FINAL PROPOSED RULE # 25-P047.

Final Proposed Filing - Coversheet

Instructions:

In accordance with Title 3 Chapter 25 of the Vermont Statutes Annotated and the "Rule on Rulemaking" adopted by the Office of the Secretary of State, this filing will be considered complete upon filing and acceptance of these forms with the Office of the Secretary of State, and the Legislative Committee on Administrative Rules.

All forms shall be submitted at the Office of the Secretary of State, no later than 3:30 pm on the last scheduled day of the work week.

The data provided in text areas of these forms will be used to generate a notice of rulemaking in the portal of "Proposed Rule Postings" online, and the newspapers of record if the rule is marked for publication. Publication of notices will be charged back to the promulgating agency.

PLEASE REMOVE ANY COVERSHEET OR FORM NOT REQUIRED WITH THE CURRENT FILING BEFORE DELIVERY!

Certification Statement: As the adopting Authority of this rule (see 3 V.S.A. § 801 (b) (11) for a definition), I approve the contents of this filing entitled:

Vermont Residential Building Energy Standards (RBES) Amendments

/s/ Brittney Wilson (signature), on 02/17/26 (date)

Printed Name and Title:
Brittney Wilson, Deputy Commissioner, Vermont Department of Public Service

RECEIVED BY: _____

- ☐ Coversheet
- ☐ Adopting Page
- ☐ Economic Impact Analysis
- ☐ Environmental Impact Analysis
- ☐ Strategy for Maximizing Public Input
- ☐ Scientific Information Statement (if applicable)
- ☐ Incorporated by Reference Statement (if applicable)
- ☐ Clean text of the rule (Amended text without annotation)
- ☐ Annotated text (Clearly marking changes from previous rule)
- ☐ ICAR Minutes
- ☐ Copy of Comments
- ☐ Responsiveness Summary

VERMONT

Agency of Administration
Delegation of Authority for Signature Authorization

VISION

Summary: Authority for signing the documents listed below rests solely with the exempt Agency Secretary; Department Commissioner; Elected Official; Exempt Department Head; and heads of divisions, boards, committees and commissions not reporting to an agency secretary or department commissioner (collectively "Appointing Authority"). This authority may be delegated to the exempt Agency/ Department Deputy Secretary or Deputy Commissioner ("exempt designee") by executing and submitting this form to the Agency of Administration, Secretary's Office through VISION Security. Non-exempt directors and managers may not be assigned as designees except in emergency situations or entities without sufficient exempt staff to maintain operations. For waiver consideration, please attach your request for approval by the Secretary of Administration in memo format when submitting this form to FIN.VISIONSecurity@vermont.gov.

Agency/Dept. Name: Public Service Dept

Appointing Authority Name (print): Kerrick Johnson

For Calendar Year (YYYY): 2026

Appointing Authority Title: Commissioner

☐ **I choose not to delegate authority at this time; OR**

By signing below, I certify that I am the exempt Appointing Authority for the Agency/Department listed above, and hereby delegate authority to the following individual(s) for the documents listed below:

Business Unit(s) (BU#)	Employee 5-digit #	Designee Title (print)	Designee Name (print)	Designee Signature
02240	08706	Deputy Commissioner	Brittney Wilson	Signed by: Brittney L. Wilson 047406A1ED56429...

If above designee is an emergency non-exempt appointment, during what period is this designation valid?

From: **To:**

Documents Requiring Appointing Authority Signature:

1. **State Land and Building Assets:** Deeds and easements, purchase and sales agreements, options, and leases;
2. **Grant Applications:** Applications for and acceptance of grants from federal or other external sources;
3. **Budget/Appropriation Forms:** Revised estimates of anticipated receipts; Request to expend excess receipts; Transfer of funds between appropriations pursuant to 32 VSA 706 (a) and (b); Request to establish or change an imprest (petty cash) fund;
4. **Contracts and Grants to Others:** All contract approval requests and certification; contracts and grant awards to all individuals and organizations, public and private; all amendments to those contracts or awards; and all sole source and waiver requests; in accordance with Administrative Bulletins 3.5, *Procurement & Contracting Procedures* and 5, *Policy for Grant Issuance & Monitoring*;
5. **Finance & Management (FIN) and VISION Forms:** VISION System Operator Access Request for Signature Authority; all FIN and year-end reporting forms so noted as requiring signature by department head, agency head, organization head, or appointing authority;
6. **Travel & Expense:** Any items so noted as "by Department Head only or by Appointing Authority" in Administrative Bulletin 3.4, *Employee Travel & Expense Policy*;
7. **Human Resources (DHR) and VTHR Forms:** All Department of Human Resources and VTHR forms so noted as requiring signature by department head, agency head, organization head, or appointing authority;
8. **Internal Control:** For SAIC purposes only the TOP Appointing Authority can "Certify" the annual form. Delegation is not permitted.
9. **Statutorily Required:** Any documents for which statute requires the department head, agency head, organization head, or appointing authority as signatory.

Signed by: Kerrick Johnson 263C50C995A9481...

Appointing Authority Signature

12/19/2025

Date

NOTE: This form must be submitted annually between January 1st and January 15th and as necessary, within 30 days, due to staff change of Appointing Authorities or their designees. Please email form to: FIN.VISIONSecurity@vermont.gov

FOR INTERNAL USE OFFICE ONLY (VISION Security will work with the Secretary of Administration for approval)

Secretary of Administration or Designee Signature

Date

Updated July 1, 2022

1. TITLE OF RULE FILING:
   Vermont Residential Building Energy Standards (RBES) Amendments
2. PROPOSED NUMBER ASSIGNED BY THE SECRETARY OF STATE
   25P047
3. ADOPTING AGENCY:
   Department of Public Service
4. PRIMARY CONTACT PERSON:
   (A PERSON WHO IS ABLE TO ANSWER QUESTIONS ABOUT THE CONTENT OF THE RULE).

   Name: Brittney Wilson

   Agency: Department of Public Service

   Mailing Address: 112 State Street, Montpelier, VT 05620

   Telephone: 802-828-2811 Fax:

   E-Mail: brittney.wilson@vermont.gov

   Web URL *(WHERE THE RULE WILL BE POSTED)*:
   http://publicservice.vermont.gov
5. SECONDARY CONTACT PERSON:
   (A SPECIFIC PERSON FROM WHOM COPIES OF FILINGS MAY BE REQUESTED OR WHO MAY ANSWER QUESTIONS ABOUT FORMS SUBMITTED FOR FILING IF DIFFERENT FROM THE PRIMARY CONTACT PERSON).

   Name: Ben Civiletti

   Agency: Department of Public Service

   Mailing Address: 112 State Street, Montpelier, VT 05620

   Telephone: 802-622-4388 Fax:

   E-Mail: benjamin.civiletti@vermont.gov
6. RECORDS EXEMPTION INCLUDED WITHIN RULE:
   (DOES THE RULE CONTAIN ANY PROVISION DESIGNATING INFORMATION AS CONFIDENTIAL; LIMITING ITS PUBLIC RELEASE; OR OTHERWISE, EXEMPTING IT FROM INSPECTION AND COPYING?) No

   IF YES, CITE THE STATUTORY AUTHORITY FOR THE EXEMPTION:

   PLEASE SUMMARIZE THE REASON FOR THE EXEMPTION:
7. LEGAL AUTHORITY / ENABLING LEGISLATION:
   (THE SPECIFIC STATUTORY OR LEGAL CITATION FROM SESSION LAW INDICATING WHO THE ADOPTING ENTITY IS AND THUS WHO THE SIGNATORY SHOULD BE. THIS SHOULD BE A SPECIFIC CITATION NOT A CHAPTER CITATION).

30 V.S.A. § 51 RESIDENTIAL BUILDING ENERGY STANDARDS

8. EXPLANATION OF HOW THE RULE IS WITHIN THE AUTHORITY OF THE AGENCY:
   Under 30 V.S.A. § 51(c), the Commissioner of the Department of Public Service (Department) is authorized to direct timely and appropriate revisions to the RBES through administrative rules.
9. THE FILING HAS NOT CHANGED SINCE THE FILING OF THE PROPOSED RULE.
10. THE AGENCY HAS NOT INCLUDED WITH THIS FILING A LETTER EXPLAINING IN DETAIL WHAT CHANGES WERE MADE, CITING CHAPTER AND SECTION WHERE APPLICABLE.
11. SUBSTANTIAL ARGUMENTS AND CONSIDERATIONS WERE NOT RAISED FOR OR AGAINST THE ORIGINAL PROPOSAL.
12. THE AGENCY HAS INCLUDED COPIES OF ALL WRITTEN SUBMISSIONS AND SYNOPSES OF ORAL COMMENTS RECEIVED.
13. THE AGENCY HAS INCLUDED A LETTER EXPLAINING IN DETAIL THE REASONS FOR THE AGENCY'S DECISION TO REJECT OR ADOPT THEM.
14. CONCISE SUMMARY (**150 WORDS OR LESS**):
    The Vermont Residential Building Energy Standards (RBES) regulate the design and construction of residential buildings to require adequate thermal insulation, low air leakage, effective and efficient mechanical, ventilation, electrical, service water-heating and illumination systems and equipment to enable effective use of energy in residential buildings. This is an update to the RBES to allow the 2020 Vermont Residential Building Energy Standards as an option for the purposes of complying with Vermont's residential building energy code. This update allows adherence to the requirements in either the 2020 RBES or 2024 RBES for compliance purposes with no substantive changes to the 2020 RBES or 2024 RBES as originally adopted.
15. EXPLANATION OF WHY THE RULE IS NECESSARY:
    There is a severe shortage of affordable housing in Vermont, contributing to unacceptably high housing costs for Vermonters. Homeowners, builders and design professionals, and economic development professionals

have raised significant concerns about Vermont's building energy standards, specifically the costs to comply, feasibility, readiness related to training of professionals, and the potential negative impacts on housing availability and affordability. Allowing the option to follow the 2020 RBES or 2024 RBES supports the advancement of state housing policy, along with state energy policy which emphasizes affordability, economic vitality, and efficiency.

The Agency of Commerce and Community Development issued the 2025 Housing Needs Assessment which documents the urgent need for housing and the impacts on Vermonters. The report can be found here: https://accd.vermont.gov/housing/plans-data-rules/needs-assessment

16. EXPLANATION OF HOW THE RULE IS NOT ARBITRARY:

The proposed rule update is not arbitrary as it is supported by the RBES enabling statute and (1) responds to unintended impacts and worsening economic conditions that have materialized since the 2024 standards were developed, (2) preserves the standards of the 2024 RBES as an option to achieve greater efficiency with higher up-front investment and lower long term operational costs, and (3) provides the 2020 RBES as an alternative which reduces the initial cost of compliance and maintains a high level of energy efficiency. Title 30 V.S.A. § 51 requires updates to the RBES to consider both state energy and housing policy, along with cost-effectiveness and affordability from a consumer's perspective. The proposed rule will provide flexibility to homeowners and buyers, builders, contractors, and other affected parties facing severe economic and housing-related challenges, while maintaining highly efficient standards for new homes and bolstering the State's overall economic competitiveness and vitality.

17. LIST OF PEOPLE, ENTERPRISES AND GOVERNMENT ENTITIES AFFECTED BY THIS RULE:

The Department of Public Safety (DPS), State Historic Preservation Office (SHPO)/Agency of Commerce and Community Development (ACCD), Office of Economic Opportunity (OEO), Act 250 Commissions, new home

owners/buyers, existing home owners, builders, building designers, home energy raters and municipalities.

18. BRIEF SUMMARY OF ECONOMIC IMPACT (150 WORDS OR LESS):

This rule update will allow for greater regulatory flexibility to reduce the cost to construct housing. Adoption of the rule will result in an additional compliance option which, as compared to 2024 RBES currently in effect, will provide an incremental cost decrease for the parties involved in new home construction, purchase, and ownership, and existing home renovation. The addition of this option will allow builders and homeowners to choose one of two discrete sets of standards for compliance, and ultimately, will provide the choice of affordability: 2020 RBES provides lower upfront construction costs, whereas 2024 RBES requires a higher upfront construction cost with the benefit of incrementally higher energy efficiency.

19. A HEARING WAS HELD.

20. HEARING INFORMATION

(THE FIRST HEARING SHALL BE NO SOONER THAN 30 DAYS FOLLOWING THE POSTING OF NOTICES ONLINE).

IF THIS FORM IS INSUFFICIENT TO LIST THE INFORMATION FOR EACH HEARING, PLEASE ATTACH A SEPARATE SHEET TO COMPLETE THE HEARING INFORMATION.

Date: 2/2/2026

Time: 01:30 PM

Street Address: Department of Public Service Giga Conference Room, Third Floor, 112 State Street, Montpelier VT

Zip Code: 05620

URL for Virtual: https://teams.microsoft.com/l/meetup-join/19%3ameeting_MjkyMDBhMGUtMGQyOS00MDAyLWI4YjQtMmYwYTlmZDMxMTZl%40thread.v2/0?context=%7b%22Tid%22%3a%2220b4933b-baad-433c-9c02-70edcc7559c6%22%2c%22Oid%22%3a%229dd0227c-440d-4019-8995-aa1ce25130e9%22%7d

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Date:

Time: AM

Street Address:

Zip Code:

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Date:
Time: AM
Street Address:
Zip Code:
URL for Virtual:

21. DEADLINE FOR COMMENT (NO EARLIER THAN 7 DAYS FOLLOWING LAST HEARING):
02/09/2026

KEYWORDS (PLEASE PROVIDE AT LEAST 3 KEYWORDS OR PHRASES TO AID IN THE SEARCHABILITY OF THE RULE NOTICE ONLINE).

residential building energy standards
residential energy code
RBES

Adopting Page

Instructions:

This form must accompany each filing made during the rulemaking process:

Note: To satisfy the requirement for an annotated text, an agency must submit the entire rule in annotated form with proposed and final proposed filings. Filing an annotated paragraph or page of a larger rule is not sufficient. Annotation must clearly show the changes to the rule.

When possible, the agency shall file the annotated text, using the appropriate page or pages from the Code of Vermont Rules as a basis for the annotated version. New rules need not be accompanied by an annotated text.

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1. TITLE OF RULE FILING:
   Vermont Residential Building Energy Standards (RBES) Amendments
2. ADOPTING AGENCY:
   Department of Public Service
3. TYPE OF FILING (*PLEASE CHOOSE THE TYPE OF FILING FROM THE DROPDOWN MENU BASED ON THE DEFINITIONS PROVIDED BELOW*):
   - **AMENDMENT** - Any change to an already existing rule, even if it is a complete rewrite of the rule, it is considered an amendment if the rule is replaced with other text.
   - **NEW RULE** - A rule that did not previously exist even under a different name.
   - **REPEAL** - The removal of a rule in its entirety, without replacing it with other text.

   This filing is **AN AMENDMENT OF AN EXISTING RULE** .

4. LAST ADOPTED (*PLEASE PROVIDE THE SOS LOG#, TITLE AND EFFECTIVE DATE OF THE LAST ADOPTION FOR THE EXISTING RULE*):

   SOS Log #: 23-018

   Title: Vermont Residential Building Energy Standards Amendments

   Effective Date: 07/01/2024.

Economic Impact Analysis

Instructions:

In completing the economic impact analysis, an agency analyzes and evaluates the anticipated costs and benefits to be expected from adoption of the rule; estimates the costs and benefits for each category of people enterprises and government entities affected by the rule; compares alternatives to adopting the rule; and explains their analysis concluding that rulemaking is the most appropriate method of achieving the regulatory purpose. If no impacts are anticipated, please specify "No impact anticipated" in the field.

Rules affecting or regulating schools or school districts must include cost implications to local school districts and taxpayers in the impact statement, a clear statement of associated costs, and consideration of alternatives to the rule to reduce or ameliorate costs to local school districts while still achieving the objectives of the rule (see 3 V.S.A. § 832b for details).

Rules affecting small businesses (excluding impacts incidental to the purchase and payment of goods and services by the State or an agency thereof), must include ways that a business can reduce the cost or burden of compliance or an explanation of why the agency determines that such evaluation isn't appropriate, and an evaluation of creative, innovative or flexible methods of compliance that would not significantly impair the effectiveness of the rule or increase the risk to the health, safety, or welfare of the public or those affected by the rule.

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1. TITLE OF RULE FILING:

   Vermont Residential Building Energy Standards (RBES) Amendments

2. ADOPTING AGENCY:

   Department of Public Service

3. CATEGORY OF AFFECTED PARTIES:

   LIST CATEGORIES OF PEOPLE, ENTERPRISES, AND GOVERNMENTAL ENTITIES POTENTIALLY AFFECTED BY THE ADOPTION OF THIS RULE AND THE ESTIMATED COSTS AND BENEFITS ANTICIPATED:

   This rule update will primarily affect homeowners, home buyers, builders, and developers. The rule provides an alternative compliance pathway adhering to the 2020 RBES, which will result in an incremental decrease in up-front cost for those parties as compared to the

requirements of the 2024 RBES. The option to follow the 2024 RBES will remain in place.

When adopted in 2019, the cost-benefit analysis for the 2020 RBES "Standard Code" showed that the increased requirements over the prior code were cost effective for homeowners and buyers, with the energy savings resulting in an estimated $228 of positive cash flow annually, an estimated return on investment of 11%, and an estimated payback period of 9.4 years.

The cost-benefit analysis for the 2024 RBES "Standard Low Cost" code, adopted in 2023, showed that the increased requirements over the 2020 RBES created higher up-front costs by comparison, but the rule was still cost effective. Meeting the requirements would generate an estimated positive cash flow of $9 annually, an estimated return on investment of 8%, and an estimated payback period of 12.2 years.

4. IMPACT ON SCHOOLS:
INDICATE ANY IMPACT THAT THE RULE WILL HAVE ON PUBLIC EDUCATION, PUBLIC SCHOOLS, LOCAL SCHOOL DISTRICTS AND/OR TAXPAYERS CLEARLY STATING ANY ASSOCIATED COSTS:

No impact, as school buildings are not covered under RBES.

5. ALTERNATIVES: *CONSIDERATION OF ALTERNATIVES TO THE RULE TO REDUCE OR AMELIORATE COSTS TO LOCAL SCHOOL DISTRICTS WHILE STILL ACHIEVING THE OBJECTIVE OF THE RULE.*

N/A

6. IMPACT ON SMALL BUSINESSES:
INDICATE ANY IMPACT THAT THE RULE WILL HAVE ON SMALL BUSINESSES (EXCLUDING IMPACTS INCIDENTAL TO THE PURCHASE AND PAYMENT OF GOODS AND SERVICES BY THE STATE OR AN AGENCY THEREOF):

No impact, as businesses are not covered under RBES.

7. SMALL BUSINESS COMPLIANCE: *EXPLAIN WAYS A BUSINESS CAN REDUCE THE COST/BURDEN OF COMPLIANCE OR AN EXPLANATION OF WHY THE AGENCY DETERMINES THAT SUCH EVALUATION ISN'T APPROPRIATE.*

N/A

8. COMPARISON:

COMPARE THE IMPACT OF THE RULE WITH THE ECONOMIC IMPACT OF OTHER ALTERNATIVES TO THE RULE, INCLUDING NO RULE ON THE SUBJECT OR A RULE HAVING SEPARATE REQUIREMENTS FOR SMALL BUSINESS:
An alternative to this rule would be to repeal the 2024 RBES in its entirety and replace it with the 2020 RBES. This alternative would provide the same incremental decrease in up-front cost provided by the proposed rule but would eliminate the option to achieve higher energy efficiency and the associated long-term savings on energy costs. The 2024 RBES is the product of significant development work in collaboration with stakeholders from across the housing, real estate, energy, and construction sectors. Maintaining the 2024 RBES will maintain an avenue for achieving nation-leading efficiency and additional long-term cost reduction for those who are able to take advantage of those benefits. On the other hand, adopting no rule would leave no flexibility in the current standards and would fail to alleviate the significant costs impacts and workforce pressures associated with compliance, exacerbating the State's current housing and affordability challenges.

9. SUFFICIENCY: *DESCRIBE HOW THE ANALYSIS WAS CONDUCTED, IDENTIFYING RELEVANT INTERNAL AND/OR EXTERNAL SOURCES OF INFORMATION USED.*
The cost-benefit analyses underlying the 2020 and 2024 RBES were prepared by Department contractors and were extensively reviewed by stakeholders and experts including home builders, architects, developers, and affordable housing advocates. Feedback from those stakeholders was incorporated into the estimates. External sources of information: For development of fuel costs: the Energy Information Administration (EIA). For information about electric rates: Green Mountain Power. For costs of natural gas: Vermont Gas Systems. For fuel incidence weighting: NMR VT Market Assessment Study. For costs of new measures in 2024 RBES: Internet searches, Huntington Homes analysis, and Evernorth review. For cost of carbon calculation: the Energy Information Administration (EIA).

Environmental Impact Analysis

Instructions:

In completing the environmental impact analysis, an agency analyzes and evaluates the anticipated environmental impacts (positive or negative) to be expected from adoption of the rule; compares alternatives to adopting the rule; explains the sufficiency of the environmental impact analysis. If no impacts are anticipated, please specify "No impact anticipated" in the field.

Examples of Environmental Impacts include but are not limited to:

- Impacts on the emission of greenhouse gases
- Impacts on the discharge of pollutants to water
- Impacts on the arability of land
- Impacts on the climate
- Impacts on the flow of water
- Impacts on recreation
- Or other environmental impacts

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1. TITLE OF RULE FILING:

   Vermont Residential Building Energy Standards (RBES) Amendments

2. ADOPTING AGENCY:

   Department of Public Service

3. GREENHOUSE GAS: *EXPLAIN HOW THE RULE IMPACTS THE EMISSION OF GREENHOUSE GASES (E.G. TRANSPORTATION OF PEOPLE OR GOODS; BUILDING INFRASTRUCTURE; LAND USE AND DEVELOPMENT, WASTE GENERATION, ETC.):*
   The energy savings from homes built to either the 2020 or 2024 RBES will result in direct reductions in greenhouse gas emissions through reduced on-site fuel consumption, and indirect greenhouse gas reductions through reduced electricity demand for the lifetime of the home. Homes built to the 2020 RBES will likely achieve slightly lower energy efficiency performance than homes built to the 2024 RBES. However, it should be noted that the requirements of the 2020 RBES still represent a stringent set of efficiency standards on

par with, or exceeding the current energy codes in the majority of states.

4. WATER: *EXPLAIN HOW THE RULE IMPACTS WATER (E.G. DISCHARGE / ELIMINATION OF POLLUTION INTO VERMONT WATERS, THE FLOW OF WATER IN THE STATE, WATER QUALITY ETC.):*
   No impact.

5. LAND: *EXPLAIN HOW THE RULE IMPACTS LAND (E.G. IMPACTS ON FORESTRY, AGRICULTURE ETC.):*
   No impact.

6. RECREATION: *EXPLAIN HOW THE RULE IMPACTS RECREATION IN THE STATE:*
   No impact.

7. CLIMATE: *EXPLAIN HOW THE RULE IMPACTS THE CLIMATE IN THE STATE:*
   The energy savings from homes built to either the 2020 or 2024 RBES will result in direct and indirect reductions in greenhouse gas emissions and reduce the other negative environmental impacts of energy use. As described in Section 3 of this environmental impact analysis: Homes built to the 2020 RBES will likely achieve slightly lower energy efficiency performance than homes built to the 2024 RBES. However, the 2020 RBES requirements do comprise efficiency standards on par with or exceeding the current energy codes in the majority of states.

8. OTHER: *EXPLAIN HOW THE RULE IMPACT OTHER ASPECTS OF VERMONT'S ENVIRONMENT:*
   Adherence to either set of standards incorporated in this rule (2020 or 2024 RBES) will promote insulation and air sealing in new residential construction and renovations to reduce building heating and cooling demands. This rule will also promote the use of efficient appliances, which will further reduce electricity and fuel consumption. Additionally, adherence to either set of standards incorporated in this rule will improve building durability, resident comfort and indoor air quality in new homes.

9. SUFFICIENCY: *DESCRIBE HOW THE ANALYSIS WAS CONDUCTED, IDENTIFYING RELEVANT INTERNAL AND/OR EXTERNAL SOURCES OF INFORMATION USED.*
   This environmental impact analysis covers the full range of environmental and climate impacts of the RBES updates.

Public Input Maximization Plan

Instructions:

Agencies are encouraged to hold hearings as part of their strategy to maximize the involvement of the public in the development of rules. Please complete the form below by describing the agency's strategy for maximizing public input (what it did do, or will do to maximize the involvement of the public).

This form must accompany each filing made during the rulemaking process:

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1. TITLE OF RULE FILING:

   Vermont Residential Building Energy Standards (RBES) Amendments

2. ADOPTING AGENCY:

   Department of Public Service

3. PLEASE DESCRIBE THE AGENCY'S STRATEGY TO MAXIMIZE PUBLIC INVOLVEMENT IN THE DEVELOPMENT OF THE PROPOSED RULE, LISTING THE STEPS THAT HAVE BEEN OR WILL BE TAKEN TO COMPLY WITH THAT STRATEGY:

   The Department will host a hybrid public informational hearing, and will post the rule on its website here: https://publicservice.vermont.gov/efficiency/building-energy-standards/building-energy-standards-update. The Department will notify stakeholders of the proposed rule, including: home builders, contractors, architects, multi-family housing developers, low-income housing advocates, electric and gas utilities, energy efficiency utilities, municipalities, and state entities.

   Public comments will be accepted from the date the proposed rule is filed with the Secretary of State through the 7th day following the last public hearing.

4. BEYOND GENERAL ADVERTISEMENTS, PLEASE LIST THE PEOPLE AND ORGANIZATIONS THAT HAVE BEEN OR WILL BE INVOLVED IN THE DEVELOPMENT OF THE PROPOSED RULE:

Public Input

Home builders, contractors, architects, multi-family housing developers, low-income housing advocates, electric and gas utilities, energy efficiency utilities, state entities (ACCD, SHPO, DPS, EOE), modular home manufacturers, municipalities, individual Vermonters and groups interested in or affected by housing and energy issues.

Scientific Information Statement

THIS FORM IS ONLY REQUIRED IF THE RULE RELIES ON SCIENTIFIC INFORMATION FOR ITS VALIDITY.

PLEASE REMOVE THIS FORM PRIOR TO DELIVERY IF IT DOES NOT APPLY TO THIS RULE FILING:

Instructions:

In completing the Scientific Information Statement, an agency shall provide a summary of the scientific information including reference to any scientific studies upon which the proposed rule is based, for the purpose of validity.

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1. TITLE OF RULE FILING:

   Vermont Residential Building Energy Standards (RBES) Amendments

2. ADOPTING AGENCY:

   Department of Public Service

3. BRIEF EXPLANATION OF SCIENTIFIC INFORMATION:

   30 V.S.A.§ 51 RESIDENTIAL BUILDING ENERGY STANDARDS permits the update of the RBES after the issuance of updated standards for residential construction under the International Energy Conservation Code (IECC). This proposed rule for RBES is based on the 2015, 2018, and 2021 editions of the International Energy Conservation Code which has been extensively vetted by an international committee of code professionals.

   The Vermont Legislature adopted Act 89 of 2013, and (Section 6 of 30 V.S.A. § 51) which allowed the adoption of Vermont's first stretch code for application in proceedings under 10 V.S.A. chapter 151 (Act 250), and to be available for adoption by municipalities under 24 V.S.A. chapter 117.

   The 2020 RBES standards incorporated as an optional compliance pathway in this rule were developed based on a review of residential construction practices in

Vermont and included more stringent insulation and air sealing requirements as compared to the 2015 RBES, along with new requirements from the 2018 IECC.

The existing 2024 RBES standards include more stringent insulation, window u-values, and air leakage rates, as compared to the 2020 RBES, along with added 2021 IECC requirements. The primary substantive difference between the standards of the 2020 and 2024 RBES is the requirement for balanced ventilation.

4. CITATION OF SOURCE DOCUMENTATION OF SCIENTIFIC INFORMATION:

Energy modeling for the 2020 and 2024 RBES was provided using REM/Rate software published by NORESCO, LLC (version 15.7 for 2020, version v16.3.3 for 2024). For both 2020 and 2024 RBES, the ventilation standard support was published in two papers; "Mechanical Ventilation for Residential New Construction in Vermont: A Review of Codes, Standards, and Research With Recommendations for a Vermont Ventilation Standard" (August 18, 1999) and "A Field Study of Exhaust Only Ventilation Systems Performance in Residential New Construction in Vermont" (August 26, 1999).

5. INSTRUCTIONS ON HOW TO OBTAIN COPIES OF THE SOURCE DOCUMENTS OF THE SCIENTIFIC INFORMATION FROM THE AGENCY OR OTHER PUBLISHING ENTITY:

REM/Rate software can be accessed and purchased at www.remrate.com. The ventilation studies are available by request to the Department of Public Service.

Incorporation by Reference

THIS FORM IS ONLY REQUIRED WHEN INCORPORATING MATERIALS BY REFERENCE. PLEASE REMOVE PRIOR TO DELIVERY IF IT DOES NOT APPLY TO THIS RULE FILING:

Instructions:

In completing the incorporation by reference statement, an agency describes any materials that are incorporated into the rule by reference and how to obtain copies.

This form is only required when a rule incorporates materials by referencing another source without reproducing the text within the rule itself (e.g., federal or national standards, or regulations).

Incorporated materials will be maintained and available for inspection by the Agency.

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1. TITLE OF RULE FILING:

   Vermont Residential Building Energy Standards (RBES) Amendments

2. ADOPTING AGENCY:

   Department of Public Service

3. DESCRIPTION (*DESCRIBE THE MATERIALS INCORPORATED BY REFERENCE*):

   The 2020 Vermont Residential Building Energy Standards published by International Code Council (ICC).

   The 2024 Vermont Residential Building Energy Standards published by ICC.

4. FORMAL CITATION OF MATERIALS INCORPORATED BY REFERENCE:

   2020 Vermont Residential Building Energy Standards. International Code Council(ICC), Inc.: July 2020. First Printing. ISBN: 978-1-952468-32-2.
   2024 Vermont Residential Building Energy Standards. International Code Council (ICC), Inc.: April 2025. First Printing. ISBN: 978-1-964970-14-1.

5. OBTAINING COPIES: *(EXPLAIN WHERE THE PUBLIC MAY OBTAIN THE MATERIAL(S) IN WRITTEN OR ELECTRONIC FORM, AND AT WHAT COST)*:

The 2020 and 2024 VT Residential Building Energy Standards can be obtained from the ICC website at: www.iccsafe.org. Electronic view only copies are available for free. The Department of Public Service has hard copies available for free. Hard copies are available to order from the ICC for $32.00 (non-member) or $26.00 (member). Pdf downloads are available from ICC for $27.00 (non-member) or $22.00 (member).

6. MODIFICATIONS (*PLEASE EXPLAIN ANY MODIFICATION TO THE INCORPORATED MATERIALS E.G., WHETHER ONLY PART OF THE MATERIAL IS ADOPTED AND IF SO, WHICH PART(S) ARE MODIFIED)*:

There are amendments to the introductory sections and Section R.101.8 of 2024 VT Residential Building Energy Standards. The amendments are attached.

Run Spell Check

Vermont Agency of Administration

Interagency Committee on Administrative Rules (ICAR) Minutes

Date/Time: December 15, 2025, 2:00 PM

Location: Virtually via Microsoft Teams

Members Present: Nick Kramer, Jared Adler, John Kessler, Natalie Weill, Michael Obuchowski, John Kessler,

Members Absent: Diane Sherman, Nicole Dubuque, Jennifer Mojo

Minutes By: Chrissy Gilhuly

- 3:00 p.m. meeting called to order
- Review and approval of minutes from the December 8, 2025 meeting.
- No additions/deletions to agenda. Agenda approved as drafted.
- No public comments were made.
- Presentation of Proposed Rules with recommended changes on pages to follow:
    1. Vermont Department of Public Service (PSD) – Vermont Commercial Building Energy Standards (CBES) Amendment
        a. The Vermont Commercial Building Energy Standards (CBES) regulate the design of building envelopes for adequate thermal resistance and low air leakage and the design and selection of mechanical, ventilation, electrical, service water- heating and illumination systems and equipment in commercial building construction.

    2. Vermont Department of Public Service (PSD) – Vermont Residential Building Energy Standards (RBES) Amendment
        a. The Vermont Residential Building Energy Standards (RBES) regulate the design and construction of residential buildings to require adequate thermal insulation, low air leakage, effective and efficient mechanical, ventilation, electrical, service water-heating and illumination systems and equipment to enable effective use of energy in residential buildings.

- Other business – Advice for completing APA forms discussion moved to January 12, 2025, meeting.
- Next scheduled meeting is January 12, 2026, at 2:00 p.m.
- 3:28 p.m. meeting adjourned.

Proposed Rule: Vermont Department of Public Service (PSD) – Vermont Commercial Building Energy Standards (CBES) Amendment

Presented By: Brittney Wilson, Deputy Commissioner

Motion was made to accept the rule by John Kessler, seconded by Jared Adler, and passed with the following recommendation:

1) Economic Impact Analysis:
    a. #3 – Qualify numbers; statement that clearly mentions upfront cost differential

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Proposed Rule: Vermont Department of Public Service (PSD) – Vermont Residential Building Energy Standards (RBES) Amendment

Presented By: Brittney Wilson, Deputy Commissioner

Motion was made to accept the rule by John Kessler, seconded by Natalie Wiell, and passed with the following recommendation:

1) Economic Impact Analysis:
    a. #3 – Make consistent with whatever language was included in Rule #1 (CBES).

112 STATE STREET
MONTPELIER, VT 05620-2601

TEL: (802) 828-2811
TTY (VT): 1-800-734-8390
FAX: (802) 828-2342

VERMONT
DEPARTMENT OF PUBLIC SERVICE

February 17, 2026

Louise Corliss
Office of the Secretary of State
128 State Street
Montpelier, VT 05633

Legislative Committee on Administrative Rules
Vermont State House
115 State Street
Montpelier, VT 05633

RE: Vermont Residential Building Energy Standards Rule Responsiveness Summary

Attached please find the responses of the Public Service Department ("Department") to comments (summarized in the document) received during the public comment period for the Residential Building Energy Standards ("RBES") rule. Each comment received by the Department (in full) is also included in its filing.

No modifications to the proposed rule were made since the initial filing with the Secretary of State on 12/24/2025 ("Proposed Rule Filing"). As described in the Department's filing, the Final Proposed Rule represents a response to the severe housing shortage and dramatic increase in building costs now facing Vermont. Executive Order No. 06-25, issued by the Governor in September of 2025, spoke directly to these issues and highlighted the importance of flexibility and cost reduction. The Final Proposed Rule is responsive to that Executive Order, and: responds to unintended impacts and worsening economic conditions that have materialized since the 2024 RBES were developed; preserves the 2024 RBES as an option to achieve greater efficiency with higher up-front investment and lower long-term operational costs; and provides the 2020 RBES as an alternative which reduces the initial cost of compliance, yet retains a high level of energy efficiency. Of the public comments received, those that were not supportive of the proposal generally raised concerns in the following areas: (1) public process around the rule revisions; (2) premature conclusions regarding cost-effectiveness of the 2024 RBES; and (3) impacts on building energy efficiency and greenhouse gas emissions.

To the extent these topics have not been addressed elsewhere in the Department's filing:

(1) Prior updates to the RBES have been required by statute and have featured a longer development and stakeholder engagement process. Those prior updates have involved the consideration of new and more demanding standards governing the construction of residential buildings. This proposed update does not change or alter prior adopted standards: it retains the existing 2024 RBES and adds the 2020 RBES as an alternative compliance pathway. Both the 2020 and 2024 CBES were previously adopted and are known sets of standards with significant development and stakeholder engagement behind them.

(2) The proposed rule does not replace the 2024 RBES and does not suggest that the 2024 RBES are uneconomic. Rather, it offers a choice between two previously adopted sets of standards which have been shown to be cost effective. One option results in lower upfront costs with slightly lower long-term energy savings (2020 RBES) and one results in higher upfront costs with higher long-term energy savings (2024 RBES). The proposed rule will allow homeowners to determine which standard is more cost effective for them. Depending on the size of the home and which code (base vs. stretch) is used, the estimated upfront cost difference between the 2020 and 2024 RBES ranges from $12,000 to $25,000. Importantly, the cost differences are significantly higher when factoring in loan interest rates. For example, for a $250,000 home built to the 2020 RBES, there would be about $26,000 in savings over the 2024 RBES assuming a 20% down payment and 6% interest rate. With less money down and

higher rates, the savings could be up to $30,000. And, for a home closer to the median home price, savings would be over $30,000.

(3) The energy savings from homes built to either the 2020 or 2024 RBES will result in direct reductions in greenhouse gas emissions through reduced on-site fuel consumption, and indirect greenhouse gas reductions through reduced electricity demand for the lifetime of the home. Homes built to the 2020 RBES will likely achieve slightly lower energy efficiency performance and emissions reductions than homes built to the 2024 RBES. However, the requirements of the 2020 RBES still represent a stringent set of efficiency standards on par with or exceeding current energy codes in the majority of states.

Issues surrounding code administration, including compliance or enforcement, were also recurring topics in the public comments received. These issues are not within the scope of the proposed rule, as compliance and enforcement requirements are embedded in statute.

Please contact me if you need any additional information or clarification.

Regards,

Brittney Wilson
Deputy Commissioner
Vermont Department of Public Service
Brittney.Wilson@vermont.gov

Date	Commenter	Affiliation	Comment Summaries (Full Comments Included in Filing Package	PSD response	Decision and Resulting Changes Made
12/22/2025	Joe Green	Joseph Architects	It should be noted and potentially clarified that all projects have to verify local/municipal zoning regulations. The Town of South Burlington for example, adopts the new CBES and stretch code regardless of the Executive Order. This has led to multiple cases of confusion. The EO is already slightly confusing as the interpreted intent is to create the most flexibility, affordability and easiest regulatory path. But, it doesn't definitively state that one has to choose one version or the other. The inference is that the applicant can "cherry pick" from both 2020 and 2024.	Local regulations are outside the Department's purview and outside the scope of the proposed rule. However, as to clarity on the issue of "cherry picking" between codes: the proposed rule language addresses this by stating that for the 2020 CBES compliance pathway, "all provisions and requirements of the 2020 CBES shall govern compliance." The same is true for the 2024 CBES pathway. For RBES, the proposed language is similar and also states: "Projects electing to follow the 2020 RBES must follow the associated stretch code when required."	No changes made.
12/22/2025	Sandra Vitzthum		Adding to complexity surrounding the codes: it's still not clear whether municipalities have authority to enforce any energy code.	Issues related to Building Energy Standards administration, such as compliance evaluation or enforcement, are governed by statute. As such, these issues are outside the scope of the proposed rule.	No changes made.
1/6/2026	Michael Chaucer		I support the proposed rule to amend RBES to allow compliance with the 2020 regulations. The 2020 standards provide a pathway for designing buildings that are energy efficiency, cost effective, and buildable. Requiring the 2024 standards will only result in a larger gap between the haves and have-nots in Vermont, and worsen the already dire housing affordability crisis we are facing here.	The proposed rule adds the 2020 RBES as an alternative compliance pathway.	No changes made.
1/15/2026	Dixie O'Connor	Vermont Builders and Remodelers Association (VBRA)	• We write in support of the re-adoption of the 2020 Residential and Commercial Building Energy Standards (RBES and CBES), with no amendments, through the current rulemaking. • VBRA members are actively preparing projects for upcoming construction seasons, and certainty around applicable energy standards is essential. Re-adopting the 2020 RBES and CBES without modification would allow builders and developers to continue relying on existing, well-understood compliance pathways without disruption or delay, including continued use of 2020 ResCheck for residential projects. • We understand that this rulemaking is intended to restore the previously adopted standards following Executive Order 06-25, not to introduce new requirements or technical changes. VBRA supports this limited and practical approach, which helps avoid confusion in the field and provides a stable regulatory framework. • Thank you for your efforts to provide timely clarity to Vermont's construction community.	The proposed rule incorporates the 2020 and 2024 RBES with no changes to those standards. This will enable the use of all existing technical resources and tools supporting the RBES.	No changes made
1/13/2026	Kevin Dennis		• As an architect, I find the standards to be overly complicated and onerous on the design team. I have almost 20 years of experience in the design of net-zero buildings, and I am well versed in building science. I cannot imagine for those who are not how this code is even vaguely comprehensible. • My understanding is the rate of compliance with RBES in particular is believed to be around 50%. I suspect it is lower. The standards creep higher and higher by the code cycle, and the majority of construction is left behind. The focus should be on education and enforcement. I am particularly concerned with the change to U-values for the envelope. I am unaware of any architect or builder who can confidently model an assembly to determine an accurate U-value. The number of projects that employ an energy consultant is an even smaller subset of the ones who employ design professionals more broadly. • In addition, I am very concerned with the construction of unvented roof assemblies utilizing exterior rigid insulation to counteract dew point condensation risk. The IECC has a table with specific requirements for the ratio of R-value between cavity and continuous based on climate zone. The Vermont code has no specific requirement, and the guide book says "Conservative building sciences suggests..." I have personally seen roofs constructed with ratios appropriate to the mid-atlantic climate. These assemblies are at a high risk of failure, not just in the opinion of conservative building scientists, but in the opinion of the IECC. • Governor Scott's executive order reverted to the 2020 cycles citing compliance as a hindrance to new housing development. It is the administrative, not the technical aspects that are a hindrance.	The Department shares this concern about building durability, and has published the RBES Handbook with a new chapter on Moisture Management and Building Durability to aid builders in complying with the code without compromising indoor air quality or building durability. Efficiency Vermont also provided numerous free in-person and online training on the energy codes and building science	No changes made.

Date	Commenter	Affiliation	Comment Summaries (Full Comments Included in Filing Package	PSD response	Decision and Resulting Changes Made
1/19/2026	No Name		As a Vermont resident, I am writing to oppose the adoption of this proposed rule. In my view, this proposed rule is a misguided attempt to accelerate construction of housing, at the expense of both the environment and the ultimate homeowners. The 2024 update to the RBES is, by construction cost-effective, and Vermont should be focusing on lifecycle cost (and environmental impacts) rather than upfront costs. This proposed rule should be rejected, and the 2024 RBES should remain in effect until updated.	In keeping with the Governor's Executive Order #06-25, the proposed rule provides flexibility to reduce the cost of new construction and address Vermont's severe housing shortage. Both the 2020 and 2024 RBES have been shown to be cost-effective; generally speaking, compliance with the 2020 RBES would yield a lower up-front cost of construction and likely result in slightly higher energy use and lower energy savings over the life of a typical building as compared to the 2024 RBES. The proposed rule maintains the 2024 RBES as a compliance pathway, which will allow for higher efficiency and life cycle energy savings at a higher up-front cost.	No changes made.
1/26/2026	Sally Jenks Roth		I propose that Vermont initiate a rule that all new buildings should include geothermal energy infrastructure while digging foundations. It is the best, cheapest and most reliable energy source of the future. Harder and more expensive to retro-fit. Do. It. Now!	This proposal would run counter to the intent of the proposed rule, as it would increase upfront costs associated with compliance.	No changes made
1/29/2026	Kate Stephenson	Helm Construction Solutions, LLC	•Writing to oppose the proposed rules for RBES and CBES. • I care deeply about VT's path toward decarbonization and meeting our climate goals. • I work closely with builders, architects, small-scale housing developers, and tradespeople. Many of them are committed to the highest standards of energy-efficient construction practices - this is not only doable, but we also know it is cost-effective. • Need to continue to push the state forward with progressively more stringent energy codes if we are going to meet the state's overall climate goals. Reverting to the 2020 RBES and CBES standards (or, confusingly, offering a choice of 2020 or 2024 versions) is not really going to make housing more affordable. It may reduce the upfront cost in some cases, but it will cost more in the long-term, both for occupants of the buildings and for the state climate goals. • If DPS serious about having an impact, the real lever would be statewide enforcement of the Energy Code. We know from the most recent RBES compliance reviews that less than 50% of new homes built are actually meeting the current RBES standards. • VT's lack of an "authority having jurisdiction" over energy codes means there is no state agency enforcing the codes, which is highly problematic for compliance rates. • I urge you to stick with the 2024 RBES and CBES as written, and recind these proposed Rules. It will only create confusion amongst builders in service to a false promise of affordability.	Issues related to Building Energy Standards administration, such as compliance and enforcement, are governed by statute. As such, those issues are outside the scope of the proposed rule. The Department agrees that compliance with the RBES has been low, and this has not been helped by the up-front costs and complex building requirements associated with increasing code standards. The proposed rule, which allows compliance with either the 2020 or 2024 standards, provides flexibility to reduce up-front cost while maintaining efficiency standards on par with or more stringent than the majority of states. This flexibility also enables those with the means to do so to achieve higher efficiency and associated energy savings, with a higher up-front cost	No changes made.
1/30/2026	Nicole Henry		• I reside and run an energy auditing business out of Rutland Vermont. I fully support giving builders the option of completing new projects using 2020 or 2024 VT RBES- WITH THE CAVEAT- that a whole house ventilation system (ERV) be required regardless of which RBES path is being taken by the builder • At 3 air exchanges per hour (2020 RBES) there is still a significant risk for moisture and indoor air pollutants that, if remedied though a continuous exhaust fan alone, will create negative pressure in the home affecting the overall comfort of the occupant. It also means that the "fresh" air being brought in from outside is still coming from existing breaks in the air pressure barrier without being filtered and at various rates. A dedicated filtered supply inlet ensures comfortable indoor air pressure and continuous clean supply of air. • Please consider adding the amendment that balanced whole house ventilation is required whether utilizing the 2020 or 2024 RBES. • Yes we want to house people - but we cannot afford to be short-sighted about it because what may save money in the housing sector can inadvertently create higher costs in another- health care.	The Department shares the concern about indoor air quality, however, the 2020 RBES were the product of significant stakeholder feedback and were applicable to new construction from 2020 through 2024. The building and design community is already quite familiar with the details of the code standards and requirements. There is a need to ensure ongoing availability of appropriate training, building science education, and resources - and to that end, all of the supporting materials associated with the 2020 RBES will continue to be available.	No changes made.

