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# PREFACE

## Introduction

Internationally, code officials recognize the need for a modern, up-to-date energy conservation code addressing the design of energy-efficient building envelopes and installation of energy efficient mechanical, lighting and power systems through requirements emphasizing performance. The *International Energy Conservation Code*<sup>®</sup>, in this 2006 edition, is designed to meet these needs through model code regulations that will result in the optimal utilization of fossil fuel and nondepletable resources in all communities, large and small.

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. This 2006 edition is fully compatible with all the *International Codes*<sup>®</sup> (I-Codes<sup>®</sup>) published by the International Code Council (ICC)<sup>®</sup>, including: the *International Building Code*<sup>®</sup>, *ICC Electrical Code*<sup>®</sup>, *International Existing Building Code*<sup>®</sup>, *International Fire Code*<sup>®</sup>, *International Fuel Gas Code*<sup>®</sup>, *International Mechanical Code*<sup>®</sup>, *ICC Performance Code*<sup>®</sup>, *International Plumbing Code*<sup>®</sup>, *International Private Sewage Disposal Code*<sup>®</sup>, *International Property Maintenance Code*<sup>®</sup>, *International Residential Code*<sup>®</sup>, *International Wildland-Urban Interface Code*<sup>™</sup> and *International Zoning Code*<sup>®</sup>.

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 forum provides an excellent arena to debate proposed revisions. This model code also encourages international consistency in the application of provisions.

## Development

The first edition of the *International Energy Conservation Code* (1998) was based on the 1995 edition of the *Model Energy Code* promulgated by the Council of American Building Officials (CABO) and included changes approved through the CABO Code Development Procedures through 1997. CABO assigned all rights and responsibilities to the International Code Council and its three statutory members at that time, including Building Officials and Code Administrators International, Inc. (BOCA), International Conference of Building Officials (ICBO) and Southern Building Code Congress International (SBCCI). This 2006 edition presents the code as originally issued, with changes reflected in the 2003 edition and further changes approved through the ICC Code Development Process through 2005. A new edition such as this is promulgated every three years.

This code 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.

## Adoption

The *International Energy Conservation Code* is available for adoption and use by jurisdictions internationally. Its use within a governmental jurisdiction is intended to be accomplished through adoption by reference in accordance with proceedings establishing the jurisdiction's laws. At the time of adoption, jurisdictions should insert the appropriate information in provisions requiring specific local information, such as the name of the adopting jurisdiction. These locations are shown in bracketed words in small capital letters in the code and in the sample ordinance. The sample adoption ordinance on page v addresses several key elements of a code adoption ordinance, including the information required for insertion into the code text.

## Maintenance

The *International Energy Conservation Code* is kept up to date through the review of proposed changes submitted by code enforcing officials, industry representatives, design professionals and other interested parties. Proposed changes are carefully considered through an open code development process in which all interested and affected parties may participate.

The contents of this work are subject to change both through the Code Development Cycles and the governmental body that enacts the code into law. For more information regarding the code development process, contact the Code and Standard Development Department of the International Code Council.

While the development procedure of the *International Energy Conservation Code* assures the highest degree of care, ICC, its members and those participating in the development of this code do not accept any liability resulting from compliance or noncompliance with the provisions because ICC and its members do not have the power or authority to police or enforce compliance with the contents of this code. Only the governmental body that enacts the code into law has such authority.

## Letter Designations in Front of Section Numbers

In each code development cycle, proposed changes to this code are considered at the Code Development Hearing by the International Energy Conservation Code Development Committee, whose action constitutes a recommendation to the voting membership for final action on the proposed change. Proposed changes to a code section whose number begins with a letter in brackets are considered by a different code development committee. For instance, proposed changes to code sections which have the letter [EB] in front (e.g., [EB] 101.2.2.1), are considered by the International Existing Building Code Development Committee at the Code Development Hearing. Where this designation is applicable to the entire content of a main section of the code, the designation appears at the main section number and title and is not repeated at every subsection in that section.

