRS: July 2023	<ul style="list-style-type: none">• New construction in towns & cities that are a green or stretch community• 299 communities Residential: Jan 2023 Commercial: July 2023	<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

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225 CMR 22: MASSACHUSETTS RESIDENTIAL STRETCH ENERGY CODE AND MUNICIPAL OPT-IN SPECIALIZED CODE 2023

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The Updated MASSACHUSETTS STRETCH ENERGY CODE

AKA:

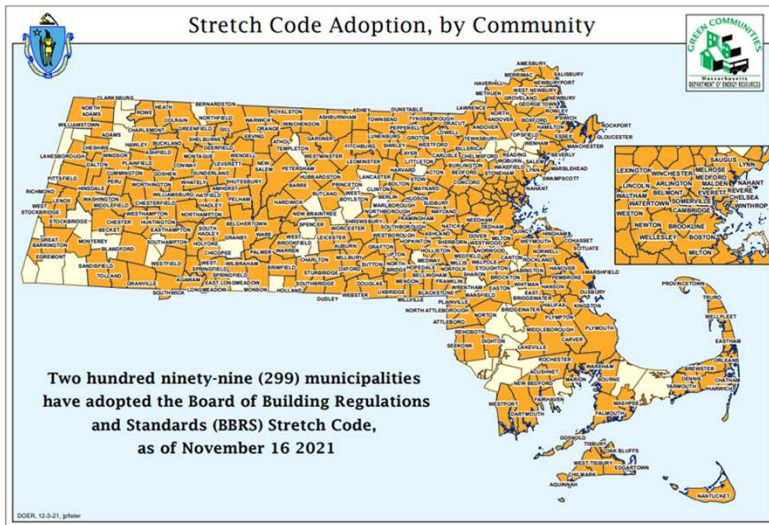
THE STRETCH CODE *or*

STRETCH ENERGY CODE *or*

HOUSING PRICE INFLATION CODE

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300 of 351
Communities
are Stretch
Towns



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STRUCTURE

The updated Stretch Code as newly incorporated into DOER regulations (225 CMR) is divided into 2 chapters, following the format of the IECC.

- A. 225 CMR 22 - Residential Low-rise Construction Stretch Energy Code**
- B. B. 225 CMR 23 - Commercial (and all other) Construction Stretch Energy Cod

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Updated
Stretch
Energy
Code = 2021
IECC + 225 CMR 22

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STRETCH CODE COMPLIANCE PATHWAYS

HERS Index Score: Sections R403.6 (Ventilation), R404.4 (EV Ready), R406 (HERS) & Appendix RB (Solar Ready)

Passive House: Sections R404.4 (EV Ready), R405 (Passive House) & Appendix RB (Solar Ready)

New Construction Prescriptive: Sections R401- R404 (Prescriptive), R408 (Additional Efficiency Packages) & Appendix RB (Solar Ready)

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PRESCRIPTIVE?

Prescriptive compliance is only allowed for new construction buildings that do not include individually separate dwelling units, as well as small additions and building alterations. The prescriptive sections include requirements for envelope (R402), HVAC and service water heating systems (R403), and electrical and lighting systems- including EV Ready (R404.) Massachusetts has amended the prescriptive requirements for software eligible for the opaque envelope UA alternative, insulation installation, duct testing, mechanical ventilation, and EV Ready parking, so be sure to reference the base code and Stretch Code amendments if complying prescriptively.

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R 408 Additional Efficiency Packages

R408.2.1 Enhanced envelope performance option.

The enhanced envelope performance option lowers the allowed building thermal envelope UA as compared to the code baseline UA, requiring a higher performing envelope to comply with this option.

R408.2.2 More efficient HVAC equipment performance option.

Heating and cooling equipment shall meet one of the following efficiencies:

1. Greater than or equal to 10 HSPF/16 SEER air source heat pump.
2. Greater than or equal to 3.5 COP ground source heat pump.

