



BUILDING ENERGY CODES PROGRAM

Setting the Standard

U.S. Department of Energy • Office of Energy Efficiency and Renewable Energy

January 2007



Code Notes Help Building Professionals

Code Notes help builders obtain code compliance of energy-efficient technologies. These information sheets are written to code officials, and they address single above-code or otherwise obscure building features. They are available to view and download as PDFs from the Building Energy Codes Program (BECP) Resource Center at www.energycodes.gov/support/code_notes.stm.

Most Code Notes are developed based on questions received in the field. Recently, a code official from Colorado asked the BECP team whether new, lower ventilation levels that had recently been implemented by some designers really made sense. The answer is yes, and a new Code Note offers specific clarifications based on the code language and updates. This Code Note, which applies to commercial buildings, and an additional example that applies to residential buildings are provided here.

Code Notes are available on a variety of topics, and new ideas are always welcome. To identify a topic or issue that would be helpful to clarify for code officials, send an email through the Web form at www.energycodes.gov/support/helpdesk.php.

Updated ANSI/ASHRAE Standard for Commercial Ventilation Rate Procedure

The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) has modified its ventilation procedure to reflect the most current data available on indoor air quality. The new Standard was developed under American National Standards Institute (ANSI) guidelines and released in 2004.

The 2004 Standard incorporates a new Ventilation Rate Procedure (VRP) to calculate the minimum ventilation rate that satisfies indoor air quality, first cost, and energy cost concerns and has been used to develop new prescriptive ventilation rates. In contrast to the previous version of Standard 62.1, which accounted only for occupancy, the improved VPR considers the added effects of pollutants generated by people and building contents. The new requirements will not affect outdoor air intake rates for most spaces; they have the greatest effect on ventilation requirements for high-occupancy areas, such as auditoriums.

Currently, the 2003-2006 International Mechanical Code (IMC) criteria are based on the previous ANSI/ASHRAE Standard (see Table 1). Many states use the IMC ventilation rates, and implementing the newer values in commercial buildings may lower first costs and energy costs, while maintaining indoor air quality.

Table 1. Required minimum ventilation rate in cubic feet per minute (cfm) per person for 2006 IMC and 62.1-2004 ASHRAE

Occupancy Category	IMC (cfm/person)	ASHRAE (cfm/person)
Correctional facility cell	20	10
Educational classroom	15	15 (students ages 5-8); 13 (students age 9+)
Public assembly space or theater auditorium	15	5
General or office conference room	20	6
Office building office space	20	17
Hotel, motel, resort, and dormitory lobbies	15	10



Plan Review

Perform ventilation inspection during plan review following current IMC procedures, and determine what ventilation level is used for equipment calculations. If the newer ASHRAE ventilation levels are not used in design, consider discussing the updated rates with the mechanical system designer.

Field Inspection

Perform standard ventilation inspection based on current IMC requirements at the building site. Confirm that appropriate ventilation equipment is in place and properly installed.

Code Citations¹

Table 1 provides a comparison of the current IMC criteria and updated ASHRAE requirements for the minimum ventilation rate in selected spaces. Note that the table data is not comprehensive. Additional, specific ASHRAE and IMC requirements must be addressed by the system designer.