Date	Commenter	Affiliation	Comment Summaries (Full Comments Included in Filing Package	PSD response	Decision and Resulting Changes Made
2/2/2026	Andrew Shapiro	Energy Balance, Inc.	• The 2024 RBES underwent a two-year development process, including a working group and stakeholders from various sectors. That rulemaking should not be overridden without a similar process. • The study underpinning the 2024 RBES showed it is cost effective from the consumer perspective: annual energy savings are greater than the incremental cost of the mortgage to support the higher efficiency. This is cash flow positive for the owner. It costs less to own a home under the 2024 RBES than the same home under the 2020 RBES. This is a far more relevant affordability metric than construction cost, as most construction is financed over time. • A PSD residential study planned for Spring will re-assess baseline efficiency and compliance with the 2020 and 2024 RBES, including the cost of non-compliance. It makes no sense to make conclusions before this study is completed. Costs for construction and fuel have increased and the cost/benefit analysis should be updated before declaring the 2024 standard not cost-effective. • The 2024 code improves durability and occupant comfort/health: excellent insulation and air sealing greatly reduce interior moisture and mold problems found in many commercial buildings. These are costly and can have significant health impacts. • Disregarding the 2024 RBES creates market confusion. There have been 2 years of training on the 2024 RBES. Consistency and clarity is important for businesses. • The Division of Fire Safety should be made the authority having jurisdiction over the CBES. At present there is no enforcement, disadvantaging builders following the rules. Surveys indicate significant lack of compliance. • Vermont has adopted a Climate Action Plan to reduce emissions. A rule that increases cost to building owners while increasing emissions is in direct opposition to that Plan. • The rising cost of construction is NOT caused by the 2024 RBES. The incremental cost from the 2020 to 2024 code is a very small fraction of the general cost increases. • Proposing this rule leading into construction season creates confusion. This rule should be rescinded immediately to create certainty, with a considered process for revision instead.	Prior RBES updates have been required by statute and have featured a longer development and stakeholder engagement process. Those prior updates have involved the consideration of new and more demanding standards governing the construction of residential buildings. This proposed update does not involve new standards: it retains the existing 2024 RBES and adds the 2020 RBES as an alternative compliance pathway. Both the 2020 and 2024 RBES have been previously adopted and are known sets of standards with significant development work behind them. The proposed rule does not replace the 2024 RBES and does not suggest that the 2024 RBES are uneconomic. Rather, it offers a choice between two previously adopted sets of standards which have been shown to be cost effective. One option results in lower up-front costs with lower long-term energy savings (2020 RBES) and one results in higher upfront costs with higher long-term energy savings (2024 RBES). [Other PSD responses throughout are relevant to this comment].	No changes made.
2/4/2026	Andres Gutierrez	American Institute of Architects Vermont (AIAVT)	• AIAVT supports the proposal to re-adopt the 2020 Residential and Commercial Building Energy Standards (RBES and CBES), without amendment, through the current rulemaking. [Additional context offered in comments]. • Architectural projects extend over long timelines and depend on consistency from early design through permitting and construction. Re-adopting the previously adopted 2020 standards provides necessary continuity for projects already underway and allows design teams to rely on established compliance pathways and documentation. • AIAVT members strongly support Vermont's long-term energy efficiency and climate goals and the continued advancement of building standards. We also believe those standards must be technically sound, cost-effective, and administratively workable in practice. • The forthcoming compliance and cost-effectiveness study will inform future updates to Vermont's energy standards. That process, however, will not conclude in time to resolve the immediate uncertainty facing the design and construction community. • For these reasons, AIAVT supports this limited and temporary action to restore legal clarity and keep projects moving forward while the State completes its analysis and prepares for a robust stakeholder process later this year. • AIAVT appreciates DPS's efforts to provide certainty during this transition and looks forward to continued engagement on longer-term building energy code policy.	The proposed rule incorporates the 2020 and 2024 RBES with no changes to those standards. This will enable the use of all existing technical resources and tools supporting the RBES.	No changes made.

Date	Commenter	Affiliation	Comment Summaries (Full Comments Included in Filing Package	PSD response	Decision and Resulting Changes Made
2/6/2026	Dragana Thibault	Northeast Energy Efficiency Partnerships (NEEP)	•The Proposed rulemaking would create unnecessary complexity for designers, builders, code officials: establishing two different minimum energy performance standards for residential and commercial construction during the same period. • The 2024 RBES/CBES are based on the 2021 International Energy Conservation Code (IECC) with Vermont-specific amendments, including sections from the 2024 IECC. Allowing compliance with the 2020 RBES/CBES based on the 2015, 2018, and portions of the 2021 IECC, permits construction of buildings without all the improvements, resulting in higher immediate and long-term energy use and operating costs for buildings constructed under the older code compared to buildings in compliance with the 2024 RBES and CBES. •The U.S. Department of Energy, with analysis conducted by Pacific Northwest National Laboratory (PNNL), has evaluated the cost-effectiveness and energy impacts of adopting the 2021 IECC at the state level, including for Vermont. For residential buildings, PNNL prepared a Vermont-specific cost-effectiveness analysis comparing the 2021 IECC to the prior code basis. That analysis found that adoption of the 2021 IECC results in an estimated 4.5 percent reduction in annual energy use for a representative single-family home in Vermont, compared to the 2015 IECC with amendments as adopted by Vermont. The analysis further estimated average first-year utility bill savings of approximately $126 per household, with positive life-cycle cost savings over the life of the home when incremental construction costs are weighed against long-term energy savings. This indicates that the residential provisions of the 2021 IECC are cost-effective for Vermont households and reduce long-term energy expenditures. • Allowing continued compliance with the 2020 RBES and CBES is a step backward from Vermont's established code trajectory and results in lower minimum performance for new construction. • NEEP respectfully encourages the Department to consider maintaining the 2024 RBES and CBES as the sole statewide energy code standard in order to preserve consistent implementation, avoid unnecessary complexity, and ensure that new buildings achieve the long-term energy performance benefits already established in Vermont's current standards.	In keeping with the Governor's Executive Order #06-25, the proposed rule provides flexibility to reduce the cost of new construction and address Vermont's severe housing shortage. Generally speaking, compliance with the 2020 RBES would yield a lower up-front cost of construction and likely result in slightly higher energy use and lower energy savings over the life of a typical building as compared to the 2024 RBES. The 2020 RBES standards remain stringent, and the proposed rule maintains the 2024 RBES as an option, which will allow for higher efficiency and energy savings at a higher up-front cost. Both sets of standards are familiar to building professionals and other stakeholders, as they have already been in effect in Vermont within the last 5 years. As none of the standards are changing, the training and technical support resources that have already been developed will be available and will assist with smooth implementation.	No changes made.
2/9/2026	William Nash	International Code Council (ICC)	• The Code Council is a member-focused association dedicated to helping the building safety community and the construction industry provide safe and sustainable construction through developing codes and standards used in the design, build, and compliance process. • The I-Codes (including the 2018 and 2021 IECC) are updated and revised every three years through a governmental consensus process. It encourages input from all individuals and groups and includes many beneficial changes to the model codes that Vermont currently adopts. • While housing affordability is a serious concern, building energy standards represent only a small share of overall construction costs. For many multi-family projects, the added cost of updated CBES requirements is relatively modest and is balanced by long-term energy savings. Strong energy standards can help improve affordability by reducing utility costs, particularly for households with limited incomes. Concerns about readiness/training are important and can be addressed through phased implementation and additional support for professionals. Maintaining updated standards helps ensure new housing remains affordable and efficient over the long term. • We respectfully recommend that Vermont continue to support the currently adopted CBES (2024), based on the 2024 IECC model code, as the proposed amendments would effectively weaken the codes in Vermont. In addition, the I-Codes correlate without conflicts, eliminating confusion, inconsistent code enforcement, and interpretation across jurisdictions. • However, we recognize Vermont's unique characteristics and the significant efforts Vermont leaders have made, including their commitment to a safe built environment through up-to-date codes.	In keeping with the Governor's Executive Order #06-25, the proposed rule provides flexibility to reduce the cost of new construction and address Vermont's severe housing shortage. The 2020 RBES standards remain stringent, and the propose rules maintains the 2024 RBES as an option, which will allow for higher efficiency and energy savings at a higher up-front cost.	No changes made.

Date	Commenter	Affiliation	Comment Summaries (Full Comments Included in Filing Package	PSD response	Decision and Resulting Changes Made
2/9/2026	Richard Faesy	Energy Futures Group	• Each of the RBES revisions involved significant stakeholder meetings and input. PSD included additional rounds of engagement for the 2024 RBES to ensure robust and ample input. Unfortunately, Executive Order 06-25 seems to have disregarded this process, setting us back in our progress to make VT homes more efficient and affordable. • Housing affordability needs to consider annual operating costs alongside upfront costs of new buildings. This Executive Order and resulting rule would set us back when we need to ensure that Vermont homebuyers and renters minimize operating costs of a home. • The analysis for the 2024 RBES showed that it was cost effective from a consumer perspective: the annual energy cost savings were greater than the incremental cost of the mortgage to support the higher efficiency. It costs less to own a home built to the 2024 RBES than the same home built to the 2020 RBES. Not considering operating costs or long-term benefits and focusing just on first cost is short-sighted and poor policy. • Many numbers have been cited to justify scaling back RBES from 2024 to 2020, but there has not been any widely shared independent survey or analysis. In making policy changes, it is important to understand the basis for the numbers and provide analysis built on sound information. When someone quotes a cost for the 2024 RBES, it needs to be clear "compared to what?" Of course, it costs a lot compared to sub-code construction. The correct analysis considers incremental costs over the prior code, to which all new buildings must be built. Not referencing the prior code does disservice to those following the code, justifies sub-code construction, and feeds into VT's challenges with lack of code enforcement. • Making changes before the PSD completes its upcoming market assessment would be premature. That study will generate new data and the opportunity to conduct a new evidence-based analysis comparing costs and outcomes of building to the 2020 RBES and 2024 RBES. • [More detail in comments] Idea of reverting back to 2020 RBES has created market confusion. Consistency/clarity important for businesses. Division of Fire Safety should be named authority having jurisdiction over the RBES/CBES, currently there is no enforcement. Adopting a rule that increases costs while increasing emisssions is in direct opposition VT Climate Action Plan.	Prior RBES updates have been required by statute and have featured a longer development and stakeholder engagement process. Those prior updates have involved the consideration of new and more demanding standards governing the construction of residential buildings. This proposed update does not involve new standards: it retains the existing 2024 RBES and adds the 2020 RBES as an alternative compliance pathway. Both the 2020 and 2024 RBES have been previously adopted and are known sets of standards with significant development work behind them. The proposed rule does not replace the 2024 RBES and does not suggest that the 2024 RBES are uneconomic. Rather, it offers a choice between two previously adopted sets of standards which have been shown to be cost effective. One option results in lower up-front costs with lower long-term energy savings (2020 RBES) and one results in higher upfront costs with higher long-term energy savings (2024 RBES). Both sets of standards are familiar to building professionals and other stakeholders, as they have already been in effect in Vermont within the last 5 years. As none of the standards are changing, the training and technical support resources that have already been developed will be available and will assist with smooth implementation. [Other PSD responses throughout are relevant to this comment].	No changes made.
	Johanna Miller, Adam Aguirre, Peter Sterling, Robb Kidd, Dan Fingas, Jenny Carter, Ben Edgerly Walsh	VNRC, CLF, REV, VT Sierra Club, VT Conservation Voters, IEE/VLGS, VPIRG	• Writing to express our organizations' concerns about changes to the adopted 2024 RBES. These largely relate to the absence of comprehensive, stakeholder and data-informed process, and potential for conflict with state energy goals, policies, and requirements, along with likely impact on energy affordability. • Recognize and support need for more housing. Also recognize potential impacts of recent federal changes that could be creating issues and additional costs. Since Executive Order 6-25, we understand it has been challenging for contractors asked to choose between two different standards – 2020 or 2024 – creating market confusion and an uneven playing field. If potential legitimate issues are creating confusion and additional costs, we urge a comprehensive, transparent rulemaking, not what appears to be a fast tracked/more opaque effort. • The rulemaking for the 2024 RBES concluded that it met a core threshold for adoption – cost effectiveness. EO 6-25 contradicts that conclusion and confuses implementation; lowering the bar on energy efficiency. More specifically, our concerns relate to: [more detail in comments] • Undermining the robust process and informed conclusion that led to the 2024 RBES. PSD should not override the 2024 rule without a thorough public process. In fact, 30 V.S.A. § 51(c) envisions an Advisory Committee be established prior to each rule revision. The law also requires the rule to be "cost-effective and affordable from the consumer's perspective." The current process appears to fall short on these fronts. • Shortsighted analysis of affordability and cost effectiveness. 2024 RBES was found to be cost effective at that time. Nowhere in the new proposal, as far as we've seen, are the economic impacts over the life of a home analyzed. • The creation of market confusion and likely accompanying challenges when we need to be building more housing – and more durably affordable housing – more quickly. • Timing - doing this before a planned PSD study on code compliance/efficiency doesn't make sense. • Disregarding other benefits of 2024 RBES. • Disregarding core principles from 30 V.S.A. 202a on how to best meet energy needs. • Lack of authority having jurisdiction over compliance. • Undermining VT's efforts/obligations to reduce climate pollution. • We respectfully urge the PSD to pause this rulemaking and direct builders, contractors and architects to comply with the adopted 2024 RBES.	Prior RBES updates have been required by statute and have featured a longer development and stakeholder engagement process. Those prior updates have involved the consideration of new and more demanding standards governing the construction of residential buildings. This proposed update does not involve new standards: it retains the existing 2024 RBES and adds the 2020 RBES as an alternative compliance pathway. Both the 2020 and 2024 RBES have been previously adopted and are known sets of standards with significant development work behind them. The proposed rule does not replace the 2024 RBES and does not suggest that the 2024 RBES are uneconomic. Rather, it offers a choice between two previously adopted sets of standards which have been shown to be cost effective. One option results in lower up-front costs with lower long-term energy savings (2020 RBES) and one results in higher upfront costs with higher long-term energy savings (2024 RBES). Both sets of standards are familiar to building professionals and other stakeholders, as they have already been in effect in Vermont within the last 5 years. As none of the standards are changing, the training and technical support resources that have already been developed will be available and will assist with smooth implementation. [Other PSD responses throughout are relevant to this comment].	No changes made.

From: Michael Chaucer
To: PSD - Code Update Res
Subject: Support for new rule
Date: Tuesday, January 6, 2026 2:36:50 PM

I support the proposed rule to amend RBES to allow compliance with the 2020 regulations. The 2020 standards provide a pathway for designing buildings that are energy efficiency, cost effective, and buildable. Requiring the 2024 standards will only result in a larger gap between the haves and have-nots in Vermont, and worsen the already dire housing affordability crisis we are facing here.

Thank you for your time.

Michael Chaucer, AIA, NCARB
Architect
Haven Architecture LLC
web: haven-architecture.com
phone: 802-310-4774
email: michael@haven-architecture.com

From: Sally Jenks Roth
To: PSD - Code Update Res
Subject: Geothermal energy
Date: Monday, January 26, 2026 12:21:46 PM

I propose that Vermont initiate a rule that all new buildings should include geothermal energy infrastructure while digging foundations. It is the best, cheapest and most reliable energy source of the future. Harder and more expensive to retro-fit.
Do. It. Now!
Sally Jenks Roth
Bristol, VT

From: Kate Stephenson
To: PSD - Code Update Res; PSD - Code Update Comm
Subject: Public Comment: Energy Code Updates
Date: Thursday, January 29, 2026 11:51:45 AM

Dear representatives of the Department of Public Service,

I am writing to oppose the proposed energy code Rules regarding the enforcement of both RBES and CBES.

I write as both a Vermonter, a construction-industry business owner, and someone who cares deeply about Vermont's path towards decarbonization and meeting our climate goals.

I work closely with builders, architects, small-scale housing developers, and tradespeople across the state. Many of them are committed to the highest standards of energy-efficient construction practices - building to Passive House, Net Zero, and EVT's High Performance standard. We know this is not only doable, but we also know it is cost-effective.

We need to continue to push the state forward by adopting progressively more stringent energy codes if we are going to meet the state's overall climate goals. Reverting to the 2020 RBES and CBES standards (or, confusingly, offering people a choice of both 2020 or 2024 versions) is not really going to make housing more affordable. It may reduce the upfront cost in some cases, but it will cost more in the long-term, both for occupants of the buildings and for the state to meet its climate goals.

If DPS is serious about having an impact on buildings through the Energy Code, the real lever would be to create a mechanism for statewide enforcement of the Energy Code. We know that from the most recent RBES compliance reviews that less than 50% of new homes being built are actually meeting the current RBES standards.

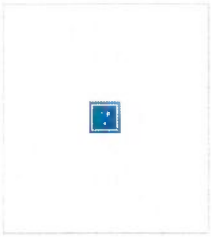
As my colleague Richard Faesy wrote in his VT Digger commentary: "*Vermont's lack of an "authority having jurisdiction" over all energy codes means there is no state agency enforcing the energy codes, resulting in our abysmal energy code compliance rates. Besides home buyers paying higher energy bills, builders can compete on home prices by building sub-standard homes and undercutting their legally compliant competition.*
Naming a state agency such as the Division of Fire Safety to oversee both energy and building codes for all buildings in Vermont — and not just "public buildings" as is currently the case — while establishing a code enforcement system would provide consumer protection."

I urge you to stick with the 2024 RBES and CBES as written, and recind these proposed Rules. It will only create confusion amongst builders in service to a false promise of affordability.

Kate Stephenson
Montpelier, VT

--

Kate Stephenson (she/her)
Co-Founder/Director of Finance
HELM Construction Solutions LLC
802.225.8933



01/15/2026

Brittney Wilson
Department of Public Service
112 State Street
Montpelier, VT
05620

Re: Support for Re-Adoption of 2020 Residential and Commercial Building Energy Standards

Dear Deputy Commissioner,

On behalf of the Vermont Builders & Remodelers Association (VBRA), we write in support of the re-adoption of the 2020 Residential and Commercial Building Energy Standards (RBES and CBES), with no amendments, through the current rulemaking.

VBRA members are actively planning and preparing projects for upcoming construction seasons, and certainty around applicable energy standards is essential. Re-adopting the 2020 RBES and CBES without modification would allow builders and developers to continue relying on existing, well-understood compliance pathways without disruption or delay, including continued use of 2020 ResCheck for residential projects.

We understand that this rulemaking is intended to restore the previously adopted standards following Executive Order 06-25, not to introduce new requirements or technical changes. VBRA supports this limited and practical approach, which helps avoid confusion in the field and provides a stable regulatory framework for projects already underway or in late-stage planning.

Thank you for your efforts to provide timely clarity to Vermont's construction community. We appreciate the opportunity to weigh in and are available for further discussion if helpful.

Sincerely,
Dixie O'Connor
President
Vermont Builders & Remodelers Association

Comments on the Vermont Residential Building Energy Standards (RBES) Amendments -- Signed by June E. Tierney DPS Commissioner, 4/25/23

Comments from Andrew M. Shapiro, Energy Balance, Inc., Montpelier VT 05602
andy@energybalance.us 802-522-0165 -- 2/3/26
I have been a building energy consultant in Vermont since 1988, working on residential, commercial and institutional buildings, new and retrofit, from single family homes to multi-family, ranging in size up to 50,000 square feet. I hold an engineering degree. Please consider my following comments.

1. The 2024 Residential Building Energy Standards were developed with an extensive two-year rule making process that resulted in the 2024 standard, which included a year of delay of implementation. A thoughtful process was led by the Public Service Department (PSD) with a working group and stakeholders from various sectors. This rulemaking should not be over-ridden without a similar process of engagement of the working group and stakeholders, including public meetings, testimony and analysis of cost-effectiveness.

2. The study undertaken in support of the 2024 code development showed that the 2024 code is cost effective from a consumer perspective. That is, when a homeowner buys a new home built to the 2024 standard the annual energy cost savings are greater than the incremental cost of the mortgage to support the higher level of efficiency. The study showed that the upgrade is cash flow positive for the homeowner. In other words, it cost less to own the home built to the 2024 standard than it did to own the same home built to the 2020 standard. This is a far more relevant metric than construction cost when considering affordability, since almost all construction is financed over time.

3. The PSD has a study planned for Spring to re-assess the baseline efficiency and compliance to 2020 and 2024 Standards, with results expected by May, including HERS rating to determine compliance to codes and cost of non-compliance. It makes no sense to make conclusions before this study is completed. Costs for construction and fuel have increased since this analysis was done and the cost/benefit analysis should be updated before declaring the 2024 standard not cost-effective.

4. The 2024 code is not only cost-effective, it improves building durability and occupant comfort and health. In my consulting practice, lack of whole house ventilation (required in the 2024 standard) has led to moisture and mold problems. These problems are costly to repair and mold can have significant health impacts.

5. Disregarding the 2024 Standard creates market confusion. There have been two years of training on the 2024 code. Consistency is important for businesses -- they need to have clear rules that do not change unnecessarily.

6. If the Governor wants to be helpful in making buildings efficient and affordable, he should name the Division of Fire Safety as the authority having jurisdiction over the Energy Standards. At present there is no enforcement of the Standards, disadvantaging builders who abide by the rules compared to those that do not. Surveys have indicated significant lack of adherence to building to the Standards that are now in place.

7. Vermont has adopted a Climate Action Plan to reduce greenhouse gas emissions. Adopting a rule that increases costs to homeowners while increasing greenhouse gas emissions is in direct opposition to that Plan.

8. The high cost of construction, and the rapid rise of those costs, is NOT caused by the 2024 RBES. The incremental cost for going from 2020 to 2024 code is a very small fraction of the general rise in materials and labor costs.

9. Th Governor has introduced significant confusion by attempting to promulgate this rule during the time when builders are planning and costing out projects for the Spring. To blame this confusion on the Energy Standards is misguided. This rule should be rescinded immediately to create certainty for builders for this building season, with a considered process for any revision to take place instead.

ENERGY FUTURES GROUP

PO Box 587
Hinesburg, VT 05461 USA
802.482.5001
info@energyfuturesgroup.com

energyfuturesgroup.com

Comments on "2025/2026 Vermont Building Energy Standards Update"

Richard Faesy, Energy Futures Group, Hinesburg, Vermont 05461
rfaesy@energyfuturesgroup.com, 802-355-9153

February 9, 2026

As a principal at Energy Futures Group (EFG) in Hinesburg, Vermont since 2010--and before that while at the Vermont Energy Investment Corporation (VEIC)--since 1995 I have been involved with the initial establishment of Vermont's Residential Building Energy Standards (RBES) and then every code update, including supporting the Department of Public Service's (PSD) energy code collaboratives and leading the RBES and Commercial Building Energy Standards (CBES) recent update processes. We focus on RBES in these comments.

Each of the RBES revisions (i.e., 1997, 2005, 2011, 2015, 2020 and 2024) involved stakeholder and Advisory Committee meetings and input. More recently, the PSD included additional rounds of stakeholder engagement leading up to the 2024 RBES to ensure a robust discussion and ample opportunity for input from all interested parties. This process was very inclusive and a model of rulemaking to ensure adequate opportunities for engagement and comment. Unfortunately, the Governor's Executive Order 06-25 seems to have disregarded this process while setting us back in our progress to make Vermont homes more energy efficient and affordable. This was a missed opportunity resulting in a rush to judgement.

Housing affordability needs to consider the year-over-year operating costs in addition to the upfront costs of new buildings. This Order and resulting rule would set us backwards at a time when we need to ensure that Vermont homebuyers minimize energy operating costs of a home, especially for renters. The analysis conducted as part of the 2024 RBES update process showed that the 2024 RBES was cost effective from a consumer perspective. That is, the annual energy cost savings were shown to be greater than the incremental cost of the mortgage to support the higher level of efficiency (i.e., "cash flow positive"). In other words, it costs less to own a home built to the 2024 RBES standard than it does to own the same home built to the 2020 standard. And these considerations do not include the fact that a more efficient

building also reduces the homeowner's risk of exposure the future fuel price vulnerability. Not considering the annual operating costs or longer-term benefits and focusing just on first cost is short-sighted and poor policy.

While there are a lot of numbers that have been thrown around as justification for scaling back RBES from 2024 to 2020, there has not been any independent survey of costs or supporting analysis behind this decision that has been widely shared. In making policy changes, it is important to understand the basis for those numbers and provide an analysis built on sound information from the field. This analysis also needs to establish the proper reference basis from which to determine incremental costs of any new code. When someone suggests that the cost to build to the 2024 RBES is $3,000 or $15,000, they need to make it clear "compared to what?". Of course, it costs a lot to achieve 2024 RBES if the basis is sub-code construction. The correct analysis considers the incremental costs above the previous code, since that is legally the level to which all new buildings must be built. Not referencing the prior code does disservice to those law-abiding builders who follow the code, justifies sub-code construction, and feeds into the challenges Vermont has with a lack of energy code enforcement.

Making any decision to roll back RBES to the 2020 standard before the PSD completes its upcoming market assessment baseline study would be premature. That study will generate new field-based data on RBES compliance, creating an opportunity to conduct a fresh, evidence-based analysis comparing the costs and outcomes of building to the 2020 RBES versus the 2024 RBES. While such a comparative analysis may fall outside the scope of the current study contract, the data needed to support it will be available. That research should be completed and considered before any action is taken to roll back the code.

The 2024 RBES made several improvements to the 2020 RBES. A summary of those changes is presented here:

1. Multifamily Alignment
    a. Aligned RBES and CBES standards for multifamily buildings to ensure that regardless of the building height, the energy standards would remain consistent
2. Packages
    a. Combined Base Code and Stretch Code into a single "Standard Package" for simplicity and flexibility
    b. Maintained a "Log Home Package"
3. Thermal Envelope Improvements
    a. Increased insulation requirements for all surfaces

        i. Require continuous insulation on walls
    b. Reduced window U-factors from U-0.30 to U-0.27
    c. Tighter air leakage rates from 3 ACH50 to 0.15 CFM50/Sq. Ft. of Building Shell (~2 ACH50)
        i. Transitioning air leakage measurements from "air changes per hour (ACH) at 50 Pascals pressure" to "cubic feet per minute (CFM) at 50 Pascals pressure per square foot of building shell area of all six sides of the building"
4. Points
    a. Adjusted the number of required points based on house size, while recognizing the inherent higher efficiency of multifamily buildings
    b. Added additional options for points
        i. Demand Response (DR) enabled appliances
        ii. Higher insulation levels
        iii. More efficient mechanical ventilation systems
        iv. Better windows
    c. Insulation Embodied Carbon
        i. Developed new optional points for selecting low embodied carbon insulation materials
5. Mechanical Ventilation
    a. Now require an efficient balanced whole-house ventilation system with heat or energy recovery
6. Electrification
    a. Electric Vehicles (EV)
        i. Included "EV Capable" requirements to ensure that it will be easy to install EV Supply Equipment in the future
    b. Solar
        i. Included "Solar Ready" requirements to ensure that it will be easy to install solar photovoltaic panels in the future
    c. Electric Service Panel
        i. Require an electric service panel capable of powering the whole home or apartment will all electric end-uses
7. Tiny Houses
    a. Recognized and added standards for tiny houses
8. Definitions
    a. Updated and added a number of definitions
9. New Specific Measures
    a. 100% LED lighting
    b. Air-sealed electrical boxes
    c. All ducts must be placed inside the building thermal envelope
    d. Exterior lighting controls
    e. Electric meter for every unit (except affordable multifamily housing)
    f. Efficient electrical transformers
10. Home Energy Rating System (HERS)
    a. Reduced (improved) HERS Index scores for Base Code (54) and Stretch Code (47)
    b. Recognize additional HERS software tools
11. Additions and Alterations
    a. Clarified that unaltered portions of buildings do not need to comply with RBES

12. Referenced Standards
    a. Updated referenced standards

While many of these improvements are focused on code clarifications and improved energy performance of buildings, a key improvement of 2024 RBES is the requirement to install a balanced mechanical ventilation system. Having such a ventilation system in a home allows for a tighter building. Not only is reducing air leakage the most cost-effective energy savings strategy in buildings, but by pairing it with a mechanical ventilation system, this approach helps reduce potential moisture and mold issues to support building durability while—most importantly—providing fresh healthy air for the occupants. Providing homes to buyers and renters in 2026 without an efficient mechanical ventilation system is doing them a disservice or potentially worse if building durability and occupant health are not addressed as part of construction.

Introducing such a significant energy code change years after the 2024 RBES had been enacted has created significant market confusion. We, Efficiency Vermont, and others have been training on the 2024 RBES for years now and worked with hundreds of building professionals to make sure builders, designers, trades contractors, towns, planners, and others are familiar with the 2024 RBES. Consistency is important for businesses -- they need to have clear rules that do not change unnecessarily and cause market confusion.

Ultimately, if the Governor wants to be helpful in making buildings efficient and affordable, he should name the Division of Fire Safety (DFS) as the authority having jurisdiction ("AHJ") over both RBES and CBES. At present there is no enforcement of RBES and CBES, disadvantaging builders who abide by the rules compared to those that do not. Surveys have indicated significant lack of adherence to building to the Standards that are now in place. The DFS already administers electrical and other building codes and would be well-positioned to work with the construction industry to put into place an energy code administration system that would level the playing field for everyone and ensure that buyers and renters benefit by receiving a code-compliant structure.

Finally, Vermont has adopted a Climate Action Plan to reduce greenhouse gas emissions. Adopting a rule that increases costs to homeowners while increasing greenhouse gas emissions is in direct opposition to that Plan.

In summary, rolling back RBES from 2024 to 2020 standards without a meaningful stakeholder process that considers the current construction costs and benefits that are based on an updated market assessment study and analysis seems shortsighted. Any energy code changes should fully account for more than just first-costs and should also consider on-going energy savings, occupant health, building durability, market disruptions, and public policy. If such a robust process were undertaken, we suggest that the result would be to stay the course with the 2024 RBES.

Vermont Builders & Remodelers Association

Public Comments submission to the Department of Public Service
February 9, 2025

Cost effectiveness documentation for Vermont's adoption of the 2024 standards (RBES) was not accurate.

Updates to Vermont's energy codes must be cost effective. (30 VSA 51) According to the Department of Public Services' website, the last version to illustrate 2024 RBES' cost effectiveness was published 4/25/23: PSD website for energy code updates The document is here: PSD Final Proposed Rule Filing 4/25/23

Here are the charts from pages 16-17:

Table 1: Revised Costs and Benefits Anticipated for 2023 RBES Standard Base Code

$1,018

	Average Annual Weighted Savings	Package Costs (over 2020 RBES)	Simple Payback	ROI	Cash Flow
Standard Low Cost 2023	$83	$1,018	12.2	8%	$9
Standard Low Cost 2023 (with Social Cost of Carbon)	$127	$1,018	8.0	12%	N/A
Standard All Electric 2023	$785	$2,951	3.8	27%	$570
Standard All Electric 2023 (with Social Cost of Carbon)	$1,042	$2,951	2.8	35%	N/A
Standard Blended (81% Fossil & 19% Electric)	$216	$1,385	6.4	16%	$116
Standard Blended (81% Fossil & 19% Electric) (with Social Cost of Carbon)	$301	$1,385	4.6	22%	N/A

Table 3: Revised Costs and Benefits Anticipated for 2023 RBES Stretch Code

$1,718

	Average Annual Weighted Savings	Package Costs (over 2020 RBES)	Simple Payback (years)	ROI	Cash Flow
Stretch Low Cost 2023	$158	$1,718	10.9	9%	$33
Stretch Low Cost 2023 (with Social Cost of Carbon)	$227	$1,718	7.6	13%	N/A
Stretch All Electric 2023	$908	$4,551	5.0	20%	$577
Stretch All Electric 2023 (with Social Cost of Carbon)	$1,203	$4,551	3.8	26%	N/A
Stretch Blended (81% Fossil & 19% Electric)	$301	$2,256	7.5	13%	$137
Stretch Blended (81% Fossil & 19% Electric) (with Social Cost of Carbon)	$412	$2,256	5.5	18%	N/A

The three analyses we enclose focus on compliance with the Base Code, but the costs we report exceed Stretch Code numbers as well.

- Analysis #1 finds a $11,847 difference.
- Analysis #2 finds a $16,963 difference. This higher number includes carpentry labor.
- Analysis #3 finds a $9,584 - $16,524 difference. This estimate does not include new mechanical requirements.

Besides envelope and mechanical requirements, the base code requires meeting a certain number of "points." Some of these can be seen in Analysis #1. Our preliminary list of "points" costs is appended as "List of Prescriptive Points." To our knowledge there was no professionally reviewed analysis of the cost effectiveness or even the cost of each point. In practice most add more than $1,000 to the cost of the building. Certainly there are not seven points (the number needed for an average sized home) that are cost free.

Further, statute requires that the new code must generate a positive cash flow and an 8% to 27% return on investment (ROI) for a typical new home. One of our members recently analyzed a 1,900 sf home for R-5 continuous insulation. The additional cost was $5,465. It will have a 43-year payback or 2.3% ROI.

Analysis #1

HUNTINGTON HOMES SINCE 1978

			PROPOSED
Client: Benson. 1872sf. 3 bed. 2 1/2 bath Location: Vermont Quote Date: July 8 2025	2015 Code Package 4	2020 Code Package 4	2024 Code Package 1
Modules: Base Price	$268,348	$268,348	$268,348
Delivery	$5,200	$5,200	$5,200
Crane	$4,500	$4,500	$4,500
2x8 EPS Walls	N/A	N/A	$5,456
Add Heatlock Glass - for 1 point	N/A	N/A	$1,276
Option Tax - If Needed			
Module Total:	**$278,048**	**$278,048**	**$284,780**
ONSITE WORK			
Site Improvements / Utilities	TBD	TBD	TBD
Secondary Wire Allowance	TBD	TBD	TBD
Foundation	$21,900	$21,900	$21,900
Add Foundation Wall Insulation. R15 Continuous	$4,680	N/A	N/A
Add Foundation Wall Insulation. R13+10. Includes Drywall Walls	N/A	$10,800	$10,800
Add R10 Underslab Insulation. - For 1 Point	N/A	$3,190	N/A
Add R20 Underslab Insulation - For 2 Points	N/A	N/A	$4,205
R60 Attic - for 1 point	N/A	N/A	Inc
1.5 ACH50. for 1 point	N/A	N/A	Inc
Onsite Carpentry, Materials, and General Conditions	$55,300	$55,300	$55,300
Propane Fired Boiler / Side Arm Hot Water - for 2 Points	$16,900	$16,900	N/A
Propane Fired Boiler / Hybrid Electric Water Heater - for 3 Points	N/A	N/A	$19,400
Change HBWW to low temp units. SlantFIn Series 80 - for 1 Point	N/A	N/A	$1,200
Onsite Plumbing	$6,800	$6,800	$6,800
Onsite HRV Unit. Blower Door Test under 2.0ACH50 - 3 Points	N/A	$4,800	N/A
Onsite HRV Unit.	N/A	N/A	$5,200
Onsite Electrical	$9,500	$9,500	$9,500
Solar Ready - for 1 Point	N/A	Inc	N/A
Appliance. Allowance	$10,000	$10,000	$10,000
Porch	$8,500	$8,500	$8,500
Contract Total	**$411,628**	**$425,738**	**$437,585**
	$220	$227	$234 $/sf
Net over 2015 Code		$14,110	$25,957
Net over 2020 Code			$11,847
% increase over 2015 Code		3.43%	6.31%
% increase over 2020 Code			**2.78%**

Analysis #2

BOURBEAU CUSTOM HOMES INC
Making your dream home a reality

4657 Lower Newton Road
Swanton, VT 05488
(802) 527-0244 Office
(802) 527-0225 Fax
www.bhomes.org
sales@bhomes.org

Added Cost to comply to 2024 RBES Code compared to 2020 RBES Code
Pricing for average 1600 Sq ft house

Upgraded Features needed to comply to 2024 RBES	Required Feature to meet 2020 RBES	Added Cost to comply to 2024 RBES
R21 cavity wall plus R5 Continuos insulation, Includes added labor and material costs	R21 Cavity wall Insulation	$ 6,375.00
70% SRE Air to Air exchanger ducted and tested	Bath fans with automated timers	$ 6,000.00
Exterior Door jambs extenisions to accomadated thicker walls. Custom sized. Average 3 doors per house	Standard size sills	$ 600.00
Exterior wall Air sealed Electical Boxes	Standard electrical boxes	$ 85.00
Air sealing to meet minumum 2 air exchanges per hour, Materials and Labor	Minumum 3 air exchanges per hour	$ 650.00
Wider window custom jambs for thicker walls	Standard 2x6 wall depth jambs	$ 200.00
	Total Added cost to consumer including Builder Margin	$ 16,963.41

Analysis #3

Jim Bradley, Project Manager & Energy Professional

HERS Rater • BPI Auditor • PHIUS Certified Builder • EEN Professional

221 Cambridge Glen Road, Cambridge VT 05444

Cost to Install Rigid Insulation

July 2025

Rigid Wall Insulation Installation Calculator

Zip Code: 05403

Square Feet*: 2200

Update

Item details	Qty	Low	High
☑ **Rigid Insulation Cost** Non-discounted retail pricing for popular: 1" x 4' x 8' rigid foam insulated panels with foil facing. R6 rating per inch thickness. Calculated purchase quantity includes overage for typical waste and small future repairs.	2349 SF	$2,804	$3,871
☑ **Rigid Wall Insulation Installation Labor, Basic** Basic labor to install rigid insulation with favorable site conditions. Layout, fit, secure and edge seal rigid insulation boards. Includes planning, equipment and material acquisition, area preparation and protection, setup and cleanup.	31.9 h	$1,656	$3,512
☑ **Rigid Wall Insulation Installation Job Supplies** Cost of related materials and supplies typically required to install rigid insulation including: fasteners, vent flow baffles and sealing tape.	2349 SF	$124	$141
Totals - Cost To Install Rigid Insulation	2200 SF	$4,584	$7,524
Average Cost per Square Foot		$2.08	$3.42
Assume extension jambs for 20 openings @ $250-450 each		5,000	9,000
		$ 9, 584	**$16,524**

This analysis does not include the extra 1" of continuous rigid insulation that is recommended for Climate Zone 6 (+ $2,500).

It also does not include cost for seven (7) points.

Actual Costs for Prescriptive Path Points (2024 RBES)
Compiled July 15, 2025

Costs for "Points"

The analysis submitted to LCAR 4/24/23 was for the "average house size." No size stated.
RBES includes the area of unfinished basements, attics, storage, and utility areas. We are therefore using the category "Single family homes 2500 - 4000 sf" which is required to meet seven points.

Component		Description	Points	Incremental Cost above Base Code
Envelope	Slab	R-20 @perimeter and below all	2	$4,205
		R-25 @perimeter and below all	3	(more)
	Walls	R-28 (U-0.036)	1	$1,276
		R-35 (U-0.028)	2	(more)
		R-40 (U-0.025)	3	(more)
		R-48 SIPs (U-0.021)	4	(more)
	Ceiling	R-60 flat/R-49 slope (U-0.021)	1	
		R-80 flat/R-60 slopes (U-0.018)	2	
	Cold floors	R-49 (U-0.021)	1	
	Windows	Triple Pane U-0.27 or better	1	$1,200
		Triple Pane U-0.25 or better	2	(more)
		Triple Pane U-0.21 or better	3	Avg 20 windows @ $360 each = $7200
		Triple Pane U-0.18 or better	4	(more)
	Ext. doors	U-0.26	1	
Air leakage	Tight	0.11 CFM50/sf or better	1	
	Tigher	0.07 CFM50/sf or better	2	
	Tightest	0.03 CFM50/sf or better	3	
Mechanical ventilation	Testing	Testing as specified	1	
Heating & Cooling	Equipment	Energy Star AFUEs: gas furnace >95, oil furnace>85, ...	1	Most contractors meet this standard already. $0 cost.
	Cold Climate Pump	Whole building - Energy Star v.6	5	$2,500
	Ground Source Heat Pump	Whole building - Energy Star	10	$53,500 above propane system if one can find a designer/installer
	Air to water Heat Pump	Whole building - COP > 2.5	5	Are these even available in Vermont?
	Advanced Wood Heat	Comply w RERCVT.org eligible equipment	5	$44,500 above propane system
	Low Temp Hydronic system	Designed to meet peak heat demand w 120 deg water	1	$1,200
	Demand Responsive Thermostats	All thermostats equipped with demant responsive controls	1	$1,500 just for subpanel.
Water	Basic Heat Pump	Elec H20 heater UEF>2.20	3	
	Advanced Heat Pump	Elec H20 heater UEF>3.3	5	
	Low Flow	Shwrs <1.75 gpm, Lavs <1.0 gpm, toilets < 1.28gpf	1	
	Certified	WERS, Watersense, HERS	2	
	Drain Heat Recovery	on primary showers and tubs	1	
	Recirculation	System w push button for remote fixtures	1	
	Pipe insulation	R-4 throughout building	1	
	Demand Responsive Controls	Elec storage H2O heater w on-demand controls	1	
	Point of Use	Remote fixtures have local source of heat	1	
	Solar Ready Zone	R402.7 compliant	2	
	Solar Hot Water	System meets 50% of annual hot water load or better	2	
Renewables	On site generation	PV or other system: 1 point per 1.5 kw, max 4	varies	
Other	Monitoring	Whole building, min 5 circuits	1	
	Radon system	to EPA standards	1	
	Energy Model	Modeled and followed	1	$5,000 + outside Chittenden County
	Battery	Min 6kWh grid connected	1	
	Adv. Lighting Controls	50% of building is controlled continuously/automatically	2	

International Code Council
73 Allston Avenue
Middletown, RI 02842
t: 888.422.7233, ext. 4876
c: 401.265.0003
wnash@iccsafe.org
www.iccsafe.org

February 9, 2026

Brittney Wilson
Department of Public Service
112 State Street
Montpelier, VT 05620

Via email: brittney.wilson@vermont.gov

RE: 2026 Vermont Residential Building Energy Standards (RBES) Amendments

Dear Ms. Wilson,

I am William Nash, a Senior Governmental Relations Manager in Vermont for the **International Code Council** (Code Council) and your liaison to the Code Council. Please allow this letter to serve as written comments regarding the *Vermont Residential Building Energy Standards (RBES) Amendments* based on the 2018, 2021, and 2024 **International Energy Conservation Code** (IECC).

The Code Council is a member-focused association dedicated to helping the building safety community and the construction industry provide safe and sustainable construction through developing codes and standards used in the design, build, and compliance process. Most U.S. states (including Vermont), counties, Federal agencies, and many global markets use the International Codes (I-Codes) to set standards for regulating construction, fire prevention, and energy conservation in the built environment. The IECC is in use or adopted in 48 states, the District of Columbia, the U.S. Virgin Islands, and Puerto Rico, among other jurisdictions (you can view an adoption chart at **Code_Adoption_Maps.pdf (iccsafe.org)**.

The I-Codes (including the 2018 and 2021 IECC) are updated and revised every three years through a **governmental consensus process**. Beginning with the 2024 code development cycle, the IECC is updated every three years through a **standards development process** that adheres to the American National Standards Institute (ANSI) Essential Requirements for openness, balance, consensus, and due process. Both code-development processes incorporate the latest technology, new building products, installation techniques, economics, and costs, while leveraging the most recent advances in public and first-responder safety. It encourages input from all individuals and groups and includes many beneficial changes to the model codes that Vermont currently adopts.

While housing affordability is a serious concern, building energy standards account for only a small share of overall construction costs, which are more heavily influenced by land, labor, financing, and permitting. For many multi-family projects, the added cost of meeting updated RBES requirements is relatively modest and is balanced by long-term energy savings for residents. Strong energy standards can help improve ongoing affordability by reducing utility costs, particularly for households with limited incomes. Concerns about readiness and training are important and can be addressed through phased implementation and additional support for professionals. Maintaining updated standards helps ensure new housing remains affordable and efficient over the long term.

