# Setting the Standard

Codes and Standards—cooperative efforts to raise minimum energy efficiency standards

4th Quarter 2000 Volume 9, Issue 3

## In This Issue…

Video Available for Standard 90.1-1999 Satellite Broadcast . 2

New **MEC*check***™ Training Tool Available ..... 2

"In the Field" – Perimeter Slab Insulation..... 3

Energy Codes Adoption Moved Forward in 2000 ..... 4

2001 National Workshop Set for July ..... 4

**MEC*check***™ 3.2 to Include AreaCalc Tool ..... 5

Free **MEC*check***™ Training at NAHB 2001 ..... 5

# DOE Signs Residential Determination

### Designers, Builders, Owners, Code Officials, Environment Will Benefit

Energy Secretary Bill Richardson announced January 4, 2001 that the Department of Energy (DOE) has determined that the 2000 edition of the International Energy Conservation Code (IECC) will substantially improve the energy efficiency of low-rise residential buildings if adopted by all the states.

"Provisions of the 2000 edition of the IECC will improve residential energy efficiency and make building code compliance simpler and easier for designers, builders, and code officials," said Secretary Richardson. "Buildings are more likely to have all the required energy efficiency features when the code is easy to use and interpret. And by reducing energy use, these codes will reduce power plant emissions and benefit the environment. If all the states adopt this upgraded model code, the energy savings would be substantial."

DOE determined that the 2000 IECC code would improve energy efficiency after comparing it with the 1995 Model Energy Code and the 1998 IECC, fulfilling DOE's mandate under the Energy Conservation and Production Act, as amended, to determine if successors to the Model Energy Code (MEC) will improve residential energy efficiency. Various editions of the Model Energy Code, or codes derived from it, have been adopted by 25 states. Due to this determination, states have two years to inform the Department whether it is appropriate to update their residential code to the 2000 IECC. If a state reports that it is not appropriate to revise its code, the state must explain why. However, States are not required to adopt the IECC code. States that inform the Department about their decision on updating to the 2000 IECC are excused from reporting their decision about adopting the 1998 IECC.

The Department offers a range of services and products to help states update, implement, and enforce building energy codes. State Energy Program grants provide states with resources to design and implement more energy efficient codes. DOE also provides technical assistance, including economic analyses, code comparisons, training on code compliance software, and other specialized support.

The Department's Building Standards and Guidelines Program (BSGP) website **http://www.eren.doe.gov/buildings/codes_standards/buildings/determinations.html,** contains information on building energy codes, including downloadable versions of **MEC*check***™, code compliance software that provides a fast and easy way for designers, builders, and code officials to determine compliance with energy codes. Information and assistance about building energy codes is available by calling BSGP at **1-800-270-2633** or sending an e-mail message to **techsupport@bsgp.pnl.gov.**

OFFICE OF BUILDING TECHNOLOGY, STATE AND COMMUNITY PROGRAMS
OFFICE OF ENERGY EFFICIENCY AND RENEWABLE ENERGY
U.S. DEPARTMENT OF ENERGY

# Video Available for Standard 90.1-1999 Satellite Broadcast

On September 12, a two-hour, live satellite broadcast presenting an overview of the building envelope, mechanical, and lighting requirements of Standard 90.1-1999 was produced by the U.S. Department of Energy's Building Standards and Guidelines Program (BSGP) in partnership with the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) and the Illuminating Engineering Society of North America (IESNA).

ASHRAE/IESNA Standard 90.1-1999, "Energy Standard for Buildings Except Low-Rise Residential Buildings," provides minimum requirements for the energy-efficient design of buildings. It was published earlier this year by ASHRAE.

The live broadcast included four presentations, as well as question and answer sessions. The four presenters, all members of the Standing standards Project Committee (SSPC) 90.1 when the Standard was developed, were Ron Jarnagin (Pacific Northwest National Laboratory, Past Chair of ASHRAE SSPC 90.1), Steve Skalko (Portland Cement Association, Past Chair of ASHRAE SSPC 90.1 Envelope Subcommittee), Mick Schwedler (The Trane Company, Member of ASHRAE SSPC 90.1 Mechanical Subcommittee), and Joe Howley (GE Lighting, Past Chair of SSPC 90.1 Lighting Subcommittee). Members of the audience called or faxed in questions to be answered by the panel.

More than 2019 people at 101 sites viewed the broadcast live. The audience responded favorably on evaluation forms received following the broadcast, and viewers suggested that more of these presentations should take place in the future.