Sources

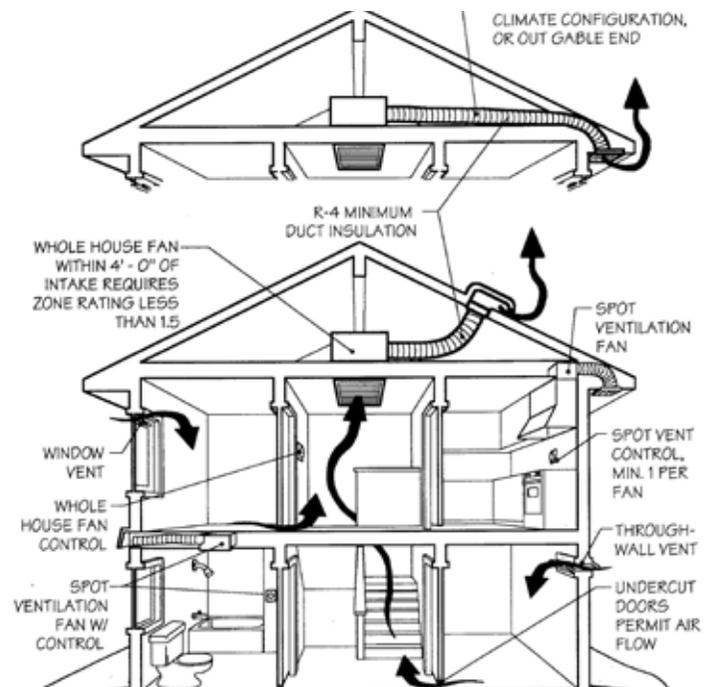
- *Use of ASHRAE Standard 62.1 in IMC Would Provide Lower Costs*, Accessed September 15, 2006
- *ASHRAE Proposes Changes to ICC Based on Standards 62.1, 90.1, 90.2*, Accessed September 15, 2006
- *2006/2007 Proposed Changes to the International Mechanical Code*
- ANSI/ASHRAE Standard 62.1-2004, *Ventilation for Acceptable Indoor Air Quality*

¹ ASHRAE 62.2-2004 Reference and link, Copyright, 2004, American Society of Heating, Refrigerating and Air-Conditioning Engineers, Atlanta, Georgia. ASHRAE Standard 62.2-2004. Reproduced with permission. All rights reserved. PNNL-SA-52672

Whole-House Mechanical Ventilation

The American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) Standard 62.2 provides guidance on the appropriate ventilation and acceptable indoor air quality in low-rise residential buildings. The information provided in the Standard offers some guidance for incorporating whole-house systems into a home. This material augments requirements in the national model energy codes for compliance with mechanical ventilation systems. At this time, the residential IECC does not reference ASHRAE 62.2.

Historically, residential buildings did not have specific requirements for ventilation because leakage in envelope components and natural ventilation was considered adequate. As envelope construction practice has improved, the need to control air quality in the home has increased.



ASHRAE has developed a new consensus Standard that provides guidelines for ventilation requirements. In addition to addressing whole-house ventilation, the Standard addresses local exhaust and source control. Ventilation requirements for safety (such as garage air handlers) are also important.

To comply with the ASHRAE Standard, residential buildings (including manufactured homes) are required to install a mechanical ventilation system. An override control for the occupants is also required. Ventilation systems are not currently required by the IECC in warm climates.

Definitions

Ventilated Mechanically – The process of supplying or removing air by mechanical means to or from any space. Such air may or may not have been conditioned.

Ventilated Naturally – The process of supplying or removing air by natural means to or from any space.

cfm – Cubic feet per minute. A standard measurement of airflow.

Plan Review

1. Confirm that a mechanical ventilation system that provides the appropriate ventilation rate (cfm) is called out.
2. Check that the planned ventilation rate is not greater than 7.5 cfm per 100 square feet if located in a very cold climate or a hot, humid climate. See Tables 8.1 and 8.3 for details.
3. Check that other ventilation items (local exhaust) have been planned for appropriately. Typically, this is simply local exhaust systems in kitchens and bathrooms.

Field Inspection

1. Confirm that a mechanical ventilation system that provides the appropriate ventilation rate (cfm) is present.
2. Confirm that an occupant override has been installed as required by ASHRAE 62.2-2004 Section 4.3, and IECC 2003 Section 503.3.3.5.

Code Citations²

IECC 2003, Section 503.3.3.5 Mechanical ventilation

Each mechanical ventilation system (supply, exhaust, or both) shall be equipped with a readily accessible switch or other means for shutoff (or volume reduction and shutoff) when ventilation is not required. Automatic or gravity dampers that close when the system is not operating shall be provided for outdoor air intakes and exhausts.