R408.2.3 Reduced energy use in service water-heating option.

The hot water system shall meet one of the following efficiencies:

1. Greater than or equal to 2.0 UEF electric service water-heating system.
2. Greater than or equal to 0.4 solar fraction solar water-heating system.

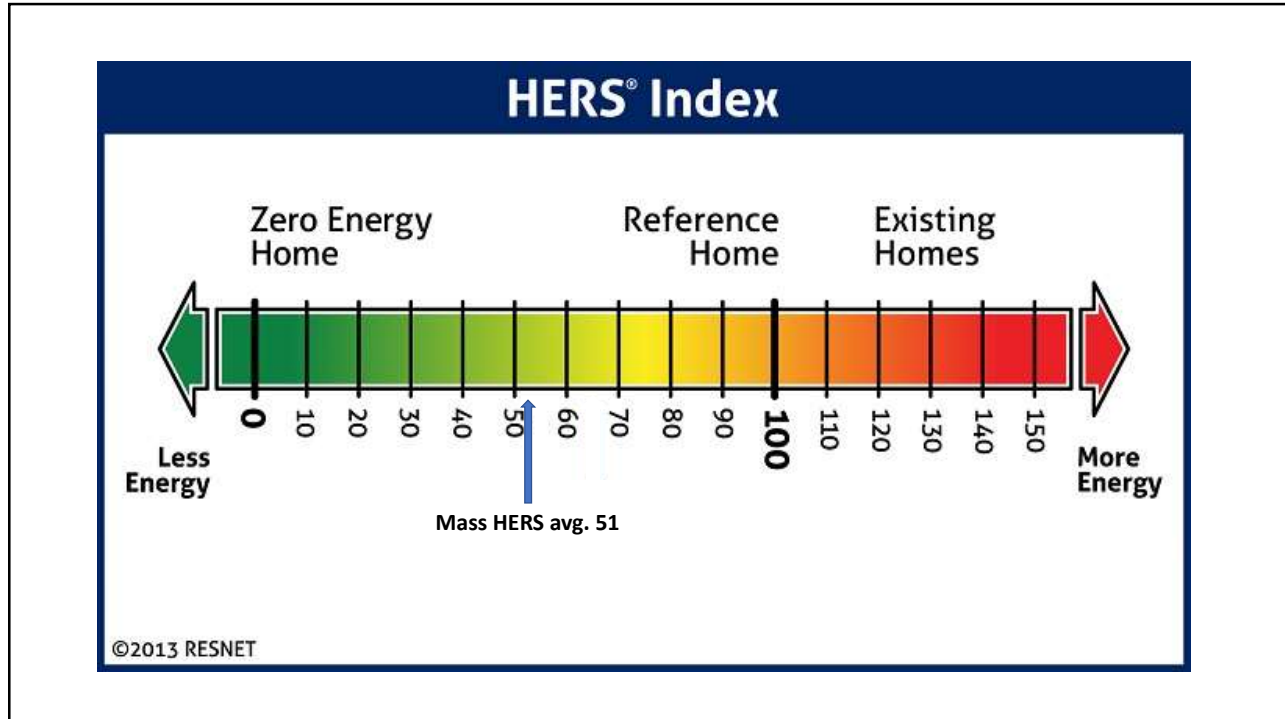
Choose Two

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Insulation minimum R-Values and Fenestration Requirements by Component

	Climate Zone	Fenestration U-Factor	Skylight U-Factor	Glazed Fenestration SHGC	Ceiling R-Value	Wood Frame Wall R-Value	Mass Wall R-Value	Floor R-Value	Basement Wall R-Value	Slab R-Value & Depth	Crawl Space Wall R-Value
OLD	5	.30	.55	NR	49	20 or 13&5ci	13/17	30	15/19	10, 4 ft	15/19
NEW	5A	.30	.55	0.40	60	30 or 20&5ci or 13&10ci or 0&20ci	13/17	30	15ci or 19 or 13&5ci	10ci, 4 ft	15ci or 19 or 13&5ci