International Code Council
73 Allston Avenue
Middletown, RI 02842
t: 888.422.7233, ext. 4876
c: 401.265.0003
wnash@iccsafe.org
www.iccsafe.org

We respectfully recommend that Vermont continue to support the currently adopted version of RBES (2024), based on the most recent version of the IECC model code (2024), as the proposed amendments would effectively weaken the adopted life-safety codes in Vermont. In addition, the I-Codes correlate without conflicts, eliminating confusion in building design, inconsistent code enforcement, and interpretation across different jurisdictions. Jurisdictions that utilize the most current edition of the I-Codes thereby ensure the highest standards for safety, energy efficiency, sustainability, economic incentive, and long-term resiliency of their built environment. However, we recognize Vermont's unique characteristics and the significant efforts Vermont leaders have made, including their commitment to a safe built environment through up-to-date codes for their visitors and citizens.

The Code Council would like to commend the State of Vermont for its consistently outstanding work in reviewing and proposing regular updates to all of Vermont's life safety codes, as well as the 2018, 2021, and 2024 IECC. The currently adopted life safety codes, including the 2024 IECC, while incorporating amendments that reflect the unique character and needs of Vermont, ensure that the Vermont RBES remains technically viable, allow for consistency in code application and enforcement, allow for economic investment in building construction, and provide for the most significant safety of the public and emergency responders while embracing modern technology, energy efficiency, and building practices.

Technical assistance and training from the Code Council is always available to groups, including, but not limited to: Vermont Design Professionals, Vermont Plans Examiners, The Vermont Plumbers' Examining Board, The State Department of Public Safety, Department of Public Service, and the State Fire Marshal's Office and inspection staff. These groups will continue to have access to, among other things, Code Council training programs and materials, product Evaluation Reports, certification programs, and Code Council technical staff, who assist with code opinions and interpretations based on the IECC and other referenced materials.

Thank you for the opportunity to submit these comments. The Code Council is honored to partner with the State of Vermont to support the adoption and administration of the Vermont RBES, and we look forward to continuing to serve your needs for many years to come. Don't hesitate to contact me via email or cell phone (information noted below) if you have any questions, concerns, or comments about the IECC/RBES adoption or anything else Code Council-related.

Sincerely,

William J. Nash, Jr.
Senior Regional Manager - Government Relations
International Code Council
wnash@iccsafe.org
401-265-0003
888-422-7233; Ext. 4876

From: Joe Greene <joe@josepharchitects.com>
Sent: Monday, December 22, 2025 7:02 AM
To: Sandra Vitzthum
Cc: PSD - Code Update Res
Subject: RE: update on VT building energy codes

Follow Up Flag: Follow up
Flag Status: Completed

Indeed. Yet, they do. These pseudo judiciary boards like DRB's impose this regulatory authority because the Town is allowed to adopt a development zoning regulation without State oversight that says, ..."thou must adhere to whatever code we choose...". If the State happens to be references, it's usually written with the qualifier of, "....applicant must meet the Town or the State requirement...whichever is more restrictive...". The key being that so many of our codes, ordinances, bylaws, etc. are all conditioned by the term "most restrictive".

Hard to stand in front of these folks begging for a permit and tell them they do not have the authority to enforce their own bylaws. It would seem that in order for the municipality to adopt such language, they would need State approval...or, at a minimum be required to stay consistent with the State standard. But, unfortunately, that's just not the world we live in.

Joe Greene, AIA
Joseph Architects
25 Crossroad
Waterbury, VT 05676
802-244-5220
joe@josepharchitects.com

From: Sandra Vitzthum <svitzthum@proton.me>
Sent: Monday, December 22, 2025 6:53 AM
To: Joe Greene <joe@josepharchitects.com>
Cc: psd.codeupdateres@vermont.gov
Subject: RE: update on VT building energy codes

Joe, these are very good points. Adding to the complexity, it's still not clear whether municipalities have authority to enforce any energy code.

From: Joe Greene <joe@josepharchitects.com>
Sent: Monday, December 22, 2025 6:37 AM
To: Sandra Vitzthum <svitzthum@proton.me>
Cc: psd.codeupdateres@vermont.gov
Subject: RE: update on VT building energy codes

Hi Sandra.
Happy holidays. Thanks for the outreach. I also think it should be noted and potentially clarified that all projects have to verify local/municipal zoning regulations. The Town of South Burlington for example, adopts the new CBES and stretch code regardless of the Executive Order. This has led to multiple cases of confusion. The EO is already slightly confusing as the interpreted intent is to create the most flexibility, affordability and easiest regulatory path. But, it doesn't definitively state that one has to choose one version or the other. The inference is that the applicant can "cherry pick" from both 2020 and 2024.

Cheers,

Joe Greene, AIA
Joseph Architects
25 Crossroad
Waterbury, VT 05676
802-244-5220
joe@josepharchitects.com

From: Sandra Vitzthum <svitzthum@proton.me>
Sent: Friday, December 19, 2025 1:30 PM
To: 'Sandra Vitzthum' <svitzthum@proton.me>
Subject: update on VT building energy codes

Just a quick note to let BSAVT members know that Public Service has initiated the process to re-adopt 2020 CBES and 2020 RBES, so that all persons commencing building construction projects shall have the option of complying with either the 2020 or the 2024 version of both CBES and RBES, including the 2020 Stretch Code.

More information is available here: https://publicservice.vermont.gov/efficiency/building-energy-standards/building-energy-standards-update

The goal is to have the new rule be effective by July 1, 2026.

Until then, it is not clear which code you should design to. It may not become clearer until March. Public Service writes, *"there is an Executive Order reinstating the 2020 RBES. Some have raised legal questions about aspects of that order, which does create uncertainty for all involved. What we know with the most confidence today is that the 2024 RBES remains in effect. With that in mind, it's our assessment that designing/building to the 2024 RBES is currently the avenue with the least risk. We would like to be able to offer more guidance on potential options but, given the uncertainty, we'd hate to suggest something that inadvertently leads to higher costs or greater difficulties."*

We can share that VT Builders & Remodelers Association supports adopting 2020 RBES without further amendments so that designers and builders can reference the code and use ResCheck as soon as possible. We will keep you updated as we learn more.

Comments and questions can be submitted to: psd.codeupdateres@vermont.gov

Season's greetings from the folks at BSAVT!
And wishing you a prosperous and safe 2026.

AIA Vermont

Deputy Commissioner, Brittney Wilson
Vermont Department of Public Service
112 State Street Third Floor
Montpelier, VT, 05620-2601
brittney.wilson@vermont.gov

February 4, 2026

Re: Re-Adoption of 2020 Residential and Commercial Building Energy Standards

Dear Deputy Commissioner Wilson,

AIA Vermont (AIAVT) represents architects practicing across residential and commercial building types throughout the state. Our members are committed to advancing building performance and energy efficiency in Vermont while also ensuring that regulatory standards are clear, stable, and workable across the full lifecycle of a project.

AIAVT supports the Department of Public Service's proposal to re-adopt the 2020 Residential and Commercial Building Energy Standards (RBES and CBES), without amendment, through the current rulemaking process.

We offer this support in the following context:

1. Through no fault of DPS staff, cost-effectiveness data incorporated into the 2024 RBES rulemaking was later found to be significantly inaccurate and was not fully vetted during the adoption process.
2. In August 2025, AIAVT suggested to its members that, pending finalized compliance tools for the 2024 RBES/CBES, projects could be certified under the 2020 standards while continuing to pursue higher-performance design outcomes.
3. In September, Governor Scott directed DPS to allow compliance using either the 2020 or 2024 RBES/CBES while this issue is addressed.
4. DPS is now undertaking formal rulemaking to ensure that this flexibility has a clear and defensible legal foundation.
5. Designers, builders, and municipalities are currently facing real confusion about which standard applies to projects beginning this spring, resulting in delays, disputes with clients, and risk for projects already in design.

Architectural projects extend over long timelines and depend on consistency from early design through permitting and construction. Re-adopting the previously adopted 2020 standards provides necessary continuity for projects already underway and allows design teams to rely on established compliance pathways and documentation.

AIA Vermont

AIAVT members strongly support Vermont's long-term energy efficiency and climate goals and the continued advancement of building standards. We also believe those standards must be technically sound, cost-effective, and administratively workable in practice.

The forthcoming compliance and cost-effectiveness study will inform future updates to Vermont's energy standards. That process, however, will not conclude in time to resolve the immediate uncertainty facing the design and construction community.

For these reasons, AIAVT supports this limited and temporary action to restore legal clarity and keep projects moving forward while the State completes its analysis and prepares for a robust stakeholder process later this year.

AIAVT appreciates DPS's efforts to provide certainty during this transition and looks forward to continued engagement on longer-term building energy code policy.

Sincerely,

ANDRES GUTIERREZ.

Andres Gutierrez
President, AIA Vermont

AIA Vermont, 11 Main St. Suite B110A, Vergennes, VT 05491 802-448-2169 info@aiavt.org

February 9, 2026

Department of Public Service
Kerrick Johnson, Commissioner
Brittney Wilson, Deputy Commissioner
112 State Street
Montpelier, VT 05620-2601

RE: Vermont Residential Building Energy Standards (RBES) Rulemaking

Commissioner Johnson and Deputy Commissioner Wilson,

Thank you for the opportunity to comment on the Vermont Residential Building Energy Standards rulemaking. We are writing to express our organizations' concerns about proposed or potential changes to the adopted 2024 Residential Building Energy Standards. Our concerns largely relate to the absence of the usual, comprehensive, stakeholder and data-informed process to warrant an update at this time, as well as the potential for a less stringent energy code to conflict with state energy goals, policies, and requirements and the likely impact on durable energy affordability.

We recognize the need for and support the development of more housing in Vermont. We also recognize and are sympathetic to the potential impacts of recent federal changes that could be creating supply chain issues and additional costs. On top of that, since Governor Scott issued Executive Order 6-25, we understand that it has been a challenging landscape for contractors who have been asked to choose between two different compliance standards – 2020 or 2024 –

creating market confusion and an uneven playing field for contractors who build to (or quote costs for) a higher energy efficiency standard. If these and other potential legitimate issues are creating market confusion and additional costs, we urge a full, comprehensive, data-driven and transparent energy code rulemaking – not what appears to be a fast tracked and more opaque effort.

As you know, in 2023, after more than a two-year, robust, PSD-led public and stakeholder process, the State of Vermont adopted an update to the 2020 Vermont Residential Building Energy Standards (RBES). Among the more significant changes from the 2020 RBES to the 2024 RBES per an April 2023 amendment are: *"Increased insulation R- values for basements; tighter air sealing requirements; efficient balanced whole-house ventilation system with heat recovery requirement; and EV Capable requirements."*

The 2023 RBES amendment also stated an economic rationale for the 2024 update. *"... Adoption of the rule will result in an incremental cost increase for the parties involved in new home construction, purchase, and ownership, and existing home renovation compared to the 2020 RBES, currently in effect. On the other hand, adoption of the rule will provide economic benefits of reduced energy costs, reduced environmental impacts, and improved indoor air quality for the lifetime of the home/building."*[1]

In short: That comprehensive rulemaking effort concluded that an update to the 2020 standard met a core threshold for adoption – cost effectiveness. Despite that, Governor Scott's EO 6-25 contradicts that vetted state conclusion and confuses the implementation of the 2024 RBES standard; lowering the bar on energy efficiency, enabling contractors to comply with *either* the 2020 code or the 2024 code, and creating confusion and uneven application of energy codes.

More specifically, our concerns relate to:

1. **Undermining the robust public- and stakeholder-engaged process and informed conclusion that led to the adoption of an updated 2024 RBES.** Over two years, the PSD convened a diverse group of stakeholders to examine a potential code update. The result of that effort was the adoption of an updated 2024 RBES. This new effort fundamentally disregards and undercuts that public process and its conclusion. The PSD should not override the 2024 rule without a thorough public process that includes diverse stakeholder engagement and an advisory group, public hearings, and expert analysis, including an updated and comprehensive cost-effectiveness test. In fact, 30 V.S.A. § 51(c)

[1] The Department noted that "[f]or the home buyer or home owner, this rule will result in a positive cash flow and an 8% to 27% (35% including the social cost of carbon) return on investment (ROI) for a typical new home compared to the same home built to the 2020 RBES, [then] currently in effect."

envisions an Advisory Committee be established prior to each rule revision. The law also requires the rule to be *"cost-effective and affordable from the consumer's perspective."* The current process appears to fall short on these fronts, and has not been robust or involved robust engagement: the posting of the rule was not far in advance of the initial ICAR hearing, the recent virtual hearing(s) held on February 3, 2026 were poorly attended, and there has been limited data and analysis used to support the PSD's decision to amend the rule.

2. **A shortsighted analysis of affordability and cost effectiveness.** The analysis undertaken to develop and adopt a 2024 RBES found it to be cost effective to the consumer at that time. That means, when a homeowner buys or builds a new home that complies with the 2024 standard, the annual energy cost savings are estimated to be more than the incremental cost of the investment needed to adhere to a higher level of efficiency. That makes it cash flow positive for the homeowner over time by saving them money through the increased efficiency improvements delivered by a higher energy standard; meaning that it will cost less to own a home built to the 2024 standard over time than to build to the 2020 standard. Nowhere in the PSD's new proposal, as far as we've seen, are the economic impacts on residents over the life of a home analyzed, including energy savings, which would be necessary to determine affordability. In short: It is unclear what updated, vetted, and data-driven analysis the PSD would be – or is – relying on to update the rule at this time.

3. **The creation of market confusion and likely accompanying challenges when we need to be building more housing – and more durably affordable housing – more quickly.** The Executive Order – which is not legally binding – de facto enables contractors to either comply with the 2020 *or* 2024 code. This ambivalence creates market uncertainty, inconsistencies and confusion for both contractors and consumers, potentially slowing down building at a time when we need to be bringing more housing to market. It also creates an inequitable playing field for contractors who do comply with the more stringent code.

4. **The timing of this rulemaking procedure.** While we haven't been able to get a clear sense of the focus and timing, it is our understanding that the PSD has a study planned for the coming months that will re-assess the baseline efficiency and code compliance, with results expected sometime this coming April or May. As we noted, it may well be reasonable to reassess the costs and benefits of compliance at this moment – considering the significant market changes imposed by tariffs, inflation and beyond – but

adopting a new rule before this study is released, and a more comprehensive, stakeholder-engaged and data-driven process is conducted, simply doesn't make sense.

5. **Disregarding other benefits of compliance with the 2024 RBES.** Beyond the goal we all share of saving Vermonters money and energy, there are other benefits of adhering to the 2024 code. That includes building homes that are more comfortable for people to live in, more healthy to live in (with better air quality), and that improve building durability by fostering better ventilation and avoiding moisture and mold issues.

6. **Disregarding core principles that guide how to best meet the energy needs of Vermonters.** Per 30 V.S.A. § 202a, Vermont is to look to meet its energy needs in a manner that is *"adequate, reliable, secure and sustainable; that ensures affordability and encourages the State's economic vitality, the efficient use of energy resources, and cost-effective demand-side management; and that is environmentally sound."* Retreating from a more efficient energy code driven largely by a short-term, potentially shortsighted view of affordability directly contradicts and makes several state energy goals of 30 V.S.A. § 202a more difficult to achieve. Retreating also conflicts with 30 V.S.A. § 51(c)(1) which requires *"(1) Any amendments to the RBES shall be: (A) consistent with duly adopted State energy policy, as specified in section 202a of this title ..."*

   Building more energy inefficient houses today will require a greater use of energy to maintain those homes over time; directly contradicting a stated energy goal of efficient use of energy resources – as well as proactively undermining potential demand side management benefits of building more efficient homes out of the gate. When it comes to the state's obligation to provide "adequate," "reliable," "sustainable," and "efficient use of energy resources," adhering to the more stringent 2024 energy code will help the state meet that obligation. That's because building energy efficient homes, from the outset, will require less energy use, meaning less power procured and/or fossil fuels consumed in the state. We also know that it's often far more difficult and expensive to retrofit and weatherize existing homes than it is to make that investment upfront. So enabling building to less efficient standards locks homeowners into using more energy than necessary and the state and energy providers to procure more supply than is otherwise necessary. In short: A less stringent energy code directly contradicts several provisions of state energy policy.

7. **The lack of an authority having clear jurisdiction over compliance.** Currently, and problematically, there is no enforcement of energy standards. This creates a significant disadvantage for builders who abide by the updated codes compared to builders who do

not. To create a more even playing field for builders and to better ensure long-term energy affordability for homeowners, the Division of Fire Safety should be named as the authority having jurisdiction over energy standards compliance, and every builder should follow the same standards. This, unfortunately, is not a new problem and carries over no matter what code contractors are (or are not) abiding by. Enforcement – and one authorized entity to enforce them – is desperately needed. Solving for this significant challenge is largely outside of the bounds of this rulemaking and will likely require statutory change.

8. **Undermining Vermont's efforts – and legal obligation – to reduce climate pollution. In Vermont, that will require strategies that significantly curb reliance on fossil fuels.** Lowering the efficiency bar which new homes must meet simply doesn't make sense. It's bad economic policy for consumers and the State of Vermont as a whole, since we import all of the fossil fuels we collectively use, creating a significant economic drain on our economy and sending over 70% of the dollars Vermonters spend on fossil-fired energy out of state. It's also bad economics for homeowners – especially over time. Again, the 2024 RBES was found to be cost effective over time for consumers. While builders and consumers might balk at potential upfront, additional costs to build more efficiently, that upfront investment will likely save them money over time – potentially significantly. When it comes to the state's guiding energy policy to provide "adequate," "reliable," "sustainable," and "efficient use of energy resources," adhering to the more stringent 2024 energy code will help the state meet that obligation. That's because, as we noted above, building energy efficient homes from the outset will require less power be procured and fossil fuels delivered to and consumed in the state. Inefficient homes use more energy and lock homeowners into avoidable and unnecessarily high energy bills over time. A less stringent rule that will increase energy consumption (and costs) to homeowners while increasing greenhouse gas emissions is also in direct opposition to Vermont's legal obligation to cut planet-warming pollution in line with the requirements of the Global Warming Solutions Act and adopted Climate Action Plan.

For these reasons, we respectfully urge the PSD to pause this rulemaking procedure and direct builders, contractors and architects to comply with the adopted 2024 RBES to avoid further market confusion and help level the playing field for contractors who are voluntarily complying with the updated code. Any further changes to the RBES should be premised on the results of another full rulemaking proceeding – with all its public procedures and analyses – as well informed by the updated baseline analysis we have heard the PSD will be undertaking, with results available this spring.

While we have focused our comments on the RBES, we also have similar concerns about the process and potential economic, environmental and public health issues as it relates to the Commercial Building Energy Standards.

We would look forward to participating in a new, robust rulemaking process that fairly and comprehensively examines current cost compliance and other considerations in what we recognize is a vastly shifting market landscape, while also advancing a shared goal of getting more durably affordable and sorely needed homes built in this moment.

Thank you for your consideration of this input and, in advance, for your responsiveness to it.

Adam Aguirre, *Conservation Law Foundation*
Peter Sterling, *Renewable Energy Vermont*
Robb Kidd, *Vermont Chapter of the Sierra Club*
Dan Fingas, *Vermont Conservation Voters*
Jenny Carter, *Vermont Law and Graduate School*
Johanna Miller, *Vermont Natural Resources Council*
Ben Edgerly Walsh, *Vermont Public Interest Research Group*

February 6, 2026

Submitted via Email to psd.codeupdateres@vermont.gov and psd.codeupdatecomm@vermont.gov

Department of Public Service
Kerrick Johnson, Commissioner
112 State Street
Montpelier, VT 05620-2601

Re: Comments on the Vermont Department of Public Service proposed amendments to the Residential Building Energy Standards and Commercial Building Energy Standards filed with the Interagency Committee on Administrative Rules on December 9, 2025

Vermont Department of Public Service,

Northeast Energy Efficiency Partnerships (NEEP) appreciates the opportunity to provide public comments on the Department's proposed amendments to the Residential Building Energy Standards and Commercial Building Energy Standards filed to align with Executive Order 06-25.

Northeast Energy Efficiency Partnerships[1] is a nonpartisan, non-profit organization that advances energy efficiency in the Northeast and Mid-Atlantic to improve energy affordability, reduce greenhouse gas emissions, lower air pollution, and promote economic development.

As outlined below, the proposed rulemaking would establish two different minimum energy performance standards for new residential and commercial construction during the same regulatory period. This would create unnecessary complexity. And by permitting construction of buildings to the prior code that do not incorporate recent energy performance improvements, the proposed rulemaking would increase energy use and operating costs for households built to the prior code.

The proposed amendments to the Residential Building Energy Standards (RBES) and Commercial Building Energy Standards (CBES) would implement Executive Order 06-25 by allowing projects commencing construction on or after July 1, 2024, to comply with either the 2024 RBES/CBES or the 2020 RBES/CBES. The 2024 RBES and CBES are based on the 2021 International Energy Conservation Code (IECC) with Vermont-specific amendments, including some sections from the 2024 IECC. The 2020 RBES and CBES are based on the 2015 IECC with state amendments and sections from the 2018 and 2021 IECC. The 2015, 2018, and 2021 IECC

[1] About NEEP, https://neep.org/about-neep.

Northeast Energy Efficiency Partnerships 500 Unicorn Park Drive Suite 300 Woburn, MA 01801 P: 781-860-9177 www.neep.org

are distinct model code editions, with the 2021 IECC incorporating updated minimum requirements for building envelope performance, mechanical systems, lighting, air leakage, and verification relative to the 2015 and 2018 IECC. Allowing compliance with the 2020 RBES/CBES based on the 2015, 2018, and portions of the 2021 IECC, permits construction of buildings that do not incorporate all the improvements, resulting in higher energy use and higher operating costs for consumers immediately and over the life of the building.

The U.S. Department of Energy (DOE), supported by analysis conducted by Pacific Northwest National Laboratory (PNNL), has evaluated the cost-effectiveness and energy impacts of adopting the 2021 IECC at the state level, including for Vermont. For residential buildings, PNNL prepared a Vermont-specific cost-effectiveness analysis comparing the 2021 IECC to the prior code basis. That analysis found that adoption of the 2021 IECC results in an estimated 4.5 percent reduction in annual energy use for a representative single-family home in Vermont, compared to the 2015 IECC with amendments as adopted by Vermont[2] The analysis further estimated average first-year utility bill savings of approximately $126 per household, with positive life-cycle cost savings over the life of the home when incremental construction costs are weighed against long-term energy savings. These findings indicate that the residential provisions of the 2021 IECC are cost-effective for Vermont households and reduce long-term energy expenditures.

For commercial buildings, DOE's Building Energy Codes Program has published state-level energy code impact data indicating that updated commercial energy code requirements consistent with the 2021 IECC and associated standards yield average annual energy cost savings of approximately $130 per 1,000 square feet of floor area in Vermont.[3] Furthermore, it estimates life-cycle energy cost savings of approximately $1,820 per 1,000 square feet over a 30-year period, with an average simple payback of approximately seven years for the efficiency measures associated with updated commercial code provisions.[4]

Allowing continued compliance with the 2020 RBES and CBES will contribute to the construction of residential and commercial buildings that do not achieve these documented

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[2] Pacific Northwest National Laboratory, Cost-Effectiveness of the 2021 IECC for Residential Buildings in Vermont, July 2021, available at: https://www.energycodes.gov/sites/default/files/2021-07/VermontResidentialCostEffectiveness_2021_0.pdf.

[3] Department of Energy, Building Energy Codes Program, Vermont, State Profile, available at: https://www.energycodes.gov/status/states/vermont.

[4] Ibid.

Northeast Energy Efficiency Partnerships 500 Unicorn Park Drive Suite 300 Woburn, MA 01801 P: 781-860-9177 www.neep.org

energy and cost savings. This results in higher long-term energy consumption and operating costs for buildings constructed under the older code compared to buildings constructed in compliance with the 2024 RBES and CBES.

Maintaining two concurrent energy code compliance options introduces additional complexity for designers, builders, and code officials. A single statewide energy code baseline improves clarity for market participants and simplifies plan review and inspection. Dual compliance pathways increase administrative burden and make it more difficult to ensure uniform application of energy code requirements.

Vermont's 2024 RBES and CBES represent the state's most current and effective minimum energy performance standards for residential and commercial buildings. Allowing continued compliance with the 2020 RBES and CBES constitutes a step backward from Vermont's established code trajectory and results in lower minimum performance for new construction.

NEEP respectfully encourages the Department to consider maintaining the 2024 RBES and CBES as the sole statewide energy code standard in order to preserve consistent implementation, avoid unnecessary complexity, and ensure that new buildings achieve the long-term energy performance benefits already established in Vermont's current standards.

Thank you again for the opportunity to provide input and for your leadership in advancing energy-efficient buildings in Vermont.

Sincerely,

Dragana Thibault

Dragana Thibault
Manager, Codes and Standards
Northeast Energy Efficiency Partnerships (NEEP)

Northeast Energy Efficiency Partnerships 500 Unicorn Park Drive Suite 300 Woburn, MA 01801 P: 781-860-9177 www.neep.org

From: noreply@vermont.gov
Sent: Monday, January 19, 2026 11:09 AM
To: brittney.wilson@vermont.gov
Subject: Comments on Rule 25P047

EXTERNAL SENDER: Do not open attachments or click on links unless you recognize and trust the sender.

Comments on Rule 25P047
Reply To:co2negative@yahoo.com
As a Vermont resident, I am writing to oppose the adoption of this proposed rule. In my view, this proposed rule is a misguided attempt to accelerate construction of housing, at the expense of both the environment and the ultimate homeowners. The 2024 update to the RBES is, by construction cost-effective, and Vermont should be focusing on lifecycle cost (and environmental impacts) rather than upfront costs. This proposed rule should be rejected, and the 2024 RBES should remain in effect until updated.

From: Nicole <802energyaudits@gmail.com>
Sent: Friday, January 30, 2026 11:52 AM
To: PSD - Code Update Res
Subject: Public comment submission

Follow Up Flag: Follow up
Flag Status: Completed

Hello,

My name is Nicole Henry. I reside and run an energy auditing business out of Rutland Vermont.

I fully support giving builders the option of completing new projects using 2020 or 2024 VT RBES- WITH THE CAVEAT- that a whole house ventilation system (ERV) be required regardless of which RBES path is being taken by the builder.

At 3 air exchanges per hour (2020 RBES) there is still a significant risk for the build-up of moisture and indoor air pollutants that if able to remedied though a continuous exhaust fan alone will create negative pressure in the home affecting the overall comfort of the occupant. It also means that the "fresh" air being brought in from outside is still coming from the existing breaks in the air pressure barrier without being filtered and at various rates.

A dedicated filtered supply inlet ensures that the home has a comfortable indoor air pressure and a continuous clean supply of air for its occupants.

If the executive order is passed into law please consider adding the amendment that balanced whole house ventilation is required whether utilizing the 2020 or 2024 RBES.

Thank you for your time and consideration of this important health and human services issue. Yes we want to house people- but we cannot afford to be short-sighted about it because what may save money in the housing sector can inadvertently create higher costs in another- health care.

Nicole Henry
802 Energy Audits
(802) 353-3539

From: Kevin Dennis <kevincdennis@gmail.com>
Sent: Tuesday, January 13, 2026 12:43 PM
To: PSD - Code Update Res
Subject: Comments Re: RBES, CBES Code Updates

Follow Up Flag: Follow up
Flag Status: Completed

To whom it may concern:

I am writing to express my opinions and concerns with the current and future state of RBES & CBES and their enforcement.

As an architect, I find the standards to be overly complicated and onerous on the design team. I have almost 20 years of experience in the design of net-zero buildings, and I am well versed in building science. I cannot imagine for those who are not how this code is even vaguely comprehensible. I have asked specific questions of Steve Spatz and others at VEIC, and they are unable to decipher the logic of certain aspects of the code. While I understand VEIC is not the governing body, the fact that they are baffled by certain aspects of the code is telling.

From a presentation I saw several years ago at the Better Buildings By Design conference, my understanding is the rate of compliance with RBES in particular is believed to be around 50%. I suspect it is lower. The standards creep higher and higher by the code cycle, and the majority of construction is left behind. The focus should be on education and enforcement. Without it, architects and design professionals are obligated by their professional standards and liability to comply, and Contractors who are completely unregulated have zero motivation for compliance. It simply becomes an "architect's tax," where clients who work with design professionals are held to a different standard than those who do not. I have yet to find a town office that has any understanding of the Compliance Certificates; They simply file them. The Division of Fire Safety is more than overloaded with the responsibilities of enforcing Life Safety, Building Code, and Accessibility. Their knowledge of Energy Code is understandably limited. I can think of a particular building I worked on renovating that was constructed in 2008 by a major Vermont contractor that had zero insulation for the first 4' of the exterior walls. Zero. The occupants literally wore sweaters and drank tea to keep warm.

More specifically, I am particularly concerned with the change to U-values for the envelope. I am unaware of any architect or builder who can confidently model an assembly to determine an accurate U-value. The number of projects that employ an energy consultant is an even smaller subset of the ones who employ design professionals more broadly. A colleague of mine was in disbelief as I explained to them recently that based on the 2024 code, I was unable to give them an accurate assessment of prescriptive envelope requirements.

In addition, I am very concerned with the construction of unvented roof assemblies utilizing exterior rigid insulation to counteract dew point condensation risk. The IECC has a table with specific requirements for the ratio of R-value between cavity and continuous based on climate zone. The Vermont code has no specific requirement, and the guide book says "Conservative building sciences suggests..." I have personally seen roofs constructed with ratios appropriate to the mid-atlantic climate. These assemblies are at a high risk of failure, not just in the opinion of conservative building scientists, but in the opinion of the IECC.

Governor Scott's executive order reverted to the 2020 cycles citing compliance as a hindrance to new housing development. It is the administrative, not the technical aspects that are a hindrance.

--
Kevin C Dennis | Architect
Duxbury, VT | (802) 299-5655

Annotated Text

~~2024~~ Vermont Residential Building Energy Standard AMENDMENTS

DEPARTMENT OF PUBLIC SERVICE

112 State Street
Montpelier, VT 05620

802-828-2811

https://publicservice.vermont.gov/

These rules are adopted under 30 V.S.A. § 51. This document shall be known and cited as the ~~2024~~ *Vermont Residential Building Energy Standard Amendments.* The *2024 Vermont Residential Building Energy Standards* (First Printing: April 2025) published by International Code Council, Inc., (ICC), as amended herein, are incorporated by reference and are available in print from the Vermont Department of Public Service or on the ICC website at: www.iccsafe.org. The *2020 Vermont Residential Building Energy Standards* (First Printing: July 2020) published by ~~International Code Council (~~ICC~~), Inc., as amended herein,~~ are incorporated by reference and are available in print from the Vermont Department of Public Service or on the ICC website at: www.iccsafe.org

PREFACE

delete and replace Preface as follows:

Introduction

The 2024 *Vermont Residential Building Energy Standards* (RBES) is based on the *2020 Vermont Residential Building Energy Standards*, which are based on the 2018 and 2015 *International Energy Conservation Code*® (IECC®). The 2024 RBES also includes 2021 and 2018 IECC energy efficiency requirements as well as select language updates and additional, more stringent Vermont energy efficiency requirements.

This comprehensive energy conservation code establishes minimum regulations for energy efficient buildings using prescriptive and performance-related provisions. It is founded on broad-based principles that make possible the use of new materials and new energy efficient designs.

The *International Energy Conservation Code* provisions provide many benefits, among which is the model code development process that offers an international forum for energy professionals to discuss performance and prescriptive code requirements. This model code also encourages international consistency in the application of provisions.

Development

This 2024 RBES is founded on principles intended to establish provisions consistent with the scope of an energy conservation code that adequately conserves energy; provisions that do not unnecessarily increase construction costs; provisions that do not restrict the use of new materials, products or methods of construction; and provisions that do not give preferential treatment to particular types or classes of materials, products or methods of construction.

Background

The Vermont Residential Building Energy Standards (RBES) was adopted by statute (30 V.S.A. § 51) in 1997. Act 89 of 2013 established a Stretch Code defined as a building energy code for residential buildings that achieves greater energy savings than the RBES. The stretch code shall be available for adoption by municipalities under 24 V.S.A. §117 and shall apply in proceedings under 10 V.S.A. §151 (Act 250).

Update Process

The Residential Building Energy Standards statute ~~requires that revisions to the RBES are made promptly after~~provides that the Commissioner of Public Service may direct the timely and appropriate revision of the RBES after the issuance of updated standards under the *International Energy Conservation Code* (IECC). The Department of Public Service (PSD) ~~is required to~~ convened stakeholders that included mortgage lenders, builders, building designers, utility representatives, and other persons with experience and expertise prior to the adoption of ~~a revised~~the 2024 RBES to provide recommendations.

The 2024 RBES is based on the language in the 2015 edition of the IECC and includes efficiency improvements included in the 2018 and 2021 IECC to ensure continued progression in efficiency in the Vermont RBES. The 2024 RBES builds on the "Package Plus Points" approach to code compliance, initiated in 2020. (Previous code compliance was achieved through a "prescriptive package" approach). The addition of "points" provides builders and designers greater flexibility in complying with the RBES. The 2024 RBES also simplified the Packages and makes them applicable to both the Base Code and the Stretch Code, with the only difference being the number of Points needing to be achieved. The 2024 RBES also attempts to better address multifamily construction by aligning the standards between RBES and the Commercial Building Energy Standards (CBES) so that regardless of whether the multifamily building falls under RBES (up to three stories in height) or CBES (buildings four stories or higher), the energy standards should be consistent. The Code Collaborative Process undertaken in 2021 allowed for more in-depth discussions with stakeholders on topics and many of the suggestions are reflected in the 2024 RBES. The Vermont PSD also held a series of stakeholder meetings in 2022 to gather feedback on proposed changes to the RBES. The ~~revisions presented in this document~~2024 RBES provisions were modified based on input received from these meetings.

The PSD has continued to receive input from stakeholders since the adoption of the 2024 RBES, including significant feedback from builders and architects. Since the development of the 2024 RBES, undertaken from 2021-2023, Vermont has continued to confront challenges in the housing and construction sectors – including rising costs and a severe housing shortage. Pursuant to 30 V.S.A. § 51, the RBES must be cost effective and affordable from the consumer perspective and must be consistent with state housing and energy policy. Recognizing these principles, the revisions presented in this document provide additional flexibility to address the pressing housing need while maintaining highly efficient standards for residential construction.

EFFECTIVE USE OF THE 2024 VERMONT RESIDENTIAL BUILDING ENERGY STANDARDS

The 2024 *Vermont Residential Building Energy Standards* (RBES) is a code that regulates minimum energy conservation requirements for new buildings as well as additions, alterations, renovations, and repairs to existing buildings. The 2024 RBES addresses energy conservation

requirements for all aspects of energy uses in residential construction, including heating and ventilating, lighting, water heating, and power usage for appliances and building systems.

The 2024 RBES is a design document. For example, before constructing a building, the designer must determine the minimum insulation *R*-values and fenestration *U*-factors for the building exterior envelope. The RBES sets forth minimum requirements for exterior envelope insulation, window and door *U*-factors and SHGC ratings, duct insulation, lighting and power efficiency, mechanical ventilation, and water distribution insulation.

Arrangement and Format of the 2024 RBES

The 2024 RBES, like other codes published by the International Code Council® (the ICC®), is arranged and organized to follow sequential steps that generally occur during a plan review or inspection. The 2024 RBES is divided into six different parts:

Chapters	Subjects
1-2	Scope, administration and definitions
3	General requirements
4	Residential energy efficiency
5	Existing buildings
6	Referenced standards

The following is a chapter-by-chapter synopsis of the scope and intent of the provisions of the 2024 *Vermont Residential Building Energy Standards*:

Chapter 1 Scope and Administration. This chapter contains provisions for the application, enforcement and administration of subsequent requirements of the code. In addition to establishing the scope of the code, Chapter 1 identifies which buildings and structures come under its purview. Chapter 1 is largely concerned with maintaining "due process of law" in enforcing the energy conservation criteria contained in the body of this code. Only through careful observation of the administrative provisions can the *code official or authority having jurisdiction*, where one exists, reasonably expect to demonstrate that "equal protection under the law" has been provided.

Chapter 2 Definitions. Chapter 2 is the repository of the definitions of terms used in the body of the code. Codes are technical documents and every word, term and punctuation mark can impact the meaning of the code text and the intended results. The code often uses terms that have a unique meaning in the code and the code meaning can differ substantially from the ordinarily understood meaning of the term as used outside of the code.

The terms defined in Chapter 2 are deemed to be of prime importance in establishing the meaning and intent of the code text. The user of the code should be familiar with and consult this chapter because the definitions are essential to the correct interpretation of the code and the user may not be aware that a term is defined.

Where understanding of a term's definition is especially key to or necessary for understanding of a particular code provision, the term is shown in *italics* wherever it appears in the code. This is true only for those terms that have a meaning that is unique to the code. In other words, the generally understood meaning of a term or phrase might not be sufficient or consistent with the

meaning prescribed by the code; therefore, it is essential that the code-defined meaning be known.

Guidance regarding tense, gender and plurality of defined terms as well as guidance regarding terms not defined in this code is provided.

Chapter 3 General Requirements. Chapter 3 provides interior design conditions that are used as a basis for assumptions in heating and cooling load calculations, and provides basic material requirements for insulation materials and fenestration materials, and provides standards for residential mechanical ventilation and combustion safety.

Chapter 4 Residential Energy Efficiency. Chapter 4 contains the energy-efficiency-related requirements for the design and construction of residential buildings regulated under this code. It should be noted that the definition of a *residential building* in this code is unique for this code. In this code, a *residential building* is an R-2, R-3 or R-4 building three stories or less in height. All other R-1 buildings, including residential buildings greater than three stories in height, are regulated by the energy conservation requirements in the Vermont Commercial Building Energy Standards (CBES). The applicable portions of a residential building must comply with the provisions within this chapter for energy efficiency. This chapter defines requirements for the portions of the building and building systems that impact energy use in new residential construction and promotes the effective use of energy. The provisions within the chapter promote energy efficiency in the building envelope, the heating and cooling system, lighting and the service water heating system of the building. Vermont has adopted a two-tiered code structure with a "B*ase Code*" that applies statewide, and a "*Stretch Code*" that is more stringent. The *Stretch Code* applies to all Act 250 development projects and is also available for municipalities that choose to adopt a higher energy standard.

Chapter 5 Existing Buildings. Chapter 5 of each set of provisions contains the technical energy efficiency requirements for existing buildings. Chapter 5 provisions address the maintenance of buildings in compliance with the code as well as how additions, alterations, repairs and changes of occupancy need to be addressed from the standpoint of energy efficiency. Specific provisions are provided for historic buildings.

Chapter 6 Referenced Standards. The code contains numerous references to standards that are used to regulate materials and methods of construction. Chapter 6 contains a comprehensive list of all standards that are referenced in the code. The standards are part of the code to the extent of the reference to the standard. Compliance with the referenced standard is necessary for compliance with this code. By providing specifically adopted standards, the construction and installation requirements necessary for compliance with the code can be readily determined. The basis for code compliance is, therefore, established and available on an equal basis to the *code official or authority having jurisdiction*, where one exists, contractor, designer and owner.

Chapter 6 is organized in a manner that makes it easy to locate specific standards. It lists all of the referenced standards, alphabetically, by acronym of the promulgating agency of the standard. Each agency's standards are then listed in either alphabetical or numeric order based on the standard identification. The list also contains the title of the standard; the edition (date) of the standard referenced; any addenda included as part of the ICC adoption; and the section or sections of this code that reference the standard.

Italicized Terms

Selected terms set forth in Chapter 2, Definitions, are italicized where they appear in code text. Such terms are not italicized where the definition set forth in Chapter 2 does not impart the intended meaning in the use of the term. The terms selected have definitions that the user should read carefully to facilitate better understanding of the code.

Marginal Markings

Solid vertical lines in the margins within the body of the code indicate Vermont specific additions and changes from the requirements of the 2015 IECC and the 2018 edition. Deletion indicators in the form of an arrow (➡) are provided in the margin where an entire section, paragraph, exception or table has been deleted or an item in a list of items or a table has been deleted.

Abbreviations and Notations

The following is a list of common abbreviations and units of measurement used in this code. Some of the abbreviations are for terms defined in Chapter 2. Others are terms used in various tables and text of the code.

AFUE	Annual fuel utilization efficiency
ATWHP	Air-to-water heat pump
bhp	Brake horsepower (fans)
Btu	British thermal unit
Btu/h-ft^2	Btu per hour per square foot
C-factor	See Chapter 2—Definitions
CDD	Cooling degree days
CFA	Conditioned floor area
cfm	Cubic feet per minute
cfm/ft^2	Cubic feet per minute per square foot
ci	Continuous insulation
COP	Coefficient of performance
CO_2e	Carbon dioxide equivalent
DCV	Demand control ventilation
°C	Degrees Celsius
°F	Degrees Fahrenheit
DWHR	Drain water heat recovery
DX	Direct expansion
E_c	Combustion efficiency
E_v	Ventilation efficiency
E_t	Thermal efficiency
ECM	Electronically commutated motor
EER	Energy efficiency ratio
EF	Energy factor
ERI	Energy rating index
EPD	Environmental product declaration

F-factor	See Chapter 2—Definitions
FDD	Fault detection and diagnostics
FEG	Fan efficiency grade
FL	Full load
ft^2	Square foot
GPF	Gallons per flush
GPM	Gallons per minute
GSHP	Ground-source heat pump
GWP	Global warming potential
HDD	Heating degree days
HERS	Home Energy Rating System
hp	Horsepower
H/ERV	Heat or energy recovery ventilation
HSPF	Heating seasonal performance factor
HVAC	Heating, ventilating and air conditioning
IEER	Integrated energy efficiency ratio
IPLV	Integrated Part Load Value
Kg/m^2	Kilograms per square meter
kW	Kilowatt
LPD	Light power density (lighting power allowance)
L/s	Liters per second
Ls	Liner system
m^2	Square meters
MERV	Minimum efficiency reporting value
NAECA	National Appliance Energy Conservation Act
NPLV	Nonstandard Part Load Value
Pa	Pascal
PF	Projection factor
pcf	Pounds per cubic foot
PSD	Department of Public Service (Vermont)
psf	Pounds per square foot
PTAC	Packaged terminal air conditioner
PTHP	Packaged terminal heat pump
R-value	See Chapter 2—Definitions
SCOP	Sensible coefficient of performance
SEER	Seasonal energy efficiency ratio
SHGC	Solar Heat Gain Coefficient
SPVAC	Single packaged vertical air conditioner
SPVHP	Single packaged vertical heat pump
SRE	System recovery efficiency
SRI	Solar reflectance index
SWHF	Service water heat recovery factor
U-factor	See Chapter 2—Definitions
VAV	Variable air volume
VRF	Variable refrigerant flow
VT	Visible transmittance
W	Watts
w.c.	Water column
w.g.	Water gauge

CHAPTER 1
ADMINISTRATION

PART 1—SCOPE AND APPLICATION

SECTION R101
SCOPE AND GENERAL REQUIREMENTS

delete and replace **R101.1 Title.**
This code shall be known as the 2024 *Vermont Residential Building Energy Standards* (RBES) and shall be cited as such. It is referred to herein as "this code."

delete and replace **R101.2 Scope.**
This code applies to *residential buildings* and the *building sites* and associated systems and equipment, including one family dwellings, two family dwellings, and multifamily housing three stories or less in height.

For the purpose of determining the building type that must comply with the RBES under Vermont statute, a multifamily building is a *residential building* or *mixed-use* building with three or more *dwelling units* three stories or less in height. Multifamily buildings of four stories or more in height must comply with the CBES (from Vermont 30 V.S.A. § 51.)
While many sections of this code (e.g., inspections, review of construction documents, compliance, etc.) do not pertain to most of Vermont that lacks a *code official or authority having jurisdiction*, these sections are included to provide guidance for those jurisdictions that do have a *code official or authority having jurisdiction*.

delete and replace **R101.7 Base and Stretch Code.**
The "*Base Code*" is the RBES Energy Code that is applicable throughout Vermont, except for projects subject to 10 V.S.A. Chapter 151 (Act 250), and in any municipalities that have adopted the more stringent "Stretch Code."

All *Base Code* requirements shall be met in addition to the requirements in the *Stretch Code* section R407 in order to be in compliance with the *Stretch Code*.

delete and replace **R101.8 Compliance options.**

2020 RBES Pathway
As an alternative compliance pathway, projects meeting the requirements of the *2020 Vermont Residential Building Energy Standards* (RBES) (First Printing: July 2020), published by International Code Council (ICC), shall satisfy this code. For purposes of this pathway, all provisions and requirements of the 2020 RBES shall govern compliance. Projects electing to follow the 2020 RBES must follow the associated stretch code when required.

The 2020 RBES are available in print from the Vermont Department of Public Service, and on the ICC website at iccsafe.org. Additional resources for compliance are available at https://publicservice.vermont.gov/efficiency/building-energy-standards/residential-building-energy-standards.

