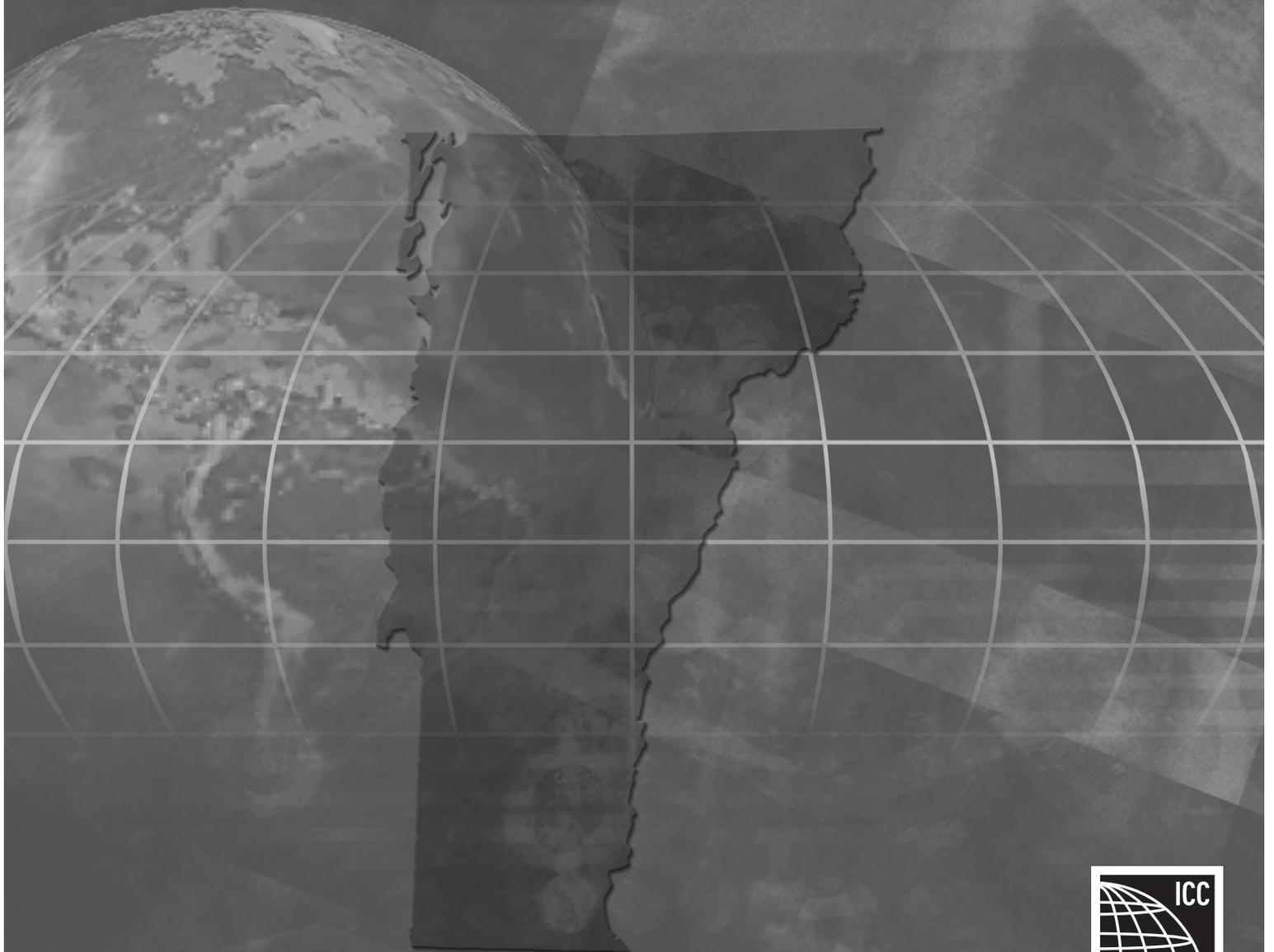




2015 Vermont Commercial Building Energy Standards



Effective March 1, 2015



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PREFACE

Introduction

This document is the 2015 Vermont Commercial Building Energy Standards (CBES). It is based on the 2015 *International Energy Conservation Code*® (IECC®) and includes many elements of ASHRAE/IESNA Standard 90.1-2013. Amendments have been made to suit Vermont's climate and special needs.