Training for the Energy Codes Community

What Happened at the Recent ICC Code Development Hearing?

The Building Energy Codes Program (BECP) continues to broadcast their popular webcasts on a variety of subjects ranging from the requirements in ASHRAE Standard 90.1 and the International Energy Conservation Code (IECC) to how to use the Check tools, REScheck™ and COMcheck™.

The latest BECP webcast, *On the Road to the 2009 IECC*, was presented by Pam Cole and Todd Taylor of Pacific Northwest National Laboratory as well as David Weitz of Conservation Services Group. The presenters provided an overview of the International Code Council (ICC) code development process and gave a status of the recent residential and commercial code change proposals submitted to the ICC. The table, *Code Development Hearing Overall Results*, summarizes the broad decisions made at the recent code hearings. For more specific information, refer to the ICC Report of Public Hearings at www.iccsafe.org/cs/codes/2006-07cycle/ROH/index.html.

The presenters provided an overview of the ICC code development process and gave a status of the recent residential and commercial code change proposals submitted to the ICC.

Floor Area (ft ²)	0-1 Bedroom	2-3 Bedrooms	4-5 Bedrooms	6-7 Bedrooms	>7 Bedrooms
<1500	30	45	60	75	90
1501-3000	45	60	75	90	105
3001-4500	60	75	90	105	120
4501-6000	75	90	105	120	135
6001-7500	90	105	120	135	150
>7500	105	120	135	150	165

Alabama: Mobile, Montgomery, Selma	Louisiana: Baton Rouge, Lake Charles, New Orleans, Shreveport
Arkansas: Texarkana	Mississippi: Biloxi, Gulfport, Jackson
Florida: Apalachicola, Daytona, Jacksonville, Miami, Orlando, Pensacola, Tallahassee, Tampa	North Carolina: Wilmington
Georgia: Savannah, Valdosta	South Carolina: Charleston, Myrtle Beach
Hawaii: Hilo, Honolulu, Lihue, Kahului	Texas: Austin, Beaumont, Brownsville, Corpus Christi, Dallas, Houston, Galveston, San Antonio, Waco

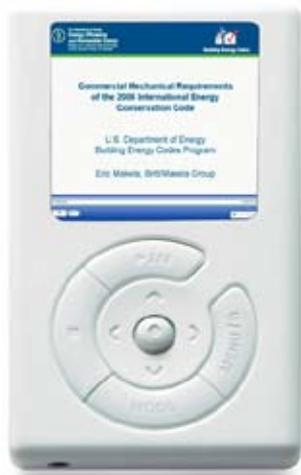
Alaska: Anchorage, Fairbanks	Minnesota: Duluth, International Falls
Maine: Caribou	North Dakota: Fargo, Grand Forks, Williston
Michigan: Marquette, Sault Ste. Marie	

² ICC Reference and link, Copyright, 2003, *International Code Council, Inc.* Falls Church, Virginia. 2003 International Residential Code. Reproduced with permission. All rights reserved. PNNL-SA-49261

Code Development Hearing Overall Results				
Type of Proposal	Number of Proposals			
	Submitted	Approved <i>(as submitted or as modified)</i>	Denied	Withdrawn
Mixed residential and commercial proposals	31	15	15	1
Commercial only proposals	49	23	25	1
Residential only proposals	52	18	30	4

Podcasts are Coming!

BECP will offer podcasts in fiscal year 2007. Check www.energycodes.gov often for updates on the availability of this new communication tool for users.



New Self-Paced Training Tool Online

Area Takeoffs 101 is now available. This self-paced online training provides a basic explanation of the building envelope concept and gives helpful hints for calculating area takeoffs, including instructions and examples. All of the BECP self-paced training tools are accessible at www.energycodes.gov/training/onlinetraining/self-paced.stm.