2024 RBES Pathway

For projects following the 2024 RBES, t~~T~~here are three thermal efficiency compliance options:

1. Package Plus Points: For the *Base Code* and *Strech Code*, Table R402.2.1.1 lists the options for insulation and fenestration packages. Table R402.1.2.2 lists the additional points required for compliance based on building square footage for both *Base Code* and *Stretch Code*, and Table R402.1.2.3 lists the components and respective point values to be used to meet the point requirement in Table R402.1.2.2.

2. RES*check*™: The U.S. Department of Energy's RES*check*™ software.

3. Home Energy Rating System (HERS): A HERS energy rating that demonstrates compliance with Section 406.4 for the Base or Stretch Code based on REM v16.3.3 or later or Ekotrope version 4.0 or later that is accredited by RESNET at https://www.resnet.us/providers/accredited-providers/hers-software-tools/.

PART 2—ADMINISTRATION AND ENFORCEMENT

SECTION R103
CONSTRUCTION DOCUMENTS

delete and replace **R103.1 General.**
Where required, construction documents, technical reports and other supporting data shall be submitted in one or more sets, or in a digital format where allowed by the code *official or authority having jurisdiction*, where one exists, with each application for a permit. The construction documents and technical reports shall be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed. Where special conditions exist, the *code official or authority having jurisdiction*, where one exists, is authorized to require necessary construction documents to be prepared by a registered design professional.

> **Exception:** The *code official or authority having jurisdiction,* where one exists, is authorized to waive the requirements for construction documents or other supporting data if the *code official or authority having jurisdiction,* where one exists, determines they are not necessary to confirm compliance with this code.

delete and replace **R103.2 Information on construction documents.**
Where required, construction documents shall be drawn to scale upon suitable material. Electronic media documents are permitted to be submitted where *approved* by the *code official or authority having jurisdiction*, where one exists. Construction documents shall be of sufficient clarity to indicate the location, nature and extent of the work proposed, and show in sufficient detail pertinent data and features of the *building*, systems and equipment as herein governed. Details shall include, but are not limited to, the following as applicable:

1. Insulation materials and their *R*-values.
2. Fenestration *U*-factors and *solar heat gain coefficients* (SHGC).
3. Area-weighted U-factor and *solar heat gain coefficients* (SHGC) calculations.

4. Mechanical system design criteria.

5. Mechanical and service water-heating systems and equipment types, sizes and efficiencies.

6. Equipment and system controls and control strategies.

7. Duct sealing, duct and pipe insulation and location.

8. Air sealing details.

9. Energy code compliance path.

SECTION R104
INSPECTIONS

delete and replace **R104.1 General.**
Where required, construction or work for which a permit is required shall be subject to inspection by the *code official or authority having jurisdiction*, where one exists, or his or her designated agent, and such construction or work shall remain visible and able to be accessed for inspection purposes until *approved.* It shall be the duty of the permit applicant to cause the work to remain visible and able to be accessed for inspection purposes. Neither the *code official or authority having jurisdiction*, where one exists, nor the jurisdiction shall be liable for expense entailed in the removal or replacement of any material, product, system or building component required to allow inspection to validate compliance with this code.

CHAPTER 2
DEFINITIONS

SECTION R202
GENERAL DEFINITIONS

add **ACCESS (TO).** That which enables a device, appliance, or equipment to be reached by *ready access* or by a means that first requires the removal or movement of a panel or similar obstruction.

delete and replace **AIR BARRIER.** An air barrier is a durable solid (non-porous) assembly that blocks air flow through the *building thermal envelope* and its assemblies. Air barriers must be continuous, sealed at all joints, penetrations, and interruptions using durable sealants intended for such use and compatible with all adjacent materials, and able to resist pressures without displacement or damage.

add **BUILDING SHELL AREA.** The sum of the area of ceiling, floors, and walls, slab (all "six sides") separating a *dwelling unit's conditioned space* from the exterior or from adjacent conditioned or unconditioned spaces. Wall height shall be measured from the finished floor of the *dwelling unit* to the underside of the floor above.

delete and replace **BUILDING SITE.** A contiguous area of land that is under the ownership or control of one entity.

add **CARBON DIOXIDE EQUIVALENT (CO_2E).** A measure used to compare the impact of various greenhouse gases based on their global warming potential (GWP). CO_2e approximates the warming effect of a unit mass of a given greenhouse gas relative to that of carbon dioxide (CO_2).

add **CAVITY INSULATION.** Insulating material located between framing members.

delete and replace **CLIMATE ZONE.** A geographical region based on climatic criteria as specified in this code. Vermont is *Climate Zone* 6.

delete **DEADBAND.** The temperature range in which no heating or cooling is used.

add **DEMAND RESPONSE SIGNAL.** A signal that indicates a price or a request to modify electricity consumption for a limited time period.

add **DEMAND RESPONSIVE CONTROL.** A control capable of receiving and automatically responding to a demand response signal.

add **DIMMER.** A control device that is capable of continuously varying the light output and energy use of light sources.

add **ELECTRIC VEHICLE CHARGING – LEVEL 2 CAPABLE.** Level 2 "capable" includes space in the utility room for panel(s) of at least one minimum 40-ampere branch circuit to be provided to garages and/or the exterior of the building to accommodate a future dedicated Society of Automotive Engineers (SAE) standard J1772-approved Level 2 EVSE with a J1772 connector or NEMA 14-50, or equivalent, within 5 feet of the centerline for each EV charging parking space. A conduit or other unobstructed path to easily run a future wire to the parking spot shall also be provided.

add **ELECTRIC VEHICLE CAPABLE PARKING SPACE. A parking** space with all the requisite infrastructure in place within five feet to allow electrical wiring and connection to power for EVSE.

delete and replace **ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE).** Level 2 electric vehicle charging parking that requires one 208/240V 40 amp grounded connection for electric vehicle charging through dedicated EVSE with J1772 connector or AC receptacle, NEMA 14-50, or equivalent, within 5 feet (1524 mm) of the centerline for each EV charging parking space.

add **GLOBAL WARMING POTENTIAL (GWP).** GWP is an index for estimating the relative global warming contribution of atmospheric emissions of 1 kg of a particular greenhouse gas compared to emissions of 1 kg of CO_2. The following GWP values are used based on a 100-year time horizon: 1 for CO_2, $\leq$ 10 for pentane (e.g., C_5H_{12}), and 1430 for R-134a (CH_2FCF_3).

add **GLOBAL WARMING POTENTIAL (GWP) INTENSITY**. For the purposes of this document, GWP intensity refers to the GWP impact from materials (kg $CO2_e$) divided by the project's total conditioned floor area in square feet (ft^2).

delete **HIGH-EFFICACY LAMPS/ LIGHTING.**

add **HIGH-EFFICACY LIGHT SOURCES.** Non-linear medium screw- and pin-base lamps with a minimum efficacy of not less than65 lumens per watt; or light fixtures of not less than 65 lumens per watt. In determining the number or percent of lamps, each replaceable lamp (or light string) connected to a permanently installed lighting fixture shall count as one lamp.

delete **LEVEL 1 ELECTRIC VEHICLE CHARGING.**

delete **LEVEL 2 ELECTRIC VEHICLE CHARGING.**

delete and replace **LIGHTING.** See "High-efficacy light sources."

delete and replace **MULTIFAMILY DWELLING/BUILDING.** A building containing three or more dwelling units where the occupants are primarily permanent in nature and which are adjacent vertically or horizontally. If built side-by-side, at least one of the following is true: (1) they do not have a wall that extends from ground to roof, (2) they share a heating system, or (3) they have interstructural public utilities such as water supply/sewage disposal.

add **NET ZERO ENERGY READY.** A highly efficient and cost-effective building designed and constructed so that renewable energy could offset all or most of its annual energy consumption.

add **OCCUPANT SENSOR CONTROL.** An automatic control device that detects the presence or absence of people within an area and causes lighting, equipment or appliances to be regulated accordingly.

add **ON-SITE RENEWABLE ENERGY GENERATION.** Energy from renewable energy resources that is generated at the building site.

add **READY ACCESS (TO).** That which enables a device, appliance, or equipment to be directly reached without requiring the removal or movement of any panel or similar obstruction.

add **RENEWABLE ENERGY CERTIFICATE (REC).** An instrument that represents the environmental attributes of one megawatt hour of renewable energy; also known as an energy attribute certificate (EAC).

delete **RENEWABLE ENERGY SOURCES.**

add **RENEWABLE ENERGY RESOURCES.** Energy produced using a technology that relies on a resource that is being consumed at a harvest rate at or below its natural regeneration rate including, but not limited to, solar hot water, solar hot air, solar photovoltaics, wind, and hydro.

(A) Methane gas and other flammable gases produced by the decay of sewage treatment plant wastes or landfill wastes and anaerobic digestion of agricultural products,

byproducts, or wastes shall be considered renewable energy resources, but no form of solid waste, other than agricultural or silvicultural waste, shall be considered renewable.

(B) The only portion of electricity produced by a system of generating resources that shall be considered renewable is that portion generated by a technology that utilizes a renewable fuel or energy source.

(C) The following fuels shall not be considered renewable energy sources: coal, oil, propane, and fossil natural gas.

(D) *Biomass* is considered renewable.

(E) *Biodiesel* is considered renewable.

delete and replace **SOLAR ENERGY SOURCE.** Source of thermal, chemical, or electrical energy derived directly from conversion of incident solar radiation.

delete and replace **STRETCH CODE.** A building energy code that achieves greater energy savings than the B RBES *Base Code*. The *Stretch Code* is required for Act 250 projects and may be adopted by municipalities.

add **THERMAL DISTRIBUTION EFFICIENCY (TDE).** The resistance to changes in air heat as air is conveyed through a distance of air duct. TDE is a heat loss calculation evaluating the difference in the heat of the air between the air duct inlet and outlet caused by differences in temperatures between the air in the duct and the duct material. TDE is expressed as a percent difference between the inlet and outlet heat in the duct.

add **TINY HOUSE.** A detached *dwelling unit* of less than **400** square feet of floor area **excluding lofts.**

add **TYPE III PRODUCT-SPECIFIC ENVIRONMENTAL PRODUCT DECLARATION (EPD).** An EPD is a document that describes the results of a life cycle assessment (LCA) for a material or product. While there are industry-specific EPDs, which average results across multiple product manufacturers, product-specific EPDs are the most thorough type of EPD. Type III, product-specific EPDs cover a single product from a manufacturer and are reviewed by a third-party entity. They conform to ISO 14025 and either EN 15804 or ISO 21930. Like all product specific EPDs, the scope must cover the product's life-cycle from cradle to gate.

CHAPTER 3
GENERAL REQUIREMENTS

SECTION R302
DESIGN CONDITIONS

delete and replace **R302.2 Climactic data.**
The following design parameters in Table R302.2 shall be used for calculations required under this code.

Adjustments may be made only in the following cases:

1. Winter heating design temperatures for projects either:

   i. Located at an elevation of 1,500 feet (457 m) or higher, or

   ii. Located in Caledonia, Essex or Orleans counties.

   iii. Adjustments shall be made as listed in the National Climate Data Center for the specific weather station: http://www.ncdc.noaa.gov/cdo-web/.

2. As approved by the *code official or authority having jurisdiction,* where one exists.

SECTION R303
MATERIALS, SYSTEMS AND EQUIPMENT

delete and replace **R303.1.2 Insulation mark installation.**
Insulating materials shall be installed such that the manufacturer's *R*-value mark is readily observable upon inspection. For insulation materials that are installed without an observable manufacturer's R-value mark, such as blown or draped products, an insulation certificate complying with **Section R303.1.1** shall be left immediately after installation by the installer, in a conspicuous location within the building, to certify the installed R-value of the insulation material.

add **R303.1.5 Air-impermeable insulation.**
Insulation having an air permeability not greater than 0.004 cubic feet per minute per square foot [0.002 L/(s × m2)] under pressure differential of 0.3 inch water gauge (75 Pa) when tested in accordance with **ASTME2178** shall be determined air-impermeable insulation.

SECTION 304
DESIGN CRITERIA FOR RESIDENTIAL VENTILATION SYSTEMS

delete and replace **R304.1 Scope.**
This section shall govern ventilation of the dwelling unit(s) within Type R-1 *residential buildings*, Type R-2 *residential buildings* and multiple single-family attached dwellings (townhouses and *multifamily* buildings) not more than three stories in height.

delete and replace **R304.1.1 Compliance.**
Compliance with Section 304 shall be achieved by installing a *whole house balanced ventilation system* with minimum 75 *SRE* and 1.2 cfm/Watt, determined in accordance with HVI Publication 920 and listed in HVI Publication 911, while also meeting compliance with Sections 304.2

through 304.11 or demonstrating compliance with one of the following alternatives:

1. ASHRAE Standard 62.2—2019 (Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings)

2. Passive house ventilation requirements (PHI or PHIUS)

Exceptions:

1. *Whole house balanced ventilation systems* that are controlled using user-settable closed-loop feedback based on pollutant levels (e.g., carbon dioxide or volatile organic compounds) are not subject to run-time ventilation rate minimums in the standards referenced above, or Section 304.6.1.1.

2. *Tiny houses* may install an exhaust-only ventilation system.

delete and replace **304.2 Local ventilation.**
Ventilation fans in bathrooms containing a bathtub, shower, spa or similar bathing fixture and not included in the whole house ventilation system shall be sized to provide 50 CFM intermittent or 20 CFM continuous exhaust capacity. Whole house ventilation fans serving both localized and whole house ventilation functions shall be sized to meet the net capacity rates as required by Section R304.6 and must meet all other requirements listed in Section R304.3, as applicable.

TABLE 304.2
MINIMUM REQUIRED LOCAL EXHAUST

OCCUPANCY CLASSIFICATION	MECHANICAL EXHAUST CAPACITY (CFM)
Bathrooms	50 cfm intermittent or 20 cfm continuous

delete **R304.3 Whole house balanced ventilation.**

delete and replace **R304.5 Fan motor requirements.**
Fans installed for the purpose of providing whole house ventilation must meet the minimum requirements as specified in this section.

delete **R304.5.2 Fan power consumption.**

delete **R304.5.34 Performance verification.**

delete and replace **R304.6 Net capacity requirements.**
Whole house ventilation system fans shall be installed according to the manufacturer's installation instructions and shall have the manufacturer's fan flow ratings as listed in accordance with HVI 911. Unless the whole house system is tested according to procedures in Section R304.6.1, the minimum continuous flow rate that the ventilation system must be capable of supplying during its operation shall be based on the rate per bedroom as specified in Table R304.6.

TABLE R304.6

PRESCRIPTIVE FAN CAPACITY REQUIREMENTS FOR CENTRALLY DUCTED SYSTEMS

NUMBER OF BEDROOMS	MINIMUM NOMINAL RATED TOTAL FAN CAPACITY[a] (at 0.1 inches w.g.)
1	50 cfm
2	75 cfm
3	100 cfm
4	125 cfm
5	150 cfm
Homes > 3,000 ft^2	cfm = 0.05 · ft^2

For SI: 1 cubic foot per minute = 0.0004719 m^3/s, 1 cubic foot per minute per square foot = 0.00508 $m^3/(s \cdot m^2)$.
a. Represents the total installed rated capacity of all fans designed for whole house ventilation.

delete and replace **R304.6.1 Testing option.**
Testing may be done for Points to verify that the whole house ventilation system satisfies the ventilation requirements of this section in accordance with Sections R304.6.1.1 and R304.6.1.2.

delete and replace **R304.8 Controls.**
Whole house ventilation systems (balanced ventilation) shall be capable of being set remotely for continuous operation or shall be provided with an automatic control for intermittent operation. All whole house ventilation controls shall be readily accessible.

Exception: Fans installed expressly for local ventilation purposes.

delete and replace **R304.9.3 Ducts.**
Smooth wall ducts (for example, metal or composite) must be used for all duct runs longer than 8 feet (2438 mm). Ducts shall be insulated when installed in an unheated location

add **R304.9.9 Exhaust Dampers.**
Dampers with positive closures shall be installed to keep outside air from entering the exhaust duct when the system is not operating.

Exception: Mechanical ventilation systems designed for continuous operation.

delete and replace **R304.11 Makeup air required.**
Exhaust hood systems and clothes dryers capable of exhausting in excess of 400 cubic feet per minute (0.19 m^3/s) shall be provided with makeup air at a rate approximately equal to the exhaust air rate. Such makeup air systems shall be equipped with a means of closure and shall be automatically controlled to start and operate simultaneously with the exhaust system.

CHAPTER 4
RESIDENTIAL ENERGY EFFICIENCY

SECTION R401
GENERAL

delete and replace **R401.1 Scope.**

This chapter applies to *residential buildings* compliance with both the *Base Code* and *Stretch Code*. *Stretch Code* requires compliance with all Base Code requirements throughout RBES, plus achieving the additional points specified in Table R402.1.2.2, following all requirements of the following sections, and complying with Section R407 Vermont Stretch Code.

delete and replace **R401.2 Compliance.**

Projects for both *Base Code* and *Stretch Code* shall comply with one of the following:

1. **Package Plus Points:** Sections R402 through R404.

2. **RES*check*™ software:** Section R405 and the provisions of Sections R401 through R404 indicated as "Mandatory."

3. **Home Energy Rating System (HERS):** An energy rating index (ERI) approach in Section R406.

delete and replace **R401.3 Certificate of Compliance**

An *RBES certificate* is required to be issued. The *certificate* should be issued upon completion and before occupancy of any project subject to the Residential Building Energy Standards. A *certificate* may be issued by a builder, a licensed professional engineer, a licensed architect or an accredited home energy rating organization. If certification is not issued by a licensed professional engineer, a licensed architect or an accredited home energy rating organization, it shall be issued by the builder. Any certification shall certify that residential construction meets the RBES. The Department of Public Service will develop and make available to the public a certificate that lists key features of the RBES. Any person certifying shall use this certificate or one substantially like it to certify compliance with the RBES. Certification shall be issued by completing and signing a certificate and affixing it to the electrical service panel, without covering or obstructing the visibility of the circuit directory label, service disconnect label or other required labels. The certificate shall certify that the residential building has been constructed in compliance with the requirements of the RBES. The person certifying under this subsection shall provide a copy of the certificate to the Department of Public Service and shall assure that a certificate is recorded and indexed in the town land records. A builder may contract with a licensed professional engineer, a licensed architect or an accredited home energy rating organization to issue certification and to indemnify the builder from any liability to the owner of the residential construction caused by noncompliance with the RBES.

SECTION R402
BUILDING THERMAL ENVELOPE

delete and replace **R402.1 General.**
The *building thermal envelope* shall meet the requirements of Sections R402.1.1 through R402.1.6. for compliance with the *Base Code* and the *Stretch Code*.

Exception: The following *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 R402.

1. **Low energy use buildings.** Those with a peak design rate of energy usage less than 3.4 Btu/h per square foot of floor space for space conditioning purposes (10.7 W/m^2 or 1.0 $watt/ft^2$ of floor area for space-conditioning purposes
2. **Unconditioned buildings.** Those that do not contain *conditioned space*.
3. **Mobile homes.** Homes subject to Title VI of the National Manufactured Housing Construction and Safety Standards Act of 1974 (42 U.S.C. §§ 5401–5426).
4. **Hunting camps.** Residential buildings shall not include hunting camps.
5. **Summer camps.** Residential buildings constructed for nonwinter occupation with only a biomass (wood) or other on-site renewable heating system.
6. **Yurts** with only a biomass (wood) or other on-site renewable heating and hot water system.
7. **Owner-built homes.** Residential construction by an owner, if all of the following apply:

    7.1. The owner of the residential construction is the *builder*, as defined in 30 V.S.A. § 51.

    7.2. The residential construction is used as a dwelling by the owner.

    7.3. The owner in fact directs the details of construction with regard to the installation of materials not in compliance with the RBES.

    7.4. The owner discloses in writing to a prospective buyer, before entering into a binding purchase and sales agreement, with respect to the nature and extent of any noncompliance with the RBES.

    Any statement or certificate given to a prospective buyer shall itemize how the home does not comply with the RBES and shall itemize which measures do not meet the RBES in effect at the time construction commenced. Any certificate given under this subsection shall be recorded in the land records where the property is located and sent to the Department of Public Service (PSD) within 30 days following sale of the property by the owner. A certificate that itemizes how the home does not comply with the RBES is available from the PSD.

8. **Tiny Houses.** While not specifically exempt, *tiny houses* as defined in Chapter 2 must comply with the envelope, insulation and fenestration requirements in R402.8. All other code provisions are still required with the exception that the mechanical ventilation

system does not have to be heat recovery with balanced ventilation and may be exhaust-only.

delete and replace **R402.1.1 Vapor retarder.**
Wall assemblies in the *building thermal envelope* shall comply with the vapor retarder requirements of Section R702.7 of the *International Residential Code* or Section 1404.3 of the *International Building Code*, as applicable.

delete and replace **R402.1.2 Insulation and fenestration criteria.**
The *building thermal envelope* shall **comply** with one of the following only:

1. Package Plus Points Approach: Tables R402.1.2.1, R402.1.2.2 and R402.1.2.3.
2. *U*-Factor Alternative Approach: Section R402.1.4.
3. Total UA Approach: Section R402.1.5.
4. Log Home Approach: Section R402.1.6.
5. *Tiny House* Approach: Section R402.8.

Building science principles should be applied in all circumstances. Consult with a building science professional and refer to the Vermont Residential Energy Code Handbook for additional guidance and details.

delete and replace **R402.1.2.1 Package Plus Points Approach.**
Projects shall comply with Items 1 through 4: for both *Base Code* and *Stretch Code*:

1. Select one of the packages listed in Table R402.1.2.1. These standard packages apply to both *Base Code* and *Stretch Code*.
2. Determine the number of points needed to comply with Table R402.1.2.2 based on building size and whether the building needs to comply with *Base Code* or *Stretch Code*.
3. Incorporate a sufficient number of points from Table R402.1.2.3 to meet the points requirements from Table R402.1.2.2.
4. . Points can only be earned from measures that are not already required in the chosen standard package.

delete and replace **R402.1.2.1 Package Plus Points Approach.**
Projects shall comply with Items 1 through 4: for both *Base Code* and *Stretch Code*:

1. Select one of the packages listed in Table R402.1.2.1. These standard packages apply to both *Base Code* and *Stretch Code*.
2. Determine the number of points needed to comply with Table R402.1.2.2 based on building size and whether the building needs to comply with *Base Code* or *Stretch Code*.

3. Incorporate a sufficient number of points from Table R402.1.2.3 to meet the points requirements from Table R402.1.2.2.

4. . Points can only be earned from measures that are not already required in the chosen standard package.

Delete and replace **TABLE R402.1.2.1**

TABLE R402.1.2.1
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT FOR STANDARD PACKAGES FOR BASE CODE AND STRETCH CODE [a]

Component	Package 1	Package 2
	"Standard Package"	"Log Homes"
Ceiling – flat attic[g]	**U-0.020:** R-49[g]	
Ceiling – slope (no attic)	**U-0.025:** R-44	
Above Grade Wall[b]	**U-0.044:** R-21+5ci[e] OR R-13+10ci OR R-20 6 ½" ci (SIP) OR Other that meets U-factor	Construct log home walls to ICC 400—2022 Standard on the Design and Construction of Log Structures Table 305.3.1.2 or Vermont RBES Table R402.1.6
Frame Floor	**U-0.029:** R-38	
Basement/Crawl[c]	R-20ci OR R13+10ci	
Slab, on grade[d]	R-20,4' (edge) OR R-15,4'(edge) + R-7.5 (under entire slab)	
Slab, on grade, Heated[d]	R-20,4' (edge) + R-15 (under entire slab)	
Windows	**U-0.30**	
Skylights	**U-0.41**	
Doors	**U-0.37**	
Air Leakage	0.15 CFM50/Sq. Ft. of Building Shell (~2 ACH50)[h]	
Ducts	Inside thermal boundary	

For SI: 1 foot = 304.8 mm.

a. *R*-values are minimums. *U*-factors are maximums. Where insulation is installed in a cavity that is less than the label or design thickness of the insulation, the installed *R*-value of the insulation shall be not less than the *R*-

value specified in the table. See Section R402.1.4 for alternative compliance methods.

b. These are *example* wall assemblies. Any wall assembly would need to meet required U values and should consider building science to avoid moisture concerns. See RBES Handbook for building science guidance and more example wall assemblies.
c. The continuous portion of basement and crawlspace insulation can be met through interior, exterior or combination.
d. "4 ft" can be horizontal or vertical coverage including slab edge. "Edge and under" requires complete coverage. Up to 8 lineal feet of exposed slab edge may be insulated to R-10. "Heated slab" are those with embedded radiation.
e. The first value is cavity insulation, the second value is continuous insulation, or "ci", so "20 + 5ci" means R-20 cavity insulation plus R-5 continuous insulation.
f. Consider building science principles in all design and construction. Buildings should be designed and constructed recognizing principles behind moisture vapor control approaches for cold climates. Maintain the envelope assembly's ability to adequately dry in at least one direction by not installing low-perm vapor retarder materials (e.g., vapor barrier) on both sides of an assembly, seek to optimize the assembly's ability to dry, and limit the potential for wetting. (From Applied Building Technologies Group, LLC).
g. If there is insufficient space in the eaves, installing R-38 over the top of exterior walls shall be deemed to satisfy the requirement for R-49 insulation provided the rest of the ceiling is R-49. (See Section R402.2.1). Multifamily buildings using continuous insulation with a maximum U-factor of 0.023 or tapered insulation with an average U-factor of 0.023 for the ceiling assembly satisfies this requirement. A minimum value of R-12 is required for tapered insulation.
h. "ACH50" = air changes per hour at 50 Pascals building pressure as measured with a blower door. CFM50/Sq. Ft. of Building Shell = amount of air leakage (in cubic feet per minute, or CFM) that leaks out of each square foot of the exterior surface all six sides of the building measured at 50 Pascals of pressure with a blower door.
i. Installing R-38 over the top of exterior walls where insulation is compressed in the eaves shall be deemed to satisfy the requirement for R-44 where there is insufficient space in framing rafters for more than R-38 provided the rest of the ceiling is R-44. See R402.2.2 for more detail.

delete **R402.1.2.2 Required Points by Building Size.**

add **R402.1.2.2 Required points by building or addition size.**

Determine the number of points required by building or addition size from Table R402.1.2.2. Building size for this table is determined by the *finished conditioned floor* area per dwelling unit inside the *building thermal envelope*, including unfinished basements and storage/utility spaces.

The Multifamily less than 1,250 square feet (185.8 m^2) and 1,2500-2,500 square feet point requirement categories cannot be used for semi-detached (semi-attached, side-by-side), row houses, and townhouses, as defined as *single-family dwellings* in Section R202, General Definitions. *Multifamily dwelling* unit size is based on the average *finished conditioned floor* area dwelling size for the building, excluding common areas, hallways, stairwells, etc..

delete and replace **TABLE R402.1.2.2**

TABLE R402.1.2.2
REQUIRED POINTS BY BUILDING SIZE FOR BASE CODE AND STRETCH CODE

BUILDING/DWELLING SIZE	BASE CODE REQUIRED POINTS	STRETCH CODE REQUIRED POINTS
Alterations	0	0
Additions < 250 square feet	0	0
Additions 250 to 500 square feet	1	2
Addition 501 to 1,000 square feet	2	3

Addition > 1,000 square feet	3	4
Multifamily <650 square feet	0	1
Multifamily 650 to 900 square feet	1	2
Multifamily 900 to 1,250 square feet	2	3
Multifamily >1,250 to 2,500 square feet	4	5
< 2,500 square feet	5	7
2,500 to 4,000 square feet	7	12
> 4,000 square feet	10	15

delete and replace **TABLE R402.1.2.3**

TABLE R402.1.2.3
POINTS BY COMPONENT FOR BASE CODE AND STRETCH CODE

Component		Description	Points
Envelope	Slab (on or below grade, heated or unheated)	R-20 around perimeter and below entire slab **OR**[b]	2
		R-25 around perimeter and below entire slab	3
	Walls	R-28 2x6 cavity insulation with continuous (R20+9ci or similar) (U-0.036 wall assembly) **OR**[b]	1
		R-35 double stud or similar (cavity and continuous) (U-0.028 wall assembly) **OR**[b]	2
		R-40 double stud or similar (cavity and continuous) (U-0.025 wall assembly) **OR**[b]	3
		R-48 SIP 10 1/4" XPS or similar (cavity and continuous) (U-0.021 wall assembly)	4
	Ceiling	R-60 attic flats (U-0.018) and R-49 slopes, vaulted and cathedral (U-.020)	1
		R-80 attic flats (U-0.013) and R-60 slopes, vaulted and cathedral (U-.018)	2
	Floors - Exposed	R-49 (U-0.021)	1
	Windows- Triple Pane	Average U-factor ≤ 0.27 **OR**[b]	1
		Average U-factor ≤ 0.25 **OR**[b]	2
		Average U-factor ≤ 0.21 **OR**[b]	3
		Average U-factor ≤ 0.18	4
	Doors - Exterior	U-0.26	1
Air Leakage	Tight	Tested to ≤0.11 CFM50/Sq. Ft. of Building Shell (6-sided) (~1.5 ACH50) **OR**[b]	1
	Tighter	Tested to ≤0.07 CFM50/Sq. Ft. of Building Shell (6-sided) (~1.0 ACH50) **OR**[b]	2

	Tightest	Tested to ≤0.03 CFM50/Sq. Ft. of Building Shell (6-sided) (~0.5 ACH50)	3
Mechanical Ventilation	Better Heat Recovery **OR**	Balanced ventilation with ECM fans and ≥80% SRE and ≥1.2 cfm/watt **OR**[b]	3
	Better Electrical Efficiency	Balanced ventilation with ECM fans and ≥70% SRE, and ≥2.0 cfm/watt	
	Mechanical Ventilation Testing	Mechanical ventilation systems shall be tested and verified to provide the minimum ventilation flow rates required by Section R403.6. Testing shall be performed according to the ventilation equipment manufacturer's instructions, or by using a flow hood or box, flow grid, or other airflow measuring device at the mechanical ventilation fan's inlet terminals or grilles, outlet terminals or grilles, or in the connected ventilation ducts.	1
Heating and Cooling[a]	Basic Equipment	ENERGY STAR basic: (1) Gas/propane furnace ≥ 95 AFUE, Oil furnace ≥ 85 AFUE; (2) Gas/propane boiler ≥ 90 AFUE, Oil boiler ≥ 87 AFUE; **OR**[b]	1
	Cold Climate Air Source Heat Pump	Whole building heating /cooling is ENERGY STAR v.6 labeled[d]	5
	Ground Source Heat Pump	Whole building heating /cooling is Ground Source Heat Pump (GSHP) and ENERGY STAR labeled[d]	10
	Air-to-Water Heat Pump	Whole building heating/cooling is Air-to-Water Heat Pump (ATWHP) COP ≥ 2.5	5
	Advanced Wood Heating System	Whole building heating/cooling is Advanced wood heating system from http://www.rerc-vt.org/advanced-wood-heating-system/eligible-equipment-inventory-eei	5
	Low-Temperature Hydronic Distribution System	Hydronic distribution system designed to meet building peak heating demand with 120-degree water	1
	Demand Responsive Thermostats	All electric heating thermostats provided with *demand responsive controls*	1
Water	Heat Pump Basic	Electric Heat Pump Water Heater UEF ≥ 2.20 **OR**[b]	3
	Heat Pump Advanced	Electric Heat Pump Water Heater UEF ≥ 3.30	5

	Low flow	All showerheads ≤ 1.75 gpm, all lavatory faucets ≤ 1.0 gpm, and all toilets ≤ 1.28 gpf[c] **OR**[b]	1
	Certified[e]	Certified water efficient design per WERS, WaterSense, or RESNET $HERS_{H2O}$	2
	Drain heat recovery	Drain water heat recovery system on *primary showers* and tubs	1
	Recirculation User-demand	Controlled hot water recirculation system with user-demand via push-button for furthest fixtures	1
	Pipe Insulation	All service hot water piping is insulated to at least R-4 from the hot water source to the fixture shutoff.	1
	Demand Responsive Controls	Electric storage water heater(s) provided with *demand responsive controls*	1
	Point of Use Electric Water Heater	Remote fixtures requiring hot water supplied from a localized source of hot water with no recirculating system.	1
	Solar Ready Zone	Follow R402.7 Solar –ready zone requirements. These points are only available for Base Code and not Stretch Code since Stretch Code requires following R402.7.	2
	Solar Hot Water	Solar hot water system designed to meet at least 50% of the annual hot water load	2
Renewables	On-Site Generation	Solar photovoltaic (PV) (or other on-site renewable energy system), 1 point per 1.5 kW per housing unit of renewable generation on site	1 per 1.5 kW, max. 4
Other Measures	Monitoring	Whole-building energy monitoring system installed, minimum 5 circuits and homeowner access to data	1
	Radon Mitigation System	Radon mitigation designed to https://www.epa.gov/radon/radon-standards-practice is installed and documented to homeowner	1
	Energy Model	Building energy model with projected annual energy use and costs developed, used in design and construction decisions, and provided to homeowner	1
	Battery	Minimum 6 kWh grid-connected dispatchable demand-response-enabled battery	1
	Advanced Lighting Controls	All lighting for at least 50% of floor area is controlled and/or continuously dimmed based by occupancy, daylight, load shedding, and/or schedule.	2

Insulation Embodied Carbon Emissions	Global Warming Potential (GWP)/square footage (kg CO2e/ ft^2)	Report the global warming potential (GWP) impact of project insulation materials as described in Section R408. Use calculation table R408.1.1 to summarize insulation GWP intensity (kg $CO2e/ft^2$) for the project. Default global warming potential (GWP) values for common insulation products are provided in table R408.1.2. The calculation may utilize Type III, product-specific environmental product declaration (EPD) in lieu of default values for insulation products. If EPD values are used for a given insulation product, include the sum of lifecycle stages A1-A3 from the sourced EPD instead of default GWP value when completing the calculation. Include A5 and B1 GWP values for SPF and XPS products, as noted in R408. **OR**[b]	1
	Global Warming Potential (GWP)/square footage (kg $CO2e/ft^2$)	Demonstrate a calculated insulation GWP intensity (kg $CO2e/ft^2$) less than 0.5. Product-specific EPDs may be used in place of default values, subject to requirements in R408. **OR**[b]	2
		Demonstrate a calculated insulation GWP intensity (kg $CO2e/ft^2$) less than 0. Product-specific EPDs may be used in place of default values, subject to requirements in R408.	3
Multifamily Buildings	Efficient Elevator Equipment	Elevators in the building qualify with Energy Efficiency Class A per ISO 25745-2, Table 7.	1
	Residential Kitchen Equipment	All dishwashers, refrigerators, and freezers comply with the most recent ENERGY STAR Most Efficient label.	2
	Water Heating System Submeters	Each individual dwelling unit served by a central service water-heating system is provided with a service hot water meter connected to a reporting system that provides individual dwelling unit reporting of actual domestic hot water use.	1

For SI: 1 foot = 304.8 mm.

a. Heating and cooling system points are only available if all components of primary systems comply.

b. "OR" indicates that points are not additive; one component OR the following one can be selected, but not both.

c. Applies to new construction only.

d. https://www.energystar.gov/products/spec/central_air_conditioner_and_air_source_heat_pump_specification_version_6_0_pd

e. Certification standard as of 1/1/2019 or later. "WERS" = Water Efficiency Rating Score http://www.wers.us/. EPA WaterSense compliance for all water products: https://www.epa.gov/watersense. RESNET Water Energy Rating Index compliant: http://www.resnet.us/professional/about/resnet_to_develop_water_efficiency_rating_system.

delete and replace **R402.1.3 *R*-value computation.**
Insulation material used in layers, such as framing cavity insulation, or continuous insulation Cavity insulation alone shall be used to determine compliance with the cavity insulation R-value requirements in Tables R402.1.1 and R402.1.3. Where cavity insulation is installed in multiple layers, the R-values of the cavity insulation layers shall be summed to compute the corresponding component *R*-value determine compliance with the cavity insulation R-value requirements. The manufacturer's settled *R*-value shall be used for blown insulation. Continuous insulation (ci) alone shall be used to determine compliance with the continuous insulation R-value requirements in Tables R402.1.1 and R402.1.3. Where continuous insulation is installed in multiple layers, the R-values of the continuous insulation layers shall be summed to determine compliance with the continuous insulation R-value requirements. Cavity insulation R-values shall not be used to determine compliance with the continuous insulation R-value requirements in Tables R402.1.1 and R402.1.3. Computed *R*-values shall not include an *R*-value for other building materials or air films. Where insulated siding is used for the purpose of complying with the continuous insulation requirements of Tables R402.1.1 and R402.1.3, the manufacturer's labeled *R*-value for insulated siding shall be reduced by R-0.6. Average continuous insulation R-values across flat roofs meet the requirements of **Tables R402.1.2.1 and R402.1.2.3**,

delete and replace **R402.1.4 *U*-factor alternative.**
An assembly with a *U*-factor equal to or less than that specified in Table R402.1.4 shall be permitted as an alternative to the *R*-values in Tables R402.1.2.1 and R402.1.2.3. The building must still comply with Tables R402.1.2.1, R402.1.2.2, and Table R402.1.2.3.

An assembly with a *U*-factor equal to or less than that specified in Table R402.1.4 shall be permitted as an alternative compliance method with no Table R402.1.2.3 points required, provided that (a) airtightness is less than or equal to 0.15 CFM50/Sq. Ft. of Building Shell (~2 ACH50) tested, and (b) the ventilation system complies with section R304.

Exception: The following are not required to comply with the airtightness limit or the balanced ventilation system and heat recovery efficiency requirements.

1. Alterations.

2. Additions complying with this code based on the attributes of the addition alone using the *U*-factor alternative.

delete and replace **TABLE R402.1.4**

TABLE R402.1.4
EQUIVALENT *U*-FACTORS[a,c]

FENESTRATION *U*-FACTOR	SKYLIGHT *U*-FACTOR	CEILING *U*-FACTOR	FRAME WALL *U*-FACTOR	MASS WALL *U*-FACTOR[b]	FLOOR *U*-FACTOR	BASEMENT WALL *U*-FACTOR	CRAWL SPACE WALL *U*-FACTOR	SLAB ON GRADE & UNHEATED SLAB *U*-FACTOR & DEPTH
0.30	0.41	0.020	0.044	0.060	0.027	0.39	0.39	0.05, 4 ft

For SI: 1 foot = 304.8 mm.

a. Nonfenestration *U*-factors shall be obtained from measurement, calculation or an approved source.
b. When more than half the insulation is on the interior, the mass wall *U*-factors shall be a maximum of 0.057.
c. Airtightness of less than or equal to 0.15 CFM50/Sq. Ft. of Building Shell (~2 ACH50) tested and balanced ventilation system compliant with R304, or the building must comply with Tables R402.1.2.2 and R402.1.2.3.

delete and replace **R402.1.5 Total UA alternative.**
Where the total *building thermal envelope* UA, the sum of *U*-factor times assembly area, is less than or equal to the total UA resulting from multiplying the U-factors in Table R402.1.4 by the same assembly area as in the proposed *building*, the *building* shall be considered to be in compliance provided that (a) airtightness is less than or equal to 0.15 CFM50/Sq. Ft. of Building Shell (~2 ACH50) tested, and (b) the ventilation system is: balanced, complying with R304. The UA calculation shall be performed using a method consistent with the ASHRAE *Handbook of Fundamentals* and shall include the thermal bridging effects of framing materials.

Exception: The following are not required to comply with the airtightness limit (a) or the balanced ventilation system and heat recovery efficiency requirements (b).

1. Alterations.

2. Additions complying with this code based on the attributes of the addition alone using the Total UA alternative.

delete and replace **R402.1.6 Log homes.**
Log homes shall comply by doing all of the following steps:

1. Design log home in accordance with ICC 400—2022 or to the requirements of Table R402.1.6.

2. Determine the number of points needed to comply, using Table R402.1.2.2 based on building size.

3. Incorporate a sufficient number of points from Table R402.1.2.3 to meet the points requirement from Table R402.1.2.2.

delete and replace **TABLE R402.1.6**

TABLE R402.1.6
LOG HOME INSULATION, FENESTRATION AND HEATING REQUIREMENTS BY COMPONENT[a]

FENESTRATION *U*-FACTOR [b]	SKYLIGHT *U*-FACTOR	CEILING *R*-VALUE	LOG WALL [d]	FLOOR *R*-VALUE [e]	BASEMENT/ CRAWL SPACE WALL *U*-VALUE [f]	SLAB *R*-VALUE & DEPTH	HEATED SLAB *R*-VALUE [g]	AIR LEAKAGE i	HEATING SYSTEM AFUE [h]

0.30	0.41	49	□≥ 5 in. log	38	R-20ci OR R13+10ci	R-20,4' (edge) OR R-15,4'(edge) + R-7.5 (under)	R-20,4' (edge) OR R-15,4'(edge) + R-15 (under)	0.15 CFM50/ Sq. Ft. of Building Shell (~2 ACH50)	ENERGY STAR basic: (1) Gas/propane furnace ≥ 95 AFUE, Oil furnace ≥ 85 AFUE; (2) Gas/propane boiler ≥ 90 AFUE, Oil boiler ≥ 87 AFUE;

For SI: 1 foot = 304.8 mm.

a. *U*-factors are maximums, *R*-values are minimums.
b. The fenestration *U*-factor column excludes skylights.
c. Glazing area includes window and skylight opening area, plus actual glazed area of glass in doors, as a percentage of wall area. Sunrooms are exempt from this requirement.
d. Log walls must comply with ICC 400 with an average minimum average wall thickness of 5 inches or greater. Nonlog exterior walls shall be insulated in accordance with Table 402.2.1.
e. Alternatively, insulation sufficient to fill the framing cavity, with R-38 as the absolute maximum.
f. Basement walls shall be R-15 continuous insulation or R-20 cavity full basement height.
g. Heated slabs shall be completely insulated around the perimeter and under the entire slab.
h. Boilers must have an outdoor temperature reset or thermal purge control.
i. "ACH50" = air changes per hour at 50 Pascals building pressure as measured with a blower door. CFM50/Sq. Ft. of Building Shell = amount of air leakage (in cubic feet per minute, or CFM) that leaks out of each square foot of the exterior surface all six sides of the building measured at 50 Pascals of pressure with a blower door.

delete and replace **R402.2.1 Ceilings with attic spaces.**
Where Section R402.1.2 would require R-49 insulation in the ceiling, installing R-38 over the top of exterior walls where insulation is compressed in the eaves shall be deemed to satisfy the requirement for R-49 insulation provided that the balance of the ceiling is at R-49. Where Section R402.1 would require R-60 insulation in the ceiling, installing R-49 over the top of exterior walls where insulation is compressed in the eaves shall be deemed to satisfy the requirement for R-60 provided the balance of the ceiling is at R-60. This reduction shall not apply to the U-factor alternative approach in Section R402.1.4 and the total UA alternative in Section R402.1.5.

delete and replace **R402.2.2 Ceilings without attic spaces (slopes).**
Where Section R402.1.2 would require R-49 insulation in the ceiling, installing R-38 over the top of exterior walls where insulation is compressed in the eaves shall be deemed to satisfy the requirement for R-49 insulation provided that the balance of the ceiling is at R-49. Where Section R402.1 would require R-60 insulation in the ceiling, installing R-49 over the top of exterior walls where insulation is compressed in the eaves shall be deemed to satisfy the requirement for R-60

This reduction shall not apply to the *U*-factor alternative approach in Section R402.1.4 and the Total UA alternative in Section R402.1.5.

delete and replace **R402.2.3 Eave baffle.**
For air-permeable insulations in vented attics, a baffle shall be installed adjacent to soffit and eave vents. Baffles shall maintain a net free area opening equal to or greater than the net free area of the vent. The baffle shall extend over the top of the attic insulation. The baffle shall be permitted to be any solid material.

The baffle shall be installed to the outer edge of the exterior wall top plate so as to provide maximum space for attic insulation coverage over the top plate. Where soffit venting is not continuous, baffles shall be installed continuously to prevent ventilation air in the eave soffit from bypassing the baffle.

delete and replace **R402.2.4 Access hatches and doors.**
Access hatches and doors from conditioned spaces to unconditioned spaces such as attics and crawl spaces shall be weatherstripped and insulated to the same R-value required by Section R402 for the wall or ceiling in which they are installed. Access shall be provided to all equipment that prevents damaging or compressing the insulation. A wood-framed or equivalent baffle or retainer is required to be provided when loose-fill insulation is installed, the purpose of which is to prevent the loose-fill insulation from spilling into the living space when the attic access is opened, and to provide a permanent means of maintaining the installed *R*-value of the loose-fill insulation.

> **Exception:** Vertical doors that provide access from conditioned to unconditioned spaces shall be permitted to meet the fenestration requirements of Table R402.1.2.1.