Link to **http://www.eren.doe.gov/buildings/codes_standards/buildings/satellite_post.html** to review questions from viewers, or presentations from the broadcast (.ppt format), or to replay the broadcast over the web.

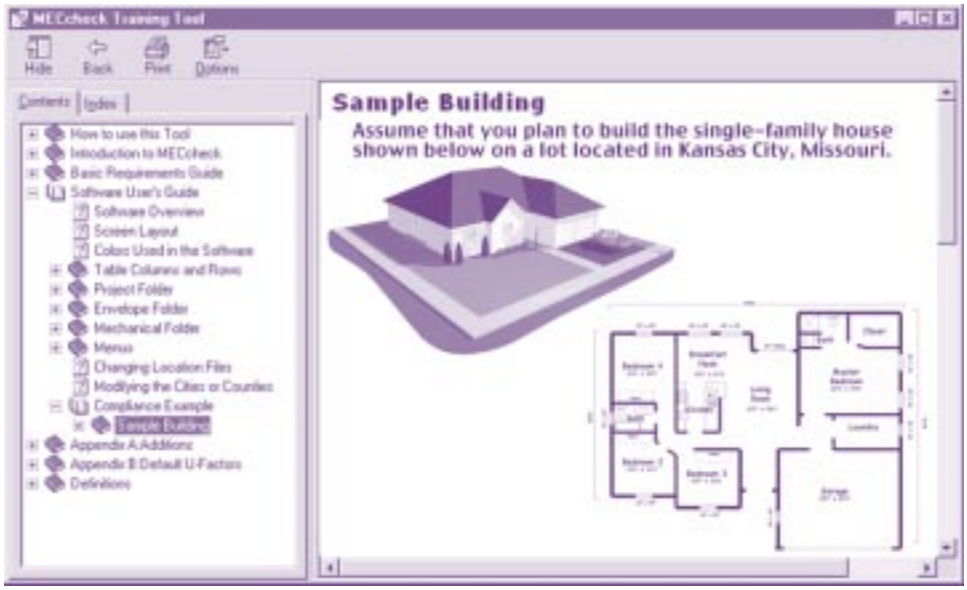
To order a copy of the video for $15, send an e-mail request to products@bsgp.pnl.gov or call 1-800-270-CODE(2633), option 1.

# New **MEC*check*™** Training Tool Available

DOE is introducing the new **MEC*check*™** Training Tool to train users of the **MEC*check*™** 3.0 software. This interactive multimedia tool is available on CD-Rom with the **MEC*check*™** software and includes text, full-color photographs and illustrations, and video and audio narration. Topics covered in the Training tool include the following:

- ✓ Introduction to **MEC*check*™**
- ✓ Basic Requirements
- ✓ Software Compliance
- ✓ Definitions

The **MEC*check*™** Training Tool is designed to be as flexible as possible, allowing users to select any topic of interest, in any order. Users have several options for navigating through the tool, which are explained in the How to Use the Tool section.




A residential building compliance example is included in the tool. A building rendering, floor plan, and specifications, as well as video and audio narration, are provided to illustrate how information is entered into the **MEC*check*™**software.

# “In The Field” – Perimeter Slab Insulation

### Q Why is perimeter slab insulation important?

A substantial amount of heat is lost through an uninsulated slab, resulting in cold, uncomfortable floors. Even if the foundation wall is insulated vertically under the slab (Figure 1), significant heat is still lost from the slab edge that is closest to the cold outside air.

### Q Where and how should perimeter slab insulation be applied?

The insulation can be applied outside (Figure 2) or inside (Figure 3) the foundation wall. Exterior applications require a metal flashing or durable finish for protection. The insulation can also be placed vertically along the foundation wall (Figure 3) or horizontally under the slab (Figure 4). Perimeter slab insulation can give termites access, so be sure to provide a termite shield (Figure 8). Some jurisdictions do not allow external insulation because the foundation must be visible for termite inspection.