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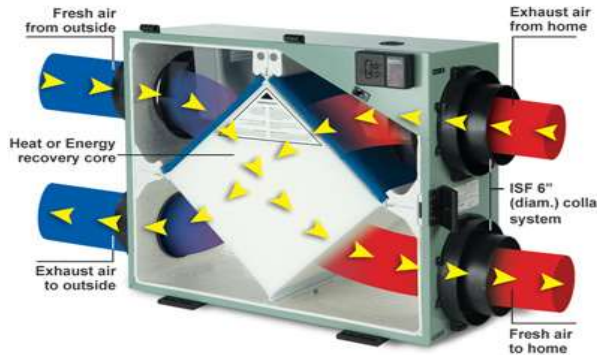
TABLE R406.5
MAXIMUM ENERGY RATING INDEX

Clean Energy Application	New construction until June 30, 2024	New construction permits after July 1, 2024	Major alterations, additions, or Change of use
Mixed-Fuel Building	52	42	52
Solar Electric Generation	55	42	55
All-Electric Building	55	45	55
Solar Electric & All-Electric Building	58	45	58

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MECHANICAL VENTILATION: HRV or ERV Required

Energy or heat recovery ventilation (Section R403.6.1) The updated Stretch Code adds ventilation requirements through either heat recovery or energy recovery to the HERS Pathway.



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TABLE R404.4
EV READY PARKING SPACE REQUIREMENTS

Type of Building	Number of parking spaces
1 & 2 family dwellings and town homes	At least 1 50-amp branch circuit per dwelling unit to provide for AC Level II charging
All other R-use buildings	At least 20% of spaces served with a 40-amp, 208/240-volt circuit with a minimum capacity of 9.6 kVA

R404.4 Wiring for Electric Vehicle Ready Parking Spaces (“EV Ready Spaces”). EV Ready Spaces shall be provided in accordance with Table R404.4. 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 or a Society of Automotive Engineers (SAE) Standard SAE J1772 electrical connector for EVSE servicing Electric Vehicles, located within 6 feet (1828 mm) of each EV ready space. Conductors and outlets for EVSE shall be sized and installed in accordance with the MA electrical code.

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LED Lighting All Over the Place!

HIGH-EFFICACY LAMPS. Light-emitting diode (LED) lamps with an efficacy of not less than the following:

1. 60 lumens per watt for lamps over 40 watts.
2. 50 lumens per watt for lamps over 15 watts to 40 watts.
3. 45 lumens per watt for lamps 15 watts or less.



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Appendix RB: Solar-ready Provisions – Detached One- and Two-family Dwellings, Low-rise Residential buildings and Townhouses

RB103.1 General. New R-use buildings including but not limited to detached one- and two-family dwellings, and townhouses with not less than 600 square feet (55.74 m²) of roof area oriented between 110 degrees and 270 degrees of true north shall comply with Sections RB103.2 through RB103.8.

Exceptions:

1. New residential buildings with a permanently installed on-site renewable energy system.
2. A building with a solar-ready zone that is shaded for more than 70 percent of daylight hours annually.

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SOLAR ZONE

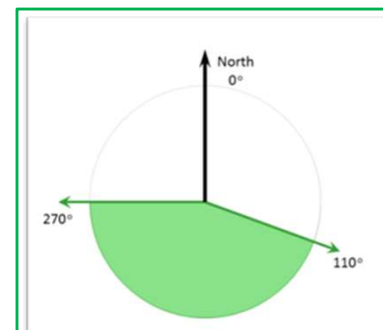
RB103.3 Solar-ready zone area. The total solar-ready zone area shall consist of an area not less than 300 square feet (27.87 m²) exclusive of mandatory access or set back areas as required by the MA Fire Code.