The content of sections in this code which begin with a letter designation is maintained by another code development committee in accordance with the following:

- [B] = International Building Code Development Committee;
- [EB] = International Existing Building Code Development Committee; and
- [M] = International Mechanical Code Development Committee.

## Marginal Markings

Solid vertical lines in the margins within the body of the code indicate a technical change from the requirements of the 2003 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.

# ORDINANCE

The International Codes are designed and promulgated to be adopted by reference by ordinance. Jurisdictions wishing to adopt the 2006 *International Energy Conservation Code* as an enforceable regulation governing energy efficient building envelopes and installation of energy efficient mechanical, lighting and power systems should ensure that certain factual information is included in the adopting ordinance at the time adoption is being considered by the appropriate governmental body. The following sample adoption ordinance addresses several key elements of a code adoption ordinance, including the information required for insertion into the code text.

## SAMPLE ORDINANCE FOR ADOPTION OF THE *INTERNATIONAL ENERGY CONSERVATION CODE* ORDINANCE NO. \_\_\_\_\_

An ordinance of the [JURISDICTION] adopting the 2006 edition of the *International Energy Conservation Code*, regulating and governing energy efficient building envelopes and installation of energy efficient mechanical, lighting and power systems in the [JURISDICTION]; providing for the issuance of permits and collection of fees therefor; repealing Ordinance No. \_\_\_\_\_ of the [JURISDICTION] and all other ordinances and parts of the ordinances in conflict therewith.

The [GOVERNING BODY] of the [JURISDICTION] does ordain as follows:

**Section 1.** That a certain document, three (3) copies of which are on file in the office of the [TITLE OF JURISDICTION'S KEEPER OF RECORDS] of [NAME OF JURISDICTION], being marked and designated as the *International Energy Conservation Code*, 2006 edition, as published by the International Code Council, be and is hereby adopted as the Energy Conservation Code of the [JURISDICTION], in the State of [STATE NAME] for regulating and governing energy efficient building envelopes and installation of energy efficient mechanical, lighting and power systems as herein provided; providing for the issuance of permits and collection of fees therefor; and each and all of the regulations, provisions, penalties, conditions and terms of said Energy Conservation Code on file in the office of the [JURISDICTION] are hereby referred to, adopted, and made a part hereof, as if fully set out in this ordinance, with the additions, insertions, deletions and changes, if any, prescribed in Section 2 of this ordinance.

**Section 2.** The following sections are hereby revised:

Section 101.1. Insert: [NAME OF JURISDICTION].

**Section 3.** That Ordinance No. \_\_\_\_\_ of [JURISDICTION] entitled [FILL IN HERE THE COMPLETE TITLE OF THE ORDINANCE OR ORDINANCES IN EFFECT AT THE PRESENT TIME SO THAT THEY WILL BE REPEALED BY DEFINITE MENTION] and all other ordinances or parts of ordinances in conflict herewith are hereby repealed.

**Section 4.** That if any section, subsection, sentence, clause or phrase of this ordinance is, for any reason, held to be unconstitutional, such decision shall not affect the validity of the remaining portions of this ordinance. The [GOVERNING BODY] hereby declares that it would have passed this ordinance, and each section, subsection, clause or phrase thereof, irrespective of the fact that any one or more sections, subsections, sentences, clauses and phrases be declared unconstitutional.

**Section 5.** That nothing in this ordinance or in the Energy Conservation Code hereby adopted shall be construed to affect any suit or proceeding impending in any court, or any rights acquired, or liability incurred, or any cause or causes of action acquired or existing, under any act or ordinance hereby repealed as cited in Section 3 of this ordinance; nor shall any just or legal right or remedy of any character be lost, impaired or affected by this ordinance.

**Section 6.** That the [JURISDICTION'S KEEPER OF RECORDS] is hereby ordered and directed to cause this ordinance to be published. (An additional provision may be required to direct the number of times the ordinance is to be published and to specify that it is to be in a newspaper in general circulation. Posting may also be required.)

