Edson, Becca (ENE)

From: Jacob Deva Racusin <jacob@newframeworks.com>
Sent: Thursday, September 19, 2024 1:24 PM
To: Betsy Ames
Cc: STRETCHCODE (ENE); Michael Rossi; Andy Buccino
Subject: Re: Embodied Carbon MA Code Comments Meeting

Follow Up Flag: Follow up
Flag Status: Completed

Greetings,

My apologies for missing the comment period - I was out of the office much of the last few weeks. I was one of the primary developers of Vermont's embodied carbon energy code provision, and am a co-developer of the BEAM tool. I would be happy to discuss this further with you if that would be of service. I am thrilled to see this provision incorporated into the MA Stretch Code proposal, and I would love to help support its refinement to avoid some of the limitations of the Vermont version and coordinate effectively with both the tool developer and practitioner/user stakeholder groups' experiences. Let me know if I can be of support, and again my apologies for my tardiness in submitting this feedback.

Cheers,
Jacob

Jacob Deva Racusin
Co-Founder
Director of Building Science and Sustainability
Pronouns: He/Him

(802) 782-7783
www.newframeworks.com
18A Morse Drive, Essex, VT 05452

On Thu, Sep 19, 2024 at 11:38 AM Betsy Ames <betsy@nehers.org> wrote:

> Dear Mr. Finlayson,

Edson, Becca (ENE)

From: Betsy Ames <betsy@nehers.org>
Sent: Thursday, September 19, 2024 11:38 AM
To: STRETCHCODE (ENE)
Cc: Michael Rossi; Jacob Deva Racusin; Andy Buccino
Subject: RE: Embodied Carbon MA Code Comments Meeting

Importance: High

Dear Mr. Finlayson,

I realize that the public comment period has closed, but I received this comment from Jacob after the deadline and it seems worth passing along, just for your own reference. He's done a lot of work with this in VT, so his comments carry a lot of weight in my book.

Warmest regards,
Betsy

From: Jacob Deva Racusin <jacob@newframeworks.com>
Sent: Wednesday, September 18, 2024 7:29 PM
To: Betsy Ames <betsy@nehers.org>
Cc: Michael Rossi <mrossi@psdconsulting.com>
Subject: Re: Embodied Carbon MA Code Comments Meeting

Hi folks,

I was just able to review the redlines through another process, and noticed this:

TABLE R406.5.3 *Add Table R406.5.3, as follows:*

TABLE R406.5.3 DEFAULT INSULATION GLOBAL WARMING POTENTIAL VALUES

All values are from Building Emissions Accounting for Materials (BEAM)[a], unless noted.

Insulation Material	Default Global Warming Potential (GWP) in Kg CO^2e/ sq.m. RSI-1
Cellular glass – Aggregate	3.93[b]
Cellulose – Densepack	-2.10
Cellulose – Blown/loosefill	-1.10
Cork – Board	-6.80
EPS/graphite – Board, unfaced, Type II – 15 psi	2.80
EPS/graphite – Board, unfaced, Type IX – 25 psi	3.40
EPS – Board, unfaced, Type I – 10 psi	2.80
EPS – Board, unfaced, Type II – 15 psi	3.80
EPS – Board, unfaced, Type IX – 25 psi	4.80
Fiberglass – Batt, unfaced	0.70
Fiberglass – Blown/loosefill	1.00
Fiberglass – Blown/spray	1.93[c]
Hemp – Batt	-0.50
HempCrete	-3.00
Mineral wool – Batt, unfaced	1.70
Mineral wool - Blown	1.60
Mineral wool – Board, unfaced, "light" density	3.30
Mineral wool – Board, unfaced, "heavy" density	8.10
Phenolic foam – Board	1.54[d]
Polyiso – Wall Board	4.10
Polyiso – Roof Board	2.90
SPF – Spray, open cell	1.40
SPF – Spray, closed cell HFO	4.20
SPF – Spray, high density HFO	4.90

(partial screenshot)

This looks to be lifted from the VT code. I don't recommend including this - it bakes in values that are changing regularly and will likely conflict with other sources. As it stands, given VT's code development process, some of these are already out of date. I'd suggest that rather than provide static values in the code that requires regular updating based on manufacturer results, that references to Type III EPDs or BEAM and EC3 be provided for compliance.

Let me know if I should direct this feedback elsewhere, sorry for the delay, too much going on!
Jacob

Jacob Deva Racusin
Co-Founder
Director of Building Science and Sustainability
Pronouns: He/Him

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18A Morse Drive, Essex, VT 05452

On Mon, Sep 16, 2024 at 9:02 AM Jacob Deva Racusin <jacob@newframeworks.com> wrote:

> Hi folks,
>
> Thanks for sharing. The public comments look good, nothing to add - thanks for participating in this process! All the best to you both.
> Jacob

Jacob Deva Racusin
Co-Founder
Director of Building Science and Sustainability
Pronouns: He/Him

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18A Morse Drive, Essex, VT 05452

Edson, Becca (ENE)

From: Sullivan, Lisa M (ENE)
Sent: Wednesday, September 18, 2024 4:17 PM
To: STRETCHCODE (ENE)
Subject: Re: Draft Stretch Code Updates Released for Public Comment; Fall Code Trainings

I forwarded to stretch code email

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From: Sullivan, Lisa M (ENE) <Lisa.M.Sullivan@mass.gov>
Sent: Wednesday, September 18, 2024 3:58:21 PM
To: STRETCHCODE (ENE) <stretchcode@mass.gov>
Subject: Fw: Draft Stretch Code Updates Released for Public Comment; Fall Code Trainings

Please see email chain below

Get Outlook for iOS

From: Lauren Sinatra <lsinatra@nantucket-ma.gov>
Sent: Wednesday, September 18, 2024 3:41:03 PM
To: Sullivan, Lisa M (ENE) <Lisa.M.Sullivan@mass.gov>
Subject: Fw: Draft Stretch Code Updates Released for Public Comment; Fall Code Trainings

Lisa, I just was forwarded this by a local architect and guess I'm confused. Does the new code language regarding historic homes replace the current exemption process? If you think it is constructive, can you please share this feedback with your code team? We would appreciate hearing their feedback.

Many thanks,
LAuren

> **From:** Ethan Griffin RA <ethan@gryphonarchitects.com>
> **Date:** September 18, 2024 at 3:08:00 PM EDT
> **To:** Nantucket Builders Association <admin@nantucketbuildersassociation.org>
> **Cc:** Board of Directors <directors@nantucketbuildersassociation.org>
> **Subject: RE: Draft Stretch Code Updates Released for Public Comment; Fall Code Trainings**
>
> NBA Board,

Regarding item 2, I think there is a danger in mandating the Prescriptive Path for historic buildings. People are already trigger happy with the closed cell spray foam, which in my opinion will do nothing but create hidden long term degradation to historic structures. It's a challenge to achieve prescriptive code baselines in new construction (in 20+ years I have never used the Prescriptive Path) and will be a greater challenge on historic structures, which also will lack the comprehensive air sealing, highly managed air circulation, and all the other elements that must work in concert to create an IAQ that aligns with modern code.

If Prescriptive Path offers the cleanest solution, then I would suggest language that relates to R-Value per inch instead of total R-Value : "achieve a minimum of R-3.7 per inch for depth of cavity" etc.

Thanks,

-ethan

From: Nantucket Builders Association <admin@nantucketbuildersassociation.org>
Sent: Saturday, September 7, 2024 3:44 PM
Cc: Board of Directors <directors@nantucketbuildersassociation.org>
Subject: Draft Stretch Code Updates Released for Public Comment; Fall Code Trainings

Dear Members,

The DOER has just issued a series of proposed updates to the Stretch Code, for both residential and commercial construction. Public comments on the new changes are being accepted now through September 17th at 5pm. Additionally, a public hearing to accept verbal comments has been scheduled for September 16, 2024, from 10 AM – 12 PM on Zoom (details enclosed below).

Of note, for residential construction:

1. For major (level 3) alterations, and large additions and change of use projects that require a HERS rating, we propose to increase (loosen) the HERS rating requirement from a range of 52-58 to 65-75. This matches the HERS rating levels in the base code and provides significantly more leeway for the wide variety of existing residential building types, or building conversions to provide new housing units, to comply with the Stretch and Specialized Codes.
2. For large changes to historic buildings, we remove the requirement to get a HERS rating, and allow the use of the modified prescriptive compliance path.
3. For Accessory Dwelling Units (ADUs) we provide a new category to retain the HERS 52-58 range, in order to not hamper development of smaller sized ADUs at a time when new construction of larger homes has just moved to HERS 42-48.
4. For new construction we propose to add an optional 3-point HERS credit for embodied carbon savings earned through use of either low embodied carbon concrete or insulation products. This new credit gives more flexibility for builders concerned about meeting HERS 42 or 45 and aligns with the embodied carbon incentive recently adopted in Vermont (for insulation products) and the growing local market for low GWP concrete ready mixes.

Also, make sure to stay up to date with all of the (free) Mass Save Energy Code training events this fall, available here: https://psdconsulting.com/calendar/

DOER
Massachusetts Department of Energy Resources

Draft Stretch Code Updates Released for Public Comment

Dear Stretch Code Stakeholders and Building Officials,

DOER is pleased to release a series of proposed revisions to the Stretch and Specialized codes, covering both commercial and residential sections. Based on the feedback received over the last year and a half of these regulations being in place, these modest revisions are now available for public comment.

The revisions to the Stretch and Specialized codes are presented here, in both clean and redline versions:

- 225 CMR 22 MA Residential public comment CLEAN 8-8-24
- 225 CMR 23 MA Residential public comment REDLINE 8-8-24
- 225 CMR 23 MA Commercial public comment CLEAN 8-8-24
- 225 CMR 23 MA Commercial public comment REDLINE 8-8-24
- Proposed stretch and specialized code changes summary 08-08-24

DOER is seeking public comment on these documents. There will be a Public Hearing on September 16, 2024, from 10 AM – 12 PM on Zoom:

https://zoom.us/webinar/register/WN_dp6evcDIQZWx3tPOZ7xStQ#/registration

Written comments will be accepted until **5 PM EST on September 17, 2024**. Please submit written comments on the proposed revisions electronically to stretchcode@mass.gov with the words STRETCH CODE FEEDBACK in the subject line. Alternatively, comments can be submitted via mail to Ian Finlayson, Department of Energy Resources, 100 Cambridge Street, 9th floor, Boston, MA 02114.

Thank you,

Jo Ann Bodemer
Director, Energy Efficiency
Department of Energy Resources

Register for the Public Hearing

Boston, MA 02114

--

NANTUCKET BUILDERS ASSOCIATION
Phone: 508-228-1600 (Please leave a message)
Address: P.O. Box 3446
Nantucket, MA 02584
admin@nantucketbuildersassociation.org

AIA Massachusetts

a chapter of The American Institute of Architects

September 17, 2024

Ian Finlayson
Department of Energy Resources
100 Cambridge Street, Suite 1020
Boston, MA 02114

Re: Department of Energy Resources (DOER) Stretch and Specialized Energy Codes Aug 2024 proposed updates - Comments

Dear Mr. Finlayson:

This letter follows up on DOER's August 12, 2024, release of proposed updates to the Stretch and Specialized Energy Codes. Please see our enclosed written comments on the proposed updates.

We applaud DOER for addressing many comments in the March Listening Session, many of which were also brought up by AIA Massachusetts members in the survey we conducted in January. This is especially true of changes related to Alterations, Additions, and District Energy Systems. While many of the proposed updates address these concerns, some proposed language needs more clarification, and there is some clarification that is not addressed in the proposed updates. Please see the detailed items below.

- **C503.2.4 – Derating thermal bridges in Alterations**
  - We applaud the efforts to make retrofits of existing buildings attainable. The exception to exclude existing thermal bridges needs clarification regarding the definition of "*inherent to the building structure and/or components that are not part of the alteration*." For example, would adding insulation result in an assembly becoming "*part of the alteration*" and, therefore, trigger full compliance? Also, please define "*inherent to the building structure*."
  - We encourage this exception to also be explicitly applicable to Change of Use.
- **C503.1 – Existing Wall Cavity Insulation**
  - This requires further clarification and modification to address real-world situations. Does 10 square feet refer to an instance, an entire wall, or a façade? For example, replacing windows could expose >10 square feet of wall cavity, which would occur at each window. This could be for replacing the lintel above a large window or removing portions of the fenestration rough opening to accommodate new tie-ins to existing waterproofing, flashing, or exterior detailing as part of the window replacement.
- **C407.4/R406.5.2-3**
  - Introducing an optional 3-point HERS credit for embodied carbon savings in residential and commercial codes is a noteworthy advancement. This aligns with the growing importance of addressing the entire carbon lifecycle of buildings. However, the "less than 0" requirement is not mathematically attainable for low-carbon insulation. This is because negative GWP insulation, as defined in the table, is not currently available for several insulation applications, including above-deck roof, below-grade, and outboard

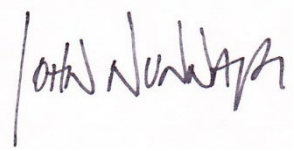
continuous insulation. While there are low-carbon insulation options for these applications, the total GWP will not be less than 0. We recommend that the language be adjusted to result in achievable values.

- **C505.1 – Change of Use**
  - The current language should clarified regarding partial reconfiguration of spaces (e.g., a lab building increasing lab space on one floor). Clear guidelines, including practical examples and baseline energy use clarifications, are crucial to ensure consistency in code enforcement and avoid misapplication.
- **C402.1.5.2**
  - We support eliminating the "*high-glazed wall system*" aspect of the UA calculation. It has had the effect of encouraging projects to add more vision glazing rather than less. This is because a panelized opaque façade is considered a glazed wall system, but a 100% vision glass curtainwall is not. We support all buildings being allowed to follow the more relaxed UA requirement if they are all electric.
- One of the recurring requests from stakeholders is creating a "blended code" that integrates base code language with the updated Stretch and Specialized Codes for ease of reference. While we understand this is in progress, we strongly urge DOER to prioritize the completion of this document, ensuring it provides access to technical guidance and appendices.
- We have heard from practitioners about the need for more explicit guidance and collaboration on energy modeling for compliance. Creating partnerships or providing tools for energy model review would significantly aid professionals in adhering to the updated code requirements.

Established in 1941, AIA Massachusetts represents over 5,000 architects, design professionals, and allied members statewide. We are the state chapter of our national organization, the American Institute of Architects, with over 98,000 members representing more than 200,000 U.S. jobs. We have been actively involved with developing the Commonwealth's response to climate issues and aligning with the policy positions of our national organization. We support the role of the energy codes in achieving Massachusetts decarbonization goals.

We want to thank DOER for their leadership and effort in implementing the changes needed to our energy codes, and for holding the March listening session as well as the listening session on September 16th.

Thank you;



John Nunnari
Executive Director
AIA Massachusetts

AIA Massachusetts
290CongressStreet
Suite 200
Boston, MA 02210 www.aiama.org

Edson, Becca (ENE)

From: Finlayson, Ian (ENE)
Sent: Wednesday, September 18, 2024 9:40 AM
To: STRETCHCODE (ENE)
Subject: FW: Stretch Code Feedback

Follow Up Flag: Follow up
Flag Status: Completed

From: Sustainable Wellesley <info@sustainablewellesley.com>
Sent: Wednesday, September 18, 2024 9:22 AM
To: Finlayson, Ian (ENE) <ian.finlayson@mass.gov>
Subject: Stretch Code Feedback

Dear Ian Finlayson, Department of Energy Resources,

We are writing with a request to address a serious concern in DOER's Proposed Changes to the current Stretch Energy Code and Municipal Opt-in Specialized Code pertaining to projects pursuing passive house certification and seeking final certificate of occupancy ("CoO"). Per Sections R405.2, R405.3, C407.3.2.1, and C407.3.2.2 of the Draft MA 2023 Residential and Commercial Stretch Code and Specialized Opt-in Code with proposed revisions, projects pursuing passive house certification, whether through Phius or PHI, have two options for obtaining final CoO, as summarized below:

1. Option 1:
    a. Design phase pre-certification/approval
    b. Verification report demonstrating as-built conditions comply with passive house requirements
    c. Statement from consultant confirming hygrothermal requirements are satisfied
    d. Statement from consultant confirming project satisfies all testing and modeling requirements
    e. Back-up documentation with test results
2. Option 2:
    a. Final certification letter from certifying body

While projects can obtain *temporary* CoO regardless of certification status, which is necessary for occupancy, the current proposed code language still puts extremely high-performance projects at risk by requiring Options 1 or 2 above for obtaining *final* CoO. Neither option above is feasible for development teams who fail to achieve final Passive House levels of performance despite well documented best efforts. As currently written, the Draft Stretch Code and Opt-In Code do not support projects that achieve design phase certification, do their best to construct to passive house levels of performance, but ultimately fall short of satisfying 100% of certification requirements. These projects need a defined path to achieve a final CoO in the event neither option above is attainable.

Without final CoO, projects may not convert high-interest rate construction loans to permanent mortgages. In low-income housing tax credit ("LIHTC") projects, the construction loan, typically paid down with LIHTC equity upon receiving final CoO, is significantly larger than the permanent mortgage, making the conversion critical for LIHTC developers to continue doing business in Massachusetts. Furthermore, it is not realistic for projects to pursue an appeal with their Authority Having

Jurisdiction and/or the State, which would cause significant delays to project delivery, while adding cost and risk to very high-performance projects.

Given the quantity of passive house projects in the state, estimated at more than 272 projects consisting of over 20,600 units, it is very likely that some of these projects that are designed to Passive House certification, as evidenced at the time of permitting, and constructed per design, as evidenced by frequent third-party inspection reports, may encounter insurmountable issues that make satisfying Option 1 and Option 2 impossible. These projects will have spent considerable time and money designing and constructing buildings with the intent of certifying – which will be easily documented with consultant contracts, inspection reports, and test results -- and yet still encounter issues such as air infiltration or ventilation balancing preventing final CoO. These projects require a 3rd option for achieving final CoO that does not reduce the performance objectives of the code nor present an easier, race-to-the-bottom option for developers to consider. The 3rd option proposed below requires **nearly identical requirements** for design and construction as the two existing options and should only be available for projects who cannot achieve options 1 or 2. This 3rd option must be included in code to avoid local review and waiver ambiguity, further delays, significant added costs, and extreme risk in an industry that cannot absorb additional cost.

3. Proposed Option 3 for Final CoO:

a. Copy of certified passive house consultant and rater/verifier contracts demonstrating all required inspections and testing requirements for certification

b. Design phase pre-certification/approval

c. Verification report demonstrating as-built conditions, including those that comply with passive house requirements, and those that do not (if applicable)

i. For projects following Phius, demonstrate final Energy Star and Zero Energy Ready Homes certification requirements are met.

d. Hygrothermal analysis confirming the building does not face any durability concerns based on as-built condition

e. Statement from passive house consultant confirming project has completed all interim, final, and corrective testing and modeling requirements, including a summary of deviations from passive house requirements

i. Taped and untaped blower door testing at 50 Pascal and 75 Pascal demonstrating results are within 20% of passive house requirements. If initial whole building blower door testing exceeds passive house requirement, statement must reflect evidence of a re-test, with results, as well as an explanation for sources of leakage and attempted remediation efforts.

ii. Back-up documentation with test results for initial and follow up re-tests with explanation for any deviation from passive house requirements

f. Ventilation flow rates demonstrating mechanical code compliance

This proposed 3rd option is nearly identical to Option 1 and offers similar flexibility as the Passive House Institute U.S. offers projects that may not satisfy all program requirements necessary for certification. Phius does not have adequate capacity to evaluate projects seeking waivers on a case-by-case basis in a timely manner, making it necessary for the Commonwealth to allow a similar approval path for municipal building departments.

Without this option, projects will face significant cost and major delays after having made significant investments in developing extremely well performing buildings. Project teams pursuing passive house certification that have obtained pre-certification at design and who work closely with their consultants and contractors to follow all inspection and testing procedures necessary for passive house certification are deserving of final CoO without facing onerous cost, risk, or delay.

Sincerely,

_____

Phyllis Theermann
President
Sustainable Wellesley

--

The Passive House Network

September 16, 2024

Mr. Ian Finlayson
Department of Energy Resources
Massachusetts

Via: Email

Subject: Proposed “Option 3” edit to MA Stretch Code made by PHMA.

Dear Mr. Finlayson,

The Passive House Network would like to offer the following feedback with regards to the proposed amendments to the current MA Stretch Code, which adds an alternative to the current requirements for ‘certified’ Passive House projects.

While we support the intent of the Option 3 amendment put forward by PHMA, experience has shown in Vancouver and in other jurisdictions that we can expect the market to rapidly adapt and hit the mark.

Consequently, we suggest that if a fallback option like Option 3 is adopted, that a sunset provision be included**.** This will allow industry time to build greater capacity in certification and improve expertise in meeting the air-tightness targets, before taking this 'trainer wheel' clause out of the code. A sunset clause offers an opportunity to revisit this revision to see how this ‘soft landing’ really gets used, and whether it becomes an 'easy out' or option of last resort.

PHN would like to ensure that we do not sabotage the leadership and success being demonstrated in Massachusetts with this innovative Stretch Code. Therefore, PHN supports making some accommodation for beginners aiming for Passive House certification. However, we would prefer that this accommodation include an expiration date.

Sincerely,

Bronwyn Barry

Bronwyn Barry, RA, CPHD
Policy Director
The Passive House Network
Cc. PHMA

AIRLIT studio
environmental design consulting
www.airlitstudio.com | 617.888.4801
30 N Gould St
Sheridan WY 82801

September 13, 2024
Department of Energy Resources (DOER)
100 Cambridge Street, Suite 1020
Boston, MA 02114
Attention: Ian Finlayson
Via email: stretchcode@mass.gov

RE: STRETCH CODE FEEDBACK

AIRLIT studio appreciates the opportunity to provide comments to the 8/8/24 revisions to the Stretch and Specialized codes. Our comments and suggestions are divided into the following sections:

1. We appreciate and recognize the effort that DOER has made in addressing some of the comments put forwards by the public. Particularly, we commend DOER for the following:
    a. Clarifying the language related to Section C505, Change of Use, and that establishes that the increase in energy that results in such change of use is based on modeling results and related to either fossil fuel or total energy use.
    b. Recognizing the challenge that Project Teams face when dealing with thermal bridges in alterations of existing buildings, especially when they are inherent to the building, by adding Section C503.2.4, which exempts such thermal bridges from the required derating calculations.
    c. Clarifying that air infiltration testing is only required in the additions when working on such additions.
2. Sections that we strongly believe need to be modified for the Stretch Code to be impactful in a way that meets the State's climate goals:
    a. Reconsider increasing currently unreasonably low TEDI thresholds for schools**.** This feedback was provided in June of 2022 and April of 2023 and, after almost two years working on several more TEDI models, we remain convinced that the TEDI limits, particularly the heating TEDI limits, are unreasonably low. As a result, meeting these low values require replicating energy modeling strategies from the prototype models published online, which are not standard practice in the industry. Moreover, several key modeling strategies used in the prototype models are not explicitly stated in the modeling guidelines, Attachment C of the Final Stretch and Specialized Code Guidelines, published in September of 2023. This includes, for instance, atypical "setpoint manager" configurations after the coils of the air handling units in the model.

3. Comments related to the Stretch Code Technical Guidelines and its Attachments:
    a. Update the prototype models so they match the modeling guidelines.
    There are more than a few instances where the prototype models do not match the modeling guidelines. As an example, the U-values of the façade of a few of the prototype buildings seem unreasonably high, as these are supposed to be derated values. Another example is implementing "air cascading" from the cafeteria to the kitchen to reduce the amount of makeup air provided in the kitchen. This strategy was recommended to us in a model review session with DOER, however the guidelines do not explicitly explain how this strategy should be modeled. Ensuring that the prototype models match the modeling guidelines, by updating either or both of them, will reduce unnecessary confusion and frustration.
    As we have modified the prototype models to better align with the guidelines, we have found that the prototype models themselves do not comply with the TEDI thresholds (see comment 2.a). We have yet to find, for example, a school project - including in the prototype models- that can comply with the thresholds when following the "Default HVAC" modeling path.
    b. Provide an example in Attachment A, Envelope Performance and Thermal Bridge Derating, that includes (or explicitly excludes) point thermal bridges that are not related to curtainwall systems, such as pipe penetrations. Currently, Attachment A only states that "the designer should consider the effect of point thermal bridges, using thermal bridge mitigation whenever possible," but neither this attachment, nor the code, provides prescriptive values to use for such point thermal bridges or excludes them.
    c. Create a public record with responses to DOER inquiries.
    The Stretch Code includes new concepts and requirements that have not been included in previous versions of the energy code or in codes in other localities. As Project Teams learn to comply with the new requirements, requests for clarification are unavoidable, especially as some of the language of the code and the accompanying guidelines are subject to interpretation. We have submitted clarification requests to DOER several times in the last few months. The response we receive is sometimes inconsistent with past conversations or with responses other teams have received.
    To avoid further confusion, we request the creation of a public record with the responses to DOER inquiries so that the clarification process is expedited and more consistent.

Thank you for the opportunity to provide comment on this important issue. If you have any comments, please do not hesitate to reach out.

Sincerely,

Alejandra Menchaca, PhD, LEED AP, WELL AP
Principal
AIRLIT studio, LLC

Alonso Dominguez, PhD
Principal
AIRLIT studio, LLC

Edson, Becca (ENE)

From: Jacob Bloom <JBLOOM@cambridgeseven.com>
Sent: Tuesday, September 17, 2024 5:29 PM
To: STRETCHCODE (ENE)
Subject: STRETCH CODE FEEDBACK

Follow Up Flag: Follow up
Flag Status: Completed

The DOER has made many good changes in the proposed update to the stretch code. I support these revisions and offer the following comments.

1. I commend the DOER's work to make retrofits of existing buildings more attainable.
2. (C503.2.4) The exception to exclude existing linear thermal bridges from the backstop calculation is good, but I have concerns about the wording. What is a thermal bridge that is "inherent to the building structure" and what counts as being "part of the alteration"? Slab edges? Parapets? Window frames? Does adding continuous insulation outside of the thermal bridge "alter" it, since the psi value will be changed? This may discourage teams from making partial improvements to thermal bridges because they would then need to include them in the backstop calculation. While improving existing thermal bridges should be encouraged, it may be best to exclude all existing linear thermal bridges from the backstop calculation but still require them to be drawn and calculated so teams can evaluate the costs and benefits of improving them.
3. (C503.2.4) The linear thermal bridge exception needs to be applied to change of use as well.
4. (C503.1 Exception 7) The clarification on when an existing wall assembly needs to be upgraded is good, but the limit of 10sf is not functional for many conditions. In many cases it is adequate, but some larger repair or replacement of existing building components will require more of the wall to be opened and should not trigger upgrading the entire wall assembly.
5. It is confusing that the 110% UA benefit for existing buildings is in section 503 for alterations but is an exception in C402.1.5 for Change of Use.
6. (C402.1.5.2) The backstop benefit for "high glazed wall system" should be eliminated in its current form. It is encouraging teams to add more glazed wall system, rather than less. It also doesn't make sense that a panelized brick façade is a glazed wall system, but a zero-spandrel curtainwall is not. Any building being allowed to follow the more relaxed UA requirement if it is all-electric regardless of glazing.
7. These updates do not address the issues with TEDI. In concept, TEDI makes sense, but the current modelling guidelines do not. TEDI should be updated to represent building performance more accurately. Being slightly more strict than Passive House is reasonable for TEDI since there is less scrutiny and QA/QC as compared to the passive house process, but it still needs to be attainable and try to reflect actual heating and cooling loads.
8. There should be a secondary compliance pathway for projects pursuing passive house that are slightly out of compliance with their final air infiltration testing. All efforts should be made to meet the Passive House infiltration standards, and if it does not comply, efforts should be made to improve it. If a project cannot reasonably meet the infiltration requirements by a small amount, it should still be allowed to get a Final Certificate of Occupancy.

Jacob Bloom, LFA
Associate
He/Him

CambridgeSeven
1050 Massachusetts Ave
Cambridge, MA 02138
p: 617-492-7000 x.216

www.cambridgeseven.com
facebook instagram linkedin

Edson, Becca (ENE)

From: Jacob Bloom <JBLOOM@cambridgeseven.com>
Sent: Tuesday, September 17, 2024 5:29 PM
To: STRETCHCODE (ENE)
Subject: STRETCH CODE FEEDBACK

Follow Up Flag: Follow up
Flag Status: Completed

The DOER has made many good changes in the proposed update to the stretch code. I support these revisions and offer the following comments.

1. I commend the DOER's work to make retrofits of existing buildings more attainable.
2. (C503.2.4) The exception to exclude existing linear thermal bridges from the backstop calculation is good, but I have concerns about the wording. What is a thermal bridge that is "inherent to the building structure" and what counts as being "part of the alteration"? Slab edges? Parapets? Window frames? Does adding continuous insulation outside of the thermal bridge "alter" it, since the psi value will be changed? This may discourage teams from making partial improvements to thermal bridges because they would then need to include them in the backstop calculation. While improving existing thermal bridges should be encouraged, it may be best to exclude all existing linear thermal bridges from the backstop calculation but still require them to be drawn and calculated so teams can evaluate the costs and benefits of improving them.
3. (C503.2.4) The linear thermal bridge exception needs to be applied to change of use as well.
4. (C503.1 Exception 7) The clarification on when an existing wall assembly needs to be upgraded is good, but the limit of 10sf is not functional for many conditions. In many cases it is adequate, but some larger repair or replacement of existing building components will require more of the wall to be opened and should not trigger upgrading the entire wall assembly.
5. It is confusing that the 110% UA benefit for existing buildings is in section 503 for alterations but is an exception in C402.1.5 for Change of Use.
6. (C402.1.5.2) The backstop benefit for "high glazed wall system" should be eliminated in its current form. It is encouraging teams to add more glazed wall system, rather than less. It also doesn't make sense that a panelized brick façade is a glazed wall system, but a zero-spandrel curtainwall is not. Any building being allowed to follow the more relaxed UA requirement if it is all-electric regardless of glazing.
7. These updates do not address the issues with TEDI. In concept, TEDI makes sense, but the current modelling guidelines do not. TEDI should be updated to represent building performance more accurately. Being slightly more strict than Passive House is reasonable for TEDI since there is less scrutiny and QA/QC as compared to the passive house process, but it still needs to be attainable and try to reflect actual heating and cooling loads.
8. There should be a secondary compliance pathway for projects pursuing passive house that are slightly out of compliance with their final air infiltration testing. All efforts should be made to meet the Passive House infiltration standards, and if it does not comply, efforts should be made to improve it. If a project cannot reasonably meet the infiltration requirements by a small amount, it should still be allowed to get a Final Certificate of Occupancy.

Jacob Bloom, LFA
Associate
He/Him

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September 17, 2024

Jo Ann Bodemer

Director of Energy Efficiency

Massachusetts Department of Environmental Resources

100 Cambridge St., 9th Floor

Boston, MA 02114

Re: Comments on Proposed Stretch Code Updates

Dear Ms. Bodemer:

On behalf of Phius, I am pleased to provide this letter of support for the proposed Stretch Code Updates. We have reviewed the amendment and find they will improve the administration and implementation of the stretch code. We specifically support the change of documentation requirements in Section 405.2 (2).

Please feel free to contact us if you have any questions.

Thank you for your consideration.

Sincerely,

Isaac R. Elnecave

Phius

ENERGY MODELING STUDIO

15 Park Pl
Somerville, MA 02143

September 17, 2024

Via email to stretchcode@mass.gov

JoAnn Bodemer
Director, Energy Efficiency
Department of Energy Resources
Commonwealth of Massachusetts

RE: STRETCH CODE FEEDBACK

Department of Energy Resources

I am a PHI-accredited Certifier and Certified Passivhaus Designer by PHI (Passivhaus Institute) residing and practicing in Somerville MA.

Our own residence is a PHI Certified Passivhaus Plus in Somerville MA with details accessible here in the PHI Database: https://passivehouse-database.org/index.php?lang=en#d_6422

Thank you for the opportunity to submit these comments:

C407.3.1 and R405.1

Assuming this is a general provision to distinguish Phius and PHI's programs and to define their relative software and standards, I recommend (as to PHI's program) the following changes from:

Current language (R405.1):

. . . Projects pre-certified as meeting the Certified Passive House standard using the current software and program criteria by the Passive House Institute (PHI), where PHI certification is demonstrated by a Certified Passive House Certifier and a Certified Passive House Designer.

Change to:

. . . Buildings meeting the Passive House Institute (PHI)'s Passive House Standard, EnerPHit Standard, or Low-Energy Building Standard (collectively, PHI's building standards) using PHI's current software and program criteria where PHI building certification is conditionally assured at the design stage by the PHI or a PHI-accredited building Certifier based on software, plans, and documentation submitted by a Certified Passive House Consultant or a Certified Passive House Designer which demonstrate performance to one of PHI's building standards according to C407.3.2.2 [or R405.3].

Or alternatively, change to this preferable version:

. . . Buildings meeting the Passive House Institute (PHI)'s Passive House Standard, EnerPHit Standard, or Low-Energy Building Standard (collectively, PHI's building standards) using PHI's current software and program criteria according to C407.3.2.2 [or R405.3].

Supporting information:
1. PHI certifies buildings; not just PHI-accredited certifiers;
2. There is no such status as "pre-certified" in PHI's program. Please see below;
3. This provision will be more clear and comprehensible if it is limited to general information and refers to (and thus incorporates) the detailed "compliance" requirements in the subsequent sections C407.3.2.2 [or R405.3]; and
4. PHI has three standards carefully defined in its building certification program (and we are able to certify to all three and recommend DOER include all three in its Stretch Code). Please see the note at the end of this letter for more information about PHI's Low-Energy Building Standard.**

C407.3.2.2 and R405.3

Your reference to the Passive House Institute (PHI) at C407.3.1 is correct, but the reference in C407.3.2.2 is incorrect. To our knowledge, there is no entity called "Passive House International." The confusion is understandable since PHI's work is international and PHI's programs are active on every continent.

C407.3.2.2.1.a. and R405.3.1.a.

This reference to a "Design Certification Letter from a Certified Passive House Certifier" could be improved in two ways.

First, although PHI certifies professionals, e.g. "Certified Passive House Consultant" (CPHC), "Certified Passive House Designer" (CPHD), and "Certified Passive House Tradesperson" (CPHT), PHI trains, *accredits*, and reviews the work of certifiers. Therefore, we recommend the longer but more accurate ". . . Letter from a Passive House Certifier accredited by PHI" or ". . . Letter from a PHI-accredited Certifier."

It is not clear what the DOER or Commonwealth expects the certifier to say in the Design Certification Letter. We typically review a building before construction begins (or early in construction) in a process commonly known as "Design Stage Review" producing a letter which we call a Design Stage Conditional Assurance Letter. We write this letter after we have reviewed PHI's Passive House Planning Package ("PHPP") energy model as well as documents supporting values entered in the PHPP.

PHI confers no status or recognition when we send such a letter. Thus, we do not use the term "pre-certified" as that could confuse people. In PHI's program, a building is either certified or not. There is no "pre-certified" status.

Importantly, our Design Stage Conditional Assurance Letter expressly states we are conferring no building certification status. The letter simply is our indication that based on the plans, submitted documentation supporting the PHPP, and the PHPP, upon completion of construction consistent with the plans and PHPP, we see no bar to certification and can conditionally assure the recipient that upon fulfillment of all of PHI's requirements, we will certify the building. Importantly, our Letter also notes that our certification will be conditioned on "submission of documents and photographs demonstrating construction according to the information submitted at the design stage review and air leakage and ventilation system commissioning within PHI requirements."

This need not be spelled out in C407.3.2.2.1.a (and C407.3.2.2.2.a and the similar residential code sections) so long as DOER understands the limitations of our Design Stage Conditional Assurance Letters based on our Design Stage Reviews and accepts them on this basis.

C407.3.2.2.2.c. & e.and R405.3.2.d. & e.

PHI does not require a Passive House Verifier/Rater or such a person's "test results" in order to certify a building.

We do require one or more persons (typically independent from the building CPHC or CPHD) to a) test the air leakage according to specific ISO standards and b) commission settings and performance of the building's ventilation system. In both cases, the person(s) performing the test/commissioning must supply reports meeting PHI's specifications.

However, we do not require the person conducting and reporting on either the average induced air leakage or the building ventilation system to have a particular title (including "verifier or rater.")

DOER's requirement may lead to confusion since it references specific people not within PHI's program. We recommend DOER delete this provision to avoid confusion as well as unnecessarily increasing the cost of our building certification.

C407.3.1 and R405.1

Additional Notes:

1. Although we expect everyone working in PHI's program will know what you mean by "Certified Passive House Certifier," in fact PHI does not use this term. Nor do the Passive House Network and Passive House Canada, two North American national organizations promoting PHI's program. We recommend you use simply "Certifier" (or "certifier") or "PHI-accredited Certifier" (or "PHI-accredited certifier").
2. These paragraphs reference "Certified Passive House Designer." PHI uses the same training materials and test (and alternative qualifications) for both Certified Passive House Consultants and Certified Passive House Designers. They are considered functional equivalents for PHI building certification. In fact, we typically refer to them as the "project CPHC/D".

   PHI's training, testing, and alternative qualification pathways are the same for both CPHC and CPHD, and PHI awards CPHD only to persons who have academic degrees or professional registration/membership in the design field of architecture and engineering.

**PHI Low-Energy Building Standard (L-EB)

PHI publishes its three Standards, their requirements, and details related to certification. We recommend the IP (inch and pound) version developed for the USA at https://passiv.de/downloads/03_building_criteria_ip_en.pdf

Many design and construction teams choose the LEB as their initial target for their building's performance, especially in environments (financial, climatic, energy costs, construction costs, etc.) where they conclude the cost of achieving the Passive House Standard's higher thermal/energy performance is not merited. They believe L-EB is their best "value proposition."

Others find the L-EB certification is a welcome "fall-back" certification when they attempt, but fail to achieve more stringent performance of the Passive House Standard or EnerPHit Standard, especially in their first few Passive House attempts.

Comparison of L-EB and Passive House Standard certification.

1. Identical: Defined by published criteria, required use of PHPP software calculating all certification performance values, no surface condensation allowed, all ventilation requirements, and all testing, reporting, and documentation requirements.
2. L-EB permitted air leakage (1.0 ACH @ 50 Pa) is 160% of permitted air leakage for a building meeting the Passive House Standard (0.6 ACH @ 50 Pa).
3. L-EB permitted Specific Annual Heat Demand is double the limit for the Passive House Standard.
4. L-EB permitted Specific Annual Cooling Energy Demand is double the limit for the Passive House Standard.
5. L-EB permitted whole-building energy demand (PER or Renewable Primary Energy and PE or Primary Energy) is 125% of the limit for the Passive House Standard.

Sincerely,

Vladimir Pezel, CPHD, Certifier
M.Sc., M.Eng.
emodstudio.com
vp@emodstudio.com
+1.617.201.3422

Edson, Becca (ENE)

From: Madeline Burns <mburns@cambridgeseven.com>
Sent: Tuesday, September 17, 2024 5:12 PM
To: STRETCHCODE (ENE)
Cc: Adam Mitchell
Subject: MA Stretch code update comments

Follow Up Flag: Follow up
Flag Status: Completed

To whom it may concern,

RE: MA Stretch Code Update Comments

We support many of the changes that provide more clarity or more feasible application of the Stretch Code and Specialized Code. We are excited to continue using the stretch code and the opportunity to give feedback as design professionals. As practitioners, our work primary deals with the commercial code, and our comments are focused thusly;

Some components of the code revisions we are particularly pleased to see are:

a. Requirements for Air Infiltration Testing in Additions (C502.3.7)
b. Change of Use clarification (C505.1)
c. Reduction in on-site renewable energy for highly ventilation and hospital buildings following mixed-fuel pathway (CC105.2)
d. Electric Readiness Accomodation for District Systems (CC106.1)

The following are below comments we have on the existing and proposed code:

1. Requirements for Derating and Thermal Bridges in Alterations (C503.2.4)
    a. We applaud the DOER's efforts to make retrofits of existing buildings more attainable. The exception to exclude existing thermal bridges needs clarification as to the definition of "inherent to the building structure and/or components that are not part of the alteration". For example: would adding insulation result in an assembly becoming "part of the alteration" and therefore trigger compliance, which would deter people from adding insulation? Also, what parts are "inherent to the building structure"?.
    b. Thermal bridge exceptions for alterations (C503.2.4) should also apply to change of use

2. Insulation of Existing Wall Cavities (C503.1)
    a. This requires further guidance (possibly in the Technical Guidance Document) to address situations such as replacing windows could result in >10 square feet of wall cavity being opened, but should not necessarily trigger bringing the wall up to compliance. Additionally, clarification how many localized cavity openings would be allowable or further definition

(could have 20 ‘localized’ cavity openings in a single wall?). We might propose that specific language be included for removal and replacement of fenestration as it relates to the opening of wall cavities, to incentivize window & frame replacement. Currently, clients are very wary of touching *anything* on the exterior wall in a renovation project to avoid possible triggers that would be cost prohibitive. This is limiting positive work such as window upgrades. For example, if you are replacing the lintel above a large window in order to replace that window, you would be 'exposing the exterior wall cavity' in an area likely greater that 10sf. Or, if you need to remove portions of the fenestration rough opening to accommodate new tie-ins to existing waterproofing, flashing, or exterior detailing as part of the window replacement, you may be in an area larger than 10sf.

3. Current TEDI modeling guidelines are difficult to follow and understand. TEDI should be updated to more accurately represent building performance. It is fair for TEDI to be more stringent than PH since there is less scrutiny and QA/QC as compared to the passive house process, but it still needs to be attainable in real world projects without requiring a separate additional energy model.

4. The embodied carbon section, referenced in the commercial code, exists within the residential code. This creates confusion, and we think that section may be better as a separate document referenced by both codes.

5. We still support eliminating the “high glazed wall system” aspect of the UA calc. It is encouraging teams to add more glazed wall system, rather than less. It also doesn’t make any sense that a panelized brick façade is a glazed wall system but a zero-spandrel curtainwall is not. We support any building being allowed to follow the more relaxed UA requirement if it is all-electric regardless of glazing.

6. The passive house pathway has been groundbreaking for code in the US. We very much want to see the passive house standard continue as a code-compliant pathway, and want to support the major energy reductions that the system has undoubtedly demonstrated. However, there are many projects that are going for passive house that may very narrowly fail their final tests. We understand the owner has the ability to revise/fix problems to pass the final blower door tests and other inspections of the Passive House process, but we think there should be ways to allow final occupancies of projects that have narrowly failed, even after attempts to remedy the issue. For example, the air leak may be in an area that would cost tens of millions of dollars to fix, which would likely cause the project to die. We do not think that lowering the passive house standard is the route, rather we support a system by which the owner/contractor may be able to make improvements that do not necessary result in a blower door test passing, but have other viable energy improvements, a route to take only after the owner has made a documented effort to improve the situation or after they have demonstrated sufficient hardship to fix the issues. We think that the success of having the passive house standard in the code is reliant on building support from successful projects, if large scale projects fail and cannot achieve occupancy, it could have really significant blow back that harms the overall significant strides the code has achieved.

Thanks,
Maddie

Madeline Burns, AIA, LEED AP BD + C, NCARB, CPHC®
Associate
She/Hers/Her

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I realize that the public comment period has closed, but I received this comment from Jacob after the deadline and it seems worth passing along, just for your own reference. He's done a lot of work with this in VT, so his comments carry a lot of weight in my book.

Warmest regards,
Betsy

From: Jacob Deva Racusin <jacob@newframeworks.com>
Sent: Wednesday, September 18, 2024 7:29 PM
To: Betsy Ames <betsy@nehers.org>
Cc: Michael Rossi <mrossi@psdconsulting.com>
Subject: Re: Embodied Carbon MA Code Comments Meeting

Hi folks,

I was just able to review the redlines through another process, and noticed this:

TABLE R406.5.3 *Add Table R406.5.3, as follows:*

TABLE R406.5.3 DEFAULT INSULATION GLOBAL WARMING POTENTIAL VALUES

All values are from Building Emissions Accounting for Materials (BEAM)[a], unless noted.

Insulation Material	Default Global Warming Potential (GWP) in Kg CO^2e/ sq.m. RSI-1
Cellular glass – Aggregate	3.93[b]
Cellulose – Densepack	-2.10
Cellulose – Blown/loosefill	-1.10
Cork – Board	-6.80
EPS/graphite – Board, unfaced, Type II – 15 psi	2.80
EPS/graphite – Board, unfaced, Type IX – 25 psi	3.40
EPS – Board, unfaced, Type I – 10 psi	2.80
EPS – Board, unfaced, Type II – 15 psi	3.80
EPS – Board, unfaced, Type IX – 25 psi	4.80
Fiberglass – Batt, unfaced	0.70
Fiberglass – Blown/loosefill	1.00
Fiberglass – Blown/spray	1.93[c]
Hemp – Batt	-0.50
HempCrete	-3.00
Mineral wool – Batt, unfaced	1.70
Mineral wool - Blown	1.60
Mineral wool – Board, unfaced, "light" density	3.30
Mineral wool – Board, unfaced, "heavy" density	8.10
Phenolic foam – Board	1.54[d]
Polyiso – Wall Board	4.10
Polyiso – Roof Board	2.90
SPF – Spray, open cell	1.40
SPF – Spray, closed cell HFO	4.20
SPF – Spray, high density HFO	4.90

(partial screenshot)

This looks to be lifted from the VT code. I don't recommend including this - it bakes in values that are changing regularly and will likely conflict with other sources. As it stands, given VT's code development process, some of these are already out of date. I'd suggest that rather than provide static values in the code that requires regular updating based on manufacturer results, that references to Type III EPDs or BEAM and EC3 be provided for compliance.

Let me know if I should direct this feedback elsewhere, sorry for the delay, too much going on!

Jacob

Jacob Deva Racusin
Co-Founder
Director of Building Science and Sustainability
Pronouns: He/Him

(802) 782-7783
www.newframeworks.com
18A Morse Drive, Essex, VT 05452

On Mon, Sep 16, 2024 at 9:02 AM Jacob Deva Racusin <jacob@newframeworks.com> wrote:

> Hi folks,
>
> Thanks for sharing. The public comments look good, nothing to add - thanks for participating in this process! All the best to you both.
>
> Jacob
>
> Jacob Deva Racusin
> Co-Founder
> Director of Building Science and Sustainability
> Pronouns: He/Him
>
> (802) 782-7783
> www.newframeworks.com
> 18A Morse Drive, Essex, VT 05452

Edson, Becca (ENE)

From: Douglas Flandro <dflandro@cambridgeseven.com>
Sent: Tuesday, September 17, 2024 5:07 PM
To: STRETCHCODE (ENE)
Subject: Stretch Code Comments

Follow Up Flag: Follow up
Flag Status: Completed

I support many of the changes that provide more clarity or more feasible application of the Stretch Code and Specialized Code. I am excited to continue using the stretch code and the opportunity to give feedback as design professionals. As practitioners, our work primary deals with the commercial code, and our comments are focused thusly;

Some components of the code revisions I am particularly pleased to see are:

1. Requirements for Air Infiltration Testing in Additions (C502.3.7)
2. Change of Use clarification (C505.1)
3. Reduction in on-site renewable energy for highly ventilation and hospital buildings following mixed-fuel pathway (CC105.2)
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1. Requirements for Derating and Thermal Bridges in Alterations (C503.2.4)
    1. I applaud the DOER's efforts to make retrofits of existing buildings more attainable. The exception to exclude existing thermal bridges needs clarification as to the definition of "inherent to the building structure and/or components that are not part of the alteration". For example: would adding insulation result in an assembly becoming "part of the alteration" and therefore trigger compliance, which would deter people from adding insulation? Also, what parts are "inherent to the building structure"?.
    2. Thermal bridge exceptions for alterations (C503.2.4) should also apply to change of use

2. Insulation of Existing Wall Cavities (C503.1)
    1. This requires further guidance (possibly in the Technical Guidance Document) to address situations such as replacing windows could result in >10 square feet of wall cavity being opened, but should not necessarily trigger bringing the wall up to compliance. Additionally, clarification how many localized cavity openings would be allowable or further definition (could have 20 'localized' cavity openings in a single wall?). We might propose that specific language be included for removal and replacement of fenestration as it relates to the opening of wall cavities, to incentivize window & frame replacement. Currently, clients are very wary of touching *anything* on the exterior wall in a renovation project to avoid possible triggers that would be cost prohibitive. This is limiting positive work such as window upgrades. For example, if you are replacing the lintel above a large window in order to replace that window, you would be 'exposing the exterior wall cavity' in an area likely greater that 10sf. Or, if you need to remove portions of the fenestration rough opening to accommodate new tie-ins to existing waterproofing, flashing, or exterior detailing as part of the window replacement, you may be in an area larger than 10sf.

3. Current TEDI modeling guidelines are difficult to follow and understand. TEDI should be updated to more accurately represent building performance. It is fair for TEDI to be more stringent than PH since there is less scrutiny and QA/QC as compared to the passive house process, but it still needs to be attainable in real world projects without requiring a separate energy model that is of no use to the building owner. Very, very few projects are permitting under this option as it is widely seen in the design community as not feasible.

4. The embodied carbon section, referenced in the commercial code, exists within the residential code. This creates confusion, and we think that section may be better as a separate document referenced by both codes.

5. I still support eliminating the "high glazed wall system" aspect of the UA calc. It is encouraging teams to add more glazed wall system, rather than less. It also doesn't make any sense that a panelized brick façade is a glazed wall system but a zero-spandrel curtainwall is not. We support any building being allowed to follow the more relaxed UA requirement if it is all-electric regardless of glazing.

Douglas Flandro, LEED AP BD+C, LEED AP ID+C, CPHC®
Associate

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RDH Building Science Inc.
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Boston, MA 02108

Making Buildings Better™

memorandum

FROM Andrew Steingiser
TOTAL PAGES

DATE September 16, 2024

TO Ian Finlayson
EMAIL stretchcode@mass.gov
CC

REGARDING **STRETCH CODE FEEDBACK - RDH**

MESSAGE Please see enclosed RDH commentary on current draft MA Stretch Code language and proposed amendments.

225 CMR 23 MA Commercial

C202 Definitions

GLAZED WALL SYSTEM. System consisting of any combination of ~~both~~ vision glass and/or spandrel sections to create an above-grade wall that is designed to separate the exterior and interior environments. These systems include, but are not limited to, curtain walls, window walls, and storefront windows. Vertical fenestration is considered a type of glazed wall system. (see comments below in Appendix A comments)

C402.4.6.2 Calculated Performance

Fenestration products outside the scope of NFRC may demonstrate compliance by submitting a thermal simulation report prepared by a registered design professional for each product as defined by NFRC 100. Thermal simulations shall be performed in accordance with the NFRC 100-2020 simulation procedures ~~at the size and configuration defined in NFRC 100 Table 4.3.~~

We recommend striking the reference to NFRC 100 table 4.3. NFRC 100 expressly allows for the determination of non-standard product sizes. Mandating adherence to sizes in Table 4.3 could potentially lead to inaccurate U-value reporting. I.e., if project fenestration has a frame to glass ratio that is smaller than the sizes listed in Table 4.3, calculated U-values would be more conservative than actual. Conversely, if project fenestration has a frame to glass ration that is larger than NFRC sizes, calculated U-values would be more optimistic than actual. We recommend the following be added: It is acceptable to area-weight the modelled fenestration U-value based on the relative proportions of fixed and operable windows and window sizes. It is also acceptable to simplify the calculations by assuming the worst case by using the highest window U-value for all fenestration specified on the project.

To prevent mixing and matching approaches to game the system, we recommend requiring that one consistent approach be used per project.

C402.4.7 Derating and Thermal Bridges

For clarity and consistency across projects, we recommend defining typical thermal bridges as such:

Thermal Bridges to be Included: Except where it can be proven to be insignificant (see below), the calculation of the overall thermal transmittance of opaque building envelope assemblies shall include the following thermal bridging effect elements: (a) Closely spaced repetitive structural members, such as studs and joists, and of ancillary members, such as lintels, headers, sills and plates, (b) Major structural penetrations, such as floor slabs, beams, girders, columns, curbs or structural penetrations on roofs and ornamentation or appendages that substantially or completely penetrate the insulation layer, (c) The interface junctions between building envelope assembles such as: roof to wall junctions and glazing to wall or roof junctions (d) Repeating cladding structural attachments including shelf angles, girts, channels, clips, fasteners and brick ties, (e) The edge of walls or floors that intersect the building enclosure that substantially or completely penetrate the insulation layer. (f) opaque wall panel joints where insulation is not continuous.

Although designers should detail discrete point penetrations in ways that mitigate thermal bridging and condensation, area-weighted backstop calculations on several projects have shown that discreet point thermal bridges have negligible impact on the overall U-factor. The exclusion below would unify and simplify the documentation and review process.

Thermal Bridges that may be Excluded: The impact of small thermal bridges such as singular mechanical penetrations or canopy structural penetrations can be ignored if the expected cumulative heat transfer through these thermal bridges is so low that the effect does not change the overall thermal transmittance of the above grade opaque building envelope by more than 10%.