New townhouses three stories or less in height above grade plane and with a total floor area less than or equal to 2,000 square feet (185.8 m²) per dwelling shall have a solar-ready zone area of not less than 150 square feet (13.94 m²). The solar-ready zone shall be composed of areas not less than 5 feet (1524 mm) in width and not less than 80 square feet (7.44 m²) exclusive of access or set back areas as required by the MA Fire Code

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EXCEPTIONS TO SOLAR READY

There are two exceptions to providing a solar roof zone when the building's roof is not amenable to solar systems. Specifically, the following exceptions do not need to comply with RC105: - Detached one- and two-family dwellings or townhomes with less than 600 sq.ft. of roof area oriented between 110 & 270 degrees of true North - Buildings where all areas of the roof are in full or partial shade for more than 70% of annual daylight hours (demonstrate with a solar shading study)



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EXISTING BUILDINGS: Alterations, Additions and Changes of Use (Section R503.1.5)

- **Additions**

- *Changed to mandate stretch code for large additions*
- Small additions (<1,000-sf): continue to follow base code
- Large additions (>=1,000-sf or 100% increase in conditioned floor area): require HERS 52 if using fossil fuel and HERS 55 if all-electric

- **Alterations**

- *Changed to require substantial renovations to meet HERS 52 if using fossil fuel and HERS 55 if all-electric*
- Level 3 Alterations (over 50% of the home is renovated and reconfigured)
- Substantial Improvements (improvements that cost more than 50% of the value of the existing home)

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Historic Buildings

The Stretch Code will maintain R501.6 from Base Code: Provisions of this code relating to the construction, repair, alteration, restoration and movement of structures, and change of occupancy shall not be mandatory for historic buildings provided that a report has been submitted to the code official and signed by the owner, a registered design professional, or a representative of the State Historic Preservation Office or the historic preservation authority having jurisdiction, demonstrating that compliance with that provision would threaten, degrade or destroy the historic form, fabric or function of the building.

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MASSACHUSETTS MUNICIPAL OPT-IN SPECIALIZED STRETCH CODE 2023

AKA:


SPECIALIZED STRETCH ENERGY CODE

The SPECIALIZED CODE

NET-ZERO ENERGY CODE

WTF?!!! 😞


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Specialized Code: Proposed Net Zero Definition

Net-Zero new construction is compatible, as-built, with the Commonwealth's net-zero emissions economy in 2050.

- Consistent with electrification and deep efficiency approach in EEA's 2050 Roadmap
- Does not necessitate onsite or offsite renewables, nor the assumption that an individual building is net-zero energy
- A building becomes net zero energy when MA electric grid is net zero





All-Electric:
no additional requirements, compliant as-built with net-zero in 2050

Fossil Fuel used:
Required solar PV and pre-wire for future electric heating, drying and cooking

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STRUCTURE – Municipal Opt-in Specialized Stretch Code 2023

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

C. 225 CMR 22 Appendix RC – Residential Low-rise Construction Specialized Code

D. 225 CMR 23 Appendix CC – Commercial (and all other) Construction Specialized Code

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MUNICIPAL
OPT-IN
SPECIALIZED
STRETCH
CODE = 2021
IECC + 225
CMR 22 + MA
APPENDIX
RC

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APPENDIX RC

MASSACHUSETTS MUNICIPAL OPT-IN SPECIALIZED STRETCH CODE 2023 RESIDENTIAL LOW-RISE BUILDING PROVISIONS

The provisions contained in this appendix together with referenced sections from the Stretch energy code constitute the Specialized opt-in code for residential low-rise buildings, and may be adopted by a city or town together with the Commercial Specialized code Appendix CC 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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Requirements by Residential Building Size & Fuel

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:

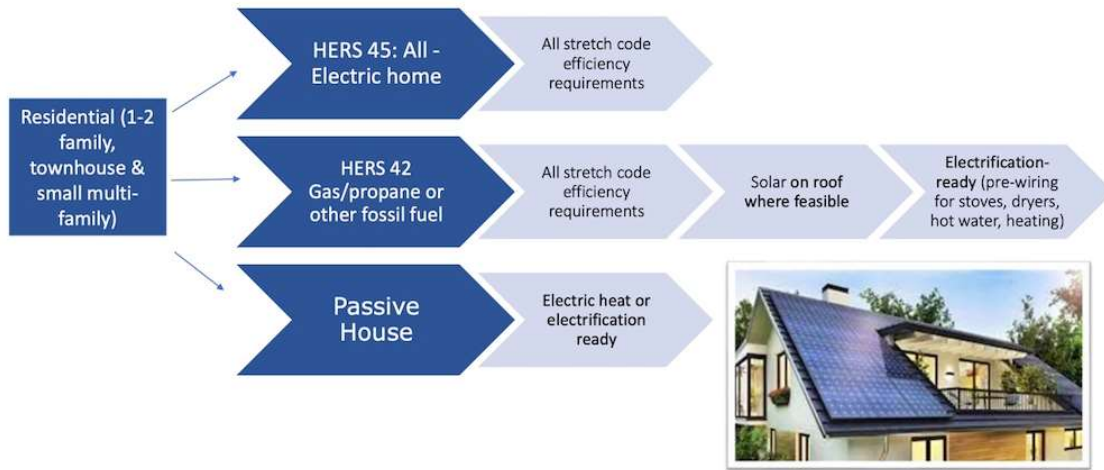
- 1. Zero Energy pathway:** (Section RC102)
- 2. All-Electric pathway:** (Section RC103)
- 3. Mixed-Fuel pathway:** (Sections RC104 and RC105)

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.**

Buildings with any combustion equipment designed for fossil fuel use are termed 'mixed-fuel' buildings.

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Specialized Stretch Code (Net Zero) - Residential



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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

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ALL-ELECTRIC INCENTIVES

What Determines Incentive Eligibility?

To qualify for the All-Electric Home incentive, homes must meet the criteria of either Level 1 or Level 2 eligibility requirements.

Component	Level 1	Level 2
Energy savings percentage or HERS Index Score	Savings ≥ 30% or HERS Index Score ≤ 45*	Savings ≥ 50% or HERS Index Score ≤ 35*
Heat pump for space heating [†]	Required	Required
Heat pump for water heating	Optional	Required
All-electric cookware	Required	Required
Infiltration rate (ACH)	ACH50 ≤ 1.5	ACH50 ≤ 1.0
Balanced ventilation systems (HRVs & ERVs)	Required	Required
Continuous envelope insulation [‡]	Optional	Required
Electric vehicle-ready checklist	Required	Required

*The HERS Index Score is calculated without factoring in on-site generation.
[†]Installed air-source heat pumps must be on the Mass Save Heat Pump Qualified Product List.
[‡]Level 2 requirement applies to whole home (i.e., slab, slab edge, foundation, exterior walls, and roof assemblies).

What Are the Incentives?

The incentives for high-performance, all-electric new construction homes depend on the number of individually metered dwelling units on the premise. For homes with two or more units, all units must meet the same level of eligibility requirements. Incentive amounts are per building.

Home Type	Level 1	Level 2
Single family	\$15,000	\$25,000
2-unit dwelling	\$17,500	\$30,000
3-unit dwelling	\$20,000	\$35,000
4-unit dwelling	\$22,500	\$40,000

How Do I Apply for Incentives?

You must work with a HERS Rater approved by the Sponsors of Mass Save. Your HERS Rater must enroll the project before construction begins and conduct all of the mandatory inspections and verifications for the home to ensure that all eligibility requirements have been met.

QUESTIONS?



CONTACT INFO

Guy Webb

gwebb@hbrama.com

(508) 864-3464