The reduction shall not apply to the total UA alternative in Section R402.1.5.

delete and replace **R402.2.6 Steel-frame ceilings, walls and floors.**
Steel-frame ceilings, walls, and floors shall comply with the U-factor requirements of Table R402.1.2.1. The calculation of the U-factor for steel-framed ceilings and walls in an envelope assembly shall be determined in accordance with AISI S250 as modified herein.

1. Where the steel-framed wall contains no cavity insulation and uses continuous insulation to satisfy the U-factor maximum, the steel-framed wall member spacing is permitted to be installed at any on center spacing.
2. Where the steel-framed wall contains framing spaced at 24 inches (610 mm) on center with a 23% framing factor or framing spaced at 16 inches (400 mm) on center with a 25% framing factor, the net lower framing member spacing input values shall be used when calculating using AISI S250.
3. Where the steel-framed wall contains less than 23% froaming factors the AISI S250 shall be used without any modifications.
4. Where the steel-framed wall contains other than standard C-shape framing members the AISI S250 calculation option for other than standard C-shape framing is permitted to be used.

delete **TABLE R402.2.6**

delete and replace **R402.2.8 Floors.**
Floor framing-*cavity insulation* shall be installed to maintain permanent contact with the underside of the subfloor decking.

Exception: The floor framing-cavity insulation shall be permitted to be in contact with the topside of sheathing or continuous insulation installed on the bottom side of floor framing where combined with insulation that meets or exceeds the minimum wood frame wall *R*-value in Table 402.1.2.1 and that extends from the bottom to the top of all perimeter floor framing members.

delete and replace **R402.2.9 Basement walls.**
Walls associated with conditioned basements shall be insulated from the top of the *basement wall* down to 10 feet (3048 mm) below grade or to the basement floor, whichever is less. Walls associated with unconditioned basements shall meet this requirement unless the floor overhead is insulated in accordance with Sections R402.1.2.1 and R402.2.8.

delete and replace **R402.2.10 Slab-on-grade floors.**
Slab-on-grade floors with a floor surface less than 12 inches (305 mm) below grade shall be insulated in accordance with Table R402.1.2.1. The insulation shall extend downward from the top of the slab on the outside or inside of the foundation wall. Insulation located below grade shall be extended the distance provided in Table R402.1.2.1 by any combination of vertical insulation, insulation extending under the slab or insulation extending out from the building. Insulation extending away from the building shall be protected by pavement or by not less than 10 inches (254 mm) of soil. The top edge of the insulation installed between the *exterior wall* and the edge of the interior slab shall be permitted to be cut at a 45-degree (0.79 rad) angle away from the *exterior wall.* Slab-edge insulation is not required in jurisdictions designated by the *code official or authority having jurisdiction*, where one exists, as having a very heavy termite infestation.

delete and replace **R402.2.13 Sunroom and conditioned garage insulation.**
Sunrooms enclosing *conditioned space* and conditioned garages shall meet the insulation requirements of this code.

Exception: For *sunrooms* and conditioned garages provided with *thermal isolation*, and enclosing *conditioned space*, the following exceptions to the insulation requirements of this code shall apply:

1. The minimum ceiling insulation *R*-value shall be R-38.

2. The minimum wall insulation *R*-value shall be R-20. Walls separating a *sunroom* or heated garage with a *thermal isolation* from *conditioned space* shall comply with the *building thermal envelope* requirements of this code.

add **R402.2.16 Building Science**
Consider building science principles in all design and construction. Buildings should be designed and constructed recognizing principles behind moisture vapor control approaches for cold climates. Maintain the envelope assembly's ability to adequately dry in at least one direction by not installing low-perm vapor retarder materials (e.g., vapor barrier) on both sides of an assembly, seek to optimize the assembly's ability to dry, and limit the potential for wetting. (From Applied Building Technologies Group, LLC).

delete and replace **R402.3 Fenestration.**
In addition to the requirements of Section R402.1.2.1, fenestration shall comply with Sections R402.3.1 through R402.3.5.

delete and replace **R402.3.2 Glazed fenestration SHGC.**
An area-weighted average of fenestration products more than 50-percent glazed shall be permitted to satisfy the SHGC requirements.

Dynamic glazing shall be permitted to satisfy the SHGC requirements of Table R402.1.2.1 provided the ratio of the higher to lower labeled SHGC is greater than or equal to 2.4, and the *dynamic glazing* is automatically controlled to modulate the amount of solar gain into the space in multiple steps. *Dynamic glazing* shall be considered separately from other fenestration, and area-weighted averaging with other fenestration that is not dynamic glazing shall not be permitted.

Exception: *Dynamic glazing* is not required to comply with this section when both the lower and higher labeled SHGC already comply with the requirements of Table R402.1.2.1.

delete and replace **R402.3.3 Glazed fenestration exemption.**

Up to 15 square feet (1.4 m^2) of glazed fenestration per dwelling unit shall be permitted to be exempt from *U*-factor and SHGC requirements in Section R402.1.2.1. This exemption shall not apply to the *U*-factor alternative approach in Section R402.1.4 and the Total UA alternative in Section R402.1.5.

delete and replace **R402.3.4 Opaque door exemption.**

One side-hinged opaque door assembly up to 24 square feet (2.22 m^2) in area is exempted from the *U*-factor requirement in Section R402.1.2.1. This exemption shall not apply to the *U*-factor alternative approach in Section R402.1.4 and the total UA alternative in Section R402.1.5.

delete and replace **R402.3.5 Sunroom and conditioned garage fenestration.**
Sunrooms and conditioned garages enclosing *conditioned space* shall meet the fenestration requirements of this code.

Exception: *sunrooms and conditioned garages* with *thermal isolation* and enclosing *conditioned space*, the fenestration *U*-factor shall not exceed 0.30 and the *skylight U*-factor shall not exceed 0.41.

New fenestration separating a *sunroom* or heated garage with *thermal isolation* from *conditioned space* shall comply with the *building thermal envelope* requirements of this code.

delete and replace **R402.4 Air leakage.**
The *building thermal envelope* shall be constructed to limit air leakage in accordance with the requirements of this Section.

delete and replace **R402.4.1 Building thermal envelope.**
The *building thermal envelope* shall comply with Sections R402.4.1.1 through R402.4.1.3. The sealing methods between dissimilar materials shall allow for differential expansion and contraction.

delete and replace **R402.4.1.1 Installation.**
The components of the *building thermal envelope* as listed in Table R402.4.1.1 shall be installed

in accordance with the manufacturer's instructions and the criteria listed in Table R402.4.1.1, as applicable to the method of construction.

delete and replace **TABLE R402.4.1.1**

TABLE R402.4.1.1
AIR BARRIER, AIR SEALING AND INSULATION INSTALLATION

COMPONENT	AIR BARRIER CRITERIA	INSULATION INSTALLATION CRITERIA
General conditions and appropriate materials for air barriers	A continuous, durable air barrier shall be installed in the building envelope. Breaks or joints in the air barrier shall be sealed. The air barrier should be continuous and be durably connected to all penetrations, windows and other (structural) interruptions. Open-cell or closed-cell foam shall have a finished thickness greater than or equal to 5.5 in. or 1.5 in., respectively, to qualify as an air barrier unless the manufacturer indicates otherwise. If flexible air barriers are used, they shall be fully sealed at all seams and edges and supported in accordance with manufacturer's installation instructions. Flexible air barriers shall not be made of kraft paper, or other materials that are easily torn. If polyethylene is used, its thickness shall be greater than or equal to 6 mil. Materials meeting ASTM E2357 Standard Test Method for Determining Air Leakage of Air Barrier Assemblies are acceptable.	Air-permeable insulation shall not be used as a sealing material; when installed in vertical walls, sloped ceilings, and floors within the thermal envelope, it shall be enclosed on all six sides and in contact with a durable, air barrier.
Dropped ceilings/soffits	The air barrier in any dropped ceiling/soffit shall be aligned with (in contact with) the insulation and any gaps in the air barrier shall be sealed. Access openings, drop downstairs or knee wall doors to unconditioned attic spaces shall be sealed, insulated and gasketed.	The insulation in any dropped ceiling/soffit shall be aligned with (in contact with) the air barrier and shall be enclosed on five sides and in contact with a durable, interior air barrier. A top-side air barrier is not required in a flat attic.
Framing junctions and cavities	The junction of the foundation and sill plate shall be sealed. The junction of the top plate and the top of exterior wall sheathing shall be sealed. Knee walls shall be air sealed. When part of the thermal envelope, knee wall insulation shall be enclosed on all six sides and in contact with a durable, interior air barrier.	Cavities within corners and headers of frame walls shall be insulated by completely filling the cavity with a material having a minimum thermal resistance of R-3 per inch. Exterior thermal envelope insulation for framed walls shall be installed in substantial contact and continuous alignment with the air barrier. Exterior thermal envelope insulation

		for framed walls shall be enclosed on all six sides and in contact with a durable, air barrier.
Windows, skylights and doors	The space between window/door jambs and framing, and skylights and framing shall be sealed with minimally-expanding foam, caulk with backer rod and sealant as well as flexible membranes supported by or adhered to rigid air barrier material.	—
Rim joists	Rim joists shall include an exterior air barrier. Junctions of the foundation and sill plate, sill plate and rim band, and rim band and subfloor shall be sealed. When air permeable insulation is installed, a durable, interior air barrier shall be installed at the rim joist.	Rim joists shall be insulated and air sealed so that the insulation maintains permanent contact with the exterior rim board.[b]
Floors (including above garage and cantile vered floors)	The air barrier shall be installed at any exposed edge of insulation.	Floor framing cavity insulation shall be installed to maintain permanent contact with the underside of subfloor decking, or floor framing cavity insulation shall be permitted to be in contact with the top side of sheathing, or with continuous insulation installed on the underside of floor framing and extending from the bottom to the top of all perimeter floor framing members.
Basement crawl space and slab foundations	Exposed earth in unvented crawl spaces shall be covered with a Class I vapor retarder/air barrier in accordance with Section R402.2.10 with overlapping joints taped.in accordance with Section R402.2.10. Penetrations through concrete foundation walls and slabs shall be air sealed. Class 1 vapor retarders shall not be used as an air barrier on below-grade walls and shall be installed in accordance with Section R702.7 of the *International Residential Code*.	Where provided instead of floor insulation, vapor barrier shall be installed in accordance with Section R402.2.10. Conditioned basement foundation wall insulation shall be installed in accordance with Section R402.2.8. Slab-on-grade floor insulation shall be installed in accordance with Section R402.2.10.
Shafts, penetrations	Duct and flue shafts, and other penetrations to exterior or unconditioned space shall be sealed to allow for expansion, contraction, and mechanical vibration. Utility penetrations of the air barrier shall be caulked, gasketed or otherwise sealed and shall allow for expansion, contraction of materials and mechanical vibration.	Insulation shall be fitted tightly around utilities passing through shafts and penetrations in the building thermal envelope to maintain required *R*-value.

	Doors or hatches in knee walls opening to exterior or unconditioned space shall be insulated and gasketed.	

(continued)

TABLE R402.4.1.1—continued
AIR BARRIER AND INSULATION INSTALLATION

COMPONENT	AIR BARRIER CRITERIA	INSULATION INSTALLATION CRITERIA
Narrow cavities	Narrow cavities of 1 inch or less that are not able to be insulated shall be air sealed.	Batts in narrow cavities shall be cut to fit, or narrow cavities shall be filled by insulation that on installation readily conforms to the available cavity space.
Garage separation	Air sealing shall be provided between the garage and *conditioned spaces*.	Insulated portions of the garage separation assembly shall be installed in accordance with Sections R303 and R402.2.7.and R402.2.7.
Recessed lighting and appliances	Recessed light fixtures installed in the building thermal envelope shall be air sealed in accordance with Section R402.4.5. Recessed light fixtures and other appliances (speakers, exhaust fans, light shafts, etc.) installed in the building thermal envelope shall be ICAT (Insulation Contact and Air Tight) rated, airtight labeled (or "Washington State Approved") and sealed with a gasket or caulk between the housing and the interior wall or ceiling cover. Fixtures and appliances shall maintain required clearances of not less than 1/2 inch from combustible material and not less than 3 inches from insulation material, or as required by manufacturer's installation requirements.	Recessed light fixtures installed in the building thermal envelope shall be airtight and ICAT rated (ICAT-rated indicates Insulation Contact and Airtight and meets the IC and air tightness requirement), and shall be buried or surrounded with insulation.
Plumbing and wiring	All holes created by wiring, plumbing or other penetrations in the air barrier assembly shall be air sealed.	Insulation shall be installed to fill the available space and surround wiring, plumbing, or other obstructions, unless the required *R*-value can be met by installing insulation and air barrier systems completely to the exterior side of the obstructions. Insulation shall be placed between the exterior of the wall assembly and

		pipes. Insulation should not be installed on the interior of the piping. Batt insulation shall be cut neatly to fit around wiring and plumbing in exterior walls, or insulation that on installation readily conforms to available space shall extend behind piping and wiring and shall be in full contact with all air barriers.
Shower/tub on exterior wall	Exterior walls adjacent to showers and tubs shall have insulation filling any gaps or voids between tub or shower walls and unconditioned space.	Exterior walls adjacent to showers and tubs shall have a rigid, durable air barrier separating the exterior wall from the shower and tubs and be insulated.
Electrical/phone box on exterior walls	The air barrier shall be installed behind electrical, or communication boxes or air-sealed boxes shall be installed.	Insulation completely fills voids between the box and exterior sheathing.
Common wall	Whenever continuity of the building thermal envelope is broken at walls separating dwelling units in Group R-2 building, including common, party, and fire walls, such walls shall be insulated to a minimum of R-10 on each side of the break in insulation continuity.	Air barrier shall be installed in the common wall between dwelling units. Common walls shall be sealed at junctions with outside walls and at the top pressure plane of the house.
HVAC register boots	HVAC register boots that penetrate building thermal envelope shall be sealed to the subfloor or drywall.	—
Concealed sprinklers	When required to be sealed, concealed fire sprinklers shall only be sealed in a manner that is recommended by the manufacturer. Caulking or other adhesive sealants shall not be used to fill voids between fire sprinkler cover plates and walls or ceilings.	—
Fireplace	A durable air barrier shall be installed in contact with insulation. Fireplaces shall have compression closure doors and combustion air supplied from the outdoors.	—

a. In addition, inspection of log walls shall be in accordance with the provisions of ICC-400—2022
b. Air barrier and insulation full enclosure is not required in unconditioned/ventilated attic spaces and at rim joints.

delete and replace **R402.4.1.2 Air Leakage Testing.**
The *building* or dwelling unit shall be tested *and* verified as having an air leakage rate not exceeding two (2) air changes per hour or 0.15 CFM50/Sq. Ft. Building Shell area of all six sides of the building. Testing shall be conducted in accordance with **ANSI/RESNET/ICC 380**, **ASTM E779** or **ASTM E1827** and reported at a pressure of 0.2 inches w.g. (50 Pascals). Multifamily buildings shall comply with CBES C402.4.–Testing and verification shall be conducted by an applicable Building Performance Institutes (BPI) Professional, a Home Energy Rating System (HERS) Energy Rater, HERS Field Inspector, or a Vermont Department of Public Service approved air leakage tester. A written report of the results of the test shall be signed by the party

conducting the test. Testing shall be performed at any time after creation of all penetrations of the *building thermal envelope*.

During testing:

1. Exterior windows and doors, fireplace and stove doors shall be closed, but not sealed, beyond the intended weatherstripping or other infiltration control measures.

2. Dampers including exhaust, intake, makeup air, backdraft and flue dampers shall be closed, but not sealed beyond intended infiltration control measures.

3. Interior doors, where installed at the time of the test, shall be open.

4. Exterior or interior terminations for continuous ventilation systems shall be sealed.

5. Heating and cooling systems, where installed at the time of the test, shall be turned off.

6. Supply and return registers, where installed at the time of the test, shall be fully open.

7. Plumbing and drainage traps shall be filled with water as normally found, but not otherwise sealed.

Mechanical ventilation shall be provided in accordance with Section M1505 of the International Residential Code or Section 403.3.2 of the International Mechanical Code, as applicable, or with other approved means of ventilation.

delete and replace **R402.4.1.3 Reporting.**
Air leakage testing shall be reported on the RBES Certificate in units of air changes per hour at 50 Pascals (ACH50) and CFM50/Sq. Ft. Building Shell area of all six sides of the building.

delete and replace **R402.4.2 Fireplaces.**
New wood-burning fireplaces shall have tight-fitting doors and outdoor combustion air. Where using tight-fitting doors on factory-built fireplaces *listed* and *labeled* in accordance with UL 127, the doors shall be tested and *listed* for the fireplace. Where using tight-fitting doors on masonry fireplaces, the doors shall be listed and labeled in accordance with UL 907 2019.

add **R402.4.6 Electrical and communication outlet boxes (air-sealed boxes).**
Electrical and communication outlet boxes installed in the building thermal envelope that are through or outside the building air barrier shall be sealed to limit air leakage between conditioned and unconditioned spaces. Electrical and communication outlet boxes shall be tested in accordance with **NEMA OS 4**, Requirements for Air-Sealed Boxes for Electrical and Communication Applications and shall have an air leakage rate of not greater than 2.0 cubic feet per minute (0.944 L/s) at a pressure differential of 1.57 psf (75 Pa). Electrical and communication outlet boxes shall be marked "NEMA OS 4" or "OS 4" in accordance with **NEMA OS 4**. Electrical and communication outlet boxes shall be installed per the manufacturer's instructions and with any supplied components required to achieve compliance with **NEMA OS 4**.

delete and replace **R402.5 Maximum fenestration *U*-factor and SHGC ().**
The area-weighted average maximum *fenestration U*-factor permitted using tradeoffs from Section R402.1.5 or R405 shall be 0.30 for *vertical fenestration*, and 0.41 for skylights.

add **R402.7 Solar-ready zone.**

add **R402.7.1 General.**
Solar-ready zone is required for Stretch Code but is optional for Base Code. Points are available for meeting the solar-ready zone requirements for Base Code.

For Stretch Code, new detached one- and two-family dwellings, and multiple single-family dwellings (townhouses) with not less than 600 square feet (55.74 m^2) of roof area oriented between 110 and 270 degrees of true north shall comply with this Section.

Exceptions:

1. New residential buildings with a permanently installed on-site renewable energy system.

2. A building where all areas of the roof that would otherwise meet the requirements of Section R407.5 are in full or partial shade for more than 70 percent of daylight hours annually.

3. Buildings and structures as designed and shown in construction documents that do not meet the conditions for a solar-ready zone area.

4. Buildings with possible location(s) for ground mounted systems identified in the submitted construction documents. Buildings claiming this exception must either install appropriate electrical conduit to the site of the proposed ground mounted solar array or include a solar site evaluation that supports the siting of the proposed ground mounting location.

Multifamily buildings shall comply with CBES C402.5.

add **R402.7.2 Construction document requirements for solar-ready zone.**
Construction documents shall indicate the solar-ready zone where applicable.

add **R402.7.3 Solar-ready zone area.**

The total solar-ready zone area shall consist of an area not less than 300 square feet (27.87 m^2) per dwelling exclusive of mandatory access or setback areas. New multiple single-family dwellings (townhouses) three stories or less in height above grade plane and with a total floor area less than or equal to 2,000 square feet (185.8 m^2) per dwelling shall have a solar-ready zone area of not less than 150 square feet (13.94 m^2) per dwelling. The solar-ready zone area shall be not less than 40 percent of the roof area calculated as the horizontally projected gross roof area less the area covered by skylights, occupied roof decks, vegetative roof areas and mandatory access or set back areas as required by the *International Fire Code*. The solar-ready zone shall be composed of areas not less than 5 feet (1524 mm) in width and not less than 80 square feet

(7.44 m^2) exclusive of access or required set back areas.

For ground-mounted systems, possible locations of the panels must be identified in the submitted construction documents and be supported by a solar site evaluation. At least one potential location must be identified in the construction documents for the future installation of the panels.

add **R402.7.4 Obstructions.**

Solar-ready zones shall consist of an area free from obstructions, including but not limited to vents, chimneys, and roof-mounted equipment.

add **R402.7.5 Shading.**

The solar-ready zone shall be set back from any existing or new permanently affixed object on the building or site that is located south, east or west of the solar zone a distance not less than two times the object's height above the nearest point on the roof surface. Such objects include, but are not limited to, taller portions of the building itself, parapets, chimneys, antennas, signage, rooftop equipment, trees, and roof plantings.

add **R402.7.6 Capped roof penetration sleeve.**

A capped roof penetration sleeve shall be provided adjacent to a solar-ready zone located on a roof slope of not greater than 1 unit vertical in 12 units horizontal (8-percent slope). The capped roof penetration sleeve shall be sized to accommodate the future photovoltaic system conduit, but shall have an inside diameter of not less than 11/4 inches (32 mm).

add **R402.7.7 Roof load documentation.**

The structural design loads for roof dead load and roof live load to support the solar system shall be clearly indicated on the construction documents.

add **R402.7.8 Interconnection pathway.**

Construction documents shall indicate pathways for routing of conduit (or plumbing for solar thermal systems) from the solar-ready zone to the electrical service panel or service hot water system. Alternatively, install two 1-inch minimum diameter EMT conduits from the main electrical panel location to the attic or other area easily accessible to the solar array's proposed location. Conduits for future solar installations are to be capped, airtight and labeled at both ends.

add **R402.7.9 Electrical service reserved space.**

The main electrical service panel shall have a reserved space to allow installation of a dual pole circuit breaker for future solar electric installation and shall be labeled "For Future Solar Electric." The reserved space shall be positioned at the opposite (load) end from the input feeder location or main circuit location. Note: this requirement is in addition to the electrical service reserved space for electric vehicle charging. This requirement is only for the building master panel and not individual dwelling unit panels in the case of multifamily buildings.

add **R402.7.10 Electrical energy storage system-ready area.**

The floor area of the electrical energy storage system-ready area shall be not less than 2 feet (610 mm) in one dimension and 4 feet (1219 mm) in another dimension and located in accordance with Section 1207 of the *International Fire Code*. The location and layout diagram of the electrical energy storage system-ready area shall be indicated on the construction documents.

add **R402.7.11 Construction documentation certificate.**

A permanent certificate, indicating the solar-ready zone and other requirements of this section, shall be posted near the electrical distribution panel, water heater or other conspicuous location by the builder or registered design professional.

add **R402.8 *Tiny houses*.**

Tiny Houses as defined in Chapter 2 must comply with the envelope, insulation and fenestration requirements below. All other code provisions are still required.

Tiny houses require the following:

- ceiling flat attic U-0.033 (R-30);
- ceiling slope U-0.04 (R-24);
- above grade walls U-0.08 (R-13);
- frame floors U-0.05 (R-21);
- basement/crawl space walls R-20 continuous (ci) or R13+10ci;
- slab on grade R-20 for 4' on edge or under, OR R-15,4'(edge) + R-15 (under entire slab);
- heated slab on grade R-20,4' (edge) + R-15 (under entire slab);
- windows U-0.27;
- doors U-0.37;
- air leakage 0.15 CFM50/Sq. Ft. of Building Shell (~2 ACH50);
- ducts inside thermal boundary.

Compliance with all other provisions of this code is required.

Exception: Mechanical ventilation system for *tiny houses* is not required to be a *balanced ventilation system* and may be exhaust-only.

SECTION R403
SYSTEMS

delete and replace **R403.1.1 Programmable thermostat.**

The thermostat controlling the primary heating or cooling system of the *dwelling unit* shall be capable of controlling the heating and cooling system on a daily schedule to maintain different temperature set points at different times of the day and different days of the week. This thermostat shall include the capability to set back or temporarily operate the system to maintain *zone* temperatures down to 55°F (13°C) or up to 85°F (29°C). The thermostat shall initially be programmed by the manufacturer with a heating temperature set point no higher than 70°F (21°C) and a cooling temperature set point no lower than 78°F (26°C). Adjustments to these settings for elderly, disabled or those with special needs is permissible.

Exception: The following are allowed only where a 5-wire connection to thermostat location is provided:

1. Radiant floor, wall, ceiling and/or beam system on dedicated zone.

2. *Cold-climate heat pump* not designed for setbacks.

3. Wi-Fi or "smart" Internet-connected thermostats.

delete **R403.1.2 Heat pump supplementary heat.**

add **R403.1.2 Ductless heat pump supplementary heat.**
Ductless heat pumps shall not have integrated supplementary electric-resistance heat other than that provided for frost control. See Section R404.4 for guidance on electric-resistance heating equipment other than heat pumps.

delete and replace **R403.3 Ducts.**

Ducts and air handlers for space conditioning shall be in accordance with Sections R403.3.1 through R403.3.2.

delete **R403.3.1 Ducts located outside conditioned space**.

add **R403.3.1 Duct placement.**

All ducts and air handlers shall be located within *conditioned space*.

delete **R403.3.3 Duct testing.**

delete **R403.3.4 Duct leakage**

delete **R403.3.5 Building cavities**

delete **R403.3.6 Ducts buried within ceiling insulation.**

delete **R403.3.7 Ducts located in conditioned space.**

delete and replace **R403.4 Mechanical system piping insulation (Mandatory).**
Mechanical system piping designed to carry fluids above 105°F (41°C) or below 55°F (13°C) shall be located within the building thermal envelope and insulated to a minimum of R-4.

delete and replace **R403.5.1.1 Circulation systems.**
Where installed, heated water circulation systems shall be provided with a circulation pump. The system return pipe shall be a dedicated return pipe or a cold-water supply pipe. Gravity and thermosyphon circulation systems shall be prohibited. Controls for circulating hot water system pumps shall automatically turn off the pump when the water in the circulation loop is at the desired temperature and when there is no demand for hot water. The controls shall limit the temperature of the water entering the cold-water piping to not greater than 104°F (40°C).

delete and replace **R403.5.3 Hot water pipe insulation ().**
Insulation for service hot water pipe with a minimum thermal resistance (*R*-value) of R-4 shall be applied to the following:

1. Piping $^{3}/_{4}$ inch (19.1 mm) and larger in nominal diameter located inside the *conditioned space*
2. Piping serving more than one dwelling unit.
3. Piping located outside the conditioned space.
4. Piping from the water heater to a distribution manifold.
5. Piping located under a floor slab.
6. Buried piping.
7. Supply and return piping in circulation and recirculation systems other than cold water pipe return demand recirculation systems.

R403.6 Mechanical ventilation.
Follow the mechanical ventilation requirements in R304.

delete **R403.6.1 Heat or energy recovery ventilation**.

delete **R403.6.1 Whole-house mechanical ventilation system fan efficacy**.

delete **TABLE R403.6.1**

delete and replace **R403.8 Systems serving multiple dwelling units.**
Systems serving multiple dwelling units shall comply with Sections C403 and C404 of the 2024 *Vermont Commercial Building Energy Standards* (CBES) in lieu of Section R403 but will not be subject to the additional requirements outlined in Tables C406.1.1 and Table 406.1.2.

delete and replace **R403.10.1 Residential pools and permanent residential spas.**
Where installed, the energy consumption of residential swimming pools and permanent residential spas shall be controlled in accordance with the requirements of APSP 15.

delete and replace **R403.10.4 Covers.**
Outdoor heated pools and outdoor permanent spas shall be provided with an insulated vapor-retardant cover of at least R-12 or other *approved* vapor-retardant means.

> **Exception:** Where more than 75 percent of the energy for heating, computed over an operation season of not fewer than 3 calendar months, is from site-recovered energy, such as from a heat pump or solar energy source, covers or other vapor-retardant means shall not be required.

SECTION R404
ELECTRICAL POWER AND LIGHTING SYSTEMS

delete and replace **R404.1 Lighting equipment.**
All permanently installed lighting fixtures, excluding kitchen appliance lighting fixtures, shall contain only high-efficacy lighting sources.

delete **R404.1.1 Lighting equipment**

add **R404.1.1 Exterior lighting.**
Exterior lighting for residential buildings shall comply with Sections C405.5 (Exterior Lighting Power Requirements) of the *Vermont Commercial Building Energy Standards* (CBES).

Exceptions:

1. Detached one- and two- family dwellings.
2. Townhouses.
3. Solar-powered lamps not connected to any electrical service.
4. Luminaires controlled by a motion sensor.
5. Lamps and luminaires that comply with Section R404.1.

delete and replace **R404.1.2 Lighting equipment for multifamily spaces**
Multifamily buildings three-stories or less with common areas, stairwells, vestibules, lobbies, parking garages, and exterior parking areas and drives must meet the lighting power density (LPD) specifications of the *Vermont Commercial Building Energy Standards* (CBES). For parking garages, see Section C405.3.2; for uncovered parking areas and drives, see Section C405.5.2.

add **R404.1.3 Fuel gas lighting equipment.** Fuel gas lighting systems shall not be permitted.

add **R404.1.44 Exterior lighting controls**. Where the total permanently installed exterior lighting power is greater than 30 watts, the permanently installed exterior lighting shall comply with the following

1. Lighting shall be controlled by a manual on and off switch which permits automatic shut-off actions. Exception: Lighting serving multiple dwelling units.
2. Lighting shall be automatically shut off when daylight is present and satisfies the lighting needs.
3. Controls that override automatic shut-off actions shall not be allowed unless the override automatically returns automatic control to its normal operation within 24 hours.

For multifamily buildings, follow C405.2.7 (Exterior Lighting Controls).

delete **R404.2 Electric resistance heating equipment.**

add **R404.2 Electric heating equipment.**
Heat pumps shall be certified *cold-climate heat pumps* only and shall have controls that, except during defrost, prevent supplementary electric heat operation where the heat pump compressor can meet the heating load.

Building heating with electric-resistance heating equipment is prohibited.

Exceptions:

1. Replacement of existing electrical resistance units.

2. Limited areas where other heating sources are cost prohibitive or impractical (for example, a small interior space such as a bathroom or stairwell, which is distant from the distribution system).

3. Buildings with cold-climate heat pump(s) as the primary heating system, provided that:

   a. The supplemental electric-resistance heat is controlled to prevent it from operating at an outside air temperature of 5°F or higher.

   b. The building has a tested air tightness of less than or equal to 0.15 CFM50/Sq. Ft. of Building Shell (~2 ACH50).

4. Multifamily buildings with heating loads less than or equal to 6.0 Btu/h/ft^2 at design temperature.

Note: Buildings served by the Burlington Electric Department (BED) must also receive approval from BED before installing electric resistance heating equipment.

delete and replace **R404.3 Electric vehicle charging.**
One *Electric Vehicle Charging - Level 2 Capable* parking space or *Electric Vehicle Charging - Level 2 EVSE* is required for new construction based on Table R404.3.

Exception: Electric vehicle parking spaces are not required if one of the following conditions apply:

1. Parking spaces intended exclusively for storage of vehicles for retail sale or vehicle service.
2. Parking spaces are separated from the meter by a public right-of-way
1. Parking spaces which are limited to parking durations of less than one hour.
2. EV Capable Spaces are not required where no parking spaces are provided.

Parking spaces with *electric vehicle supply equipment* (*EVSE*) shall be marked for EV use only.

Exception: The number of parking spaces with *EVSE* that are marked for "EV use only" need not exceed the number of EV cars driven by occupants of the building. This exception does not reduce the number of EVSE spaces required, just the number that are marked for EV use only.

delete and replace **TABLE R404.3 REQUIRED LEVEL 2 CAPABLE ELECTRIC VEHICLE CHARGING PARKING SPACES FOR ALL NEW BUILDINGS (BASE CODE and STRETCH CODE)**

BUILDING/PARKING TYPE	MINIMUM REQUIRED NUMBER OF LEVEL 2 CAPABLE EV CHARGING PARKING SPACES

Single Family Home or Multifamily Building	1 per dwelling unit or the number of parking spaces provided, whichever is less
Additional Parking Spaces	25% of remaining parking spaces not utilized by dwelling units, or 40 spaces, whichever is less

For *multifamily building* garage or covered parking, provide on electrical drawings the appropriate sized pathway to the building electrical room to accommodate a future electrical upgrade for Level 2 EVSE electric vehicle charging; provide adequate wall and floor space in the building electrical room for future EV charging related electrical equipment; provide the appropriate sized pathways to exterior on-grade surface parking spaces for future Level 2 EVSE electric vehicle charging; provide a line diagram on the electrical drawings demonstrating a pathway for future Level 2 EVSE electric vehicle charging. Quantity of future Level 2 EVSE electric vehicle charging stations shall be as required by Table R404.3.

add **R404.4 200 Amp Electrical Service.**

Each new building, except for individual multifamily units, shall be supplied with at least 200 amp electrical service in anticipation of increased electrical services that will need to be provided in the future.

add **R404.5 Dwelling electrical meter.**

Each residential unit and each dwelling unit located **in a** *Group R*-2 building shall have a separate electrical meter.

Exception: Buildings where a majority of the living units serve tenants at or below 80 percent of area median income.

add **R404.6 Electrical transformers.**

Low-voltage dry-type distribution electric transformers shall meet the minimum efficiency requirements of Table R405.6 as tested and rated in accordance with the test procedure listed in DOE 10 CFR 431. The efficiency shall be verified through certification under an approved certification program or, where a certification program does not exist, the equipment efficiency ratings shall be supported by data furnished by the transformer manufacturer.

Exception: The following transformers are exempt:

1. Transformers that meet the *Energy Policy Act of 2005* exclusions based on the DOE 10 CFR 431 definition of special purpose applications.

2. Transformers that meet the *Energy Policy Act of 2005* exclusions that are not to be used in general purpose applications based on information provided in DOE 10 CFR 431.

3. Transformers that meet the *Energy Policy Act of 2005* exclusions with multiple voltage taps where the highest tap is not less than 20 percent more than the lowest tap.

4. Drive transformers.
5. Rectifier transformers.
6. Auto-transformers.
7. Uninterruptible power system transformers.
8. Impedance transformers.
9. Regulating transformers.
10. Sealed and nonventilating transformers.
11. Machine tool transformers.
12. Welding transformers.
13. Grounding transformers.
14. Testing transformers.

TABLE R405.6
MINIMUM NOMINAL EFFICIENCY LEVELS FOR 10 CFR 431 LOW-VOLTAGE DRY-TYPE DISTRIBUTION TRANSFORMERS

SINGLE-PHASE TRANSFORMERS		THREE-PHASE TRANSFORMERS	
kVA[a]	Efficiency (%)[b]	kVA[a]	Efficiency (%)[b]
15	97.70	15	97.89
25	98.00	30	98.23
37.5	98.20	45	98.40
50	98.30	75	98.60
75	98.50	112.5	98.74
100	98.60	150	98.83
167	98.70	225	98.94
250	98.80	300	99.02
333	98.90	500	99.14
—	—	750	99.23
—	—	1000	99.28

a. kiloVolt-Amp rating.
b. Nominal efficiencies shall be established in accordance with the DOE 10 CFR 431 test procedure for low-voltage dry-type transformers.

SECTION R405
ALTERNATIVE USING RES*check*™ SOFTWARE

delete and replace **R405.2 Mandatory requirements.**

Compliance with this section requires that the applicable provisions in Sections R401.3, R402, R403, R404, and Chapter 3 be met.

modify **"SECTION R406 ENERGY RATING INDEX COMPLIANCE ALTERNATIVE"** *to"***SECTION R406 ENERGY RATING INDEX / HOME ENERGY RATING SYSTEM COMPLIANCE ALTERNATIVE"**

SECTION R406
ENERGY RATING INDEX/ HOME ENERGY RATING SYSTEM COMPLIANCE ALTERNATIVE

delete and replace **R406.2 Mandatory requirements.**

Compliance with this section requires that the applicable provisions in Sections R401.3, R402, R403 and R404 be met. The *building thermal envelope* shall be greater than or equal to levels of efficiency and *solar heat gain coefficients* in Table 402.1.2 of the 2009 *International Energy Conservation Code* for *Climate Zone* 6.

delete **R406.4 ERI-based compliance.**

add **R406.4 ERI/HERS-Based Compliance for *Base Code* and *Stretch Code*.**

Compliance based on an ERI analysis requires that the *rated design* be shown to have an ERI/HERS Index less than or equal to 54 for *Base Code* and less than or equal to 47 for *Stretch Code* when compared to the *ERI reference design*. Up to 5 ERI points can be earned with renewables. This includes all residential structures, including log homes. The ERI to be used to verify compliance is REM v16.3.3 or later or Ekotrope version 4.0 or later that is accredited by RESNET at https://www.resnet.us/providers/accredited-providers/hers-software-tools/.If the HERS Index scale is revised, the Department of Public Service may update these Index points.

TABLE R406.4
ERI/HERS COMPLIANCE FOR BASE CODE AND STRETCH CODE

BASE CODE	STRETCH CODE
60	59

delete **R406.6.3 Additional documentation.**

add **R406.6.3 Renewable Energy Certificate (REC) Documentation.**

Where on-site renewable energy is included in the calculation of an ERI, one of the following forms of documentation shall be provided to the *code official or authority having jurisdiction,* where one exists:

1. Substantiation that the RECs associated with the on-site renewable energy are owned by, or retired on behalf of, the homeowner.

2. An executed contract that conveys to the homeowner the RECs associated with the on-site renewable energy, or conveys to the homeowner an equivalent quantity of RECs associated with other renewable energy

add **R406.6.4 Additional documentation.**

The *code official or authority having jurisdiction*, where one exists shall be permitted to require the following documents:

1. Documentation of the building component characteristics of the *ERI reference design*.

2. A certification signed by the builder providing the building component characteristics of the *rated design*.

3. Documentation of the actual values used in the software calculations for the *rated design*.

SECTION R407
VERMONT STRETCH CODE

delete and replace **R407.2 Compliance**

Compliance for *Stretch Code* shall be documented through either Section R402.1.2.1 "Package Plus Points Approach" or Section R406 "Energy Rating Index / Home Energy Rating System (HERS) Compliance Approach".

For both Base Code and Stretch Code compliance, in Section R402.1.2.1 "Package Plus Points Approach", the same standard package is used. Stretch Code then requires more Points than the Base Code. For ERI/HERS compliance, a lower HERS Index is required for Stretch Code than for Base Code.

delete **R407.2.1 Package Plus Points Approach.**

delete **TABLE R407.2.1.1 INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT FOR STRETCH PACKAGES**

delete **R407.2.1.2 Required points by building size.**

delete **TABLE R407.2.1.2**

delete **R407.2.1.3 Points by Component.**

delete **TABLE R407.2.1.3**

delete **R407.2.2 ERI-based compliance for Stretch Code.**

delete **R407.3 Air Leakage Testing for Stretch Code.**

delete **R407.4 Electric vehicle charging**

delete **R407.5 Solar Ready Zone for Stretch Code.**

SECTION R408
INSULATION EMBODIED CARBON EMISSIONS

R408.1 Insulation Embodied Carbon

In order to earn Points from Table 402.1.2.3, complete calculation Table 408.1.1 to summarize estimated embodied carbon emissions from 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, wall, and roof insulation materials:

1. Insulation material type
2. Product R-value
3. Total surface area (ft^2)
4. Default, industry-average GWP value, from Table 408.1.2 or GWP values from *Type III Product-specific Environmental Product Declaration (EPD)*
5. Total project area (conditioned square feet)

Projects may substitute product-specific data for the default GWP value if the specified product has a lower reported GWP than the default value. Product-specific shall be substituted in Column G of the calculation Table 408.1.1. Substitution of default GWP values is only allowed when type III product-specific EPDs are sourced and noted in Column G. Projects shall use GWP values that include A1-A3 lifecycle stages, as documented in product-specific EPDs, with the exception of SPF and XPS products. For these products, the A5 and B1 values shall be included in the documented GWP value to account for the on-site and off gassing impact of blowing agents. Projects shall provide the EPDs declaration number in Column G.

TABLE R408.1.1

Table 1 – Insulation Global Warming Potential Calculation								Optional				
A	B	C	D	E	F	G		H	I
Assembly	Material *List insulation material type from Table 2*	Product R-Value	Surface Area (gross square feet)	Framing Factor ("1.0" for continuous, "0.8" for cavity)	Default Global Warming Potential (kg CO2e /sq.m. RSI-1) *Use Default GWP values from Table 2. Leave blank for products where product specific data will be*	Project has sourced Type III - Product-specific Environmental Product *Check box if project will be substituting default value with product specific data*	Product Specific Global Warming Potential (kg CO2e /sq.m. RSI-1) *Leave blank when EPDs have been sourced. Use GWP value from product-specific EPDs.*	Conversion Factor	GWP Result (kg CO2e)
Below grade, slab/slab edge			x	x	1.0	x	☐		x	0.0184	=	
Basement walls			x	x	1.0	x	☐		x	0.0184	=	
Above grade walls, cavity			x	x	0.8	x	☐		x	0.0184	=	
Above grade walls, continuous			x	x	1.0	x	☐		x	0.0184	=	
Roof, flat			x	x	1.0	x	☐		x	0.0184	=	
Roof, sloped, cavity			x	x	0.8	x	☐		x	0.0184	=	
Roof, sloped, continuous			x	x	1.0	x	☐		x	0.0184	=	
	Input for basic calculation							Summary Metrics	Total Insulation GWP (kg CO2e)			
	Inputs for product-specific data								Conditioned Floor Area (sf)			
	Calculation outputs								OUTPUT: Insulation GWP Intensity			

TABLE R408.1.2
DEFAULT INSULATION GLOBAL WARMING POTENTIAL VALUES

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

Material	Default Global Warming Potential (kg CO2e /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 - 15psi	2.80
EPS/graphite - Board, unfaced, Type IX - 25psi, graphite	3.40
EPS - Board, unfaced, Type I - 10psi	2.80
EPS - Board, unfaced, Type II- 15psi	3.80
EPS - Board, unfaced, Type IX- 25psi	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
SPF – Spray, closed cell HFC	13.10
SPF – Spray, high density HFC	17.00
Straw – Panel	-6.50
Vacuum Insulated Panel	7.40
Wood fiber – Board, unfaced, European	-6.50
Wood fiber – Board, unfaced, North America	-10.30
Wood fiber – Batt, unfaced	-2.40
Wool (Sheep) – Batt	1.00
Wool (Sheep) – Loosefill	0.80
XPS – Board, 25psi HFC	55.50
XPS – Board, 25psi "Low GWP" (HFO/HFC)	4.90

[a] https://www.buildersforclimateaction.org/beam-estimator.html
[b] EPD Declaration Number NEPD-2012-889-EN
[c] EPD Declaration Number 4788647002.102.1
[d] EPD Declaration Number EPD-KSI-20190072-IBC1-EN

CHAPTER 5
EXISTING BUILDINGS

SECTION R501
GENERAL

delete **R501.2 Existing buildings.**

add **R501.2 General**

Except as specified in this chapter, this code shall not be used to require the removal, *alteration* or abandonment of, nor prevent the continued use and maintenance of, an existing *building* or building system lawfully in existence at the time of adoption of this code. Unaltered portions of the existing building or building supply system shall not be required to comply with this code.

delete and replace **R501.4 Compliance.**

Additions, alterations, or changes of occupancy to, or relocation of, an existing building, building system or portion thereof shall comply with Section R502, R503, R504 or R505, respectively, in this code. Changes where unconditioned space is changed to conditioned space shall comply with Section R502.

SECTION R502
ADDITIONS

delete and replace **R502.1.1.1 Building envelope.**

New *building* envelope assemblies that are part of the *addition* shall comply with Sections R402.1, R402.2, R402.3.1 through R402.3.5, and R402.4. Air leakage testing in accordance with Section R402.4.1.2 is not required for *additions* complying with this code based on the attributes of the *addition* alone. Where the existing *building* and the *addition* comply with this code as a single building, or where the *building* with the *addition* does not use more energy than the existing *building*, testing must be performed in accordance with Section R402.4.1.2 and an air leakage rate not exceeding three (3) air changes per hour at 50 Pascals (or 0.23 CFM50/Sq. Ft. building shell area, six sided) must be verified.

Exception: Where *unconditioned* space is changed to *conditioned* space, the building envelope of the addition shall comply where the UA, as determined in Section R402.1.5, of the existing building and the addition, and any alterations that are part of the project, is less than or equal to UA generated for the existing *building*.

SECTION R503
ALTERATIONS

delete and replace **R503.1 General.**

Alterations to any building or structure shall comply with the requirements of the code for new construction, without requiring the unaltered portions of the existing building or building system to comply with this code. *Alterations* shall be such that the existing *building* or structure is no less conforming to the provisions of this code than the existing *building* or structure was prior to the *alteration*.

Alterations shall not create an unsafe or hazardous condition or overload existing *building* systems. *Alterations* shall be such that the existing *building* or structure uses no more energy than the existing *building* or structure prior to the *alteration*. *Alterations* to existing *buildings* shall comply with Sections R503.1.1 throughR503.1.4.

delete and replace **R503.1.4 Lighting.**

New lighting systems that are part of the *alteration* shall comply with Section R404.1.

> **Exception:** *Alterations* that replace less than 10 percent of the luminaires in a space, provided that such *alterations* do not increase the installed interior lighting power.

SECTION R505
CHANGE OF OCCUPANCY OR USE

delete and replace **R505.2 General.**

Any space that is converted to a dwelling unit or portion thereof from another use shall comply with this code.