Technical Guidance Appendix A

This language in the guidance document conflicts with C402.1.5 which states that 'above grade walls and fenestration values and areas are included in Component Performance calculations. We agree that vertical fenestration is a glazed wall assembly and should count towards the Glazed wall calculations. The language and diagrams in Appendix A should be amended:

How to determine if a building is high glazed or low glazed

The example below shows the steps in determining whether a building is a high glazed wall system building or a low glazed wall system building. North Elevation South Elevation East Elevation West Elevation For each elevation, breakout the above-grade vertical wall areas into 5 categories: (1) Framed Wall, (2) Glazed Wall System : Fenestration ~~Punched Window~~, (3) Door (per C401, opaque doors are defined as fenestration.), (4) Glazed wall system: Vision Portion, and (5) Glazed wall system: Spandrel Portion. The vision and spandrel sections (red text) of the glazed wall system are summed to obtain a total percent of glazed wall system. If this percent is larger than 50%, the building is a high glazed wall system building. If this percent is 50% or less, the building is a low glazed wall

system building. ~~Note that the areas of punched windows and doors are not included in the total of glazed wall system area.~~

C402.1.5.2 High glazed wall system buildings.

Buildings in which more than 50% of the total, above-grade wall area of the building thermal envelope is a glazed wall system ***and/or fenestration*** *shall comply with Equation 4-2b, vision glass used in the glazed wall system shall have a maximum whole assembly U factor of U-0.25, the building shall comply with Section C401.4.2.*

If Fenestration is differentiated from glazed wall systems, it needs to be clear that fenestration is also included in the "backstop" calculation per C402.1.5, for both low glazed and high glazed wall system buildings. The intent is to capture all glazing in the backstop, if it is being used, whether the backstop is required, or is being used by choice instead of prescriptive path for windows in buildings with less than 30% window wall ratio. It is not just glazed wall systems going into the backstop calculation(s).

C407.1.1.5 TEDI Limits

The extremely low heating TEDI and extremely high cooling TEDI values are out of balance. Phius standards are a better example of TEDI values in balance. Extremely low heating TEDI requires unreasonably high cooling TEDI as it increases the risk of localized overheating and makes the building harder to cool. The extremely low heating TEDI limits also requires higher amounts of insulation in the building enclosure, which is not necessary and adds embodied carbon to buildings. The methods by which these targets were derived, and the resulting targets need to be re-examined and updated to be more in balance in subsequent versions of the code.

In addition, forcing such specific requirements of the TEDI energy model per the MA Guidelines makes it unusable for determining building EUI, or for LEED, or local incentive programs. This requires a separate hourly energy model be performed for most projects. As we understand it, this is contrary to the intent of the TEDI pathway, as it introduces additional costs for building owners/project teams to do two separate energy models. TEDI is a good metric, but the way employed by the MA Guidelines is highly flawed. Look to Toronto or British Colombia for good examples.

C407.3.2.1 Phius Documentation

There needs to be language to allow for buildings to receive their Certificate of Occupancy, if they have made every best effort to achieve Passive House certification, but fall short for some reason (slightly missing airtightness requirement, or ventilation flow rate balancing requirement). It could be left to be resolved by the certifying body, or an exception to be made by the AHJ. We do not want to create a public uproar from projects not being allowed to receive C of O, falsely accusing Passive House certification to be infeasible. We do not want to give fodder to opponents of the energy conservation measures that the MA Stretch and Opt In code try to employ.

C503.2.4 Derating and Thermal Bridges.

Existing linear thermal bridges inherent to the building structure and/or components that are not part of the alteration shall not be accounted for per C402.7.3. Construction documents shall include the following documentation in tabular format for these linear thermal bridges that may be excluded from vertical envelope performance:

1. Linear thermal bridge type.
2. Aggregate length of each type of linear thermal bridge.
3. Relevant detail in the construction documents showing a cross-section through the thermal bridge.

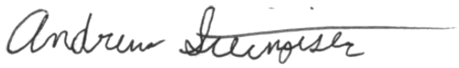
This language is a good addition to the code, to allow for unmitigable thermal bridging in existing buildings, without having to compensate with infeasible amounts of opaque wall insulation, with diminishing return. This language should also be included in C505 Change of Occupancy as well.

With the addition of this language, there is no longer the need for the 110% buffer in the UA, nor in the glazing U-value limit, as noted in exception 3 of C503.1 and exception 1 of C505.1. It should be eliminated.

The ability to exclude the unmitigable thermal bridging from the backstop already allows a tremendous amount of flexibility, enabling more realistic opaque wall assemblies in existing building types that are being interior insulated, like mass masonry buildings.

This is critically important: The 110% allowance of the U-value of glazing, allowing U-0.275 rather than U-0.25 should be eliminated in existing buildings, and the same U-0.25 maximum for new construction should be required of existing buildings, now that there is this extra flexibility in the backstop, per this updated code section to exclude certain thermal bridges. The goal SHOULD BE to get the U-values of windows as low as possible, and use less insulation in opaque walls. It is a more efficient use of windows, and ensures lower condensation risk, and better thermal comfort for occupants if the interior surface temperature of windows/glazing is closer to that of the opaque walls (like we do in Passive House). Allowing glazing of U-0.275 doesn't support this goal, and in our recent experience has allowed the use of some poorly performing window products in some of our projects. Using higher performing windows also allows the use of less insulation which can save on embodied carbon of materials.

Regards,



Andrew Steingiser | RA, CPHC, LEED AP
Associate | Senior Project Architect

RDH Building Science Inc.

Edson, Becca (ENE)

From: Amy Latva-Kokko <alatvakokko@dskap.com>
Sent: Tuesday, September 17, 2024 5:01 PM
To: STRETCHCODE (ENE)
Subject: STRETCH CODE FEEDBACK - commercial

Follow Up Flag: Follow up
Flag Status: Completed

DOER Committee Members,
Thank you for this opportunity to provide feedback on the proposed amendments. Our comments relate to ease of implementation – as the stretch code leads the industry, how to not have the code hinder improvements and make projects unachievable.

C402.5.2.3 Building Envelope Performance Verification
The Metal Building association guide Best Practices to Comply with Whole Building Air Leakage Testing Requirements provides good guidance for metal buildings but we have not been able to ascertain the levels of tightness a metal building can achieve. The guide is for buildings with liner systems, which are no longer the preferred construction method; insulated wall panels provide tight joints, durability, a higher level of finish and tight air sealing. We are unaware of a metal building that can meet those requirements.
For some building types that have overhead door(s), e.g. a water treatment plant with backwash tanks, or a building that has overhead doors often open, such as a fire station, that is not heating and cooled as much as a regularly occupied building, there should be a higher level of air leakage allowed, e.g. at minimum the levels of the 2021 IECC as opposed to the lower MA amendments.

C505.1
We recommend an exception regarding change of use for an interior renovation. For an interior fit out from retail to restaurant, it does not make sense to upgrade the existing building envelope when the envelope was going to be unaltered.

Sincerely,
Amy

Amy Sheehan Latva-Kokko, AIA, CPHD, LEED BD+C
Sustainability Leader | Senior Project Manager

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2023 Best Places to Work

Edson, Becca (ENE)

From: Eric Reinhard <ericreinhard1@gmail.com>
Sent: Tuesday, September 17, 2024 4:55 PM
To: STRETCHCODE (ENE)
Subject: stretch code feedback

Follow Up Flag: Follow up
Flag Status: Completed

To: Ian Finlayson, Department of Energy Resources
From: Eric Reinhard, Assoc. AIA, LEED AP, Building Designer
Re: Stretch Code Feedback

I am writing with a request to address a serious concern in DOER's Proposed Changes to the current Stretch Energy Code and Municipal Opt-in Specialized Code pertaining to projects pursuing passive house certification and seeking final certificate of occupancy ("CoO"). Per Sections R405.2, R405.3, C407.3.2.1, and C407.3.2.2 of the Draft MA 2023 Residential and Commercial Stretch Code and Specialized Opt-in Code with proposed revisions, projects pursuing passive house certification, whether through Phius or PHI, have two options for obtaining final CoO, as summarized below:
Option 1:
Design phase pre-certification/approval
Verification report demonstrating as-built conditions comply with passive house requirements
Statement from consultant confirming hygrothermal requirements are satisfied
Statement from consultant confirming project satisfies all testing and modeling requirements
Back-up documentation with test results
Option 2:
Final certification letter from certifying body
While projects can obtain temporary CoO regardless of certification status, which is necessary for occupancy, the current proposed code language still puts extremely high-performance projects at risk by requiring Options 1 or 2 above for obtaining final CoO. Neither option above is feasible for development teams who fail to achieve final Passive House levels of performance despite well documented best efforts. As currently written, the Draft Stretch Code and Opt-In Code do not support projects that achieve design phase certification, do their best to construct to passive house levels of performance, but ultimately fall short of satisfying 100% of certification requirements. These projects need a defined path to achieve a final CoO in the event neither option above is attainable.
Without final CoO, projects may not convert high-interest rate construction loans to permanent mortgages. In low-income housing tax credit ("LIHTC") projects, the construction loan, typically paid down with LIHTC equity upon receiving final CoO, is significantly larger than the permanent mortgage, making the conversion critical for LIHTC developers to continue doing business in Massachusetts. Furthermore, it is not realistic for projects to pursue an appeal with their Authority Having Jurisdiction and/or the State, which would cause significant delays to project delivery, while adding cost and risk to

very high-performance projects.
Given the quantity of passive house projects in the state, estimated at more than 272 projects consisting of over 20,600 units, it is very likely that some of these projects that are designed to Passive House certification, as evidenced at the time of permitting, and constructed per design, as evidenced by frequent third-party inspection reports, may encounter insurmountable issues that make satisfying Option 1 and Option 2 impossible. These projects will have spent considerable time and money designing and constructing buildings with the intent of certifying – which will be easily documented with consultant contracts, inspection reports, and test results -- and yet still encounter issues such as air infiltration or ventilation balancing preventing final CoO. These projects require a 3rd option for achieving final CoO that does not reduce the performance objectives of the code nor present an easier, race-to-the-bottom option for developers to consider. The 3rd option proposed below requires nearly identical requirements for design and construction as the two existing options and should only be available for projects who cannot achieve options 1 or 2. This 3rd option must be included in code to avoid local review and waiver ambiguity, further delays, significant added costs, and extreme risk in an industry that cannot absorb additional cost.
Proposed Option 3 for Final CoO:

Copy of certified passive house consultant and rater/verifier contracts demonstrating all required inspections and testing requirements for certification
Design phase pre-certification/approval
Verification report demonstrating as-built conditions, including those that comply with passive house requirements, and those that do not (if applicable)
For projects following Phius, demonstrate final Energy Star and Zero Energy Ready Homes certification requirements are met.
Hygrothermal analysis confirming the building does not face any durability concerns based on as-built condition
Statement from passive house consultant confirming project has completed all interim, final, and corrective testing and modeling requirements, including a summary of deviations from passive house requirements
Taped and untaped blower door testing at 50 Pascal and 75 Pascal demonstrating results are within 20% of passive house requirements. If initial whole building blower door testing exceeds passive house requirement, statement must reflect evidence of a re-test, with results, as well as an explanation for sources of leakage and attempted remediation efforts.
Back-up documentation with test results for initial and follow up re-tests with explanation for any deviation from passive house requirements
Ventilation flow rates demonstrating mechanical code compliance
This proposed 3rd option is nearly identical to Option 1 and offers similar flexibility as the Passive House Institute U.S. offers projects that may not satisfy all program requirements necessary for certification. Phius does not have adequate capacity to evaluate projects seeking waivers on a case-by-case basis in a timely manner, making it necessary for the Commonwealth to allow a similar approval path for municipal building departments.
Without this option, projects will face significant cost and major delays after having made significant investments in developing extremely well performing buildings. Project teams pursuing passive house certification that have obtained pre-certification at design and who work closely with their consultants and contractors to follow all inspection and testing procedures necessary for passive house certification are deserving of final CoO without facing onerous cost, risk, or delay.
Sincerely,

_____

Eric Reinhard, Assoc. AIA, LEED AP bd+c
Building Designer

September 17, 2024

Mr. Ian Finlayson
Massachusetts Department of Energy Resources
100 Cambridge Street, Suite 1020
Boston, MA 02114

Re: Public Comment on Municipal Opt-In Stretch Code and Specialized Code
Submitted via email: stretchcode@mass.gov

Dear Mr. Finlayson,

On behalf of the Massachusetts Net Zero Building Coalition, facilitated by Northeast Energy Efficiency Partnerships (NEEP), we commend the Massachusetts Department of Energy Resources (DOER) for continued progress with respect to the implementation of the Updated Stretch Code and Municipal Opt-In Specialized Code. These forward-thinking codes are vital to ensuring energy-efficient, resilient, and healthy residential and commercial buildings across the Commonwealth. The efforts of DOER are vital to moving Massachusetts closer to its goal of achieving a net-zero economy by 2050.

History shows that major code updates and introductions require attention and refinement to ensure successful implementation and effectiveness. We would like to highlight both the progress made and areas for further improvement. While several key aspects of the code revision reflect valuable advancements, there remain concerns that have yet to be fully addressed. Our comments recognize these advancements and outline specific areas where we recommend further clarification and adjustment.

We commend key improvements that have been made based on feedback:

1. **EV Ready Requirements**: We appreciate the updates made in response to feedback on electric vehicle (EV) infrastructure. Changes in section C405.13.1, specifically the inclusion of managed charging incentives, reflect a strong commitment to supporting the transition to electrified transportation.
2. **Chapter 5, Existing Buildings**: We commend the thoughtful revisions made to address issues around alterations and additions, particularly the inclusion of clarifications in C502.3.7 and the added exception in C503.1. These changes provide important guidance for ensuring energy efficiency standards are met in existing buildings without imposing undue burdens.

a. **Renovation vs. Alteration**: Clarifications in sections such as R405.3 and C503.2.4 have helped differentiate between renovation and alteration processes, addressing important concerns related to terminology and how these processes are applied in practice.

3. **Air Infiltration Testing in Additions**: The addition of section C502.3.7, clarifying that air infiltration testing applies only to new additions and not to existing buildings, demonstrates an important consideration of the complexities inherent in renovations and additions.
4. **Insulation of Existing Wall Cavities**: Section C503.1 now includes an important exception that addresses insulation requirements for exposed wall assemblies in existing buildings. Allowing up to 10 square feet of exposed elements without requiring full insulation updates is a pragmatic solution, especially for small projects.
5. **Embodied Carbon**: The introduction of an optional 3-point HERS credit for new dwelling units that demonstrate embodied carbon savings through use of low embodied carbon concrete or insulation products is a welcome advancement. This aligns with the growing importance of addressing the full carbon lifecycle of buildings.
6. **Solar Requirement for High-Ventilation Buildings**: The reduction in the mandatory solar PV requirement for hospitals and laboratories, as outlined in section CC105.2, addresses the unique challenges these building types face in conforming to renewable energy standards due to extensive rooftop equipment.

While we recognize the progress reflected in DOER's proposed code revisions, there remain key concerns and areas for further improvement that are not yet addressed. We believe these issues warrant continued collaboration and consideration in further timely code revisions and guidance from DOER. We recommend the following additional clarifications and adjustments:

- **Photovoltaic (PV) Roof Panels**: Although stakeholders requested clearer provisions on the installation of PV roof panels, such as limited roof space concerns and modeling guidelines inconsistencies, this issue was not addressed in the proposed changes. We urge DOER to revisit this topic in code updates, given the critical role of renewable energy in achieving the state's net-zero goals.
- **Curtainwall De-rating for Thermal Breaks**: Section C503.2.4 offers general guidance on thermal de-rating for walls with thermal bridges, but it does not fully address the unique thermal performance challenges of curtainwall systems. It's important to address the complexity of tables for determining curtainwall de-rating for thermal breaks because the current format can lead to confusion and errors in energy code compliance. Simplifying these tables would improve clarity for designers and builders, ensuring more

accurate assessments of thermal performance and encouraging broader adoption of energy-efficient practices.

- **Change of Use in Existing Buildings**: Section C505.1 lacks clarity around 'change of use' requirements, particularly in cases where there is an increase in energy use. For instance, the 2023 Technical Guidance document suggests that an office building which increases its ventilation to meet lab program would qualify as a 'change of use', despite the fact that it may not constitute a change of use per the MA building code. However, we have been told by DOER that a building that is increasing its ventilation to meet minimum IAQ standards (e.g., an existing building lacking a ventilation system) would not need to meet the 'çhange of use' requirements per the MA Stretch Code. More clarity around which scenarios trigger a 'change of use' per the MA stretch code is needed to ensure consistency in code enforcement and avoid misapplication.
- **Blended Code and Documentation**: One of the recurring requests from stakeholders is the creation of a "blended code" that integrates base code language with the updated Stretch and Specialized Codes for ease of reference. While we understand this is in progress, we strongly urge DOER to prioritize the completion of this document and to ensure it provides access to technical guidance and practical tools, including links to compliance documentation (e.g., COMCheck) and thermal bridge databases specific to Massachusetts.
- **Increased Support for Stakeholder Engagement**: A key area that requires attention is the expansion of resources to engage a more diverse range of stakeholders, particularly small businesses and under-resourced professionals who may struggle to navigate the complexity of these updated codes. Consistent, accessible support from DOER will be essential to ensuring equitable compliance and adoption.
- **Energy Modeling Assistance**: We continue to hear from building practitioners about the need for clearer guidance and collaboration on energy modeling for compliance. Creating partnerships or providing tools for energy model review would significantly aid professionals in adhering to the updated code requirements.
- **TEDI Guidelines**: The current Thermal Energy Demand Intensity (TEDI) guidelines remain a challenge for some buildings, particularly when well-designed projects still face difficulties in meeting the prescribed limits. We recommend further refining TEDI modeling protocols to better accommodate a range of building designs while maintaining the goal of energy efficiency and sustainability.

In conclusion, we appreciate DOER's efforts in advancing energy efficiency and decarbonization through these vital updates to the Stretch and Specialized Codes. The progress made thus far is commendable, and we look forward to continued conversation to address remaining priority issues that are essential for the successful implementation of these codes. By ensuring these

remaining concerns are addressed, Massachusetts will continue to lead the nation in building a sustainable, equitable future for all its residents.

Thank you for your attention and for your ongoing work in this critical area.

Sincerely,

Massachusetts Net Zero Building Coalition,

Facilitated by Northeast Energy Efficiency Partnerships (NEEP)

Municipal officials & building industry practitioners

- Alejandra Menchaca, PhD and Alonso Dominguez, PhD, AIRLIT studio
- Chris Schaffner PE, CEO The Green Engineer, Inc.
- Ellen Watts, FAIA, LEED AP, BSA/AIA Member, 2024 President AIA Massachusetts (signing individually)
- Lisa Cunningham, Director, ZeroCarbonMA
- Maciej Konieczny, CPHC/B (signing individually)
- Mark Sandeen, Town of Lexington Select Board Member, President, MassSolar
- Pat Hanlon, Co-Chair, Sustainable Arlington (signing individually)

Organizational partners

- Green Energy Consumers Alliance
- LISC Massachusetts
- Metropolitan Area Planning Council (MAPC)
- Passive House Massachusetts
- Phius+

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September 17, 2024

STRETCH CODE RED LINE COMMENTS

Revised Exception to R401.2 Application

R401.2 Application. Residential buildings shall comply with Section R401.2.5 and either Sections R401.2.2, R401.2.3 or R401.2.4. R-use buildings without individually separate dwelling units (such as single-room occupancy buildings) may comply with Section R401.2.1. The option selected for compliance shall be identified in the certificate required by Section R401.3.

Exception: ~~Additions under 1,000 sf, Level 1 and Level 2 alterations, and repairs to existing buildings complying with Chapter 5 [RE].~~ Any new materials and building systems, or parts thereof, installed in additions under 1,000 SF or in Level 1 or Level 2 alterations shall comply with the relevant requirements of Sections R402, R403, and R404.

THE PROBLEM(S)

- This revision seems to be read that under a Level 1 with the removal of Chapter 5 that when repairs occur with the issuance of a permit these items will need to meet the energy code for elements such as paint, wallpapering, flooring etc. If the intent was to clarify what would be required or not using the word 'relevant' it is not working.
- Level 1 are typically projects where permits are not issued, or are interior finishes only, or Reroofing. So, any new materials (paint/trim/Reroofing) shall comply with the relevant requirements of Sections R402, R403, and R404 ?
- Level 1 describes in Section 708 Energy conservation, 708.1 Minimum requirements. "Level 1…existing buildings or structures are permitted without requiring the entire building or structure to comply with the energy requirements of the International Energy Conservation Code or International Residential Code. The alterations shall conform to the energy requirements of the International Energy Conservation Code or International Residential Code as they relate to new construction.

AN EXAMPLE

- Type 1
  - Adding 2nd layer of roofing would require more insulation?
  - Repair to windows such as painting or weather stripping now requires replace of those windows?
  - Repairing siding does this require new insulation on that section?
  - Replacing flooring, does that require new insulation?
- Type 2

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- Removing plaster under section 5 allowed filling the cavity with insulation. With section R402, the existing cavity such as roof or walls or floors may not allow for the required R-value, as example making ceiling heights lower and violate other code criteria that is insurmountable.

SOLUTION

Exception: Additions under 1,000 sf shall comply with requirements of Sections R402, R403, and R404. Level 1 and Level 2 alterations, and repairs to existing buildings complying with Chapter 5 [RE].

R503.1.1 Building Envelope.

Exception:

2. Existing ceiling, wall or floor cavities exposed during construction provided that these cavities are filled with the highest possibly insulation R-Value available but not required to be any more than shown in Table R402.1.3 .

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Major Alterations, Additions, or Change of Use – HERS

TABLE R406.5 MAXIMUM ENERGY RATING INDEX

Clean Energy Application	Maximum HERS Index score [a,b]				
	~~New Construction until June 30, 2024~~	New construction permits after July 1, 2024	New Construction with R406.5.2 embodied carbon credit	Accessory Dwelling Units	Major alterations, additions, or Change of use[c]
Mixed-Fuel Building	~~52~~	42	45	52	~~52~~ 65
Solar Electric Generation	~~55~~	42	45	55	~~55~~ 70
All-Electric Building	~~55~~	45	48	55	~~55~~ 70
Solar Electric & *All-Electric Building*	~~58~~	45	48	58	~~58~~ 75

[a] Maximum HERS rating prior to onsite renewable electric generation in accordance with Section R406.5

[b] The building shall meet the mandatory requirements of Section R406.2, ~~and the building thermal envelope shall be greater than or equal to the levels of efficiency and SHGC in Table R402.1.2 or Table R402.1.4 of the 2015 International Energy Conservation Code.~~

[c] Alterations, Additions or Change of use covered by Section R502.1.1 or R503.1.5 are subject to this maximum HERS rating, except for Historic buildings which may opt to follow the prescriptive compliance pathway in R401.2.1.

THE PROBLEM

A HERS being a one size fits all does not allow for many projects of renovations and additions to occur while some other projects can meet a much lower HERS rating. The goal of having as many existing homes having a reduced carbon usage is not found in having a one size fits all number. Instead having a simple formula that most builders, architects and engineers are accustom to, to capture more homes into the lowering of the carbon usage would be desired.

AN EXAMPLE

Older home may have an initial HERS of 120 or greater and may be 2,500 sf with a new addition of 1,000 sf. Due to the size of the original home and HERS of an existing 120 in order to meet a HERS for the original home and addition together the existing home would require to many revisions financially for a home owner and in turn the project would be abandoned. This has become a 'too often' scenario in the residential construction industry since the Stretch Code has been enacted.

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SOLUTION

Below is a simple formula that is used in the construction industry for zoning type bylaws to equate a weighted average. We have provided an addendum sheet showing how this formula works with differing sized homes, additions and homes with existing HERS calculations. The finalized equation examples show how existing homes can be improved greatly and some projects can even be lower than a 65 and in the end many, many more existing homes can be captured allowing for a lower carbon used in the state of Mass.

Formula:

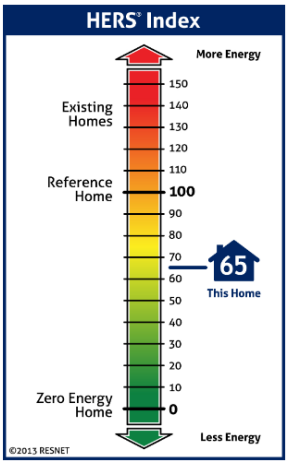
$$\text{WEIGHTED AVERAGE HERS} = \left(\frac{(\text{EXIST SQFT} + \text{PROP SQFT})}{\left(\frac{\text{EXIST SQFT}}{\text{EXIST HERS}}\right) + \left(\frac{\text{PROP SQFT}}{\text{NEW HERS}}\right)} \right) 0.85$$

HERS Control is based on the New Construction Maximum HERS Score
The project could be on a scale where the lower required score being the New Construction Maximum and the top end of the scale could be the 2006 Reference home.
Example:

Weighted Avg. HERS Score = {(2500 sqft + 1000 sqft) / [(2500 sqft/100 HERS) + (1000 sqft/45 HERS)]} x 0.85
Weighted Avg. HERS Score = {(3500 sqft) / (25 sqft/HERS + 22.2 sqft/HERS)} x 0.85
Weighted Avg. HERS Score = {3500 sqft / 47.2 sqft/HERS} x 0.85
Weighted Avg. HERS Score = 74.1 HERS x 0.85
Weighted Avg. HERS Score = 63

Examples shown in chart below of some differing homes and conditions:

EXIST HOUSE SIZE (Sqft)	EXIST HERS	PROP ADDITION SIZE (Sqft)	NEW CONSTR. HERS	CONTROL	WEIGHTED AVG HERS MIXED FUEL	WEIGHTED AVG HERS SOLAR ELECTRIC (+5)	WEIGHTED AVG HERS ALL ELECTRIC (+5)	WEIGHTED AVG HERS SOLAR & ALL ELECTRIC (+10)
2500	100	1000	45	0.85	63.0	68.0	68.0	73.0
2300	95	2500	45	0.85	51.1	56.1	56.1	61.1
4000	120	1000	45	0.85	76.5	81.5	81.5	86.5
3000	100	2000	45	0.85	57.1	62.1	62.1	67.1
2500	100	2000	45	0.85	55.1	60.1	60.1	65.1
5500	160	1000	45	0.85	97.6	102.6	102.6	107.6



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ROOF INSULATION

Prescriptive method table R402.1.3, Zone 5 replace Ceiling R Value of R60 with R49 where used.

THE PROBLEM

An R60 has found to be negligible in energy savings and carbon usage. The requirement for R60 requires larger lumber being of 2x10's over 2x8's often using more unnecessary lumber and materials. Many older homes are restricted in their opportunity to fit a R60 but often can fit a R49 making the chance to retrofit more homes to reduce carbon.

SOLUTION

R402.1.3 Amend Table R402.1.3 as follows:

5 and Marine 4, Ceiling R-Value R60 or R49 when rafter or ceiling joist size does not allow.

Boston Green Ribbon Commission | Higher Education Working Group

September 17, 2024

Elizabeth Mahony
Commissioner
Massachusetts Department of Energy Resources
100 Cambridge Street, 9th floor
Boston MA 02114

Via: stretchcode@mass.gov

CC: Ian Finlayson & Paul Ormond, Department of Energy Resources

RE: Comments on Proposed Changes to 225 CMR 22.00 and 23.00 Stretch Energy Code and Municipal Opt-in Specialized Code

Dear Commissioner Mahony:

The Boston Green Ribbon Commission Higher Ed Working Groups wishes to thank the Department of Energy Resources for your efforts to advance climate action in the Commonwealth through the Stretch Energy Code and Municipal Opt-in Specialized Code. We also wish to thank you for including provisions designed to leverage district energy systems' ability to accelerate decarbonization in support of the Codes' objectives. We wanted to take this opportunity to provide feedback, in collaboration with our colleagues at the Association of Independent Colleges and Universities in Massachusetts (AICU Mass), which we hope you will find useful in considering the energy code updates.

CHAPTER 2 [CE] DEFINITIONS

***Code Provision**: DISTRICT ENERGY SYSTEM, HEAT RECOVERY ENABLED. A district energy system capable of recovering excess heat energy from buildings on the distributed network which are in cooling mode for useful space and/or service water heating in other buildings on the network.*

> **Comment:** It is important the definition for heat recovery enabled is not overly narrow to prescribe only one technology/system and would not preclude the use of steam distribution from non-fossil fuel generation, as long as thermal recovery and/or exchange was possible across the district energy system, which we understand is the intent for this definition. More specifically, the definition should not prescribe only a hydronic distribution system as described in the summary of changes document.
>
> ***Proposed Change:** DISTRICT ENERGY SYSTEM, HEAT RECOVERY ENABLED. A district energy system capable of recovering ~~excess heat energy from buildings on the distributed network which are in cooling mode for useful space and/or service water heating in other buildings on the network~~ and/or exchanging excess thermal energy within the district energy system and connected buildings.*

***Code Provision**: DISTRICT ENERGY SYSTEM ORDER OF CONDITIONS. A document issued by the Commonwealth of Massachusetts Department of Energy Resources which regulates the decarbonization and efficient electrification plan for a district energy system.*

> **Comment:** Two comments are proposed to clarify the definition of order of conditions that (1) it applies to the decarbonization for a district energy system being technology agnostic and (2) it applies for the purposes on building energy code compliance.
>
> ***Proposed Change:** DISTRICT ENERGY SYSTEM ORDER OF CONDITIONS. A document issued by the Commonwealth of Massachusetts Department of Energy Resources which regulates a voluntary decarbonization ~~and efficient electrification~~ plan for a district energy system for the purposes of building energy code compliance.*

SECTION C505 CHANGE OF USE OR OCCUPANCY

***Code Provision:** C505.1 General. Spaces undergoing a change in occupancy that would result in an increase in ~~demand for~~ either total modeled annual fossil fuel use ~~or electrical energy~~ or total modeled annual energy use shall comply with Sections C401.3, C402 through C406, and Section C408.*

> **Comments:**
>
> 1. The proposed edits result in a penalty for electrification while we believe the intent is to penalize an increase in annual fossil fuel use only, not all energy. To clarify the intent, it is proposed that only an increase in total annual fossil fuel use is included to apply to changes of use or occupancy.
> 2. The proposed change from a demand-based calculation to modeled annual energy use implies that an energy model would be required to meet this requirement and could preclude the use of the prescriptive path for spaces undergoing a change of use or occupancy. We suggest deleting 'modeled' from the code change to avoid requiring the burden of additional energy modeling where an energy model would not typically be necessary and adds time and cost to a project.
>
> ***Proposed Change:** C505.1 General. Spaces undergoing a change in occupancy that would result in an increase in ~~demand for either~~ total annual fossil fuel use ~~or electrical energy or total modeled annual energy use~~ shall comply with Sections C401.3, C402 through C406, and Section C408.*

CC105.3 ADDITIONAL EFFICIENCY REQUIREMENTS

***Provision:** CC105.3.1 MORE EFFICIENCY HVAC EQUIPMENT PERFORMANCE. Primary heating and cooling equipment shall meet the following efficiencies as applicable:*

1. Space heating combustion equipment shall be rated at greater than or equal to 95 AFUE.

2. All refrigerant-based air conditioning equipment shall be a heat pump with greater than or equal to ~~10~~ 8.5 HSPF2 rated heating performance and greater than or equal to ~~16~~ 15.2 SEER2 rated cooling performance for ducted systems, and greater than or equal to 8.5 HSPF2 rated heating performance and greater than or equal to 16 SEER2 rated cooling performance for ductless systems.

3. Ground source heat pump systems shall be rated at greater than or equal to 3.5 COP at design temperature.

For multiple cooling systems, all systems shall meet or exceed the minimum efficiency requirements in this section and collectively shall be sized to serve 100 percent of the cooling design load. For multiple heating systems, all systems shall meet or exceed the minimum efficiency requirements in this section and collectively shall be sized to serve 100 percent of the heating design load.

Comments: It is unclear in the code how a building connecting to a district energy system with an order of conditions in good standing is required to comply with (1) the efficiency and (2) heating and cooling load sizing requirements or if they apply.

Proposed Change: *This provision should include the following EXCEPTION, "Space and service water heating and space cooling uses provided by a district energy system subject to a district energy system order of conditions in good standing from the Commonwealth of Massachusetts Department of Energy Resources."*

CC402.1.5.2 HIGH GLAZED WALL SYSTEM BUILDINGS

Comment: Additional language should be added in the code or guidance documents to clarify that for existing highly-glazed buildings already connected to a district energy system, which are undergoing change of use or alteration, the electrification requirements for highly-glazed buildings do not apply.

On behalf of the Boston Green Ribbon Commission Higher Ed Working Group, we want to thank you for your leadership to move the Commonwealth forward on climate action. Please feel free to reach out if you have any questions on the comments we have provided.

Sincerely,
Boston Green Ribbon Commission Higher Ed Working Group Co-chairs

Dennis Carlberg, (he/him) AIA, LEED AP BD+C
Chief Sustainability Officer &
Associate Vice President for Climate Action
Boston University

Jacob Glickel, (he/him)
Director of Sustainability Operations
Northeastern University

cc: Dano Weisbord, Tufts University
Steve Lanou, MIT
Leah Bamberger, Northeastern University
Amy Longsworth, Boston Green Ribbon Commission
Joe Higgins, MIT
Heather Henriksen, Harvard University
John Cleveland, Boston Green Ribbon Commission
Azanta Thakur, Boston Green Ribbon Commission

NAIOP
COMMERCIAL REAL ESTATE DEVELOPMENT ASSOCIATION
MASSACHUSETTS

September 17, 2024

Elizabeth Mahony, Commissioner
Department of Energy Resources
100 Cambridge St., 9th Floor
Boston, MA 02133

Re: NAIOP Comments on Draft Updates to Stretch Energy Code and Municipal Opt-In "Specialized" Code 225 CMR 23

Dear Commissioner Mahony:

NAIOP Massachusetts, The Commercial Real Estate Development Association, **appreciates the opportunity to provide feedback on the proposed changes to the Stretch Energy Code and Specialized Municipal Opt-in code, Code 225 CMR 23.**

NAIOP represents the interests of companies involved with the development, ownership, management, and financing of commercial properties. NAIOP's 1800 members are involved with office, lab, industrial, mixed use, multifamily, retail, and institutional space across Massachusetts.

NAIOP members represent large and complex projects, typically employing teams with global expertise on design, construction and energy efficiency. Since the codes were promulgated in 2022, NAIOP members have expressed frustration with the additional costs associated with compliance and technical requirements that often conflict with best practices and are directly impacting the production of desperately needed new housing and economic development projects. **NAIOP is grateful that the Department of Energy Resources (DOER) recognizes the barriers both the municipal opt-in and stretch code present to achieving the Healey-Driscoll Administration's goals for housing production and economic development.**

NAIOP applauds the modest amendments released in August 2024 and believes that the relief the draft provisions provide is a critical step in addressing the overall concerns the regulated community has with the promulgated codes. Below, please find limited comments related to the proposed amendments.

I. CC105.3.1

While the proposed lowered standards help advance the application of the code, the industry is unsure if compliance with the new A2L standards is possible, given the manufacturers have not yet published the new testing data. NAIOP urges DOER to consider amending this language to ensure that compliance with as-yet-unpublished standards is not required.

II. TABLE C407.4

NAIOP members are grateful for DOER's proposed additions to the table R406.5.2 - New Construction with embodied carbon credit and Accessory Dwelling Units. Given the increased focus on embodied carbon in the City of Boston and other key municipalities, **NAIOP believes this pathway should exist for all commercial buildings.**

III. **District Energy**
NAIOP applauds the inclusion of district energy as a pathway in the Stretch Code. **NAIOP hopes that DOER will continue to work with stakeholders to advance strategies allowing district energy to fulfill requirements in meeting the all-electric pathway.**

Finally, for the building code, project proponents have an opportunity to seek relief from its provisions (780 CMR) in the form of a variance or interpretation of the applicability of a particular code section. Appeals Board members are not allowed to waive code requirements in their entirety but may consider alternative methods of complying with the intent of the code.

However, there is no such relief pathway for the stretch and specialized energy codes. To achieve the Commonwealth's carbon reduction goals, NAIOP members would appreciate the opportunity to present a life cycle assessment showing environmental impacts of different scenarios to demonstrate overall decarbonization so that the emissions factors for the project account for different strategies. For example, an analysis could demonstrate the difference in emissions associated with requiring new glazing to improve thermal performance versus the emissions associated with the current energy usage (which should be decreasing over time assuming that the grid continues to "green") and ensure that projects are choosing the pathway that has a smaller overall carbon footprint.

NAIOP strongly recommends the inclusion of a relief pathway modeled on the existing Board of Building Regulations and Standards frameworks to allow project proponents the ability to present hardship (including financial) and navigate solutions that advance climate goals without harming projects.

NAIOP appreciates DOER's actions to proactively address outstanding concerns with the promulgated stretch and municipal opt-in energy codes. As conversations regarding the practical implementation of these codes continues, NAIOP looks forward to collaborating with the Healey-Driscoll Administration to ensure that our strategies to achieve the Commonwealth's housing, economic and climate goals are aligned. Please contact me if you have any questions.

Sincerely,

Tamara C. Small
Chief Executive Officer
NAIOP Massachusetts, The Commercial Real Estate Development Association

CC:
Secretary Rebecca Tepper, Executive Office of Energy and Environmental Affairs

Massachusetts Housing Partnership

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September 17, 2024

Mr. Ian Finlayson
Deputy Director, Energy Efficiency Division
Department of Energy Resources
100 Cambridge St.
9th Floor
Boston, MA 02114

Re: Specialized Code Feedback

Dear Ian:

First, we would like to take the opportunity to commend the Department of Energy Resources for your continued work on ensuring that energy codes are aligned with our state climate goals and are clear and implementable for the development community. We are invested in supporting the Department's effort in ensuring high performance new construction in the Commonwealth, and as such we request your consideration around an issue pertaining to multifamily projects pursuing compliance with the requirements of the Specialized Energy Code via passive house certification. Per the Draft MA 2023 Residential and Commercial Stretch Code and Specialized Opt-in Code with proposed revisions, projects can obtain temporary Certificate of Occupancy (CoO) regardless of certification status, which is necessary for occupancy. However, the current proposed code language still puts extremely high-performance projects at risk by requiring compliance with Options 1 or 2 for obtaining final CoO. Neither option is feasible for development teams who almost reach but fail to achieve final Passive House levels of performance despite well documented best efforts.

Without final CoO, projects can face significant challenges in converting high-interest rate construction loans to permanent mortgages. Most of the new construction affordable housing in the state is financed using Low-Income Housing Tax Credits ("LIHTC"). In these projects the construction loan, typically paid down with LIHTC equity upon receiving final CoO, is significantly larger than the permanent mortgage. This makes timely conversion critical for LIHTC developers to continue doing business in Massachusetts. Recent conversations with LIHTC syndicators have revealed that a delayed CoO due to final testing that falls just short of passive house requirements would inhibit funding of the conversion equity payment. Furthermore, it is not realistic for projects to pursue an appeal with their Authority Having Jurisdiction and/or the State, which would cause significant delays to project delivery and add cost and risk.

Given the quantity of passive house projects in the state, estimated at more than 272 projects consisting of over 20,600 units, it is very likely that some of the projects that are designed to passive house certification (as evidenced at the time of permitting) and constructed per design (as evidenced by frequent third-party inspection reports) may encounter insurmountable issues that make satisfying the existing pathways to final CoO impossible.

These projects will have spent considerable time and money designing and constructing buildings with the intent of certifying – which will be easily documented with consultant contracts, inspection reports, and test results -- and yet still encounter issues such as air infiltration or ventilation balancing preventing final CoO. These projects require a 3rd option for achieving final CoO that does not reduce the performance objectives of the code nor present an easier, race-to-the-bottom option for developers to consider. The 3rd option proposed below requires nearly identical requirements for design and construction as the two existing options and should only be available for projects who cannot achieve Options 1 or 2. Including this 3rd option in the code will avoid local review and waiver ambiguity, further delays, significant added costs, and extreme risk in an industry that cannot absorb additional cost.

1. Proposed Option 3 for Final CoO:

    a. Copy of certified passive house consultant and rater/verifier contracts demonstrating all required inspections and testing requirements for certification
    b. Design phase pre-certification/approval
    c. Verification report demonstrating as-built conditions, including those that comply with passive house requirements, and those that do not (if applicable)
        i. For projects following Phius, demonstrate final Energy Star and Zero Energy Ready Homes certification requirements are met.
    d. Hygrothermal analysis confirming the building does not face any durability concerns based on as-built condition
    e. Statement from passive house consultant confirming project has completed all interim, final, and corrective testing and modeling requirements, including a summary of deviations from passive house requirements
        i. Taped and untaped blower door testing at 50 Pascal and 75 Pascal demonstrating results are within 20% of passive house requirements. If initial whole building blower door testing exceeds passive house requirement, statement must reflect evidence of a re-test, with results, as well as an explanation for sources of leakage and attempted remediation efforts.
        ii. Back-up documentation with test results for initial and follow up re-tests with explanation for any deviation from passive house requirements
    f. Ventilation flow rates demonstrating mechanical code compliance

This proposed 3rd option is nearly identical to Option 1 and offers similar flexibility as has been granted by one (but not all) of the passive house certifying agencies in the past. This type of consideration in the code is necessary to ensure that projects are treated equally, and municipal building departments have an efficient and effective pathway to final CoO for high performance multifamily projects.

Without this option, important affordable housing projects could face major delays and associated added costs after having made significant investments in developing one of the highest performance buildings in the Commonwealth. We believe that this outcome will inhibit our ability to make meaningful progress on both our housing and climate goals.

Thank you very much for your consideration of this issue of significant importance to the affordable housing community.

Sincerely,

Lauren Baumann

Lauren Baumann
Director of Sustainability and Climate Initiatives
Massachusetts Housing Partnership

539 SE 59th Court
Portland, OR 97215-1969

September 17, 2024

Via email to stretchcode@mass.gov

JoAnn Bodemer
Director, Energy Efficiency
Department of Energy Resources
Commonwealth of Massachusetts

RE: STRETCH CODE FEEDBACK

Department of Energy Resources

We are building certifiers accredited by the Passive House Institute (PHI) and actively certifying buildings to PHI's standards continuously since 2015. You can see some of the many buildings my colleagues and I have certified by clicking on the image at https://www.certiphiers.com/buildings-we-certified

Thank you for the opportunity to submit these comments:

C407.3.1 and R405.1

Given the more specific sections C407.3.2.2 and R405.3, the purpose(s) of C407.3.1 and R405.1 are not clear.

Assuming this is a general provision to distinguish Phius' and PHI's programs and to define their relative software and standards, I recommend (as to PHI's program) the following changes from:

Current language (R405.1):

. . . Projects pre-certified as meeting the Certified Passive House standard using the current software and program criteria by the Passive House Institute (PHI), where PHI certification is demonstrated by a Certified Passive House Certifier and a Certified Passive House Designer.

Change to:

. . . Buildings meeting the Passive House Institute (PHI)'s Passive House Standard, EnerPHit Standard, or Low-Energy Building Standard (collectively, PHI's building standards) using PHI's current software and program criteria where PHI building certification is conditionally assured at the design stage by the PHI or a PHI-accredited building Certifier based on software, plans, and documentation submitted by a Certified Passive House Consultant or a Certified Passive House Designer which demonstrate performance to one of PHI's building standards according to C407.3.2.2 [or R405.3].

Or alternatively, change to this preferable version:

. . . Buildings meeting the Passive House Institute (PHI)'s Passive House Standard, EnerPHit Standard, or Low-Energy Building Standard (collectively, PHI's building standards) using PHI's current software and program criteria according to C407.3.2.2 [or R405.3].

Supporting information:
1. In addition to PHI-accredited Certifiers, PHI certifies buildings and should be mentioned.
2. There is no such status as "pre-certified" in PHI's program. Please see below.
3. This provision will be more clear and comprehensible if it is limited to general information and refers to (and thus incorporates) the detailed "compliance" requirements in the subsequent sections C407.3.2.2 [or R405.3].
4. PHI has three standards carefully defined in its building certification program (and we are able to certify to all three and recommend DOER include all three in its Stretch Code). Please see the note at the end of this letter for more information about PHI's Low-Energy Building Standard.**

C407.3.2.

It appears the references to following provisions should be changed from C407.3.3.1 to C407.3.2.1 and from C407.3.3.2 to C407.3.2.2.

C407.3.2.2 and R405.3

Your reference to the Passive House Institute (PHI) at C407.3.1 is correct, but the reference in C407.3.2.2 is incorrect. To our knowledge, there is no entity called "Passive House International." The confusion is understandable since PHI's work is international and PHI's programs are active on every continent.

C407.3.2.2.1.a. and R405.3.1.a.

This reference to a "Design Certification Letter from a Certified Passive House Certifier" could be improved in two ways.

First, although PHI certifies professionals, e.g. “Certified Passive House Consultant” (CPHC), “Certified Passive House Designer” (CPHD), and “Certified Passive House Tradesperson” (CPHT), PHI trains, licenses, and reviews the work of certifiers. Thus, PHI *accredits* building certifiers. Therefore, we recommend the longer but more accurate “. . . Letter from a Passive House Certifier accredited by PHI” or “. . . Letter from a PHI-accredited Certifier.”

It is not clear what the DOER or Commonwealth expects the certifier to say in the Design Certification Letter. We typically review a building before construction begins (or early in construction) in a process commonly known as “Design Stage Review” producing a letter which we call a Design Stage Conditional Assurance Letter. We write this letter after we have reviewed PHI’s Passive House Planning Package (“PHPP”) energy model as well as documents supporting values entered in the PHPP.

PHI confers no status or recognition when we send such a letter. Thus, we do not use the term “pre-certified” as that could confuse people. In PHI’s program, a building is either certified or not. There is no “pre-certified” status.

Importantly, our Design Stage Conditional Assurance Letters expressly states we are conferring no building certification status. The letter simply is our indication that based on the plans, submitted documentation supporting the PHPP, and the PHPP, upon completion of construction consistent with the plans and PHPP, we see no bar to certification and can conditionally assure the recipient that upon fulfillment of all of PHI’s requirements, we will certify the building. Importantly, our Letter also notes that our certification will be conditioned on “submission of documents and photographs demonstrating construction according to the information submitted at the design stage review and air leakage and ventilation system commissioning within PHI requirements.”

This need not be spelled out in C407.3.2.2.1.a (and C407.3.2.2.2.a and the similar residential code sections) so long as DOER understands the limitations of our Design Stage Conditional Assurance Letters based on our Design Stage Reviews and accepts them on this basis.

C407.3.2.2.2.c. & e.and R405.3.2.d. & e.

PHI does not require (and hence we at CertiPHIers Cooperative likewise do not require) a Passive House Verifier/Rater or such a person’s “test results” in order to certify a building.

We do require one or more persons (typically independent from the building CPHC or CPHD) to a) test the air leakage according to specific ISO standards and b) commission settings and performance of the building’s ventilation system. In both cases, the person(s) performing the test/commissioning must supply reports meeting PHI’s specifications.

These are PHI’s requirements, and we enforce them. We will not certify any building without them.

However, we do not require the person conducting and reporting on either the average induced air leakage or the building ventilation system to have a particular title (including "verifier or rater."

PHI has additional "site supervisor" and "construction verifier" training for people who wish to learn more about how to assure building thermal/operating energy performance and documenting building construction, especially for large, complex, or special-purpose buildings. However, PHI does not require people have such training/education to perform the air leakage testing or ventilation commissioning. There is no requirement in PHI's building certification program for such a person ("site supervisor," "rater," or "verifier") to provide any test results for us to certify a building. It may be helpful to both the building CPHC/D and to us, but we do not require it.

DOER's requirement may lead to confusion since it references specific people not within PHI's program. We recommend DOER delete this provision to avoid confusion as well as unnecessarily increasing the cost of our building certification. Our Cooperative has certified three commercial/office buildings without such accredited persons (in addition to many small residential buildings).

C407.3.1 and R405.1

Additional Notes:

1. Although we expect everyone working in PHI's program will know what you mean by "Certified Passive House Certifier," in fact PHI does not use this term. Nor do the Passive House Network and Passive House Canada, two North American national organizations promoting PHI's program. We recommend you use simply "Certifier" (or "certifier") or "PHI-accredited Certifier" (or "PHI-accredited certifier"). We and PHI often refer to the certifier without capitalizing the name, but you may want to capitalize Certifier to be consistent with capitalized names of other persons in your codes.
2. These paragraphs reference "Certified Passive House Designer." PHI uses the same training materials and test (and alternative qualifications) for both Certified Passive House Consultants and Certified Passive House Designers. They are considered functional equivalents for PHI building certification. In fact, we typically refer to them as the "project CPHC/D" since we may not know in advance which professional certification they have. And do not care in any event. Although PHI's training, testing, and alternative qualification pathways are the same for both CPHC and CPHD, PHI awards CPHD only to person who have academic degrees or professional registration/membership in the design field such as architects and engineers. That is the only difference. For more information, please see https://cms.passivehouse.com/en/training/resources/faq/designer-or-consultant/ Please refer to both Certified Passive House Consultants and Certified Passive House Designers in this provision.

**PHI Low-Energy Building Standard (L-EB)

PHI publishes its three Standards, their requirements, and details related to certification at https://passiv.de/en/03_certification/02_certification_buildings/08_energy_standards/08_energy_standards.html

We recommend the IP (inch and pound) version developed for the USA at https://passiv.de/downloads/03_building_criteria_ip_en.pdf

Many design and construction teams choose the LEB as their initial target for their building's performance, especially in environments (financial, climatic, energy costs, construction costs, etc.) where they conclude the cost of achieving the Passive House Standard's higher thermal/energy performance is not merited. They believe L-EB is their best "value proposition."

Others find the L-EB certification is a welcome "fall-back" certification when they attempt, but fail to achieve more stringent performance of the Passive House Standard or EnerPHit Standard, especially in their first few Passive House attempts.

Comparison of L-EB and Passive House Standard certification.

1. Identical: Defined by published criteria, required use of PHPP software calculating all certification performance values, no surface condensation allowed, all ventilation requirements, and all testing, reporting, and documentation requirements.
2. L-EB permitted air leakage (1.0 ACH @ 50 Pa) is 160% of permitted air leakage for a building meeting the Passive House Standard (0.6 ACH @ 50 Pa).
3. L-EB permitted Specific Annual Heat Demand is double the limit for the Passive House Standard.
4. L-EB permitted Specific Annual Cooling Energy Demand is double the limit for the Passive House Standard.
5. L-EB permitted whole-building energy demand (PER or Renewable Primary Energy and PE or Primary Energy) is 125% of the limit for the Passive House Standard.

If you would like any further assistance with this or understanding PHI's program, please contact us.

Sincerely,

/signed Christina A. Snyder and Tad Everhart/

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MCCB
MASSACHUSETTS COMMUNITY CLIMATE BANK™

September 17, 2024

by email: Finlayson, Ian (ENE) <ian.finlayson@mass.gov>

Massachusetts Department of Energy Resources
100 Cambridge Street, Suite 1020, Boston, MA 02114

RE: Stretch Code Feedback

Dear Ian:

I am writing in support of the addition of a 3rd compliance pathway to the current Stretch Energy Code and Municipal Opt-in Specialized Code (Proposed Option 3 for Final CoO) that Passive House of MA is advocating for. As an industry group, Passive House of MA is well informed and includes architects, engineers, builders and testing professionals on its board of directors. I support the below proposed adjustments to the current Stretch Energy Code and Municipal Opt-in Specialized Code. It may be useful to consider creating this 3rd pathway for a period of time as project teams build experience with the standards and to consider removing this 3rd pathway in the future.

Per Sections R405.2, R405.3, C407.3.2.1, and C407.3.2.2 of the Draft MA 2023 Residential and Commercial Stretch Code and Specialized Opt-in Code with proposed revisions, projects pursuing Passive House certification, whether through Phius or PHI, have two options for obtaining final CoO, as summarized below:

1. Option 1:
    a. Design phase pre-certification/approval
    b. Verification report demonstrating as-built conditions comply with Passive House requirements
    c. Statement from consultant confirming hygrothermal requirements are satisfied
    d. Statement from consultant confirming project satisfies all testing and modeling requirements
    e. Back-up documentation with test results
2. Option 2:
    a. Final certification letter from certifying body

While projects can obtain *temporary* CoO regardless of certification status, which is necessary for occupancy, the current proposed code language still puts extremely high-performance projects at risk by requiring Options 1 or 2 above for obtaining *final* CoO. Neither option above is feasible for development teams who fail to achieve final Passive House levels of performance despite well documented best

efforts. As currently written, the Draft Stretch Code and Opt-In Code do not support projects that achieve design phase certification, do their best to construct to Passive House levels of performance, but ultimately fall short of satisfying 100% of certification requirements. These projects need a defined path to achieve a final CoO in the event neither option above is attainable.

Without final CoO, projects may not convert high-interest rate construction loans to permanent mortgages. In low-income housing tax credit ("LIHTC") projects, the construction loan, typically paid down with LIHTC equity upon receiving final CoO, is significantly larger than the permanent mortgage, making the conversion critical for LIHTC developers to continue doing business in Massachusetts. Furthermore, it is not realistic for projects to pursue an appeal with their Authority Having Jurisdiction and/or the State, which would cause significant delays to project delivery, while adding cost and risk to very high-performance projects.