Upcoming Training Events

The webcast, *REScheck™ for the 2006 IECC*, will be broadcast on February 15, 2007.

Visit www.energycodes.gov/events/index.php for a calendar of upcoming events.



Software Updates Released and on the Way

What's New?

REScheck™ desktop version 4.0, released in December 2006, now includes compliance for the 2006 International Energy Conservation Code (IECC). Recent releases of REScheck and COMcheck™ have reintroduced the capability to generate reports as RTFs. These new versions also offer users the ability to specify new preferences, including:

- code, location, and contact information for owner and/or agent as well as designer and/or contractor for new projects
- names, titles, and numbers of signature lines for compliance certificates
- contact information to be used for emailing reports.

Coming Soon

Upcoming releases in fiscal year 2007 include:

- compliance for the 2006 International Residential Code
- a restructured Beyond Code Advisor in REScheck
- an automatic update feature for desktop versions of REScheck and COMcheck
- a new and improved AreaCalc in REScheck and COMcheck.

In addition, by the end of fiscal year 2007, COMcheck will include compliance for the 2006 IECC and will have several interior and exterior lighting enhancements.



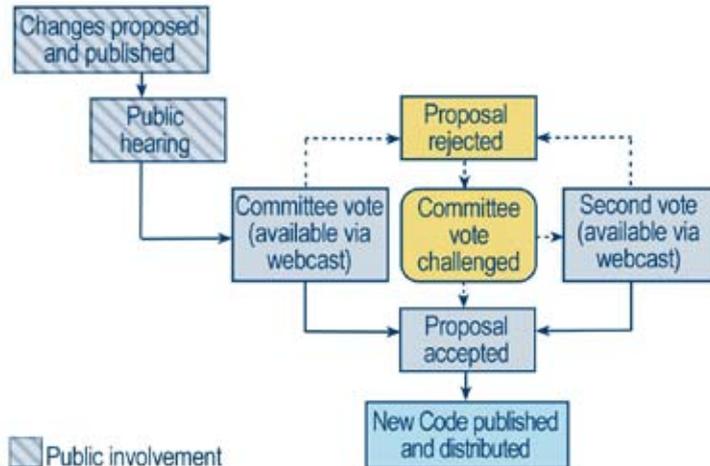
How to Get Involved in ICC

The International Code Council (ICC) publishes and maintains the International Energy Conservation Code (IECC) and International Residential Code (IRC), which are both Model Energy Codes. The IECC contains energy efficiency criteria for new residential and commercial buildings and additions to existing buildings. The IRC is a more general code that offers guidelines about non-energy features as well as a reference to the IECC.

The ICC revises the IECC and IRC every 18 months through an open public hearing process. The first steps to this review process are for the ICC committee to publish changes proposed by individuals and groups and to distribute them for review. Next, public hearings are held. These steps rely on public involvement. Decisions are then carried out by the IECC committee, which consists of code, building science, and energy experts or the IRC committee, which consists of builders, code officials, and industry representatives.

More information is available at the Building Energy Codes Program website (www.energycodes.gov) and the ICC website (www.iccsafe.org/).

ICC Code Development and Revisions



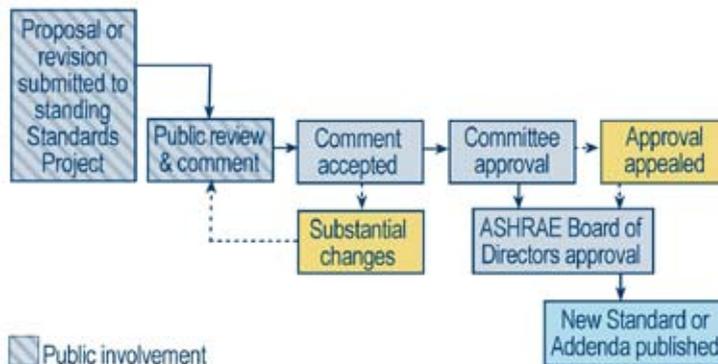
Anyone can suggest a revision to the ICC by requesting a code change form, preparing a recommended change and substantiation, and participating in open public debate.