> **Exception:** Where the simulated performance option in Section R405 is used to comply with this section, the annual energy cost of the proposed design is permitted to be 110 percent of the annual energy cost otherwise allowed by Section R405.

add **R505.2.1 Unconditioned space.**

> Any unconditioned or low-energy space that is altered to become a conditioned space shall comply with **Section R502.**

CHAPTER 6
REFERENCED STANDARDS

delete and replace the following referenced standards in Chapter 6 as follows:

ASHRAE

ASHRAE—2017 ASHRAE Handbook of Fundamentals
R402.1.5

ASHRAE 62.2 Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings
R304.1.1

ASHRAE 193—2010 (RA2014) Method of Test for Determining the Airtightness of HVAC Equipment
R403.3.2.1

APSP

The Association of Pool and Spa Professionals
2111 Eisenhower Avenue
Alexandria, VA 22314

ANSI/APSP/ICC 14—2014 American National Standard for Portable Electric Spa Energy Efficiency
R403.11

ANSI/APSP/ICC 15a—2013 American National Standard for Residential Swimming Pool and Spa Energy Efficiency—includes Addenda A Approved January 9, 2013
R403.10.1

ASTM

ASTM International
100 Barr Harbor Drive
West Conshohocken, PA 19428-2859

C1363—11 Standard Test Method for Thermal Performance of Building Materials and Envelope Assemblies by Means of a Hot Box Apparatus
R303.1.4.1

E283—2004(2012) Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls and Doors Under Specified Pressure Differences Across the Specimen
R202 "Air-Impermeable Insulation," R402.4.4

E779—10 Standard Test Method for Determining Air Leakage Rate by Fan Pressurization
R402.4.1.2

E1827—2011(2017) Standard Test Methods for Determining Airtightness of Building Using an Orifice Blower Door
R402.4.1.2

E2178—2013: Standard Test Method for Air Permanence of Building Materials
R202 "Air-Impermeable Insulation"

CSA

CSA Group
8501 East
Pleasant Valley
Cleveland, OH
44131-5575

R402.4.3

R403.5.4

CSA B55.2—2020 Drain Water Heat Recovery Units
R403.5.4

DASMA

Door and Access Systems
Manufacturers Association
1300 Sumner Avenue
Cleveland, OH 44115-2851

105 - 2017
R303.1.3

HVI

Home Ventilating Institute
1000 North Rand Road, Suite 214
Wauconda, IL 60084

HVI Publication 916 - Air Flow Test Procedure
Table R403.6.1

HVI Publication 920 - Product Performance Certification Procedure
R304.1.1, R403.6.1

R304.5.1, R304.6

ICC International Code Council, Inc.
500 New Jersey Avenue, NW
6th Floor
Washington, DC 20001

ICC 400—17 Standard on the Design and Construction of Log Structures
Table R402.1.2.1, R402.1.6, Table R402.1.6, Table 402.4.1.1

IBC—18 International Building Code®
R202 – Occupancy Classifications, R303.2, R402.1.1, R402.2.11,

IECC—06 2006 International Energy Conservation Code®
R406.2, R406.3.1

IECC—09 2009 International Energy Conservation Code®
R406.2

IFC—21 International Fire Code®
R201.3, R402.7.3, R402.7.10, R501.5

IFGC—21 International Fuel Gas Code®
R201.3,

IMC—21 International Mechanical Code®
R201.3, R402.4.1.2, R403.3.2, R403.6,

IPC—21 International Plumbing Code®
R201.3,

IRC—21 International Residential Code®
R201.3, R303.2, R402.1.1, R402.2.11, Table R402.4.1.1, R402.4.1.2, R402.4.4, R403.3.2, R403.6, R501.5

IEEE The Institute of Electrical and Electronic

Engineers, Inc.
3 Park Avenue
New York, NY 1016-5997

515.1—2012 IEEE Standard for the Testing, Design, Installation, and Maintenance of Electrical Resistance Trace Heating for Commercial Applications
R403.5.1.2

NEMA

National Electrical Manufacturers Association 1300 17th Street North No. 900
Arlington, VA 22209

OS 4—2016: Requirements for Air-Sealed Boxes for Electrical and Communication Applications
R402.4.6

NFPA

National Fire Protection Association.
1 Batterymarch Park
Quincy, MA 02169-7471

31—06 Installation of Oil-Burning Equipment
R305.1, R305.2, R305.3

54—09 National Fuel Gas Code
R202, R305.1, R305.2, R305.3

NFRC

National Fenestration Rating Council, Inc.
6305 Ivy Lane, Suite 140
Greenbelt, MD 20770

100—2020 Procedure for Determining Fenestration Products *U*-factors
R303.1.3

200—2020 Procedure for Determining Fenestration Product Solar Heat Gain Coefficients and Visible Transmittance at Normal Incidence
R303.1.3

400—2020 Procedure for Determining Fenestration Product Air Leakage
R402.4.3

RESNET

Residential Energy
Services
Network, Inc.
P.O. Box 4561
Oceanside, CA
92052-4561

ANSI/RESNET/ICC 301—2019 Standard for the Calculation and Labeling of the Energy Performance of Dwelling and Sleeping Units using an Energy Rating Index Published December 18, 2018
R406.6.1, R406.7.3

ANSI/RESNET/ICC 380—2016 Standard for Testing Airtightness of Building Dwelling Unit and Sleeping Unit Enclosures, Airtightness of Heating and Cooling Air Distribution Systems, and Airflow of Mechanical Ventilation Systems — Republished January 2016
R402.4.1.2

UL

UL LLC
333 Pfingsten Road
Northbrook, IL 60062

127—2011 Standard for Factory Built Fireplaces — with Revisions through July 2016
R402.4.2

515—2015 Standards for Electrical Resistance Trace Heating for Commercial Applications
R403.5.1.2

907—2016 Standard for Fireplace Accessories
R402.4.2

Clean Copy

Vermont Residential Building Energy Standard
AMENDMENTS

DEPARTMENT OF PUBLIC SERVICE

112 State Street
Montpelier, VT 05620

802-828-2811

https://publicservice.vermont.gov/

These rules are adopted under 30 V.S.A. § 51. This document shall be known and cited as the *Vermont Residential Building Energy Standard Amendments*. The *2024 Vermont Residential Building Energy Standards* (First Printing: April 2025) published by International Code Council, Inc., (ICC), as amended herein, are incorporated by reference and are available in print from the Vermont Department of Public Service or on the ICC website at: www.iccsafe.org. The *2020 Vermont Residential Building Energy Standards* (First Printing: July 2020) published by ICC are incorporated by reference and are available in print from the Vermont Department of Public Service or on the ICC website at: www.iccsafe.org

PREFACE

delete and replace Preface as follows:

Introduction

The 2024 *Vermont Residential Building Energy Standards* (RBES) is based on the *2020 Vermont Residential Building Energy Standards*, which are based on the 2018 and 2015 *International Energy Conservation Code*® (IECC®). The 2024 RBES also includes 2021 and 2018 IECC energy efficiency requirements as well as select language updates and additional, more stringent Vermont energy efficiency requirements.

This comprehensive energy conservation code establishes minimum regulations for energy efficient buildings using prescriptive and performance-related provisions. It is founded on broad-based principles that make possible the use of new materials and new energy efficient designs.

The *International Energy Conservation Code* provisions provide many benefits, among which is the model code development process that offers an international forum for energy professionals to discuss performance and prescriptive code requirements. This model code also encourages international consistency in the application of provisions.

Development

This 2024 RBES is founded on principles intended to establish provisions consistent with the scope of an energy conservation code that adequately conserves energy; provisions that do not unnecessarily increase construction costs; provisions that do not restrict the use of new materials, products or methods of construction; and provisions that do not give preferential treatment to particular types or classes of materials, products or methods of construction.

Background

The Vermont Residential Building Energy Standards (RBES) was adopted by statute (30 V.S.A. § 51) in 1997. Act 89 of 2013 established a Stretch Code defined as a building energy code for residential buildings that achieves greater energy savings than the RBES. The stretch code shall be available for adoption by municipalities under 24 V.S.A. §117 and shall apply in proceedings under 10 V.S.A. §151 (Act 250).

Update Process

The Residential Building Energy Standards statute provides that the Commissioner of Public Service may direct the timely and appropriate revision of the RBES after the issuance of updated standards under the *International Energy Conservation Code* (IECC). The Department of Public Service (PSD) convened stakeholders that included mortgage lenders, builders, building designers, utility representatives, and other persons with experience and expertise prior to the adoption of the 2024 RBES to provide recommendations.

The 2024 RBES is based on the language in the 2015 edition of the IECC and includes efficiency improvements included in the 2018 and 2021 IECC to ensure continued progression in efficiency in the Vermont RBES. The 2024 RBES builds on the "Package Plus Points" approach to code compliance, initiated in 2020. (Previous code compliance was achieved through a "prescriptive package" approach). The addition of "points" provides builders and designers greater flexibility in complying with the RBES. The 2024 RBES also simplified the Packages and makes them applicable to both the Base Code and the Stretch Code, with the only difference being the number of Points needing to be achieved. The 2024 RBES also attempts to better address multifamily construction by aligning the standards between RBES and the Commercial Building Energy Standards (CBES) so that regardless of whether the multifamily building falls under RBES (up to three stories in height) or CBES (buildings four stories or higher), the energy standards should be consistent. The Code Collaborative Process undertaken in 2021 allowed for more in-depth discussions with stakeholders on topics and many of the suggestions are reflected in the 2024 RBES. The Vermont PSD also held a series of stakeholder meetings in 2022 to gather feedback on proposed changes to the RBES. The 2024 RBES provisions were modified based on input received from these meetings.

The PSD has continued to receive input from stakeholders since the adoption of the 2024 RBES, including significant feedback from builders and architects. Since the development of the 2024 RBES, undertaken from 2021-2023, Vermont has continued to confront challenges in the housing and construction sectors – including rising costs and a severe housing shortage. Pursuant to 30 V.S.A. § 51, the RBES must be cost effective and affordable from the consumer perspective and must be consistent with state housing and energy policy. Recognizing these principles, the revisions presented in this document provide additional flexibility to address the pressing housing need while maintaining highly efficient standards for residential construction.

EFFECTIVE USE OF THE 2024 VERMONT RESIDENTIAL BUILDING ENERGY STANDARDS

The 2024 *Vermont Residential Building Energy Standards* (RBES) is a code that regulates minimum energy conservation requirements for new buildings as well as additions, alterations, renovations, and repairs to existing buildings. The 2024 RBES addresses energy conservation requirements for all aspects of energy uses in residential construction, including heating and ventilating, lighting, water heating, and power usage for appliances and building systems.

The 2024 RBES is a design document. For example, before constructing a building, the designer must determine the minimum insulation *R*-values and fenestration *U*-factors for the building exterior envelope. The RBES sets forth minimum requirements for exterior envelope insulation, window and door *U*-factors and SHGC ratings, duct insulation, lighting and power efficiency, mechanical ventilation, and water distribution insulation.

Arrangement and Format of the 2024 RBES

The 2024 RBES, like other codes published by the International Code Council® (the ICC®), is arranged and organized to follow sequential steps that generally occur during a plan review or inspection. The 2024 RBES is divided into six different parts:

Chapters	Subjects
1-2	Scope, administration and definitions
3	General requirements
4	Residential energy efficiency
5	Existing buildings
6	Referenced standards

The following is a chapter-by-chapter synopsis of the scope and intent of the provisions of the 2024 *Vermont Residential Building Energy Standards*:

Chapter 1 Scope and Administration. This chapter contains provisions for the application, enforcement and administration of subsequent requirements of the code. In addition to establishing the scope of the code, Chapter 1 identifies which buildings and structures come under its purview. Chapter 1 is largely concerned with maintaining "due process of law" in enforcing the energy conservation criteria contained in the body of this code. Only through careful observation of the administrative provisions can the *code official or authority having jurisdiction*, where one exists, reasonably expect to demonstrate that "equal protection under the law" has been provided.

Chapter 2 Definitions. Chapter 2 is the repository of the definitions of terms used in the body of the code. Codes are technical documents and every word, term and punctuation mark can impact the meaning of the code text and the intended results. The code often uses terms that have a unique meaning in the code and the code meaning can differ substantially from the ordinarily understood meaning of the term as used outside of the code.

The terms defined in Chapter 2 are deemed to be of prime importance in establishing the meaning and intent of the code text. The user of the code should be familiar with and consult this chapter because the definitions are essential to the correct interpretation of the code and the user may not be aware that a term is defined.

Where understanding of a term's definition is especially key to or necessary for understanding of a particular code provision, the term is shown in *italics* wherever it appears in the code. This is true only for those terms that have a meaning that is unique to the code. In other words, the generally understood meaning of a term or phrase might not be sufficient or consistent with the meaning prescribed by the code; therefore, it is essential that the code-defined meaning be known.

Guidance regarding tense, gender and plurality of defined terms as well as guidance regarding terms not defined in this code is provided.

Chapter 3 General Requirements. Chapter 3 provides interior design conditions that are used as a basis for assumptions in heating and cooling load calculations, and provides basic material requirements for insulation materials and fenestration materials, and provides standards for residential mechanical ventilation and combustion safety.

Chapter 4 Residential Energy Efficiency. Chapter 4 contains the energy-efficiency-related requirements for the design and construction of residential buildings regulated under this code. It should be noted that the definition of a *residential building* in this code is unique for this code. In this code, a *residential building* is an R-2, R-3 or R-4 building three stories or less in height. All other R-1 buildings, including residential buildings greater than three stories in height, are regulated by the energy conservation requirements in the Vermont Commercial Building Energy Standards (CBES). The applicable portions of a residential building must comply with the provisions within this chapter for energy efficiency. This chapter defines requirements for the portions of the building and building systems that impact energy use in new residential construction and promotes the effective use of energy. The provisions within the chapter promote energy efficiency in the building envelope, the heating and cooling system, lighting and the service water heating system of the building. Vermont has adopted a two-tiered code structure with a "B*ase Code*" that applies statewide, and a "*Stretch Code*" that is more stringent. The *Stretch Code* applies to all Act 250 development projects and is also available for municipalities that choose to adopt a higher energy standard.

Chapter 5 Existing Buildings. Chapter 5 of each set of provisions contains the technical energy efficiency requirements for existing buildings. Chapter 5 provisions address the maintenance of buildings in compliance with the code as well as how additions, alterations, repairs and changes of occupancy need to be addressed from the standpoint of energy efficiency. Specific provisions are provided for historic buildings.

Chapter 6 Referenced Standards. The code contains numerous references to standards that are used to regulate materials and methods of construction. Chapter 6 contains a comprehensive list of all standards that are referenced in the code. The standards are part of the code to the extent of the reference to the standard. Compliance with the referenced standard is necessary for compliance with this code. By providing specifically adopted standards, the construction and installation requirements necessary for compliance with the code can be readily determined. The basis for code compliance is, therefore, established and available on an equal basis to the *code official or authority having jurisdiction*, where one exists, contractor, designer and owner.

Chapter 6 is organized in a manner that makes it easy to locate specific standards. It lists all of the referenced standards, alphabetically, by acronym of the promulgating agency of the standard. Each agency's standards are then listed in either alphabetical or numeric order based on the standard identification. The list also contains the title of the standard; the edition (date) of the standard referenced; any addenda included as part of the ICC adoption; and the section or sections of this code that reference the standard.

Italicized Terms

Selected terms set forth in Chapter 2, Definitions, are italicized where they appear in code text. Such terms are not italicized where the definition set forth in Chapter 2 does not impart the

intended meaning in the use of the term. The terms selected have definitions that the user should read carefully to facilitate better understanding of the code.

Marginal Markings

Solid vertical lines in the margins within the body of the code indicate Vermont specific additions and changes from the requirements of the 2015 IECC and the 2018 edition. Deletion indicators in the form of an arrow (➡) are provided in the margin where an entire section, paragraph, exception or table has been deleted or an item in a list of items or a table has been deleted.

Abbreviations and Notations

The following is a list of common abbreviations and units of measurement used in this code. Some of the abbreviations are for terms defined in Chapter 2. Others are terms used in various tables and text of the code.

AFUE	Annual fuel utilization efficiency
ATWHP	Air-to-water heat pump
bhp	Brake horsepower (fans)
Btu	British thermal unit
Btu/h-ft^2	Btu per hour per square foot
C-factor	See Chapter 2—Definitions
CDD	Cooling degree days
CFA	Conditioned floor area
cfm	Cubic feet per minute
cfm/ft^2	Cubic feet per minute per square foot
ci	Continuous insulation
COP	Coefficient of performance
CO_2e	Carbon dioxide equivalent
DCV	Demand control ventilation
°C	Degrees Celsius
°F	Degrees Fahrenheit
DWHR	Drain water heat recovery
DX	Direct expansion
E_c	Combustion efficiency
E_v	Ventilation efficiency
E_t	Thermal efficiency
ECM	Electronically commutated motor
EER	Energy efficiency ratio
EF	Energy factor
ERI	Energy rating index
EPD	Environmental product declaration
F-factor	See Chapter 2—Definitions
FDD	Fault detection and diagnostics
FEG	Fan efficiency grade
FL	Full load

ft^2	Square foot
GPF	Gallons per flush
GPM	Gallons per minute
GSHP	Ground-source heat pump
GWP	Global warming potential
HDD	Heating degree days
HERS	Home Energy Rating System
hp	Horsepower
H/ERV	Heat or energy recovery ventilation
HSPF	Heating seasonal performance factor
HVAC	Heating, ventilating and air conditioning
IEER	Integrated energy efficiency ratio
IPLV	Integrated Part Load Value
Kg/m^2	Kilograms per square meter
kW	Kilowatt
LPD	Light power density (lighting power allowance)
L/s	Liters per second
Ls	Liner system
m^2	Square meters
MERV	Minimum efficiency reporting value
NAECA	National Appliance Energy Conservation Act
NPLV	Nonstandard Part Load Value
Pa	Pascal
PF	Projection factor
pcf	Pounds per cubic foot
PSD	Department of Public Service (Vermont)
psf	Pounds per square foot
PTAC	Packaged terminal air conditioner
PTHP	Packaged terminal heat pump
R-value	See Chapter 2—Definitions
SCOP	Sensible coefficient of performance
SEER	Seasonal energy efficiency ratio
SHGC	Solar Heat Gain Coefficient
SPVAC	Single packaged vertical air conditioner
SPVHP	Single packaged vertical heat pump
SRE	System recovery efficiency
SRI	Solar reflectance index
SWHF	Service water heat recovery factor
U-factor	See Chapter 2—Definitions
VAV	Variable air volume
VRF	Variable refrigerant flow
VT	Visible transmittance
W	Watts
w.c.	Water column
w.g.	Water gauge

CHAPTER 1
ADMINISTRATION

PART 1—SCOPE AND APPLICATION

SECTION R101
SCOPE AND GENERAL REQUIREMENTS

delete and replace **R101.1 Title.**
This code shall be known as the 2024 *Vermont Residential Building Energy Standards* (RBES) and shall be cited as such. It is referred to herein as "this code."

delete and replace **R101.2 Scope.**
This code applies to *residential buildings* and the *building sites* and associated systems and equipment, including one family dwellings, two family dwellings, and multifamily housing three stories or less in height.

For the purpose of determining the building type that must comply with the RBES under Vermont statute, a multifamily building is a *residential building* or *mixed-use* building with three or more *dwelling units* three stories or less in height. Multifamily buildings of four stories or more in height must comply with the CBES (from Vermont 30 V.S.A. § 51.)
While many sections of this code (e.g., inspections, review of construction documents, compliance, etc.) do not pertain to most of Vermont that lacks a *code official or authority having jurisdiction*, these sections are included to provide guidance for those jurisdictions that do have a *code official or authority having jurisdiction*.

delete and replace **R101.7 Base and Stretch Code.**
The "*Base Code*" is the RBES Energy Code that is applicable throughout Vermont, except for projects subject to 10 V.S.A. Chapter 151 (Act 250), and in any municipalities that have adopted the more stringent "Stretch Code."

All *Base Code* requirements shall be met in addition to the requirements in the *Stretch Code* section R407 in order to be in compliance with the *Stretch Code*.

delete and replace **R101.8 Compliance options.**

2020 RBES Pathway
As an alternative compliance pathway, projects meeting the requirements of the *2020 Vermont Residential Building Energy Standards* (RBES) (First Printing: July 2020), published by International Code Council (ICC), shall satisfy this code. For purposes of this pathway, all provisions and requirements of the 2020 RBES shall govern compliance. Projects electing to follow the 2020 RBES must follow the associated stretch code when required.

The 2020 RBES are available in print from the Vermont Department of Public Service, and on the ICC website at iccsafe.org. Additional resources for compliance are available at https://publicservice.vermont.gov/efficiency/building-energy-standards/residential-building-energy-standards.

2024 RBES Pathway

For projects following the 2024 RBES, there are three thermal efficiency compliance options:

1. Package Plus Points: For the *Base Code* and *Strech Code*, Table R402.2.1.1 lists the options for insulation and fenestration packages. Table R402.1.2.2 lists the additional points required for compliance based on building square footage for both *Base Code* and *Stretch Code*, and Table R402.1.2.3 lists the components and respective point values to be used to meet the point requirement in Table R402.1.2.2.

2. RES*check*™: The U.S. Department of Energy's RES*check*™ software.

3. Home Energy Rating System (HERS): A HERS energy rating that demonstrates compliance with Section 406.4 for the Base or Stretch Code based on REM v16.3.3 or later or Ekotrope version 4.0 or later that is accredited by RESNET at https://www.resnet.us/providers/accredited-providers/hers-software-tools/.

PART 2—ADMINISTRATION AND ENFORCEMENT

SECTION R103
CONSTRUCTION DOCUMENTS

delete and replace **R103.1 General.**
Where required, construction documents, technical reports and other supporting data shall be submitted in one or more sets, or in a digital format where allowed by the code *official or authority having jurisdiction*, where one exists, with each application for a permit. The construction documents and technical reports shall be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed. Where special conditions exist, the *code official or authority having jurisdiction*, where one exists, is authorized to require necessary construction documents to be prepared by a registered design professional.

> **Exception:** The *code official or authority having jurisdiction,* where one exists, is authorized to waive the requirements for construction documents or other supporting data if the *code official or authority having jurisdiction,* where one exists, determines they are not necessary to confirm compliance with this code.

delete and replace **R103.2 Information on construction documents.**
Where required, construction documents shall be drawn to scale upon suitable material. Electronic media documents are permitted to be submitted where *approved* by the *code official or authority having jurisdiction*, where one exists. Construction documents shall be of sufficient clarity to indicate the location, nature and extent of the work proposed, and show in sufficient detail pertinent data and features of the *building*, systems and equipment as herein governed. Details shall include, but are not limited to, the following as applicable:

1. Insulation materials and their *R*-values.
2. Fenestration *U*-factors and *solar heat gain coefficients* (SHGC).
3. Area-weighted U-factor and *solar heat gain coefficients* (SHGC) calculations.

4. Mechanical system design criteria.

5. Mechanical and service water-heating systems and equipment types, sizes and efficiencies.

6. Equipment and system controls and control strategies.

7. Duct sealing, duct and pipe insulation and location.

8. Air sealing details.

9. Energy code compliance path.

SECTION R104
INSPECTIONS

delete and replace **R104.1 General.**
Where required, construction or work for which a permit is required shall be subject to inspection by the *code official or authority having jurisdiction*, where one exists, or his or her designated agent, and such construction or work shall remain visible and able to be accessed for inspection purposes until *approved.* It shall be the duty of the permit applicant to cause the work to remain visible and able to be accessed for inspection purposes. Neither the *code official or authority having jurisdiction*, where one exists, nor the jurisdiction shall be liable for expense entailed in the removal or replacement of any material, product, system or building component required to allow inspection to validate compliance with this code.

CHAPTER 2
DEFINITIONS

SECTION R202
GENERAL DEFINITIONS

add **ACCESS (TO).** That which enables a device, appliance, or equipment to be reached by *ready access* or by a means that first requires the removal or movement of a panel or similar obstruction.

delete and replace **AIR BARRIER.** An air barrier is a durable solid (non-porous) assembly that blocks air flow through the *building thermal envelope* and its assemblies. Air barriers must be continuous, sealed at all joints, penetrations, and interruptions using durable sealants intended for such use and compatible with all adjacent materials, and able to resist pressures without displacement or damage.

add **BUILDING SHELL AREA.** The sum of the area of ceiling, floors, and walls, slab (all "six sides") separating a *dwelling unit's conditioned space* from the exterior or from adjacent conditioned or unconditioned spaces. Wall height shall be measured from the finished floor of the *dwelling unit* to the underside of the floor above.

delete and replace **BUILDING SITE.** A contiguous area of land that is under the ownership or control of one entity.

add **CARBON DIOXIDE EQUIVALENT (CO_2E).** A measure used to compare the impact of various greenhouse gases based on their global warming potential (GWP). CO_2e approximates the warming effect of a unit mass of a given greenhouse gas relative to that of carbon dioxide (CO_2).

add **CAVITY INSULATION.** Insulating material located between framing members.

delete and replace **CLIMATE ZONE.** A geographical region based on climatic criteria as specified in this code. Vermont is *Climate Zone* 6.

delete **DEADBAND.** The temperature range in which no heating or cooling is used.

add **DEMAND RESPONSE SIGNAL.** A signal that indicates a price or a request to modify electricity consumption for a limited time period.

add **DEMAND RESPONSIVE CONTROL.** A control capable of receiving and automatically responding to a demand response signal.

add **DIMMER.** A control device that is capable of continuously varying the light output and energy use of light sources.

add **ELECTRIC VEHICLE CHARGING – LEVEL 2 CAPABLE.** Level 2 "capable" includes space in the utility room for panel(s) of at least one minimum 40-ampere branch circuit to be provided to garages and/or the exterior of the building to accommodate a future dedicated Society of Automotive Engineers (SAE) standard J1772-approved Level 2 EVSE with a J1772 connector or NEMA 14-50, or equivalent, within 5 feet of the centerline for each EV charging parking space. A conduit or other unobstructed path to easily run a future wire to the parking spot shall also be provided.

add **ELECTRIC VEHICLE CAPABLE PARKING SPACE. A parking** space with all the requisite infrastructure in place within five feet to allow electrical wiring and connection to power for EVSE.

delete and replace **ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE).** Level 2 electric vehicle charging parking that requires one 208/240V 40 amp grounded connection for electric vehicle charging through dedicated EVSE with J1772 connector or AC receptacle, NEMA 14-50, or equivalent, within 5 feet (1524 mm) of the centerline for each EV charging parking space.

add **GLOBAL WARMING POTENTIAL (GWP).** GWP is an index for estimating the relative global warming contribution of atmospheric emissions of 1 kg of a particular greenhouse gas compared to emissions of 1 kg of CO_2. The following GWP values are used based on a 100-year time horizon: 1 for CO_2, $\underline{< 10 \text{ for pentane (e.g., } C_5H_{12})}$, $\underline{\text{and 1430 for R-134a } (CH_2FCF_3)}$.

add **GLOBAL WARMING POTENTIAL (GWP) INTENSITY**. For the purposes of this document, GWP intensity refers to the GWP impact from materials (kg $CO2_e$) divided by the project's total conditioned floor area in square feet (ft^2).

delete **HIGH-EFFICACY LAMPS/ LIGHTING.**

add **HIGH-EFFICACY LIGHT SOURCES.** Non-linear medium screw- and pin-base lamps with a minimum efficacy of not less than65 lumens per watt; or light fixtures of not less than 65 lumens per watt. In determining the number or percent of lamps, each replaceable lamp (or light string) connected to a permanently installed lighting fixture shall count as one lamp.

delete **LEVEL 1 ELECTRIC VEHICLE CHARGING.**

delete **LEVEL 2 ELECTRIC VEHICLE CHARGING.**

delete and replace **LIGHTING.** See "High-efficacy light sources."

delete and replace **MULTIFAMILY DWELLING/BUILDING.** A building containing three or more dwelling units where the occupants are primarily permanent in nature and which are adjacent vertically or horizontally. If built side-by-side, at least one of the following is true: (1) they do not have a wall that extends from ground to roof, (2) they share a heating system, or (3) they have interstructural public utilities such as water supply/sewage disposal.

add **NET ZERO ENERGY READY.** A highly efficient and cost-effective building designed and constructed so that renewable energy could offset all or most of its annual energy consumption.

add **OCCUPANT SENSOR CONTROL.** An automatic control device that detects the presence or absence of people within an area and causes lighting, equipment or appliances to be regulated accordingly.

add **ON-SITE RENEWABLE ENERGY GENERATION.** Energy from renewable energy resources that is generated at the building site.

add **READY ACCESS (TO).** That which enables a device, appliance, or equipment to be directly reached without requiring the removal or movement of any panel or similar obstruction.

add **RENEWABLE ENERGY CERTIFICATE (REC).** An instrument that represents the environmental attributes of one megawatt hour of renewable energy; also known as an energy attribute certificate (EAC).

delete **RENEWABLE ENERGY SOURCES.**

add **RENEWABLE ENERGY RESOURCES.** Energy produced using a technology that relies on a resource that is being consumed at a harvest rate at or below its natural regeneration rate including, but not limited to, solar hot water, solar hot air, solar photovoltaics, wind, and hydro.

(A) Methane gas and other flammable gases produced by the decay of sewage treatment plant wastes or landfill wastes and anaerobic digestion of agricultural products,

byproducts, or wastes shall be considered renewable energy resources, but no form of solid waste, other than agricultural or silvicultural waste, shall be considered renewable.

(B) The only portion of electricity produced by a system of generating resources that shall be considered renewable is that portion generated by a technology that utilizes a renewable fuel or energy source.

(C) The following fuels shall not be considered renewable energy sources: coal, oil, propane, and fossil natural gas.

(D) *Biomass* is considered renewable.

(E) *Biodiesel* is considered renewable.

delete and replace **SOLAR ENERGY SOURCE.** Source of thermal, chemical, or electrical energy derived directly from conversion of incident solar radiation.

delete and replace **STRETCH CODE.** A building energy code that achieves greater energy savings than the B RBES *Base Code*. The *Stretch Code* is required for Act 250 projects and may be adopted by municipalities.

add **THERMAL DISTRIBUTION EFFICIENCY (TDE).** The resistance to changes in air heat as air is conveyed through a distance of air duct. TDE is a heat loss calculation evaluating the difference in the heat of the air between the air duct inlet and outlet caused by differences in temperatures between the air in the duct and the duct material. TDE is expressed as a percent difference between the inlet and outlet heat in the duct.

add **TINY HOUSE.** A detached *dwelling unit* of less than **400** square feet of floor area **excluding lofts.**

add **TYPE III PRODUCT-SPECIFIC ENVIRONMENTAL PRODUCT DECLARATION (EPD).** An EPD is a document that describes the results of a life cycle assessment (LCA) for a material or product. While there are industry-specific EPDs, which average results across multiple product manufacturers, product-specific EPDs are the most thorough type of EPD. Type III, product-specific EPDs cover a single product from a manufacturer and are reviewed by a third-party entity. They conform to ISO 14025 and either EN 15804 or ISO 21930. Like all product specific EPDs, the scope must cover the product's life-cycle from cradle to gate.

CHAPTER 3
GENERAL REQUIREMENTS

SECTION R302
DESIGN CONDITIONS

delete and replace **R302.2 Climactic data.**
The following design parameters in Table R302.2 shall be used for calculations required under this code.

Adjustments may be made only in the following cases:

1. Winter heating design temperatures for projects either:

   i. Located at an elevation of 1,500 feet (457 m) or higher, or

   ii. Located in Caledonia, Essex or Orleans counties.

   iii. Adjustments shall be made as listed in the National Climate Data Center for the specific weather station: http://www.ncdc.noaa.gov/cdo-web/.

2. As approved by the *code official or authority having jurisdiction,* where one exists.

SECTION R303
MATERIALS, SYSTEMS AND EQUIPMENT

delete and replace **R303.1.2 Insulation mark installation.**
Insulating materials shall be installed such that the manufacturer's *R*-value mark is readily observable upon inspection. For insulation materials that are installed without an observable manufacturer's R-value mark, such as blown or draped products, an insulation certificate complying with **Section R303.1.1** shall be left immediately after installation by the installer, in a conspicuous location within the building, to certify the installed R-value of the insulation material.

add **R303.1.5 Air-impermeable insulation.**
Insulation having an air permeability not greater than 0.004 cubic feet per minute per square foot [0.002 L/(s × m2)] under pressure differential of 0.3 inch water gauge (75 Pa) when tested in accordance with **ASTME2178** shall be determined air-impermeable insulation.

SECTION 304
DESIGN CRITERIA FOR RESIDENTIAL VENTILATION SYSTEMS

delete and replace **R304.1 Scope.**
This section shall govern ventilation of the dwelling unit(s) within Type R-1 *residential buildings*, Type R-2 *residential buildings* and multiple single-family attached dwellings (townhouses and *multifamily* buildings) not more than three stories in height.

delete and replace **R304.1.1 Compliance.**
Compliance with Section 304 shall be achieved by installing a *whole house balanced ventilation system* with minimum 75 *SRE* and 1.2 cfm/Watt, determined in accordance with HVI Publication 920 and listed in HVI Publication 911, while also meeting compliance with Sections 304.2

through 304.11 or demonstrating compliance with one of the following alternatives:

1. ASHRAE Standard 62.2—2019 (Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings)

2. Passive house ventilation requirements (PHI or PHIUS)

Exceptions:

1. *Whole house balanced ventilation systems* that are controlled using user-settable closed-loop feedback based on pollutant levels (e.g., carbon dioxide or volatile organic compounds) are not subject to run-time ventilation rate minimums in the standards referenced above, or Section 304.6.1.1.

2. *Tiny houses* may install an exhaust-only ventilation system.

delete and replace **304.2 Local ventilation.**
Ventilation fans in bathrooms containing a bathtub, shower, spa or similar bathing fixture and not included in the whole house ventilation system shall be sized to provide 50 CFM intermittent or 20 CFM continuous exhaust capacity. Whole house ventilation fans serving both localized and whole house ventilation functions shall be sized to meet the net capacity rates as required by Section R304.6 and must meet all other requirements listed in Section R304.3, as applicable.

TABLE 304.2
MINIMUM REQUIRED LOCAL EXHAUST

OCCUPANCY CLASSIFICATION	MECHANICAL EXHAUST CAPACITY (CFM)
Bathrooms	50 cfm intermittent or 20 cfm continuous

delete **R304.3 Whole house balanced ventilation.**

delete and replace **R304.5 Fan motor requirements.**
Fans installed for the purpose of providing whole house ventilation must meet the minimum requirements as specified in this section.

delete **R304.5.2 Fan power consumption.**

delete **R304.5.34 Performance verification.**

delete and replace **R304.6 Net capacity requirements.**
Whole house ventilation system fans shall be installed according to the manufacturer's installation instructions and shall have the manufacturer's fan flow ratings as listed in accordance with HVI 911. Unless the whole house system is tested according to procedures in Section R304.6.1, the minimum continuous flow rate that the ventilation system must be capable of supplying during its operation shall be based on the rate per bedroom as specified in Table R304.6.

TABLE R304.6

PRESCRIPTIVE FAN CAPACITY REQUIREMENTS FOR CENTRALLY DUCTED SYSTEMS

NUMBER OF BEDROOMS	MINIMUM NOMINAL RATED TOTAL FAN CAPACITY[a] (at 0.1 inches w.g.)
1	50 cfm
2	75 cfm
3	100 cfm
4	125 cfm
5	150 cfm
Homes > 3,000 ft^2	cfm = 0.05 · ft^2

For SI: 1 cubic foot per minute = 0.0004719 m^3/s, 1 cubic foot per minute per square foot = 0.00508 $m^3/(s \cdot m^2)$.
a. Represents the total installed rated capacity of all fans designed for whole house ventilation.

delete and replace **R304.6.1 Testing option.**
Testing may be done for Points to verify that the whole house ventilation system satisfies the ventilation requirements of this section in accordance with Sections R304.6.1.1 and R304.6.1.2.

delete and replace **R304.8 Controls.**
Whole house ventilation systems (balanced ventilation) shall be capable of being set remotely for continuous operation or shall be provided with an automatic control for intermittent operation. All whole house ventilation controls shall be readily accessible.

Exception: Fans installed expressly for local ventilation purposes.

delete and replace **R304.9.3 Ducts.**
Smooth wall ducts (for example, metal or composite) must be used for all duct runs longer than 8 feet (2438 mm). Ducts shall be insulated when installed in an unheated location

add **R304.9.9 Exhaust Dampers.**
Dampers with positive closures shall be installed to keep outside air from entering the exhaust duct when the system is not operating.

Exception: Mechanical ventilation systems designed for continuous operation.

delete and replace **R304.11 Makeup air required.**
Exhaust hood systems and clothes dryers capable of exhausting in excess of 400 cubic feet per minute (0.19 m^3/s) shall be provided with makeup air at a rate approximately equal to the exhaust air rate. Such makeup air systems shall be equipped with a means of closure and shall be automatically controlled to start and operate simultaneously with the exhaust system.

CHAPTER 4
RESIDENTIAL ENERGY EFFICIENCY

SECTION R401
GENERAL

delete and replace **R401.1 Scope.**

This chapter applies to *residential buildings* compliance with both the *Base Code* and *Stretch Code*. *Stretch Code* requires compliance with all Base Code requirements throughout RBES, plus achieving the additional points specified in Table R402.1.2.2, following all requirements of the following sections, and complying with Section R407 Vermont Stretch Code.

delete and replace **R401.2 Compliance.**

Projects for both *Base Code* and *Stretch Code* shall comply with one of the following:

1. **Package Plus Points:** Sections R402 through R404.

2. **RES*check*™ software:** Section R405 and the provisions of Sections R401 through R404 indicated as "Mandatory."

3. **Home Energy Rating System (HERS):** An energy rating index (ERI) approach in Section R406.

delete and replace **R401.3 Certificate of Compliance**

An *RBES certificate* is required to be issued. The *certificate* should be issued upon completion and before occupancy of any project subject to the Residential Building Energy Standards. A *certificate* may be issued by a builder, a licensed professional engineer, a licensed architect or an accredited home energy rating organization. If certification is not issued by a licensed professional engineer, a licensed architect or an accredited home energy rating organization, it shall be issued by the builder. Any certification shall certify that residential construction meets the RBES. The Department of Public Service will develop and make available to the public a certificate that lists key features of the RBES. Any person certifying shall use this certificate or one substantially like it to certify compliance with the RBES. Certification shall be issued by completing and signing a certificate and affixing it to the electrical service panel, without covering or obstructing the visibility of the circuit directory label, service disconnect label or other required labels. The certificate shall certify that the residential building has been constructed in compliance with the requirements of the RBES. The person certifying under this subsection shall provide a copy of the certificate to the Department of Public Service and shall assure that a certificate is recorded and indexed in the town land records. A builder may contract with a licensed professional engineer, a licensed architect or an accredited home energy rating organization to issue certification and to indemnify the builder from any liability to the owner of the residential construction caused by noncompliance with the RBES.

SECTION R402
BUILDING THERMAL ENVELOPE

delete and replace **R402.1 General.**
The *building thermal envelope* shall meet the requirements of Sections R402.1.1 through R402.1.6. for compliance with the *Base Code* and the *Stretch Code*.

Exception: The following *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 R402.

1. **Low energy use buildings.** Those with a peak design rate of energy usage less than 3.4 Btu/h per square foot of floor space for space conditioning purposes (10.7 W/m^2 or 1.0 watt/ft^2 of floor area for space-conditioning purposes
2. **Unconditioned buildings.** Those that do not contain *conditioned space*.
3. **Mobile homes.** Homes subject to Title VI of the National Manufactured Housing Construction and Safety Standards Act of 1974 (42 U.S.C. §§ 5401–5426).
4. **Hunting camps.** Residential buildings shall not include hunting camps.
5. **Summer camps.** Residential buildings constructed for nonwinter occupation with only a biomass (wood) or other on-site renewable heating system.
6. **Yurts** with only a biomass (wood) or other on-site renewable heating and hot water system.
7. **Owner-built homes.** Residential construction by an owner, if all of the following apply:

    7.1. The owner of the residential construction is the *builder*, as defined in 30 V.S.A. § 51.

    7.2. The residential construction is used as a dwelling by the owner.

    7.3. The owner in fact directs the details of construction with regard to the installation of materials not in compliance with the RBES.

    7.4. The owner discloses in writing to a prospective buyer, before entering into a binding purchase and sales agreement, with respect to the nature and extent of any noncompliance with the RBES.

    Any statement or certificate given to a prospective buyer shall itemize how the home does not comply with the RBES and shall itemize which measures do not meet the RBES in effect at the time construction commenced. Any certificate given under this subsection shall be recorded in the land records where the property is located and sent to the Department of Public Service (PSD) within 30 days following sale of the property by the owner. A certificate that itemizes how the home does not comply with the RBES is available from the PSD.

8. **Tiny Houses.** While not specifically exempt, *tiny houses* as defined in Chapter 2 must comply with the envelope, insulation and fenestration requirements in R402.8. All other code provisions are still required with the exception that the mechanical ventilation

system does not have to be heat recovery with balanced ventilation and may be exhaust-only.

delete and replace **R402.1.1 Vapor retarder.**
Wall assemblies in the *building thermal envelope* shall comply with the vapor retarder requirements of Section R702.7 of the *International Residential Code* or Section 1404.3 of the *International Building Code*, as applicable.

delete and replace **R402.1.2 Insulation and fenestration criteria.**
The *building thermal envelope* shall **comply** with one of the following only:

1. Package Plus Points Approach: Tables R402.1.2.1, R402.1.2.2 and R402.1.2.3.
2. *U*-Factor Alternative Approach: Section R402.1.4.
3. Total UA Approach: Section R402.1.5.
4. Log Home Approach: Section R402.1.6.
5. *Tiny House* Approach: Section R402.8.

Building science principles should be applied in all circumstances. Consult with a building science professional and refer to the Vermont Residential Energy Code Handbook for additional guidance and details.

delete and replace **R402.1.2.1 Package Plus Points Approach.**
Projects shall comply with Items 1 through 4: for both *Base Code* and *Stretch Code*:

1. Select one of the packages listed in Table R402.1.2.1. These standard packages apply to both *Base Code* and *Stretch Code*.
2. Determine the number of points needed to comply with Table R402.1.2.2 based on building size and whether the building needs to comply with *Base Code* or *Stretch Code*.
3. Incorporate a sufficient number of points from Table R402.1.2.3 to meet the points requirements from Table R402.1.2.2.
4. . Points can only be earned from measures that are not already required in the chosen standard package.

delete and replace **R402.1.2.1 Package Plus Points Approach.**
Projects shall comply with Items 1 through 4: for both *Base Code* and *Stretch Code*:

1. Select one of the packages listed in Table R402.1.2.1. These standard packages apply to both *Base Code* and *Stretch Code*.
2. Determine the number of points needed to comply with Table R402.1.2.2 based on building size and whether the building needs to comply with *Base Code* or *Stretch Code*.

3. Incorporate a sufficient number of points from Table R402.1.2.3 to meet the points requirements from Table R402.1.2.2.

4. . Points can only be earned from measures that are not already required in the chosen standard package.