Given the quantity of Passive House projects in the state, estimated at more than 272 projects consisting of over 20,600 units, it is very likely that some of these projects that are designed to Passive House certification, as evidenced at the time of permitting, and constructed per design, as evidenced by frequent third-party inspection reports, may encounter insurmountable issues that make satisfying Option 1 and Option 2 impossible. These projects will have spent considerable time and money designing and constructing buildings with the intent of certifying – which will be easily documented with consultant contracts, inspection reports, and test results -- and yet still encounter issues such as air infiltration or ventilation balancing preventing final CoO. These projects require a 3rd option for achieving final CoO that does not reduce the performance objectives of the code nor present an easier, race-to-the-bottom option for developers to consider. The 3rd option proposed below requires **nearly identical requirements** for design and construction as the two existing options and should only be available for projects who cannot achieve options 1 or 2. This 3rd option must be included in code to avoid local review and waiver ambiguity, further delays, significant added costs, and extreme risk in an industry that cannot absorb additional cost.

3. Proposed Option 3 for Final CoO:

    a. Copy of certified Passive House consultant and rater/verifier contracts demonstrating all required inspections and testing requirements for certification
    b. Design phase pre-certification/approval
    c. Verification report demonstrating as-built conditions, including those that comply with Passive House requirements, and those that do not (if applicable)
        i. For projects following Phius, demonstrate final Energy Star and Zero Energy Ready Homes certification requirements are met.
    d. Hygrothermal analysis confirming the building does not face any durability concerns based on as-built condition
    e. Statement from Passive House consultant confirming project has completed all interim, final, and corrective testing and modeling requirements, including a summary of deviations from Passive House requirements
        i. Taped and untaped blower door testing at 50 Pascal and 75 Pascal demonstrating results are within 20% of Passive House requirements. If initial whole building blower door testing exceeds Passive House requirement, statement must reflect evidence of a re-test, with results, as well as an explanation for sources of leakage and attempted remediation efforts.

ii. Back-up documentation with test results for initial and follow up re-tests with explanation for any deviation from Passive House requirements

f. Ventilation flow rates demonstrating mechanical code compliance

This proposed 3rd option is nearly identical to Option 1 and offers similar flexibility as the Passive House Institute U.S. offers projects that may not satisfy all program requirements necessary for certification. Phius does not have adequate capacity to evaluate projects seeking waivers on a case-by-case basis in a timely manner, making it necessary for the Commonwealth to allow a similar approval path for municipal building departments.

Without this option, projects will face significant cost and major delays after having made significant investments in developing extremely well performing buildings. Project teams pursuing Passive House certification that have obtained pre-certification at design and who work closely with their consultants and contractors to follow all inspection and testing procedures necessary for Passive House certification are deserving of final CoO without facing onerous cost, risk, or delay.

Yours truly,

Maggie Super Church
Director of Policies and Programs
Massachusetts Community Climate Bank
Office: (617) 854-1060
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The Town of Barnstable
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Mark S. Ells, Town Manager
mark.ells@town.barnstable.ma.us

M. Andy Clyburn, Assistant Town Manager
andy.clyburn@town.barnstable.ma.us

September 17, 2024

Massachusetts Department of Energy Resources
c/o Ian Finlayson, Deputy Director, Energy Efficiency Division
100 Cambridge Street, 9th Floor
Boston, MA 02114

By Email only to: stretchcode@mass.gov

Subject: STRETCH CODE FEEDBACK

In August 2024, the Department of Energy Resources ("DOER") proposed changes to its stretch energy code and specialized opt-in code regulations and sought written comments with respect to the proposed changes. The Town of Barnstable ("Barnstable") is submitting these written comments regarding the proposed modifications.
The building energy code that currently applies to Barnstable is the base code. Thus far, Barnstable has not adopted the stretch code and, as a consequence, has not been designated as a Green Community under DOER's Green Communities program. Barnstable's Infrastructure and Energy Committee is currently exploring the advantages and disadvantages to the Town associated with adoption of the stretch code and becoming a Green Community. Adoption of the stretch code and applying for Green Community status would require approval of Barnstable's Town Council.

Barnstable's professional staff and its Infrastructure and Energy Committee have reviewed the proposed regulations and, as a general matter, support the proposed changes in that they provide clearer guidance with regard to code requirements and applicability, are more lenient in various respects especially with regard to major building additions and alterations, and provide more flexibility for builders and homeowners to comply with the code. As a result, adoption of these modifications (along with other reasonable changes that would serve the same objectives) would make it more likely that Barnstable in the future would adopt the stretch energy code and apply for Green Community status.

Barnstable appreciates that the proposed modifications are the result of feedback DOER has received, including from written comments received in April 2024, regarding the provisions of the stretch code and specialized opt-in code, and the practical impacts on homeowners, builders, designers, and building officials, and that the proposed changes are designed to make the rules and requirements more reasonable, less burdensome, and more workable. Barnstable also appreciates a major underlying rationale for the stretch and specialized opt-in codes and the Green Communities program—to incentivize reduction of Greenhouse Gase ("GHG") emissions in buildings, in furtherance of the Commonwealth's legally binding mandates for GHG reductions for 2030 and beyond.[1]

With regard to the specifics of the proposed modifications to the residential stretch code and specialized code applicable to major alterations and large additions, Barnstable supports:

1. Increasing (loosening) the HERS (Home Energy Rating System) performance standards from 52-58 to 65-75 but believes that the DOER could do more to help with remodeling projects, particularly in light of recent economic inflationary trends.
2. For large changes to historic buildings, allowing the use of the modified prescriptive compliance path rather than requiring HERS ratings.

We also support the proposed exception that would make it clear that finishing or partially finishing a basement or attic would not require a HERS rating (R502.1.1 Large Additions). Barnstable understands that this proposed change means that the square footage of such an addition would not count in the calculation that would trigger the stretch code HERS rating requirement of 1,000 square foot or exceeding 100% of the existing conditioned floor area. As an example, if a room was added equal to 500 square feet and a basement (or portion thereof) equal to 800 square feet was finished as part of the same project, such a project would not trigger the 1,000 square foot threshold for HERS ratings. DOER may want to consider whether the proposed language needs any further clarification. Barnstable also believes that the square footage limit of 1,000 should be increased to 1,250 which is 50% of the average home being constructed in the U.S. 50%, being the current threshold in the building codes requiring full upgrades to most systems.

With regard to new residential construction, Barnstable supports the additional flexibility offered by providing a 3-point optional HERS credit for builders who opt to use either low embodied carbon concrete or insulation products that meet the proposed standards.

[We note that with regard to the passive house building compliance option, DOER has proposed amending Section 4.502 and 4.503 in a manner that "allows building officials to issue a temporary certificate of occupancy to housing that the building official believes is ready to occupy while the developer/builder is waiting for successful completion of final testing and results."[2] Barnstable supports this modification.

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[1] In this regard, in November 2020, "due to the threat posed by climate change," Barnstable adopted "as its policy the objective of reducing net greenhouse gas emissions from human activity within and by the Town to zero to the extent technically and economically feasible." Both before and after adoption of this policy, Barnstable has taken a variety of relevant actions, including the support/building of renewable energy and electric vehicle charging stations, steps to reduce energy consumption in Town facilities, and electrification of part of the Town's motor vehicle fleet.

[2] Summary of Proposed Changes to 225 CMR 22.00 and 23.00 p. 1; see also p. 3.

While it may or may not be directly relevant to the proposed code modifications, Barnstable suggests that DOER update the economic analysis its consultants performed in 2022 comparing the cost of various types of new residential construction under the base code and stretch code. See https://www.mass.gov/doc/residential-stretch-code-costs-and-benefits-case-studies/download. In doing so, the updated analysis should:

1. Utilize the current/proposed stretch code and base code standards (e.g., maximum HERS rating of 45 for all-electric houses for stretch code);
2. Utilize updated cost estimates (e.g., for heating/cooling systems) and make assumptions explicit;
3. Update estimates, as needed, for rebates, tax benefits, and other governmental incentives (including income-based incentives, as applicable) and tons of Greenhouse Gases saved, with explanation of assumptions;[3]
4. Incorporate explicitly the cost of a HERS rater in the cost estimates.

Such an updated economic analysis is important to Barnstable in considering whether to adopt the stretch code. While we understand that a similar economic analysis with respect to large additions/major alterations is difficult due to the variety of such projects, economic analysis with respect to some examples of large additions/major alterations would be useful to Barnstable and likely to other interested parties.
Thank you for your consideration of these comments.

Sincerely,

Mark S. Ells, Town Manager

Cc: Andy Clyburn, Assistant Town Manager
Felicia Penn, Town Council President
David Anthony, Director Asset Management
Brian Florence, Director Inspectional Services
Barry Sheingold, Chair of Energy and Infrastructure Committee

[3] Incremental costs, if any, required to obtain rebates and/or tax benefits not otherwise accounted for should also be considered in the analysis.

The Town of Barnstable
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Mark S. Ells, Town Manager
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M. Andy Clyburn, Assistant Town Manager
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September 17, 2024

Massachusetts Department of Energy Resources
c/o Ian Finlayson, Deputy Director, Energy Efficiency Division
100 Cambridge Street, 9th Floor
Boston, MA 02114

By Email only to: stretchcode@mass.gov

Subject: STRETCH CODE FEEDBACK

In August 2024, the Department of Energy Resources ("DOER") proposed changes to its stretch energy code and specialized opt-in code regulations and sought written comments with respect to the proposed changes. The Town of Barnstable ("Barnstable") is submitting these written comments regarding the proposed modifications.
The building energy code that currently applies to Barnstable is the base code. Thus far, Barnstable has not adopted the stretch code and, as a consequence, has not been designated as a Green Community under DOER's Green Communities program. Barnstable's Infrastructure and Energy Committee is currently exploring the advantages and disadvantages to the Town associated with adoption of the stretch code and becoming a Green Community. Adoption of the stretch code and applying for Green Community status would require approval of Barnstable's Town Council.

Barnstable's professional staff and its Infrastructure and Energy Committee have reviewed the proposed regulations and, as a general matter, support the proposed changes in that they provide clearer guidance with regard to code requirements and applicability, are more lenient in various respects especially with regard to major building additions and alterations, and provide more flexibility for builders and homeowners to comply with the code. As a result, adoption of these modifications (along with other reasonable changes that would serve the same objectives) would make it more likely that Barnstable in the future would adopt the stretch energy code and apply for Green Community status.

Barnstable appreciates that the proposed modifications are the result of feedback DOER has received, including from written comments received in April 2024, regarding the provisions of the stretch code and specialized opt-in code, and the practical impacts on homeowners, builders, designers, and building officials, and that the proposed changes are designed to make the rules and requirements more reasonable, less burdensome, and more workable. Barnstable also appreciates a major underlying rationale for the stretch and specialized opt-in codes and the Green Communities program—to incentivize reduction of Greenhouse Gase ("GHG") emissions in buildings, in furtherance of the Commonwealth's legally binding mandates for GHG reductions for 2030 and beyond.[1]

With regard to the specifics of the proposed modifications to the residential stretch code and specialized code applicable to major alterations and large additions, Barnstable supports:

1. Increasing (loosening) the HERS (Home Energy Rating System) performance standards from 52-58 to 65-75 but believes that the DOER could do more to help with remodeling projects, particularly in light of recent economic inflationary trends.
2. For large changes to historic buildings, allowing the use of the modified prescriptive compliance path rather than requiring HERS ratings.

We also support the proposed exception that would make it clear that finishing or partially finishing a basement or attic would not require a HERS rating (R502.1.1 Large Additions). Barnstable understands that this proposed change means that the square footage of such an addition would not count in the calculation that would trigger the stretch code HERS rating requirement of 1,000 square foot or exceeding 100% of the existing conditioned floor area. As an example, if a room was added equal to 500 square feet and a basement (or portion thereof) equal to 800 square feet was finished as part of the same project, such a project would not trigger the 1,000 square foot threshold for HERS ratings. DOER may want to consider whether the proposed language needs any further clarification. Barnstable also believes that the square footage limit of 1,000 should be increased to 1,250 which is 50% of the average home being constructed in the U.S. 50%, being the current threshold in the building codes requiring full upgrades to most systems.

With regard to new residential construction, Barnstable supports the additional flexibility offered by providing a 3-point optional HERS credit for builders who opt to use either low embodied carbon concrete or insulation products that meet the proposed standards.

[We note that with regard to the passive house building compliance option, DOER has proposed amending Section 4.502 and 4.503 in a manner that "allows building officials to issue a temporary certificate of occupancy to housing that the building official believes is ready to occupy while the developer/builder is waiting for successful completion of final testing and results."[2] Barnstable supports this modification.

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[1] In this regard, in November 2020, "due to the threat posed by climate change," Barnstable adopted "as its policy the objective of reducing net greenhouse gas emissions from human activity within and by the Town to zero to the extent technically and economically feasible." Both before and after adoption of this policy, Barnstable has taken a variety of relevant actions, including the support/building of renewable energy and electric vehicle charging stations, steps to reduce energy consumption in Town facilities, and electrification of part of the Town's motor vehicle fleet.

[2] Summary of Proposed Changes to 225 CMR 22.00 and 23.00 p. 1; see also p. 3.

While it may or may not be directly relevant to the proposed code modifications, Barnstable suggests that DOER update the economic analysis its consultants performed in 2022 comparing the cost of various types of new residential construction under the base code and stretch code. See https://www.mass.gov/doc/residential-stretch-code-costs-and-benefits-case-studies/download. In doing so, the updated analysis should:

1. Utilize the current/proposed stretch code and base code standards (e.g., maximum HERS rating of 45 for all-electric houses for stretch code);
2. Utilize updated cost estimates (e.g., for heating/cooling systems) and make assumptions explicit;
3. Update estimates, as needed, for rebates, tax benefits, and other governmental incentives (including income-based incentives, as applicable) and tons of Greenhouse Gases saved, with explanation of assumptions;[3]
4. Incorporate explicitly the cost of a HERS rater in the cost estimates.

Such an updated economic analysis is important to Barnstable in considering whether to adopt the stretch code. While we understand that a similar economic analysis with respect to large additions/major alterations is difficult due to the variety of such projects, economic analysis with respect to some examples of large additions/major alterations would be useful to Barnstable and likely to other interested parties.
Thank you for your consideration of these comments.

Sincerely,

Mark S. Ells, Town Manager

Cc: Andy Clyburn, Assistant Town Manager
Felicia Penn, Town Council President
David Anthony, Director Asset Management
Brian Florence, Director Inspectional Services
Barry Sheingold, Chair of Energy and Infrastructure Committee

[3] Incremental costs, if any, required to obtain rebates and/or tax benefits not otherwise accounted for should also be considered in the analysis.

Edson, Becca (ENE)

From: Shari Rauls <srauls@swinter.com>
Sent: Tuesday, September 17, 2024 3:43 PM
To: STRETCHCODE (ENE)
Subject: STRETCH CODE FEEDBACK

Follow Up Flag: Follow up
Flag Status: Completed

Mass. Stretch Code Residential Public Comments by Steven Winter Associates

Steven Winter Associates strongly supports the added Embodied Carbon Credit to the HERS compliance pathway in both the residential and commercial Mass Stretch Codes.
A 3-point credit for embodied carbon measures in the HERS score encourages teams to incorporate materials with lower global warming potentials in the design. Projects struggling to meet the HERS 45 will also benefit by reducing the total carbon of the building through concrete and/or insulation.

Programmatic suggestions:
Align the targeted materials, strategies and concrete benchmarks with emerging Commonwealth departments and utility programs like the drafted Mass Save incentive for embodied carbon (LINK). Other frameworks to be aware of include ASHRAE 240P, CLF Benchmarks and Federal Buy Clean benchmarks.

1. Align the material benchmarks with leading industry GSA Buy Clean benchmarks for concrete, steel, glass, and gypsum.
    a. For concrete specifically, the GSA Buy Clean benchmark values include data from a wide range of manufacturers, not only NRMCA members. LEED v5 also aligns directly with GSA concrete thresholds. The GSA Buy Clean top 20% limit is still quite a bit higher than the proposed concrete thresholds in the Stretch Code updates. This leads us to believe that the concrete threshold values indicated in the stretch code are not achievable. We suggest aligning with the GSA Buy Clean top 20% limit.
2. Consider the drafted Mass Save incentive, which proposes a hybrid approach to reducing embodied carbon in new homes/buildings and major renovations, combining both a materials-based approach and a whole building approach. Applied here, we suggest a tiered HERS bonus option for simply doing a whole building LCA (1 point) and additional points for using materials lower than the GSA Buy Clean (2-3 points). Encouraging the industry to do a Whole Building LCA can achieve more significant carbon reductions than prescriptive material options alone.
3. Keep in mind that LEEDv5, which applies in many jurisdictions and the Commonwealth for commercial and large MF projects, also references the GSA Buy Clean material list and benchmarks. Aligning with GSA Buy Clean benchmarks could reduce redundancy and confusion. Although there is not a timeframe for LEEDv5 for Homes and Multifamily yet, this could avoid misalignment in the future and streamline embodied carbon processes for teams working on multiple building types.

Technical questions/suggestions:

1. The Embodied Carbon HERS credit for concrete should be taken on a whole building scale for multifamily projects, rather than on a unit scale. The language as it is written now is confusing. If it were on a unit scale, a first-floor slab on grade unit in a 3 story all-electric building have a HERS 48 threshold to meet the stretch code if it installs 90% by weight low carbon concrete in the slab, but a unit in the middle floor in the same building, with no concrete associated with the HERS model, would still have the HERS 45. For multifamily buildings, middle floor apartments are often the worst-case units, so allowing the bottom floor unit to have a higher HERS threshold won't incentivize a project to install low carbon concrete, nor reward a project for doing so. Therefore, we recommend changing the language in the updated stretch code to apply the Low GWP Concrete Mix Credit for the "whole building" not "for one or more new dwelling units." See below.

R406.5.4 *Add Subsection R406.5.4, as follows:*

> **R406.5.4 Documentation for Low GWP concrete mix credit.** In order to apply the Low GWP Concrete Mix Credit for one or more new dwelling units, the HERS rater of the unit must submit specific EPDs for concrete used in the unit. Where multiple concrete mixes are used, a complete calculation to summarize estimated embodied carbon emissions from all concrete materials used in the project is required. The output metric for this measure shall be global warming potential (GWP) per cubic meter as supplied, with the EPD verified by the concrete ready-mix provider. The 3 HERS point credit shall be applied when the GWP per cubic meter is demonstrated to be less than the Maximum GWP per cubic meter value shown in Table R406.5.4. for at least 90% of all concrete used for that unit.

2. The Embodied Carbon HERS credit for insulation should also be taken on a whole building scale for multifamily projects, rather than on a unit scale. To calculate the insulation embodied carbon credit, the Stretch Code language is written to apply for the "new dwelling unit" using a calculation from "all insulation materials used in the project." This needs clarification whether all apartment units in a multifamily project, where the insulation credit was calculated using a whole building calculator like BEAM, will achieve the insulation credit. If the unit boundary within a multifamily dwelling unit is drawn at the demising wall/floor and corridor walls, is the insulation of the roof not included in a bottom floor unit and the slab insulation not included in the calculation for a top floor unit? Performing a whole building analysis would simplify the calculation and reward the project with a fair point leniency across all units, regardless of where the worst-case unit is located. This is the same argument as for low embodied carbon concrete and we recommend changing the language in the stretch code from "new dwelling unit" to "new project" and clearly defining where the project boundary is. See below:

R406.5.3 *Add Subsection R406.5.3, as follows:*

> **R406.5.3 Documentation for insulation embodied carbon credit.** In order to apply the Insulation Embodied Carbon Credit for a new dwelling unit, the HERS rater of the unit must submit a complete calculation to summarize estimated embodied carbon emissions from all insulation materials used in the project. The output metric for this measure shall be global warming potential (GWP) intensity, capturing insulation GWP per conditioned square foot of project area. To complete the basic calculation, project teams shall provide the following information for foundation, floor, wall, and roof insulation materials:

3. "Table R406.5.3 Default Insulation Global Warming Potential Values" indicates that GWP values come from BEAM:

TABLE R406.5.3 *Add Table R406.5.3, as follows:*

> **TABLE R406.5.3 DEFAULT INSULATION GLOBAL WARMING POTENTIAL VALUES**
> All values are from Building Emissions Accounting for Materials (BEAM)[a], unless noted.

We would like to see another reference showing where BEAM gets their information from. We support using open-source tools to document reductions to allow teams options.

4. Smaller dwelling units often don't perform as well in energy models. Since the code language does not allow an average HERS Index Score across all units in a multifamily building, this means smaller units are often the worst-case scenario. We propose a 3 HERS point offset for newly constructed dwelling units ≤ 850 ft^2.

	Maximum HERS Index Score			
	NC	NC ≤ 850 ft^2	NC with EC Credit	NC with EC and ≤ 850 ft^2 Credit
Mixed Fuel	42	45	45	48
All Electric	45	48	48	51

5. Table R406.5 Maximum Energy Rating Index is confusingly written for new construction solar electric generation. There is no change in HERS score in the table, but when referencing R406.5.1 Trade-off for Clean Energy Systems, bullet point 2. clearly references "new construction" having a 3 HERS point offset, which should make the HERS score for "solar electric & all-electric building" be 48 instead of 45. If this isn't the case, then the writing should be reworded to remove "new construction" in the second bullet of R406.5.1 Trade-off for Clean Energy Systems. See below:

TABLE R406.5 MAXIMUM ENERGY RATING INDEX

Clean Energy Application	Maximum HERS Index score [a,b]				
	~~New Construction until June 30, 2024~~	New construction permits after July 1, 2024	New Construction with R406.5.2 embodied carbon credit	Accessory Dwelling Units	Major alterations, additions, or Change of use[c]
Mixed-Fuel Building	~~52~~	42	45	52	~~52~~ 65
Solar Electric Generation	~~55~~	42	45	55	~~55~~ 70
All-Electric Building	~~55~~	45	48	55	~~55~~ 70
Solar Electric & *All-Electric Building*	~~58~~	45	48	58	~~58~~ 75

[a] Maximum HERS rating prior to onsite renewable electric generation in accordance with Section R406.5

[b] The building shall meet the mandatory requirements of Section R406.2, ~~and the building thermal envelope shall be greater than or equal to the levels of efficiency and SHGC in Table R402.1.2 or Table R402.1.4 of the 2015 International Energy Conservation Code.~~

[c] Alterations, Additions or Change of use covered by Section R502.1.1 or R503.1.5 are subject to this maximum HERS rating, except for Historic buildings which may opt to follow the prescriptive compliance pathway in R401.2.1.

R406.5.1 Trade-off for Clean energy systems. New construction following Section R406 or existing buildings and additions following IECC chapter 5[RE] may use clean energy trade-offs to increase the maximum allowable HERS rating for each unit separately served by any combination of the following:

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.

Mass. Stretch Code Commercial Public Comments by Steven Winter Associates

Steven Winter Associates strongly recommends adding requirements in the commercial Mass Stretch Code to address embodied carbon in materials specifically concrete, steel, glass, and insulation. An approach modeled on the CALGreen Mandatory Measures for Embodied Carbon Reduction requires all nonresidential building projects over 100,000 square feet and public K-12 school building projects over 50,000 square feet to comply with one of three pathways: (1) reuse at least 45% of an existing structure; (2) complete a WBLCA that demonstrates 10% lower embodied emissions than a baseline project; or (3) provide EPDs and meet maximum CO2e limits for certain materials. CO2e limits for concrete, steel, glass, and insulation align with the GSA Buy Clean benchmarks. The CA Building Code Commission voted unanimously to approve these requirements, which go into effect in July 2024. An FAQ for the adopted code and sample language can be found HERE. We recommend adopting similar requirements in the Mass Stretch Code as was done in California.

Thank you for taking the time to read our comments.

Best,
Shari Rauls on behalf of Steven Winter Associates.

Shari Rauls
Sustainability Consultant
[Pronounced: SHAH-ri]

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swinter.com + Party Walls Blog | Buildings + Beyond Podcast

Join our team! We are always looking for talented individuals who are passionate and driven to improve the built environment.

To: Ian Finlayson, Department of Energy Resources

From: Christine Vohringer, Perkins Eastman Architects.

Re: Stretch Code Feedback

We would like to start by expressing our gratitude for most of the Stretch Code proposed new aspects together with the pursue behind this enormous effort, we believe this will certainly be the first step for a more sustainable Massachusetts.

While most of the updates to the requirements were really positive, we do believe the following changes are not sufficiently defined and recommend clearer language:

1. Requirements for Derating and Thermal Bridges in Alterations (C503.2.4)

   a. We applaud the DOER's efforts to make retrofits of existing buildings more attainable. The exception to exclude existing thermal bridges needs clarification as to the definition of "inherent to the building structure and/or components that are not part of the alteration". For example: would adding insulation result in an assembly becoming "part of the alteration" and therefore trigger compliance, which would deter people from adding insulation? Also, what parts are "inherent to the building structure"?.

2. Insulation of Existing Wall Cavities (C503.1)

   a. This requires further guidance (possibly in the Technical Guidance Document) to address situations such as replacing windows could result in >10 square feet of wall cavity being opened but should not necessarily trigger bringing the wall up to compliance. Additionally, clarification how many localized cavity openings would be allowable or further definition (could have 20 'localized' cavity openings in a single wall?)

While we recognize the progress made in the current code revisions, there remain several concerns and areas for further improvement that may not be fully addressed through this update process. These issues warrant continued collaboration and consideration in code revisions and guidance from DOER.

1. **TEDI Guidelines:** The current Total Energy Design Index (TEDI) guidelines remain a challenge for some net-zero buildings, particularly when well-designed projects still face difficulties in meeting the prescribed limits. We recommend further refining TEDI modeling protocols to better accommodate a range of building designs while maintaining the goal of energy efficiency and sustainability. TEDI should be updated to more accurately represent building performance. It is fair for TEDI to be more stringent than PH since there is less scrutiny and QA/QC as compared to the passive house process, but it still needs to be attainable in real world projects without requiring a separate energy model that is of no use to the building owner.
2. **Increased Support for Stakeholder Engagement:** A key area that requires attention is the expansion of resources to engage a more diverse range of stakeholders, particularly small businesses and under-resourced professionals who may struggle to navigate the complexity of these updated codes. Consistent, accessible support from DOER will be essential to ensuring equitable compliance and adoption.

3. **Energy Modeling Assistance:** there is a need from building practitioners for clearer guidance and collaboration on energy modeling for compliance. Creating partnerships or providing tools for energy model review would significantly aid professionals in adhering to the updated code requirements.

4. **The embodied carbon section,** referenced in the commercial code, exists within the residential code. This creates confusion, and we think that section may be better as a separate document referenced by both codes. Also, concrete embodied carbon crediting could be tiered.

5. **Photovoltaic (PV) Roof Panels:** Although stakeholders requested clearer provisions on the installation of PV roof panels, this issue was not addressed in the proposed changes. We urge DOER to revisit this topic in code updates, given the critical role of renewable energy in achieving the state's net-zero goals.

6. **Curtainwall De-rating for Thermal Breaks:** Section C503.2.4 offers general guidance on thermal de-rating for walls with thermal bridges, but it does not fully address the unique thermal performance challenges of curtainwall systems. It's important to address the complexity of tables for determining curtainwall de-rating for thermal breaks because the current format can lead to confusion and errors in energy code compliance. Simplifying these tables would improve clarity for designers and builders, ensuring more accurate assessments of thermal performance and encouraging broader adoption of energy-efficient practices.

7. **Change of Use in Existing Buildings:** Section C505.1 lacks clarity around 'change of use' requirements, particularly in cases where there is an increase in energy use. The current language is open to various interpretations, especially regarding partial reconfiguration of spaces (e.g., an office increasing lab space). Clear guidelines, including practical examples and baseline energy use clarifications, are crucial to ensure consistency in code enforcement and avoid misapplication

8. **Finally we, share the concern shared by Passive House Massachusetts regarding the Municipal Opt-in Specialized Code pertaining to projects pursuing passive house certification and seeking final certificate of occupancy ("CoO").** Per Sections R405.2, R405.3, C407.3.2.1, and C407.3.2.2 of the Draft MA 2023 Residential and Commercial Stretch Code and Specialized Opt-in Code with proposed revisions, projects pursuing passive house certification, whether through Phius or PHI, have two options for obtaining final CoO, as summarized below:

1. Option 1:
    a. Design phase pre-certification/approval
    b. Verification report demonstrating as-built conditions comply with passive house requirements
    c. Statement from consultant confirming hygrothermal requirements are satisfied
    d. Statement from consultant confirming project satisfies all testing and modeling requirements

e. Back-up documentation with test results

2. Option 2:
    a. Final certification letter from certifying body

While projects can obtain *temporary* CoO regardless of certification status, which is necessary for occupancy, the current proposed code language still puts extremely high-performance projects at risk by requiring Options 1 or 2 above for obtaining *final* CoO. Neither option above is feasible for development teams who fail to achieve final Passive House levels of performance despite well documented best efforts. As currently written, the Draft Stretch Code and Opt-In Code do not support projects that achieve design phase certification, do their best to construct to passive house levels of performance, but ultimately fall short of satisfying 100% of certification requirements. These projects need a defined path to achieve a final CoO in the event neither option above is attainable.

Without final CoO, projects may not convert high-interest rate construction loans to permanent mortgages. In low-income housing tax credit ("LIHTC") projects, the construction loan, typically paid down with LIHTC equity upon receiving final CoO, is significantly larger than the permanent mortgage, making the conversion critical for LIHTC developers to continue doing business in Massachusetts. Furthermore, it is not realistic for projects to pursue an appeal with their Authority Having Jurisdiction and/or the State, which would cause significant delays to project delivery, while adding cost and risk to very high-performance projects.

Given the quantity of passive house projects in the state, estimated at more than 272 projects consisting of over 20,600 units, it is very likely that some of these projects that are designed to Passive House certification, as evidenced at the time of permitting, and constructed per design, as evidenced by frequent third-party inspection reports, may encounter insurmountable issues that make satisfying Option 1 and Option 2 impossible. These projects will have spent considerable time and money designing and constructing buildings with the intent of certifying – which will be easily documented with consultant contracts, inspection reports, and test results -- and yet still encounter issues such as air infiltration or ventilation balancing preventing final CoO. These projects require a 3rd option for achieving final CoO that does not reduce the performance objectives of the code nor present an easier, race-to-the-bottom option for developers to consider. The 3rd option proposed below requires **nearly identical requirements** for design and construction as the two existing options and should only be available for projects who cannot achieve options 1 or 2. This 3rd option must be included in code to avoid local review and waiver ambiguity, further delays, significant added costs, and extreme risk in an industry that cannot absorb additional cost.

3. Proposed Option 3 for Final CoO:

a. Copy of certified passive house consultant and rater/verifier contracts demonstrating all required inspections and testing requirements for certification

b. Design phase pre-certification/approval

c. Verification report demonstrating as-built conditions, including those that comply with passive house requirements, and those that do not (if applicable)

i. For projects following Phius, demonstrate final Energy Star and Zero Energy Ready Homes certification requirements are met.

d. Hygrothermal analysis confirming the building does not face any durability concerns based on as-built condition

e. Statement from passive house consultant confirming project has completed all interim, final, and corrective testing and modeling requirements, including a summary of deviations from passive house requirements

i. Taped and untaped blower door testing at 50 Pascal and 75 Pascal demonstrating results are within 20% of passive house requirements. If initial whole building

blower door testing exceeds passive house requirement, statement must reflect evidence of a re-test, with results, as well as an explanation for sources of leakage and attempted remediation efforts.

ii. Back-up documentation with test results for initial and follow up re-tests with explanation for any deviation from passive house requirements

f. Ventilation flow rates demonstrating mechanical code compliance

This proposed 3rd option is nearly identical to Option 1 and offers similar flexibility as the Passive House Institute U.S. offers projects that may not satisfy all program requirements necessary for certification. Phius does not have adequate capacity to evaluate projects seeking waivers on a case-by-case basis in a timely manner, making it necessary for the Commonwealth to allow a similar approval path for municipal building departments.

Without this option, projects will face significant cost and major delays after having made significant investments in developing extremely well performing buildings. Project teams pursuing passive house certification that have obtained pre-certification at design and who work closely with their consultants and contractors to follow all inspection and testing procedures necessary for passive house certification are deserving of final CoO without facing onerous cost, risk, or delay.

Sincerely,

_____

Christine Vohringer
Sustainability Specialist
Perkins Eastman Architects

NEHERS
NORTHEAST HOME ENERGY RATING SYSTEM ALLIANCE

PO Box 808
Northampton, MA 01061

9/17/24

Department of Energy Resources
c/o Ian Finlayson, Deputy Director, Energy Efficiency Division
100 Cambridge Street, Suite 1020
Boston, MA 02114

Dear Mr. Finlayson,

These comments are submitted on behalf of the Northeast Home Energy Rating System Alliance (NEHERS)'s Energy Code Committee and Embodied Carbon Committee. The NEHERS Alliance was formed in 1998 to foster, unify and promote HERS programs in the Northeast and we represent over 250 rater members, plus over 125 RFI, Modeler, and HERS Rater candidates in training. The Energy Codes Committee is responsible for reviewing the Residential Energy Code with respect to HERS Raters concerns and taking actions where appropriate to attempt to improve the clarity and implementation of the Residential Energy Code. The Embodied Carbon Committee is leading an initiative to propose a new RESNET Standard on Embodied Carbon and will be conducting a 100-Home Embodied Carbon Study on new construction in MA this fall.

We applaud Massachusetts' efforts to create an energy code that is ambitious and designed to meet the state's climate goals and appreciate the commonwealth's interest in addressing Embodied Carbon.

Although we do support the overall goal of addressing embodied carbon, our members have expressed questions and concerns around the specific requirements which we have outlined below.

- Is this credit available for multi-family housing development projects with multiple dwelling units that have a shared thermal boundary? If so, how would the credit be allocated? Would each unit receive the 3-points?
- We also request clarification on how to calculate the GWP in situations where two insulation types are used in one cavity-such as flash and batt, or possibly 3 inches of closed cell spray foam plus cellulose? It isn't explicitly described how this would be addressed in the code and clarification would be helpful for the HERS Rater community.
- There are a couple of errors we noticed as well to be addressed. In Section R406.5.2 (1) the table number referenced is Table R406.5.2, however the default values are in Table R406.5.3. Additionally, Item 4 of section R406.5.3 does not have an "R" before the reference to "Table 406.5.3".

We support DOER's recommendation to adjust the stringency of the requirements for large existing building additions and alterations. As we had noted in previous comments in April, "*a HERS 52 is difficult to achieve in an existing building because the air leakage of unaltered portions of the building remains high, and a whole home blower door test is going to include both new and existing portions of the thermal envelope. Rating the whole home will also factor in equipment that may not be replaced, which can also negatively impact the energy model."* By adjusting the limits for additions and alterations to HERS 65, 70, or 75 to align with the base code, the requirements will become easier to enforce and less burdensome to our clients and the larger building community.

These public comments are intended to express a snapshot of the biggest concerns of the HERS industry about the updates to the Stretch Code and Municipal Opt-In Specialized Code, and we encourage our members to submit their own additional comments for clarification.

The Northeast HERS Alliance appreciates the opportunity for public comment, and we encourage the DOER to reach out to us with any questions or concerns,

Thank You!

Betsy L. Ames

Betsy L. Ames
Executive Director
On behalf of the NEHERS Energy Code Committee and NEHERS Embodied Carbon Committee

Edson, Becca (ENE)

From: Amy Latva-Kokko <alatvakokko@dskap.com>
Sent: Tuesday, September 17, 2024 3:23 PM
To: STRETCHCODE (ENE)
Cc: Jeff Dearing
Subject: STRETCH CODE FEEDBACK - Residential

Follow Up Flag: Follow up
Flag Status: Completed

DOER Committee Members,
Thank you for this opportunity to provide feedback/suggestions for proposed amendments to the stretch code. The following comments/suggestions were compiled from architects in our office who are focused on residential design. These notes are all based on conversations, questions, and challenges that we have encountered over the past year:

AMMENDMENT CONSIDERATIONS:

- **Garages:**
  - ***Omit the HERS Requirement for Garages:***
    - Air sealing around overhead doors is very difficult and generally impractical with current technology.
    - The level of conditioning is less than the primary residence, so the impact is lessened.
  - ***Maintain the Requirements for:***
    - Air sealing at the person door between the garage and primary residence.
    - Building envelope associated with the primary residence.

- **Solar Requirement:**
  - Provide an acceptable alternative to rooftop solar minimum requirements for homes over 4,000 sf:
    - Where Town bylaws preclude the cutting of trees necessary to provide enough shade free roofing area to comply with the requirements.
    - Where Conservation Land and/or Wetlands regulation compliance impacts the ability to provide shade free roofing area to comply with the requirements.
    - Consider utilizing R406.5.2.1 Insulation Embodied Carbon Credit to partially offset the current required solar requirements.

- **Address how to Measure a Structure's Square & Cubic Footage for Lot Coverage, FAR, ADU, etc. :**
  - Compliance with the Stretch Code often requires the incorporation of continuous insulation for both walls and roofs:
    - The addition of continuous insulation adds dimension to the thickness of wall and roof assemblies:
      - Where to measure is an open question / interpretation for each Town:
      - Addition thickness if measured to the outer face adversely affects the net usable square & cubic footage.

- Suggest stipulating a standard that provides the equivalent net usable square footages such as face of foundation, or face of primary frame sheathing.

- **Zero Fossil Fuel (In particular this applies to work in the 10 pilot Fossil Fuel Communities)**
  - ***Allow Dual Fuel Ranges and Gas Cooktop*** [natural gas/propane] Appliances. This would only apply to the cooktop, or the cooktop portion of the appliance:
    - Rationale: Natural gas and propane cooking appliances are still the primary choice / preference for homeowners. Traditional electric for cooktop applications is considered substandard, and induction is relatively unknown, and many homeowners are only familiar with the issues associated with the early generation of induction cooktops.
    - Induction is now making its way to center stage, but there are well documented issues associated with tripping GFI outlets. We know of inspectors allowing replacement of GFI only where tripping is demonstrated, but this adds trips , frustration and work unnecessarily.
    - Induction hasn't had the time required to make it a perceived equivalent, or superior technology to gas.
    - Homeowners are consistently expressing their anger / frustration over this limitation.
    - The step to no fossil fuels while commendable as a goal, is too big of an initial step. The omission of fossil fuels for home heating, water heating, and clothes drying is a significant step forward and it addresses a significant portion of fossil fuel usage in the home. However, cooktops and dual fuel ranges with their intermittent use do not have the same impact as continuous fossil fuel use for heating and cooling.
    - Outdoor natural gas and propane grills & cooktops are allowed as they are not part of the building envelope and thus not regulated by the stretch code.
    - Unless the electric source for these homes is supplied from 100% clean, renewable sources, is there any measurable advantage or disadvantage to allowing their use?

  - ***Allow Natural Gas and Propane Fireplaces:***
    - Fireplaces are typically an occasional and / or seasonal use. They are no longer used as the primary heat source for the house, thus the impact on the goals of the stretch code is negligible.
    - Wood burning fireplaces are still permitted, since wood is not a fossil fuel. Wood burning fireplaces are not as environmentally friendly as natural gas or propane.
    - Electric fireplace simulators are not an acceptable or equivalent alternative. They are still in the early stages of development and do not provide an equivalent approximation of a wood or gas fireplace. The only equivalent is the real thing, wood burning, which is less environmentally friendly.
- ***List of Exclusions:***
  - Provide a list of exclusions to level the playing field for all Towns throughout the Commonwealth. Examples include:
    - Outdoor grills, fire pit / fire table, generator and pool/spa heating:
      - Natural Gas and Propane are acceptable.
        These uses / elements are not part of the building enclosure and thus ought to be exempt from Stretch Code requirements.
    - Wood burning fireplaces:
      - Wood is not a fossil fuel and therefore ought to be exempt from Stretch Code requirements.

We would be happy to follow up with you on any of these matters.
Sincerely,
Amy

Amy Sheehan Latva-Kokko, AIA, CPHD, LEED BD+C
Sustainability Leader | Senior Project Manager

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2023 Best Places to Work
Boston Business Journal

Via Electronic Mail

September 17, 2024

Ian Finlayson
Deputy Director, Energy Efficiency Division
Massachusetts Department of Energy Resources
100 Cambridge Street, Suite 1020
Boston, MA 02114

Dear Mr. Finlayson,

MATEP, LLC is pleased to submit these comments in response to the Department of Energy Resource's ("Department") August 8th, 2024, request for public comment related to the Department's release of proposed revisions to the Commercial Stretch code ("Stretch Code") and Specialized Opt-in code. MATEP supports the Department's effort to update the existing Stretch Code to encourage more energy-efficient, sustainable, and resilient solutions for heating and cooling the Commonwealth's buildings. We look forward to working with the Department to develop the Stretch Code. In particular, as it applies to microgrid and district heating and cooling systems, such as MATEP, which will build on the work MATEP is considering to decarbonize its operations.

I. ABOUT MATEP

The Medical Area Total Energy Plant ("MATEP") facility, is a combined heat and power (CHP) plant, electricity microgrid and district heating and cooling network serving the needs of The Harvard Medical School and affiliated hospitals and research institutions in the Longwood

Medical Area.[1] The facility is co-owned (with Axium Infrastructure) and fully operated by ENGIE North America, Inc. ("ENGIE").

In 2018, ENGIE and Axium Infrastructure, operating jointly as Longwood Energy Partners ("LEP"), acquired MATEP. MATEP, a microgrid and district energy system ("DES") is integral to the day-to-day operation of several world-renowned medical facilities, which are active in critical research initiatives and have approximately 2,000 hospital beds serving more than 100,000 inpatients and 2.4 million outpatients annually. District energy networks are ideal for the energy needs of critical institutions because they are among the most efficient, reliable, and cost-effective ways to provide energy security while improving sustainability.

ENGIE's 33-year service agreement provides central plant management for the six main facilities. The agreement includes the microgrid, with a capacity to produce 94 MW of electricity, 1,050,000 lbs./hr. of steam, and 42,0000 tons of chilled water, serving an 11.2-million-square-foot district heating and cooling network in 74 buildings.

Importantly, MATEP is vastly more efficient than the electricity MATEP customers would otherwise draw from the electricity grid. For example, the efficiency of MATEP is approximately 65 percent compared with the overall Independent System Operator for New England's ("ISO-NE") system efficiency of approximately 40 percent. On certain portions of the facility, MATEP produces 110 percent of the energy that it consumes. MATEP remains vital to the customers it serves.

[1] The six medical institutions are Beth Israel Deaconess Medical Center, Boston Children's Hospital, Brigham and Women's Hospital, Dana-Farber Cancer Institute, Harvard Medical School and School of Public Health and Joslin Diabetes Center. MATEP also provides steam-only service to a Merck facility in the Longwood neighborhood.

II. ABOUT ENGIE SA and ENGIE NA

ENGIE SA, a global energy company and leader in the transition to low-carbon energy solutions and services has a mission to accelerate the transition towards a carbon-neutral world. ENGIE SA is a principal player globally in sustainable heating networks fed from renewable sources or waste heat, and in highly efficient cooling networks. Co-ownership and operation of MATEP is a testament to the work ENGIE is doing to accelerate the transition to carbon-neutrality in the Commonwealth.

ENGIE participates in several aspects of the energy economy in the Commonwealth as well as across the United States. ENGIE owns and operates 5 GW of grid-scale and distributed renewable and energy storage projects, some of which participate in the Massachusetts programs. We also supply natural gas and electricity to 40,000 corporate and industrial customers, manage assets in multiple wholesale competitive markets and have a 1 GW of green hydrogen and sustainable fuels ambition by 2030.

III. COMMENTS

a. The Department should provide additional information on "Direct Energy System Order of Conditions" so that stakeholders can comment and engage appropriately.

MATEP requests that the Department provide further information related to "District Energy System Order of Conditions" ("Order of Conditions"). Specifically, MATEP would like to better understand the form and content of an Order of Conditions and how it would be negotiated and agreed to between the Department and the DES.

MATEP offers that an Order of Conditions should be specific to the DES it purports to regulate. Further, it is essential that the DES owner and operator are deeply involved in the design and finalization of the Order of Conditions. Not only is each system unique, but the

systems are highly complex and face their own challenges to decarbonization. For example, some DES, like MATEP, are located in urban settings with limited space and limited access to utility services. Further, these systems provide electric and gas distribution-like service to their customers but are also themselves customers of the electric distribution and local gas distribution companies. However, there is no analogue to the additional services that MATEP provides to its customers including high pressure steam and cooling. Ownership models are different. And customer are different. A one-size-fits-all solution or Order of Conditions is not feasible for the DES in the Commonwealth.

Further, in response to the City of Boston's Building Emissions Reduction and Disclosure Ordinance ("BERDO") in alignment with ENGIE's mission to be a leader in the net-zero carbon transition, MATEP has invested significant resources developing possible decarbonization pathways for the customers that it serves in the Longwood Medical Area (ÈLMA"). MATEP has performed extensive technical and economic analyses evaluating the most efficient and economic solutions. However, given the complexity of MATEP's operations, the size of the facility, and the exigent need that the hospitals and academic and research facilities have for reliable power, the decarbonization process is not simply a matter of retrofitting either the existing plant or individual campuses or buildings with heat pumps. The decarbonation of the LMA will be a multi-decade, multi-million-dollar effort.

Decarbonization efforts will require a thoughtful and highly planned implementation schedule so as not to disrupt the provision of electricity, heat and cooling to the buildings served by MATEP in the LMA. Currently the LMA area is constrained by the current infrastructure that is in place. Any efforts on the part of MATEP and/or its end use customers will likely require significant upgrades to the electrical transmission and distribution infrastructure in the

LMA and may ultimately be dependent upon the successful decarbonization of the electricity and fuels being provided to the area from Eversource and National Grid, respectively.

b. The Department should clarify central plant requirements for district energy systems connecting new buildings.

MATEP recommends that the Department provide specific and explicit guidance for new buildings and renovations that are connecting to existing district energy systems (DES). Clarification on whether the Department is considering DES central plant requirements separate from the building heating requirements provided in the Stretch Code (e.g. section C401.4.1) (see below comment III c) would also be helpful. Further, it would be helpful to understand whether the Department is considering requirements for electrification of cooling (electric vs. steam-driven chillers). Also, whether the Department will consider separate efficiency requirements for equipment located at a central DES plant vs. in-building equipment. Also, because it will be difficult to electrify to serve some load types reliably, it may be helpful to consider that, in lieu of electrification, whether there should be consideration for the use of clean fuels such as renewable natural gas ("RNG") or clean hydrogen ("H2") to decarbonize a central plant's power and thermal generation.

c. The Department should clarify what percentage of heating must be electrified.

Given that there are different approaches to electrifying heating load, MATEP recommends that the Department clarify the percentage of heating load that must be electrified. The Stretch Code states that "Electric air source, *exhaust source*, or ground source heat pump systems shall supply 25% of the building's peak space heating and ventilation air heating load…" It is not clear whether this provision means that 25% of overall load must be electrified by heat pumps or that 25% of the electrified load must be electrified using heat pumps.

d. The Department should consider expanding the types of allowable technologies included in the Stretch Code to both facilitate and accelerate the clean energy transition.

ENGIE recommends that the Department consider expanding the types of technologies included in the Stretch Code, including electric boilers. While technology is improving, heat pump technology for steam systems is not sufficiently advanced to utilize in our processes. The sizing of the units is small and would not meet the current load requirements. Electric boilers would provide MATEP the opportunity to meet electrification goals while also maintaining the high level of reliability required by the medical institutions that we serve.

Additionally, by including electric boilers MATEP could potentially meet the new code requirements without significantly impacting the DES distribution system. For example, this change would be a straightforward boiler substitute out for the electrification, rather than new equipment and design changes to the distribution that may be required for heat pumps.

IV. CONCLUSION

MATEP thanks the Department for the opportunity to comment its release of proposed revisions to the Commercial Stretch code ("Stretch Code") and Specialized Opt-in code. MATEP supports the Department's effort to update the existing codes to encourage more energy-efficient, sustainable, and resilient solutions for heating and cooling the Commonwealth's buildings. We look forward to further engaging with the Department on the complexities

relating to DES. MATEP is available to discuss any of the above recommendations further and looks forward to engaging with the Department throughout the stakeholder process.

Sincerely,

Sarah Bresolin Silver
Vice President, Government and Regulatory Affairs
ENGIE North America
sarah.bresolin@engie.com

CITY OF SOMERVILLE, MASSACHUSETTS
OFFICE OF SUSTAINABILITY AND ENVIRONMENT
KATJANA BALLANTYNE
MAYOR

September 16, 2024
Commissioner Elizabeth Mahony
Department of Energy Resources
100 Cambridge Street Suite 1020
Boston, MA 02116
Sent via email to stretchcode@mass.gov
Re: City of Somerville Comment on Proposed Stretch Code Updates

Dear Commissioner Mahony,

Thank you for providing an opportunity to comment on the draft updates to the Stretch and Specialized Energy Codes.

The City of Somerville strongly supports the DOER's efforts to update these codes based on the feedback that has been received since communities have started adopting them. Somerville is a regional climate leader and committed to early adoption of the Specialized Code; we adopted it on January 26, 2023, and it has been in effect since July 1 of that year. Since the code has been in effect, Somerville has seen developers and construction professionals adapt well to these new codes while continuing to build world-class buildings in the densest city in New England. The Specialized Code has been a success story in Somerville.

In that time, the Ballantyne Administration has also updated Climate Forward, Somerville's community climate action plan, setting a bold vision to be carbon net-negative by 2050. The plan aims to equitably mitigate greenhouse gas emissions and adapt to climate change. The City has enacted ordinances, programs, and policies to transition away from fossil fuels to support greenhouse gas emissions reduction. Somerville is also beginning work to develop a rental registry and energy disclosure ordinance, which is designed to improve energy efficiency, affordability, and healthiness, as well as advance climate action efforts.

Today in Somerville, there are more than 200 PHIUS housing units in various stages of development, with more than 30 designated affordable. We will continue to use the tools provided by the DOER to achieve substantial, necessary building emissions reductions. In support of the aims of these updates and with gratitude for the DOER's consideration during the comment period, we offer the following comments.

First, Somerville commends the DOER for creating and proposing changes to the Stretch and Specialized Energy Codes. It is critical that the Commonwealth maintains its reputation as a climate leader. These

proposed changes will make widespread adoption and implementation more likely and more effective. We look forward to working with the DOER to continue building upon this strong foundation and remain committed to leading by example. Somerville is committed to meeting the highest possible decarbonization standards and is poised to successfully maintain construction rates while also preventing new building emissions.

Goal BE-1.3 of Climate Forward seeks to, "Pursue deep energy efficiency and electrification through retrofits of existing buildings." According to the Commonwealth's 2050 Decarbonization Roadmap, "electrification and efficiency strategies rely on infrequent opportunities to change out…equipment" including at "end-of-life or major renovation. Leveraging these opportunities early is essential for keeping costs low." The existing maximum HERS rating detailed in Table R406.5 supported those missions, and Somerville adopted the code with the understanding and ability to meet that ambition.

While the City understands that by loosening the HERS rating requirement from a range of 52-58 to 65-75 provides more leeway for the wide variety of existing residential building types, Somerville was and remains ready to significantly retrofit the existing housing stock. Somerville is excited that bringing requirements to base energy code levels has the potential to capture a greater array of projects that might not have occurred under a more stringent code, resulting in a greater amount of total emissions reduction potential.

A center of cutting-edge research and innovation, Somerville is home to several highly ventilated buildings that will be affected by the proposed changes to Section CC105.2. A reduction in on-site renewable energy for highly ventilated and hospital buildings following the mixed-fuel pathway from 1.5 W/sf to 0.5 W/sf is an understandable change given the extensive rooftop equipment requirements for these types of developments. This change, however, does not recognize the totality of the solar potential for a site, including paved ground and non-active open space if the rooftop is insufficient for the necessary generation. Offsets through RECs or non-solar alternative energy could also have been considered to meet the existing generation requirement. Energy demands in Massachusetts are growing at significant pace. To meet the need, we must maximize the ability to generate clean renewable energy.

The City of Somerville applauds the DOER for taking an inclusive approach to expand the impact and adoption of these codes across the Commonwealth. We encourage the DOER to continue strengthening the regulations to progress shared emissions goals. We look forward to the outcome of this proceeding and future opportunities to collaborate.

Thank you for the opportunity to provide public comment. We appreciate your time and consideration.

Sincerely,

Katjana Ballantyne

Katjana Ballantyne

Mayor

Edson, Becca (ENE)

From: Fennell, Michelle <mfennell@brplusa.com>
Sent: Tuesday, September 17, 2024 3:13 PM
To: STRETCHCODE (ENE)
Subject: STRETCH CODE FEEDBACK

Follow Up Flag: Follow up
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All,

Please find comments below:

For Part 2: Commercial Stretch Code proposed changes

5. Partial Electrification Accommodation for District Systems (Section C407.2.1)
This proposed change creates a new exception which allows relief from having to include partial efficient electrification for new buildings connecting to a District Energy System (DES) which is transitioning to hydronic distribution enabled with inter-building heat energy recovery.

Feedback: Consider a path for DES systems that are outside of those owned by the same owner as the building and all buildings on the system. Specifically, suggest allowing for a private DES providing purchased energy to quality for meeting this requirement if the timeline of the transition to a system with heat recovery with take place within the first 2 years of building completion.