The Vermont Energy Act of 2009 (Act 45) directed the Commissioner of the Department of Public Service to amend the CBES to ensure that commercial building construction be designed and constructed in a manner that complies with ASHRAE/IESNA Standard 90.1-2007 or the 2009 edition of the IECC.

The Vermont Energy Act of 2009 (Act 45) legislation requires that at least every three years after January 1, 2011 the Commissioner of Public Service shall amend and update the CBES.

30 V.S.A. §53 of the Vermont Statutes requires certification that both the design and the construction of a commercial building is in compliance with the CBES. Certification shall be issued by a completed and signed certificate permanently affixed to the outside of the heating or cooling equipment, to the electrical service panel and located inside the building, or in a visible location in the immediate vicinity of one of these three areas. Copies of the signed certification documents shall be sent to the local town clerk and to the Vermont Department of Public Service.

The Vermont Division of Fire Safety may request completed certificates at the time of inspection, and certificate of occupancy may be withheld until the CBES certificate and affidavits are posted.

Certificates, affidavits and contact information for questions about the energy code can be found at:

http://publicservice.vermont.gov/topics/energy_efficiency/cbes

The statute pertaining to CBES (30 V.S.A. §53) can be found at:

<http://tinyurl.com/VT-Statute-CBES>

Users of the code are encouraged to view the publicly available interpretations of the ASHRAE 90.1-2013 standard, available online at:

<http://tinyurl.com/90-1-2013>

Marginal Markings

Solid vertical lines in the margins within the body of the code indicate a State of Vermont amendment has been made to the 2015 *International Energy Conservation Code*. 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.

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.

EFFECTIVE USE OF THE COMMERCIAL BUILDING ENERGY STANDARDS

Arrangement and Format of the 2015 CBES

Before applying the requirements of the 2015 CBES it is beneficial to understand its arrangement and format. The 2015 CBES, like other codes published by ICC, is arranged and organized to follow sequential steps that generally occur during a plan review or inspection. The 2015 CBES is divided into five different parts:

Chapters	Subjects
1–2	Administration and definitions
3	Climate zones and general materials requirements
4	Energy efficiency requirements
5	Existing buildings
6	Referenced standards

The following is a chapter-by-chapter synopsis of the scope and intent of the provisions of the 2015 *Vermont Commercial Building Energy Standards*:

Chapter 1 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 the code. Only through careful observation of the administrative provisions can the building official or the authority having jurisdiction 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.

Climate has a major impact on the energy use of most buildings. The code establishes many requirements such as wall and roof insulation *R*-values, window and door thermal transmittance requirement (*U*-factors) as well as provisions that affect the mechanical systems.

Chapter 4 Commercial Energy Efficiency. Chapter 4 contains the energy-efficiency-related requirements for the design and construction of most types of commercial buildings, and residential buildings greater than three stories in height above grade. This chapter defines requirements for the portions of the building and building systems that impact energy use in new commercial construction and new residential construction greater than three stories in height, and promotes the effective use of energy. The provisions within the chapter promote energy efficiency in the building envelope, the heating and cooling system and the service water heating system of the building.

Chapter 5 Existing Buildings. Chapter 5 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 other authority having jurisdiction, 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 numerical order based upon 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.

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
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
cfm	Cubic feet per minute
cfm/ft ²	Cubic feet per minute per square foot
ci	Continuous insulation
COP	Coefficient of performance
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
EER	Energy efficiency ratio
EF	Energy factor
ERI	Energy Rating index
<i>F</i> -factor	See Chapter 2—Definitions
FDD	Fault detection and diagnostics
FE _G	Fan efficiency grade
FL	Full load
ft ²	Square foot
gpm	Gallons per minute
HDD	Heating degree days
hp	Horsepower
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
psf	Pounds per square foot
PTAC	Packaged terminal air conditioner
PTHP	Packaged terminal heat pump
<i>R</i> -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
SRI	Solar reflectance index
SWHF	Service water heat recovery factor
<i>U</i> -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

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