**Section 7.** That this ordinance and the rules, regulations, provisions, requirements, orders and matters established and adopted hereby shall take effect and be in full force and effect [TIME PERIOD] from and after the date of its final passage and adoption.



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## CHAPTER 6 REFERENCED STANDARDS

This chapter lists the standards that are referenced in various sections of this document. The standards are listed herein by the promulgating agency of the standard, the standard identification, the effective date and title, and the section or sections of this document that reference the standard. The application of the referenced standards shall be as specified in Section 107.

| American Architectural Manufacturers Association<br>1827 Walden Office Square<br>Suite 550<br>Schaumburg, IL 60173-4268 |  |   |
|---|--|---|
| Standard<br>reference<br>number   | Title  | Referenced<br>in code<br>section number |
| AAMA/WDMA/CSA<br>101/I.S.2/a440—05  | Specifications for Windows, Doors and Unit Skylights . . . . . | 402.4.2, 502.4.1                        |

| Air Movement and Control Association International<br>30 West University Drive<br>Arlington Heights, IL 60004-1806 |   |   |
|--|---|---|
| Standard<br>reference<br>number  | Title   | Referenced<br>in code<br>section number |
| 500D—98  | Laboratory Methods for Testing Dampers for Rating . . . . . | 502.4.4                                 |

| American National Standards Institute<br>25 West 43rd Street<br>Fourth Floor<br>New York, NY 10036 |   |   |
|--|---|---|
| Standard<br>reference<br>number  | Title   | Referenced<br>in code<br>section number |
| Z21.10.3—01  | Gas Water Heaters, Volume III - Storage Water Heaters with Input Ratings Above 75,000 Btu per Hour,<br>Circulating Tank and Instantaneous—with Addenda Z21.10.3a-2003 and Z21.10.3b-2004. . . . . | Table 504.2                             |
| Z21.13—04  | Gas-Fired Low Pressure Steam and Hot Water Boilers . . . . .  | Table 503.2.3(5)                        |
| Z21.47—03  | Gas-Fired Central Furnaces. . . . .   | Table 503.2.3(4)                        |
| Z83.8—02   | Gas Unit Heaters and Gas-Fired Duct Furnaces—with Addendum Z83.8a-2003 . . . . .  | Table 503.2.3(4)                        |

| Air Conditioning and Refrigeration Institute<br>4301 North Fairfax Drive<br>Suite 200<br>Arlington, VA 22203 |  |   |
|--|--|---|
| Standard<br>reference<br>number  | Title  | Referenced<br>in code<br>section number |
| 210/240—03   | Unitary Air-Conditioning and Air-Source Heat Pump Equipment . . . . .  | Table 503.2.3(1), Table 503.2.3(2)      |
| 310/380—93   | Standard for Packaged Terminal Air-Conditioners and Heat Pumps . . . . .   | Table 503.2.3(3)                        |
| 340/360—2000   | Commercial and Industrial Unitary Air-conditioning and Heat Pump<br>Equipment. . . . .                                   | Table 503.2.3(1), Table 503.2.3(2)      |
| 365—02   | Commercial and Industrial Unitary Air-Conditioning Condensing Units . . . . .  | Table 503.2.3(6)                        |
| 460-00   | Remote Mechanical-Draft Air-Cooled Refrigerant Condensers. . . . .   | Table 503.2.3(11)                       |
| 550/590—98   | Water Chilling Packages Using the Vapor Compression Cycle—with Addenda. . . . .  | Table 503.2.3(7)                        |
| 560—00   | Absorption Water Chilling and Water Heating Packages . . . . .   | Table 503.2.3(7)                        |
| 13256-1 (2004)   | Water-source Heat Pumps—Testing and Rating for Performance—Part 1: Water-to-air and<br>Brine-to-air Heat Pumps . . . . . | Table 503.2.3(2)                        |
| 1160—2004  | Performance Rating of Heat Pump Pool Heaters . . . . .   | Table 504.2                             |