Part 3: Proposed Specialized Code Changes

1.Reduction in on-site renewable energy for highly-ventilated and hospital buildings following mixed-fuel pathway (Section CC105.2)These building types generally have extensive rooftop equipment requirements which significantly impact these projects' ability to conform to the installed PV requirement of the mixed fuel pathway of the Specialized Code. This change reduces the mandatory solar PV from 1.5 W/sf to 0.5 W/sf (a 67% reduction).

Feedback: Consider allowing both highly ventilated and non-highly ventilated buildings an option for proving that the PV system has been maximized for any locations without mechanical equipment based on the building orientation (and the shading from adjacent buildings). The intent is not to install PV that cannot produce electricity, but some project may be required to install PV in locations with little to no sun coverage in order to meet the requirement.

3.Electric Readiness Accommodation for District Systems (Section CC106.1)This proposed change creates a new exception which allows relief from having to include efficient electrification readiness for new buildings connecting to a District Energy System (DES) which can demonstrate that it is transitioning to be fossil-fuel free.

Feedback: This is an important accommodation and highly recommend implementing the proposed item.

Thank you.

-Michelle

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RESPONSIVE BUILDINGS. RESPONSIVE PEOPLE.

Ian Finlayson
Deputy Director, Energy Efficiency Division
Department of Energy Resources
100 Cambridge Street, Suite 1020
Boston, MA 02114

September 17, 2024

RE: A Better City's Comments on the Updated Building Stretch Energy and Specialized Stretch Energy Codes

Deputy Director Finlayson:

On behalf of A Better City's nearly 130 member businesses and institutions, thank you for your efforts to understand the impact of the Building Stretch Energy and Specialized Stretch Energy Codes. We appreciate your effort to improve the codes based on this input and thank you for sending out updated draft codes for review.

A Better City's comments are a combination of previous comments, as well as new or updated comments that include: defining rooftop solar readiness; extending embodied carbon reduction as an alternative path for all commercial buildings; clarifying requirements for derating and thermal bridges in alterations; reviewing existing building facades; reviewing building improvement setbacks; exempting fossil-fuel boilers in all-electric lab buildings; clarifying the boundaries for the blower door test in residential additions; continuing to promote policy and procedures to allow district energy to fulfill requirements in meeting the all-electric pathway utilizing industry scale heat pump technology; and developing a state-managed relief pathway for the Building Stretch Energy and Specialized Stretch Energy Codes.

Thank you for your consideration, for your leadership, and for your commitment to code improvement to ensure that they are implementable, while also moving us toward our shared climate goals. Please reach out to Yve Torrie (ytorrie@abettercity.org) with any comments or questions.

Thank you,

Y. L. Torrie

Yve Torrie
Director of Climate, Energy & Resilience
A Better City

Cc: Elizabeth Mahony, Commissioner, DOER
Paul Ormond, Energy Engineer, DOER

- **Define Rooftop Solar Readiness:** In addition to A Better City's previous comments expressing concerns from our members with the on-site solar "where feasible" requirement in the Specialized Stretch Energy Code, we have since learned that the vast majority of developments in downtown Boston will be unable to interconnect any solar because Eversource operates an underground network system that does not allow interconnection. A solar requirement for these buildings is therefore not feasible. Additionally, solar plus storage options are limited because the Boston Fire Department requires storage to be located outside a building with setbacks which is not a viable option in many downtown developments. ***A Better City requests further definition and clarity about "solar where feasible" for buildings that are unable to abide by this requirement.***

- **Extend Embodied Carbon Reduction as an Alternative Pathway for All Commercial Buildings:** A Better City members appreciate the inclusion of embodied carbon reduction as an alternative pathway for energy reduction in residential and multi-family buildings. However, it is unclear why this pathway is not offered for other commercial buildings as well. Also, it's worth noting that this will not be a very likely pathway for projects far outside of Boston or other markets that do not have specific concrete suppliers with high cement replacement options. ***A Better City recommends extending embodied carbon reduction as an alternative pathway for all commercial buildings.***

- **Clarify Requirements for Derating and Thermal Bridges in Alterations:** We have heard from A Better City members that it is unclear what constitutes alterations that are inherent to building structures in C503.2.4, Derating and Thermal Bridges in Alterations. Also there has been a suggestion that thermal bridge exceptions for alterations in C503.2.4 apply to change of use as well. ***A Better City recommends providing clarity on alterations as specified above***.

- **Review of Existing Building Facades:** The way the code is currently written derates existing facades that cannot always be overcome by insulating the inside of the facade. As buildings age, they will need renovations, which may become impossible if they cannot meet code without stripping the facades from existing buildings. This outcome does not seem to meet the intent of the code; new facades will be expensive and costly in their impact on embodied carbon. ***A Better City recommends a review of the derating of existing facades to ensure the intent of the code is met as it relates to expense and impact on embodied carbon.***

- **Review of Building Improvement Setbacks:** A Better City members understand that they are required to bring the buildings up to the current code if more than 30% of the asset's value is spent on improvements. The 30% threshold, however, is limiting renovations in some buildings. In industrial buildings, for example, that were built more than 20 years ago when industrial buildings were built cheaply, the 30% threshold is limiting required upgrades. ***A Better City requests that thresholds be reviewed to ensure that renovations can be made for all building use types.***

- **Exempt Fossil Fuel Boilers in All-Electric Lab Buildings:** In pursuing an all-electric lab building development, an A Better City member has found that the most efficient way to deliver that is using an exhaust source heat pump (ESHP) system, using diesel boilers as a back-up heat source. However, the Specialized code considers any building with back-up fossil fuel boilers to be a mixed-fuel building, thereby triggering the requirement to provide additional onsite solar PV. There is already a substantial cost premium to installing an EHSP system, over and above a more typical air source heat pump (ASHP) system, which can only efficiently achieve ~80%-90% reduction of fossil fuel. The additional cost of delivering onsite solar PV makes this option unviable, thereby disincentivizing the developer to pursue an all-electric ESHP system. The only alternative available under the new code to qualify as an all-electric building is to provide back-up heat through electric resistant boilers tied to a diesel generator. This comes at a higher capital cost, takes up more space on the roof, and provides only 50%

efficiency (in a back-up scenario) compared to ~80% efficiency for back-up diesel boilers. Forcing a higher energy use technology is in direct conflict with the overall energy conservation goals of the new code. ***A Better City recommends the use of fossil fuel boilers as a back-up heat source be exempt in complying as an all-electric lab building, as is the case with back-up diesel generators. This will incentivize developers to pursue a cost-viable and more efficient all-electric lab building design, through an ESHP system.***

- **Clarify the Boundaries for the Blower Door Test in Residential Additions:** A Better City members appreciate that the blower door test now only applies to additions in residential spaces, and not the entire building. They, however, are unsure how this will be accomplished, and how the boundary for this is being determined. ***A Better City requests clarity is provided on the boundaries for the blower door test in residential additions.***

- **Continue to Promote Policy and Procedures to Allow District Energy to Fulfill Requirements in Meeting the All-Electric Pathway Utilizing Industry Scale Heat Pump Technology:** A Better City members appreciate that district energy is now recognized as a pathway in the Stretch Code. ***A Better City urges you to continue to work with Vicinity Energy and others to promote policy and procedures that will allow district energy to fulfill requirements in meeting the all-electric pathway utilizing industry scale heat pump technology.***

- **Develop a State-Managed Relief Pathway for the Building Stretch Energy and Specialized Stretch Energy Codes:** For the base building code, project proponents have an opportunity to seek relief from its provisions (780 CMR) in the form of a variance or interpretation of the applicability of a particular code section. Appeals Board members are not allowed to waive code requirements in their entirety but may consider alternative methods of complying with the intent of the code. However, there is no such relief pathway for the stretch and specialized energy codes. By allowing for additional flexibility for project proponents to comply with the Building Stretch Energy and Specialized Stretch Energy Codes, projects can move forward that increase project construction and renovation, and still meet critical climate goals. ***A Better City recommends a state-managed relief pathway be developed for the Building Stretch Energy and Specialized Stretch Energy Codes.***

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ASSOCIATION OF INDEPENDENT COLLEGES
& UNIVERSITIES IN MASSACHUSETTS

September 17, 2024

Elizabeth Mahony
Commissioner
Massachusetts Department of Energy Resources
100 Cambridge Street, 9th floor
Boston MA 02114

Via: stretchcode@mass.gov

CC: Ian Finlayson & Paul Ormond, Department of Energy Resources

RE: **Comments on Proposed Changes to 225 CMR 22.00 and 23.00 Stretch Energy Code and Municipal Opt-in Specialized Code**

Dear Commissioner Mahony:

The Association of Independent Colleges and Universities in Massachusetts [AICUM] represents the public policy interests of 58 independent colleges and universities throughout the Commonwealth – institutions responsible for educating more than 290,000 students each year and employing more than 98,000 people. Our members include large nationally and internationally renowned research universities, smaller, highly regarded liberal arts colleges, religiously affiliated institutions, and colleges with special missions focused on entrepreneurship or music or allied health services.

Our members are committed to supporting policies and practices that reduce emissions, transition the Commonwealth to clean energy, support healthy communities, and help to stem the tide of climate change. From Boston to the Berkshires, colleges and universities have been leaders in building green and resilient buildings and infrastructure (for example, Boston University's net zero Center for Computing & Data Sciences building and Smith College's Geothermal Energy Project that seeks to reduce campus carbon emissions by 90 percent). Not only are these buildings, and the district energy systems that power them, critical to helping the Commonwealth achieve its climate goals, they also are essential tools in colleges and universities' ability to execute their educational and research missions. These buildings house world-class research labs and enable lifechanging discoveries and cures. They allow institutions to house their students, faculty, and staff—alleviating pressure on the state's housing stock. They allow institutions to pilot new green building practices that can be scaled beyond the walls of our campuses.

AICUM's members recognize the energy code as a critical tool in helping the Commonwealth achieve its climate goals by 2050. We appreciate the opportunity to provide comments to the Draft Stretch and Specialized Code Updates as part of the public comment period. We also are grateful for the Department of Energy Resources' continued climate leadership and proactive engagement with stakeholders to support the thoughtful development and operationalization of these regulations.

The DOER's proposed updates are a helpful step in clarifying the energy code, particularly in how the code applies to district energy systems. Working in collaboration with our colleagues on the Higher Education Working Group of the Boston Green Ribbon Commission, AICUM is pleased to share our comments to the Draft Stretch and Specialized Code Updates, including edits we believe are still needed to optimize implementation of the code.

CHAPTER 2 [CE] DEFINITIONS

***Code Provision**: DISTRICT ENERGY SYSTEM, HEAT RECOVERY ENABLED. A district energy system capable of recovering excess heat energy from buildings on the distributed network which are in cooling mode for useful space and/or service water heating in other buildings on the network.*

> **Comment:** It is important the definition for heat recovery enabled is not overly narrow to prescribe only one technology/system and would not preclude the use of steam distribution from non-fossil fuel generation, as long as thermal recovery and/or exchange was possible across the district energy system, which we understand is the intent for this definition. More specifically, the definition should not prescribe only a hydronic distribution system as described in the summary of changes document.
>
> ***Proposed Change:** DISTRICT ENERGY SYSTEM, HEAT RECOVERY ENABLED. A district energy system capable of recovering ~~excess heat energy from buildings on the distributed network which are in cooling mode for useful space and/or service water heating in other buildings on the network~~ **and/or exchanging excess thermal energy within the district energy system and connected buildings**.*

***Code Provision**: DISTRICT ENERGY SYSTEM ORDER OF CONDITIONS. A document issued by the Commonwealth of Massachusetts Department of Energy Resources which regulates the decarbonization and efficient electrification plan for a district energy system.*

> **Comment:** Two comments are proposed to clarify the definition of order of conditions that (1) it applies to the decarbonization for a district energy system being technology agnostic and (2**)** it applies for the purposes on building energy code compliance.
>
> ***Proposed Change:** DISTRICT ENERGY SYSTEM ORDER OF CONDITIONS. A document issued by the Commonwealth of Massachusetts Department of Energy Resources which regulates a voluntary decarbonization ~~and efficient electrification~~ plan for a district energy system **for the purposes of building energy code compliance.***

SECTION C505 CHANGE OF USE OR OCCUPANCY

***Code Provision:** C505.1 General. Spaces undergoing a change in occupancy that would result in an increase in ~~demand for~~ either total modeled annual fossil fuel use ~~or electrical energy~~ or total modeled annual energy use shall comply with Sections C401.3, C402 through C406, and Section C408.*

Comments:

1. The proposed edits result in a penalty for electrification while we believe the intent is to penalize an increase in annual fossil fuel use only, not all energy. To clarify the intent, it is proposed that only an increase in total annual fossil fuel use is included to apply to changes of use or occupancy.

2. The proposed change from a demand-based calculation to modeled annual energy use implies that an energy model would be required to meet this requirement and could preclude the use of the prescriptive path for spaces undergoing a change of use or occupancy. We suggest deleting 'modeled' from the code change to avoid requiring the burden of additional energy modeling where an energy model would not typically be necessary and adds time and cost to a project.

Proposed Change: *C505.1 General. Spaces undergoing a change in occupancy that would result in an increase in ~~demand for~~ ~~either~~* ***total annual*** *fossil fuel* ***use*** *~~or electrical energy or total modeled annual energy use~~ shall comply with Sections C401.3, C402 through C406, and Section C408.*

CC105.3 ADDITIONAL EFFICIENCY REQUIREMENTS

Provision: *CC105.3.1 MORE EFFICIENCY HVAC EQUIPMENT PERFORMANCE. Primary heating and cooling equipment shall meet the following efficiencies as applicable:*

1. Space heating combustion equipment shall be rated at greater than or equal to 95 AFUE.

2. All refrigerant-based air conditioning equipment shall be a heat pump with greater than or equal to ~~10~~ 8.5 HSPF2 rated heating performance and greater than or equal to ~~16~~ 15.2 SEER2 rated cooling performance for ducted systems, and greater than or equal to 8.5 HSPF2 rated heating performance and greater than or equal to 16 SEER2 rated cooling performance for ductless systems.

3. Ground source heat pump systems shall be rated at greater than or equal to 3.5 COP at design temperature.

For multiple cooling systems, all systems shall meet or exceed the minimum efficiency requirements in this section and collectively shall be sized to serve 100 percent of the cooling design load. For multiple heating systems, all systems shall meet or exceed the minimum efficiency requirements in this section and collectively shall be sized to serve 100 percent of the heating design load.

Comments: It is unclear in the code how a building connecting to a district energy system with an order of conditions in good standing is required to comply with (1) the efficiency and (2) heating and cooling load sizing requirements or if they apply.

Proposed Change: *This provision should include the following EXCEPTION, "Space and service water heating and space cooling uses provided by a district energy system subject*

to a district energy system order of conditions in good standing from the Commonwealth of Massachusetts Department of Energy Resources."

CC402.1.5.2 HIGH GLAZED WALL SYSTEM BUILDINGS

Comment: Additional language should be added in the code or guidance documents to clarify that for existing highly-glazed buildings already connected to a district energy system, which are undergoing change of use or alteration, the electrification requirements for highly-glazed buildings do not apply.

On behalf of our member colleges and universities, we thank you for your work to maintain Massachusetts' leadership on climate action. Please do not hesitate to reach out if you have any questions on the comments above.

Sincerely,

Rob McCarron
AICUM President and CEO

City of Boston
Environment

September 17, 2024

Ian Finlayson
Director, Energy Efficiency Division
Department of Energy Resources
100 Cambridge Street, Floor 9
Boston, MA 02114

By Electronic Submission to stretchcode@mass.gov

RE: Stretch Code Feedback

Mr. Finlayson,

Thank you for the opportunity to provide feedback on the Department of Energy Resources' (the Department) proposed changes to the Stretch Code and Specialized Opt-In Code. We appreciate the Department's ongoing commitment to decarbonizing the Commonwealth and ensuring healthy, livable buildings. As one of the first communities to adopt the statewide Municipal Opt-In Specialized Stretch Code, Boston has been at the forefront of advancing these initiatives. Additionally, The City's Building Emissions Reduction and Disclosure Ordinance, which requires reducing greenhouse gas emissions from existing larger buildings, sets predictable standards for new construction to shift to a decarbonized future. We support updating the Stretch Code and Opt-In Code to further help meet our shared climate goals, we also emphasize the importance of ensuring that these regulations account for the diverse build environments and characteristics of the Commonwealth.

At a high level our comments focus on:

1. Balance Flexibility while Ensuring Reaching Climate Goals
    a. Refinements related to Change of Use to create new R-use residential dwelling units to better enable office to residential conversion.
    b. Clarifications related to District Energy Systems.
    c. Final documentation PHI and PHIUS for the issuance of Certificate of Occupancy.

2. Administrative Capacity, including;

a. Support for training and resources to increase municipal capacity for the review of PHI and PHIUS documentation related to building permit and final certificate of occupancy determination.
b. Support for training and workforce development for passive house professionals.

1. **Balance Flexibility while Ensuring Reaching Climate Goals**

a. **Refinements related to Change of Use to create new R-use residential dwelling units. Section - C402.1.5 Component performance alternative.**
    i. The City of Boston supports the proposed refinements for both HERS performance criteria and the weighted envelope equation. These refinements help to enable Boston's office to residential conversion efforts and will help increase housing production while meeting the climate goals of the City of Boston and across the Commonwealth.
b. **Clarification related to District Energy Systems -C407.2.1 Electrification and Documentation for Highly Ventilated Buildings and CC106.1 Additional electric infrastructure.**
    i. The City of Boston fully supports the District Energy System clarification especially as it pertains to high ventilation buildings and their designated permitting pathway. The City of Boston also acknowledges the importance of District Energy System owners to decarbonize their systems and supports DOER requirements for operators to develop a viable transition plan to ensure systems will meet all-electric performance requirements and targeted timelines. The City of Boston also supports DOER's ability to generate an Order of Conditions, to act as an binding commitment to which the District Energy System transition targets must abide; milestones, monitoring and compliance.

c. **Final documentation PHI and PHIUS certification requirements for issuance of Building Permits and Certificates of Occupancy.**
    i. **Passivehouse Compliance (Section C407.3 Passivehouse)**
    ii. The City of Boston supports the clarification of "final" and the time extension for *final certificate of occupancy*. Allowing projects to achieve "temporary occupancy" while undergoing final PHIUS/PHI review is an important step to improve the predictability and viability of housing production in Boston. The City of Boston also recognizes the need for further clarification in the code for projects that may not be able to fully

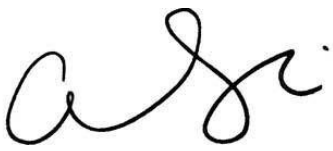
meet final Passive House certification in order to receive their final certificate of occupancy.

2. **Administrative Capacity, including;**
    a. The City of Boston recommends that DOER provide additional training and resources to increase municipal capacity for the review of PHI and PHIUS documentation related to building permits and temporary and permanent certificate of occupancy determinations. With the expanded use of the PHIUS and PHI code compliance path there remains a need for additional public official training and support to increase municipal capacity to review PHIUS and PHI documentation and building practices.
    b. In addition, we strongly encourage DOER to provide additional training to support and promote CPH Consultant, CPH Builder, CPH Verifier, CPH Certifier, CPH Designer qualifications in order to grow the local workforce necessary to design, build, and certify PHIUS and PHI code compliant projects.

* * *

Thank you for your consideration of our comments. Should you have any questions, please contact Hannah Payne, Director of Carbon Neutrality (hannah.payne@boston.gov; 617-635-1385).

Sincerely,



Oliver Sellers-Garcia
Green New Deal Director, Office of Mayor Michelle Wu;
Commissioner of the Environment Department, City of Boston

84 Milton Street, Arlington, MA, 02474
781-718-4319
www.electrifybuildings.org

To: Ian Finlayson, Department of Energy Resources

From: Anne Wright, Co-Founder and Facilitator, Building Electrification Accelerator

Re: Stretch Code Feedback

Dear Mr. Finlayson,

The Building Electrification Accelerator is a nonprofit, no-cost network with the mission of accelerating equitable building decarbonization in Massachusetts via municipal action. We are submitting this comment at the request of Hank Keating, President of Passive House MA.

We are writing with a request to address a serious concern in DOER's Proposed Changes to the current Stretch Energy Code and Municipal Opt-in Specialized Code pertaining to projects pursuing Passive House certification and seeking final certificate of occupancy ("CoO"). Per Sections R405.2, R405.3, C407.3.2.1, and C407.3.2.2 of the Draft MA 2023 Residential and Commercial Stretch Code and Specialized Opt-in Code with proposed revisions, projects pursuing Passive House certification, whether through Phius or PHI, have two options for obtaining final CoO, as summarized below:

1. Option 1:
    a. Design phase precertification/approval
    b. Verification report demonstrating as-built conditions comply with Passive House requirements
    c. Statement from consultant confirming hygrothermal requirements are satisfied
    d. Statement from consultant confirming project satisfies all testing and modeling requirements
    e. Back-up documentation with test results
2. Option 2:
    a. Final certification letter from certifying body

While projects can obtain *temporary* CoO regardless of certification status, which is necessary for occupancy, the current proposed code language still puts extremely high-performance projects at risk by requiring Options 1 or 2 above for obtaining *final* CoO. Neither option above is feasible for development teams who fail to achieve final Passive House levels of performance despite well documented best efforts. As currently written, the Draft Stretch Code and Opt-In Code do not support projects that achieve design phase certification, do their best to construct to Passive House levels of performance, but ultimately fall short of satisfying 100% of certification requirements. These projects need a defined path to achieve a final CoO in the event neither option above is attainable.

Without final CoO, projects may not convert high-interest rate construction loans to permanent mortgages. In low-income housing tax credit ("LIHTC") projects, the construction loan, typically paid down with LIHTC equity upon receiving final CoO, is significantly larger than the permanent mortgage, making the conversion critical for LIHTC developers to continue doing business in Massachusetts. Furthermore, it is not realistic for projects to pursue an appeal with their Authority Having Jurisdiction and/or the State, which would cause significant delays to project delivery, while adding cost and risk to very high-performance projects.

Given the quantity of Passive House projects in the state, estimated at more than 272 projects consisting of over 20,600 units, it is very likely that some of these projects that are designed to Passive House certification, as evidenced at the time of permitting, and constructed per design, as evidenced by frequent third-party inspection reports, may encounter insurmountable issues that make satisfying Option 1 and Option 2 impossible. These projects will have spent considerable time and money designing and constructing buildings with the intent of certifying – which will be easily documented with consultant contracts, inspection reports, and test results -- and yet still encounter issues such as air infiltration or ventilation balancing preventing final CoO. These projects require a 3rd option for achieving final CoO that does not reduce the performance objectives of the code nor present an easier, race-to-the-bottom option for developers to consider. The 3rd option proposed below requires nearly identical requirements for design and construction as the two existing options and should only be available for projects who cannot achieve options 1 or 2. This 3rd option must be included in code to avoid local review and waiver ambiguity, further delays, significant added costs, and extreme risk in an industry that cannot absorb additional cost.

3. Proposed Option 3 for Final CoO:
    a. Copy of certified Passive House consultant and rater/verifier contracts demonstrating all required inspections and testing requirements for certification
    b. Design phase precertification/approval
    c. Verification report demonstrating as-built conditions, including those that comply with Passive House requirements, and those that do not (if applicable)
        i. For projects following Phius, demonstrate final Energy Star and Zero Energy Ready Homes certification requirements are met.
    d. Hygrothermal analysis confirming the building does not face any durability concerns based on as-built condition

    e. Statement from Passive House consultant confirming project has completed all interim, final, and corrective testing and modeling requirements, including a summary of deviations from Passive House requirements
        i. Taped and untaped blower door testing at 50 Pascal and 75 Pascal demonstrating results are within 20% of Passive House requirements. If initial whole building blower door testing exceeds Passive House requirement, statement must reflect evidence of a re-test, with results, as well as an explanation for sources of leakage and attempted remediation efforts.

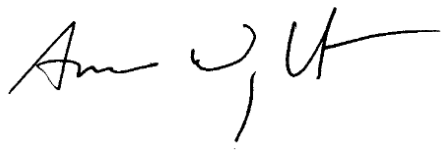
ii. Back-up documentation with test results for initial and follow up re-tests with explanation for any deviation from Passive House requirements

f. Ventilation flow rates demonstrating mechanical code compliance

This proposed 3rd option is nearly identical to Option 1 and offers similar flexibility as the Passive House Institute U.S. offers projects that may not satisfy all program requirements necessary for certification. Phius does not have adequate capacity to evaluate projects seeking waivers on a case-by-case basis in a timely manner, making it necessary for the Commonwealth to allow a similar approval path for municipal building departments.

Without this option, projects will face significant cost and major delays after having made significant investments in developing extremely well performing buildings. Project teams pursuing Passive House certification that have obtained pre-certification at design and who work closely with their consultants and contractors to follow all inspection and testing procedures necessary for Passive House certification are deserving of final CoO without facing onerous cost, risk, or delay.

Sincerely,



Anne Wright
Co-Founder and Facilitator
Building Electrification Accelerator

METRO WEST
COLLABORATIVE DEVELOPMENT

September 17, 2024

Department of Energy Resources
Attn: Ian Finlayson
100 Cambridge Street, 9th floor
Boston, MA 02114.
Via email: stretchcode@mass.gov

RE: STRETCH CODE FEEDBACK

Dear Mr. Finlayson,

Thank you for the opportunity to comment on the DOER's Proposed Changes to the current Stretch Energy Code and Municipal Opt-in Specialized Code. As affordable housing developers and owners with extensive experience in the Boston Metro West region, we are concerned that the proposed regulations would unnecessarily add cost and risk to new housing development at a time when housing supply is among the most critical issues facing the Commonwealth.

While we fully understand and support the need for changes to these important codes that help the Commonwealth achieve necessary climate goals in the near-term, we urge you to ensure that such changes do not create additional barriers to the creation and preservation of much-needed affordable housing across the state. Having recently achieved PHIUS Passive House Design Certification on our West Newton Armory affordable housing project, we are on-the-ground advocates for quality housing development that meets the highest climate and sustainability standards.

With that said, I am writing with a request to address a serious concern in the Proposed Changes pertaining to projects pursuing Passive House certification and seeking final certificate of occupancy ("CoO"). Per Sections R405.2, R405.3, C407.3.2.1, and C407.3.2.2 of the Draft MA 2023 Residential and Commercial Stretch Code and Specialized Opt-in Code with proposed revisions, projects pursuing Passive House certification, whether through Phius or PHI, have two options for obtaining final CoO, as summarized below:

1. Option 1:
    a. Design phase pre-certification/approval
    b. Verification report demonstrating as-built conditions comply with Passive House requirements

79-B Chapel Street, Newton, MA 02458
P: 617-923-3505 F: 617-923-8241
www.metrowestcd.org

c. Statement from consultant confirming hygrothermal requirements are satisfied
d. Statement from consultant confirming project satisfies all testing and modeling requirements
e. Back-up documentation with test results

2. Option 2:
    a. Final certification letter from certifying body

While projects can obtain *temporary* CoO regardless of certification status, which is necessary for occupancy, the current proposed code language still puts extremely high-performance projects at risk by requiring Options 1 or 2 above for obtaining *final* CoO. Neither option above is feasible for development teams who fail to achieve final Passive House levels of performance despite well documented best efforts. As currently written, the Draft Stretch Code and Opt-In Code do not support projects that achieve design phase certification, do their best to construct to Passive House levels of performance, but ultimately fall short of satisfying 100% of certification requirements. **These projects need a defined path to achieve a final CoO in the event neither option above is attainable.**

Without final CoO, projects may not convert high-interest rate construction loans to permanent mortgages. In low-income housing tax credit ("LIHTC") projects, the construction loan, typically paid down with LIHTC equity upon receiving final CoO, is significantly larger than the permanent mortgage, making the conversion critical for LIHTC developers to continue doing business in Massachusetts. Furthermore, it is not realistic for projects to pursue an appeal with their Authority Having Jurisdiction and/or the State, which would cause significant delays to project delivery, while adding cost and risk to very high-performance projects.

A recent Metro West CD project that would have been severely impacted by these requirements is our Glen Brook Way Phase 2 development. The project was designed to meet Passive House standards; however, it faced delays in full certification due to the complexities of end-of-construction coordination and the administrative process for obtaining full certification. The building was completed in February 2024, but as of September 2024, it has not yet achieved full certification. While we expect to receive full certification by September 2024, if we had been required to wait for this certification to obtain a final Certificate of Occupancy, the financial consequences would have been disastrous due to our LIHTC requirements, as detailed above.

Given the quantity of Passive House projects in the state, estimated at more than 272 projects consisting of over 20,600 units, it is very likely that some of these projects that are designed to Passive House certification, as evidenced at the time of permitting, and constructed per design, as evidenced by frequent third-party inspection reports, may encounter insurmountable issues that make satisfying Option 1 and Option 2 impossible. These projects will have spent considerable time and money designing and constructing buildings with the intent of certifying

– which will be easily documented with consultant contracts, inspection reports, and test results -- and yet still encounter issues such as air infiltration or ventilation balancing preventing final CoO.

These projects require a 3rd option for achieving final CoO that does not reduce the performance objectives of the code nor present an easier, race-to-the-bottom option for developers to consider. **The 3rd option proposed below requires nearly identical requirements for design and construction as the two existing options and should only be available for projects who cannot achieve options 1 or 2.** This 3rd option must be included in code to avoid local review and waiver ambiguity, further delays, significant added costs, and extreme risk in an industry that cannot absorb additional cost.

3. **Proposed Option 3 for Final CoO:**

    a. Copy of certified Passive House consultant and rater/verifier contracts demonstrating all required inspections and testing requirements for certification
    b. Design phase pre-certification/approval
    c. Verification report demonstrating as-built conditions, including those that comply with Passive House requirements, and those that do not (if applicable)
        i. For projects following Phius, demonstrate final Energy Star and Zero Energy Ready Homes certification requirements are met.
    d. Hygrothermal analysis confirming the building does not face any durability concerns based on as-built condition
    e. Statement from Passive House consultant confirming project has completed all interim, final, and corrective testing and modeling requirements, including a summary of deviations from Passive House requirements
        i. Taped and untaped blower door testing at 50 Pascal and 75 Pascal demonstrating results are within 20% of Passive House requirements. If initial whole building blower door testing exceeds Passive House requirement, statement must reflect evidence of a re-test, with results, as well as an explanation for sources of leakage and attempted remediation efforts.
        ii. Back-up documentation with test results for initial and follow up re-tests with explanation for any deviation from Passive House requirements
    f. Ventilation flow rates demonstrating mechanical code compliance

This proposed 3rd option is nearly identical to Option 1 and offers similar flexibility as the Passive House Institute U.S. offers projects that may not satisfy all program requirements necessary for certification. Phius does not have adequate capacity to evaluate projects seeking waivers on a case-by-case basis in a timely manner, making it necessary for the Commonwealth to allow a similar approval path for municipal building departments.

Without this option, projects will face significant cost and major delays after having made significant investments in developing extremely well performing buildings. Project teams pursuing Passive House certification that have obtained pre-certification at design and who work closely with their consultants and contractors to follow all inspection and testing procedures necessary for Passive House certification are deserving of final CoO without facing onerous cost, risk, or delay.

Thank you for the opportunity to provide our written comments on the DOER's Proposed Changes to the current Stretch Energy Code and Municipal Opt-in Specialized Code. If you have questions, please feel free to reach out to me at Caitlin@metrowestcd.org.

Sincerely,

Caitlin Madden
Executive Director
Metro West Collaborative Development
79-B Chapel Street

9/17/24

Department of Energy Resources

c/o Ian Finlayson, Deputy Director, Energy Efficiency Division

100 Cambridge Street, Suite 1020

Boston, MA 02114

Dear Mr. Finlayson,

These comments are submitted on behalf of Innova Building Advisors, LLC. We applaud Massachusetts' efforts to create an energy code that is ambitious and designed to meet the state's climate goals and appreciate the commonwealth's interest in addressing Embodied Carbon.

Although we do support the overall goal of addressing embodied carbon, our members have expressed questions and concerns around the specific requirements which we have outlined below.

- Is this credit available for multi-family housing development projects with multiple dwelling units that have a shared thermal boundary? If so, how would the credit be allocated? Would each unit receive the 3-points?
- We also request clarification on how to calculate the GWP in situations where two insulation types are used in one cavity-such as flash and batt, or possibly 3 inches of closed cell spray foam plus cellulose? It isn't explicitly described how this would be addressed in the code and clarification would be helpful for the HERS Rater community.

We support DOER's recommendation to adjust the stringency of the requirements for large existing building additions and alterations. As we had noted in previous comments in April, "*a HERS 52 is difficult to achieve in an existing building because the air leakage of unaltered portions of the building remains high, and a whole home blower door test is going to include both new and existing portions of the thermal envelope. Rating the whole home will also factor in equipment that may not be replaced, which can also negatively impact the energy model.*" By adjusting the limits for additions and alterations to HERS 65, 70, or 75 to align with the base code, the requirements will become easier to enforce and less burdensome to our clients and the larger building community.

We do, however, oppose lowering the stringency of the requirements for changes of use/occupancy, as we want to maximize savings and lower energy burden for tenants. We collaborate closely with developers who own and manage the property. As such, tenant utility bills, comfort and indoor air quality are a significant concern. While we support measures to maximize savings and lower energy burdens for tenants, we oppose loosening requirements for changes of use and accessory dwelling units. These regulations help maintain the overall quality and value of the property, ensuring that tenants have access to affordable, energy-efficient housing.

These public comments are intended to express a snapshot of the biggest concerns of the HERS industry about the updates to the Stretch Code and Municipal Opt-In Specialized Code, and we encourage our members to submit their own additional comments for clarification.

Innova Building Advisors appreciates the opportunity for public comment, and we encourage the DOER to reach out to us with any questions or concerns,

Thank You!

Innova Building Advisors, LLC

CITY OF VANCOUVER

APPENDIX: CHECKLIST

Passive House Verification Plan for Building Permit Application

This checklist is to be attached to the front of a Passive House Verification Plan. The checklist is intended to assist with the preparation of the plan and will be prepared by the project team and verified by the Passive House Building Certifier (as part of their design stage review) on behalf of the project team.

Project Address:	Date:
Certified Passive House Designer or Consultant (CPHD or CPHC)	Phone Number:
Company:	Email:

The following items are enclosed as part of the Verification Plan:

- ☐ A letter from a Passive House Building Certifier approving this Verification Plan
- ☐ A document stating the number of planned site visits and at what intervals
- ☐ A written plan for monitoring and grading insulation installation in all assemblies - including inspections of insulation layers below-grade and insulation installation within assemblies - to verify that all assemblies, insulation materials, and components (including windows, doors and ventilation equipment) are installed as per the specifications in the project documentation.
- ☐ A written plan for monitoring and verifying continuous air barrier in all assemblies and components
- ☐ A written plan for verifying all key components and assemblies specified in the project documentation.
- ☐ A written plan for air tightness testing, including who will conduct mid-construction and final blower door tests to the protocol prescribed by the Passive House Institute
- ☐ A written plan for ventilation commissioning, including who will conduct
- ☐ A written plan for occupant training, including who will conduct

If, at any point, any element of the Verification Plan should become non-compliant, this must be immediately brought to the attention of the City of Vancouver by the CPHD or CPHC, who is responsible for the Verification Plan.

CPHD or CPHC Signature:	Date:

boston communities

29 Humphreys Street,
Dorchester MA 02125
www.bostoncommunities.com

September 17, 2024

To: Ian Finlayson, Department of Energy Resources
From: Matthew Robayna, Principal, Boston Communities
Re: Stretch Code Feedback

Dear Mr. Finlayson,

I am writing with a request to address a serious concern in DOER's Proposed Changes to the current Stretch Energy Code and Municipal Opt-in Specialized Code pertaining to projects pursuing Passive House certification and seeking final certificate of occupancy ("CoO"). Per Sections R405.2, R405.3, C407.3.2.1, and C407.3.2.2 of the Draft MA 2023 Residential and Commercial Stretch Code and Specialized Opt-in Code with proposed revisions, projects pursuing Passive House certification, whether through Phius or PHI, have two options for obtaining final CoO, as summarized below:

1. Option 1:
    a. Design phase pre-certification/approval
    b. Verification report demonstrating as-built conditions comply with Passive House requirements
    c. Statement from consultant confirming hygrothermal requirements are satisfied
    d. Statement from consultant confirming project satisfies all testing and modeling requirements
    e. Back-up documentation with test results
2. Option 2:
    a. Final certification letter from certifying body

While projects can obtain *temporary* CoO regardless of certification status, which is necessary for occupancy, the current proposed code language still puts extremely high-performance projects at risk by requiring Options 1 or 2 above for obtaining *final* CoO. Neither option above is feasible for development teams who fail to achieve final Passive House levels of performance despite well documented best efforts. As currently written, the Draft Stretch Code and Opt-In Code do not support projects that achieve design phase certification, do their best to construct to Passive House levels of performance, but ultimately fall short of satisfying 100% of certification requirements. These projects need a defined path to achieve a final CoO in the event neither option above is attainable.

Without final CoO, projects may not convert high-interest rate construction loans to permanent mortgages. In low-income housing tax credit ("LIHTC") projects, the construction loan, typically paid down with LIHTC equity upon receiving final CoO, is significantly larger than the permanent

mortgage, making the conversion critical for LIHTC developers to continue doing business in Massachusetts. Furthermore, it is not realistic for projects to pursue an appeal with their Authority Having Jurisdiction and/or the State, which would cause significant delays to project delivery, while adding cost and risk to very high-performance projects.

Given the quantity of Passive House projects in the state, estimated at more than 272 projects consisting of over 20,600 units, it is very likely that some of these projects that are designed to Passive House certification, as evidenced at the time of permitting, and constructed per design, as evidenced by frequent third-party inspection reports, may encounter insurmountable issues that make satisfying Option 1 and Option 2 impossible. These projects will have spent considerable time and money designing and constructing buildings with the intent of certifying – which will be easily documented with consultant contracts, inspection reports, and test results -- and yet still encounter issues such as air infiltration or ventilation balancing preventing final CoO. These projects require a 3rd option for achieving final CoO that does not reduce the performance objectives of the code nor present an easier, race-to-the-bottom option for developers to consider. The 3rd option proposed below requires **nearly identical requirements** for design and construction as the two existing options and should only be available for projects who cannot achieve options 1 or 2. This 3rd option must be included in code to avoid local review and waiver ambiguity, further delays, significant added costs, and extreme risk in an industry that cannot absorb additional cost.

3. Proposed Option 3 for Final CoO:

    a. Copy of certified Passive House consultant and rater/verifier contracts demonstrating all required inspections and testing requirements for certification
    b. Design phase pre-certification/approval
    c. Verification report demonstrating as-built conditions, including those that comply with Passive House requirements, and those that do not (if applicable)
        i. For projects following PHIUS, demonstrate final Energy Star and Zero Energy Ready Homes certification requirements are met.
    d. Hygrothermal analysis confirming the building does not face any durability concerns based on as-built condition
    e. Statement from Passive House consultant confirming project has completed all interim, final, and corrective testing and modeling requirements, including a summary of deviations from Passive House requirements
        i. Taped and untaped blower door testing at 50 Pascal and 75 Pascal demonstrating results are within 20% of Passive House requirements. If initial whole building blower door testing exceeds Passive House requirement, statement must reflect evidence of a re-test, with results, as well as an explanation for sources of leakage and attempted remediation efforts.
        ii. Back-up documentation with test results for initial and follow up re-tests with explanation for any deviation from Passive House requirements

f. Ventilation flow rates demonstrating mechanical code compliance

This proposed 3rd option is nearly identical to Option 1 and offers similar flexibility as the Passive House Institute U.S. offers projects that may not satisfy all program requirements necessary for certification. PHIUS does not have adequate capacity to evaluate projects seeking waivers on a case-by-case basis in a timely manner, making it necessary for the Commonwealth to allow a similar approval path for municipal building departments.

Boston Communities is an emerging minority owned developer and is embarking on its first Passive House project, a 13-unit affordable homeownership project located in the Dorchester neighborhood of Boston. As an emerging developer, our company has significant development expertise to take on this kind of project, but is not capitalized to mitigate significant unforeseen delays. While we have worked closely with our design team and sustainability consultants to ensure our design is compliant with PHIUS standards, we understand the risk that comes with translating those designs into a fully constructed building. As such, we are relying on the redrafting of the code to ensure that if we, our designers, and our contractors do everything right and yet we still cannot comply with final certification requirements through PHIUS, that there is some level of relief afforded to us to be able to close out our project and be able to sell our units to deserving middle-Income families.

Without this option, projects will face significant cost and major delays after having made significant investments in developing extremely well performing buildings. Project teams pursuing Passive House certification that have obtained pre-certification at design and who work closely with their consultants and contractors to follow all inspection and testing procedures necessary for Passive House certification are deserving of final CoO without facing onerous cost, risk, or delay.

Sincerely,

Matthew Robayna, Principal
Boston Communities

Celebrating 34 Years of Environmental Leadership!

To: Ian Finlayson, Department of Energy Resources
From: Judy Lehrer Jacobs, Executive Director, Green Newton
Re: Stretch Code Feedback
Date: September 16, 2024

Green Newton is devoted to combatting the climate crisis at the local level and empowering Newton residents and businesses to rapidly transition to clean energy. To further our mission, Green Newton has worked with developers to increase energy efficiency and has successfully promoted Passive House construction standards.

I am writing with a request to address a serious concern in DOER's Proposed Changes to the current Stretch Energy Code and Municipal Opt-in Specialized Code pertaining to projects pursuing passive house certification and seeking final certificate of occupancy ("CoO"). Per Sections R405.2, R405.3, C407.3.2.1, and C407.3.2.2 of the Draft MA 2023 Residential and Commercial Stretch Code and Specialized Opt-in Code with proposed revisions, projects pursuing passive house certification, whether through Phius or PHI, have two options for obtaining final CoO, as summarized below:

1. Option 1:
   a. Design phase pre-certification/approval
   b. Verification report demonstrating as-built conditions comply with passive house requirements
   c. Statement from consultant confirming hygrothermal requirements are satisfied
   d. Statement from consultant confirming project satisfies all testing and modeling requirements
   e. Back-up documentation with test results
2. Option 2:
   a. Final certification letter from certifying body

While projects can obtain *temporary* CoO regardless of certification status, which is necessary for occupancy, the current proposed code language still puts extremely high-performance projects at risk by requiring Options 1 or 2 above for obtaining *final* CoO. Neither option above is feasible for development teams who fail to achieve final Passive House levels of performance despite well documented best efforts. As currently written, the Draft Stretch Code and Opt-In Code do not support projects that achieve design phase certification, do their best to construct to passive house levels of performance, but ultimately fall short of satisfying 100% of certification requirements. These projects need a defined path to achieve a final CoO in the event neither option above is attainable.

Without final CoO, projects may not convert high-interest rate construction loans to permanent mortgages. In low-income housing tax credit ("LIHTC") projects, the construction loan, typically paid down with LIHTC equity upon receiving final CoO, is significantly larger than the permanent mortgage, making the conversion critical for LIHTC developers to continue doing business in Massachusetts. Furthermore, it is not realistic for projects to pursue an appeal with their Authority Having Jurisdiction and/or the State, which would cause significant delays to project delivery, while adding cost and risk to very high-performance projects.

Given the quantity of passive house projects in the state, estimated at more than 272 projects consisting of over 20,600 units, it is very likely that some of these projects that are designed to Passive House certification, as evidenced at the time of permitting, and constructed per design,

as evidenced by frequent third-party inspection reports, may encounter insurmountable issues that make satisfying Option 1 and Option 2 impossible. These projects will have spent considerable time and money designing and constructing buildings with the intent of certifying – which will be easily documented with consultant contracts, inspection reports, and test results -- and yet still encounter issues such as air infiltration or ventilation balancing preventing final CoO. These projects require a 3rd option for achieving final CoO that does not reduce the performance objectives of the code nor present an easier, race-to-the-bottom option for developers to consider. The 3rd option proposed below requires **nearly identical requirements** for design and construction as the two existing options and should only be available for projects who cannot achieve options 1 or 2. This 3rd option must be included in code to avoid local review and waiver ambiguity, further delays, significant added costs, and extreme risk in an industry that cannot absorb additional cost.

3. Proposed Option 3 for Final CoO:

    a. Copy of certified passive house consultant and rater/verifier contracts demonstrating all required inspections and testing requirements for certification
    b. Design phase pre-certification/approval
    c. Verification report demonstrating as-built conditions, including those that comply with passive house requirements, and those that do not (if applicable)
        i. For projects following Phius, demonstrate final Energy Star and Zero Energy Ready Homes certification requirements are met.
    d. Hygrothermal analysis confirming the building does not face any durability concerns based on as-built condition
    e. Statement from passive house consultant confirming project has completed all interim, final, and corrective testing and modeling requirements, including a summary of deviations from passive house requirements
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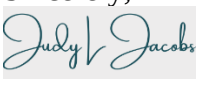
        ii. Back-up documentation with test results for initial and follow up re-tests with explanation for any deviation from passive house requirements
    f. Ventilation flow rates demonstrating mechanical code compliance

This proposed 3rd option is nearly identical to Option 1 and offers similar flexibility as the Passive House Institute U.S. offers projects that may not satisfy all program requirements necessary for certification. Phius does not have adequate capacity to evaluate projects seeking waivers on a case-by-case basis in a timely manner, making it necessary for the Commonwealth to allow a similar approval path for municipal building departments.

Without this option, projects will face significant cost and major delays after having made significant investments in developing extremely well performing buildings. Project teams pursuing passive house certification that have obtained pre-certification at design and who work closely with their consultants and contractors to follow all inspection and testing procedures necessary for passive house certification are deserving of final CoO without facing onerous cost, risk, or delay.

Thank you for your consideration.

Sincerely,



Judy Lehrer Jacobs, Executive Director

POLYISOCYANURATE INSULATION MANUFACTURERS ASSOCIATION

3033 Wilson Blvd., Suite 700
Arlington, VA 22201
703.258.0093
www.polyiso.org

Sent Electronically

September 17, 2024

Ian Finlayson
Department of Energy Resources
100 Cambridge Street, 9th floor
Boston, MA 02114
stretchcode@mass.gov

Re: Polyisocyanurate Insulation Manufacturers Association's Public Comments on Proposed Massachusetts Strech Energy Code

Dear Mr. Finlayson,

Thank you for this opportunity to comment on the proposed update to the Massachusetts Stretch Energy Code. The Polyisocyanurate Insulation Manufacturers Association (PIMA) urges the Department to modify the proposed modifications in two ways:

- Delete the proposed modification related to tapered roof insulation (commercial code); and
- Modify language related to embodied carbon by providing points for completing a whole building life cycle assessment (WBLCA) that demonstrates a decline in embodied carbon compared to a baseline (residential code).

I. Delete Proposed Modification Related to Tapered Roof Insulation.

The proposed modification to Section C402.1.4.1.1, which would change the methodology for determining the roof U-factor for tapered roof systems, should be removed. The comments on this topic provided by Simpson, Gumpertz & Herger (see pages 8-10 of the public comments) are correct that the relationship between insulation R-values and heat flow is non-linear, but the graph they provided is misleading and their explanation exaggerates the impacts.

The model code's use of an average thickness calculation is widely accepted within the roofing industry and is more accurate than the proposed modification, especially with the more common scenario of a four-way sloped tapered system. The average thickness methodology currently allowed under Section C402.1.4.1.1 is the standard best practice within the roofing industry and is integrated into the software tools used to design today's complex tapered insulation systems. The methodology's acceptance and familiarity within the roofing industry is likely to result in a higher level of compliance with the energy code.

II. Embodied Carbon Provisions Should Incentivize Whole Building Life Cycle Assessments.

For nearly a decade, the insulation industry has been a leader in the development of Environmental Product Declarations (EPDs). PIMA supports their use and the environmental impacts summarized in the reports as one of many factors considered in the specification process for insulation and other building materials. Along with energy efficiency, reducing the level of embodied carbon in building construction is an important policy for addressing the entire impact that buildings have on the environment. Addressing embodied carbon at the whole building level should be the goal. Policies that incentivize the appropriate and transparent use of EPDs can further this goal by raising awareness within the construction industry. However, policies that set product specific limits, by definition, restrict product choices and create the potential for regrettable substitutes.

More importantly, product specific limits for insulation ignore the life cycle impacts of alternative wall assemblies and reduced energy use and do not necessarily guarantee a net environmental benefit. For example, polyiso insulation can be used as an exterior continuous insulation option for walls and simultaneously serve as an air and water barrier. If polyiso is eliminated from the design, other insulation options may necessitate the use of one or more materials to achieve code-compliance for air and water barriers. Under Massachusetts' approach, the environmental impacts of these additional products are not considered and may result in higher levels of embodied carbon.

Finally, while it is true that Vermont recently adopted a similar approach, it has been in place for only a few months (effective July 1, 2024). As a general matter, a longer track record with data might help determine whether policies adopted in other jurisdictions are appropriate for Massachusetts.

Therefore, we recommend that Massachusetts delete the provisions that create carbon limits for insulation products and replace with provisions that incentivize builders to perform a whole building life cycle assessment (WBLCA) that can be compared to a baseline for purposes of awarding credits to the project. WBLCA as a practice ensures the building design and operation reduces carbon emissions across the building's entire life cycle. WBLCA also preserves the builder's ability to select products and designs that best meet the needs of a particular project while achieving the jurisdiction's goal for reduced environmental impacts. As a proposed provision for the State's stretch energy code, we believe it is important that Massachusetts take this opportunity to incentivize the adoption of WBLCA as an industry best practice rather than targeting insulation products.

III. Additional Errors in Proposed Approach to Embodied Carbon

If Massachusetts retains the current approach for embodied carbon emissions, we recommend the following modifications:

Updated GWP Values for Polyiso: PIMA publishes third-party verified, ISO-compliant EPDs for polyiso products. The reports are available at: https://www.polyiso.org/page/EPDs. The proposed default insulation GWP values included in proposed Table R406.5.3 are different than the values included in the PIMA industry-averaged EPD for roof insulation for the covered life-cycle stages. We request that these be revised to reflect the North American industry-averaged values reflected in the PIMA EPDs. The GWP values for the sum of lifecycle stages A1-A3 according to the PIMA industry-averaged EPDs are as follows:

Material	**GWP Value** (kg CO2e/sq. m. RSI-1)	
	PIMA EPD	MA Default Values
Polyiso, Roof Board (GRF facer)	**2.11**	2.90
Polyiso, Roof Board (CGF facer)	**2.95**	2.90
Polyiso, Wall Board	4.10	4.10

Industry Averaged vs. Product Specific EPDs: The proposed default values in proposed Table R406.5.3 are intended to be based on industry averaged values (notwithstanding the errors mentioned above). Therefore, it would be appropriate to allow this use of either an industry-average EPD or product-specific EPD to demonstrate compliance with the code requirements.

IV. Summary

PIMA commends Massachusetts for its leadership and innovation in developing a stretch energy code that is both effective and widely adopted. Building energy codes are the most cost-effective policy for addressing climate change, and Massachusetts has been a true leader in this regard. Also, the thermal envelope is difficult to improve after a building is constructed and can last the entire life of a building. Therefore, these improved requirements will benefit Massachusetts residents, business, and the environment for decades.

With respect to the treatment of tapered insulation under section C402.1.4.1.1, we urge you to follow industry practice and reject the proposed modifications. With respect to embodied carbon, we urge caution on this new policy approach. At this stage of policy development, it would be progress to offer incentives for using products (insulation, steel, concrete, glass, and other products) that are covered by EPDs and where the building designer performs a whole building life cycle assessment. The proposed 0.0 kg CO2e/ft.^{2} insulation limit and the corresponding credits appear arbitrary and do not ensure that the net embodied carbon of the entire building is less if other materials or design aspects increase embodied carbon.

V. About PIMA

PIMA is the trade association for North American manufacturers of rigid polyiso foam insulation – a product that is used in most low-slope commercial roofs as well as in commercial and residential walls. Polyiso insulation products and the raw materials used to manufacture polyiso are produced in over 50 manufacturing facilities across North America.

Thank you for the opportunity to submit these comments. Please contact me should additional information be necessary (jkoscher@pima.org, 703-224-2289).