Delete and replace **TABLE R402.1.2.1**

TABLE R402.1.2.1
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT FOR STANDARD PACKAGES FOR BASE CODE AND STRETCH CODE [a]

Component	Package 1	Package 2
	"Standard Package"	"Log Homes"
Ceiling – flat attic[g]	**U-0.020:** R-49[g]	
Ceiling – slope (no attic)	**U-0.025:** R-44	
Above Grade Wall[b]	**U-0.044:** R-21+5ci[e] OR R-13+10ci OR R-20 6 ½" ci (SIP) OR Other that meets U-factor	Construct log home walls to ICC 400—2022 Standard on the Design and Construction of Log Structures Table 305.3.1.2 or Vermont RBES Table R402.1.6
Frame Floor	**U-0.029:** R-38	
Basement/Crawl[c]	R-20ci OR R13+10ci	
Slab, on grade[d]	R-20,4' (edge) OR R-15,4'(edge) + R-7.5 (under entire slab)	
Slab, on grade, Heated[d]	R-20,4' (edge) + R-15 (under entire slab)	
Windows	**U-0.30**	
Skylights	**U-0.41**	
Doors	**U-0.37**	
Air Leakage	0.15 CFM50/Sq. Ft. of Building Shell (~2 ACH50)[h]	
Ducts	Inside thermal boundary	

For SI: 1 foot = 304.8 mm.

a. *R*-values are minimums. *U*-factors are maximums. Where insulation is installed in a cavity that is less than the label or design thickness of the insulation, the installed *R*-value of the insulation shall be not less than the *R*-

value specified in the table. See Section R402.1.4 for alternative compliance methods.

b. These are *example* wall assemblies. Any wall assembly would need to meet required U values and should consider building science to avoid moisture concerns. See RBES Handbook for building science guidance and more example wall assemblies.
c. The continuous portion of basement and crawlspace insulation can be met through interior, exterior or combination.
d. "4 ft" can be horizontal or vertical coverage including slab edge. "Edge and under" requires complete coverage. Up to 8 lineal feet of exposed slab edge may be insulated to R-10. "Heated slab" are those with embedded radiation.
e. The first value is cavity insulation, the second value is continuous insulation, or "ci", so "20 + 5ci" means R-20 cavity insulation plus R-5 continuous insulation.
f. Consider building science principles in all design and construction. Buildings should be designed and constructed recognizing principles behind moisture vapor control approaches for cold climates. Maintain the envelope assembly's ability to adequately dry in at least one direction by not installing low-perm vapor retarder materials (e.g., vapor barrier) on both sides of an assembly, seek to optimize the assembly's ability to dry, and limit the potential for wetting. (From Applied Building Technologies Group, LLC).
g. If there is insufficient space in the eaves, installing R-38 over the top of exterior walls shall be deemed to satisfy the requirement for R-49 insulation provided the rest of the ceiling is R-49. (See Section R402.2.1). Multifamily buildings using continuous insulation with a maximum U-factor of 0.023 or tapered insulation with an average U-factor of 0.023 for the ceiling assembly satisfies this requirement. A minimum value of R-12 is required for tapered insulation.
h. "ACH50" = air changes per hour at 50 Pascals building pressure as measured with a blower door. CFM50/Sq. Ft. of Building Shell = amount of air leakage (in cubic feet per minute, or CFM) that leaks out of each square foot of the exterior surface all six sides of the building measured at 50 Pascals of pressure with a blower door.
i. Installing R-38 over the top of exterior walls where insulation is compressed in the eaves shall be deemed to satisfy the requirement for R-44 where there is insufficient space in framing rafters for more than R-38 provided the rest of the ceiling is R-44. See R402.2.2 for more detail.

delete **R402.1.2.2 Required Points by Building Size.**

add **R402.1.2.2 Required points by building or addition size.**

Determine the number of points required by building or addition size from Table R402.1.2.2. Building size for this table is determined by the *finished conditioned floor* area per dwelling unit inside the *building thermal envelope*, including unfinished basements and storage/utility spaces.

The Multifamily less than 1,250 square feet (185.8 m^2) and 1,2500-2,500 square feet point requirement categories cannot be used for semi-detached (semi-attached, side-by-side), row houses, and townhouses, as defined as *single-family dwellings* in Section R202, General Definitions. *Multifamily dwelling* unit size is based on the average *finished conditioned floor* area dwelling size for the building, excluding common areas, hallways, stairwells, etc..

delete and replace **TABLE R402.1.2.2**

TABLE R402.1.2.2
REQUIRED POINTS BY BUILDING SIZE FOR BASE CODE AND STRETCH CODE

BUILDING/DWELLING SIZE	BASE CODE REQUIRED POINTS	STRETCH CODE REQUIRED POINTS
Alterations	0	0
Additions < 250 square feet	0	0
Additions 250 to 500 square feet	1	2
Addition 501 to 1,000 square feet	2	3

Addition > 1,000 square feet	3	4
Multifamily <650 square feet	0	1
Multifamily 650 to 900 square feet	1	2
Multifamily 900 to 1,250 square feet	2	3
Multifamily >1,250 to 2,500 square feet	4	5
< 2,500 square feet	5	7
2,500 to 4,000 square feet	7	12
> 4,000 square feet	10	15

delete and replace **TABLE R402.1.2.3**

TABLE R402.1.2.3
POINTS BY COMPONENT FOR BASE CODE AND STRETCH CODE

Component		Description	Points
Envelope	Slab (on or below grade, heated or unheated)	R-20 around perimeter and below entire slab **OR**[b]	2
		R-25 around perimeter and below entire slab	3
	Walls	R-28 2x6 cavity insulation with continuous (R20+9ci or similar) (U-0.036 wall assembly) **OR**[b]	1
		R-35 double stud or similar (cavity and continuous) (U-0.028 wall assembly) **OR**[b]	2
		R-40 double stud or similar (cavity and continuous) (U-0.025 wall assembly) **OR**[b]	3
		R-48 SIP 10 1/4" XPS or similar (cavity and continuous) (U-0.021 wall assembly)	4
	Ceiling	R-60 attic flats (U-0.018) and R-49 slopes, vaulted and cathedral (U-.020)	1
		R-80 attic flats (U-0.013) and R-60 slopes, vaulted and cathedral (U-.018)	2
	Floors - Exposed	R-49 (U-0.021)	1
	Windows- Triple Pane	Average U-factor ≤ 0.27 **OR**[b]	1
		Average U-factor ≤ 0.25 **OR**[b]	2
		Average U-factor ≤ 0.21 **OR**[b]	3
		Average U-factor ≤ 0.18	4
	Doors - Exterior	U-0.26	1
Air Leakage	Tight	Tested to ≤0.11 CFM50/Sq. Ft. of Building Shell (6-sided) (~1.5 ACH50) **OR**[b]	1
	Tighter	Tested to ≤0.07 CFM50/Sq. Ft. of Building Shell (6-sided) (~1.0 ACH50) **OR**[b]	2

	Tightest	Tested to ≤0.03 CFM50/Sq. Ft. of Building Shell (6-sided) (~0.5 ACH50)	3
Mechanical Ventilation	Better Heat Recovery **OR**	Balanced ventilation with ECM fans and ≥80% SRE and ≥1.2 cfm/watt **OR**[b]	3
	Better Electrical Efficiency	Balanced ventilation with ECM fans and ≥70% SRE, and ≥2.0 cfm/watt	
	Mechanical Ventilation Testing	Mechanical ventilation systems shall be tested and verified to provide the minimum ventilation flow rates required by Section R403.6. Testing shall be performed according to the ventilation equipment manufacturer's instructions, or by using a flow hood or box, flow grid, or other airflow measuring device at the mechanical ventilation fan's inlet terminals or grilles, outlet terminals or grilles, or in the connected ventilation ducts.	1
Heating and Cooling[a]	Basic Equipment	ENERGY STAR basic: (1) Gas/propane furnace ≥ 95 AFUE, Oil furnace ≥ 85 AFUE; (2) Gas/propane boiler ≥ 90 AFUE, Oil boiler ≥ 87 AFUE; **OR**[b]	1
	Cold Climate Air Source Heat Pump	Whole building heating /cooling is ENERGY STAR v.6 labeled[d]	5
	Ground Source Heat Pump	Whole building heating /cooling is Ground Source Heat Pump (GSHP) and ENERGY STAR labeled[d]	10
	Air-to-Water Heat Pump	Whole building heating/cooling is Air-to-Water Heat Pump (ATWHP) COP ≥ 2.5	5
	Advanced Wood Heating System	Whole building heating/cooling is Advanced wood heating system from http://www.rerc-vt.org/advanced-wood-heating-system/eligible-equipment-inventory-eei	5
	Low-Temperature Hydronic Distribution System	Hydronic distribution system designed to meet building peak heating demand with 120-degree water	1
	Demand Responsive Thermostats	All electric heating thermostats provided with *demand responsive controls*	1
Water	Heat Pump Basic	Electric Heat Pump Water Heater UEF ≥ 2.20 **OR**[b]	3
	Heat Pump Advanced	Electric Heat Pump Water Heater UEF ≥ 3.30	5

	Low flow	All showerheads ≤ 1.75 gpm, all lavatory faucets ≤ 1.0 gpm, and all toilets ≤ 1.28 gpf[c] **OR**[b]	1
	Certified[e]	Certified water efficient design per WERS, WaterSense, or RESNET $HERS_{H2O}$	2
	Drain heat recovery	Drain water heat recovery system on *primary showers* and tubs	1
	Recirculation User-demand	Controlled hot water recirculation system with user-demand via push-button for furthest fixtures	1
	Pipe Insulation	All service hot water piping is insulated to at least R-4 from the hot water source to the fixture shutoff.	1
	Demand Responsive Controls	Electric storage water heater(s) provided with *demand responsive controls*	1
	Point of Use Electric Water Heater	Remote fixtures requiring hot water supplied from a localized source of hot water with no recirculating system.	1
	Solar Ready Zone	Follow R402.7 Solar –ready zone requirements. These points are only available for Base Code and not Stretch Code since Stretch Code requires following R402.7.	2
	Solar Hot Water	Solar hot water system designed to meet at least 50% of the annual hot water load	2
Renewables	On-Site Generation	Solar photovoltaic (PV) (or other on-site renewable energy system), 1 point per 1.5 kW per housing unit of renewable generation on site	1 per 1.5 kW, max. 4
Other Measures	Monitoring	Whole-building energy monitoring system installed, minimum 5 circuits and homeowner access to data	1
	Radon Mitigation System	Radon mitigation designed to https://www.epa.gov/radon/radon-standards-practice is installed and documented to homeowner	1
	Energy Model	Building energy model with projected annual energy use and costs developed, used in design and construction decisions, and provided to homeowner	1
	Battery	Minimum 6 kWh grid-connected dispatchable demand-response-enabled battery	1
	Advanced Lighting Controls	All lighting for at least 50% of floor area is controlled and/or continuously dimmed based by occupancy, daylight, load shedding, and/or schedule.	2

Insulation Embodied Carbon Emissions	Global Warming Potential (GWP)/square footage (kg CO2e/ ft^2)	Report the global warming potential (GWP) impact of project insulation materials as described in Section R408. Use calculation table R408.1.1 to summarize insulation GWP intensity (kg $CO2e/ft^2$) for the project. Default global warming potential (GWP) values for common insulation products are provided in table R408.1.2. The calculation may utilize Type III, product-specific environmental product declaration (EPD) in lieu of default values for insulation products. If EPD values are used for a given insulation product, include the sum of lifecycle stages A1-A3 from the sourced EPD instead of default GWP value when completing the calculation. Include A5 and B1 GWP values for SPF and XPS products, as noted in R408. **OR**[b]	1
	Global Warming Potential (GWP)/square footage (kg $CO2e/ft^2$)	Demonstrate a calculated insulation GWP intensity (kg $CO2e/ft^2$) less than 0.5. Product-specific EPDs may be used in place of default values, subject to requirements in R408. **OR**[b]	2
		Demonstrate a calculated insulation GWP intensity (kg $CO2e/ft^2$) less than 0. Product-specific EPDs may be used in place of default values, subject to requirements in R408.	3
Multifamily Buildings	Efficient Elevator Equipment	Elevators in the building qualify with Energy Efficiency Class A per ISO 25745-2, Table 7.	1
	Residential Kitchen Equipment	All dishwashers, refrigerators, and freezers comply with the most recent ENERGY STAR Most Efficient label.	2
	Water Heating System Submeters	Each individual dwelling unit served by a central service water-heating system is provided with a service hot water meter connected to a reporting system that provides individual dwelling unit reporting of actual domestic hot water use.	1

For SI: 1 foot = 304.8 mm.

a. Heating and cooling system points are only available if all components of primary systems comply.

b. "OR" indicates that points are not additive; one component OR the following one can be selected, but not both.

c. Applies to new construction only.

d. https://www.energystar.gov/products/spec/central_air_conditioner_and_air_source_heat_pump_specification_version_6_0_pd

e. Certification standard as of 1/1/2019 or later. "WERS" = Water Efficiency Rating Score http://www.wers.us/. EPA WaterSense compliance for all water products: https://www.epa.gov/watersense. RESNET Water Energy Rating Index compliant: http://www.resnet.us/professional/about/resnet_to_develop_water_efficiency_rating_system.

delete and replace **R402.1.3 *R*-value computation.**
Insulation material used in layers, such as framing cavity insulation, or continuous insulation Cavity insulation alone shall be used to determine compliance with the cavity insulation R-value requirements in Tables R402.1.1 and R402.1.3. Where cavity insulation is installed in multiple layers, the R-values of the cavity insulation layers shall be summed to compute the corresponding component *R*-value determine compliance with the cavity insulation R-value requirements. The manufacturer's settled *R*-value shall be used for blown insulation. Continuous insulation (ci) alone shall be used to determine compliance with the continuous insulation R-value requirements in Tables R402.1.1 and R402.1.3. Where continuous insulation is installed in multiple layers, the R-values of the continuous insulation layers shall be summed to determine compliance with the continuous insulation R-value requirements. Cavity insulation R-values shall not be used to determine compliance with the continuous insulation R-value requirements in Tables R402.1.1 and R402.1.3. Computed *R*-values shall not include an *R*-value for other building materials or air films. Where insulated siding is used for the purpose of complying with the continuous insulation requirements of Tables R402.1.1 and R402.1.3, the manufacturer's labeled *R*-value for insulated siding shall be reduced by R-0.6. Average continuous insulation R-values across flat roofs meet the requirements of **Tables R402.1.2.1 and R402.1.2.3**,

delete and replace **R402.1.4 *U*-factor alternative.**
An assembly with a *U*-factor equal to or less than that specified in Table R402.1.4 shall be permitted as an alternative to the *R*-values in Tables R402.1.2.1 and R402.1.2.3. The building must still comply with Tables R402.1.2.1, R402.1.2.2, and Table R402.1.2.3.

An assembly with a *U*-factor equal to or less than that specified in Table R402.1.4 shall be permitted as an alternative compliance method with no Table R402.1.2.3 points required, provided that (a) airtightness is less than or equal to 0.15 CFM50/Sq. Ft. of Building Shell (~2 ACH50) tested, and (b) the ventilation system complies with section R304.

Exception: The following are not required to comply with the airtightness limit or the balanced ventilation system and heat recovery efficiency requirements.

1. Alterations.

2. Additions complying with this code based on the attributes of the addition alone using the *U*-factor alternative.

delete and replace **TABLE R402.1.4**

TABLE R402.1.4
EQUIVALENT *U*-FACTORS[a,c]

FENESTRATION *U*-FACTOR	SKYLIGHT *U*-FACTOR	CEILING *U*-FACTOR	FRAME WALL *U*-FACTOR	MASS WALL *U*-FACTOR[b]	FLOOR *U*-FACTOR	BASEMENT WALL *U*-FACTOR	CRAWL SPACE WALL *U*-FACTOR	SLAB ON GRADE & UNHEATED SLAB *U*-FACTOR & DEPTH
0.30	0.41	0.020	0.044	0.060	0.027	0.39	0.39	0.05, 4 ft

For SI: 1 foot = 304.8 mm.

a. Nonfenestration *U*-factors shall be obtained from measurement, calculation or an approved source.
b. When more than half the insulation is on the interior, the mass wall *U*-factors shall be a maximum of 0.057.
c. Airtightness of less than or equal to 0.15 CFM50/Sq. Ft. of Building Shell (~2 ACH50) tested and balanced ventilation system compliant with R304, or the building must comply with Tables R402.1.2.2 and R402.1.2.3.

delete and replace **R402.1.5 Total UA alternative.**
Where the total *building thermal envelope* UA, the sum of *U*-factor times assembly area, is less than or equal to the total UA resulting from multiplying the U-factors in Table R402.1.4 by the same assembly area as in the proposed *building*, the *building* shall be considered to be in compliance provided that (a) airtightness is less than or equal to 0.15 CFM50/Sq. Ft. of Building Shell (~2 ACH50) tested, and (b) the ventilation system is: balanced, complying with R304. The UA calculation shall be performed using a method consistent with the ASHRAE *Handbook of Fundamentals* and shall include the thermal bridging effects of framing materials.

Exception: The following are not required to comply with the airtightness limit (a) or the balanced ventilation system and heat recovery efficiency requirements (b).

1. Alterations.

2. Additions complying with this code based on the attributes of the addition alone using the Total UA alternative.

delete and replace **R402.1.6 Log homes.**
Log homes shall comply by doing all of the following steps:

1. Design log home in accordance with ICC 400—2022 or to the requirements of Table R402.1.6.

2. Determine the number of points needed to comply, using Table R402.1.2.2 based on building size.

3. Incorporate a sufficient number of points from Table R402.1.2.3 to meet the points requirement from Table R402.1.2.2.

delete and replace **TABLE R402.1.6**

TABLE R402.1.6
LOG HOME INSULATION, FENESTRATION AND HEATING REQUIREMENTS BY COMPONENT[a]

FENESTRATION *U*-FACTOR[b]	SKYLIGHT *U*-FACTOR	CEILING *R*-VALUE	LOG WALL[d]	FLOOR *R*-VALUE[e]	BASEMENT/ CRAWL SPACE WALL *U*-VALUE[f]	SLAB *R*-VALUE & DEPTH	HEATED SLAB *R*-VALUE[g]	AIR LEAKAGE i	HEATING SYSTEM AFUE[h]

0.30	0.41	49	□≥ 5 in. log	38	R-20ci OR R13+10ci	R-20,4' (edge) OR R-15,4'(edge) + R-7.5 (under)	R-20,4' (edge) OR R-15,4'(edge) + R-15 (under)	0.15 CFM50/ Sq. Ft. of Building Shell (~2 ACH50)	ENERGY STAR basic: (1) Gas/propane furnace ≥ 95 AFUE, Oil furnace ≥ 85 AFUE; (2) Gas/propane boiler ≥ 90 AFUE, Oil boiler ≥ 87 AFUE;

For SI: 1 foot = 304.8 mm.

a. *U*-factors are maximums, *R*-values are minimums.
b. The fenestration *U*-factor column excludes skylights.
c. Glazing area includes window and skylight opening area, plus actual glazed area of glass in doors, as a percentage of wall area. Sunrooms are exempt from this requirement.
d. Log walls must comply with ICC 400 with an average minimum average wall thickness of 5 inches or greater. Nonlog exterior walls shall be insulated in accordance with Table 402.2.1.
e. Alternatively, insulation sufficient to fill the framing cavity, with R-38 as the absolute maximum.
f. Basement walls shall be R-15 continuous insulation or R-20 cavity full basement height.
g. Heated slabs shall be completely insulated around the perimeter and under the entire slab.
h. Boilers must have an outdoor temperature reset or thermal purge control.
i. "ACH50" = air changes per hour at 50 Pascals building pressure as measured with a blower door. CFM50/Sq. Ft. of Building Shell = amount of air leakage (in cubic feet per minute, or CFM) that leaks out of each square foot of the exterior surface all six sides of the building measured at 50 Pascals of pressure with a blower door.

delete and replace **R402.2.1 Ceilings with attic spaces.**
Where Section R402.1.2 would require R-49 insulation in the ceiling, installing R-38 over the top of exterior walls where insulation is compressed in the eaves shall be deemed to satisfy the requirement for R-49 insulation provided that the balance of the ceiling is at R-49. Where Section R402.1 would require R-60 insulation in the ceiling, installing R-49 over the top of exterior walls where insulation is compressed in the eaves shall be deemed to satisfy the requirement for R-60 provided the balance of the ceiling is at R-60. This reduction shall not apply to the U-factor alternative approach in Section R402.1.4 and the total UA alternative in Section R402.1.5.

delete and replace **R402.2.2 Ceilings without attic spaces (slopes).**
Where Section R402.1.2 would require R-49 insulation in the ceiling, installing R-38 over the top of exterior walls where insulation is compressed in the eaves shall be deemed to satisfy the requirement for R-49 insulation provided that the balance of the ceiling is at R-49. Where Section R402.1 would require R-60 insulation in the ceiling, installing R-49 over the top of exterior walls where insulation is compressed in the eaves shall be deemed to satisfy the requirement for R-60

This reduction shall not apply to the *U*-factor alternative approach in Section R402.1.4 and the Total UA alternative in Section R402.1.5.

delete and replace **R402.2.3 Eave baffle.**
For air-permeable insulations in vented attics, a baffle shall be installed adjacent to soffit and eave vents. Baffles shall maintain a net free area opening equal to or greater than the net free area of the vent. The baffle shall extend over the top of the attic insulation. The baffle shall be permitted to be any solid material.

The baffle shall be installed to the outer edge of the exterior wall top plate so as to provide maximum space for attic insulation coverage over the top plate. Where soffit venting is not continuous, baffles shall be installed continuously to prevent ventilation air in the eave soffit from bypassing the baffle.

delete and replace **R402.2.4 Access hatches and doors.**
Access hatches and doors from conditioned spaces to unconditioned spaces such as attics and crawl spaces shall be weatherstripped and insulated to the same R-value required by Section R402 for the wall or ceiling in which they are installed. Access shall be provided to all equipment that prevents damaging or compressing the insulation. A wood-framed or equivalent baffle or retainer is required to be provided when loose-fill insulation is installed, the purpose of which is to prevent the loose-fill insulation from spilling into the living space when the attic access is opened, and to provide a permanent means of maintaining the installed *R*-value of the loose-fill insulation.

> **Exception:** Vertical doors that provide access from conditioned to unconditioned spaces shall be permitted to meet the fenestration requirements of Table R402.1.2.1.

The reduction shall not apply to the total UA alternative in Section R402.1.5.

delete and replace **R402.2.6 Steel-frame ceilings, walls and floors.**
Steel-frame ceilings, walls, and floors shall comply with the U-factor requirements of Table R402.1.2.1. The calculation of the U-factor for steel-framed ceilings and walls in an envelope assembly shall be determined in accordance with AISI S250 as modified herein.

1. Where the steel-framed wall contains no cavity insulation and uses continuous insulation to satisfy the U-factor maximum, the steel-framed wall member spacing is permitted to be installed at any on center spacing.
2. Where the steel-framed wall contains framing spaced at 24 inches (610 mm) on center with a 23% framing factor or framing spaced at 16 inches (400 mm) on center with a 25% framing factor, the net lower framing member spacing input values shall be used when calculating using AISI S250.
3. Where the steel-framed wall contains less than 23% froaming factors the AISI S250 shall be used without any modifications.
4. Where the steel-framed wall contains other than standard C-shape framing members the AISI S250 calculation option for other than standard C-shape framing is permitted to be used.

delete **TABLE R402.2.6**

delete and replace **R402.2.8 Floors.**
Floor framing-*cavity insulation* shall be installed to maintain permanent contact with the underside of the subfloor decking.

Exception: The floor framing-cavity insulation shall be permitted to be in contact with the topside of sheathing or continuous insulation installed on the bottom side of floor framing where combined with insulation that meets or exceeds the minimum wood frame wall *R*-value in Table 402.1.2.1 and that extends from the bottom to the top of all perimeter floor framing members.

delete and replace **R402.2.9 Basement walls.**
Walls associated with conditioned basements shall be insulated from the top of the *basement wall* down to 10 feet (3048 mm) below grade or to the basement floor, whichever is less. Walls associated with unconditioned basements shall meet this requirement unless the floor overhead is insulated in accordance with Sections R402.1.2.1 and R402.2.8.

delete and replace **R402.2.10 Slab-on-grade floors.**
Slab-on-grade floors with a floor surface less than 12 inches (305 mm) below grade shall be insulated in accordance with Table R402.1.2.1. The insulation shall extend downward from the top of the slab on the outside or inside of the foundation wall. Insulation located below grade shall be extended the distance provided in Table R402.1.2.1 by any combination of vertical insulation, insulation extending under the slab or insulation extending out from the building. Insulation extending away from the building shall be protected by pavement or by not less than 10 inches (254 mm) of soil. The top edge of the insulation installed between the *exterior wall* and the edge of the interior slab shall be permitted to be cut at a 45-degree (0.79 rad) angle away from the *exterior wall.* Slab-edge insulation is not required in jurisdictions designated by the *code official or authority having jurisdiction*, where one exists, as having a very heavy termite infestation.

delete and replace **R402.2.13 Sunroom and conditioned garage insulation.**
Sunrooms enclosing *conditioned space* and conditioned garages shall meet the insulation requirements of this code.

Exception: For *sunrooms* and conditioned garages provided with *thermal isolation*, and enclosing *conditioned space*, the following exceptions to the insulation requirements of this code shall apply:

1. The minimum ceiling insulation *R*-value shall be R-38.

2. The minimum wall insulation *R*-value shall be R-20. Walls separating a *sunroom* or heated garage with a *thermal isolation* from *conditioned space* shall comply with the *building thermal envelope* requirements of this code.

add **R402.2.16 Building Science**
Consider building science principles in all design and construction. Buildings should be designed and constructed recognizing principles behind moisture vapor control approaches for cold climates. Maintain the envelope assembly's ability to adequately dry in at least one direction by not installing low-perm vapor retarder materials (e.g., vapor barrier) on both sides of an assembly, seek to optimize the assembly's ability to dry, and limit the potential for wetting. (From Applied Building Technologies Group, LLC).

delete and replace **R402.3 Fenestration.**
In addition to the requirements of Section R402.1.2.1, fenestration shall comply with Sections R402.3.1 through R402.3.5.

delete and replace **R402.3.2 Glazed fenestration SHGC.**
An area-weighted average of fenestration products more than 50-percent glazed shall be permitted to satisfy the SHGC requirements.

Dynamic glazing shall be permitted to satisfy the SHGC requirements of Table R402.1.2.1 provided the ratio of the higher to lower labeled SHGC is greater than or equal to 2.4, and the *dynamic glazing* is automatically controlled to modulate the amount of solar gain into the space in multiple steps. *Dynamic glazing* shall be considered separately from other fenestration, and area-weighted averaging with other fenestration that is not dynamic glazing shall not be permitted.

Exception: *Dynamic glazing* is not required to comply with this section when both the lower and higher labeled SHGC already comply with the requirements of Table R402.1.2.1.

delete and replace **R402.3.3 Glazed fenestration exemption.**
Up to 15 square feet (1.4 m^2) of glazed fenestration per dwelling unit shall be permitted to be exempt from *U*-factor and SHGC requirements in Section R402.1.2.1. This exemption shall not apply to the *U*-factor alternative approach in Section R402.1.4 and the Total UA alternative in Section R402.1.5.

delete and replace **R402.3.4 Opaque door exemption.**
One side-hinged opaque door assembly up to 24 square feet (2.22 m^2) in area is exempted from the *U*-factor requirement in Section R402.1.2.1. This exemption shall not apply to the *U*-factor alternative approach in Section R402.1.4 and the total UA alternative in Section R402.1.5.

delete and replace **R402.3.5 Sunroom and conditioned garage fenestration.**
Sunrooms and conditioned garages enclosing *conditioned space* shall meet the fenestration requirements of this code.

Exception: *sunrooms and conditioned garages* with *thermal isolation* and enclosing *conditioned space*, the fenestration *U*-factor shall not exceed 0.30 and the *skylight U*-factor shall not exceed 0.41.

New fenestration separating a *sunroom* or heated garage with *thermal isolation* from *conditioned space* shall comply with the *building thermal envelope* requirements of this code.

delete and replace **R402.4 Air leakage.**
The *building thermal envelope* shall be constructed to limit air leakage in accordance with the requirements of this Section.

delete and replace **R402.4.1 Building thermal envelope.**
The *building thermal envelope* shall comply with Sections R402.4.1.1 through R402.4.1.3. The sealing methods between dissimilar materials shall allow for differential expansion and contraction.

delete and replace **R402.4.1.1 Installation.**
The components of the *building thermal envelope* as listed in Table R402.4.1.1 shall be installed

in accordance with the manufacturer's instructions and the criteria listed in Table R402.4.1.1, as applicable to the method of construction.

delete and replace **TABLE R402.4.1.1**

TABLE R402.4.1.1
AIR BARRIER, AIR SEALING AND INSULATION INSTALLATION

COMPONENT	AIR BARRIER CRITERIA	INSULATION INSTALLATION CRITERIA
General conditions and appropriate materials for air barriers	A continuous, durable air barrier shall be installed in the building envelope. Breaks or joints in the air barrier shall be sealed. The air barrier should be continuous and be durably connected to all penetrations, windows and other (structural) interruptions. Open-cell or closed-cell foam shall have a finished thickness greater than or equal to 5.5 in. or 1.5 in., respectively, to qualify as an air barrier unless the manufacturer indicates otherwise. If flexible air barriers are used, they shall be fully sealed at all seams and edges and supported in accordance with manufacturer's installation instructions. Flexible air barriers shall not be made of kraft paper, or other materials that are easily torn. If polyethylene is used, its thickness shall be greater than or equal to 6 mil. Materials meeting ASTM E2357 Standard Test Method for Determining Air Leakage of Air Barrier Assemblies are acceptable.	Air-permeable insulation shall not be used as a sealing material; when installed in vertical walls, sloped ceilings, and floors within the thermal envelope, it shall be enclosed on all six sides and in contact with a durable, air barrier.
Dropped ceilings/soffits	The air barrier in any dropped ceiling/soffit shall be aligned with (in contact with) the insulation and any gaps in the air barrier shall be sealed. Access openings, drop downstairs or knee wall doors to unconditioned attic spaces shall be sealed, insulated and gasketed.	The insulation in any dropped ceiling/soffit shall be aligned with (in contact with) the air barrier and shall be enclosed on five sides and in contact with a durable, interior air barrier. A top-side air barrier is not required in a flat attic.
Framing junctions and cavities	The junction of the foundation and sill plate shall be sealed. The junction of the top plate and the top of exterior wall sheathing shall be sealed. Knee walls shall be air sealed. When part of the thermal envelope, knee wall insulation shall be enclosed on all six sides and in contact with a durable, interior air barrier.	Cavities within corners and headers of frame walls shall be insulated by completely filling the cavity with a material having a minimum thermal resistance of R-3 per inch. Exterior thermal envelope insulation for framed walls shall be installed in substantial contact and continuous alignment with the air barrier. Exterior thermal envelope insulation

		for framed walls shall be enclosed on all six sides and in contact with a durable, air barrier.
Windows, skylights and doors	The space between window/door jambs and framing, and skylights and framing shall be sealed with minimally-expanding foam, caulk with backer rod and sealant as well as flexible membranes supported by or adhered to rigid air barrier material.	—
Rim joists	Rim joists shall include an exterior air barrier. Junctions of the foundation and sill plate, sill plate and rim band, and rim band and subfloor shall be sealed. When air permeable insulation is installed, a durable, interior air barrier shall be installed at the rim joist.	Rim joists shall be insulated and air sealed so that the insulation maintains permanent contact with the exterior rim board.[b]
Floors (including above garage and cantile vered floors)	The air barrier shall be installed at any exposed edge of insulation.	Floor framing cavity insulation shall be installed to maintain permanent contact with the underside of subfloor decking, or floor framing cavity insulation shall be permitted to be in contact with the top side of sheathing, or with continuous insulation installed on the underside of floor framing and extending from the bottom to the top of all perimeter floor framing members.
Basement crawl space and slab foundations	Exposed earth in unvented crawl spaces shall be covered with a Class I vapor retarder/air barrier in accordance with Section R402.2.10 with overlapping joints taped.in accordance with Section R402.2.10. Penetrations through concrete foundation walls and slabs shall be air sealed. Class 1 vapor retarders shall not be used as an air barrier on below-grade walls and shall be installed in accordance with Section R702.7 of the *International Residential Code*.	Where provided instead of floor insulation, vapor barrier shall be installed in accordance with Section R402.2.10. Conditioned basement foundation wall insulation shall be installed in accordance with Section R402.2.8. Slab-on-grade floor insulation shall be installed in accordance with Section R402.2.10.
Shafts, penetrations	Duct and flue shafts, and other penetrations to exterior or unconditioned space shall be sealed to allow for expansion, contraction, and mechanical vibration. Utility penetrations of the air barrier shall be caulked, gasketed or otherwise sealed and shall allow for expansion, contraction of materials and mechanical vibration.	Insulation shall be fitted tightly around utilities passing through shafts and penetrations in the building thermal envelope to maintain required *R*-value.

	Doors or hatches in knee walls opening to exterior or unconditioned space shall be insulated and gasketed.	

(continued)

TABLE R402.4.1.1—continued
AIR BARRIER AND INSULATION INSTALLATION

COMPONENT	AIR BARRIER CRITERIA	INSULATION INSTALLATION CRITERIA
Narrow cavities	Narrow cavities of 1 inch or less that are not able to be insulated shall be air sealed.	Batts in narrow cavities shall be cut to fit, or narrow cavities shall be filled by insulation that on installation readily conforms to the available cavity space.
Garage separation	Air sealing shall be provided between the garage and *conditioned spaces*.	Insulated portions of the garage separation assembly shall be installed in accordance with Sections R303 and R402.2.7.and R402.2.7.
Recessed lighting and appliances	Recessed light fixtures installed in the building thermal envelope shall be air sealed in accordance with Section R402.4.5. Recessed light fixtures and other appliances (speakers, exhaust fans, light shafts, etc.) installed in the building thermal envelope shall be ICAT (Insulation Contact and Air Tight) rated, airtight labeled (or "Washington State Approved") and sealed with a gasket or caulk between the housing and the interior wall or ceiling cover. Fixtures and appliances shall maintain required clearances of not less than $^{1}/_{2}$ inch from combustible material and not less than 3 inches from insulation material, or as required by manufacturer's installation requirements.	Recessed light fixtures installed in the building thermal envelope shall be airtight and ICAT rated (ICAT-rated indicates Insulation Contact and Airtight and meets the IC and air tightness requirement), and shall be buried or surrounded with insulation.
Plumbing and wiring	All holes created by wiring, plumbing or other penetrations in the air barrier assembly shall be air sealed.	Insulation shall be installed to fill the available space and surround wiring, plumbing, or other obstructions, unless the required *R*-value can be met by installing insulation and air barrier systems completely to the exterior side of the obstructions. Insulation shall be placed between the exterior of the wall assembly and

		pipes. Insulation should not be installed on the interior of the piping. Batt insulation shall be cut neatly to fit around wiring and plumbing in exterior walls, or insulation that on installation readily conforms to available space shall extend behind piping and wiring and shall be in full contact with all air barriers.
Shower/tub on exterior wall	Exterior walls adjacent to showers and tubs shall have insulation filling any gaps or voids between tub or shower walls and unconditioned space.	Exterior walls adjacent to showers and tubs shall have a rigid, durable air barrier separating the exterior wall from the shower and tubs and be insulated.
Electrical/phone box on exterior walls	The air barrier shall be installed behind electrical, or communication boxes or air-sealed boxes shall be installed.	Insulation completely fills voids between the box and exterior sheathing.
Common wall	Whenever continuity of the building thermal envelope is broken at walls separating dwelling units in Group R-2 building, including common, party, and fire walls, such walls shall be insulated to a minimum of R-10 on each side of the break in insulation continuity.	Air barrier shall be installed in the common wall between dwelling units. Common walls shall be sealed at junctions with outside walls and at the top pressure plane of the house.
HVAC register boots	HVAC register boots that penetrate building thermal envelope shall be sealed to the subfloor or drywall.	—
Concealed sprinklers	When required to be sealed, concealed fire sprinklers shall only be sealed in a manner that is recommended by the manufacturer. Caulking or other adhesive sealants shall not be used to fill voids between fire sprinkler cover plates and walls or ceilings.	—
Fireplace	A durable air barrier shall be installed in contact with insulation. Fireplaces shall have compression closure doors and combustion air supplied from the outdoors.	—

a. In addition, inspection of log walls shall be in accordance with the provisions of ICC-400—2022
b. Air barrier and insulation full enclosure is not required in unconditioned/ventilated attic spaces and at rim joints.

delete and replace **R402.4.1.2 Air Leakage Testing.**
The *building* or dwelling unit shall be tested *and* verified as having an air leakage rate not exceeding two (2) air changes per hour or 0.15 CFM50/Sq. Ft. Building Shell area of all six sides of the building. Testing shall be conducted in accordance with **ANSI/RESNET/ICC 380**, **ASTM E779** or **ASTM E1827** and reported at a pressure of 0.2 inches w.g. (50 Pascals). Multifamily buildings shall comply with CBES C402.4.–Testing and verification shall be conducted by an applicable Building Performance Institutes (BPI) Professional, a Home Energy Rating System (HERS) Energy Rater, HERS Field Inspector, or a Vermont Department of Public Service approved air leakage tester. A written report of the results of the test shall be signed by the party

conducting the test. Testing shall be performed at any time after creation of all penetrations of the *building thermal envelope*.

During testing:

1. Exterior windows and doors, fireplace and stove doors shall be closed, but not sealed, beyond the intended weatherstripping or other infiltration control measures.

2. Dampers including exhaust, intake, makeup air, backdraft and flue dampers shall be closed, but not sealed beyond intended infiltration control measures.

3. Interior doors, where installed at the time of the test, shall be open.

4. Exterior or interior terminations for continuous ventilation systems shall be sealed.

5. Heating and cooling systems, where installed at the time of the test, shall be turned off.

6. Supply and return registers, where installed at the time of the test, shall be fully open.

7. Plumbing and drainage traps shall be filled with water as normally found, but not otherwise sealed.

Mechanical ventilation shall be provided in accordance with Section M1505 of the International Residential Code or Section 403.3.2 of the International Mechanical Code, as applicable, or with other approved means of ventilation.

delete and replace **R402.4.1.3 Reporting.**
Air leakage testing shall be reported on the RBES Certificate in units of air changes per hour at 50 Pascals (ACH50) and CFM50/Sq. Ft. Building Shell area of all six sides of the building.

delete and replace **R402.4.2 Fireplaces.**
New wood-burning fireplaces shall have tight-fitting doors and outdoor combustion air. Where using tight-fitting doors on factory-built fireplaces *listed* and *labeled* in accordance with UL 127, the doors shall be tested and *listed* for the fireplace. Where using tight-fitting doors on masonry fireplaces, the doors shall be listed and labeled in accordance with UL 907 2019.

add **R402.4.6 Electrical and communication outlet boxes (air-sealed boxes).**
Electrical and communication outlet boxes installed in the building thermal envelope that are through or outside the building air barrier shall be sealed to limit air leakage between conditioned and unconditioned spaces. Electrical and communication outlet boxes shall be tested in accordance with **NEMA OS 4**, Requirements for Air-Sealed Boxes for Electrical and Communication Applications and shall have an air leakage rate of not greater than 2.0 cubic feet per minute (0.944 L/s) at a pressure differential of 1.57 psf (75 Pa). Electrical and communication outlet boxes shall be marked "NEMA OS 4" or "OS 4" in accordance with **NEMA OS 4**. Electrical and communication outlet boxes shall be installed per the manufacturer's instructions and with any supplied components required to achieve compliance with **NEMA OS 4**.

delete and replace **R402.5 Maximum fenestration *U*-factor and SHGC ().**
The area-weighted average maximum *fenestration U*-factor permitted using tradeoffs from Section R402.1.5 or R405 shall be 0.30 for *vertical fenestration*, and 0.41 for skylights.

add **R402.7 Solar-ready zone.**

add **R402.7.1 General.**
Solar-ready zone is required for Stretch Code but is optional for Base Code. Points are available for meeting the solar-ready zone requirements for Base Code.

For Stretch Code, new detached one- and two-family dwellings, and multiple single-family dwellings (townhouses) with not less than 600 square feet (55.74 m^2) of roof area oriented between 110 and 270 degrees of true north shall comply with this Section.

Exceptions:

1. New residential buildings with a permanently installed on-site renewable energy system.

2. A building where all areas of the roof that would otherwise meet the requirements of Section R407.5 are in full or partial shade for more than 70 percent of daylight hours annually.

3. Buildings and structures as designed and shown in construction documents that do not meet the conditions for a solar-ready zone area.

4. Buildings with possible location(s) for ground mounted systems identified in the submitted construction documents. Buildings claiming this exception must either install appropriate electrical conduit to the site of the proposed ground mounted solar array or include a solar site evaluation that supports the siting of the proposed ground mounting location.

Multifamily buildings shall comply with CBES C402.5.

add **R402.7.2 Construction document requirements for solar-ready zone.**
Construction documents shall indicate the solar-ready zone where applicable.

add **R402.7.3 Solar-ready zone area.**

The total solar-ready zone area shall consist of an area not less than 300 square feet (27.87 m^2) per dwelling exclusive of mandatory access or setback areas. New multiple single-family dwellings (townhouses) three stories or less in height above grade plane and with a total floor area less than or equal to 2,000 square feet (185.8 m^2) per dwelling shall have a solar-ready zone area of not less than 150 square feet (13.94 m^2) per dwelling. The solar-ready zone area shall be not less than 40 percent of the roof area calculated as the horizontally projected gross roof area less the area covered by skylights, occupied roof decks, vegetative roof areas and mandatory access or set back areas as required by the *International Fire Code*. The solar-ready zone shall be composed of areas not less than 5 feet (1524 mm) in width and not less than 80 square feet

(7.44 m^2) exclusive of access or required set back areas.

For ground-mounted systems, possible locations of the panels must be identified in the submitted construction documents and be supported by a solar site evaluation. At least one potential location must be identified in the construction documents for the future installation of the panels.

add **R402.7.4 Obstructions.**

Solar-ready zones shall consist of an area free from obstructions, including but not limited to vents, chimneys, and roof-mounted equipment.

add **R402.7.5 Shading.**

The solar-ready zone shall be set back from any existing or new permanently affixed object on the building or site that is located south, east or west of the solar zone a distance not less than two times the object's height above the nearest point on the roof surface. Such objects include, but are not limited to, taller portions of the building itself, parapets, chimneys, antennas, signage, rooftop equipment, trees, and roof plantings.

add **R402.7.6 Capped roof penetration sleeve.**

A capped roof penetration sleeve shall be provided adjacent to a solar-ready zone located on a roof slope of not greater than 1 unit vertical in 12 units horizontal (8-percent slope). The capped roof penetration sleeve shall be sized to accommodate the future photovoltaic system conduit, but shall have an inside diameter of not less than 11/4 inches (32 mm).

add **R402.7.7 Roof load documentation.**

The structural design loads for roof dead load and roof live load to support the solar system shall be clearly indicated on the construction documents.

add **R402.7.8 Interconnection pathway.**

Construction documents shall indicate pathways for routing of conduit (or plumbing for solar thermal systems) from the solar-ready zone to the electrical service panel or service hot water system. Alternatively, install two 1-inch minimum diameter EMT conduits from the main electrical panel location to the attic or other area easily accessible to the solar array's proposed location. Conduits for future solar installations are to be capped, airtight and labeled at both ends.

add **R402.7.9 Electrical service reserved space.**

The main electrical service panel shall have a reserved space to allow installation of a dual pole circuit breaker for future solar electric installation and shall be labeled "For Future Solar Electric." The reserved space shall be positioned at the opposite (load) end from the input feeder location or main circuit location. Note: this requirement is in addition to the electrical service reserved space for electric vehicle charging. This requirement is only for the building master panel and not individual dwelling unit panels in the case of multifamily buildings.

add **R402.7.10 Electrical energy storage system-ready area.**

The floor area of the electrical energy storage system-ready area shall be not less than 2 feet (610 mm) in one dimension and 4 feet (1219 mm) in another dimension and located in accordance with Section 1207 of the *International Fire Code*. The location and layout diagram of the electrical energy storage system-ready area shall be indicated on the construction documents.

add **R402.7.11 Construction documentation certificate.**

A permanent certificate, indicating the solar-ready zone and other requirements of this section, shall be posted near the electrical distribution panel, water heater or other conspicuous location by the builder or registered design professional.

add **R402.8 *Tiny houses*.**

Tiny Houses as defined in Chapter 2 must comply with the envelope, insulation and fenestration requirements below. All other code provisions are still required.

Tiny houses require the following:

- ceiling flat attic U-0.033 (R-30);
- ceiling slope U-0.04 (R-24);
- above grade walls U-0.08 (R-13);
- frame floors U-0.05 (R-21);
- basement/crawl space walls R-20 continuous (ci) or R13+10ci;
- slab on grade R-20 for 4' on edge or under, OR R-15,4'(edge) + R-15 (under entire slab);
- heated slab on grade R-20,4' (edge) + R-15 (under entire slab);
- windows U-0.27;
- doors U-0.37;
- air leakage 0.15 CFM50/Sq. Ft. of Building Shell (~2 ACH50);
- ducts inside thermal boundary.

Compliance with all other provisions of this code is required.

Exception: Mechanical ventilation system for *tiny houses* is not required to be a *balanced ventilation system* and may be exhaust-only.

SECTION R403
SYSTEMS

delete and replace **R403.1.1 Programmable thermostat.**

The thermostat controlling the primary heating or cooling system of the *dwelling unit* shall be capable of controlling the heating and cooling system on a daily schedule to maintain different temperature set points at different times of the day and different days of the week. This thermostat shall include the capability to set back or temporarily operate the system to maintain *zone* temperatures down to 55°F (13°C) or up to 85°F (29°C). The thermostat shall initially be programmed by the manufacturer with a heating temperature set point no higher than 70°F (21°C) and a cooling temperature set point no lower than 78°F (26°C). Adjustments to these settings for elderly, disabled or those with special needs is permissible.

Exception: The following are allowed only where a 5-wire connection to thermostat location is provided:

1. Radiant floor, wall, ceiling and/or beam system on dedicated zone.

2. *Cold-climate heat pump* not designed for setbacks.