# ASHRAE

American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.  
1791 Tullie Circle, NE  
Atlanta, GA 30329-2305

| Standard reference number | Title   | Referenced in code section number     |
|---------------------------|---|---------------------------------------|
| 119—88 (RA 1994)          | Air Leakage Performance for Detached Single-family Residential Buildings . . . . .  | Table 404.5.2(1)                      |
| 146-1998                  | Testing and Rating Pool Heaters . . . . .   | Table 504.2                           |
| 13256-1 (2004)            | Water-source Heat Pumps—Testing and Rating for Performance—Part 1: Water-to-air and Brine-to-air Heat Pumps (ANSI/ASHRAE/IESNA 90.1-2004) . . . . . | Table 503.2.3(2)                      |
| 90.1—2004                 | Energy Standard for Buildings Except Low-rise Residential Buildings (ANSI/ASHRAE/IESNA 90.1-2004) . . . . .   | 501.1, 501.2, 502.1.1, Table 502.2(2) |
| ASHRAE—2001               | ASHRAE Handbook of Fundamentals-2001 . . . . .  | 402.1.4, Table 404.5.2(1), 503.2.1    |
| ASHRAE—2004               | ASHRAE HVAC Systems and Equipment Handbook-2004 . . . . .   | 503.2.1                               |

# ASME

American Society of Mechanical Engineers  
Three Park Avenue  
New York, NY 10016-5990

| Standard reference number | Title                            | Referenced in code section number |
|---------------------------|----------------------------------|-----------------------------------|
| PTC 4.1 - 1964            | Steam Generating Units . . . . . | Table 503.2.3(5)                  |

# ASTM

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

| Standard reference number | Title  | Referenced in code section number |
|---------------------------|--|-----------------------------------|
| C 90—03                   | Specification for Load-bearing Concrete Masonry Units . . . . .  | Table 502.2(1)                    |
| E 96—00e01                | Standard Test Methods for Water Vapor Transmission of Materials . . . . .  | 202, 502.5                        |
| E 283—04                  | Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls and Doors Under Specified Pressure Differences Across the Specimen . . . . . | 402.4.3, 502.4.2, 502.4.7         |

# CSA

Canadian Standards Association  
5060 Spectrum Way  
Mississauga, Ontario, Canada L4W 5N6

| Standard reference number | Title  | Referenced in code section number |
|---------------------------|--|-----------------------------------|
| 101/I.S.2/A440—05         | Specifications for Windows, Doors and Unit Skylights . . . . . | 402.4.2, 502.4.1                  |

# CTI

Cooling Technology Institute  
2611 FM 1960 West, Suite H-200  
Houston, TX 77068-3730

| Standard reference number | Title  | Referenced in code section number |
|---------------------------|--|-----------------------------------|
| ATC-105 (2000)            | Acceptance Test Code . . . . .                                       | Table 503.2.3(11)                 |
| STD-201 (2002)            | Certification Standard for Commercial Water Cooling Towers . . . . . | Table 503.2.3(11)                 |

# DOE

U.S. Department of Energy  
c/o Superintendent of Documents  
U.S. Government Printing Office  
Washington, DC 20402-9325

| Standard reference number                     | Title  | Referenced in code section number  |
|---|--|------------------------------------|
| 10 CFR Part 430, Subpart B, Appendix E (1998) | Uniform Test Method for Measuring the Energy Consumption of Water Heaters . . . . .        | Table 504.2                        |
| 10 CFR Part 430, Subpart B, Appendix N (1998) | Uniform Test Method for Measuring the Energy Consumption of Furnaces and Boilers . . . . . | Table 503.2.3(4), Table 503.2.3(5) |
| DOE/EIA—0376 (Current Edition)                | State Energy Prices and Expenditure Report . . . . .                                       | 404.3, 506.2.3                     |