Sincerely,

Justin Koscher
President

Edson, Becca (ENE)

From: Marc Rosenbaum <marc@energysmiths.com>
Sent: Tuesday, September 17, 2024 12:11 AM
To: STRETCHCODE (ENE)
Cc: Hank Keating; PHMass Aaron; Jordan Goldman; Andrew Steingiser; Christopher Nielson; Jason Forney; Jason Jewhurst; Jean Carroon FAIA LEED Fellow; Ellen Watts
Subject: comments on MA Energy Code updates

Follow Up Flag: Follow up
Flag Status: Completed

Thank you very much for this opportunity. These comments are brief as I've been away and I'm writing these at an airport 😊

1) Residential additions aren't analyzable under the HERS Rating System because HERS is designed to rate dwelling units and dwelling units have a kitchen. As the kitchen is within the existing home, the addition can't be separately rated. Rating the entire house is onerous if the existing space remains unmodified.
2) The RESNET approach to measuring air tightness in a multifamily building tests each unit separately and therefore doesn't distinguish between leakage to outdoors and leakage to adjacent units. While leakage between units matters for sound and odor transfer, it is leakage to outdoors that matters for energy efficiency. Please require whole building leakage-to-outdoors air infiltration testing on multifamily buildings.
3) Table C403.7.4.2 doesn't make sense to me as a licensed HVAC engineer. It appears to me that this table applies to variable air volume systems in which outdoor ventilation air is introduced into the central heating/cooling air handler and is therefore analyzable as a percentage of the design supply air flow of that central air handler. Many if not most of the systems being designed today are not central VAV systems and ventilation air supply is not integrated into heating and cooling distribution. Please update and clarify this table.
4) TEDI values. I have no personal experience with these however two things stand out:
a) The value is the same for several substantially different building types and this makes no sense. A police station and an office building have very different occupancies, loads, and operating hours. They need different TEDI limits.
b) The values for heating at least are unrealistically low (and cooling values are likely high). Having a code in which actual energy demand is consistently higher than the modeled value turns code compliance into a process that is gamed and adds no useful value to the calculations that need to be done during the design process for a high performance building.
5) Passive House compliance- please include some leeway for projects using the Passive House compliance path that may miss a key target (air tightness) by a small amount. Please consult Passive House MA for recommendations.

Industry professionals who have been doing TEDI code compliance calculations have told me that there are "tricks" and such to get excellent buildings to comply with TEDI limits and that the process is gamed to get the compliance that all agree is not achievable. The TEDI values need serious peer review and comparison with actual operating energy use (from which demand can be extracted) to set realistic limits for the code.

Respectfully,
Marc Rosenbaum, PE, CPHC, CSL

Nerd-in-Chief, Energysmiths
Building performance consultant
- first certified LEED project in New England
- fifth and seventeenth certified Living Building Challenge projects worldwide
- Founding Board Member, Passive House Institute of the US

To DOER and whom it may concern,

I am writing as an independent private citizen and licensed architect in MA. All comments are my own, solely intended to provide clarity and equal treatment of the two approved Passive House standard pathways with matching language for each case. While I work for ICF, which is the lead vendor delivering the Mass Save Residential New Construction incentives, and support the High Rise and Passive House multifamily path incentives, my suggested comments are in alignment with current interpretation of the Stretch and Specialized codes and do not impact those incentives.

Regarding Passive House certifications, Phius offers both new construction and existing building retrofit standards. Similarly, PHI (Passive House Institute) includes a new construction and existing building retrofit certification. Only the new construction standards are noted in the current and proposed language. It is recommended that reference to the existing building standards (Phius Revive and PHI EnerPHit) be included as a compliance pathway for existing building retrofit energy code requirements where appropriate. I have not added specific language recommendations regarding the PHI and Phius existing building standards in this set of comments. PHI also includes a unique Low Energy Building certification that allows less stringent performance targets, and though it is high performance, it is not considered "Passive House" level certification. Therefore, it is recommended the PHI Classic and Phius CORE 2021 are specifically named as the minimum recommended requirement, along with each organization's more stringent certifications as acceptable higher tier options.

The currently proposed code language for the Stretch and Specialized energy codes also includes specific mention of the currently approved software programs used to determine compliance with Phius and PHI Passive House certifications. Phius currently utilizes the WUFI software package, and PHI uses the PHPP software package for whole-building energy modeling and certifications. The modeling report output of these software packages demonstrating compliance with the certification requirements of Phius and PHI are directly tied to the issuance of Building Permits and Certificates of Occupancy within Stretch code and Specialized code communities. While these software programs play a significant role, it is more appropriate to attribute the responsibility to the standard setting organizations regarding which programs are acceptable to meet certification requirements, as is the case with HERS, ASHRAE 90.1, and other standards, rather than enshrining a product name in the Code.

Please consider the following suggested adjustments to the code language (marked in red for my proposed additions and ~~strikethrough~~ for subtractions) to maintain and clarify the current standard practices.

<u>MASSACHUSETTS STRETCH ENERGY CODE – 2023 amendments to IECC2021</u>
<u>CHAPTER 4 [CE]</u>
<u>COMMERCIAL ENERGY EFFICIENCY</u>

C407.3.1 Compliance. Buildings shall be pre-certified as meeting the Phius CORE 2021 or Phius ZERO 2021 Passive Building Standard – North America, or newer, demonstrated using approved ~~WUFI~~ Passive House certification software and program criteria by PHIUS, where PHIUS design-

certification is demonstrated by Phius and a Certified Passive House Consultant; or, Projects pre-certified as meeting the ~~Certified Passive House~~ Classic, Plus, or Premium Passive Building standard using the ~~current~~ approved Passive House certification software and program criteria by the Passive House Institute (PHI), where PHI certification is demonstrated by a Certified Passive House Certifier and a Certified Passive House Designer.

C407.3.2.1 Phius Documentation. ~~When using Phius approved WUFI Passive software:~~

1. Prior to the issuance of a building permit, the following items must be provided to the Building Official:
   a. A Passive House Verification report with results from the approved Passive House certification software which demonstrates project compliance with Phius CORE 2021 (or newer), or Phius ZERO 2021 (or newer) performance requirements.
   b. A statement from the CPHC that the verification report results accurately reflect the plans submitted.
   c. Evidence of project registration from Phius.
   OR
   a. A Design Certification Letter from Phius.

2. Prior to the issuance of a final certificate of occupancy, the following item(s) must be provided to the building official:
   a. Design Certification Letter from Phius.
   b. An updated ~~WUFI~~ Passive House Verification Report with results from the approved Passive House certification software which reflects "as-built" conditions and test results (blower door and ventilation results) that demonstrate project compliance with Phius performance requirements ~~(blower door and ventilation results)~~.
   c. A statement from the CPHC that the envelope meets the Phius hygrothermal requirements found in Appendix B of the Phius 2021 Certification guidebook

C407.3.2.2 Passive House ~~International~~ Institute (PHI) Documentation.

1. ~~If using PHI Passive House software, p~~ Prior to the issuance of a building permit, the following items must be provided to the Building Official:
   a. A ~~PHPP~~ compliance report with results from the approved Passive House certification software which demonstrates project compliance with current PHI Classic (or newer) performance requirements;
   b. A statement from the Certified Passive House Consultant/Designer (CPHC/D) that the ~~PHPP~~ approved Passive House certification software results and compliance report accurately reflect the plans submitted;
   ...

2. Prior to the issuance of a final certificate of occupancy, the following item(s) must be provided to the building official:
3. a. A Design Certification Letter from an accredited ~~Certified~~ Passive House Certifier.
   b. An updated ~~PHPP~~ compliance report with results from the approved Passive House certification software which reflects "as-built" conditions and test results (blower door and

ventilation results) that demonstrates project compliance with PHI performance requirements;

...

RESIDENTIAL MA AMENDMENTS (780CMR Chapter 51 (IRC Chapter 11) and 225CMR Chapter 22)

R405.1 Compliance. Projects pre-certified as meeting the Phius CORE 2021 or Phius ZERO 2021 Passive Building Standard – North America, or newer, demonstrated using approved ~~WUFI~~ Passive House certification software and program criteria by PHIUS, where PHIUS design-certification is demonstrated by Phius and a Certified Passive House Consultant; or, Projects pre-certified as meeting the ~~Certified Passive House~~ Classic, Plus, or Premium Passive Building standard using the ~~current~~ approved Passive House certification software and program criteria by the Passive House Institute (PHI), where PHI certification is demonstrated by a Certified Passive House Certifier and a Certified Passive House Designer.

R405.2 Phius Documentation. ~~When using Phius approved WUFI Passive software:~~

1. Prior to the issuance of a building permit, the following items must be provided to the Building Official:
   a. A Passive House Verification report with results from the approved Passive House certification software which demonstrates project compliance with Phius CORE 2021 (or newer) , or Phius ZERO 2021 (or newer) performance requirements.
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   c. A statement from the CPHC that the envelope meets the Phius hygrothermal requirements found in Appendix B of the Phius 2021 Certification guidebook.
   d. A statement from the Phius project Verifier that the project test results meet the model performance requirements, all the mandatory limits and any other mandatory requirements.
   e. A copy of the Phius workbook listing all testing results and as-built conditions.

R405.3 Passive House International (PHI) Documentation.

1. ~~If using PHI Passive House software, p~~ Prior to the issuance of a building permit, the following items must be provided to the Building Official:
   a. A ~~PHPP~~ compliance report with results from the approved Passive House certification software which demonstrates project compliance with ~~current~~ PHI Classic (or newer) performance requirements;
   b. A statement from the Certified Passive House Consultant/Designer (CPHC/D) that the ~~PHPP~~ approved Passive House certification software results and compliance report accurately reflect the plans submitted;
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   …
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   c. A statement from the CPHD that the project test results meet the model performance requirements, all the mandatory limits and any other mandatory requirements.
   d. A copy of the Passive House Verifier/Rater's test results;
   …

Any mistakes in my comments are my own, and these edits are intended only as suggestions to make the Stretch and Specialized code language more clear, equitable, and consistent across the different standards. I am happy to answer any questions as needed.

Sincerely,

Luke McKneally AIA, LEED AP, CPHC
617-835-8999
luke@lmdesignworks.com

Edson, Becca (ENE)

From: Chris Zimmel <czimmel@sea.us.com>
Sent: Monday, September 16, 2024 9:00 PM
To: STRETCHCODE (ENE)
Subject: Stretch Code Feedback

Follow Up Flag: Follow up
Flag Status: Completed

Comments round 2

Thanks for all your work synthesizing and evaluating everyone's comments.

Responding to the comments from the local ACCA/hvac representative on the call today - I 100% disagree with all of their comments. 3rd party testing is needed to keep Mechanical contractors honest. RESNET and Phius wouldn't allow their testing in lieu of ours anyway. I think she is confused that they can absolutely test their own work. We encourage it and I know many HVAC contractors who have their own equipment. HVAC contractors who own their own testing equipment tend to have tight ducts when we test them. HERS Raters and Phius Raters/Verifiers still need to verify. As Ronald Reagan once said: Trust but verify. Also, where have they been the last 15+ years?? Duct testing by HERS Raters isn't new!

Chris Zimmel

Sustainable Energy Analytics Inc.

440 Totten Pond Rd, Waltham, MA 02451

o: 781-790-5718 | w: www.sea.us.com

TRINITY
DEVELOPMENT & MANAGEMENT

To: Ian Finlayson, Department of Energy Resources

From: Rebecca Hemenway, Vice President, Trinity Financial Inc.
Patrick A.T. Lee, Executive Vice President, Trinity Financial Inc.
James G. Keefe, President, Trinity Financial Inc.

Re: Stretch Code Feedback

We are writing with a request to address a serious concern in DOER's Proposed Changes to the current Stretch Energy Code and Municipal Opt-in Specialized Code pertaining to projects pursuing passive house certification and seeking final certificate of occupancy ("CoO"). Per Sections R405.2, R405.3, C407.3.2.1, and C407.3.2.2 of the Draft MA 2023 Residential and Commercial Stretch Code and Specialized Opt-in Code with proposed revisions, projects pursuing passive house certification, whether through Phius or PHI, have two options for obtaining final CoO, as summarized below:

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Sincerely,

Rebecca Hemenway
Vice President

June 4, 2024

Ian Finlayson
Deputy Director, Energy Efficiency Division
MA Department of Energy Resources (DOER)
100 Cambridge St., 9th Floor
Boston, MA 02114

Re: Stretch Energy Code Feedback

Dear Mr. Finlayson,

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While projects can obtain temporary CoO regardless of certification status, which is necessary for occupancy, the current proposed code language still puts extremely high-performance projects at risk by requiring Options 1 or 2 above for obtaining final CoO. Neither option above is feasible for development teams who fail to achieve final Passive House levels of performance despite well documented best efforts. As currently written, the Draft Stretch Code and Opt-In Code do not support projects that achieve design phase certification, do their best to construct to Passive House levels of performance, but ultimately fall short of satisfying 100% of certification requirements. These projects need a defined path to achieve a final CoO in the event neither option above is attainable.

Without final CoO, projects may not convert high-interest rate construction loans to permanent mortgages. In low-income housing tax credit ("LIHTC") projects, the construction loan, typically paid down with LIHTC equity upon receiving final CoO, is significantly larger than the permanent mortgage,

making the conversion critical for LIHTC developers to continue doing business in Massachusetts. Furthermore, it is not realistic for projects to pursue an appeal with their Authority Having Jurisdiction and/or the State, which would cause significant delays to project delivery, while adding cost and risk to very high-performance projects.

Given the quantity of Passive House projects in the state, estimated at more than 272 projects consisting of over 20,600 units, it is very likely that some of these projects that are designed to Passive House certification, as evidenced at the time of permitting, and constructed per design, as evidenced by frequent third-party inspection reports, may encounter insurmountable issues that make satisfying Option 1 and Option 2 impossible. These projects will have spent considerable time and money designing and constructing buildings with the intent of certifying – which will be easily documented with consultant contracts, inspection reports, and test results -- and yet still encounter issues such as air infiltration or ventilation balancing preventing final CoO. These projects require a 3rd option for achieving final CoO that does not reduce the performance objectives of the code nor present an easier, race-to-the-bottom option for developers to consider. The 3rd option proposed below requires nearly identical requirements for design and construction as the two existing options and should only be available for projects who cannot achieve options 1 or 2. This 3rd option must be included in code to avoid local review and waiver ambiguity, further delays, significant added costs, and extreme risk in an industry that cannot absorb additional cost.

3. Proposed Option 3 for Final CoO:
    a. Copy of certified Passive House consultant and rater/verifier contracts demonstrating all required inspections and testing requirements for certification
    b. Design phase pre-certification/approval
    c. Verification report demonstrating as-built conditions, including those that comply with Passive House requirements, and those that do not (if applicable)
        i. For projects following Phius, demonstrate final Energy Star and Zero Energy Ready Homes certification requirements are met.
    d. Hygrothermal analysis confirming the building does not face any durability concerns based on as-built condition
    e. Statement from Passive House consultant confirming project has completed all interim, final, and corrective testing and modeling requirements, including a summary of deviations from Passive House requirements
        i. Taped and untaped blower door testing at 50 Pascal and 75 Pascal demonstrating results are within 20% of Passive House requirements. If initial whole building blower door testing exceeds Passive House requirement, statement must reflect evidence of a re-test, with results, as well as an explanation for sources of leakage and attempted remediation efforts.
        ii. Back-up documentation with test results for initial and follow up re-tests with explanation for any deviation from Passive House requirements
    f. Ventilation flow rates demonstrating mechanical code compliance

This proposed 3rd option is nearly identical to Option 1 and offers similar flexibility as the Passive House Institute U.S. offers projects that may not satisfy all program requirements necessary for certification. Phius does not have adequate capacity to evaluate projects seeking waivers on a case-by-case basis in a timely manner, making it necessary for the Commonwealth to allow a similar approval path for municipal building departments.

Without this option, projects will face significant cost and major delays after having made significant investments in developing extremely well performing buildings. Project teams pursuing Passive House certification that have obtained pre-certification at design and who work closely with their consultants and contractors to follow all inspection and testing procedures necessary for Passive House certification are deserving of final CoO without facing onerous cost, risk, or delay.

Sincerely,

Zoe Weinrobe
Chief of Real Estate
2Life Communities

Planning Office for Urban Affairs
ARCHDIOCESE OF BOSTON

To: Ian Finlayson, Department of Energy Resources

From: Mary Wambui , Asset Manager , Planning Office for Urban Affairs.

Date : 9/13/2024

Re: Stretch Code Feedback

I am writing with a request to address a serious concern in DOER's Proposed Changes to the current Stretch Energy Code and Municipal Opt-in Specialized Code pertaining to projects pursuing Passive House certification and seeking final certificate of occupancy ("CoO"). Per Sections R405.2, R405.3, C407.3.2.1, and C407.3.2.2 of the Draft MA 2023 Residential and Commercial Stretch Code and Specialized Opt-in Code with proposed revisions, projects pursuing Passive House certification, whether through Phius or PHI, have two options for obtaining final CoO, as summarized below:

1. Option 1:
    a. Design phase pre-certification/approval
    b. Verification report demonstrating as-built conditions comply with Passive House requirements
    c. Statement from consultant confirming hygrothermal requirements are satisfied
    d. Statement from consultant confirming project satisfies all testing and modeling requirements
    e. Back-up documentation with test results
2. Option 2:
    a. Final certification letter from certifying body

While projects can obtain *temporary* CoO regardless of certification status, which is necessary for occupancy, the current proposed code language still puts extremely high-performance projects at risk by requiring Options 1 or 2 above for obtaining *final* CoO. Neither option above is feasible for development teams who fail to achieve final Passive House levels of performance despite well documented best efforts. As currently written, the Draft Stretch Code and Opt-In Code do not support projects that achieve design phase certification, do their best to construct to Passive House levels of performance, but ultimately fall short of satisfying 100% of certification requirements. These projects need a defined path to achieve a final CoO in the event neither option above is attainable.

Without final CoO, projects may not convert high-interest rate construction loans to permanent mortgages. In low-income housing tax credit ("LIHTC") projects, the construction loan, typically paid down with LIHTC equity upon receiving final CoO, is significantly larger than the permanent mortgage, making the conversion critical for LIHTC developers to continue doing business in Massachusetts. Furthermore, it is not realistic for projects to pursue an appeal with their Authority Having Jurisdiction and/or the State, which would cause significant delays to project delivery, while adding cost and risk to very high-performance projects.

Given the quantity of Passive House projects in the state, estimated at more than 272 projects consisting of over 20,600 units, it is very likely that some of these projects that are designed to Passive House certification, as evidenced at the time of permitting, and constructed per design, as evidenced by frequent third-party inspection reports, may encounter insurmountable issues that make satisfying Option 1 and Option 2 impossible. These projects will have spent considerable time and money designing and constructing buildings with the intent of certifying – which will be easily documented with consultant contracts, inspection reports, and test results -- and yet still encounter issues such as air infiltration or ventilation balancing preventing final CoO. These projects require a 3rd option for achieving final CoO that does not reduce the performance objectives of the code nor present an easier, race-to-the-bottom option for developers to consider. The 3rd option proposed below requires **nearly identical requirements** for design and construction as the two existing options and should only be available for projects who cannot achieve options 1 or 2.

This 3rd option must be included in code to avoid local review and waiver ambiguity, further delays, significant added costs, and extreme risk in an industry that cannot absorb additional cost.

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        ii. Back-up documentation with test results for initial and follow up re-tests with explanation for any deviation from Passive House requirements
    f. Ventilation flow rates demonstrating mechanical code compliance

This proposed 3rd option is nearly identical to Option 1 and offers similar flexibility as the Passive House Institute U.S. offers projects that may not satisfy all program requirements necessary for certification. Phius does not have adequate capacity to evaluate projects seeking waivers on a case-by-case basis in a timely manner, making it necessary for the Commonwealth to allow a similar approval path for municipal building departments.

Without this option, projects will face significant cost and major delays after having made significant investments in developing extremely well performing buildings. Delays especially in affordable housing affect men ,women and children who are waiting lists anticipating finding a place to call home.Project teams pursuing Passive House certification that have obtained pre-certification at design and who work closely with their consultants and contractors to follow all inspection and testing procedures necessary for Passive House certification are deserving of final CoO without facing onerous cost, risk, or delay.

Sincerely,

Mary Wambui
mary wambui
Asset Manager , POUA

HBRA
Home Builders & Remodelers Association
MASSACHUSETTS

465 Waverley Oaks Road, Suite 421
Waltham, MA 02452
617.773.3305
HBRAMA.com

Ian Finlayson
Department of Energy Resources
100 Cambridge Street, 9th floor
Boston, MA 02114.

September 16, 2024

Re: Stretch Code Feedback - Draft Stretch Code Updates

Sir,

On behalf of the HBRA of Massachusetts I want to commend the DOER regarding the ongoing efforts to improve the Massachusetts Energy Codes for their effectiveness, clarity and practicality. The recent proposed revisions are both welcomed and clearly reflective of the numerous concerns expressed by many of the organizations and people who are engaged in the designing and/or building of structures regulated by the Energy Codes, as well as those who are tasked with enforcing the code.

That being said, I'd like to take the opportunity provided to point out a couple of issues.

Section R406.5.2 Embodied Carbon Credit
This proposed change would allow for a 3-point HERS credit through use of either low embodied carbon concrete or insulation products. We ask that the maximum HERS credit be extended to 6 points if the project complies with both the insulation option and the low GWP concrete option. If the carbon credit justifies the 3-point HERS credit for either option, then compliance with both options should justify a 6-point HERS credit. Given the minimum standards and overall stringency built into the Stretch and Specialized Codes, the additional 3-point credit in exchange for greater carbon reduction would not appreciably reduce a given project's energy efficiency and carbon number, but certainly would provide greater flexibility for some particularly challenging projects. While I believe this approach would only be useful in a small minority of projects, I think it's worth consideration.

Section R-402 Building Thermal Envelope – Table 402.1.3

This issue is not specific to any of the proposed evisions, but I believe it's in the spirit of what the proposed changes are attempting to achieve. As you are aware, the 2024 IECC lowers the attic insulation requirement from R-60 back to R-49 which is where it had been prior to being changed for the 2021 IECC. Given that the DOER will soon adopt the 2024 IECC as required by MGL Ch. 43 Sec. 94 (o), perhaps the DOER should take this opportunity to proactively amend 225 CMR to reflect this inevitable change? The ICC has recognized what the building industry has demonstrated regarding the change to R-60: that the increased energy efficiency from the change was extremely minimal and did not justify the added expense. In fact, a study by the Home Innovation Research Laboratory demonstrated that the increase from R-49 to R-60 for our climate zone has a cost payback through energy savings of 118 years (2021 IECC Residential Cost Effective Analysis (nahb.org). Making such a change in advance of the next iteration of the code would demonstrate the DOER's commitment to improving the code, much in the way that the current proposed changes demonstrate.

The HBRAMA sincerely hopes you will give these suggestions serious consideration. As always, I am happy to discuss these and any other pertinent issues with you.

Thank you for your attention on these matters.

Best regards,

Guy A. Webb

Guy A. Webb
Government Affairs
HBRA of Massachusetts

PRESERVATION
OF AFFORDABLE
HOUSING

To: Ian Finlayson, Department of Energy Resources

From: Julie Klump, VP Design and Building Performance, Preservation of Affordable Housing

Re: Stretch Code Feedback

I am writing with a request to address a serious concern in DOER's Proposed Changes to the current Stretch Energy Code and Municipal Opt-in Specialized Code pertaining to projects pursuing passive house certification and seeking final certificate of occupancy ("CofO"). Per Sections R405.2, R405.3, C407.3.2.1, and C407.3.2.2 of the Draft MA 2023 Residential and Commercial Stretch Code and Specialized Opt-in Code with proposed revisions, projects pursuing passive house certification, whether through Phius or PHI, have two options for obtaining final CofO, as summarized below:

1. Option 1:
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    b. Verification report demonstrating as-built conditions comply with passive house requirements
    c. Statement from consultant confirming hygrothermal requirements are satisfied
    d. Statement from consultant confirming project satisfies all testing and modeling requirements
    e. Back-up documentation with test results
2. Option 2:
    a. Final certification letter from certifying body

While projects can obtain *temporary* CofO regardless of certification status, which is necessary for occupancy, the current proposed code language still puts extremely high-performance projects at risk by requiring Options 1 or 2 above for obtaining *final* CofO. Neither option above is feasible for development teams who fail to achieve final Passive House levels of performance despite well documented best efforts. As currently written, the Draft Stretch Code and Opt-In Code do not support projects that achieve design phase certification, do their best to construct to passive house levels of performance, but ultimately fall short of satisfying 100% of certification requirements. These projects need a defined path to achieve a final Coo in the event neither option above is attainable.

Without final CofO, projects may not convert high-interest rate construction loans to permanent mortgages. In low-income housing tax credit ("LIHTC") projects, the construction loan, typically paid down with LIHTC equity upon receiving final CofO, is significantly larger than the permanent mortgage, making the conversion critical for LIHTC developers to continue doing business in Massachusetts. Furthermore, it is not realistic for projects to pursue an appeal with their Authority Having Jurisdiction and/or the State, which would cause significant delays to project delivery, while adding cost and risk to very high-performance projects.

Given the quantity of passive house projects in the state, estimated at more than 272 projects consisting of over 20,600 units, it is very likely that some of these projects that are designed to Passive House certification, as evidenced at the time of permitting, and constructed per design, as evidenced by frequent third-party inspection reports, may encounter insurmountable issues that make satisfying Option 1 and Option 2 impossible. These projects will have spent considerable time and money designing and constructing buildings with the intent of certifying – which will be easily documented with consultant contracts, inspection reports, and test results -- and yet still e

PRESERVATION OF AFFORDABLE HOUSING

encounter issues such as air infiltration or ventilation balancing preventing final CofO. These projects require a 3rd option for achieving final CofO that does not reduce the performance objectives of the code nor present an easier, race-to-the-bottom option for developers to consider. The 3rd option proposed below requires **nearly identical requirements** for design and construction as the two existing options and should only be available for projects who cannot achieve options 1 or 2. This 3rd option must be included in code to avoid local review and waiver ambiguity, further delays, significant added costs, and extreme risk in an industry that cannot absorb additional cost.

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Without this option, projects will face significant cost and major delays after having made significant investments in developing extremely well performing buildings. Project teams pursuing passive house certification that have obtained pre-certification at design and who work closely with their consultants and contractors to follow all inspection and testing procedures necessary for passive house certification are deserving of final CofO without facing onerous cost, risk, or delay.

Sincerely,

Julie Klump, VP Design and Building Performance, POAH

To: Ian Finlayson, Department of Energy Resources

From: Moriah Gavrish, Designer, The Narrow Gate Architecture

Re: Stretch Code Feedback

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Sincerely,

Moriah Gavrish
Designer
The Narrow Gate Architecture

Edson, Becca (ENE)

From: Robert Fizek <archima@rcn.com>
Sent: Monday, September 16, 2024 12:01 PM
To: STRETCHCODE (ENE)
Subject: Comment to proposed revisions

Follow Up Flag: Follow up
Flag Status: Completed

Thank you for today's listening session.
I would like to submit in writing my concerns regarding the code as it pertains to existing homes.
I hope the code designers are taking full account of the benefits for retaining existing home construction which can be significantly upgraded to greater efficiencies and converted to non-fossil fuel infrastructure.
-if doing so makes practical and financial sense.

It is well worth considering both not wasting the embodied energy of existing structures, and the avoidance of rebuilding with all new materials. Both actions support the climate correction / protection initiatives we need to achieve NOW.
We may want to design or remake everything to near net zero, but clearly that will take too long to prove effective.
We need to help people do what is most useful in as many situations as possible, and as soon as possible.
Thank you.

Oh…
I am also pleased to hear that it is now recognized that R60 is not appropriate or useful in our climate zone. Please expedite this correction to the code ASAP.

Robert Fizek, Arch.
47 Forest Street
Newton, MA 02461

9/16/2024

Hello, my name is Matthew Friedlander. I work for RenewAire, where we've manufactured residential and commercial energy recovery ventilators for over three decades.

The Massachusetts residential and commercial stretch code is by far the most ambitious in the country in its treatment of energy recovery ventilation, or ERV. We support its market transformation goals, but the code does have some problems.

First, the residential stretch code can increase its benefits to stakeholders by increasing the minimum Sensible Recovery Effectiveness, or SRE, from 65% to 72%. The market can support this, and 72% is appropriate for a stretch code.

Second, the commercial code needs to provide a compliance path for the small ERVs often used in nontransient dwelling units, such as high-rise apartmentsThe most recent ASHRAE 90.1 and IECC codes contain such compliance paths. Stakeholders will enjoy more design flexibility, control of individual dwelling unit ventilation, and in some cases reduced cost.

Thirdly, for other spaces in the commercial code, the 70% minimum energy recovery ratio, or ERR, for both heating and cooling is simply too high and not structured optimally for the Massachusetts climate. With ERV, every additional performance increase comes at exponentially-increasing size and cost. The change from the previous minimum ERR of 50% to the current 70% was a giant leap, requiring much larger and costlier equipment, disrupting and confusing the marketplace.

To optimize for the state's climate, it is sensible energy recovery that reduces energy consumption in winter. Therefore, we recommend an additional requirement of 75% sensible energy recovery ratio should be added for heating.

Again, in winter, what latent energy recovery provides is frost point depression, eliminating preheat, and to do this the enthalpy recovery ratio need only be 60%.

Given this, we recommend 60% ERR, heating and cooling, the same as in LEED, and higher than any other standard. This is still very stringent.

We think these changes together will increase annual energy savings, the primary goal of the stretch code, and will increase the equipment, technology and design options available for engineers, contractors and building owners. The stretch code would be an achievable performance target for the industry and lead the nation.

Two more points:

The Stretch Code could clearly require third-party certification of the required performance, as many codes do, protecting Stakeholders against misleading performance claims.

The code could set an explicit limit in the commercial section for transfer of exhaust air to supply air, which is rated at operating condition for AHRI-certified ERVs

Our written comment will contain specific text changes to accomplish the above suggestions. Thank you again.

Matthew Friedlander
RenewAire LLC

Edson, Becca (ENE)

From: Edson, Becca (ENE)
Sent: Monday, September 16, 2024 11:29 AM
To: Edson, Becca (ENE)
Subject: stretchcode feedback

Follow Up Flag: Follow up
Flag Status: Flagged

Scott Greenbaum Green Energy Consultants

Existing building HERS ratings were significantly reduced – thinks this is bad. Will have significant issue trying to electrify and meet carbon free. Go back to original HERS plan. Will be a lot easier for people to not have big utility bills.

Large window area buildings – why haven't you addressed? They do not perform as modeled. HVAC equipment cannot keep up, big energy user, they do not function as modeled. Need to make buildings insulated and comfortable, otherwise people crank up thermometers.

Catherine Flaherty

Representing Air Conditioning Association of NE – want to address two issues – duct testing and testing verification. Provisions conflict with existing MA law, which clearly outlines scope of work for sheet metal workers. HVAC are recognized over HERS raters. Sheet metal workers should be allowed to test their own work. Language will keep licensed sheet metal workers from performing their trades, please remove from the stretch code language.

Kevin Bergeron

RST Thermal rep

ERV portion – they made comments back in March, too, but focusing today on the lack of third party certification for portions of stretch code. They help select equipment for designer s & builders, are occasions where people think their equipment can meet the stretch code but without third party tested, we can't back certification numbers. Stretch code needs to require third party verification so that everyone is on level playing field so that equipment spec'd properly.

Chris Mazzola

Thinks standards significantly over ventilate buildings. indoor air quality monitoring needed as pathway rather than the ashrae 62.2 standard

John Borger

Commends DOER for listening sessions & listening carefully.

Kevin Haggerty

Some parts of comments not incorporated – but see written comments.

Shari Rauls

Steven Winter associates – they strongly support the added embodied carbon credit. HERS credit should be taken on whole-building scale, not unit, and language isn't clear. More that I missed cause dogs barking…. Unit boundary clarification can change how embodied carbon works, whole-building rewards building appropriately.

Robert Fizek
Architect on older homes, please continue to consider the difficulties working with existing buildings.
Consideration of embodied carbon credits and how tear downs and rebuilds will harm embodied carbon.

Matthew Friedlander – Newes Air, ERV
SRE from 65-72 will be better. 72% appropriate for stretch code. Ashrae 91.1 refers to a compliance path that I missed….. Thridly, 70% ERR too high, not structured optimely for MA climate. The change from 50%-70% was too big a leap. Optimize is better 75% SENSIBLE energy recovery ration should be added for heating. 60% ERR heating and cooling (same as LEED). These changes will be right. Set a limit for transfer to … see written comments.

Guy Webb

Overll great. Embodied carbon credit – consider that if option complies with both they get credits for each, so 6 point each.

Also, Table 402.1.3 – minimum R values (BE NOTE : MAKE SURE WE REMOVE ALL REFERENCES TO THIS!) cost benefit analysis to go from r49- r60 is good opportunity. 2024 iecc will use this anyway.

Gary Tondorf-Dick
I missed his feedback

Jay Lee – works for boston
Minor change suggestion – multifamily – 12,000 Sf threshold seems low. 20,000 SF mirrors the threshold for boston's permitting
Increase from 3-4 story building…… (I missed this part)….

Yve Torrie
Climate directed at Better City –
Concerns about solar roof top requirements. Due to eversource underground route they can't. thn boston fire code requires setbacks. So there are a lot of issues with the definition of "where feasible and where not feasible" be spelled out more clearly.

Greg Jones
Small architect.
It's hard to get older historic homes to meet the HERs requirements when adding an addition, definition of historic home doesn't cover the houses he works on…. Maybe we need to make it more clear … I missed the last part because my father started uo lawn mower……

Matthew cummings
Thank you for historic house updates! And HERs rating levels, thank you. Other suggestions – they've come up with a weighted average for HERs that they are going to send along. Aldo r-49 to r-60, and back --- check this with IECC 2024. There's also some issue with level 1,2,3… he'll send revision.

Hank Keating
President of Passive house Mass.
How can a project get final co without passing passive house certification? But what happens if project misses something else and can't get final certification? How can it get final co in order to resolve financial issues and resolve mortgages? Opportunity to degine third code option --- but not attractive path of choice but will allow prokects to finally get final c of o. they will submit.

Christine Blais – josh on behalf of sommercivlle
Two notes on proposed changes – sommerville see reduced HERs as a setback . also issues with highly ventilated buildings, please explore options to still meeting solar requirements so that solar isn't cut down so much.

Chris zimmel
HERs rating certificate – confusion on how the building inspectors will interpret…? I missed

Michael grant – ISD Wellesley.
Attic space – complies with hers, please clarify? If you're changing the structure, is it also an alteration? Filed emergency code change proposal , submitted to BBRS, and never heard back from them……. Find the contaxt he's referring to. Track down.

R502.1.1 & his emergency code change proposal

Patricia burke – where do we go from here? Next steps?

Becca Edson
Architect
Massachusetts Department of Energy Resources
100 Cambridge Street, 9th Floor, Boston, MA 02114
(617) 626-7311
becca.edson@mass.gov

Comment Type	Section
Compliance Pathway	C401.2
TEDI	C401.2.1.2
Electrification	C401.4.2, C401.4.3, CC104, CC105, CC106
Electrification	C401.4.2, C401.4.3, CC105, CC106
Envelope Backstop	C402.1.5
Passive House	C4021.2.2.1
Existing Buildings - Alterations	C503.1

Existing Building Envelope	C503.1/ C505.1
Existing Buildings Change of Use/Occupancy	C505.1

Comment

This comment is specific to projects that are following either C401.2.1.2 : Targeted Performance Compliance or C401.2.2: Certified Performance Standard Compliance. This comment is relative to attached parking garages, such as below grade parking garages that are greater than 20,000 SF.

Parking garages are not applicable to the TEDI pathway, nor the Passivehouse/HERS compliance standards, therefore if a parking garage is attached to a building following one of these pathways, a parking garage shall demonstrate compliance by following C401.2.1.3 – Relative Performance Compliance (ASHRAE 2019 App G model).

Having an energy model for just a parking garage is not the intent of IECC, ASHRAE, and 225 CMR 23. Typically for below-grade garages, the energy code pathway is one of the following: (1) Meets code following the prescriptive path, which this garage is achieving, or (2) is attached to a building going through ASHRAE 2019 App G compliance in its entirety and thus the garage does not have to demonstrate the Appendix G-necessary energy reductions in isolation, but is otherwise contributing to energy

TEDI only addresses heating and cooling loads, but does not consider the source of meeting the loads. There is no incentive to go to heat pump heating following the TEDI methodology, which is the intent of a code intending to target low-carbon design.

C401.4.2 and C401.4.3 require sizing the heat pumps based on the 99.6% design day, and require 100% of all heating needs to be supported by all-electric equipment. Additionally, if a project is in an Opt-In Specialized Community and is mixed-fuel, the project is required to meet the requirements of CC106 - Wiring for future electrification.

Adding electric equipment (such as electric resistance) or wiring for this future equipment (CC106) can increase the electrical capacity to a building beyond what is feasible at the location based on grid capacity, as well as substantially increase the size/capacity of the building electrical systems (such as transformers, electrical distribution, switchboards, etc.). Back-up fossil-fuel heating equipment, such as natural gas boilers, are installed on most projects for loss-of power scenarios, as is necessary for life safety as well as critical loads and critical occupants. Electric heating systems to support the 0.4 percentile of heating run hours heavily impact cost and space, and are carbon intensive to install, as well as redundant to the emergency fossil-fuel back-up equipment.

The reason to maintain fossil-fuel heating equipment such as natural gas boilers for buildings is because the back-up generators to support a 100% all-electric heating system day 1 or in the future (CC106) would be substantially increase generator sizing. A generator will have to be able to run the full peak of the electric boilers, along with all of the other legally required and emergency loads for the building. This could lead to the generator doubling in size. This has impacts such as:
(1) Holding a substantial roof footprint, which could be space allocated for air-source heat pumps or on-site renewables
(2) Increased fuel storage cycling and maintenance.

Additionally, upon discussions with the International Living Future Institute (ILFI), fossil fuel equipment such as natural gas boilers for extreme temperatures beyond the 99.6 percentile design day and back-up scenarios are permitted for the Zero

Adding air-source heat pumps sufficient to meet the 99.6 percentile design day condition for tall buildings (high floor to area ratio [FAR]) is difficult due to sufficient roof space to meet the requirement. Air-source heat pumps are sometimes the only heat pump technology available when there is no geothermal availability nor district energy system available to a parcel.

Sections C402.1.5.1 and C402.1.5.2 require that all vision portions within a glazed wall system must have whole assembly U-factor performance of U-0.25 or less. An assembly U-value of U-0.25 or less requires triple pane IGUs. For retail storefronts, this is particularly prohibitive as triple pane IGUs impact visual views into a retail space.

There is currently no allowance to follow PHI's EnerPHit Pathway for energy code, for existing building renovations.

With the alteration/replacement of space/zone MEP equipment, such as fan coil units or chilled beams, it is currently unclear in the language if upstream equipment, such as boilers and chillers need to be brought up to code as well.

For existing buildings required to meet the requirements of C402, there are substantial challenges with existing facades/curtainwalls. There are limited improvements available that are feasible for curtainwall style buildings and/or Mass buildings that will meet all requirements of C402, specifically C402.1.5 (envelope backstop), after accounting for thermal bridging.

Alteration projects we are supporting are forgoing updates to the facade as the design team has determined that no updates will meet the requirements. On one specific project, this is due to the mass wall construction requiring substantial demolition to meet the requirements. The team is interested in envelope improvements, but realized the challenges that come with altering the envelope relative to code provide limitied options.

On a separate Change of Use project, the project has reviewed several envelope upgrades and has determined a pathway to be

The methodology to determine the increase in energy is not clearly defined.

Proposed/Recommended Change

Adjust language so that parking garages greater than 20,000 SF, or other semi-conditioned spaces such as those that meet the requirements of C402.1.1 can follow C401.2.1: Prescriptive Compliance pathway.

Projects that are required to follow the TEDI pathway also be required to meet the C401.4.1 (Partial Space Heating Electrification) under the stretch code.

Clarification:
CC101.3.3 exception 2 clearly identifies on-site back-up generators using fossil fuels as an exception to the mixed fuel pathway. Please also add this exception to C401.4.2 and C401.4.3.

AMENDMENT
The concerns described are particularly applicable/sensitive to high ventilation buildings, where back-up needs and critical loads/critical occupants are great. It is recommended to have an exception under C401.4.2/C401.4.3 and CC106 for high ventilation buildings that allows for fossil-fuel heating equipment for the heating loads for the capacity that exceed the 99.6% design day as well as emergency/loss of power heating back-up.

It is recommended that CC106 be amended so that wiring for future electrification is sized for the incorporation of future air-source heat pumps at higher COPs/efficiencies, and not wired for future electric resistance equipment.

We understand this may be amended again in the future if and when battery back-up is available at scale.

For buildings that have a high FAR that are mixed-fuel, our team is in agreement that these building shall remain mixed-fuel. We however propose that an amendment to CC105 is introduced to permit these taller buildings with limited roof space to maximize the installation capacity of air source heat pumps in lieu of PV. This approach is likely to maximize carbon reductions.

For vision enclosing Group M spaces (Mercantile) the assembly U-value is recommended to be increased to U-0.32, which equates to a high performance double-pane IGU.

Add language that permits EnerPHit as a pathway under PHI for existing building renovations, as this is most applicable.

It is recommended that DOER introduce language that requires upstream equipment be replaced and brought up to code if mechanical equipment renovation downstream exceeds 75% of central equipment capacity. Additional language that reference ASHRAE end-of-life operational years could be considered as well.

Allow existing projects to document the best feasible envelope upgrades as an alternative approach to C402. Require projects to document several performance improvement metrics, such as U-value, infiltration, and SHGC in their analysis. Reasons for not achieving full C402 compliance shall be documented in detail, with back up analysis to support.

Please outline the process/modeling methodology for how to determine an increase in modeled energy.

Alternatively, permit project teams to document previously collated data to verify increase/decrease in energy such as NREL database results or CBECS data.

PCA

Architecture
Interiors
+ Planning

Ian Finlayson **09/17/2024**
Department of Energy Resources

Dear Mr. Finlayson:

I am writing with a request to address a serious concern in DOER's Proposed Changes to the current Stretch Energy Code and Municipal Opt-in Specialized Code pertaining to projects pursuing passive house certification and seeking final certificate of occupancy ("CoO"). Per Sections R405.2, R405.3, C407.3.2.1, and C407.3.2.2 of the Draft MA 2023 Residential and Commercial Stretch Code and Specialized Opt-in Code with proposed revisions, projects pursuing passive house certification, whether through Phius or PHI, have two options for obtaining final CoO, as summarized below:

1) Option 1:
    a) Design phase pre-certification/approval
    b) Verification report demonstrating as-built conditions comply with passive house requirements
    c) Statement from consultant confirming hygrothermal requirements are satisfied
    d) Statement from consultant confirming project satisfies all testing and modeling requirements
    e) Back-up documentation with test results

2) Option 2:

PCA
pcadesign.com
221 Hampshire Street
Cambridge, MA 02139
Phone: 617-547-8120
Email: connect@pcadesign.com

a) Final certification letter from certifying body

While projects can obtain *temporary* CoO regardless of certification status, which is necessary for occupancy, the current proposed code language still puts extremely high-performance projects at risk by requiring Options 1 or 2 above for obtaining *final* CoO. Neither option above is feasible for development teams who fail to achieve final Passive House levels of performance despite well documented best efforts. As currently written, the Draft Stretch Code and Opt-In Code do not support projects that achieve design phase certification, do their best to construct to passive house levels of performance, but ultimately fall short of satisfying 100% of certification requirements. These projects need a defined path to achieve a final CoO in the event neither option above is attainable.

Without final CoO, projects may not convert high-interest rate construction loans to permanent mortgages. In low-income housing tax credit ("LIHTC") projects, the construction loan, typically paid down with LIHTC equity upon receiving final CoO, is significantly larger than the permanent mortgage, making the conversion critical for LIHTC developers to continue doing business in Massachusetts. Furthermore, it is not realistic for projects to pursue an appeal with their Authority Having Jurisdiction and/or the State, which would cause significant delays to project delivery, while adding cost and risk to very high-performance projects.

Given the quantity of passive house projects in the state, estimated at more than 272 projects consisting of over 20,600 units, it is very likely that some of these projects that are designed to Passive House certification, as evidenced at the time of permitting, and constructed per design, as evidenced by frequent third-party inspection reports, may encounter insurmountable issues that make satisfying Option 1 and Option 2 impossible. These projects will have spent considerable time and money designing and constructing buildings with the intent of certifying - which will be easily documented with consultant contracts, inspection reports, and test results -- and yet still encounter issues such as air

infiltration or ventilation balancing preventing final CoO. These projects require a 3rd option for achieving final CoO that does not reduce the performance objectives of the code nor present an easier, race-to-the-bottom option for developers to consider. The 3rd option proposed below requires **nearly identical requirements** for design and construction as the two existing options and should only be available for projects who cannot achieve options 1 or 2. This 3rd option must be included in code to avoid local review and waiver ambiguity, further delays, significant added costs, and extreme risk in an industry that cannot absorb additional cost.

1) Proposed Option 3 for Final CoO:

    a) Copy of certified passive house consultant and rater/verifier contracts demonstrating all required inspections and testing requirements for certification

    b) Design phase pre-certification/approval

    c) Verification report demonstrating as-built conditions, including those that comply with passive house requirements, and those that do not (if applicable)

        i) For projects following Phius, demonstrate final Energy Star and Zero Energy Ready Homes certification requirements are met.

    d) Hygrothermal analysis confirming the building does not face any durability concerns based on as-built condition

    e) Statement from passive house consultant confirming project has completed all interim, final, and corrective testing and modeling requirements, including a summary of deviations from passive house requirements

        i) Taped and untaped blower door testing at 50 Pascal and 75 Pascal demonstrating results are within 20% of passive house requirements. If initial whole building blower door testing exceeds passive house requirement,

statement must reflect evidence of a re-test, with results, as well as an explanation for sources of leakage and attempted remediation efforts.

ii) Back-up documentation with test results for initial and follow up re-tests with explanation for any deviation from passive house requirements

f) Ventilation flow rates demonstrating mechanical code compliance

This proposed 3rd option is nearly identical to Option 1 and offers similar flexibility as the Passive House Institute U.S. offers projects that may not satisfy all program requirements necessary for certification. Phius does not have adequate capacity to evaluate projects seeking waivers on a case-by-case basis in a timely manner, making it necessary for the Commonwealth to allow a similar approval path for municipal building departments.

Without this option, projects will face significant cost and major delays after having made significant investments in developing extremely well performing buildings. Project teams pursuing passive house certification that have obtained pre-certification at design and who work closely with their consultants and contractors to follow all inspection and testing procedures necessary for passive house certification are deserving of final CoO without facing onerous cost, risk, or delay.

Best regards,

Laura Homich, AIA LEED AP BD+C
Principal
lhomich@pcadesign.com
Cc: File

ACA/NE
AIR CONDITIONING ASSOCIATION OF NEW ENGLAND

11 Robert Toner Blvd., # 234 | North Attl boro, MA 02763 | Phone: 508-839-3407 | www.acane.org

Comments Submitted by
Catherine Flaherty, Executive Director
Air Conditioning Association of New England (ACA/NE)
Monday, September 16, 2024
Massachusetts Department of Energy Resources (DOER)

Testimony for the Stretch Code and Specialized Code Virtual Public Hearing

Thank you for the opportunity to provide comments on the Massachusetts Department of Energy Resources (DOER) proposed revisions to the Stretch and Specialized Codes.

The Air Conditioning Association of New England (ACA/NE) is a non-profit trade association representing residential heating, ventilation, air conditioning, and refrigeration contractors.

We would like to address two specific provisions including:

- **R403.3.5 Duct Testing -** Post-construction or rough-in testing and verification shall be performed by a HERS Rater, HERS Rating Field Inspector, or an applicable BPI Certified Professional."
- **R403.6.3 Testing and Verification -** Installed performance of the mechanical ventilation system shall be tested and verified by a HERS Rater, HERS Rating Field Inspector, or an applicable BPI Certified Professional

These provisions mandate that a HERS Rater, HERS Rating Field Inspector, or an applicable BPI Certified Professional perform the testing and verification of work conducted by a professional HVAC Contractor.

We believe these provisions conflicts with existing Massachusetts law. M.G.L. c. 112, §§ 237-251 requires individuals engaged in the sheet metal trade to obtain a state license to perform their work. This law clearly outlines the scope of work for sheet metal workers, including "the testing, adjusting, and air-balancing of all air-handling equipment and ductwork installed during new or remodeling construction."

HVAC technicians, particularly those with sheet metal licenses, are the recognized experts in these areas—not HERS Raters or BPI Certified Professionals. The proposed language would require HVAC contractors to hire unlicensed individuals to complete tasks that are integral to their trade, comply with building code regulations, and obtain necessary permit approvals from authorities having jurisdiction.

Even if this language were legal, it is fundamentally discriminatory. It unjustly singles out one trade by prohibiting them from testing their own work. Other licensed trades are permitted to test their work, and there is no justification for treating sheet metal workers as unqualified or unreliable in performing these duties. Such a stance is disrespectful to a skilled and licensed trade.

Further, this language would deny licensed sheet metal workers the opportunity to fully perform their trade or force them to obtain additional and unnecessary certifications, which is both burdensome and unfair.

Therefore, we respectfully request that this language be removed from the Stretch and Specialized Codes to ensure fairness and compliance with existing law.

Thank you for considering our comments.

R403.3.5 Duct Testing. Ducts shall be pressure tested in accordance with ANSI/RESNET/ICC 380 or ASTM E1554 to determine air leakage by one of the following methods: 1. Rough-in test: Total leakage shall be measured with a pressure differential of 0.1 inch w.g. (25 Pa) across the system, including the manufacturer's air handler enclosure if installed at the time of the test. Registers shall be taped or otherwise sealed during the test. 2. Postconstruction test: Total leakage shall be measured with a pressure differential of 0.1 inch w.g. (25 Pa) across the entire system, including the manufacturer's air handler enclosure. Registers shall be taped or otherwise sealed during the test. 6 | P a g e Postconstruction or rough-in testing and verification shall be done by a HERS Rater, HERS Rating Field Inspector, or an applicable BPI Certified Professional. A written report of the results of the test shall be signed by the party conducting the test and provided to the code official. Exception: A duct air-leakage test shall not be required for ducts serving heating, cooling or ventilation systems that are not integrated with ducts serving heating or cooling systems.

R403.6.3 Testing and Verification. Installed performance of the mechanical ventilation system shall be tested and verified by a HERS Rater, HERS Rating Field Inspector, or an applicable BPI Certified Professional, and measured using a flow hood, flow grid, Residential IAQ Fault Indicator Display certified to the California Energy Commission, or other airflow measuring device in accordance with either RESNET Standard 380 or ACCA Standard 5.

Contact

Catherine Flaherty
Executive Director
New England Air Conditioning Associate (ACA/NE)
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508-846-2662
www.acane.org
cflaherty@acane.org

Edson, Becca (ENE)

From: Ashley Wisse <wisse@newecology.org>
Sent: Monday, September 16, 2024 9:12 AM
To: STRETCHCODE (ENE)
Subject: STRETCH CODE FEEDBACK

Follow Up Flag: Follow up
Flag Status: Completed

To: Ian Finlayson, Department of Energy Resources

From: Ashley Wisse, Director of Green Building Services; New Ecology, Inc.

Re: Stretch Code Feedback

I am writing with a request to address a serious concern in DOER's Proposed Changes to the current Stretch Energy Code and Municipal Opt-in Specialized Code pertaining to projects pursuing Passive House certification and seeking final certificate of occupancy ("CoO"). Per Sections R405.2, R405.3, C407.3.2.1, and C407.3.2.2 of the Draft MA 2023 Residential and Commercial Stretch Code and Specialized Opt-in Code with proposed revisions, projects pursuing Passive House certification, whether through Phius or PHI, have two options for obtaining final CoO, as summarized below:

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    d. Statement from consultant confirming project satisfies all testing and modeling requirements
    e. Back-up documentation with test results
2. Option 2:
    a. Final certification letter from certifying body

While projects can obtain *temporary* CoO regardless of certification status, which is necessary for occupancy, the current proposed code language still puts extremely high-performance projects at risk by requiring Options 1 or 2 above for obtaining *final* CoO. Neither option above is feasible for development teams who fail to achieve final Passive House levels of performance despite well documented best efforts. As currently written, the Draft Stretch Code and Opt-In Code do not support projects that achieve design phase certification, do their best to construct to Passive House levels of performance, but ultimately fall

short of satisfying 100% of certification requirements. These projects need a defined path to achieve a final CoO in the event neither option above is attainable.

Without final CoO, projects may not convert high-interest rate construction loans to permanent mortgages. In low-income housing tax credit ("LIHTC") projects, the construction loan, typically paid down with LIHTC equity upon receiving final CoO, is significantly larger than the permanent mortgage, making the conversion critical for LIHTC developers to continue doing business in Massachusetts. Furthermore, it is not realistic for projects to pursue an appeal with their Authority Having Jurisdiction and/or the State, which would cause significant delays to project delivery, while adding cost and risk to very high-performance projects.

Given the quantity of Passive House projects in the state, estimated at more than 272 projects consisting of over 20,600 units, it is very likely that some of these projects that are designed to Passive House certification, as evidenced at the time of permitting, and constructed per design, as evidenced by frequent third-party inspection reports, may encounter insurmountable issues that make satisfying Option 1 and Option 2 impossible. These projects will have spent considerable time and money designing and constructing buildings with the intent of certifying – which will be easily documented with consultant contracts, inspection reports, and test results -- and yet still encounter issues such as air infiltration or ventilation balancing preventing final CoO. These projects require a 3rd option for achieving final CoO that does not reduce the performance objectives of the code nor present an easier, race-to-the-bottom option for developers to consider. The 3rd option proposed below requires **nearly identical requirements** for design and construction as the two existing options and should only be available for projects who cannot achieve options 1 or 2. This 3rd option must be included in code to avoid local review and waiver ambiguity, further delays, significant added costs, and extreme risk in an industry that cannot absorb additional cost.