How to Get Involved in ASHRAE

The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) and the Illuminating Engineering Society of North America (IESNA), following American National Standards Institute (ANSI) procedures, jointly publish and maintain ANSI/ASHRAE/IESNA Standard 90.1, *Energy Standard for Buildings Except Low-Rise Residential Buildings*, which contains energy efficiency criteria for new commercial buildings and additions and modifications to existing buildings. The Standard is revised regularly through a continuous maintenance process.

The Standing Standards Project Committees (SSPCs), which consist of 10 to 60 voting members, are responsible for maintenance of the Standard. The SSPCs comprise individuals from a variety of groups to represent all interest categories. The revision process relies upon the SSPCs, the ASHRAE Board of Directors, and public review and comment. Public involvement is part of the revision process after a proposal is initially presented, and additional rounds of public review and comment occur after any substantive revisions. Complete copies of the Standard are published every three years, and interim revisions are posted on the ASHRAE website.

ASHRAE Standard Development and Revisions



Anyone may propose a revision to Standard 90.1 at any time by downloading the proposed change form on page www.ashrae.org/technology/page/812, preparing a recommended change and substantiation, and participating in the committee meetings.

More information is available at the Building Energy Codes Program website (www.energycodes.gov) and the ASHRAE website (www.ashrae.org/).



Building Energy Codes Website: www.energycodes.gov

Tech Support: www.energycodes.gov/support



U.S. Department of Energy

Energy Efficiency and Renewable Energy

Bringing you a prosperous future where energy is clean, abundant, reliable, and affordable

PNNL-SA-53615

Setting the Standard

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Setting the Standard is published by the Building Energy Codes Program of the U.S. Department of Energy Office of Energy Efficiency and Renewable Energy at the Pacific Northwest National Laboratory. Its purpose is to encourage information exchange among building industry professionals and organizations, state and local code officials, and researchers to facilitate timely development and early adoption of the building energy conservation standards. The Building Energy Codes Program would like to continue sending you information about energy codes and compliance tools, but if you would like your name removed from our contacts list, go to www.energycodes.gov/unsubscribe.stm. Send comments and contributions to Loel Kathmann at Pacific Northwest National Laboratory (techsupport@becp.pnl.gov).

Editor: Loel Kathmann

January 2007

www.energycodes.gov

Printed on recycled paper

January 2007

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Popular Resources in 2006



The Building Energy Codes Program (BCEP) offers a wealth of resources right at the fingertips of the energy codes community. Visit www.energycodes.gov and the award-winning Resource

Center at <http://resourcecenter.pnl.gov/cocoon/morf/ResourceCenter> to access software, Code Notes, articles, webcasts, online training, and more. These informational materials are free and written for energy code users and enforcers. Refer to the Most Accessed Online Training Videos of 2006 table and the Most Popular Recently Accessed Articles in 2006 table for resources popular with the energy codes community in 2006.

BCEP offers free educational materials to the energy codes community.

Most Accessed Online Training Videos of 2006

- How to Use REScheck for Residential Energy Code Compliance Training
- How to Use COMcheck-EZ for Commercial Energy Code Compliance Training
- Advanced Lighting Design and the Energy Code Webcast
- How Log Homes are Handled in REScheck and How to Show Compliance
- Residential Requirements of the 2006 IECC

Most Popular Recently Accessed Articles in 2006

- How to Size HVAC Systems Correctly
- Rigid Board Insulation Installed as Draft Stop in Attic Kneewall – Code Notes
- Open Spaces as Return-Air Options – Code Notes
- Should I Consider a Conditioned Crawlspace or Basement?
- Insulation Options