# HI

Hydronics Institute, Division of the Gas Appliance Manufacturers Association  
P.O. Box 218  
Berkeley Heights, NJ 07054

| Standard reference number | Title   | Referenced in code section number |
|---------------------------|---|-----------------------------------|
| HBS                       | I=B=R—Testing and Rating Standard for Heating Boilers, 1989 Ed. . . . . | Table 503.2.3(5)                  |

# ICC

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

| Standard reference number | Title                                     | Referenced in code section number  |
|---------------------------|---|--|
| IBC—06                    | International Building Code® . . . . .    | 102.2, 201.3   |
| ICC EC—06                 | ICC Electrical Code® . . . . .            | 201.3  |
| IFC—06                    | International Fire Code® . . . . .        | 201.3  |
| IFGC—06                   | International Fuel Gas Code® . . . . .    | 201.3  |
| IMC—06                    | International Mechanical Code® . . . . .  | 503.2.5, 503.2.6, 503.2.7.1, 503.2.7.1.1, 503.2.7.1.2, 503.2.9.1, 503.3.1, 503.4.5 |
| IPC—06                    | International Plumbing Code® . . . . .    | 201.3  |
| IRC—06                    | International Residential Code® . . . . . | 201.3, 403.2.2, 403.6, 404.6.1, Table 404.5.2(1)                                   |

# IESNA

Illuminating Engineering Society of North America  
120 Wall Street, 17th Floor  
New York, NY 10005-4001

| Standard reference number | Title   | Referenced in code section number     |
|---------------------------|---|---------------------------------------|
| 90.1-2004                 | Energy Standard for Buildings Except Low-rise Residential Buildings . . . . . | 501.1, 501.2, 502.1.1, Table 502.2(2) |

# NFRC

National Fenestration Rating Council, Inc.  
8484 Georgia Avenue  
Suite 320  
Silver Spring, MD 20910

| Standard reference number | Title  | Referenced in code section number |
|---------------------------|--|-----------------------------------|
| 100—01                    | Procedure for Determining Fenestration Product U-Factors—Second Edition . . . . .  | 102.1.3                           |
| 200—01                    | Procedure for Determining Fenestration Product Solar Heat Gain Coefficients and Visible Transmittance at Normal Incidence—Second Edition . . . . . | 102.1.3                           |
| 400—01                    | Procedure for Determining Fenestration Product Air Leakage—Second Edition . . . . .  | 402.4.2, 502.4.1                  |

REFERENCED STANDARDS

**SMACNA** Sheet Metal and Air Conditioning Contractors National Association, Inc.  
4021 Lafayette Center Drive  
Chantilly, VA 20151-1209

| Standard reference number | Title                                       | Referenced in code section number |
|---------------------------|---|-----------------------------------|
| SMACNA—85                 | HVAC Air Duct Leakage Test Manual . . . . . | .503.2.7.1.3                      |

**UL** Underwriters Laboratories Inc.  
333 Pfingsten Road  
Northbrook, IL 60062-2096

| Standard reference number | Title   | Referenced in code section number |
|---------------------------|---|-----------------------------------|
| 181A—98                   | Closure Systems for Use with Rigid Air Ducts and Air Connectors<br>— with Revisions through December 1998. . . . .  | .503.2.7                          |
| 181B—95                   | Closure Systems for Use with Flexible Air Ducts and Air Connectors<br>—with Revisions through August 2003 . . . . . | .503.2.7                          |
| 727—98                    | Oil-Fired Central Furnaces—with Revisions through January 2001 . . . . .  | Table 503.2.3(4)                  |
| 731—95                    | Oil-Fired Unit Heaters—with Revisions through January 1999. . . . .   | Table 503.2.3(4)                  |

**WDMA** Window and Door Manufacturers Association  
1400 East Touhy Avenue, Suite 470  
Des Plaines, IL 60018

| Standard reference number | Title  | Referenced in code section number |
|---------------------------|--|-----------------------------------|
| 101/I.S.2/A440—05         | Specifications for Windows, Doors and Unit Skylights . . . . . | .402.4.2, 502.4.1                 |