1. Proposed Option 3 for Final CoO:

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        i. For projects following Phius, demonstrate final Energy Star and Zero Energy Ready Homes certification requirements are met.
    d. Hygrothermal analysis confirming the building does not face any durability concerns based on as-built condition
    e. Statement from Passive House consultant confirming project has completed all interim, final, and corrective testing and modeling requirements, including a summary of deviations from Passive House requirements
        i. Taped and untaped blower door testing at 50 Pascal and 75 Pascal demonstrating results are within 20% of Passive House requirements. If initial whole building blower door testing exceeds Passive House requirement, statement must reflect evidence of a re-test, with results, as well as an explanation for sources of leakage and attempted remediation efforts.

ii. Back-up documentation with test results for initial and follow up re-tests with explanation for any deviation from Passive House requirements

f. Ventilation flow rates demonstrating mechanical code compliance

This proposed 3rd option is nearly identical to Option 1 and offers similar flexibility as the Passive House Institute U.S. offers projects that may not satisfy all program requirements necessary for certification. Phius does not have adequate capacity to evaluate projects seeking waivers on a case-by-case basis in a timely manner, making it necessary for the Commonwealth to allow a similar approval path for municipal building departments.

Without this option, projects will face significant cost and major delays after having made significant investments in developing extremely well performing buildings. Project teams pursuing Passive House certification that have obtained pre-certification at design and who work closely with their consultants and contractors to follow all inspection and testing procedures necessary for Passive House certification are deserving of final CoO without facing onerous cost, risk, or delay.

Sincerely,

Ashley Wisse
Director of Green Building Services | **New Ecology, Inc.**
wisse@newecology.org | 617-557-1700 x7043
www.newecology.org

Edson, Becca (ENE)

From: David Fite <dfite@studiomeander.com>
Sent: Monday, September 16, 2024 8:59 AM
To: STRETCHCODE (ENE)
Subject: Stretch Code Feedback

Follow Up Flag: Follow up
Flag Status: Completed

Hello,

I am writing regarding claims I have seen circulating in the industry about new energy code requirements in the stretch code. You have already received a form letter from activists and their specific concerns with the letter of the code. There are claims that permanent CO's are held up indefinitely which creates instability. I want to share with you an experience on a recent project to help illustrate how the spirit of energy conservation is getting lost when threshold guidelines are strictly interpreted.

Our team recently completed the Glen Brook Way Development in Medway, MA. This was a $35 million development built out in two phases over 7 years. During those seven years we saw significant energy code changes, a global pandemic, geopolitical tensions rose in Eastern Europe (this is where all of our high performance windows are coming from), and other market changes typical of any 7 year period.

Phase 1 of our project was EnergyStar compliant. By Phase 2 the owner realized that green building and Passive House is the way into the future.The owner wanted to do all of Phase 2 PHIUS certified. However, there was a critical challenge to doing this -- money. We didn't have the money to build a third elevator on the campus. In order to make the campus work we had to connect one of the Phase 2 Buildings into Phase 1. The question became -- how do we make this connection in an architecturally attractive way while meeting passive house requirements? The answer was a real challenge, and took a lot of consulting between the architect, structural engineer, contractors, owner's team, code consultant, energy consultant, and so forth. The problem was studied by multiple professionals who have green certifications and care deeply for the environment. In fact -- the energy consultant, New Ecology, is a non profit organization dedicated to greening affordable housing projects.

The reality is that because of this connection detail, one of the two buildings in the second Phase only achieved PHIUS by the slimmest of margins and after many retests. This didn't happen because people don't care about the environment. It happened because people DO care, and attempted to innovate their way out of a complex problem. Innovation is the spirit of the new energy code. In considering the path forward I encourage you to think about problems like ours, where the team works in good faith, but perhaps they are falling just short (instead of barely passing like we did). The authority having jurisdiction needs leeway to determine if energy code violations were flagrantly disregarded or if there is perhaps a more complex issue at play.

Having been in the industry over ten years I have seen progress and change in people's attitudes toward the climate. While there is still resentment in some corners, those people are outnumbered by people like me who care very deeply. *That being said, holding a building unoccupied, because it cannot meet a performance threshold by a small margin, is also damaging to the environment, because it represents an enormous amount of wasted material and transport emissions. It also means that the people who would have moved in will instead continue to live in homes that likely perform worse than these buildings will perform*.

Let's find a way to meet in the middle on this code requirement in a way that holds flagrant disregard the code accountable, while also being understanding of those of us who can demonstrate we tried to do the best we could.

--

David Fite
Associate

O: 617.812.4828 meander.studio

WinnCompanies
Development | Residential | Military

To: Ian Finlayson, Department of Energy Resources
From: Lawrence H. Curtis, President and Managing Partner, WinnDevelopment
Re: Stretch Code Feedback

I am writing with a request to address a serious concern in DOER's Proposed Changes to the current Stretch Energy Code and Municipal Opt-in Specialized Code pertaining to projects pursuing Passive House certification and seeking final certificate of occupancy ("CoO"). Per Sections R405.2, R405.3, C407.3.2.1, and C407.3.2.2 of the Draft MA 2023 Residential and Commercial Stretch Code and Specialized Opt-in Code with proposed revisions, projects pursuing Passive House certification, whether through Phius or PHI, have two options for obtaining final CoO, as summarized below:

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    c. Statement from consultant confirming hygrothermal requirements are satisfied
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    e. Back-up documentation with test results
2. Option 2:
    a. Final certification letter from certifying body

While projects can obtain *temporary* CoO regardless of certification status, which is necessary for occupancy, the current proposed code language still puts extremely high-performance projects at risk by requiring Options 1 or 2 above for obtaining *final* CoO. Neither option above is feasible for development teams who fail to achieve final Passive House levels of performance despite well documented best efforts. As currently written, the Draft Stretch Code and Opt-In Code do not support projects that achieve design phase certification, do their best to construct to Passive House levels of performance, but ultimately fall short of satisfying 100% of certification requirements. These projects need a defined path to achieve a final CoO in the event neither option above is attainable.

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cannot achieve options 1 or 2. This 3rd option must be included in code to avoid local review and waiver ambiguity, further delays, significant added costs, and extreme risk in an industry that cannot absorb additional cost.

3. Proposed Option 3 for Final CoO:

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    b. Design phase pre-certification/approval
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        i. For projects following Phius, demonstrate final Energy Star and Zero Energy Ready Homes certification requirements are met.
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    f. Ventilation flow rates demonstrating mechanical code compliance

This proposed 3rd option is nearly identical to Option 1 and offers similar flexibility as the Passive House Institute U.S. offers projects that may not satisfy all program requirements necessary for certification. Phius does not have adequate capacity to evaluate projects seeking waivers on a case-by-case basis in a timely manner, making it necessary for the Commonwealth to allow a similar approval path for municipal building departments.
Without this option, projects will face significant cost and major delays after having made significant investments in developing extremely well performing buildings. Project teams pursuing Passive House certification that have obtained pre-certification at design and who work closely with their consultants and contractors to follow all inspection and testing procedures necessary for Passive House certification are deserving of final CoO without facing onerous cost, risk, or delay.

Sincerely,

Lawrence H. Curtis

Lawrence H. Curtis
President, WinnDevelopment

9/15/24

Date

To: Ian Finlayson, Department of Energy Resources

From: Michael J Moriarty
Executive Director
OneHolyoke Community Development Corporation

Re: Stretch Code Feedback

I am writing with a request to address a serious concern in DOER's Proposed Changes to the current Stretch Energy Code and Municipal Opt-in Specialized Code pertaining to projects pursuing Passive House certification and seeking final certificate of occupancy ("CoO"). Per Sections R405.2, R405.3, C407.3.2.1, and C407.3.2.2 of the Draft MA 2023 Residential and Commercial Stretch Code and Specialized Opt-in Code with proposed revisions, projects pursuing Passive House certification, whether through Phius or PHI, have two options for obtaining final CoO, as summarized below:

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While projects can obtain *temporary* CoO regardless of certification status, which is necessary for occupancy, the current proposed code language still puts extremely high-performance projects at risk by requiring Options 1 or 2 above for obtaining *final* CoO. Neither option above is feasible for development teams who fail to achieve final Passive House levels of performance despite well documented best efforts. As currently written, the Draft Stretch Code and Opt-In Code do not support projects that achieve design phase certification, do their best to construct to Passive House levels of performance, but ultimately fall short of satisfying 100% of certification requirements. These projects need a defined path to achieve a final CoO in the event neither option above is attainable.

Without final CoO, projects may not convert high-interest rate construction loans to permanent mortgages. In low-income housing tax credit ("LIHTC") projects, the construction loan, typically paid down with LIHTC equity upon receiving final CoO, is significantly larger than the permanent mortgage, making the conversion critical for LIHTC developers to continue doing business in Massachusetts. Furthermore, it is not realistic for projects to pursue an appeal with their Authority Having Jurisdiction and/or the State, which would cause significant delays to project delivery, while adding cost and risk to very high-performance projects.

Given the quantity of Passive House projects in the state, estimated at more than 272 projects consisting of over 20,600 units, it is very likely that some of these projects that are designed to Passive House certification, as evidenced at the time of permitting, and constructed per design, as evidenced by frequent third-party inspection reports, may encounter insurmountable issues that make satisfying Option 1 and Option 2 impossible. These projects will have spent considerable time and money designing and constructing buildings with the intent of certifying – which will be easily documented with consultant contracts, inspection reports, and test results -- and yet still encounter issues such as air infiltration or

ventilation balancing preventing final CoO. These projects require a 3rd option for achieving final CoO that does not reduce the performance objectives of the code nor present an easier, race-to-the-bottom option for developers to consider. The 3rd option proposed below requires **nearly identical requirements** for design and construction as the two existing options and should only be available for projects who cannot achieve options 1 or 2. This 3rd option must be included in code to avoid local review and waiver ambiguity, further delays, significant added costs, and extreme risk in an industry that cannot absorb additional cost.

3. Proposed Option 3 for Final CoO:

    a. Copy of certified Passive House consultant and rater/verifier contracts demonstrating all required inspections and testing requirements for certification
    b. Design phase pre-certification/approval
    c. Verification report demonstrating as-built conditions, including those that comply with Passive House requirements, and those that do not (if applicable)
        i. For projects following Phius, demonstrate final Energy Star and Zero Energy Ready Homes certification requirements are met.
    d. Hygrothermal analysis confirming the building does not face any durability concerns based on as-built condition
    e. Statement from Passive House consultant confirming project has completed all interim, final, and corrective testing and modeling requirements, including a summary of deviations from Passive House requirements
        i. Taped and untaped blower door testing at 50 Pascal and 75 Pascal demonstrating results are within 20% of Passive House requirements. If initial whole building blower door testing exceeds Passive House requirement, statement must reflect evidence of a re-test, with results, as well as an explanation for sources of leakage and attempted remediation efforts.
        ii. Back-up documentation with test results for initial and follow up re-tests with explanation for any deviation from Passive House requirements
    f. Ventilation flow rates demonstrating mechanical code compliance

This proposed 3rd option is nearly identical to Option 1 and offers similar flexibility as the Passive House Institute U.S. offers projects that may not satisfy all program requirements necessary for certification. Phius does not have adequate capacity to evaluate projects seeking waivers on a case-by-case basis in a timely manner, making it necessary for the Commonwealth to allow a similar approval path for municipal building departments.

Without this option, projects will face significant cost and major delays after having made significant investments in developing extremely well performing buildings. Project teams pursuing Passive House certification that have obtained pre-certification at design and who work closely with their consultants and contractors to follow all inspection and testing procedures necessary for Passive House certification are deserving of final CoO without facing onerous cost, risk, or delay.

Sincerely,

Michael J Moriarty
Executive Director
OneHolyoke Community Development Corporation

To: Ian Finlayson, Department of Energy Resources

From: TAYLOR W. BEARDEN, PARTNER, CIVICO DEVELOPMENT

Re: Stretch Code Feedback

Date: September 14, 2024

To Whom It May Concern:

I am writing with a request to address a serious concern in DOER's Proposed Changes to the current Stretch Energy Code and Municipal Opt-in Specialized Code pertaining to projects pursuing Passive House certification and seeking final certificate of occupancy ("CoO"). Per Sections R405.2, R405.3, C407.3.2.1, and C407.3.2.2 of the Draft MA 2023 Residential and Commercial Stretch Code and Specialized Opt-in Code with proposed revisions, projects pursuing Passive House certification, whether through Phius or PHI, have two options for obtaining final CoO, as summarized below:

1. Option 1:
    a. Design phase pre-certification/approval
    b. Verification report demonstrating as-built conditions comply with Passive House requirements
    c. Statement from consultant confirming hygrothermal requirements are satisfied
    d. Statement from consultant confirming project satisfies all testing and modeling requirements
    e. Back-up documentation with test results
2. Option 2:
    a. Final certification letter from certifying body

While projects can obtain *temporary* CoO regardless of certification status, which is necessary for occupancy, the current proposed code language still puts extremely high-performance projects at risk by requiring Options 1 or 2 above for obtaining *final* CoO. Neither option above is feasible for development teams who fail to achieve final Passive House levels of performance despite well documented best efforts. As currently written, the Draft Stretch Code and Opt-In Code do not support projects that achieve design phase certification, do their best to construct to Passive House levels of performance, but ultimately fall short of satisfying 100% of certification requirements. These projects need a defined path to achieve a final CoO in the event neither option above is attainable.

Without final CoO, projects may not convert high-interest rate construction loans to permanent mortgages. In low-income housing tax credit ("LIHTC") projects, the construction loan, typically paid down with LIHTC equity upon receiving final CoO, is significantly larger than the permanent mortgage, making the conversion critical for LIHTC developers to continue doing business in Massachusetts. Furthermore, it is not realistic for projects to pursue an appeal with their Authority Having Jurisdiction and/or the State, which would cause significant delays to project delivery, while adding cost and risk to very high-performance projects.

Given the quantity of Passive House projects in the state, estimated at more than 272 projects consisting of over 20,600 units, it is very likely that some of these projects that are designed to Passive House certification, as evidenced at the time of permitting, and constructed per design, as evidenced by frequent third-party inspection reports, may encounter insurmountable issues that make satisfying Option 1 and Option 2 impossible. These projects will have spent considerable time and money designing and constructing buildings with the intent of certifying – which will be easily documented with consultant

contracts, inspection reports, and test results -- and yet still encounter issues such as air infiltration or ventilation balancing preventing final CoO. These projects require a 3rd option for achieving final CoO that does not reduce the performance objectives of the code nor present an easier, race-to-the-bottom option for developers to consider. The 3rd option proposed below requires **nearly identical requirements** for design and construction as the two existing options and should only be available for projects who cannot achieve options 1 or 2. This 3rd option must be included in code to avoid local review and waiver ambiguity, further delays, significant added costs, and extreme risk in an industry that cannot absorb additional cost.

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        ii. Back-up documentation with test results for initial and follow up re-tests with explanation for any deviation from Passive House requirements
    f. Ventilation flow rates demonstrating mechanical code compliance

This proposed 3rd option is nearly identical to Option 1 and offers similar flexibility as the Passive House Institute U.S. offers projects that may not satisfy all program requirements necessary for certification. Phius does not have adequate capacity to evaluate projects seeking waivers on a case-by-case basis in a timely manner, making it necessary for the Commonwealth to allow a similar approval path for municipal building departments.

Without this option, projects will face significant cost and major delays after having made significant investments in developing extremely well performing buildings. Project teams pursuing Passive House certification that have obtained pre-certification at design and who work closely with their consultants and contractors to follow all inspection and testing procedures necessary for Passive House certification are deserving of final CoO without facing onerous cost, risk, or delay.

Sincerely,

Taylor W. Bearden
Taylor W. Bearden
Partner
Civico Development

To: Ian Finlayson, Department of Energy Resources

From: Katie Faulkner, FAIA; West Work LLC

Re: Stretch Code Feedback

I am writing with a request to address a serious concern in DOER's Proposed Changes to the current Stretch Energy Code and Municipal Opt-in Specialized Code pertaining to projects pursuing Passive House certification and seeking final certificate of occupancy ("CoO"). Per Sections R405.2, R405.3, C407.3.2.1, and C407.3.2.2 of the Draft MA 2023 Residential and Commercial Stretch Code and Specialized Opt-in Code with proposed revisions, projects pursuing Passive House certification, whether through Phius or PHI, have two options for obtaining final CoO, as summarized below:

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Without final CoO, projects may not convert high-interest rate construction loans to permanent mortgages. In low-income housing tax credit ("LIHTC") projects, the construction loan, typically paid down with LIHTC equity upon receiving final CoO, is significantly larger than the permanent mortgage, making the conversion critical for LIHTC developers to continue doing business in Massachusetts. Furthermore, it is not realistic for projects to pursue an appeal with their Authority Having Jurisdiction and/or the State, which would cause significant delays to project delivery, while adding cost and risk to very high-performance projects.

Given the quantity of Passive House projects in the state, estimated at more than 272 projects consisting of over 20,600 units, it is very likely that some of these projects that are designed to Passive House certification, as evidenced at the time of permitting, and constructed per design, as evidenced by frequent third-party inspection reports, may encounter insurmountable issues that make satisfying Option 1 and Option 2 impossible. These projects will have spent considerable time and money designing and constructing buildings with the intent of certifying – which will be easily documented with consultant contracts, inspection reports, and test results -- and yet still encounter issues such as air infiltration or

ventilation balancing preventing final CoO. These projects require a 3rd option for achieving final CoO that does not reduce the performance objectives of the code nor present an easier, race-to-the-bottom option for developers to consider. The 3rd option proposed below requires **nearly identical requirements** for design and construction as the two existing options and should only be available for projects who cannot achieve options 1 or 2. This 3rd option must be included in code to avoid local review and waiver ambiguity, further delays, significant added costs, and extreme risk in an industry that cannot absorb additional cost.

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This proposed 3rd option is nearly identical to Option 1 and offers similar flexibility as the Passive House Institute U.S. offers projects that may not satisfy all program requirements necessary for certification. Phius does not have adequate capacity to evaluate projects seeking waivers on a case-by-case basis in a timely manner, making it necessary for the Commonwealth to allow a similar approval path for municipal building departments.

Without this option, projects will face significant cost and major delays after having made significant investments in developing extremely well performing buildings. Project teams pursuing Passive House certification that have obtained pre-certification at design and who work closely with their consultants and contractors to follow all inspection and testing procedures necessary for Passive House certification are deserving of final CoO without facing onerous cost, risk, or delay.

Sincerely,

Katherine W Faulkner
Principal
West Work, LLC

September 13, 2024

To: Ian Finlayson, Department of Energy Resources
From: William Brauner, Director of Real Estate, Urban Edge Housing Corporation
Re: Stretch Code Feedback

Dear Mr. Finlayson,

On behalf of Urban Edge Housing Corporation (Urban Edge), I am writing with a request to address a serious concern in DOER's Proposed Changes to the current Stretch Energy Code and Municipal Opt-in Specialized Code. Urban Edge is a non-profit affordable housing developer and Community Development Corporation dedicated to strengthening communities and families. We operate in the Roxbury, Jamaica Plain, Dorchester, and Mattapan neighborhoods of Boston. We work to build affordable housing and vibrant, prosperous neighborhoods. Our portfolio contains more than 1,400 units of affordable housing with another 140 units in our new construction pipeline.

Urban Edge has embraced 'green' standards such as Passive House designed and certified buildings to help address climate change, reduce property operating costs, and improve the livability of housing for our residents. These green standards are important to advance the Commonwealth's climate goals and address long-standing environmental and social justice disparities within black and brown communities. At the time of this letter Urban Edge has one sixty-five (65) unit affordable housing project under construction with a completion date of December 2024 and another sixty (60) unit development in planning and expected to break ground in early 2026.

Urban Edge's concerns about DOER's Proposed Changes to the current Stretch Energy Code pertain to projects pursuing Passive House certification and this green standard's relationship to final certificate of occupancy ("CoO"). Per Sections R405.2, R405.3, C407.3.2.1, and C407.3.2.2 of the Draft MA 2023 Residential and Commercial Stretch Code and Specialized Opt-in Code with proposed revisions, projects pursuing Passive House certification, whether through Phius or PHI, have two options for obtaining final CoO, as summarized below:

1. Option 1:
    a. Design phase pre-certification/approval
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    a. Final certification letter from certifying body

While projects can obtain *temporary* CoO regardless of certification status, which is necessary for occupancy, the current proposed code language still puts extremely high-performance projects at risk by requiring Options 1 or 2 above for obtaining *final* CoO. Neither option above is feasible for development teams who fail to achieve final Passive House levels of performance despite well documented best efforts. As currently written, the Draft Stretch Code and Opt-In Code do not support projects that achieve design phase certification, do their best to construct to Passive House levels of performance, but ultimately fall short of satisfying 100% of certification requirements. These projects need a defined path to achieve a final CoO in the event neither option above is attainable.

Without final CoO, projects may not convert high-interest rate construction loans to permanent mortgages. In low-income housing tax credit ("LIHTC") projects, the construction loan, typically paid down with LIHTC equity upon receiving final CoO, is significantly larger than the permanent mortgage, making the conversion critical for LIHTC developers to continue doing business in Massachusetts. Furthermore, it is not realistic for projects to pursue an appeal with their Authority Having Jurisdiction and/or the State, which would cause significant delays to project delivery, lengthening the timeline of affordable housing development, while adding cost and risk to very high-performance projects.

Given the quantity of Passive House projects in the state, estimated at more than 272 projects consisting of over 20,600 units, it is very likely that some of these projects that are designed to Passive House certification, as evidenced at the time of permitting, and constructed per design, as evidenced by frequent third-party inspection reports, may encounter insurmountable issues that make satisfying Option 1 and Option 2 impossible. These projects will have spent considerable time and resources designing and constructing buildings with the intent of certifying -- documented with consultant contracts, inspection reports, and test results -- and yet still encounter issues such as air infiltration or ventilation balancing preventing final CoO. These projects require a 3rd option for achieving final CoO that does not reduce the performance objectives of the code nor stifle developers adopting aggressive green standards for their projects. The 3rd option proposed below requires **nearly identical requirements** for design and construction as the two existing options and should only be available for projects who cannot achieve options 1 or 2. This 3rd option must be included in code to avoid local review and waiver ambiguity, further delays, significant added costs, and extreme risk in an industry that cannot absorb additional cost and risk.

3. Proposed Option 3 for Final CoO:

    a. Copy of certified Passive House consultant and rater/verifier contracts demonstrating all required inspections and testing requirements for certification
    b. Design phase pre-certification/approval
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        ii. Back-up documentation with test results for initial and follow up re-tests with explanation for any deviation from Passive House requirements
    f. Ventilation flow rates demonstrating mechanical code compliance

This proposed 3rd option is nearly identical to Option 1 and offers similar flexibility provided by the Passive House Institute U.S. to projects that may not satisfy all program requirements necessary for certification. Phius does not have adequate capacity to evaluate projects seeking waivers on a case-by-case basis in a timely manner, making it necessary for the Commonwealth to allow a similar approval path for municipal building departments.

Without this option, projects will face significant cost and major delays after having made significant investments in developing extremely well performing buildings. Project teams pursuing Passive House certification that have obtained pre-certification at design and who work closely with their consultants and contractors to follow all inspection and testing procedures necessary for Passive House certification are deserving of final CoO without facing onerous cost, risk, or delay.

Sincerely,

William Brauner

William Brauner
Director of Real Estate
Urban Edge Housing Corporation

Edson, Becca (ENE)

From: Brian Butler <brianbutlercs@gmail.com>
Sent: Friday, September 13, 2024 3:52 PM
To: STRETCHCODE (ENE)
Subject: STRETCH CODE FEEDBACK

Follow Up Flag: Follow up
Flag Status: Completed

To: Ian Finlayson, Department of Energy Resources
From: Brian Butler CS
Re: Stretch Code Feedback

I am writing with a request to address a serious concern in DOER's Proposed Changes to the current Stretch Energy Code and Municipal Opt-in Specialized Code pertaining to projects pursuing passive house certification and seeking final certificate of occupancy ("CoO"). Per Sections R405.2, R405.3, C407.3.2.1, and C407.3.2.2 of the Draft MA 2023 Residential and Commercial Stretch Code and Specialized Opt-in Code with proposed revisions, projects pursuing passive house certification, whether through Phius or PHI, have two options for obtaining final CoO, as summarized below:

1. Option 1:
    1. Design phase pre-certification/approval
    2. Verification report demonstrating as-built conditions comply with passive house requirements
    3. Statement from consultant confirming hygrothermal requirements are satisfied
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    5. Back-up documentation with test results
2. Option 2:
    1. Final certification letter from certifying body

While projects can obtain *temporary* CoO regardless of certification status, which is necessary for occupancy, the current proposed code language still puts extremely high-performance projects at risk by requiring Options 1 or 2 above for obtaining *final* CoO. Neither option above is feasible for development teams who fail to achieve final Passive House levels of performance despite well documented best efforts. As currently written, the Draft Stretch Code and Opt-In Code do not support projects that achieve design phase certification, do their best to construct to passive house levels of performance, but ultimately fall short of satisfying 100% of certification requirements. These projects need a defined path to achieve a final CoO in the event neither option above is attainable.

Without final CoO, projects may not convert high-interest rate construction loans to permanent mortgages. In low-income housing tax credit ("LIHTC") projects, the construction loan, typically paid down with LIHTC equity upon receiving final CoO, is significantly larger than the permanent mortgage, making the conversion critical for LIHTC developers to continue doing business in Massachusetts. Furthermore, it is not realistic for projects to pursue an appeal with their Authority Having Jurisdiction and/or the State, which would cause significant delays to project delivery, while adding cost and risk to very high-performance projects.

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    2. Copy of certified passive house consultant and rater/verifier contracts demonstrating all required inspections and testing requirements for certification
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Sincerely,

Brian Butler
brianbutlercs@gmail.com

HTS & DXS New England
1 Corporation Way | Peabody, MA 01960
T 978.977.9911

Public comments to DOER Draft Stretch Code Updates

Proponent:

Jean Samuel (JS) Rancourt

Representing:

DXS New England
1 Corporation Way
Peabody MA, 01960
978-977-9911

Table of Contents:

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Public comments to DOER Draft Stretch Code Updates

About the proponent

JS Rancourt, *Owner and Managing Principal, HTS & DXS New England*

HTS & DXS New England is a Massachusetts based HVAC equipment agency representing over 30 local and global HVAC manufacturers, including Daikin industries. HTS & DXS is highly involved in air-source-heat-pumps and in a long list of all-electric HVAC equipment used to decarbonize buildings in the commonwealth, such as: lab buildings, schools, Universities, office spaces, and a long list of multi-residential buildings both market rate and affordable. The majority of HTS & DXS HVAC products are targeted for low carbon, high performance and all-electric buildings. As a result, HTS & DXS has a broad perspective from multiple manufacturers in different sectors of the HVAC market, with multiple versions of heat pumps, energy recovery, building automation and indoor air quality solutions.

JS is a mechanical engineer from the University of Waterloo in Ontario, Canada. JS has been applying various all-electric HVAC technology with HTS & DXS for 13 years, including 8 years within the commonwealth. JS primarily works with HVAC consulting engineers, building owners, and various industry associations, and is known for educating the industry on topics such as air source heat pumps, VRF, refrigerants and strategic electrification of HVAC. JS is also a voting council member of the Commonwealth of Massachusetts Grid Modernization Advisory Council (GMAC), and often educates on the importance of heat pump efficiency and design to support or grid modernization goals.

HTS New England: https://www.hts.com/new-england

DXS New England: https://dxseng.com/new-england/

Industry education by JS Rancourt: https://nesea.org/users/js-rancourt

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Public comments to DOER Draft Stretch Code Updates

225 CMR 22 MA Residential Stretch Code and Specialized Opt-in code comments

1. R408.2.2. More Efficient HVAC equipment performance option

   - **Comment**: change minimum value of HSPF2 for ducted units from 8.5 to 8.1 to align with Mass Save.

   - **Substantiation**: The current HSPF2 value of 8.5 is well chosen for ductless units, but for ducted units eliminates many options for very efficient ASHPs commonly used in Massachusetts. Often, the same outdoor unit combined with ductless indoor units will meet this Stretch code requirement, but will not meet it with ducted indoor units. Those same outdoor units perform the same in terms of heat extraction from the atmosphere for space heating, and displacing alternative systems burning fossil fuels.

   - **Other comments**: The 16 SEER2 value for ductless units is beyond that of Mass Save, however due to the new AHRI standard the SEER2 values did not get throttled back as much as the HSPF2 values, and this does not seem to eliminate many ductless units. Therefore, we are not recommending changing this value.

2. IECC amendment to section C403 Building Mechanical Systems

   - **Comment**: Amend VRV/VRF minimum efficiency values to align with the latest AHRI 1230 2023 standard.

   - **Substantiation**: IECC 2021 has not yet updated the referenced AHRI 1230 standard for VRV/VRF systems, and the resulting reduced efficiency values. AHRI 1230 has been updated in 2023, and all new VRV/VRF systems are tested to the new standard, which has resulted in a roll-back in efficiency values. Without updating the referenced standard and the values, many VRV/VRF systems would technically be non-compliant with IECC and with the stretch code. Creating an amendment to update the values and the referenced standard would help ensure VRV/VRF systems can comply with the stretch code.

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Public comments to DOER Draft Stretch Code Updates

3. Amendment to MA Amendment to IECC section C406.2.3. Renewable space heating

   - **Comment**: Clarify that the COP value at 5F shall be the COP of the outdoor unit of the cold-climate air source heat pump, as published by the manufacturer, or calculated using performance published values by the manufacturer.

   - **Substantiation**: COP at 5F is not an official AHRI certification metric, and we have received many questions from the marketplace regarding where and how to obtain this value. Also, this section can be used for air source heat pumps across different AHRI standards (for example, small capacity heat pumps are under AHRI 210-240, whereas larger VRV/VRF style heat pumps are under AHRI 1230). Therefore, we suggest clarifying that this value should come directly from published manufacturer data. Some manufacturers and systems publish actual COP values, whereas others publish power input and power output values for the outdoor unit, which can be used to calculate COP. Note that C406.2.3. does not distinguish between ducted and ductless heat pumps, and as a result the recommendation is to direct the market to consider the COP of the outdoor unit only.

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Public comments to DOER Draft Stretch Code Updates

225 CMR 23 MA Commercial Stretch Code and Specialized Opt-in code comments

1. CC105.3.1 More Efficient HVAC equipment performance option

   - **Comment**: change minimum value of HSPF2 for ducted units from 8.5 to 8.1 to align with Mass Save.

   - **Substantiation**: same as in above comment for 225 CMR 22 section R408.2.2.

2. IECC amendment to section C403 Building Mechanical Systems

   - **Comment**: Amend VRV/VRF minimum efficiency values to align with the latest AHRI 1230 2023 standard.

   - **Substantiation**: IECC 2021 has not yet updated the referenced AHRI 1230 standard for VRV/VRF systems, and the resulting reduced efficiency values. AHRI 1230 has been updated in 2023, and all new VRV/VRF systems are tested to the new standard, which has resulted in a roll-back in efficiency values. Without updating the referenced standard and the values, many VRV/VRF systems would technically be non-compliant with IECC and with the stretch code. Creating an amendment to update the values and the referenced standard would help ensure VRV/VRF systems can comply with the stretch code.

3. Amendment to MA Amendment to IECC section C406.2.3. Renewable space heating

   - **Comment**: Clarify that the COP value at 5F shall be the COP of the outdoor unit of the cold-climate air source heat pump, as published by the manufacturer, or calculated using performance published values by the manufacturer.

   - **Substantiation**: COP at 5F is not an official AHRI certification metric, and we have received many questions from the marketplace regarding where and how to obtain this value. Also, this section can be used for air source heat pumps across different AHRI standards (for example, small capacity heat pumps are under AHRI 210-240, whereas larger VRV/VRF style heat pumps are under AHRI 1230). Therefore, we suggest clarifying that this value should come directly from published manufacturer data. Some manufacturers and systems publish actual COP values, whereas others publish power input and power output values for the outdoor unit, which can be used to calculate COP. Note that C406.2.3. does not distinguish between ducted and ductless heat pumps, and as a result the recommendation is to direct the market to consider the COP of the outdoor unit only.

HTS & DXS New England
1 Corporation Way | Peabody, MA 01960
T 978.977.9911

Public comments to DOER Draft Stretch Code Updates

General recommended addition to ALL codes regarding electric resistance heating

Comment: Add provisions prohibiting any electric resistance heating other than for emergency backup or defrost mitigation.

Substantiation: As a voting council member of the Massachusetts Grid Modernization Advisory Council (GMAC), I am exposed to the challenges that our grid faces in the coming years, especially in the 2030-2035 time period when most utilities predict that their grid peak will shift from Summer to Winter. One of the challenges with a Winter peaking grid is that this peak is predicted to happen during very cold mornings following cold nights, when all heat pumps in the commonwealth will attempt to warmup buildings, simultaneously. This can often coincide with a very low quantity of renewable energy from solar and other Distributed Energy Resources, resulting in a heavy reliance on peak power plants that use natural gas, or worse fuels when natural gas supplied is strained.

Though air-source heat pumps operate less efficiently in cold temperatures, most cold climate air source heat pumps can still deliver a COP of around 2 at design temperatures. The issue comes into play when an air source heat pump relies on electric resistance heating during very cold days, which could result in a high percentage of buildings trying to heat using electric resistance at a COP of 1. Even the best buildings full of air-source heat pumps could become electric resistance buildings if the heat pumps installed rely on electric backup on cold days, either due to the overall low quality of the heat pump, or improper sizing. This would mean that as outdoor temperatures drop, not only does the heating demand increase in all buildings, but many buildings will also jump from COPs of 2 down to COPs of 1, further increasing our grid demand and taxing our grid.

Having to build out our grid to meet a Winter peak that supports a high percentage of electric resistance heating would prevent us from meeting our grid decarbonization goals, as I do not believe that the demand predictions in the ESMPs (Electric Sector Modernization Plans) expect this much reliance on electric resistance when predicting the percentage of buildings using heat pumps.

Therefore, we recommend prohibiting any form of electric resistance heating, except for the purposes of emergency backup (defined as heating during equipment failure) or for defrost mitigation (defined as electric heat used to mitigate the defrost cycles of air-source heat pumps, or to prevent or mitigate the defrost cycles of air-side energy / heat recovery ventilation units). It is important to clarify that electric resistance heating for auxiliary heating, supplemental heating or low ambient heating is what should be prohibited.

HTS & DXS New England
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Public comments to DOER Draft Stretch Code Updates

Other comments: Most cold climate air source pumps do not use or rely on electric heat. However, with the commoditization of air-source heat pumps and with a very up-front price driven market (especially the market-rate multi-residential market), many lower tier heat pumps are entering the market and are relying on electric heat on cold days. Also, as we electrify more building types, many different types of HVAC equipment are converting to heat pumps, and though some may be lower cost than conventional cold climate heat pumps, many do not have the ability to heat in cold climates. For example, most package terminal heat pumps (becoming popular in multi-residential buildings) rely on electric heat on cold days, as do most heat pump packaged rooftops, and most commercial heat pump water heaters. As the market continues to electrify with the lowest construction cost options available, many of which result in weaker heat pumps that rely on electric heat during cold weather, we believe that DOER should build a back-stop to protect our grid and our grid modernization plans, especially once we shift to a Winter peak.

Other comments: We do believe that we must allow buildings to install *some* electric heat for emergency back-up purposes only, but not for auxiliary, supplemental or low ambient heating. Being deep in the Massachusetts HVAC marketplace, we are exposed to many designs for all-electric buildings with different versions of heat pumps that will unfortunately rely on electric heat on that 0F day in January. Most building owners and engineers have no concern with electric resistance heating during cold hours, as the number of hours at 0F are very low, resulting in a very small impact on the overall operating cost of the building. However, our electric grid and our electric sector modernization plans definitely do care, especially in 2030-2035 and beyond. The electric grid needs to be built for the peak hour of the year, but building owners and designers are not currently incentivize to consider the performance or the grid impact of buildings during this peak hour.

Other comments: Having to increase the capacity of the grid, due to a higher than predicted Winter peak in 10 or so years, has major impacts on many sectors. This results in major infrastructure and construction costs impacting rate-payers, which are most impactful to our low and medium income communities. It is also known that generation and transmission infrastructure construction tends to have greater negative impacts to our underprivilege communities, due to siting locations and to other considerations. Finally, a higher peak demand will decrease the percentage of our power than can come from renewable sources, especially during Winter months where renewable power is most limited.

Other comments: City ordinances such as BERDO will most likely not have a major influence on the peak consumption of buildings, as the overall emissions during those peak hours are not majorly impactful. BERDO is focused on overall energy consumption and emissions throughout the year, and not on the peak power consumption of the building. Therefore, our city ordinances will struggle to act as a back-stop to buildings taxing our grid by using electric resistance heating during cold hours.

Edson, Becca (ENE)

From: Erica Schwarz <eschwarz@housingcorparlington.org>
Sent: Friday, September 13, 2024 1:58 PM
To: STRETCHCODE (ENE)
Subject: Stretch Code Feedback

Follow Up Flag: Follow up
Flag Status: Completed

To Mr. Ian Finlayson, Department of Energy Resources:

I am writing on behalf of Housing Corporation of Arlington (HCA) with a request to address a serious concern in DOER's Proposed Changes to the current Stretch Energy Code and Municipal Opt-in Specialized Code pertaining to projects pursuing Passive House certification and seeking final certificate of occupancy ("CoO").

HCA has a deep commitment to environmental sustainability and is glad to have the opportunity to adhere to the stretch code with our upcoming 43-unit Passive House affordable housing development. We have a highly talented, deeply experienced development team supporting this project and need to ensure it is successful.

Per Sections R405.2, R405.3, C407.3.2.1, and C407.3.2.2 of the Draft MA 2023 Residential and Commercial Stretch Code and Specialized Opt-in Code with proposed revisions, projects pursuing Passive House certification, whether through Phius or PHI, have two options for obtaining final CoO, as summarized below:

1. Option 1:
    a. Design phase pre-certification/approval
    b. Verification report demonstrating as-built conditions comply with Passive House requirements
    c. Statement from consultant confirming hygrothermal requirements are satisfied
    d. Statement from consultant confirming project satisfies all testing and modeling requirements
    e. Back-up documentation with test results
2. Option 2:
    a. Final certification letter from certifying body

While projects can obtain *temporary* CoO regardless of certification status, which is necessary for occupancy, the current proposed code language still puts extremely high-performance projects at risk by requiring Options 1 or 2 above for obtaining *final* CoO. Neither option above is feasible for development teams who – despite a top-notch development team and well documented efforts – fail to achieve final

Passive House levels of performance. As currently written, the Draft Stretch Code and Opt-In Code do not support projects that achieve design phase certification, do their best to construct to Passive House levels of performance, but ultimately fall short of satisfying 100% of certification requirements. These projects need a defined path to achieve a final CoO in the event neither option above is attainable.

Lacking the final C of O could be devastating to our upcoming project and, in turn to HCA as an organization. Without final CoO, projects may not convert high-interest rate construction loans to permanent mortgages. In low-income housing tax credit ("LIHTC") projects, the construction loan, typically paid down with LIHTC equity upon receiving final CoO, is significantly larger than the permanent mortgage, making the conversion critical for LIHTC developers to continue doing business in Massachusetts. Furthermore, it is not realistic for projects to pursue an appeal with their Authority Having Jurisdiction and/or the State, which would cause significant delays to project delivery, while adding cost and risk to very high-performance projects.

Given the quantity of Passive House projects in the state, estimated at more than 272 projects consisting of over 20,600 units, it is very likely that some of these projects that are designed to Passive House certification, as evidenced at the time of permitting, and constructed per design, as evidenced by frequent third-party inspection reports, may encounter insurmountable issues that make satisfying Option 1 and Option 2 impossible. These projects will have spent considerable time and money designing and constructing buildings with the intent of certifying – which will be easily documented with consultant contracts, inspection reports, and test results -- and yet still encounter issues such as air infiltration or ventilation balancing preventing final CoO. These projects require a 3rd option for achieving final CoO that does not reduce the performance objectives of the code nor present an easier, race-to-the-bottom option for developers to consider. The 3rd option proposed below requires **nearly identical requirements** for design and construction as the two existing options and should only be available for projects who cannot achieve options 1 or 2. This 3rd option must be included in code to avoid local review and waiver ambiguity, further delays, significant added costs, and extreme risk in an industry that cannot absorb additional cost.

1. Proposed Option 3 for Final CoO:

    a. Copy of certified Passive House consultant and rater/verifier contracts demonstrating all required inspections and testing requirements for certification
    b. Design phase pre-certification/approval
    c. Verification report demonstrating as-built conditions, including those that comply with Passive House requirements, and those that do not (if applicable)
        i. For projects following Phius, demonstrate final Energy Star and Zero Energy Ready Homes certification requirements are met.
    d. Hygrothermal analysis confirming the building does not face any durability concerns based on as-built condition
    e. Statement from Passive House consultant confirming project has completed all interim, final, and corrective testing and modeling requirements, including a summary of deviations from Passive House requirements
        i. Taped and untaped blower door testing at 50 Pascal and 75 Pascal demonstrating results are within 20% of Passive House requirements. If initial whole building blower door testing exceeds Passive House requirement, statement must reflect

evidence of a re-test, with results, as well as an explanation for sources of leakage and attempted remediation efforts.

ii. Back-up documentation with test results for initial and follow up re-tests with explanation for any deviation from Passive House requirements

f. Ventilation flow rates demonstrating mechanical code compliance

This proposed 3rd option is nearly identical to Option 1 and offers similar flexibility as the Passive House Institute U.S. offers projects that may not satisfy all program requirements necessary for certification. Phius does not have adequate capacity to evaluate projects seeking waivers on a case-by-case basis in a timely manner, making it necessary for the Commonwealth to allow a similar approval path for municipal building departments.

Without this option, projects will face significant cost and major delays after having made significant investments in developing extremely well performing buildings. Project teams pursuing Passive House certification that have obtained pre-certification at design and who work closely with their consultants and contractors to follow all inspection and testing procedures necessary for Passive House certification are deserving of final CoO without facing onerous cost, risk, or delay.

Sincerely,

Erica Schwarz
--

Erica Schwarz
Executive Director
Housing Corporation of Arlington
252 Massachusetts Ave., Arlington, MA 02474
781-859-5294 ext. 1
www.HousingCorpArlington.org

To: Ian Finlayson, Department of Energy Resources

From: Nicole Burger, Director of High-Performance Buildings, Innova Building Advisors, LLC

Re: Stretch Code Feedback

I am writing with a request to address a serious concern in DOER's Proposed Changes to the current Stretch Energy Code and Municipal Opt-in Specialized Code pertaining to projects pursuing passive house certification and seeking final certificate of occupancy ("CoO"). Per Sections R405.2, R405.3, C407.3.2.1, and C407.3.2.2 of the Draft MA 2023 Residential and Commercial Stretch Code and Specialized Opt-in Code with proposed revisions, projects pursuing passive house certification, whether through Phius or PHI, have two options for obtaining final CoO, as summarized below:

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    e. Back-up documentation with test results
2. Option 2:
    a. Final certification letter from certifying body

While projects can obtain *temporary* CoO regardless of certification status, which is necessary for occupancy, the current proposed code language still puts extremely high-performance projects at risk by requiring Options 1 or 2 above for obtaining *final* CoO. Neither option above is feasible for development teams who fail to achieve final Passive House levels of performance despite well documented best efforts. As currently written, the Draft Stretch Code and Opt-In Code do not support projects that achieve design phase certification, do their best to construct to passive house levels of performance, but ultimately fall short of satisfying 100% of certification requirements. These projects need a defined path to achieve a final CoO in the event neither option above is attainable.

Without final CoO, projects may not convert high-interest rate construction loans to permanent mortgages. In low-income housing tax credit ("LIHTC") projects, the construction loan, typically paid down with LIHTC equity upon receiving final CoO, is significantly larger than the permanent mortgage, making the conversion critical for LIHTC developers to continue doing business in Massachusetts. Furthermore, it is not realistic for projects to pursue an appeal with their Authority Having Jurisdiction and/or the State, which would cause significant delays to project delivery, while adding cost and risk to very high-performance projects.

Given the quantity of passive house projects in the state, estimated at more than 272 projects consisting of over 20,600 units, it is very likely that some of these projects that are designed to Passive House certification, as evidenced at the time of permitting, and constructed per design, as evidenced by frequent third-party inspection reports, may encounter insurmountable issues that make satisfying Option 1 and Option 2 impossible. These projects will have spent considerable time and money designing and constructing buildings with the intent of certifying – which will be easily documented with consultant contracts, inspection reports, and test results -- and yet still encounter issues such as air infiltration or

ventilation balancing preventing final CoO. These projects require a 3rd option for achieving final CoO that does not reduce the performance objectives of the code nor present an easier, race-to-the-bottom option for developers to consider. The 3rd option proposed below requires **nearly identical requirements** for design and construction as the two existing options and should only be available for projects who cannot achieve options 1 or 2. This 3rd option must be included in code to avoid local review and waiver ambiguity, further delays, significant added costs, and extreme risk in an industry that cannot absorb additional cost.

3. Proposed Option 3 for Final CoO:

    a. Copy of certified passive house consultant and rater/verifier contracts demonstrating all required inspections and testing requirements for certification
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        ii. Back-up documentation with test results for initial and follow up re-tests with explanation for any deviation from passive house requirements
    f. Ventilation flow rates demonstrating mechanical code compliance

This proposed 3rd option is nearly identical to Option 1 and offers similar flexibility as the Passive House Institute U.S. offers projects that may not satisfy all program requirements necessary for certification. Phius does not have adequate capacity to evaluate projects seeking waivers on a case-by-case basis in a timely manner, making it necessary for the Commonwealth to allow a similar approval path for municipal building departments.

Without this option, projects will face significant cost and major delays after having made significant investments in developing extremely well performing buildings. Project teams pursuing passive house certification that have obtained pre-certification at design and who work closely with their consultants and contractors to follow all inspection and testing procedures necessary for passive house certification are deserving of final CoO without facing onerous cost, risk, or delay.

Sincerely,

Nicole Burger
CPHC, Phius Verifier, HERS Rater, Director of High-Performance Buildings
Innova Building Advisors, LLC

Planning Office for Urban Affairs
ARCHDIOCESE OF BOSTON

To: Ian Finlayson, Department of Energy Resources

From: Mary Wambui , Asset Manager , Planning Office for Urban Affairs.

Date : 9/13/2024

Re: Stretch Code Feedback

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Without final CoO, projects may not convert high-interest rate construction loans to permanent mortgages. In low-income housing tax credit ("LIHTC") projects, the construction loan, typically paid down with LIHTC equity upon receiving final CoO, is significantly larger than the permanent mortgage, making the conversion critical for LIHTC developers to continue doing business in Massachusetts. Furthermore, it is not realistic for projects to pursue an appeal with their Authority Having Jurisdiction and/or the State, which would cause significant delays to project delivery, while adding cost and risk to very high-performance projects.

Given the quantity of Passive House projects in the state, estimated at more than 272 projects consisting of over 20,600 units, it is very likely that some of these projects that are designed to Passive House certification, as evidenced at the time of permitting, and constructed per design, as evidenced by frequent third-party inspection reports, may encounter insurmountable issues that make satisfying Option 1 and Option 2 impossible. These projects will have spent considerable time and money designing and constructing buildings with the intent of certifying – which will be easily documented with consultant contracts, inspection reports, and test results -- and yet still encounter issues such as air infiltration or ventilation balancing preventing final CoO. These projects require a 3rd option for achieving final CoO that does not reduce the performance objectives of the code nor present an easier, race-to-the-bottom option for developers to consider. The 3rd option proposed below requires **nearly identical requirements** for design and construction as the two existing options and should only be available for projects who cannot achieve options 1 or 2.

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Without this option, projects will face significant cost and major delays after having made significant investments in developing extremely well performing buildings. Delays especially in affordable housing affect men ,women and children who are waiting lists anticipating finding a place to call home.Project teams pursuing Passive House certification that have obtained pre-certification at design and who work closely with their consultants and contractors to follow all inspection and testing procedures necessary for Passive House certification are deserving of final CoO without facing onerous cost, risk, or delay.

Sincerely,

Mary Wambui
mary wambui
Asset Manager , POUA

GSD Associates, LLC
146 Main Street, North Andover, MA 01845
Tel: 978-688-5422 Web: www.gsd-assoc.com
Architecture + Design + Planning + Interiors + Development Consulting

September 13, 2024

To: Ian Finlayson, Department of Energy Resources

From: Gregory P. Smith, AIA, CPHC®
GSD Associates, LLC
146 Main Street
North Andover, MA 01845

Re: Stretch Code Feedback

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Given the quantity of passive house projects in the state, estimated at more than 272 projects consisting of over 20,600 units, it is very likely that some of these projects that are designed to Passive House certification, as evidenced at the time of permitting, and constructed per design, as evidenced by frequent third-party inspection reports, may encounter insurmountable issues that make satisfying Option 1 and Option 2 impossible. These projects will have spent considerable time and money designing and constructing buildings with the intent of certifying – which will be easily documented with consultant contracts, inspection reports, and test results -- and yet still encounter issues such as air infiltration or ventilation balancing preventing final CoO.

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Without this option, projects will face significant cost and major delays after having made significant investments in developing extremely well performing buildings. Project teams pursuing passive house certification that have obtained pre-certification at design and who work closely with their consultants and contractors to follow all inspection and testing procedures necessary for passive house certification are deserving of final CoO without facing onerous cost, risk, or delay.

Sincerely,

Gregory P. Smith, AIA, CPHC®
Architect / Manager
GSD Associates, LLC
146 Main Street
North Andover, MA 01845
978-806-8066

September 13, 2024

To: Ian Finlayson, Deputy Director, Energy Efficiency Division, MA DOER

Re: Written Comments of RenewAire pursuant to DOER's "Stretch and Energy Code Listening Session"

Dear Mr. Finlayson,

Thank you for the opportunity to submit written and specific proposals for modifications to the proposed revisions issued on August 12, 2024 to the 2023 Massachusetts Stretch Energy Codes for Residential and Commercial Buildings. We sincerely hope that these will be helpful in advancing the goals of the Code to the benefit of its stakeholders.

Sincerely,

Matthew Friedlander
VP Codes and Standards
RenewAire LLC

RenewAire's Proposal for Adjustments to the 2023 Massachusetts Stretch Code for Residential and Commercial Buildings

Executive Summary

RenewAire proposes amendments to the Code as follows.

Residential Energy Code (R401.2.2 and R403.6.1):

1) Heat or Energy Recovery Ventilators (HERVs) used in the Passive House compliance paths shall meet the performance requirements in the Prescriptive and Energy Rating Paths (R401.2.2).
STAKEHOLDER BENEFIT: ensures that stakeholders following PH compliance paths receive ventilation systems not less efficient than required in the prescriptive paths.

2) Increase the minimum SRE for HERVs listed to CAN/CSA C349 from 65% to 72% (R403.6.1.2).
STAKEHOLDER BENEFIT: higher performance saves more energy, and a wide range of products from many manufacturers is still available.

3) Clearly require that HERVs rated in accordance with CAN/CSA C349 be listed in the Home Ventilating Institute's (HVI) Certified Product Directory, as is already implied in Technical Guidance Documents (R403.6.1.2).
STAKEHOLDER BENEFIT: protection from unsubstantiated performance claims.

4) Limit Exhaust Air Transfer Ratio to 5% for ERVs with rated airflow over 300 cfm (R403.6.1.1).
STAKEHOLDER BENEFIT: helps ensure desired quality of delivered air, with lower recapture rates than allowed by ASHRAE 62.1.

5) Require AHRI third-party certification of the minimum performance requirements for ERVs with rated airflow over 300 cfm (R403.6.1.1).
STAKEHOLDER BENEFIT: protection from unsubstantiated performance claims.

Commercial Energy Code (C401.2.2 and C403.7.4.2:

1) A compliance path for HVI-certified HERVs be provided in Nontransient dwelling units, as in IECC 2024 and addenda y to ASHRAE 90.1. In this compliance path, HERVs shall have an SRE rating not less than 72% at an airflow not less than the design outdoor airflow; HERVs shall have at least one TRE rating not less than 50% (C403.7.4.1).
STAKEHOLDER BENEFIT: Allows the common design choice of individual en-suite HERVs to be used in Nontransient dwelling units; provides for individual control by occupants, greater design flexibility, and lower cost in some cases.

2) For HERVs serving other spaces with Class 1 or 2 exhausts, the minimum performance requirement be changed from 70% ERR at heating and cooling design conditions, to 75% Sensible Energy Recovery Ratio (SERR) at heating design point, and 60% ERR at both heating and cooling design points.
STAKEHOLDER BENEFIT: greater market choice. Since the primary load in winter is heat (sensible energy) the high SERR will save more energy.

3) For AHRI-rated HERVs serving nontransient dwelling units, and also other spaces with Class 1 or 2 exhausts, exhaust air transfer ratio (EATR) shall not exceed 5%, per ASHRAE 62.1 requirements (C403.7.4).
STAKEHOLDER BENEFIT: helps ensure desired quality of delivered air, with lower recapture rates than allowed by ASHRAE 62.1.

4) For HERVs serving other spaces with Class 3 exhausts, EATR shall not exceed 2.5%, and for other spaces with Class 4 exhausts, EATR shall not exceed 0%, per ASHRAE 62.1 requirements (C403.7.4).
STAKEHOLDER BENEFIT: helps ensure desired quality of delivered air, with lower recapture rates than allowed by ASHRAE 62.1.