3. Wi-Fi or "smart" Internet-connected thermostats.

delete **R403.1.2 Heat pump supplementary heat.**

add **R403.1.2 Ductless heat pump supplementary heat.**
Ductless heat pumps shall not have integrated supplementary electric-resistance heat other than that provided for frost control. See Section R404.4 for guidance on electric-resistance heating equipment other than heat pumps.

delete and replace **R403.3 Ducts.**
Ducts and air handlers for space conditioning shall be in accordance with Sections R403.3.1 through R403.3.2.

delete **R403.3.1 Ducts located outside conditioned space**.

add **R403.3.1 Duct placement.**
All ducts and air handlers shall be located within *conditioned space*.

delete **R403.3.3 Duct testing.**

delete **R403.3.4 Duct leakage**

delete **R403.3.5 Building cavities**

delete **R403.3.6 Ducts buried within ceiling insulation.**

delete **R403.3.7 Ducts located in conditioned space.**

delete and replace **R403.4 Mechanical system piping insulation (Mandatory).**
Mechanical system piping designed to carry fluids above 105°F (41°C) or below 55°F (13°C) shall be located within the building thermal envelope and insulated to a minimum of R-4.

delete and replace **R403.5.1.1 Circulation systems.**
Where installed, heated water circulation systems shall be provided with a circulation pump. The system return pipe shall be a dedicated return pipe or a cold-water supply pipe. Gravity and thermosyphon circulation systems shall be prohibited. Controls for circulating hot water system pumps shall automatically turn off the pump when the water in the circulation loop is at the desired temperature and when there is no demand for hot water. The controls shall limit the temperature of the water entering the cold-water piping to not greater than 104°F (40°C).

delete and replace **R403.5.3 Hot water pipe insulation ().**
Insulation for service hot water pipe with a minimum thermal resistance (*R*-value) of R-4 shall be applied to the following:

1. Piping $^{3}/_{4}$ inch (19.1 mm) and larger in nominal diameter located inside the *conditioned space*

2. Piping serving more than one dwelling unit.

3. Piping located outside the conditioned space.

4. Piping from the water heater to a distribution manifold.

5. Piping located under a floor slab.

6. Buried piping.

7. Supply and return piping in circulation and recirculation systems other than cold water pipe return demand recirculation systems.

R403.6 Mechanical ventilation.
Follow the mechanical ventilation requirements in R304.

delete **R403.6.1 Heat or energy recovery ventilation**.

delete **R403.6.1 Whole-house mechanical ventilation system fan efficacy**.

delete **TABLE R403.6.1**

delete and replace **R403.8 Systems serving multiple dwelling units.**
Systems serving multiple dwelling units shall comply with Sections C403 and C404 of the 2024 *Vermont Commercial Building Energy Standards* (CBES) in lieu of Section R403 but will not be subject to the additional requirements outlined in Tables C406.1.1 and Table 406.1.2.

delete and replace **R403.10.1 Residential pools and permanent residential spas.**
Where installed, the energy consumption of residential swimming pools and permanent residential spas shall be controlled in accordance with the requirements of APSP 15.

delete and replace **R403.10.4 Covers.**
Outdoor heated pools and outdoor permanent spas shall be provided with an insulated vapor-retardant cover of at least R-12 or other *approved* vapor-retardant means.

> **Exception:** Where more than 75 percent of the energy for heating, computed over an operation season of not fewer than 3 calendar months, is from site-recovered energy, such as from a heat pump or solar energy source, covers or other vapor-retardant means shall not be required.

SECTION R404
ELECTRICAL POWER AND LIGHTING SYSTEMS

delete and replace **R404.1 Lighting equipment.**
All permanently installed lighting fixtures, excluding kitchen appliance lighting fixtures, shall contain only high-efficacy lighting sources.

delete **R404.1.1 Lighting equipment**

add **R404.1.1 Exterior lighting.**
Exterior lighting for residential buildings shall comply with Sections C405.5 (Exterior Lighting Power Requirements) of the *Vermont Commercial Building Energy Standards* (CBES).

Exceptions:

1. Detached one- and two- family dwellings.
2. Townhouses.
3. Solar-powered lamps not connected to any electrical service.
4. Luminaires controlled by a motion sensor.
5. Lamps and luminaires that comply with Section R404.1.

delete and replace **R404.1.2 Lighting equipment for multifamily spaces**
Multifamily buildings three-stories or less with common areas, stairwells, vestibules, lobbies, parking garages, and exterior parking areas and drives must meet the lighting power density (LPD) specifications of the *Vermont Commercial Building Energy Standards* (CBES). For parking garages, see Section C405.3.2; for uncovered parking areas and drives, see Section C405.5.2.

add **R404.1.3 Fuel gas lighting equipment.** Fuel gas lighting systems shall not be permitted.

add **R404.1.44 Exterior lighting controls**. Where the total permanently installed exterior lighting power is greater than 30 watts, the permanently installed exterior lighting shall comply with the following

1. Lighting shall be controlled by a manual on and off switch which permits automatic shut-off actions. Exception: Lighting serving multiple dwelling units.
2. Lighting shall be automatically shut off when daylight is present and satisfies the lighting needs.
3. Controls that override automatic shut-off actions shall not be allowed unless the override automatically returns automatic control to its normal operation within 24 hours.

For multifamily buildings, follow C405.2.7 (Exterior Lighting Controls).

delete **R404.2 Electric resistance heating equipment.**

add **R404.2 Electric heating equipment.**
Heat pumps shall be certified *cold-climate heat pumps* only and shall have controls that, except during defrost, prevent supplementary electric heat operation where the heat pump compressor can meet the heating load.

Building heating with electric-resistance heating equipment is prohibited.

Exceptions:

1. Replacement of existing electrical resistance units.

2. Limited areas where other heating sources are cost prohibitive or impractical (for example, a small interior space such as a bathroom or stairwell, which is distant from the distribution system).

3. Buildings with cold-climate heat pump(s) as the primary heating system, provided that:

   a. The supplemental electric-resistance heat is controlled to prevent it from operating at an outside air temperature of 5°F or higher.

   b. The building has a tested air tightness of less than or equal to 0.15 CFM50/Sq. Ft. of Building Shell (~2 ACH50).

4. Multifamily buildings with heating loads less than or equal to 6.0 Btu/h/ft^2 at design temperature.

Note: Buildings served by the Burlington Electric Department (BED) must also receive approval from BED before installing electric resistance heating equipment.

delete and replace **R404.3 Electric vehicle charging.**
One *Electric Vehicle Charging - Level 2 Capable* parking space or *Electric Vehicle Charging - Level 2 EVSE* is required for new construction based on Table R404.3.

Exception: Electric vehicle parking spaces are not required if one of the following conditions apply:

1. Parking spaces intended exclusively for storage of vehicles for retail sale or vehicle service.
2. Parking spaces are separated from the meter by a public right-of-way
1. Parking spaces which are limited to parking durations of less than one hour.
2. EV Capable Spaces are not required where no parking spaces are provided.

Parking spaces with *electric vehicle supply equipment* (*EVSE*) shall be marked for EV use only.

Exception: The number of parking spaces with *EVSE* that are marked for "EV use only" need not exceed the number of EV cars driven by occupants of the building. This exception does not reduce the number of EVSE spaces required, just the number that are marked for EV use only.

delete and replace **TABLE R404.3 REQUIRED LEVEL 2 CAPABLE ELECTRIC VEHICLE CHARGING PARKING SPACES FOR ALL NEW BUILDINGS (BASE CODE and STRETCH CODE)**

BUILDING/PARKING TYPE	MINIMUM REQUIRED NUMBER OF LEVEL 2 CAPABLE EV CHARGING PARKING SPACES

Single Family Home or Multifamily Building	1 per dwelling unit or the number of parking spaces provided, whichever is less
Additional Parking Spaces	25% of remaining parking spaces not utilized by dwelling units, or 40 spaces, whichever is less

For *multifamily building* garage or covered parking, provide on electrical drawings the appropriate sized pathway to the building electrical room to accommodate a future electrical upgrade for Level 2 EVSE electric vehicle charging; provide adequate wall and floor space in the building electrical room for future EV charging related electrical equipment; provide the appropriate sized pathways to exterior on-grade surface parking spaces for future Level 2 EVSE electric vehicle charging; provide a line diagram on the electrical drawings demonstrating a pathway for future Level 2 EVSE electric vehicle charging. Quantity of future Level 2 EVSE electric vehicle charging stations shall be as required by Table R404.3.

add **R404.4 200 Amp Electrical Service.**

Each new building, except for individual multifamily units, shall be supplied with at least 200 amp electrical service in anticipation of increased electrical services that will need to be provided in the future.

add **R404.5 Dwelling electrical meter.**

Each residential unit and each dwelling unit located **in a** *Group R*-2 building shall have a separate electrical meter.

Exception: Buildings where a majority of the living units serve tenants at or below 80 percent of area median income.

add **R404.6 Electrical transformers.**

Low-voltage dry-type distribution electric transformers shall meet the minimum efficiency requirements of Table R405.6 as tested and rated in accordance with the test procedure listed in DOE 10 CFR 431. The efficiency shall be verified through certification under an approved certification program or, where a certification program does not exist, the equipment efficiency ratings shall be supported by data furnished by the transformer manufacturer.

Exception: The following transformers are exempt:

1. Transformers that meet the *Energy Policy Act of 2005* exclusions based on the DOE 10 CFR 431 definition of special purpose applications.

2. Transformers that meet the *Energy Policy Act of 2005* exclusions that are not to be used in general purpose applications based on information provided in DOE 10 CFR 431.

3. Transformers that meet the *Energy Policy Act of 2005* exclusions with multiple voltage taps where the highest tap is not less than 20 percent more than the lowest tap.

4. Drive transformers.
5. Rectifier transformers.
6. Auto-transformers.
7. Uninterruptible power system transformers.
8. Impedance transformers.
9. Regulating transformers.
10. Sealed and nonventilating transformers.
11. Machine tool transformers.
12. Welding transformers.
13. Grounding transformers.
14. Testing transformers.

TABLE R405.6
MINIMUM NOMINAL EFFICIENCY LEVELS FOR 10 CFR 431 LOW-VOLTAGE DRY-TYPE DISTRIBUTION TRANSFORMERS

SINGLE-PHASE TRANSFORMERS		THREE-PHASE TRANSFORMERS	
kVA[a]	Efficiency (%)[b]	kVA[a]	Efficiency (%)[b]
15	97.70	15	97.89
25	98.00	30	98.23
37.5	98.20	45	98.40
50	98.30	75	98.60
75	98.50	112.5	98.74
100	98.60	150	98.83
167	98.70	225	98.94
250	98.80	300	99.02
333	98.90	500	99.14
—	—	750	99.23
—	—	1000	99.28

a. kiloVolt-Amp rating.
b. Nominal efficiencies shall be established in accordance with the DOE 10 CFR 431 test procedure for low-voltage dry-type transformers.

SECTION R405
ALTERNATIVE USING RES*check*™ SOFTWARE

delete and replace **R405.2 Mandatory requirements.**

Compliance with this section requires that the applicable provisions in Sections R401.3, R402, R403, R404, and Chapter 3 be met.

modify **"SECTION R406 ENERGY RATING INDEX COMPLIANCE ALTERNATIVE"** *to*"**SECTION R406 ENERGY RATING INDEX / HOME ENERGY RATING SYSTEM COMPLIANCE ALTERNATIVE"**

SECTION R406
ENERGY RATING INDEX/ HOME ENERGY RATING SYSTEM COMPLIANCE ALTERNATIVE

delete and replace **R406.2 Mandatory requirements.**

Compliance with this section requires that the applicable provisions in Sections R401.3, R402, R403 and R404 be met. The *building thermal envelope* shall be greater than or equal to levels of efficiency and *solar heat gain coefficients* in Table 402.1.2 of the 2009 *International Energy Conservation Code* for *Climate Zone* 6.

delete **R406.4 ERI-based compliance.**

add **R406.4 ERI/HERS-Based Compliance for *Base Code* and *Stretch Code*.**

Compliance based on an ERI analysis requires that the *rated design* be shown to have an ERI/HERS Index less than or equal to 54 for *Base Code* and less than or equal to 47 for *Stretch Code* when compared to the *ERI reference design*. Up to 5 ERI points can be earned with renewables. This includes all residential structures, including log homes. The ERI to be used to verify compliance is REM v16.3.3 or later or Ekotrope version 4.0 or later that is accredited by RESNET at https://www.resnet.us/providers/accredited-providers/hers-software-tools/.If the HERS Index scale is revised, the Department of Public Service may update these Index points.

TABLE R406.4
ERI/HERS COMPLIANCE FOR BASE CODE AND STRETCH CODE

BASE CODE	STRETCH CODE
60	59

delete **R406.6.3 Additional documentation.**

add **R406.6.3 Renewable Energy Certificate (REC) Documentation.**

Where on-site renewable energy is included in the calculation of an ERI, one of the following forms of documentation shall be provided to the *code official or authority having jurisdiction*, where one exists:

1. Substantiation that the RECs associated with the on-site renewable energy are owned by, or retired on behalf of, the homeowner.

2. An executed contract that conveys to the homeowner the RECs associated with the on-site renewable energy, or conveys to the homeowner an equivalent quantity of RECs associated with other renewable energy

add **R406.6.4 Additional documentation.**

The *code official or authority having jurisdiction*, where one exists shall be permitted to require the following documents:

1. Documentation of the building component characteristics of the *ERI reference design*.

2. A certification signed by the builder providing the building component characteristics of the *rated design*.

3. Documentation of the actual values used in the software calculations for the *rated design*.

SECTION R407
VERMONT STRETCH CODE

delete and replace **R407.2 Compliance**

Compliance for *Stretch Code* shall be documented through either Section R402.1.2.1 "Package Plus Points Approach" or Section R406 "Energy Rating Index / Home Energy Rating System (HERS) Compliance Approach".

For both Base Code and Stretch Code compliance, in Section R402.1.2.1 "Package Plus Points Approach", the same standard package is used. Stretch Code then requires more Points than the Base Code. For ERI/HERS compliance, a lower HERS Index is required for Stretch Code than for Base Code.

delete **R407.2.1 Package Plus Points Approach.**

delete **TABLE R407.2.1.1 INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT FOR STRETCH PACKAGES**

delete **R407.2.1.2 Required points by building size.**

delete **TABLE R407.2.1.2**

delete **R407.2.1.3 Points by Component.**

delete **TABLE R407.2.1.3**

delete **R407.2.2 ERI-based compliance for Stretch Code.**

delete **R407.3 Air Leakage Testing for Stretch Code.**

delete **R407.4 Electric vehicle charging**

delete **R407.5 Solar Ready Zone for Stretch Code.**

SECTION R408
INSULATION EMBODIED CARBON EMISSIONS

R408.1 Insulation Embodied Carbon

In order to earn Points from Table 402.1.2.3, complete calculation Table 408.1.1 to summarize estimated embodied carbon emissions from 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, wall, and roof insulation materials:

1. Insulation material type
2. Product R-value
3. Total surface area (ft^2)
4. Default, industry-average GWP value, from Table 408.1.2 or GWP values from *Type III Product-specific Environmental Product Declaration (EPD)*
5. Total project area (conditioned square feet)

Projects may substitute product-specific data for the default GWP value if the specified product has a lower reported GWP than the default value. Product-specific shall be substituted in Column G of the calculation Table 408.1.1. Substitution of default GWP values is only allowed when type III product-specific EPDs are sourced and noted in Column G. Projects shall use GWP values that include A1-A3 lifecycle stages, as documented in product-specific EPDs, with the exception of SPF and XPS products. For these products, the A5 and B1 values shall be included in the documented GWP value to account for the on-site and off gassing impact of blowing agents. Projects shall provide the EPDs declaration number in Column G.

TABLE R408.1.1

Table 1 - Insulation Global Warming Potential Calculation							Optional				
A	B	C	D	E	F	G		H		I	
Assembly	Material *List insulation material type from Table 2*	Product R-Value		Surface Area (gross square feet)	Framing Factor ("1.0" for continuous, "0.8" for cavity)	Default Global Warming Potential (kg CO2e /sq.m. RSI-1) *Use Default GWP values from Table 2. Leave blank for products where product specific data will be*	Project has sourced Type III - Product-specific Environmental Product *Check box if project will be substituting default value with product specific data*	Product Specific Global Warming Potential (kg CO2e /sq.m. RSI-1) *Leave blank unless EPDs have been sourced. Use GWP value from product-specific EPDs.*		Conversion Factor		GWP Result (kg CO2e)
Below grade, slab/slab edge			x		x 1.0	x	☐		x	0.0164	=	
Basement walls			x		x 1.0	x	☐		x	0.0164	=	
Above grade walls, cavity			x		x 0.8	x	☐		x	0.0164	=	
Above grade walls, continuous			x		x 1.0	x	☐		x	0.0164	=	
Roof, flat			x		x 1.0	x	☐		x	0.0164	=	
Roof, sloped, cavity			x		x 0.8	x	☐		x	0.0164	=	
Roof, sloped, continuous			x		x 1.0	x	☐		x	0.0164	=	
	Input for basic calculation						Summary Metrics	Total Insulation GWP (kg CO2e)				
	Inputs for product-specific data							Conditioned Floor Area (sf)				
	Calculation outputs							OUTPUT: Insulation GWP Intensity				

TABLE R408.1.2
DEFAULT INSULATION GLOBAL WARMING POTENTIAL VALUES

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

Material	Default Global Warming Potential (kg CO2e /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 - 15psi	2.80
EPS/graphite - Board, unfaced, Type IX - 25psi, graphite	3.40
EPS - Board, unfaced, Type I - 10psi	2.80
EPS - Board, unfaced, Type II- 15psi	3.80
EPS - Board, unfaced, Type IX- 25psi	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
SPF – Spray, closed cell HFC	13.10
SPF – Spray, high density HFC	17.00
Straw – Panel	-6.50
Vacuum Insulated Panel	7.40
Wood fiber – Board, unfaced, European	-6.50
Wood fiber – Board, unfaced, North America	-10.30
Wood fiber – Batt, unfaced	-2.40
Wool (Sheep) – Batt	1.00
Wool (Sheep) – Loosefill	0.80
XPS – Board, 25psi HFC	55.50
XPS – Board, 25psi "Low GWP" (HFO/HFC)	4.90

[a] https://www.buildersforclimateaction.org/beam-estimator.html
[b] EPD Declaration Number NEPD-2012-889-EN
[c] EPD Declaration Number 4788647002.102.1
[d] EPD Declaration Number EPD-KSI-20190072-IBC1-EN

CHAPTER 5
EXISTING BUILDINGS

SECTION R501
GENERAL

delete **R501.2 Existing buildings.**

add **R501.2 General**

Except as specified in this chapter, this code shall not be used to require the removal, *alteration* or abandonment of, nor prevent the continued use and maintenance of, an existing *building* or building system lawfully in existence at the time of adoption of this code. Unaltered portions of the existing building or building supply system shall not be required to comply with this code.

delete and replace **R501.4 Compliance.**

Additions, alterations, or changes of occupancy to, or relocation of, an existing building, building system or portion thereof shall comply with Section R502, R503, R504 or R505, respectively, in this code. Changes where unconditioned space is changed to conditioned space shall comply with Section R502.

SECTION R502
ADDITIONS

delete and replace **R502.1.1.1 Building envelope.**

New *building* envelope assemblies that are part of the *addition* shall comply with Sections R402.1, R402.2, R402.3.1 through R402.3.5, and R402.4. Air leakage testing in accordance with Section R402.4.1.2 is not required for *additions* complying with this code based on the attributes of the *addition* alone. Where the existing *building* and the *addition* comply with this code as a single building, or where the *building* with the *addition* does not use more energy than the existing *building*, testing must be performed in accordance with Section R402.4.1.2 and an air leakage rate not exceeding three (3) air changes per hour at 50 Pascals (or 0.23 CFM50/Sq. Ft. building shell area, six sided) must be verified.

Exception: Where *unconditioned* space is changed to *conditioned* space, the building envelope of the addition shall comply where the UA, as determined in Section R402.1.5, of the existing building and the addition, and any alterations that are part of the project, is less than or equal to UA generated for the existing *building.*

SECTION R503
ALTERATIONS

delete and replace **R503.1 General.**

Alterations to any building or structure shall comply with the requirements of the code for new construction, without requiring the unaltered portions of the existing building or building system to comply with this code. *Alterations* shall be such that the existing *building* or structure is no less conforming to the provisions of this code than the existing *building* or structure was prior to the *alteration.*

Alterations shall not create an unsafe or hazardous condition or overload existing *building* systems. *Alterations* shall be such that the existing *building* or structure uses no more energy than the existing *building* or structure prior to the *alteration. Alterations* to existing *buildings* shall comply with Sections R503.1.1 throughR503.1.4.

delete and replace **R503.1.4 Lighting.**

New lighting systems that are part of the *alteration* shall comply with Section R404.1.

> **Exception:** *Alterations* that replace less than 10 percent of the luminaires in a space, provided that such *alterations* do not increase the installed interior lighting power.

SECTION R505
CHANGE OF OCCUPANCY OR USE

delete and replace **R505.2 General.**

Any space that is converted to a dwelling unit or portion thereof from another use shall comply with this code.

> **Exception:** Where the simulated performance option in Section R405 is used to comply with this section, the annual energy cost of the proposed design is permitted to be 110 percent of the annual energy cost otherwise allowed by Section R405.

add **R505.2.1 Unconditioned space.**

> Any unconditioned or low-energy space that is altered to become a conditioned space shall comply with **Section R502.**

CHAPTER 6
REFERENCED STANDARDS

delete and replace the following referenced standards in Chapter 6 as follows:

ASHRAE

ASHRAE—2017 ASHRAE Handbook of Fundamentals
R402.1.5

ASHRAE 62.2 Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings
R304.1.1

ASHRAE 193—2010 (RA2014) Method of Test for Determining the Airtightness of HVAC Equipment
R403.3.2.1

APSP

The Association of Pool and Spa Professionals
2111 Eisenhower Avenue
Alexandria, VA 22314

ANSI/APSP/ICC 14—2014 American National Standard for Portable Electric Spa Energy Efficiency
R403.11

ANSI/APSP/ICC 15a—2013 American National Standard for Residential Swimming Pool and Spa Energy Efficiency—includes Addenda A Approved January 9, 2013
R403.10.1

ASTM

ASTM International
100 Barr Harbor Drive
West Conshohocken, PA 19428-2859

C1363—11 Standard Test Method for Thermal Performance of Building Materials and Envelope Assemblies by Means of a Hot Box Apparatus
R303.1.4.1

E283—2004(2012) Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls and Doors Under Specified Pressure Differences Across the Specimen
R202 "Air-Impermeable Insulation," R402.4.4

E779—10 Standard Test Method for Determining Air Leakage Rate by Fan Pressurization
R402.4.1.2

E1827—2011(2017) Standard Test Methods for Determining Airtightness of Building Using an Orifice Blower Door
R402.4.1.2

E2178—2013: Standard Test Method for Air Permanence of Building Materials
R202 "Air-Impermeable Insulation"

CSA

CSA Group
8501 East
Pleasant Valley
Cleveland, OH
44131-5575

R402.4.3

R403.5.4

CSA B55.2—2020 Drain Water Heat Recovery Units
R403.5.4

DASMA

Door and Access Systems
Manufacturers Association
1300 Sumner Avenue
Cleveland, OH 44115-2851

105 - 2017
R303.1.3

HVI

Home Ventilating Institute
1000 North Rand Road, Suite 214
Wauconda, IL 60084

HVI Publication 916 - Air Flow Test Procedure
Table R403.6.1

HVI Publication 920 - Product Performance Certification Procedure
R304.1.1, R403.6.1

R304.5.1, R304.6

ICC International Code Council, Inc.
500 New Jersey Avenue, NW
6th Floor
Washington, DC 20001

ICC 400—17 Standard on the Design and Construction of Log Structures
Table R402.1.2.1, R402.1.6, Table R402.1.6, Table 402.4.1.1

IBC—18 International Building Code®
R202 – Occupancy Classifications, R303.2, R402.1.1, R402.2.11,

IECC—06 2006 International Energy Conservation Code®
R406.2, R406.3.1

IECC—09 2009 International Energy Conservation Code®
R406.2

IFC—21 International Fire Code®
R201.3, R402.7.3, R402.7.10, R501.5

IFGC—21 International Fuel Gas Code®
R201.3,

IMC—21 International Mechanical Code®
R201.3, R402.4.1.2, R403.3.2, R403.6,

IPC—21 International Plumbing Code®
R201.3,

IRC—21 International Residential Code®
R201.3, R303.2, R402.1.1, R402.2.11, Table R402.4.1.1, R402.4.1.2, R402.4.4, R403.3.2, R403.6, R501.5

IEEE The Institute of Electrical and Electronic

Engineers, Inc.
3 Park Avenue
New York, NY 1016-5997

515.1—2012 IEEE Standard for the Testing, Design, Installation, and Maintenance of Electrical Resistance Trace Heating for Commercial Applications
R403.5.1.2

NEMA

National Electrical Manufacturers Association 1300 17th Street North No. 900
Arlington, VA 22209

OS 4—2016: Requirements for Air-Sealed Boxes for Electrical and Communication Applications
R402.4.6

NFPA

National Fire Protection Association.
1 Batterymarch Park
Quincy, MA 02169-7471

31—06 Installation of Oil-Burning Equipment
R305.1, R305.2, R305.3

54—09 National Fuel Gas Code
R202, R305.1, R305.2, R305.3

NFRC

National Fenestration Rating Council, Inc.
6305 Ivy Lane, Suite 140
Greenbelt, MD 20770

100—2020 Procedure for Determining Fenestration Products *U*-factors
R303.1.3

200—2020 Procedure for Determining Fenestration Product Solar Heat Gain Coefficients and Visible Transmittance at Normal Incidence
R303.1.3

400—2020 Procedure for Determining Fenestration Product Air Leakage
R402.4.3

RESNET

Residential Energy
Services
Network, Inc.
P.O. Box 4561
Oceanside, CA
92052-4561

ANSI/RESNET/ICC 301—2019 Standard for the Calculation and Labeling of the Energy Performance of Dwelling and Sleeping Units using an Energy Rating Index Published December 18, 2018
R406.6.1, R406.7.3

ANSI/RESNET/ICC 380—2016 Standard for Testing Airtightness of Building Dwelling Unit and Sleeping Unit Enclosures, Airtightness of Heating and Cooling Air Distribution Systems, and Airflow of Mechanical Ventilation Systems — Republished January 2016
R402.4.1.2

UL

UL LLC
333 Pfingsten Road
Northbrook, IL 60062

127—2011 Standard for Factory Built Fireplaces — with Revisions through July 2016
R402.4.2

515—2015 Standards for Electrical Resistance Trace Heating for Commercial Applications
R403.5.1.2

907—2016 Standard for Fireplace Accessories
R402.4.2

The Vermont Statutes Online

The Statutes below include the actions of the 2025 session of the General Assembly.

NOTE: The Vermont Statutes Online is an unofficial copy of the Vermont Statutes Annotated that is provided as a convenience.

Title 30 : Public Service

Chapter 002 : Building Energy

Subchapter 001 : BUILDING ENERGY STANDARDS

(Cite as: 30 V.S.A. § 51)

§ 51. Residential building energy standards; stretch code

(a) Definitions. In this subchapter, the following definitions apply:

(1) "Builder" means the general contractor or other person in charge of construction, who has the power to direct others with respect to the details to be observed in construction.

(2) "Residential buildings" means one-family dwellings, two-family dwellings, and multi-family housing three stories or less in height.

(A) With respect to a structure that is three stories or less in height and is a mixed-use building that shares residential and commercial users, the term "residential building" shall include the living spaces in the structure and the nonliving spaces in the structure that serve only the residential users such as common hallways, laundry facilities, residential management offices, community rooms, storage rooms, and foyers.

(B) "Residential buildings" shall not include hunting camps.

(3) "Residential construction" means new construction of residential buildings, and the construction of additions, alterations, renovations, or repairs to an existing residential building.

(4) "IECC" means the International Energy Conservation Code of the International Code Council.

(5) "Stretch code" means a building energy code for residential buildings that achieves greater energy savings than the RBES and is adopted in accordance with subsection (d) of this section.

(b) Adoption of Residential Building Energy Standards (RBES). Residential construction shall be in compliance with the standards adopted by the Commissioner of Public Service in accordance with subsection (c) of this section.

(c) Revision and interpretation of energy standards. The Commissioner of Public Service shall amend and update the RBES by means of administrative rules adopted in accordance with 3 V.S.A. chapter 25. On or before January 1, 2011, the Commissioner shall complete rulemaking to amend the energy standards to ensure that, to comply with the standards, residential construction must be designed and constructed in a manner that complies with the 2009 edition of the IECC. After January 1, 2011, the Commissioner may direct the timely and appropriate revision of the RBES after the issuance of updated standards for residential construction under the IECC. The Department of Public Service shall provide technical assistance and expert advice to the Commissioner in the interpretation of the RBES and in the formulation of specific proposals for amending the RBES. Prior to final adoption of each required revision of the RBES, the Department of Public Service shall convene an Advisory Committee to include one or more mortgage lenders, builders, building designers, utility representatives, and other persons with experience and expertise, such as consumer advocates and energy conservation experts. The Advisory Committee may provide the Commissioner with additional recommendations for revision of the RBES.

(1) Any amendments to the RBES shall be:

(A) consistent with duly adopted State energy policy, as specified in section 202a of this title, and consistent with duly adopted State housing policy;

(B) evaluated relative to their technical applicability and reliability; and

(C) cost-effective and affordable from the consumer's perspective.

(2) Each time the RBES are amended by the Commissioner, the amended RBES shall become effective upon a date specified in the adopted rule, a date that shall not be less than three months after the date of adoption. Persons commencing residential construction before the effective date of the amended RBES shall have the option of complying with the applicable provisions of the earlier or the amended RBES. After the effective date of the original or the amended RBES, any person commencing residential construction shall comply with the most recent version of the RBES.

(3) In the first cycle of revision of the RBES, the Commissioner shall establish standards for ventilation and shall consider revisions, including:

(A) a requirement for sealed combustion, induced or forced draft combustion equipment when exhaust-only ventilation systems are installed; and

(B) a requirement for adequate replacement air ducted directly to the combustion area of wood and pellet stoves and fireplaces.

(4)(A) As the Model Energy Code is primarily a performance-based code, the Department of Public Service shall develop and disseminate criteria that builders may use in lieu of any computer software, calculations and trade-off worksheets, or systems analysis to comply with the Code. An example package that complies with the Code shall be included in the rules and updated as appropriate.

(B) To provide for flexibility, additional packages that are equivalent to the example package under chapter 9 of the Model Energy Code and that satisfy the performance approach shall be developed by July 1, 1997 and disseminated by the Department of Public Service. Each time the RBES are amended by the Commissioner, the Department of Public Service shall develop modified compliance packages that will become available to the public by the date that the amendment becomes effective.

(5) A home energy rating conducted at the time of construction by a Vermont-accredited home energy rating organization shall be an acceptable means of demonstrating compliance if the rating indicates energy performance equivalent to the RBES.

(6) The Advisory Committee convened under this subsection, in preparing for the RBES update required on or about January 1, 1999, shall advise the Commissioner of Public Service with respect to the coordination of the RBES amendments with existing and proposed demand-side management programs offered in the State.

(d) Stretch code. The Commissioner may adopt a stretch code by rule. This stretch code shall meet the requirements of subdivision (c)(1) of this section. The stretch code shall be available for adoption by municipalities under 24 V.S.A. chapter 117 and, on final adoption by the Commissioner, shall apply in proceedings under 10 V.S.A. chapter 151 (Act 250) in accordance with subsection (e) of this section.

(e) Role of RBES and stretch code in Act 250. Substantial and reliable evidence of compliance with the RBES and, when adopted, the stretch code established and updated under this section shall serve as a presumption of compliance with 10 V.S.A. § 6086(a)(9)(F), except no presumption shall be created insofar as compliance with subdivision (a)(9)(F) involves the role of electric resistance space heating. In attempting to rebut a presumption of compliance created under this subsection, a challenge may only focus on the question of whether or not there will be compliance with the RBES and stretch code established and updated under this subsection. A presumption under this subsection may not be overcome by evidence that the RBES and stretch code adopted and updated under this section fail to comply with 10 V.S.A. § 6086(a)(9)(F).

(f) Certification.

(1) Issuance; recording. A certification may be issued by a builder, a licensed professional engineer, a licensed architect, or an accredited home energy rating organization. If certification is not issued by a licensed professional engineer, a licensed architect, or an accredited home energy rating organization, it shall be issued by the builder. Any certification shall certify that residential construction meets the RBES. The Department of Public Service will develop and make available to the public a certificate that lists key features of the RBES. Any person certifying shall use this certificate or one substantially like it to certify compliance with the RBES. Certification shall be issued by completing and signing a certificate and permanently affixing it to the outside of the heating or cooling equipment, to the electrical service panel

located inside the building, or in a visible location in the vicinity of one of these three areas. The certificate shall certify that the residential building has been constructed in compliance with the requirements of the RBES. The person certifying under this subsection shall provide a copy of each certificate to the Department of Public Service and shall ensure that a certificate is recorded and indexed in the town land records. A builder may contract with a licensed professional engineer, a licensed architect, or an accredited home energy rating organization to issue certification and to indemnify the builder from any liability to the owner of the residential construction caused by noncompliance with the RBES.

(2) Condition precedent. Provision of a certificate as required by subdivision (1) of this subsection shall be a condition precedent to:

(A) issuance by the Commissioner of Public Safety or a municipal official acting under 20 V.S.A. § 2736 of any final occupancy permit required by the rules of the Commissioner of Public Safety for use or occupancy of residential construction commencing on or after July 1, 2013 that is also a public building as defined in 20 V.S.A. § 2730(a); and

(B) issuance by a municipality of a certificate of occupancy for residential construction commencing on or after July 1, 2013, if the municipality requires such a certificate under 24 V.S.A. chapter 117.

(g) Action for damages.

(1) Except as otherwise provided in this subsection, a person aggrieved by noncompliance with this section may bring a civil action against a person who has the obligation of certifying compliance under subsection (e) of this section. The person may seek injunctive relief, damages, court costs, and attorney's fees. As used in this subdivision, "damages" means:

(A) costs incidental to increased energy consumption; and

(B) labor, materials, and other expenses associated with bringing the structure into compliance with RBES in effect on the date construction was commenced.

(2) A person's failure to affix the certification as required by this section shall not be an affirmative defense in such an action against the person.

(3) The rights and remedies created by this section shall not be construed to limit any rights and remedies otherwise provided by law.

(h) Applicability and exemptions. The construction of a residential addition to a building shall not create a requirement that the entire building comply with this subchapter. The following residential construction shall not be subject to the requirements of this subchapter:

(1) Buildings or additions whose peak energy use design rate for all purposes is less than 3.4 BTUs per hour, per square foot, or less than one watt per square foot of floor area.

(2) Homes subject to Title VI of the National Manufactured Housing Construction

and Safety Standards Act of 1974 (42 U.S.C. §§ 5401-5426).

(3) Buildings or additions that are neither heated nor cooled.

(4) Residential construction by an owner, if all of the following apply:

(A) The owner of the residential construction is the builder, as defined under this section.

(B) The residential construction is used as a dwelling by the owner.

(C) The owner in fact directs the details of construction with regard to the installation of materials not in compliance with RBES.

(D) The owner discloses in writing to a prospective buyer, before entering into a binding purchase and sales agreement, with respect to the nature and extent of any noncompliance with RBES. Any statement or certificate given to a prospective buyer shall itemize how the home does not comply with RBES and shall itemize which measures do not meet the RBES standards in effect at the time construction commenced. Any certificate given under this subsection (h) shall be recorded in the land records where the property is located and sent to the Department of Public Service within 30 days following sale of the property by the owner.

(i) Title validity not affected. A defect in marketable title shall not be created by a failure to issue certification or a certificate, as required under subsection (f) or subdivision (h)(4) of this section, or by a failure under that subsection to affix a certificate; to provide a copy of a certificate to the Department of Public Service; or to record and index a certificate in the town records. (Added 1997, No. 20, § 1; amended 2005, No. 208 (Adj. Sess.), § 7; 2007, No. 92 (Adj. Sess.), § 8; 2009, No. 45, § 11, eff. May 27, 2009; 2009, No. 159 (Adj. Sess.), § 18b, eff. June 4, 2010; 2011, No. 47, § 20t, eff. May 25, 2011; 2013, No. 89, §§ 6, 11; 2017, No. 74, § 121; 2023, No. 85 (Adj. Sess.), § 349, eff. July 1, 2024; 2023, No. 151 (Adj. Sess.), § 3, eff. June 3, 2024.)

VERMONT

Proposed Rules Postings
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Search Rules

Deadline For Public Comment

Deadline: Feb 09, 2026

The deadline for public comment has expired. Contact the agency or primary contact person listed below for assistance.

Rule Details

Rule Number:	25P047
Title:	Vermont Residential Building Energy Standards (RBES) Amendments.
Type:	Standard
Status:	Proposed
Agency:	Department of Public Service
Legal Authority:	30 V.S.A. § 51
Summary:	The Vermont Residential Building Energy Standards (RBES) regulate the design and construction of residential buildings to require adequate thermal insulation, low air leakage, effective and efficient mechanical, ventilation, electrical, service water-heating and illumination systems and equipment to enable effective use of energy in residential buildings. This is an update to the RBES to allow the 2020 Vermont Residential Building Energy Standards as an option for the purposes of complying with Vermont's residential building energy code. This update allows adherence to the requirements in either the 2020 RBES or 2024 RBES for compliance purposes with no substantive changes to the 2020 RBES or 2024 RBES as originally adopted.
Persons Affected:	The Department of Public Safety (DPS), State Historic Preservation Office (SHPO)/Agency of Commerce and Community Development (ACCD), Office of Economic Opportunity (OEO), Act 250 Commissions, new home owners/buyers, existing home owners, builders, building designers, home energy raters and municipalities.
Economic Impact:	This rule update will allow for greater regulatory flexibility to reduce the cost to construct housing. Adoption of the rule will result in an additional compliance option which, as compared to 2024 RBES currently in effect, will provide an incremental cost decrease for the parties involved in new home construction, purchase, and ownership, and existing home

	renovation. The addition of this option will allow builders and homeowners to choose one of two discrete sets of standards for compliance, and ultimately, will provide the choice of affordability: 2020 RBES provides lower upfront construction costs, whereas 2024 RBES requires a higher upfront construction cost with the benefit of incrementally higher energy efficiency.
Posting date:	Dec 31,2025

Hearing Information

Information for Hearing # 1

Hearing date:	02-02-2026 1:30 PM ADD TO YOUR CALENDAR
Location:	Department of Public Service, Giga Conference Room, Third Floor
Address:	112 State Street
City:	Montpelier
State:	VT
Zip:	05620
Hearing Notes:	Also virtually via MS. Teams at: https://teams.microsoft.com/l/meetup-join/193ameeting_MjkyMDBhMGUtMGQyOS00MDAyLWI4YjQtMmYwYTlmZDMxMTZl40thread.v2/0?context7b22Tid223a2220b4933b-baad-433c-9c02-70edcc7559c6222c22Oid223a229dd0227c-440d-4019-8995-aa1ce25130e9227d

Information for Hearing # 2

Hearing date:	02-02-2026 1:30 PM ADD TO YOUR CALENDAR
Location:	Virtually via MS Teams
Address:	https://teams.microsoft.com/l/meetup-join/193ameeting_MjkyMDBhMGUtMGQyOS00MDAyLWI4YjQtMmYwYTlmZDMxMTZl40thread.v2/0?context7b22Tid223a2220b4933b-baad-433c-9c02-70edcc7559c6222c22Oid223a229dd0227c-440d-4019-8995-aa1ce25130e9227d
City:	n/a
State:	VT
Zip:	n/a
Hearing Notes:	Virtually via MS. Teams at: https://teams.microsoft.com/l/meetup-join/193ameeting_MjkyMDBhMGUtMGQyOS00MDAyLWI4YjQtMmYwYTlmZDMxMTZl40thread.v2/0?context7b22Tid223a2220b4933b-baad-433c-9c02-70edcc7559c6222c22Oid223a229dd0227c-440d-4019-8995-aa1ce25130e9227d

Contact Information

Information for Primary Contact

PRIMARY CONTACT PERSON - A PERSON WHO IS ABLE TO ANSWER QUESTIONS ABOUT THE CONTENT OF THE RULE.

Level:	Primary
Name:	Brittney Wilson
Agency:	Department of Public Service
Address:	112 State Street
City:	Montpelier
State:	VT
Zip:	05620
Telephone:	802-828-2811
Fax:	
Email:	brittney.wilson@vermont.gov SEND A COMMENT

Website Address:	http://publicservice.vermont.gov

VIEW WEBSITE

Information for Secondary Contact

SECONDARY CONTACT PERSON - A SPECIFIC PERSON FROM WHOM COPIES OF FILINGS MAY BE REQUESTED OR WHO MAY ANSWER QUESTIONS ABOUT FORMS SUBMITTED FOR FILING IF DIFFERENT FROM THE PRIMARY CONTACT PERSON.

Level:	Secondary
Name:	Benjamin Civiletti
Agency:	Department of Public Service
Address:	112 State Street
City:	Montpelier
State:	VT
Zip:	05620
Telephone:	802-622-4388
Fax:	
Email:	benjamin.civiletti@vermont.gov

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Keyword Information

Keywords:

residential building energy standards
residential energy code
RBES

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	The Islander (islander@vermontislander.com)	Tel: 802-372-5600 FAX: 802-372-3025
	Vermont Lawyer (hunter.press.vermont@gmail.com)	Attn: Will Hunter
	VT Digger (legals@vtdigger.org)	Attn: Legals

FROM: APA Coordinator, VSARA **Date of Fax:** February 18, 2026

RE: The "Proposed State Rules " ad copy to run on **January 8, 2026**

PAGES INCLUDING THIS COVER MEMO: 3

NOTE **8-pt font in body. 12-pt font max. for headings - single space body. Please include dashed lines where they appear in ad copy. Otherwise minimize the use of white space. Exceptions require written approval.**

If you have questions, or if the printing schedule of your paper is disrupted by holiday etc. please contact VSARA at 802-828-3700, or E-Mail sos.statutoryfilings@vermont.gov, Thanks.

PROPOSED STATE RULES

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By law, public notice of proposed rules must be given by publication in newspapers of record. The purpose of these notices is to give the public a chance to respond to the proposals. The public notices for administrative rules are now also available online at https://secure.vermont.gov/SOS/rules/ . The law requires an agency to hold a public hearing on a proposed rule, if requested to do so in writing by 25 persons or an association having at least 25 members.

To make special arrangements for individuals with disabilities or special needs please call or write the contact person listed below as soon as possible.

To obtain further information concerning any scheduled hearing(s), obtain copies of proposed rule(s) or submit comments regarding proposed rule(s), please call or write the contact person listed below. You may also submit comments in writing to the Legislative Committee on Administrative Rules, State House, Montpelier, Vermont 05602 (802-828-2231).

Vermont Residential Building Energy Standards (RBES) Amendments.

Vermont Proposed Rule: 25P047

AGENCY: Department of Public Service

CONCISE SUMMARY: The Vermont Residential Building Energy Standards (RBES) regulate the design and construction of residential buildings to require adequate thermal insulation, low air leakage, effective and efficient mechanical, ventilation, electrical, service water-heating and illumination systems and equipment to enable effective use of energy in residential buildings. This is an update to the RBES to allow the 2020 Vermont Residential Building Energy Standards as an option for the purposes of complying with Vermont's residential building energy code. This update allows adherence to the requirements in either the 2020 RBES or 2024 RBES for compliance purposes with no substantive changes to the 2020 RBES or 2024 RBES as originally adopted.

FOR FURTHER INFORMATION, CONTACT: Brittney Wilson, Department of Public Service 112 State Street, Montpelier, VT 05620 Tel: 802-828-2811 E-mail: brittney.wilson@vermont.gov URL: http://publicservice.vermont.gov.

FOR COPIES: Ben Civiletti, Department of Public Service 112 State Street, Montpelier, VT 05620 Tel: 802-622-4388 E-mail: benjamin.civiletti@vermont.gov.

Vermont Commercial Building Energy Standards (CBES) Amendments.

Vermont Proposed Rule: 25P048

AGENCY: Department of Public Service

CONCISE SUMMARY: The Vermont Commercial Building Energy Standards (CBES) regulate the design of building envelopes for adequate thermal resistance and low air leakage and the design and selection of mechanical, ventilation, electrical, service water- heating and illumination systems and equipment in commercial building construction. This is an update to the CBES to allow the 2020 Vermont Commercial Building Energy Standards as an option for the purposes of complying with Vermont's commercial building energy code. This update allows adherence to the requirements in either the 2020 CBES or 2024 CBES for compliance purposes with no substantive changes to the 2020 CBES or 2024 CBES as originally adopted.

FOR FURTHER INFORMATION, CONTACT: Brittney Wilson, Department of Public Service 112 State Street, Montpelier, VT 05620 Tel: 802-828-2811 E-mail: brittney.wilson@vermont.gov URL: http://publicservice.vermont.gov.

FOR COPIES: Ben Civiletti, Department of Public Service 112 State Street, Montpelier, VT 05620 Tel: 802-622-4388 E-mail: benjamin.civiletti@vermont.gov.