5) Clearly require that HERVs rated in accordance with CAN/CSA C349 be listed in the Home Ventilating Institute's (HVI) Certified Product Directory, as is already implied in Technical Guidance Documents (C403.7.4.1).
STAKEHOLDER BENEFIT: protection from unsubstantiated performance claims.

6) Clearly require that ratings of ERR, SERR and EATR be obtained from AHRI-certified software or catalog (C403.7.4.1 and C403.7.4.2).
STAKEHOLDER BENEFIT: protection from unsubstantiated performance claims.

7) The undefined term *sensible recovery ratio* and the defined term *sensible energy recovery ratio* currently used in C403.7.4.2, be standardized to *sensible energy recovery ratio (C403.7.4.2)*.
STAKEHOLDER BENEFIT: reduces ambiguity in the text.

OTHER STRETCH CODES

With RenewAire's proposal, the Massachusetts Commercial Stretch Code would remain the most stringent in the nation, as detailed below.

The International Green Construction Code is based on ASHRAE 189.1-2023 Standard for the Design of High-Performance Green Buildings. In Climate Zone 5A, it requires 60% minimum heating and cooling ERR. *The current Stretch Code already is more stringent. With RenewAire's proposed addition of a 75% SERR, the Massachusetts Commercial Stretch Code would be even more stringent.*

NEEA's Very High Efficiency DOAS incentive program calls for minimum 82% sensible effectiveness according to AHRI 1060-2018 certified software when selected winter conditions of 35°F DBT, 35°F WBT (OA); 70°F DBT, 58°F WBT (RA), at 75% of nominal maximum airflow. This is a very stringent requirement, generally requiring units to be operated at very low airflows. This program provides financial incentives and RenewAire products are in the process of being listed. Note that there is no requirement for latent recovery in this program. *Since this program's metric is sensible effectiveness only, with no latent component, it is less stringent than RenewAire's proposed requirements for the Massachusetts Commercial Stretch Code.*

Phius effectively requires sensible ERR sufficient to provide supply at heating design conditions no less than 60°F. No latent recovery is required in Climate Zone 5A. There is no performance minimum for cooling conditions. In Massachusetts, the required Sensible Energy Recovery Ratio would be 75% to

79%. *This is comparable to RenewAire's proposed addition of a 75% SEER, but with the 60% ERR requirement, the Massachusetts Commercial Stretch Code would be more stringent.*

The current New York State 2020 Stretch Code calls for 50% ERR at heating and cooling design conditions. *With RenewAire's proposal, the Massachusetts Commercial Stretch Code would remain far more stringent.*

Draft 2023 New York State Residential Stretch Code calls for 70% Sensible Recovery Efficiency (SRE) per C439 at 32°F. *With our proposal the Massachusetts Residential Stretch Energy Code would become more stringent.*

2023 Vermont Residential Building Standard calls for 70% SRE per C439 at 32°F. With our proposal the Massachusetts Residential Stretch Energy Code would become more stringent.

Maine's Stretch Code currently is the 2021 IECC, which requires 50% heating and cooling ERR in most commercial applications, and 60% heating ERR for nontransient dwelling units. *This is less stringent than the MA Stretch Codes.*

The 2024 IECC has lower base performance requirements than proposed here: for residential, 65% SRE; for multi-family, 65% SRE or 60% ERR heating, 50% ERR cooling; for other spaces 50% ERR. *With our proposal the Massachusetts Residential Stretch Energy Code would become more stringent in every category.*

The 2024 IECC includes optional "Additional Efficiency, Renewable and Load Management Requirements". Compliance is demonstrated by selecting from a menu of many options in categories such as Envelope, Heating, Water Heating and Use, Lighting, etc.. In Residential, (5) of the (18) options related to HVAC include improved air sealing with installation of an HERV - with no minimum SRE. In Commercial, one of (5) Heating Options is provision of a Dedicated Outdoor Air System with 65% ERR heating and cooling in climate zone 5A. *With our proposal the Massachusetts Residential Stretch Energy Code would be more stringent, and arguably the Commercial Stretch Code will remain more stringent than the optional provisions in the IECC.*

TEXT MODIFICATION PROPOSAL - RESIDENTIAL CODE

SECTION R401
GENERAL

R401.2.2 Passive House Building Certification Option. The Passive House Building Certification Option requires compliance with Section R403.6, R405, R404.4 and Appendix RB.

Section R403
Systems

R403.6.1 Heat or Energy Recovery Ventilation. Heat or energy recovery balanced ventilation systems shall be provided for dwelling units as specified in either Section R403.6.1.1 or R403.6.1.2, as applicable.

R403.6.1.1 Large Systems. Systems with a rated airflow exceeding 300 cfm shall have an enthalpy recovery ratio of not less than 50 percent at cooling design condition and not less than 60 percent at heating design condition. Exhaust Air Transfer Ratio at the highest airflow operating point shall not exceed 5%. determined in accordance with AHRI 1060 at an airflow not less than the design airflow.- Compliance to the enthalpy recovery ratio and exhaust air transfer ratio requires shall be demonstrated by ratings at design conditions and airflows by software or catalogs certified by AHRI.

R403.6.1.2 Other Systems. Systems with a rated airflow of 300 cfm or less shall have a sensible recovery efficiency (SRE) of not less than ~~65~~ 72 percent at 32°F (0°C) at an airflow not less than the design airflow. SRE shall be determined in accordance with CAN/CSA-C439 and compliance to the requirement shall be ~~listed~~ demonstrated by a listing in HVI's Certified Product Directory. Linear interpolation of listed values for SRE shall be permitted.

TEXT MODIFICATION PROPOSAL - COMMERCIAL CODE

SECTION C401
GENERAL

C401.2.2 Certified Performance Standard Compliance. Commercial buildings or portions thereof when following C401.2.4 shall comply with one of the following certified performance standards:

1. Passive House Compliance: This pathway can be used for any building of any size. The Passive House Compliance pathway requires compliance with Sections C401.3, C402.3, C403.7.4, C405, C407.3 and C408.

SECTION C403
BUILDING MECHANICAL SYSTEMS

C403.7.4 Energy Recovery Systems. Energy recovery ventilation systems shall be provided as specified in either Section C403.7.4.1~~, as applicable~~, ~~and~~ or C403.7.4.2, as applicable.

C403.7.4.1 Nontransient dwelling units. Nontransient dwelling units shall be provided with outdoor air energy recovery ventilation systems ~~with an *enthalpy recovery ratio* of not less than 50 percent at cooling design condition and not less than 75 percent at heating design condition.~~ Outdoor air must be delivered directly to the dwelling unit. The energy recovery system shall result in either 1 or 2, as applicable ~~The building weighted average *sensible energy recovery effectiveness* must meet the requirements of C403.7.4.2~~.

1. The system shall have an *enthalpy recovery ratio* of not less than 60 percent at cooling design condition and a sensible energy recovery ratio of not less than 75 percent at heating design condition. Outdoor air must be delivered directly to the dwelling unit. Exhaust Air Transfer Ratio at the highest airflow operating point shall not exceed 5%. Compliance to the *sensible energy recovery ratio*, *enthalpy recovery ratio* and *exhaust air transfer ratio* requirements shall be demonstrated by ratings generated at design conditions and airflows by software or catalogs certified by AHRI.

2. The system, at or above the design outdoor airflow, shall have a *sensible recovery efficiency* (SRE) that is not less than 72% at 32°F (0°C). The system shall have a *total recovery efficiency* (TRE) rating that is not less than 50% at 95°F (35°C). SRE and TRE shall be determined in accordance with CAN/CSA-C439 and compliance to the requirement shall be ~~listed~~ demonstrated by a listing in HVI's Certified Product Directory. Linear interpolation of listed values for SRE shall be permitted.

C403.7.4.2 Spaces other than nontransient dwelling units. Where the supply airflow rate of a fan system serving a space other than a nontransient dwelling unit exceeds the values specified in Tables C403.7.4.2(1) and C403.7.4.2(2), the system shall include an energy recovery system. The energy recovery system shall result in either 1 or 2, as applicable. Where an air economizer is required, the energy recovery system shall include a bypass or controls that permit operation of the economizer as required by Section C403.5. Compliance to the *sensible energy recovery ratio* and *enthalpy recovery ratio* requirements shall be demonstrated by ratings generated at design conditions and

airflows by software or catalogs certified by AHRI.

1. A *sensible energy recovery ratio* of at least 50% at heating design conditions for systems that provide makeup for *Class 3 or 4 exhaust*. Exhaust Air Transfer Ratio shall not exceed 2.5% for Class 3 exhaust and shall not exceed 0% for Class 4 exhaust; compliance to these limits shall be demonstrated by ratings at design conditions and airflows by software or catelog certified by AHRI. The requirements can be satisfied either for each fan system individually or based on a weighted average of the ventilation air flow for all applicable fan systems in the entire building per Equation C403.7.4.2(1).

   Equation C403.7.4.2(1):

   Weighted average *sensible energy recovery ratio* = [*sensible energy recovery ratio* for fan system 1 x outside air flow for system 1 + *sensible energy recovery ratio* for fan system 2 x outside air flow for system 2 + …]/[outside air flow for system 1 + outside air flow for system 2 + …]

2. For all other systems A~~n~~ ~~*enthalpy*~~ *sensible energy recovery ratio* of not less than ~~70%~~ 75% at heating ~~and cooling~~ conditions, and *enthalpy recovery ratio* of not less than 60% at heating and cooling design conditions and airflows ~~for all other systems~~. The requirement can be satisfied either for each fan system individually or based on a weighted average of the ventilation air flow for all applicable fan systems in the entire building per Equation C403.7.4.2(1) for *sensible energy recovery ratio* and Equation C403.7.4.2(2) for *enthalpy recovery ratio.* Exhaust Air Transfer Ratio[i] at the highest airflow operating point shall not exceed 5% for any fan system[ii].

   Equation C403.7.4.2(2):

   Weighted average *enthalpy energy recovery ratio* = [*enthalpy recovery ratio* for fan system 1 x outside air flow for system 1 + *enthalpy recovery ratio* for fan system 2 x outside air flow for system 2 + …]/[outside air flow for system 1 + outside air flow for system 2 + …]

Additional Commentaries

Changes to ERR and SERR minimums for Commercial spaces (other)

Rationale for adding the heating condition minimum performance metric from of 75% SERR.

1. Sensible energy recovery ratio (SERR) is the preferred metric for heating season performance since heat recovery contributes to the primary Stretch Code goal of dramatic reduction in heating loads.

2. A 75% SEER heating minimum will move the market more than a 70% ERR heating minimum.

3. A 75% SEER heating minimum allows for competition on the merits between rotary exchangers and plate exchangers.

Rationale for changing the heating and cooling condition minimum ERR from 70% to 60%.

1. With respect to heating conditions, a 60% ERR is sufficient to provide the benefits of frost-point depression that allows energy recovery ventilators to operate at lower outside air conditions than is possible with heat-only recovery.

2. A heating minimum ERR of 60% also helps maintain a comfortable indoor relative humidity during cold dry weather, so that energy-expensive humidification may not be needed. Humidity balance is a complex subject, but it has been suggested to us by a competitor that the higher levels of latent recovery in cold weather, as required by the current code, can lead to excessive indoor humidity and IAQ problems.

3. With respect to cooling, the goal of the Stretch Code is to dramatically reduce heating loads without increasing cooling loads. The move from 50% ERR in the DOER draft of 2022-06-24 to a 70% cooling ERR in the final draft was a giant leap. A relaxation to 60% cooling ERR will reduce cooling season savings somewhat, but this is more than offset by the heating increase to 75% SERR.

4. From the DOER draft of 2022-06-24 to the final draft, no public comment was received suggesting or rationalizing the drastic increase in the cooling season ERR from 50% to 70%.

70% ERR is much higher than in any stretch model code in the country. The nearest minimum ERR requirement is 60%, in ASHRAE 189 (LEED). NEAA's Very High Efficiency DOAS incentive program calls does not call for a minimum cooling ERR at all. PHIUS does not set any ERR

Third-party Certification

Language requiring HVI or AHRI certification should be added to the Code.

This is generally consistent with the 2023-09-22 MA Stretch Energy Codes Technical Guidance document, which states on p.79, that "[systems]… must comply using an enthalpy recovery ratio determined in accordance with AHRI. Other HRVs or ERVs must comply using an SRE determined in accordance with CAN/CSA C439. The installed equipment also must be HVI certified (or equivalent)." This is in reference to section R403.6, pertaining to residential. Presumably it is an oversight that AHRI is not identified in the discussion of SERR and ERR in reference to section C403.7.4.

The Guidance document requires HVI certification (or equivalent), or "ERR determined in accordance with AHRI" (this should be "AHRI 1060"). This typically means that the standard writer wants to require full third-party certification, but also wants to allow some flexibility for early market entrants. Today's market is fairly mature, with (37) brands in the HVI Certified Product Directory, and (26) in the AHRI Packaged Unit Energy Recovery Ventilator Directory, and the industry is innovating. It is appropriate to require third-party certification.

However, it might be possible to add flexibility to allow for alternate demonstration of compliance through "through means acceptable to the AHJ", whether in Code language or the Technical Guidance document.

Ratings At Design Points

ERR, SERR, SRE and TRE ratings should be obtained at the airflows and outside air conditions applicable to the building design conditions, within the capacity of the relevant rating system.

This is consistent with the Technical Guidance Document; on page 39 it states "The recovery ratio used in compliance calculations is the value at the design airflow rate.

The AHRI-1060 certified rating software can provide rating at any reasonable indoor and outdoor psychrometric condition, heating or cooling, and the range of airflows supported by the manufacturer. These ratings include SERR, ERR and EATR, all at the design conditions.

The HVI-certified ratings per C439 provides ratings at standard heating and cooling conditions, so they can't be tuned to different psychrometric conditions. But thermal performance at these conditions (32°F and 95°F) are good representations of winter and summer performance. Another limitation is that the ratings are generated at manufacturer-selected airflow, as distinct from the specific required airflow rate. In other codes (e.g. Title 24), this is addressed by allowing for interpolation of SRE and TRE from ratings at airflows greater than and less than the design airflow, or from a rating at an airflow greater than the design airflow. RenewAire thinks this is a reasonable approach and includes it in our proposed text changes. HVI ratings also include EATR.

Exhaust Air Transfer Ratings

"Exhaust Air Transfer Ratio" is a metric provided by HVI and AHRI ratings. It is referenced in ASHRAE 61.1, Section 5.13.3 Recirculation Limitations, in which an EATR ≤ 10% is required for ERVs exhausting Class 2 air and supplying Class 1 spaces, or ≤ 5 % when exhausting Class 3 air.

This limitation is important for air quality purposes. It is also important for energy savings purposes. When EATR is not included in the energy saving metric, an exchanger with high EATR appears to have a higher energy recovery rate than it truly does. Another way to put it is that high EATR means the net supply airflow is lower than the measured gross.

The HVI certification based on C439 does rate EATR and includes it in the values SRE, TRE and Net Supply Airflow. So a very leaky ERV will have higher EATR, and lower SRE, TRE and Net Supply. Because these metrics are impacted by the EATR, we do not feel it is necessary to set EATR limits on HVI-certified

HERVs.

AHRI-certified rating software rates EATR at the actual operating condition of the exchanger. EATR reduces "Net Supply Airflow", a certified rating. It is not included in the ERR or SERR metrics. Therefore we recommend that for AHRI-certified HERVs EATR be explicitly limited.

EATR is not mentioned as such in the Massachusetts Building Codes. The MA amendments to the 2015 IMC does mention that in certain spaces no recirculation is allowed, while for other spaces roughly corresponding to Class 2 spaces, 10% "recirculation" is allowed with wheel-type energy recovery. (403.2.1.4 by reference to Note g to Table 403.3.1.1).

The 2023 Stretch Code Technical Guide speaks to recirculation on page 37: "The enthalpy recovery ratio also must not take credit for any air leakage from exhaust to supply air streams."

In this proposal, RenewAire has suggested EATR limits of one-half that allowed by 62.1, for units with AHRI rating. This should be feasible for most Plate ERVs and also for high-quality wheel-type ERVs, and represents a solid balance between IAQ, energy savings, and availability. While recirculation is more often addressed in mechanical codes, the MA Stretch Code, for many designers, code officials and contractors, is a first introduction to ERV technology; consequently, including EATR here will group the requirement with the relevant code.

Positive overall market impact of this proposal

The RenewAire proposals give designers the ability to choose from a wider range of product types and manufacturers to fit specific applications. For example, spaces with less capable maintenance crews may lean towards fixed plate ERVs; in multi-family projects, designers or property owners may prefer the central systems currently allowed, or may prefer en-suite HERV system. This will lead to better product availability as more design options are available and more manufacturers can be used, resulting in a less constricted supply chain.

Current code calls for oversizing ERV units that are larger and more expensive than int the previous code or any other stretch code. Compared to current code, the RenewAire proposal will generate space and cost savings while also requiring recovery ratios that still exceed other stretch codes.

Finally, the RenewAire proposal requiring HVI and AHRI third-party certified ratings, ensures that every manufacturer is on a level playing field, supported by reliable performance ratings, leading to a robust market for the benefit of the Commonwealth.

CONCLUSION

In light of the information presented above, DOER should amend the Commercial Stretch Energy Code as suggested by RenewAire.

Edson, Becca (ENE)

From: Mark D. Webster <MDWebster@sgh.com>
Sent: Friday, September 13, 2024 11:00 AM
To: STRETCHCODE (ENE)
Subject: STRETCH CODE FEEDBACK

Follow Up Flag: Follow up
Flag Status: Completed

I welcome and applaud the DOER's proposal to include embodied carbon incentives in the stretch code. Construction related emissions will exceed use-phase emissions of new construction over the next critical 10 to 20 years when we must reduce emissions substantially, so all policy levers should be exercised to address them.

Comments on proposed Residential Amendments:

Section R406.5.2:
The proposed 70% of the NRMCA benchmark appears overly aggressive. I reviewed the EC3 EPD database for Massachusetts EPDs that meet this threshold, and only a handful of the hundreds of mixes in the database meet it, almost entirely in the Boston metropolitan area. I recommend using a graduated approach that will be more attainable. For example:

3 HERS points for meeting 70% of the NRMCA benchmark
2 HERS points for 80%
1 HERS points for 90%

Section R406.5.4:
The proposed language is not clear regarding achievement when multiple mixes are used on a project. I recommend that if multiple mixes are used, achievement be calculated using a weighted average of all the mixes. This approach is in keeping with NRMCA recommendations.

I am a structural engineer and co-lead the CLF Boston Hub's Low-Carbon Concrete group and am available for any follow-up questions or discussion.

Best regards,

--Mark

Mark D. Webster, P.E., LEED AP BD+C
(he/him/his)
Senior Consulting Engineer
D: 781.907.9369
SIMPSON GUMPERTZ & HEGER
sgh.com

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Our commitment to SE 2050

Edson, Becca (ENE)

From: Richard Taft <RichardTaft@airxchange.com>
Sent: Friday, September 13, 2024 10:42 AM
To: STRETCHCODE (ENE)
Subject: Stretch Code Feedback - Energy Recovery Comments C403.7.4

Follow Up Flag: Follow up
Flag Status: Completed

To Whom It May Concern:

Airxchange is a leading manufacturer of energy recovery components located in Rockland, MA. Together with our other brands, Novelaire, & Innergytech, we are the leading component supplier in North America of energy recovery to components most of the major air conditioning manufacturers. Our products include energy recovery wheels, enthalpy plates, sensible recovery plates and heat pipe. We are generally supportive of efficiency improvements for air conditioning systems and the implementation of energy recovery components that make the outside ventilation the most efficient means of maintaining Indoor Air Quality (IAQ). I am also a voting member of the ASHRAE SSPC STD 62.1.

When the efficiency improvements in the 2023 stretch code increased the enthalpy recovery ratio of commercial building other than non-transient spaces to 70%, it presented the industry with a significant challenge. In order to meet that new efficiency requirement, energy recovery components generally had to increase in size which increased their cost. It also increased the overall footprint of systems which use those components. You should be aware that the cost of the footprint increase far exceeds the modest component cost increase. Our concern with the dramatic increase in cost is the disincentive it creates to use outside air ventilation for IAQ. At the same time, the 2023 stretch code did not prescribe a maximum air pressure drop for energy recovery components. One way to mitigate the footprint impact to systems is to increase flow through a component which increases pressure drop while still designing to achieve the efficiency benchmark. ASHRAE STD 90.1 does stipulate maximum air pressure drop in its standard, Table 6.5.3.1-2, with the formula MAX APD = (2.2xEnthalpy Recovery Ratio – 0.5) for each air stream. Using 70% ERR and this methodology, the max air pressure drop for energy recovery components should be no more than 1.04 in.wg. Yet, we have seen designs that frequently exceed this value by 50-100%. When designs use high pressure drop components to shrink footprint, the savings from the energy recovery function can be totally wiped by fan energy penalty needed to overcome the high component air pressure drop. We believe the proposed stretch code should explicitly include the ASHRAE formula.

The proposed stretch code frequently interchanges Enthalpy Recovery Ratio and Heating Recovery Ratio in a similar context. Technically speaking, this is incorrect and leads to confusion. Recovering enthalpy is a combination of both sensible and latent energy. Heating recovery in the context of the proposed stretch code is a sensible only recovery process. Therefore, it should be correctly referred to as Sensible Recovery Ratio (SRR). If the proposed language is intended to just cover winter climate applications, it could further stipulate SRR as for heating only climate conditions (ie. Winter). This would align the language to various industry certification standards and eliminate confusion.

The proposed stretch code creates a high differential in efficiency requirements between non-transient dwellings and commercial buildings other than non-transient, or just commercial buildings. While the proposed standard increases the heating sensible recovery to 75%, it does not similarly increase the cooling enthalpy recovery ratio. The cooling enthalpy recovery ratio for a non-transient dwelling should be the same as or much closer to the commercial building enthalpy recovery ratio of 70%.

Best regards

Richard Taft
SVP Sales and Strategy

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Ian Finlayson
Department of Energy Resources
Commonwealth of Massachusetts
100 Cambridge Street, 9th Floor
Boston, MA 02114

September 13, 2024

RE: American Chemistry Council- STRETCH CODE FEEDBACK
Oppose Proposed Changes, Unless Amended

Dear Mr. Finlayson,

The American Chemistry Council (ACC) is a national trade association representing chemicals and plastics manufacturers in the United States, including member companies in the Commonwealth of Massachusetts. The chemical industry directly employs over 6154 people in Massachusetts and indirectly supports another 5803 jobs and generates over $125 million in state and local taxes, supporting the needs of Massachusetts and its residents.

ACC is a strong advocate for energy efficiency and carbon mitigation, and we support policies that incentivize conserving energy resources and reducing greenhouse gas emissions. **ACC, however, opposes – unless amended – proposed changes to the Stretch Energy Code, a bill that would weaken energy efficiency.**

The proposed change to weaken the Energy Rating Index (ERI) of a building in exchange for lower embodied carbon insulations is fundamentally at odds with Massachusetts' GHG emissions reduction goals. By setting this trade-off to materials with GWP of 0 or less, it is effectively mandating that only bio-based insulation materials can be used for this trade-off. And the decrease in embodied emissions is small given that essentially all current insulations have low GWP[1]. Consequently, the three-point increase in the ERI score is likely to offset or erase any embodied carbon benefit of using 0 GWP insulation materials by increasing operational carbon emissions of the building due to reduced energy efficiency.
At a global scale, the building and construction sector accounts for 37 percent of carbon emissions. Embodied carbon accounts for 10 percent. Building operations account for 27 percent.[2] Building materials like concrete, steel, and glass account for the largest portion of the embodied carbon. Cement alone accounts for 7 percent of overall global greenhouse gas emissions leaving only 3 percent attributed to other materials.[3] Materials like steel and glass are the next highest contributors, which means insulation makes up an extremely small portion of a building's embodied carbon.

[1] See: Building Decarbonization Insights: Quantifying the Energy & Carbon Saving Benefits of Foam Plastic Insulating Sheathing (FPIS)
[2] See: GABC_Buildings-GSR-2021_BOOK.pdf (globalabc.org)
[3] See: Embodied carbon of concrete in buildings, Part 1: analysis of published EPD (journal-buildingscities.org)

For the U.S., all building and infrastructure construction materials produced in a year account for about 0.6% of total global emissions (0.4% if considering all building materials excluding infrastructure)[4]. Major contributors such as the annual production of concrete in the U.S. accounts for about 0.17% of total global emissions. Conversely, the annual product of all U.S. insulation materials for buildings accounts for about 0.01% of total global emissions. Yet, these embodied emissions of insulation materials (footprint) are offset within less than a year after these materials are employed in buildings. Within 10 years of building operation, the operational carbon emissions savings (handprint) are typically 25x the insulation material's initial embodied carbon. Over the life of the building, the savings are typically 100x. While these are national average projections, similar trends are likely applicable to Massachusetts. Thus, trading off operational energy efficiency (carbon emission savings) for small reductions in the minimal amount of embodied carbon attributed to insulation materials does not appear justified and may even been counterproductive.

Maximizing energy efficiency should be the primary goal when integrating building decarbonization goals into energy codes and standards. Efficient building envelopes optimize building energy use irrespective of fuel type, and they cost-effectively enable other building decarbonization strategies like electrification and smart building technologies.[5]

Insulation is unique. It is one of a very few materials that has direct carbon savings associated with its use. Therefore, these materials should be handled differently when developing policy. Insulation should not be included as an ERI (building efficiency) trade-off measure until/unless total carbon impacts of insulation are included.

Total carbon impacts include the embodied carbon and carbon savings during the material use stage, not just embodied carbon.

Because the Product Category Rule for Building Thermal Insulation does not currently include carbon savings, the reported carbon numbers for insulation do not tell a wholistic story of the materials' total impact. A recent study by ICF, *Determination of Total Carbon Impact of Plastic Insulation Materials*[6] , found the following:

- **The carbon payback period for insulation in a *typical home* can range from 2.3 to 6.1 <u>months</u>** assuming a transition to 100% heat pump systems and when analyzing a high cost of grid conversion to renewable energy and low cost of grid conversion to renewable energy using NREL's Cambium database projections.
- **The carbon payback period for insulation in a *typical medium office building* can range from 4.9 to 10.2 <u>months</u>** assuming a transition to 100% heat pump systems and when analyzing a high cost of grid conversion to renewable energy and low cost of grid conversion to renewable energy using NREL's Cambium database projections.
- **For every unit of embodied carbon investment in *residential* insulation it can return 30 to 348 times the carbon savings during the home's useful life** depending on heating system mix and grid make up.

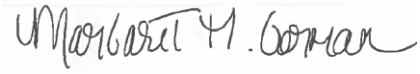
[4] Building Decarbonization Insights: Quantifying the Energy & Carbon Saving Benefits of Foam Plastic Insulating Sheathing (FPIS)
[5] U.S. Insulation Industry Building Decarbonization Statement of Policy Principles
[6] ICF, Determination of Total Carbon Impact of Plastic Insulation Materials, August 29, 2023.

- **For every unit of embodied carbon investment in *commercial* insulation it can return 18 to 305 times the carbon savings during building's useful life** depending on heating system mix and grid make up.

To summarize, the overall carbon savings resulting from the use of insulation significantly outweighs the embodied carbon investment in these materials. Creating policies that solely consider the embodied carbon of insulation materials may cause designers to limit the amount of insulation used and could limit insulation choices which could in-turn hinder moisture, air leakage and thermal performance. Furthermore, adopting policies that solely consider the embodied carbon of insulation materials may be counterproductive to carbon reduction goals. ACC members have been making great progress in lowering their embodied carbon emissions, reducing embodied carbon emissions by more than 100% over the past 50 years.[7]

For these reasons, we urge the Department of Energy Resources **not** to adopt these proposed changes to the Stretch Energy Code. If you have questions or need additional information, please feel free to contact me at Margaret_gorman@americanchemistry.com. Thank you for your consideration.

Sincerely,



Margaret M. Gorman
Senior Director, Northeast Region

[7] A. Schmidt, A. Chertack; 2023 Polyurethanes Technical Conference, Unlocking Carbon Savings with Plastic Insulation Materials.

To: Ian Finlayson, Department of Energy Resources

From: Daniel Moll, Arx Urban

Re: Stretch Code Feedback

I am writing with a request to address a serious concern in DOER's Proposed Changes to the current Stretch Energy Code and Municipal Opt-in Specialized Code pertaining to projects pursuing Passive House certification and seeking final certificate of occupancy ("CoO"). Per Sections R405.2, R405.3, C407.3.2.1, and C407.3.2.2 of the Draft MA 2023 Residential and Commercial Stretch Code and Specialized Opt-in Code with proposed revisions, projects pursuing Passive House certification, whether through Phius or PHI, have two options for obtaining final CoO, as summarized below:

1. Option 1:
    a. Design phase pre-certification/approval
    b. Verification report demonstrating as-built conditions comply with Passive House requirements
    c. Statement from consultant confirming hygrothermal requirements are satisfied
    d. Statement from consultant confirming project satisfies all testing and modeling requirements
    e. Back-up documentation with test results
2. Option 2:
    a. Final certification letter from certifying body

While projects can obtain *temporary* CoO regardless of certification status, which is necessary for occupancy, the current proposed code language still puts extremely high-performance projects at risk by requiring Options 1 or 2 above for obtaining *final* CoO. Neither option above is feasible for development teams who fail to achieve final Passive House levels of performance despite well documented best efforts. As currently written, the Draft Stretch Code and Opt-In Code do not support projects that achieve design phase certification, do their best to construct to Passive House levels of performance, but ultimately fall short of satisfying 100% of certification requirements. These projects need a defined path to achieve a final CoO in the event neither option above is attainable.

Without final CoO, projects may not convert high-interest rate construction loans to permanent mortgages. In low-income housing tax credit ("LIHTC") projects, the construction loan, typically paid down with LIHTC equity upon receiving final CoO, is significantly larger than the permanent mortgage, making the conversion critical for LIHTC developers to continue doing business in Massachusetts. Furthermore, it is not realistic for projects to pursue an appeal with their Authority Having Jurisdiction and/or the State, which would cause significant delays to project delivery, while adding cost and risk to very high-performance projects.

Given the quantity of Passive House projects in the state, estimated at more than 272 projects consisting of over 20,600 units, it is very likely that some of these projects that are designed to Passive House certification, as evidenced at the time of permitting, and constructed per design, as evidenced by frequent third-party inspection reports, may encounter insurmountable issues that make satisfying Option 1 and Option 2 impossible. These projects will have spent considerable time and money designing and constructing buildings with the intent of certifying – which will be easily documented with consultant contracts, inspection reports, and test results -- and yet still encounter issues such as air infiltration or

ventilation balancing preventing final CoO. These projects require a 3rd option for achieving final CoO that does not reduce the performance objectives of the code nor present an easier, race-to-the-bottom option for developers to consider. The 3rd option proposed below requires **nearly identical requirements** for design and construction as the two existing options and should only be available for projects who cannot achieve options 1 or 2. This 3rd option must be included in code to avoid local review and waiver ambiguity, further delays, significant added costs, and extreme risk in an industry that cannot absorb additional cost.

3. Proposed Option 3 for Final CoO:

    a. Copy of certified Passive House consultant and rater/verifier contracts demonstrating all required inspections and testing requirements for certification
    b. Design phase pre-certification/approval
    c. Verification report demonstrating as-built conditions, including those that comply with Passive House requirements, and those that do not (if applicable)
        i. For projects following Phius, demonstrate final Energy Star and Zero Energy Ready Homes certification requirements are met.
    d. Hygrothermal analysis confirming the building does not face any durability concerns based on as-built condition
    e. Statement from Passive House consultant confirming project has completed all interim, final, and corrective testing and modeling requirements, including a summary of deviations from Passive House requirements
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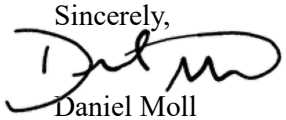
        ii. Back-up documentation with test results for initial and follow up re-tests with explanation for any deviation from Passive House requirements
    f. Ventilation flow rates demonstrating mechanical code compliance

This proposed 3rd option is nearly identical to Option 1 and offers similar flexibility as the Passive House Institute U.S. offers projects that may not satisfy all program requirements necessary for certification. Phius does not have adequate capacity to evaluate projects seeking waivers on a case-by-case basis in a timely manner, making it necessary for the Commonwealth to allow a similar approval path for municipal building departments.

Without this option, projects will face significant cost and major delays after having made significant investments in developing extremely well performing buildings. Project teams pursuing Passive House certification that have obtained pre-certification at design and who work closely with their consultants and contractors to follow all inspection and testing procedures necessary for Passive House certification are deserving of final CoO without facing onerous cost, risk, or delay.

Sincerely,



Daniel Moll
Managing Principal
Arx Urban

HOME VENTILATING INSTITUTE

13 September 2024

Massachusetts Department of Energy Resources
100 Cambridge Street
9th Floor
Boston, MA 02116

VIA EMAIL TO: stretchcode@mass.gov

Re: MA Stretch Code Proposal Feedback

Dear Massachusetts Department of Energy Resources:

The Home Ventilating Institute (HVI) is an ISO 17065 compliant certification body and a trade association representing over 100 manufacturers located in North America, South America, Asia, and Europe. Our manufacturer members provide the residential and light commercial ventilating products that deliver essential indoor air quality (IAQ) to homes and businesses. The HVI-Certified Products Directory (CPD) contains listings for heat and energy recovery ventilators (HERVs), bath/utility room exhaust fans, kitchen exhaust fans, dryer exhaust duct power ventilators, in-line supply and exhaust fans, whole-house fans, duct termination fittings, and soffit vents, among other products.

HVI appreciates the opportunity to present comments on the MA Stretch Code proposal. HVI supports the development of codes and standards that encourage the specification and use of energy efficient ventilation systems in support of IAQ.

Thank you for the opportunity to present these comments. Please direct any questions to Josh Lynch, HVI Chief Program Officer (compliance@hvi.org).

Kind regards,

Jacki Donner, CEO/Secretary

HVI Comments for MA Stretch Code Proposal

Having reviewed the Massachusetts Residential and Commercial Stretch Energy Codes of 2023, and the proposed revisions issued on August 12, 2024 for public commentary, HVI proposes that:

1. A compliance path for HVI-certified heat/energy recovery ventilators (HERVs) be provided for nontransient dwelling units in scope of the commercial section, as in the IECC 2024 and in a continuous-maintenance proposal for ASHRAE 90.1. The 2023 Technical Guidance document already references individual HERVs as a common ventilation strategy in the dwelling units, but no compliance path is available.

2. Minimum performance requirements be increased for residential HERVs rated to CAN/CSA-C439.

3. Language requiring the use of HVI certification be strengthened in both residential and commercial sections.

4. HERVs installed in buildings following the HERS, PHI or Phius compliance paths also should meet the relevant requirements in the prescriptive path.

MODIFICATION PROPOSAL – Residential Energy Code

SECTION R401
GENERAL

R401.2.2 Passive House Building Certification Option. The Passive House Building Certification Option requires compliance with Section R403.6, R405, R404.4 and Appendix RB.

SECTION R403
BUILDING MECHANICAL SYSTEMS

R403.6.1.2 Other Systems. Systems with a rated airflow of 300 cfm or less shall have a sensible recovery efficiency (SRE) of not less than ~~65~~ 72 percent at 32°F (0°C) at an airflow not less than the design airflow. SRE shall be determined in accordance with CAN/CSA-C439 and shall be listed in the HVI-Certified Products Directory. Linear interpolation of listed values for SRE shall be permitted.

MODIFICATION PROPOSAL – Commercial Energy Code

SECTION C401
GENERAL

C401.2.2 Certified Performance Standard Compliance. Commercial buildings or portions thereof when following C401.2.4 shall comply with one of the following certified performance standards:

1 Passive House Compliance: This pathway can be used for any building of any size. The Passive House Compliance pathway requires compliance with Sections C401.3, C402.3, C403.7.4, C405, C407.3 and C408.

2 HERS Compliance: This pathway can be used for any Group R building with multiple individual *dwelling units*. The HERS pathway requires compliance with Section C401.3, C402.3, C403.7.4, C405, C407.4 and C408.

SECTION C403

BUILDING MECHANICAL SYSTEMS

C403.7.4 Energy Recovery Systems. Energy recovery ventilation systems shall be provided as specified in either Section C403.7.4.1, ~~as applicable, and~~ or C403.7.4.2.

C403.7.4.1 Nontransient dwelling units. Nontransient dwelling units shall be provided with outdoor air energy recovery ventilation systems ~~with an *enthalpy recovery ratio* of not less than 50 percent at cooling design condition and not less than 75 percent at heating design condition.~~ Outdoor air must be delivered directly to the dwelling unit. The energy recovery system shall result in either 1 or 2, as applicable. ~~The building weighted average *sensible energy recovery effectiveness* must meet the requirements of C403.7.4.2~~.

1. The system shall have an *enthalpy recovery ratio* of not less than 50 percent at cooling design condition and not less than 75 percent at heating design condition. Compliance to the *sensible energy recovery ratio* and *enthalpy recovery ratio* requirements shall be demonstrated by ratings generated at design conditions and airflows.
2. The system, at the design outdoor airflow, shall have a *sensible recovery efficiency* (SRE) that is not less than 72 percent at 32°F (0°C), and at any airflow a *total recovery efficiency* (TRE) that is not less than 50 percent at 95°F (35°C). SRE and TRE shall be determined in accordance with CAN/CSA-C439 and shall be listed in the HVI-Certified Products Directory. Linear interpolation of listed values for SRE shall be permitted.

MODIFICATION PROPOSAL – 2023 Technical Guidance Massachusetts Stretch Energy Codes

Page 36, under C403.7.4.1 Nontransient Dwelling Units

Nontransient dwelling units typically use energy recovery ventilators to provide ventilation directly to each dwelling unit. Another configuration is to have a central DOAS unit that serves several dwelling units on each building floor. Energy recovery for nontransient dwelling units must have either a minimum enthalpy recovery effectiveness in cooling conditions of 50%, and a minimum enthalpy recovery effectiveness in heating of 75%; or a minimum SRE in heating of 72%, and a minimum TRE in cooling of 50%. These ratings must be at airflows not less than the design outdoor airflow.

Interpolation of ratings to determine the performance at the design airflow is permitted. Units complying with the SRE and TRE requirements shall be HVI-certified and listed in the HVI-Certified Product Directory. Note that exceptions from the IECC have been deleted in the Stretch Code. If some of the units have lower ERV effectiveness, the building can still comply by showing that the airflow-weighted average effectiveness meets the Stretch Code requirements.

Page 79, fifth paragraph

HRVs or ERVs must be included in the system design per R403.6.1. The required minimum system efficiency depends upon the rated airflow. Large systems (e.g., exceeding a rated airflow of 300 cfm) serving one or more dwelling units must comply using an enthalpy recovery ratio determined in accordance with AHRI. Other HRVs or ERVs must comply using an SRE determined in accordance with CAN/CSA C439. The installed equipment also must be HVI-certified ~~(or equivalent)~~ and listed in the HVI-Certified Products Directory.

Supporting Commentaries

1. "Language requiring use of HVI certification…"

With regards to requiring ERVs be listed in the HVI CPD, our proposal is consistent with the 2023-09-22 MA Stretch Energy Codes Technical Guidance document, which states on p.79, that "…HRVs or ERVs must comply using an SRE determined in accordance with CAN/CSA C439. The installed equipment also must be HVI-certified (or equivalent)."

The use of the phrase "(or equivalent)" sometimes is used to allow some flexibility for early market entrants. However, today's market is mature, with (37) brands in the HVI-Certified Products Directory, and the industry is innovating. Requiring certification will not unduly limit consumer choice.

Further, there is no "equivalent" to HVI certification. All other certification schemes with similar scope use metrics with significantly different meanings, and any one product will have different values under different certification schemes. The rigor of HVI's certification program is unmatched by the other schemes.

Adding requirements for HVI certification of applicable HERVs protects Massachusetts stakeholders from unsubstantiated performance claims.

2. "A compliance path for HVI-certified HERVs…"

In nontransient dwelling units in scope of the commercial code, such as multi-family, individual HERVs for each dwelling unit are a popular choice. The current stretch code does not allow for this. Adding a compliance path for individual HERVs provides Massachusetts' stakeholders with the benefits of wider designer choice, in some cases, of lower cost, and of individual control by occupants.

3. "Minimum performance requirements be increased for residential…"

For the Residential Code and for nontransient dwelling units in scope of the Commercial Code, we propose higher performance levels than currently required in the Residential Code. HVI believes these are appropriate and available performance levels for stretch codes in northern climates. Massachusetts' stakeholders benefit from higher performance, and a wide choice from a range of products is still available.

4. "HERVs installed in buildings following the HERS, PHI or Phius compliance paths…"

We recommend adoption of the prescriptive requirements for ERVs within the HERS and Passive House compliance paths to ensure that stakeholders following those compliance paths receive ventilation systems not less efficient than required in the prescriptive paths. In the case of Phius, their prescriptive path already uses HVI-certified metrics to determine compliance, so it should not be an undue burden to confirm that selected HERVs meet the requirements in proposed R403.6.1.2 and proposed C403.7.4.1. In the case of PHI, the certified ERV metric in their program only provides an input to their whole-building software, and is in no way comparable to the HVI metrics of SRE and TRE. The PHI metric is not referenced to a specific airflow, unlike SRE, TRE and ERR. The Massachusetts Stretch Code rightfully has the effect of requiring some humidity recovery in cooling conditions in non-transient dwelling units, but humidity recovery is convoluted in the PHI metric in a way that provides no information about cooling condition performance.

Commonwealth of Massachusetts
Division of Professional Licensure
Office of Public Safety and Inspections

1000 Washington Street, Suite 710
Boston, Massachusetts 02118

MASSACHUSETTS STATE BUILDING CODE – CODE CHANGE PROPOSAL FORM

Impacted code: 225 CMR 22.00	☐ Base Code ■ Residential Code	**State Use Only**	
Date Submitted:	March 4, 2024	**Date Received:**	
Code Section:	R503.1.5	**Code Change Number:**	
Name of proponent:	Michael Grant, Inspector of Buildings		
Company / Organization represented, if any:	Town of Wellesley	**Check** ☐ if representing self	
Address (number, street, city, state, ZIP):	888 Worcester Street, Suite 160, Wellesley, MA 02482		
Telephone number:	781-489-7452		
Email address:	mgrant@wellesleyma.gov		

PLEASE CHECK √ THE TYPE OF AMENDMENT PROPOSED

☐ Change existing section language ☐ Add new section ■ Delete existing section and substitute

☐ Delete existing section, no substitute ■ Other, Explain: Emergency Amendment

PLEASE TYPE THE PROPOSED AMENDMENT BELOW. If you propose to change a section, please copy the original text from either the relevant model code and/or MA amendment and indicate the code edition. Indicate, with a ~~strikethrough~~, the text that you propose to delete. Please also indicate any new text in both *italic* and red font. Finally, for each proposal submitted, please provide the justification items requested below. Completed code amendment forms may be emailed to Dan Walsh, Director of Code Development and Manufactured Buildings at Dan.P.Walsh@mass.gov . **Please attach additional pages as necessary.**

Existing language: See Attached Pages

Proposed changes: See Attached Pages

Background and rationale: See Attached Pages

Pros of the proposed change: See Attached Pages

Cons of the proposed change: See Attached Pages

Estimated impact on life safety: See Attached Pages

Estimated impact on cost: See Attached Pages

Original Code Language

~~R503.1.5 Level 3 Alterations, or Change of Use. Alterations that meet the IEBC definition for Level 3 Alteration or the IRC definition for Extensive Alteration, exceeding 1,000 sq ft or exceeding 100% of the existing conditioned floor area, shall require the dwelling unit to comply with the maximum HERS ratings for alterations, additions or change of use shown in Table R406.5.~~

Proposed Code Language

R503.1.5 Level 3 Alterations or Extensive Alterations. Alterations that meet one of the following criteria shall require the building or dwelling unit to comply with the maximum HERS ratings for alterations, additions or change of use shown in Table R406.5.:

- Meet the IEBC definition for *Level 3 Alteration* and that exceeds 1000 sq ft or 100% of the existing *conditioned floor area* of the *building area* for Group R-2, R-3, and R-4 buildings with three stories or less in height above grade plain, other than one- and two-family dwellings and multiple single-family dwellings(townhouses): or

- Meet the IRC definition for *Extensive Alteration* and that exceeds 1000 sq ft or 100% of the existing *conditioned floor area* of the *dwelling unit* for one- and two-family dwellings and multiple single-family dwellings(townhouses).

Background and Rational

I am writing to propose a change to the 2021 International Energy Conservation Code (IECC) Section R503.1.5 due to various issues that need attention. The following reasons highlight the need for a code change:

1. **Code Language Interpretation:** The current code language is susceptible to multiple interpretations, leading to confusion and inconsistency in its enforcement by Building Officials. The ambiguity in language can result in different understandings by stakeholders, hindering effective implementation.
2. **Inconsistent Enforcement:** Building Officials face challenges in enforcing the code consistently due to the poor and confusing language. This lack of clarity may lead to variations in enforcement practices, impacting the uniform application of the energy code across different jurisdictions.
3. **Misalignment with Technical Guidance:** The Technical Guidance provided by the Department of Energy Resources (DOER) does not align with the promulgated code language officially filed with the Secretary of State. This misalignment introduces discrepancies that can create confusion and hinder the accurate application of energy efficiency standards.
4. **Conflicting Definitions:** The current code language contains conflicting definitions, creating a situation where three different codes' definitions come into conflict with one another. This conflict not only complicates compliance but also introduces potential legal and regulatory challenges.
5. **Lack of Clarity for Alterations:** The existing code language fails to provide clear guidance for Alterations in Low Rise Residential Buildings. This lack of clarity poses challenges for both the regulated community and Building Officials in understanding the specific energy code requirements applicable to alterations in existing buildings within the Commonwealth.
6. **Inconsistency with Affordability and Housing Goals:** The current code language may be inconsistent with the broader state goal of making regulations affordable for housing. Ensuring that energy code requirements strike a balance between efficiency and affordability is crucial for supporting sustainable housing practices.

Considering these multifaceted issues, I propose a revision of Section R503.1.5 to address the identified shortcomings. These changes aim to enhance the understanding of energy code requirements for Alterations in Low Rise Residential Buildings, fostering compliance, uniformity, and alignment with the state's affordability and housing goals.

Thank you for considering this proposed change. I look forward to discussing this matter further and working collaboratively to improve the clarity and effectiveness of the energy code.

Pros of the proposed change

The numerous benefits of the proposed change to the 2021 International Energy Conservation Code (IECC) Section R503.1.5, specifically focusing on how these changes contribute to the consistency of state regulations with the goal of making housing more affordable. The following advantages highlight the positive impact of the proposed code modifications:

1. **Resolution of Definition Conflicts:** The proposed change addresses and rectifies conflicts between various definitions present in the current code language. By providing clarity and consistency, the revised language eliminates ambiguity and ensures that definitions align seamlessly, preventing any potential conflicts.
2. **Clearer Application to Use Classification:** The new language significantly improves clarity regarding the application of definitions to different use classifications of structures. This enhancement enables stakeholders, including the regulated community and Building Officials, to easily discern and apply the code requirements based on the specific use of the structure.
3. **Enhanced Understanding for Stakeholders:** The proposed change results in a code language that is more accessible and comprehensible for both the regulated community and Building Officials. The increased clarity reduces the likelihood of misinterpretation and promotes a shared understanding of the energy code requirements, streamlining the enforcement process.
4. **Alignment with DOER Technical Guidance:** The revised language ensures better alignment between the code language and the Technical Guidance provided by the Department of Energy Resources (DOER). This alignment is crucial for consistency in interpretation and application, fostering a cohesive approach to energy efficiency standards across the state.
5. **Consistency with Affordability and Housing Goals:** The proposed change aligns the energy code with the broader state goal of making regulations affordable for housing. By ensuring that the regulatory framework strikes a balance between efficiency and affordability, the revised code contributes to sustainable housing practices that benefit the community at large.

In summary, the proposed changes bring about a host of benefits, including the resolution of conflicts between definitions, clearer application to use classifications, enhanced understanding for stakeholders, improved alignment with DOER Technical Guidance, and consistency with the state's affordability and housing goals. These positive outcomes collectively contribute to a more effective, transparent, and user-friendly energy code, supporting the overarching objective of making housing more affordable in the state.

I am optimistic that these enhancements will lead to a more robust and accessible regulatory framework that aligns with the state's affordability goals.

Cons of the proposed change

While proposing code changes can bring about numerous benefits, it's essential to consider potential drawbacks as well. Here are some potential cons associated with the proposed changes to the 2021 International Energy Conservation Code (IECC) Section R503.1.5:

1. **Resistance to Change:** Stakeholders, including Building Officials and members of the regulated community, may resist the proposed change due to unfamiliarity or a perceived increase in complexity. Resistance to change could lead to delays in adoption and implementation.
2. **Training and Education Requirements:** The introduction of new language and definitions may necessitate additional training and education for Building Officials, contractors, and other professionals involved in the construction industry. This could incur additional costs and time commitments.
3. **Potential Legal Challenges:** Any significant revisions to the code may introduce legal uncertainties. Stakeholders may question the validity of the changes, potentially leading to legal disputes or challenges that could further delay implementation.
4. **Impact on Construction Costs:** There could be potential cost implications for construction projects. Striking a balance between energy efficiency and affordability may be challenging, and increased requirements may lead to higher construction costs.
5. **Communication Challenges:** Implementing new code language and definitions requires effective communication to ensure that all stakeholders are on the same page. Miscommunication or inadequate dissemination of information may result in non-compliance and enforcement challenges.
6. **Unintended Consequences:** The proposed change might have unintended consequences that are not immediately apparent. These could include unforeseen complications during construction, alterations, or potential loopholes that compromise the intended energy efficiency goals.
7. **Impact on Existing Structures:** The change aimed at clarifying Alterations in Low Rise Residential Buildings may have implications for existing structures. Stakeholders may face challenges in retrofitting buildings to comply with the updated code, potentially leading to increased costs for property owners.

It's crucial to carefully assess and mitigate these potential drawbacks through stakeholder engagement, thorough impact assessments, and effective communication strategies during the proposal and implementation phases.

Estimated impact on life safety

Assessing the estimated impact on life safety is a critical aspect of proposed code changes. While the specific impact may vary based on the nature of the modifications to the 2021 International Energy Conservation Code (IECC) Section R503.1.5, here are considerations regarding potential impacts on life safety:

1. **Clarity in Definitions and Language:** The proposed change will enhance the clarity of definitions and language, it will lead to better understanding and implementation of energy efficiency measures. This, in turn, may contribute positively to life safety by ensuring that structures are designed and constructed in accordance with clear and consistent standards.
2. **Consistent Enforcement:** Improved clarity and consistency in code language can facilitate more uniform enforcement by Building Officials. Consistent enforcement is crucial for ensuring that buildings, especially those in the residential sector, adhere to safety standards, thereby enhancing life safety for occupants.
3. **Alignment with Technical Guidance:** The proposed change will better align the code language with the Technical Guidance provided by the Department of Energy Resources (DOER), it may lead to a more cohesive approach to energy efficiency. This alignment could positively impact life safety by promoting standardized practices that prioritize both energy efficiency and safety.
4. **Resolution of Conflicting Definitions:** Addressing conflicts between definitions in the current code language is essential. Clear and harmonized definitions contribute to a safer built environment, reducing the risk of misinterpretation or ambiguity that could compromise life safety.
5. **Impact on Alterations:** The proposed change provides clearer guidance on Alterations in Low Rise Residential Buildings, it may influence how renovations and modifications are carried out. Clarity in this regard can contribute to life safety by ensuring that alterations are executed in a manner that does not compromise the structural integrity or safety of existing buildings.
6. **Cost Implications:** While not directly related to life safety, it's crucial to consider any potential cost implications of the proposed changes. Higher construction costs may impact the affordability of safety features and materials, indirectly influencing life safety considerations.

Estimated impacts on cost

The estimated impact on cost resulting from proposed code changes to the 2021 International Energy Conservation Code (IECC) Section R503.1.5 can vary based on the nature of the modifications. Here are considerations regarding potential impacts on costs:

1. **Training and Education Costs:** Since the proposed change minimally introduces new language and definitions, there should be minimal costs associated with training and educating Building Officials, contractors, and other professionals in the construction industry. This could include expenses for workshops, materials, and time commitments, potentially adding to overall costs.
2. **Compliance Costs:** There is no increased stringency of the proposed change from what was originally implemented. Builders and property owners will need to invest in more energy-efficient materials, technologies, or construction methods to meet the updated requirements, potentially leading to higher construction costs.
3. **Implementation Costs for Alterations:** Clearer code language on Alterations in Low Rise Residential Buildings may impact how renovations and modifications are carried out. If the proposed change necessitates specific alterations to existing structures for compliance, property owners may face additional costs to retrofit buildings accordingly.
4. **Legal and Regulatory Costs:** Any revisions to the code may lead to legal challenges or disputes. Legal and regulatory costs associated with addressing challenges, obtaining legal counsel, or participating in dispute resolution processes could contribute to overall costs.
5. **Cost of Compliance Verification:** Building Officials may incur additional costs associated with verifying compliance with the updated code. This could involve investing in training, technology, or additional staff to ensure effective enforcement and inspections.
6. **Long-Term Operational Savings:** While initial construction costs may increase, it's important to consider potential long-term operational savings resulting from improved energy efficiency. Energy-efficient buildings often lead to reduced utility costs over time, which can offset the initial investment.

To: Ian Finlayson, Department of Energy Resources

From: Emily Totten, Architectural Green Building Consultant, Sustainable Comfort Inc.

Re: Stretch Code Feedback

I am writing with a request to address a serious concern in DOER's Proposed Changes to the current Stretch Energy Code and Municipal Opt-in Specialized Code pertaining to projects pursuing Passive House certification and seeking final certificate of occupancy ("CoO"). Per Sections R405.2, R405.3, C407.3.2.1, and C407.3.2.2 of the Draft MA 2023 Residential and Commercial Stretch Code and Specialized Opt-in Code with proposed revisions, projects pursuing Passive House certification, whether through Phius or PHI, have two options for obtaining final CoO, as summarized below:

1. Option 1:
    a. Design phase pre-certification/approval
    b. Verification report demonstrating as-built conditions comply with Passive House requirements
    c. Statement from consultant confirming hygrothermal requirements are satisfied
    d. Statement from consultant confirming project satisfies all testing and modeling requirements
    e. Back-up documentation with test results
2. Option 2:
    a. Final certification letter from certifying body

While projects can obtain *temporary* CoO regardless of certification status, which is necessary for occupancy, the current proposed code language still puts extremely high-performance projects at risk by requiring Options 1 or 2 above for obtaining *final* CoO. Neither option above is feasible for development teams who fail to achieve final Passive House levels of performance despite well documented best efforts. As currently written, the Draft Stretch Code and Opt-In Code do not support projects that achieve design phase certification, do their best to construct to Passive House levels of performance, but ultimately fall short of satisfying 100% of certification requirements. These projects need a defined path to achieve a final CoO in the event neither option above is attainable.

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Sincerely,

Emily Totten
Architectural Green Building Consultant
Sustainable Comfort, Inc.

LISC MASSACHUSETTS

September 13, 2024

To: Ian Finlayson, Deputy Director, Energy Efficiency Division, Department of Energy Resources

From: Emily Jones, Deputy Director, LISC Massachusetts

Re: Stretch Code Feedback

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2. Option 2:
    a. Final certification letter from certifying body

While projects can obtain *temporary* CoO regardless of certification status, which is necessary for occupancy, the current proposed code language still puts extremely high-performance projects at risk by requiring Options 1 or 2 above for obtaining *final* CoO. Neither option above is feasible for development teams who fail to achieve final Passive House levels of performance despite well documented best efforts. As currently written, the Draft Stretch Code and Opt-In Code do not support projects that achieve design phase certification, do their best to construct to Passive House levels of performance, but ultimately fall short of satisfying 100% of certification requirements. These projects need a defined path to achieve a final CoO in the event neither option above is attainable.

Without final CoO, projects may not convert high-interest rate construction loans to permanent mortgages. In low-income housing tax credit ("LIHTC") projects, the construction loan, typically paid down with LIHTC equity upon receiving final CoO, is significantly larger than the permanent mortgage, making the conversion critical for LIHTC developers to continue doing business in Massachusetts. Furthermore, it is not realistic for projects to pursue an appeal with their Authority Having Jurisdiction and/or the State, which would cause significant delays to project delivery, while adding cost and risk to very high-performance projects.

Given the quantity of Passive House projects in the state, estimated at more than 272 projects consisting of over 20,600 units, it is very likely that some of these projects that are designed to Passive House certification, as evidenced at the time of permitting, and constructed per design, as evidenced by frequent third-party inspection reports, may encounter insurmountable issues that make satisfying Option 1 and Option 2 impossible. These projects will have spent considerable time and money designing and constructing buildings with the intent of certifying – which will be easily documented with consultant contracts, inspection reports, and test results – and yet still encounter issues such as air infiltration or

ventilation balancing preventing final CoO. These projects require a 3rd option for achieving final CoO that does not reduce the performance objectives of the code nor present an easier, race-to-the-bottom option for developers to consider. The 3rd option proposed below requires **nearly identical requirements** for design and construction as the two existing options and should only be available for projects who cannot achieve options 1 or 2. This 3rd option must be included in code to avoid local review and waiver ambiguity, further delays, significant added costs, and extreme risk in an industry that cannot absorb additional cost.

3. Proposed Option 3 for Final CoO:

    a. Copy of certified Passive House consultant and rater/verifier contracts demonstrating all required inspections and testing requirements for certification
    b. Design phase pre-certification/approval
    c. Verification report demonstrating as-built conditions, including those that comply with Passive House requirements, and those that do not (if applicable)
        i. For projects following Phius, demonstrate final Energy Star and Zero Energy Ready Homes certification requirements are met.
    d. Hygrothermal analysis confirming the building does not face any durability concerns based on as-built condition
    e. Statement from Passive House consultant confirming project has completed all interim, final, and corrective testing and modeling requirements, including a summary of deviations from Passive House requirements
        i. Taped and untaped blower door testing at 50 Pascal and 75 Pascal demonstrating results are within 20% of Passive House requirements. If initial whole building blower door testing exceeds Passive House requirement, statement must reflect evidence of a re-test, with results, as well as an explanation for sources of leakage and attempted remediation efforts.
        ii. Back-up documentation with test results for initial and follow up re-tests with explanation for any deviation from Passive House requirements
    f. Ventilation flow rates demonstrating mechanical code compliance

This proposed 3rd option is nearly identical to Option 1 and offers similar flexibility as the Passive House Institute U.S. offers projects that may not satisfy all program requirements necessary for certification. Phius does not have adequate capacity to evaluate projects seeking waivers on a case-by-case basis in a timely manner, making it necessary for the Commonwealth to allow a similar approval path for municipal building departments.

Without this option, projects will face significant cost and major delays after having made significant investments in developing extremely well performing buildings. Project teams pursuing Passive House certification that have obtained pre-certification at design and who work closely with their consultants and contractors to follow all inspection and testing procedures necessary for Passive House certification are deserving of final CoO without facing onerous cost, risk, or delay.

Sincerely,

Emily L. Jones

Emily Jones
Deputy Director
LISC Massachusetts

DIMELLA SHAFFER

Stretch Energy & Specialized Opt-in Code Updates

Public Comments
09/13/2024

1. **C401.2.1 Prescriptive and Performance Compliance**
    a. An enclosed or unenclosed unconditioned or low energy spaces (e.g., unconditioned garage, greater than 20,000 sf) cannot be modeled in ASHRAE and therefore clarification would be beneficial for these instances where these use types are greater than 20,000 sf, beyond language in C402.1.1 Low-Energy Buildings.
    b. Additionally, it is common for Passive House multifamily projects (under the Commercial Energy Code) to have nonresidential use types (e.g., retail, greater than 20,000 sf) outside of the Passive House boundary. It would be beneficial to have flexibility within the code to allow the Prescriptive pathway in lieu of two separate energy models (e.g., WUFI Passive and ASHRAE), which contributes to higher soft costs.

2. **C503.2.4 Derating and Thermal Bridges**
    a. Recommend adding clarifying language to the updated language and providing diagrams in the technical guidance. See additional suggestions below. It is important to clarify that this language applies to existing thermal bridges that are not “exposed” or “daylighted”.
    b. It would be beneficial if this language could apply to C505, Change of Use (7/18/24 SE-TAC meeting).

3. **C505.1 General**
    a. Clarify if an energy model based on the added “modeled” language. If it is, this seems like a substantial soft cost expense for projects that are following the “Prescriptive” requirements.
    b. Can thresholds be provided, such as greater than +10% in change in annual energy use would trigger C505 Change of Use requirements?

4. **C103.2 Parts 2, 3, & 4**
    a. Envelope technical guidance (last page) is different from C103.2 code requirements.

5. **Phius REVIVE 2024**
    a. We are exploring REVIVE 2024 feasibility and are in the process of writing a pilot grant to be shared with the DOER soon.

6. **Low-Rise Residential & Commercial Chapter 5**
    a. Adding EnerPHit to Chapter 5 as an alternative compliance pathway for existing building Alterations and Change of Use in lieu of adding it to C407 or R405.
    b. The only way to get to C407 or R405 is to first go to C401 or R401, which creates confusion with the Specialized Opt-in Code for existing buildings. Would the Specialized Opt-in Code apply if an existing building selects a pathway under R401 or C401?

7. CC101.2 & Table CC101.2
    a. CC101.2 indicates “residential buildings and dwelling units within mixed use buildings shall comply as follows.” Technically, “residential buildings” can be R-2 use, 3 stories or less dormitories, and only contain sleeping units. The language in CC101.2 and table indicate “R-use” buildings, which can be dormitories with only sleeping units. The language reads contradictory when indicating both R-use and dwelling units.

8. C202 District Energy Definitions
    a. It would be beneficial to cite examples in the technical guidance. For instance, there have been differing discussions surrounding Vicinity eSteam.

9. C402.1.4.1.1 Tapered, above-deck insulation based on thickness requirements
    a. Suggest providing further clarification (e.g., diagram) in the technical guidance.

10. C402.1.5.1 Low glazed wall system buildings exception
    a. Clarify how an R-use building greater than 4 stories is allowed to comply with low-rise residential R406 & R406.5 requirements. Is this contradictory with IECC “residential building” definition (C202 & R202) which requires R-2/R-3/R-4, 4 stories or more buildings to follow the commercial energy code requirements?
    b. There are alterations that touch the entire building enclosure. Recommend reviewing consistency for both Alterations and Change of Use, similar to the existing thermal bridge comment above.

11. Table C407.4 Maximum Energy Rating Index
    a. Table C407.4 references R406.5 requirements. Similar question to above: Is this contradictory with IECC “residential building” definition (C202 & R202) which requires R-2/R-3/R-4, 4 stories or more buildings to follow the commercial energy code requirements?
    b. How would an Alteration or Change of Use (C503 and C505) get to Table C407.4? Both C503 and C505 sections indicate “Prescriptive” requirements. If the project scope is an Alteration or Change of Use, I begin with C503 and C505 and not C401. If an existing building begins in C401, would the project be subject to the Specialized Opt-in Code requirements (if in a Specialized community)?
    c. HERS 65 & 70 create a slippery slope for existing buildings by easing HERS ratings. Has this been reviewed with heat pump electrification and what utility costs these HERS scores could result in? It is important to consider that these HERS scores extend to R-2, 3 story or less buildings and not only single-family homes (per IECC “Residential Building” definition).

12. Table C407.4 Maximum Energy Rating Index
    a. Table C407.4 references R406.5 requirements. Similar question to above: Is this contradictory with IECC residential building definition (C202 & R202) which requires R-2/R-3/R-4, 4 stories or more buildings to follow the commercial energy code requirements?

13. **Table R406.5 Maximum Energy Rating Index**
    a. HERS 65 & 70 create a slippery slope for existing buildings by easing HERS ratings. Has this been reviewed with heat pump electrification and what utility costs these HERS scores could result in? It is important to consider that these HERS scores extend to R-2, 3 story or less buildings and not only single-family homes.

14. **Table R406.5.2 Embodied Carbon Credit**
    a. Suggest adding air barrier to the insulation GWP calculation to be a more "apples to apples" comparison. Mineral wool insulation would need an air barrier, whereas an air barrier is part of the closed cell spray foam insulation.

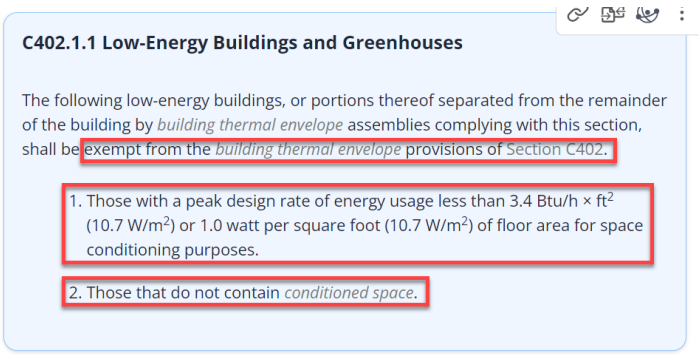
15. **R502.1.1. Large Additions Exception**
    a. Clarify if not changing the building footprint or roofline also applies to commercial additions in C502.

16. **C202 Glazed Wall System Definition**
    a. Current version: "System consisting of any combination of both vision glass and/or spandrel sections to create an above-grade wall that is designed to separate the exterior and interior environments. These systems include, but are not limited to, curtain walls, window walls, and storefront windows."
    b. Naming the "product" has caused confusion. In discussions with the DOER, the intent is centered on continuous insulation (opaque wall) versus non-continuous insulation (spandrel). Per discussions with the DOER, punched windows can qualify as "glazed wall systems" if they have spandrel glass with non-continuous insulation between the window frames. When we changed to continuous insulation and air barrier behind the glass plane with thermally broken attachments, it was no longer considered a "glazed wall system" because of the continuous insulation/air barrier and therefore qualified as a "glass rainscreen system" (opaque wall).
    c. Suggested ***edits*** to language: "System consisting of any combination of both vision glass and/or spandrel sections to create an above-grade wall that is designed to separate the exterior and interior environments. ***These systems include insulation that is interrupted by frames and non-continuous.*** ~~These systems include, but are not limited to, curtain walls, window walls, and storefront windows~~."

17. **R503, R505, C503, & C505 Alterations & Change of Use**
    a. Requirements are unclear in instances where additional interior insulation (to the inside of the existing exterior wall) cannot be added due to potential condensation risk or freeze/thaw.
    b. Some language exists, but only for alterations: "Alterations shall not create an unsafe or hazardous condition or overload existing building systems." Hazardous conditions can be interpreted as increased insulation results in brick spalling from an increase in freeze/thaw cycles of if there is potential for condensation which results in mold. However, this can also happen for change of use buildings.
    c. More clarity is needed on the process for "hazardous conditions". E.g., providing a report to the AHJ.

See the following pages for a detailed breakout for comments 1 & 2 above.

- An enclosed or unenclosed unconditioned or low energy spaces (e.g., unconditioned garage, greater than 20,000 sf) cannot be modeled in ASHRAE and therefore clarification would be beneficial for these instances where these use types are greater than 20,000 sf, beyond language in C402.1.1 Low-Energy Buildings.
    - C402.1.1 exemption only permits exemption for C402 envelope requirements if unconditioned or below the thresholds indicated, however, an ASHRAE model cannot be performed for an unconditioned space (see second image below).



C402.1.1 Low-Energy Buildings and Greenhouses

The following low-energy buildings, or portions thereof separated from the remainder of the building by *building thermal envelope* assemblies complying with this section, shall be exempt from the *building thermal envelope* provisions of Section C402.

1. Those with a peak design rate of energy usage less than 3.4 Btu/h × ft^2 (10.7 W/m^2) or 1.0 watt per square foot (10.7 W/m^2) of floor area for space conditioning purposes.

2. Those that do not contain *conditioned space*.

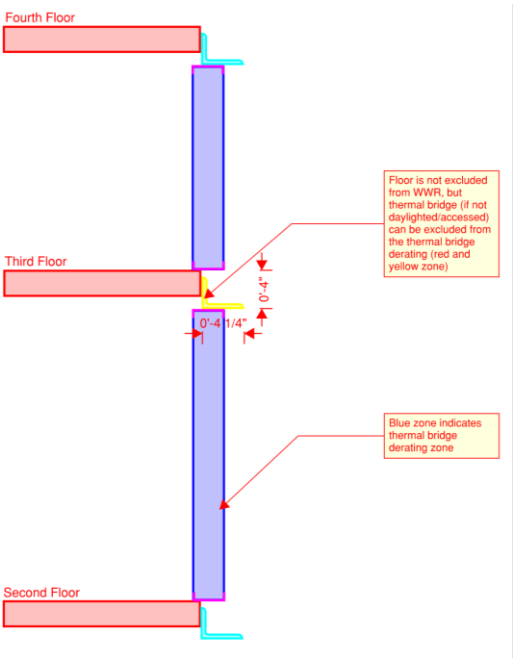
    - Per ASHRAE 90.1 Section 3, which is the ASHRAE standard utilized for energy modeling of the ASHRAE path, if unconditioned (< 3.4 Btu/hr/sf of heating), the garage would not be considered an enclosed space (see below). It is not possible to do an ASHRAE model of unenclosed spaces or unconditioned spaces because a "conditioned" ASHRAE baseline cannot be compared to an "unconditioned" proposed model.

unconditioned space: an *enclosed space* within a *building* that is not a *conditioned space* or a *semi-heated space*. Crawlspaces, attics, and parking garages with natural or mechanical *ventilation* are not considered *enclosed spaces*.

Table 3.2 Heated Space Criteria

Climate Zone	Heating Output, Btu/h·ft^2
0	>5
1	>5
2	>5
3A, 3B	>9
3C	>7
4A, 4B	>10
4C	>8
5	>12
6	>14
7	>16
8	>19

- Recommend adding clarifying language and providing diagrams in the technical guidance. See below. It is important to clarify that this language applies to existing thermal bridges that are not “exposed” or “daylighted”.
    - The detail below shows an existing thermal bridge for a “Change of Use” building (from office to lab). This type of masonry veneer construction is problematic due to the existing steel angle at the floor slabs, which continues around the entire building perimeter.
    - To meet the UA of 0.1414, the window-to-wall ratio needs to be decreased from ~36% to ~30%, 4” of closed cell spray foam and 4” of polyiso needs to be added to the interior, and 4’ of closed cell spray foam extends from the underside of the slab inward around the entire perimeter for each floor. This is a substantial amount of insulation & embodied carbon.
    - It is cost prohibitive to update the existing thermal bridge at the floor slab, because the existing masonry veneer would need to be removed. The intent is to maintain the existing masonry veneer without removal and replacement.



September 12, 2024

Commissioner Elizabeth Mahony
Department of Energy Resources
100 Cambridge Street, 9th Floor
Boston, MA 02114
ELECTRONIC SUBMISSION: stretchcode@mass.gov

RE: Proposed Changes to 225 CMR 22.00 and 23.00 Stretch Energy Code and Municipal Opt-in Specialized Code

Dear Commissioner Mahony,

We appreciate the opportunity to provide feedback on the proposed changes to the Stretch Energy and Municipal Opt-In Specialized Code. Vicinity Energy Inc. (Vicinity) would like to thank you and your team at the Department of Energy Resources (DOER) for facilitating productive discussions recognizing the inclusion of district energy systems within the proposed code revisions. We are pleased to see that some of our previous comments have been incorporated into the recent updates and appreciate the continued dialogue. However, we are concerned that there remain key elements that have not been addressed that will compromise the Commonwealths' carbon reduction goals. Specifically, the current language relegates electrification of buildings through the district energy system to only a small portion of the overall building energy load. Vicinity believes that with minimal additional clarifying language we can collectively fulfill the letter and spirit of the Commonwealth's ambitious objectives and allow buildings to fully electrify through a qualified district energy system.

First and foremost, we are grateful that the newly released proposal provides an exemption for district energy systems under *Section CC106: Wiring for Future Electrification* which states: "Space and service water heating uses provided by a district energy system subject to a district energy system order of conditions in good standing from the Commonwealth of Massachusetts Department of Energy Resources." This acknowledgement is an important step in recognizing the role district energy systems play in achieving the Commonwealth's climate goals.

While we appreciate the proposal's inclusion of district energy systems in the mixed-fuel pathway, it is not explicit that district energy systems qualify under *CC104: All Electric Pathway*, even with an approved order of conditions. As laid out below and consistent with our previous discussions, Vicinity recommends adding language that clarifies that there are two pathways for a building to electrify through district energy systems: a mixed-fuel pathway and an all-electric pathway. For the all-electric pathway, the code should explicitly state that any district energy system with an approved order of conditions can qualify for the All Electric pathway, if it transitions to heat pump generated steam for subject buildings. This clarification ensures that all district energy systems can be fully integrated into the Commonwealth's long-term electrification and decarbonization strategy.

We believe the clarification can be accomplished by utilizing an amended version of exception language already proposed by the DOER in another section. Specifically, we propose adding the following exception to *Sections C401.4.1, C401.4.2, C401.4.3, C401.4.4*:

> Exception: Heating provided by district energy systems subject to a district energy system order of conditions in good standing from the Commonwealth of Massachusetts Department of Energy Resources.

Further, as redlined below, Vicinity recommends striking the language that limits *Section C407.2.1: Electrification and Documentation for Highly Ventilated Buildings* to campus systems, as well as the requirement that the district energy system must own all buildings served by the district:

> Exception: Space heating uses provided by a district energy system which is ~~3.1transitioning to a heat recovery enabled district energy system and~~ subject to a district energy system order of conditions in good standing from the Commonwealth of Massachusetts Department of Energy Resources. ~~To qualify for this exception, the same entity that owns and controls the district energy system must also own and control all the buildings, both existing and future, on the district energy system.~~

We also recommend additionally revising *Sections C401.4.1, C401.4.2, and C401.4.3* to include "water source heat pump" as a qualifying technology for building and/or district energy systems. Water source heat pumps are currently used by district energy systems serving several European cities, where they play a key role in advancing the decarbonization of urban areas. These systems leverage the thermal energy of bodies of water, providing a highly efficient and reliable source of heat. This would be a logical addition to the list which currently includes air source, exhaust source, and ground source heat pump systems.

Finally, we appreciate your team's comments regarding "best available technology" relative to the COP for a qualified heat pump. We respectfully ask that this be reflected in Section C403.3.2 for industrial heat pumps over a certain size.

Vicinity's district energy system and existing infrastructure are critical to helping and accelerating the Commonwealth of Massachusetts achieve its GHG emissions reduction goals. While our customer base consists of several vital institutions with mission-critical energy requirements, the environmental benefits extend to all corners of Boston and Cambridge, including the environmental justice neighborhoods that are disproportionately affected by fossil fuel pollution.

Thank you to the DOER staff for the opportunity to provide comments and for your consideration. We share your commitment to tackling climate change and achieving net zero carbon emissions and welcome the opportunity to discuss our responses in more detail.

Sincerely,

Kevin Hagerty
CEO, Vicinity Energy

Edson, Becca (ENE)

From: Chris Schaffner <chris@greenengineer.com>
Sent: Wednesday, September 11, 2024 12:26 PM
To: STRETCHCODE (ENE)
Subject: comments on proposed revisions to the Stretch and Specialized codes

Follow Up Flag: Follow up
Flag Status: Completed

Thank you for the opportunity to comment on the proposed revisions to the Stretch and Specialized codes. My comments will be focused on the Commercial portion of the code.

1. Overall, the proposed changes provide clarity to enable project teams to implement the code, and I support the changes.
2. Additional clarifications are needed beyond the changes outlined, especially when applying the code requirements to existing buildings being renovated. I understand a separate energy code for existing buildings is being considered, and I strongly support that effort.
3. The changes to C503.2.4 particularly address an issue that was having unintended consequences with projects contemplating not improving building envelopes to avoid triggering the need for financially unfeasible upgrades to existing conditions.
4. While the changes to C505.1 are a step in the right direction, more clarity is required. The new language discusses “an increase in total modeled annual” energy or fuel use. This begs the question of the appropriate modeling procedure - would a project compare against a model of the existing conditions and use, or would they use a code baseline? What if the existing conditions are a vacant building? What if the existing building has inadequate ventilation or undersized HVAC equipment, which would result in lower energy consumption? I’ve been told that these details would be included in updates to the Technical Guidance documents, and I hope that will be the case. Again, I fear that we will end up with existing buildings that sit empty or get torn down because any reuse would trigger the need for code-mandated upgrades that would not be financially feasible.
5. The changes that allow a district energy system to transition over time are logical and sensible. In the proposed language, this pathway only applies to buildings owned by the same entity as the district energy system. I would like to see more clarity on third-party district energy systems, as I think there is a place for well-designed third-party systems in our future utility mix.

Thank you,

—

Christopher Schaffner, PE
MA License #37211, Mechanical
534 Old Marlboro Rd

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Conservation
Law Foundation

For a thriving New England

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Filed electronically to stretchcode@mass.gov

September 11, 2024

Massachusetts Department of Energy Resources
Attn: Ian Finlayson
100 Cambridge Street, 9th Floor
Boston, Massachusetts 02114
stretchcode@mass.gov

RE: Draft DOER Stretch and Specialized Code Updates to 225 CMR 23 and 225 CMR 24 Public Comment, dated August 2024

Dear Mr. Finlayson:

Conservation Law Foundation ("CLF")[1] offers the following comments in support of the draft stretch code regulatory updates proposed by the Massachusetts Department of Energy Resources ("DOER" or "agency") in August 2024, 225 CMR 22 and 225 CMR 23. CLF supports DOER's efforts to propose changes based on public feedback and encourages the agency to continue policy amendments to the stretch energy code ("stretch code") and specialized code that align with the Commonwealth's clean energy transition and mandatory climate targets.[2]

With respect to the residential stretch code proposed amendments, CLF specifically supports the embodied carbon credit amendments to encourage use of low embodied carbon concrete or insulation products in new construction projects. Generally, embodied carbon within construction and building materials can be overlooked as a contributor to greenhouse gas emissions within the buildings sector, and inclusion of the embodied carbon credit amendments to the stretch code aims to lower the overall environmental impact of new construction within our Commonwealth.

As DOER continues to work with the construction industry and environmental advocates to further develop stretch and specialized code building policy, CLF encourages the agency

[1] CLF is a regional environmental advocacy organization headquartered in Boston. Since 1966, CLF has used the law, science, and market solutions to help preserve New England's natural resources, build healthy communities, and sustain a vibrant economy for the benefit of all people.
[2] Global Warming Solutions Act, M.G.L. ch. 21N.

clf
Conservation
Law Foundation

to consider reducing emissions in the context of the lifecycle of a building to align with the Commonwealth's climate goals. In addition to sustainable construction practices, reuse and recycling of materials can further reduce environmental impact within the buildings sector. Both stretch and specialized codes should further be amended to eliminate fossil fuel use in new buildings entirely to fully implement the Roadmap Law[3] and align with the state's clean energy transition. Prior to DOER's decision to next amend both stretch and specialized codes, CLF encourages the agency to include amendments as proposed to 225 CMR 22 and 225 CMR 23 in CLF's *Petition for Massachusetts of Energy Resources Rulemaking to Establish Regulations to Implement the Global Warming Solutions Act and An Act Creating a Next-Generation Roadmap for Massachusetts Climate Policy*.[4]

Sincerely,

Katherine Lee Goyette
Staff Attorney

[3] An Act Creating a Next-Generation Roadmap for Massachusetts Climate Policy, St. 2021, c. 8.
[4] Conservation Law Foundation, *Petition for Massachusetts Department of Energy Resources Rulemaking to Establish Regulations to Implement the Global Warming Solutions Act and An Act Creating a Next-Generation Roadmap for Massachusetts Climate Policy* (May 3, 2023), available at https://www.clf.org/wp-content/uploads/2023/05/Conservation-Law-Foundation-GWSA-DOER-Petition-May-3-202397.pdf.

Edson, Becca (ENE)

From: Sears, Tim <tsears@yarmouth.ma.us>
Sent: Wednesday, September 11, 2024 10:21 AM
To: STRETCHCODE (ENE)
Cc: Grylls, Mark
Subject: STRETCH CODE FEEDBACK

Follow Up Flag: Follow up
Flag Status: Completed

I would like to comment on the proposed changes to the current stretch code.

My comment is in regard to table 406.5 and the addition of ADU's to this table. There should be some clarity on whether this applies only to new detached ADU's or also attached. The definition of an ADU in Chapter 40A includes both attached or detached, which could lead to confusion for builders and code officials as to how to interpret this table. This would most likely lead to different interpretations of this table, for example if someone were to build an addition to an existing home to create an ADU, would that table apply?

If the intent is for the ADU requirements in table 406.5 to be for detached buildings, then either adding the word detached, or a note to the table would remove any confusion.

Respectfully Submitted,

Timothy Sears CBO
Deputy Building Commissioner
Town of Yarmouth
508-398-2231 Ext. 1259
mailto:tsears@yarmouth.ma.us

Edson, Becca (ENE)

From: Richard Curl <rcurl@curlarch.com>
Sent: Monday, September 9, 2024 3:52 PM
To: STRETCHCODE (ENE)
Subject: STRETCH CODE FEEDBACK

Follow Up Flag: Follow up
Flag Status: Completed

Hi,

As an architect in the Boston area, working primarily in the western suburbs, I have a lot of projects with additions in roughly the 1000sf range. As written, the stretch code (R502.1.1 in particular) is being interpreted by some towns as requiring an air infiltration test to be done that includes the whole house. (R502.1.1 Large Additions. Additions to a dwelling unit exceeding 1000 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).

This requirement is proving to be entirely unworkable with anything but a very recent existing house, no matter the quality of the addition. So currently, either we are left finding odd loopholes in construction phasing, square foot accounting, or other non-building solutions to get projects under 1000sf. To tighten up an existing house requires tearing our windows and finishes to get it anywhere near scoring well enough on the blower door to meet the HERS rating. Requiring that amount of work strikes me as more wasteful environmentally than the energy potentially lost and also seems against the intention of the majority of the code that says that just the addition should comply.

Some people are feeling that using the phase “dwelling unit” was an unintended mistake. If so, it should be changed. If not, this section of the code really should be rethought, in my opinion.

Richard Curl, AIA
Curl Architecture
31 Essex Street
Melrose, MA 02176
781 620-2736 x101 office
617 816-7571 cell

Edson, Becca (ENE)

From: Ken Levenson <ken@passivehousenetwork.org>
Sent: Monday, September 9, 2024 11:11 AM
To: STRETCHCODE (ENE)
Subject: STRETCH CODE FEEDBACK

Follow Up Flag: Follow up
Flag Status: Completed

Hello,

Regarding section on PHI documentation I suggest the following clarifications noted here and in image below:

- The organization certifying is the Passive House Institute (PH).
- The certifiers are accredited, not certified…(semantics, perhaps)
- While Phius offers Design Certification, the PHI equivalent is a Design Assurance Letter.

The existing intent aligns - just matching up the terminology.
Hope this helps!
Sincerely,
Ken

R405.3 Passive House ~~International~~ Institute (PHI) Documentation.

1. If using PHI Passive House software, prior to the issuance of a building permit, the following items must be provided to the Building Official:
   a. A PHPP compliance report which demonstrates project compliance with current PHI performance requirements;
   b. A statement from the Certified Passive House Consultant/Designer (CPHC/D) that the PHPP results and compliance report accurately reflect the plans submitted;
   c. Evidence of project registration from a ~~Certified~~ PHI Accredited Passive House Certifier.

   OR

   a. A Design ~~Certification~~ Assurance Letter from a ~~Certified~~ PHI Accredited Passive House Certifier.

2. Prior to the issuance of a final certificate of occupancy, the following item(s) must be provided to the building official:
   a. A Design ~~Certification~~ Assurance Letter from a ~~Certified~~ PHI Accredited Passive House Certifier.
   b. An updated PHPP compliance report which reflects "as-built" conditions and test results (blower door and ventilation results) that demonstrate project compliance with PHI performance requirements;
   c. A statement from the CPHD that the project test results meet the model performance requirements, all the mandatory limits and any other mandatory requirements.
   d. A copy of the Passive House Verifier/Rater's test results;

OR

   a. A Final Certification Letter from a Certified Passive House Certifier

AND

   e. A statement from the Passive House Verifier of compliance with R404.4: EV ready, and Appendix RB: Solar Ready Provisions.

Ken Levenson, Executive Director
The Passive House Network
929-376-8539 | passivehousenetwork.org

Read Our Report, *Safe at Home*.
Become a Certified Passive House Designer & change the world.

Edson, Becca (ENE)

From: Chris Zimmel <czimmel@sea.us.com>
Sent: Monday, September 9, 2024 8:46 AM
To: STRETCHCODE (ENE)
Cc: Chris Zimmel; Jang Yoon; Kevin Ring
Subject: STRETCH CODE FEEDBACK

Follow Up Flag: Follow up
Flag Status: Completed

DOER Team,

Thank you for your work on these proposed changes. I'm interested in diving into the proposed embodied carbon changes, but haven't had time yet. A few comments and questions below from our team here at Sustainable Energy Analytics.

1. **Effective date** - what is the proposed approval/effective date of these changes?

2. **Retroactive?** Since you're modifying the 2023 Stretch code documents and not calling this the 2025 Stretch code, am I correct that if this is approved lets say Nov 1, 2024 and we have a final inspection on 11/2/2024, even though that house got a permit based on HERS 52, can it get a C of O with up to HERS 65? I think this point will be **very very** important to clarify with building inspectors to avoid confusion and arguments at C of O time. I would encourage a clear call out in 225 CMR 22/23 for this.

3. **Accessory Dwelling Unit Definition** - What is the definition? Is it a separate structure? a basement apartment? The 2021 IECC does not have this definition. The IRC has "Accessory *Structure* - A structure that is accessory to and incidental to that of the dwelling(s) and that is located on the same lot"
I would suggest a clear definition within 225 CMR 22 to avoid confusion. My first thought was you were defining one of those tiny separate houses developers are starting to put at the back of the driveway of 3 unit multifamily properties. There will be some confusion since Boston commonly calls new basement units ADUs and has for years. I think DOER needs to clearly define what an ADU is (or isn't) in the code. (https://www.boston.gov/departments/housing/accessory-dwelling-units-adus-boston). This gets especially confusing with your new basement exclusions. Is a basement renovation that is part of another dwelling exempt from a HERS Rating now, but a new stand alone dwelling unit in a basement does need a HERS Rating?

4. **Accessory Dwelling Unit Stretch Code only?** - As written it appears as though this new ADU option is for Stretch Code towns only. Is that the case? At our company, we've only seen separate structure ADUs in Somerville, Cambridge and Newton so far. In that case, this ADU option with a higher HERS Rating wouldn't help in those cities to bring down the cost of the units, since they are Specialized Code towns.

5. **"this code"** - R502.2 and R505.1 state that certain work must "be brought into full compliance with this code". What is "this code"? Does "full compliance" differ from any other type of compliance? Comply and compliance are used frequently in the IECC, but the word "fully" appears only here. Does it mean the work must meet all of the requirements of 402? If the intention is not 402, is it 502, or 503? For example, does the 1,000 sq ft threshold in R502.1.1 apply in either case? Also, we would recommend R505.1 also references IBC 302.1 which defines occupancy classification groups.

6. **Backup generators** - I had a phone conversation with Ian in January about backup standby gas/propane generators and was told it was ok to meet the definition of an "all electric" house. Is this still the case in cities that have adopted 225 CMR 24? Is it allowed in non-225 CMR 24 towns? The definition of Fossil Fuel Free in 225 CMR 24 allows for each town to end up with a different definition of fossil fuel free. Also wood stoves and pellet stoves as ancillary/aesthetic heat sources. We've received questions on all of these items. Clarity on these items in the code would be appreciated.

7. **Appendix RC Residential "building" vs "dwelling units" for Specialized Code** - HERS Ratings hinge in the requirement that the building or unit must be a dwelling unit. The word "*buildings*" is used throughout Appendix RC 101.1 except for RC101.2 that uses "dwelling units". There is no definition for "buildings". I recently had a discussion with the Newton Plans examiner on this. He wanted a HERS Rating for an single room office above a garage. Since Appendix RC replaces Stretch section R401.2, you lose the language "R use buildings without *dwelling units*...may comply with Section R401.2.1" (i.e. Prescriptive Code). Non dwelling unit residential buildings cannot get HERS Ratings per ANSI/RESNET/ICC 301-2022. HERS Ratings must be on dwelling units or sleeping units.

Can you change or add language to define "buildings" in Appendix RC to be "dwelling units" or "buildings with dwelling units"? Or remove the word buildings and replace it with dwelling units throughout the Specialized code language. Otherwise how does one take the prescriptive path for a residential building that *isn't a dwelling* unit like pool house, garage office, dance studio etc in Specialized Code communities? I can't see the way to get there. Common sense tells me there should be a prescriptive path, but building officials go by what is written.

8. **R502.1** Looks like this section was altered, but it wasn't redlined as such. Also, "where the *addition* alone complies" language has led to some confusion. This is <u>only</u> possible if the "addition" is a separate dwelling unit. i.e. an apartment over a garage. We can't test and provide a HERS Rating on part of a dwelling unit. Should this language be updated?
Also, 502.1.1 redline indicates HERS Rating is not required for an attic conversion but only when the roofline is unchanged. Does this mean that adding a dormer eliminates this exception?

9. **Historic Buildings** The proposed changes to footnote c to Table 406.5 indicates Historic buildings may follow 401.2.1 prescriptive path. This appears to conflict with 501.6, which indicates that Historic Buildings enjoy certain exemptions. Please confirm that 501.6 supersedes this footnote. Also, should footnote c instead refer to R503.1.1 exception 2? I worry referring to R401.2.1 could cause some to think Historic buildings must meet new construction R values when in fact they only need to fill the cavity.

10. **SHGC Maximum in Specialized Code towns** - RC102.2 footnote "a" requires compliance with R402.1.2 or 401.1.3. This limits SHGC to 0.40 or lower. With more and more buildings going with Passive House compliance, this is limiting the windows that can be used in such projects. Even in regular Specialized Code HERS 42/45 situations some builders will go with high end double pane or triple pane windows and this restricts their options. Most high end european windows have u factors in the 0.10

range and SHGC in the 0.50 range. Our recommendation is to remove the restriction all together. We think the IECC got it wrong.

Thank you,

Chris Zimmel

Sustainable Energy Analytics Inc.

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Edson, Becca (ENE)

From: Robert Basile <robert@thebasilegroup.com>
Sent: Thursday, September 5, 2024 9:31 AM
To: STRETCHCODE (ENE)
Subject: STRETCH CODE FEEDBACK

Follow Up Flag: Follow up
Flag Status: Completed

My suggestion is to not add any more bull shit to the codes.... here is an example of what not to do....

SPF – Spray, closed cell HFC	
SPF – Spray, high density HFC	
- Panel	
m Insulated Panel	
fiber – Board unfaced, European	
Wood fiber – Board unfaced, North America	
Wood fiber – Batt, unfaced	
Wool (Sheep) - Batt	
Wool (Sheep) - Loosefill	
XPS – Board, 25psi HFC	
XPS – Board, 25psi "Low GWP" (HFO/HFC)	

[a]https://www.buildersforclimateaction.org/beam-estimator.html
[b]EPD Declaration Number
[c]EPD Declaration Number
[d]EPD Declaration Number EPD-KSI-20190072-IBC1-EN

R406.5.4 *Add Subsection R406.5.4, as follows:*

R406.5.4 Documentation for Low GWP concrete mix
Low GWP Concrete Mix Credit for one or more new dw
the unit must submit specific EPDs for concrete used in
mixes are used, a complete calculation to summarize est
emissions from all concrete materials used in the project
for this measure shall be global warming potential (GW
with the EPD verified by the concrete ready-mix provid
be applied when the GWP per cubic meter is demonstra

Edson, Becca (ENE)

From: Shawn Evans <shawne@rickroyconstruction.com>
Sent: Thursday, September 5, 2024 9:12 AM
To: STRETCHCODE (ENE)
Subject: STRETCH CODE FEEDBACK

Follow Up Flag: Follow up
Flag Status: Completed

Hello. To whom it may concern i would like to see the rules change from 1000 square feet to more than 50 percent of the house before we have to upgrade the entire house. 1000 square feet is not a lot and i think it would dter anyone from going forward with there projects. Thank you

Thank you,
Shawn Evans
Rick Roy Construction
Cell: 774-722-2238
Office: 508-432-6840

Edson, Becca (ENE)

From: Jay Lee <jay.lee@boston.gov>
Sent: Thursday, August 29, 2024 5:42 PM
To: STRETCHCODE (ENE)
Subject: 225 CMR 23 proposed revisions

Follow Up Flag: Follow up
Flag Status: Completed

I would like to propose the following revisions to the energy code. a 12,000 sf building is a fairly small building perhaps anywhere from 6 to 12 units. The additional cost of PH certification could be $100k for such projects. In Boston we have a threshold of 20k sf for Article 80 review. These projects are more capable of carrying these costs and generally can support the consulting cost associated with the higher energy performance.

The change to 4 stories relates to the push for greater density on infill sites. Usually fire protection kicks in at 4 stories because of egress requirements. I think strengthening the PV requirements (to be required) would be a better use of funds compared to PH certification costs .

thanks
Jay

CC101.2 Scope. This appendix applies to new buildings that are addressed by the Municipal Opt-in Specialized Code
Residential buildings and *dwelling units* within mixed use buildings shall comply as follows:

1) New *dwelling units* over 4,000 square feet in conditioned floor area in *Mixed Fuel Buildings* shall comply with the Zero Energy pathway and Section CC103 or with residential code Section RC102.
2) New R-use buildings over ~~12,000~~ square feet in conditioned floor area shall comply in accordance with Table CC101.2.

20,000 square feet

TABLE CC101.2 MULTI-FAMILY AND R-USE COMPLIANCE

R-Use buildings over ~~12,000~~ sf, or R-Use portions over ~~12,000 sf~~ in mixed-use buildings	Compliance Path options by permit submittal date		
	~~C407.3~~ Passive house	C407.1 Targeted Performance	C407.4 HERS Index
Up to 5 stories	Required from Jan 1, 2023		
6 stories and higher	Required from Jan 1, 2024	Optional until Jan 1, 2024	Optional until Jan 1, 2024

Exceptions:

1. Detached one- and two-family dwellings and townhouses as well as Group R-2 buildings ~~three~~ stories or less in height above grade plane, manufactured homes

four

(mobile dwellings), and manufactured houses (modular dwellings). These buildings and dwelling units shall comply with Residential Appendix RC under the Specialized energy code.
2. Buildings that use neither electricity nor fossil fuel.
3. Group R-1 buildings shall comply with C401.2.

Jay A. Lee AIA NOMA
Assistant Director, Design Construction Openspace
Mayor's Office of Housing
617-635-0207 (w), 617-483-0639 (c)
Active Projects & RFP: https://www.boston.gov/buildinghousing
https://www.boston.gov/departments/neighborhood-development/requests-proposals

Edson, Becca (ENE)

From: David Supple - CEO <dave@nedesignbuild.com>
Sent: Saturday, August 24, 2024 7:31 AM
To: STRETCHCODE (ENE)
Subject: STRETCH CODE FEEDBACK

Follow Up Flag: Follow up
Flag Status: Completed

Exception: Additions that add existing basement or attic spaces to the conditioned floor area of an existing dwelling unit due to changing the thermal boundary but not changing the building footprint or roofline do not require a HERS rating.

Regarding the above expectation added for R502.1.1 Large additions I have 2 suggestions:

1. One could deduct that because basements or attics are not considered additions, they would now be factored into the calculation for Level 3 Alteration or Extensive Alteration, but it does not state that explicitly and should be clarified.
2. What about 3 season rooms or enclosing porches? One could have the interpretation that because they are not "changing the building footprint or roofline" they "do not require a HERS rating" but one could also interpret that because they are not a basement or attic they do require a HERS rating if over 1,000 SF. This should be clarified so it is not open to interpretation.

•

DAVID SUPPLE, MCR
CEO

nedc

nedesignbuild.com
c: 617.474.0309
p: 617.708.0676

"We have withdrawn much too far from that original and natural approach, when conception and realization of a building were one indivisible process and when architect and builder were one and the same person." - ***Walter Gropius***

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Edson, Becca (ENE)

From: Edson, Becca (ENE)
Sent: Tuesday, August 20, 2024 11:09 AM
To: Tom Reardon; STRETCHCODE (ENE)
Cc: Bill Hezlitt
Subject: RE: SHGC from IECC, 2021

Follow Up Flag: Follow up
Flag Status: Flagged

Hi Tom,

Yes – we are hoping to propose future updates to the Stretch Code that will allow for higher SHGC ratings. There is not currently an exact number, but we're advising building inspectors on a case by case basis in the meantime. We are fine with the U-Factor and SHGC that Shine is proposing.

Thank you very much,
Becca

From: Tom Reardon <TReardon@westboroughma.gov>
Sent: Tuesday, August 20, 2024 10:56 AM
To: STRETCHCODE (ENE) <stretchcode@mass.gov>
Cc: Bill Hezlitt <bhezlitt@westboroughma.gov>
Subject: SHGC from IECC, 2021

Hi Becca,

I was copied on a recent email from Shine Construction regarding the use of new windows with a SHGC higher than allowed by the energy code. The email suggested that the DOER will be amending the current code to raise the SHGC. Do you know how much the DOER will raise the SHGC? Is there a relationship between the U-factor and SHGC which would guide our evaluation of a SHGC higher than the current code?

Shine is proposing a U-factor of .25 and SHGC of .48. Is this an acceptable range?

Thanks for your assistance,
Tom Reardon

Edson, Becca (ENE)

From: Jerrad Pierce <jpierce@nmrgroupinc.com>
Sent: Wednesday, August 14, 2024 9:48 AM
To: STRETCHCODE (ENE)
Subject: STRETCH CODE FEEDBACK

Follow Up Flag: Follow up
Flag Status: Completed

Hello,

I have one primary concern with the code, and several related issues.

Since the credit system was introduced in the 2017 9th edition, their presentation has been unnecessarily confusing and wasteful of space i.e; presenting a table with all possible combinations of credits. This is further exacerbated in the 10th edition through redefinitions and the proliferation of variations. I suggest that the table should instead look something like this:

	10th	**10th Interim**		**10th v1**			**10th v2**		
When	1/1/2025	1/1/2023		7/1/2024			TBD		
Flavor	Base	Stretch	Special	Stretch	Special	Stretch	Special	ADU	Alterations
Core / mixed-fuel	52	52	52	42	42	42	42	52	65
All-electric / Clean heat credit (optional)	*+3*	*+3*	*+3*	*+3*	*+3*	*+3*	*+3*	*+3*	*+5*
PV credit (optional)	*+3*	*+3*	–	–	–	–	–	*+3*	*+5*
Embodied carbon credit (optional)	–	–	–	–	–	*+3*	*+3*	–	–

Accompanied by the existing long-form text describing the specifics of each credit in R406.5.1. Presenting the credits in this manner makes one's options much clearer. For instance, ADUs and major additions/alterations appear to be eligible for both all-electric and PV credits, whereas other stretch and specialized construction is only available for the all-electric credit. The credits in descriptions in R406.5.1 make this clear, however the PV credit is listed as 3 points in the body while Table R406.5 provides 5 points for alterations/additions. The description could be expanded to cover both options, the added clauses would require closer reading to decipher, whereas something akin to the table of target and credits proposed above allows for plenty of nuance. Finally, this approach

also has the small added benefit of unmasking the continuity between the 9th edition/base code's "clean heat" and the 10th edition stretch code's "all-electric" credits.

P.S. There should be a space between 4 and kW in R406.5.1 #1 i.e; "Solar photovoltaic array rated at 4 kW or higher"

--

Jerrad Pierce | Data Engineering Manager | Employee Owner
NMR Group, Inc. www.nmrgroupinc.com
Phone: 617-284-6230 ext. 2014

Thornton Tomasetti

Memorandum

TO	MA Department of Energy Resources	FROM	Thornton Tomasetti
COMPANY		DATE	September 17, 2024
RE	MA Stretch Energy Code Feedback	PROJECT NO	-
CC		PROJECT NAME	-

We appreciate the opportunity to comment on the proposed updates to 225 CMR 23 MA Commercial Stretch Code and Specialized Opt-in Code (IECC 2021 with MA Amendments) released 6/10/2024.

1. Comment regarding to the proposed changes to §C505.1: The proposed language suggests that an energy model will be required to demonstrate an increase in either annual fossil fuel use or energy use. This presents multiple challenges: first, it is challenging to accurately model an existing building, especially for buildings that are mixed use and/or have multiple tenants; second, the energy code pathway for a project is often being considered far before an energy model is created for a project; and third, it creates the burden of having to create an energy model that otherwise might not be needed to meet the code (e.g. if the project ends up following prescriptive pathway). In place of modeling fossil fuel or energy use, we suggest a prescriptive checklist-based determination option. Should there be a model-based determination option, we suggest providing guidance as to how different existing space scenarios should be addressed (e.g. mixed used buildings with multiple tenants and unknown history of energy use).
2. Typo in CC105.2 Exception 2: “Buildings having average ventilation at full occupancy of greater than 0.5 cfm/sf, Hospitals, and Psychiatric Hospitals, shall have equipment installed for on-site renewable energy with a rated capacity of not less than 0.5 W/ ft² (5.4 W/m²) multiplied by the sum of the gross conditioned floor area of the three largest floors.”

To: Ian Finlayson, Department of Energy Resources

From: Hank Keating, President, Passive House Massachusetts

Re: Stretch Code Feedback

I am writing with a request to address a serious concern in DOER's Proposed Changes to the current Stretch Energy Code and Municipal Opt-in Specialized Code pertaining to projects pursuing passive house certification and seeking final certificate of occupancy ("CoO"). Per Sections R405.2, R405.3, C407.3.2.1, and C407.3.2.2 of the Draft MA 2023 Residential and Commercial Stretch Code and Specialized Opt-in Code with proposed revisions, projects pursuing passive house certification, whether through Phius or PHI, have two options for obtaining final CoO, as summarized below:

1. Option 1:
    a. Design phase pre-certification/approval
    b. Verification report demonstrating as-built conditions comply with passive house requirements
    c. Statement from consultant confirming hygrothermal requirements are satisfied
    d. Statement from consultant confirming project satisfies all testing and modeling requirements
    e. Back-up documentation with test results
2. Option 2:
    a. Final certification letter from certifying body

While projects can obtain *temporary* CoO regardless of certification status, which is necessary for occupancy, the current proposed code language still puts extremely high-performance projects at risk by requiring Options 1 or 2 above for obtaining *final* CoO. Neither option above is feasible for development teams who fail to achieve final Passive House levels of performance despite well documented best efforts. As currently written, the Draft Stretch Code and Opt-In Code do not support projects that achieve design phase certification, do their best to construct to passive house levels of performance, but ultimately fall short of satisfying 100% of certification requirements. These projects need a defined path to achieve a final CoO in the event neither option above is attainable.

Without final CoO, projects may not convert high-interest rate construction loans to permanent mortgages. In low-income housing tax credit ("LIHTC") projects, the construction loan, typically paid down with LIHTC equity upon receiving final CoO, is significantly larger than the permanent mortgage, making the conversion critical for LIHTC developers to continue doing business in Massachusetts. Furthermore, it is not realistic for projects to pursue an appeal with their Authority Having Jurisdiction and/or the State, which would cause significant delays to project delivery, while adding cost and risk to very high-performance projects.

Given the quantity of passive house projects in the state, estimated at more than 272 projects consisting of over 20,600 units, it is very likely that some of these projects that are designed to Passive House certification, as evidenced at the time of permitting, and constructed per design, as evidenced by frequent third-party inspection reports, may encounter insurmountable issues that make satisfying Option 1 and Option 2 impossible. These projects will have spent considerable time and money designing and constructing buildings with the intent of certifying – which will be easily documented with consultant contracts, inspection reports, and test results -- and yet still encounter issues such as air infiltration or

ventilation balancing preventing final CoO. These projects require a 3rd option for achieving final CoO that does not reduce the performance objectives of the code nor present an easier, race-to-the-bottom option for developers to consider. The 3rd option proposed below requires **nearly identical requirements** for design and construction as the two existing options and should only be available for projects who cannot achieve options 1 or 2. This 3rd option must be included in code to avoid local review and waiver ambiguity, further delays, significant added costs, and extreme risk in an industry that cannot absorb additional cost.

3. Proposed Option 3 for Final CoO:

    a. Copy of certified passive house consultant and rater/verifier contracts demonstrating all required inspections and testing requirements for certification
    b. Design phase pre-certification/approval
    c. Verification report demonstrating as-built conditions, including those that comply with passive house requirements, and those that do not (if applicable)
        i. For projects following Phius, demonstrate final Energy Star and Zero Energy Ready Homes certification requirements are met.
    d. Hygrothermal analysis confirming the building does not face any durability concerns based on as-built condition
    e. Statement from passive house consultant confirming project has completed all interim, final, and corrective testing and modeling requirements, including a summary of deviations from passive house requirements
        i. Taped and untaped blower door testing at 50 Pascal and 75 Pascal demonstrating results are within 20% of passive house requirements. If initial whole building blower door testing exceeds passive house requirement, statement must reflect evidence of a re-test, with results, as well as an explanation for sources of leakage and attempted remediation efforts.
        ii. Back-up documentation with test results for initial and follow up re-tests with explanation for any deviation from passive house requirements
    f. Ventilation flow rates demonstrating mechanical code compliance

This proposed 3rd option is nearly identical to Option 1 and offers similar flexibility as the Passive House Institute U.S. offers projects that may not satisfy all program requirements necessary for certification. Phius does not have adequate capacity to evaluate projects seeking waivers on a case-by-case basis in a timely manner, making it necessary for the Commonwealth to allow a similar approval path for municipal building departments.

Without this option, projects will face significant cost and major delays after having made significant investments in developing extremely well performing buildings. Project teams pursuing passive house certification that have obtained pre-certification at design and who work closely with their consultants and contractors to follow all inspection and testing procedures necessary for passive house certification are deserving of final CoO without facing onerous cost, risk, or delay.

Sincerely,

Hank Keating AIA

President PHmass