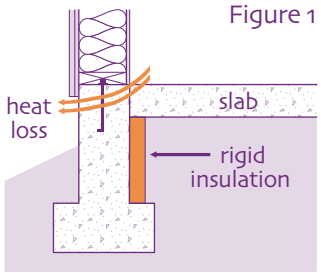


Figure 1

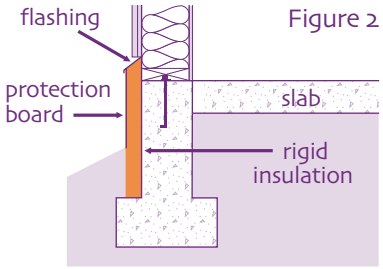


Figure 2

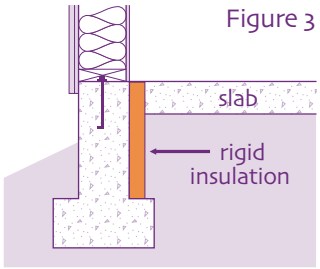


Figure 3

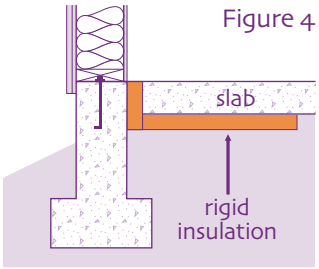


Figure 4

### Q Is there a way to avoid bringing the insulation to the top of the slab edge so a carpet tack strip can be attached? *(see Figures 3 and 4)*

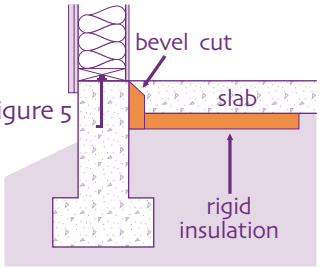


Figure 5

The insulation can be cut at a 45-degree bevel cut (Figure 5). This solution, while it does not provide full vertical face insulation, is allowed in Section 502.2.1.4 of the 2000 IECC.

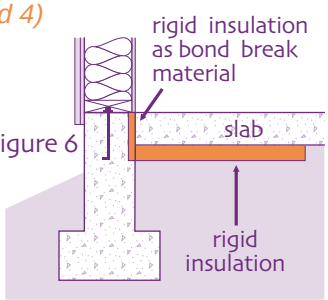


Figure 6

Rigid insulation can be used as the bond break material between the slab and footing (Figure 6). This solution requires that you have a notch in the foundation wall.

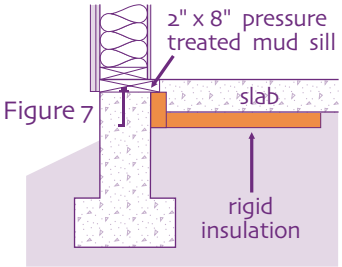


Figure 7

A 2 x 8 pressure-treated mud sill can be placed on the stem wall to cover the top edge of the insulation (Figure 7). A tack strip can then be attached to the mud sill.

### Q Is there any way to eliminate perimeter slab insulation completely?

Perimeter slab insulation can be “traded-off” using a software tool like **MEC*check***™ or **COM*check***™. Additional insulation is added in another part of the structure to compensate for the missing insulation in the slab. The code permits this trade-off, but when carpet is placed on a cold slab, the higher humidity levels that result can attract dust mites and mold.

### Q How do I protect perimeter slab insulation from moisture and termites?

One option is to install the insulation inside the foundation wall and provide a protective membrane (termite shield) between the sill plate and foundation (Figure 8).

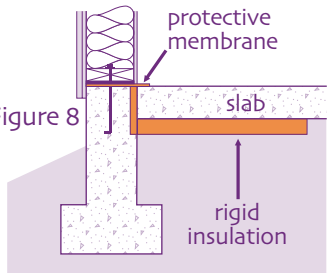


Figure 8

### Q What are the requirements for slab insulation in the IECC 2000?

The table below summarizes the prescriptive insulation requirements for residences with 15% glazing.

| Heating Degree-Days | 15% Glazing* |
|---|---|
| 0-2499 | 0 |
| 2500-4499 | R4-R5, 2 ft. |
| 4500-6999 | R6-R9, 4 ft. |
| 7000-12,999 | R13-R18, 4 ft. |

**Window area % of gross exterior wall area. Summary taken from Table 502.2.4(3), p.81; IECC 2000.*

For more information on this topic see the Energy Efficient Building Association’s Builder’s Guide (Building Science Corporation 1998. Building Science Corporation, 70 Main St., Westford, Massachusetts 01886, **www.buildingscience.com**) or the Builder’s Foundation Handbook (Oak Ridge National Laboratory 1991. Publication number ORNL/CON-295, Oak Ridge National Laboratory, Oak Ridge, Tennessee).

# Energy Codes Adoption Moved Forward in 2000

As 2000 draws to a close, there is reason to be optimistic about this year's accomplishments and the increasing acceptance of the 2000 International Energy Conservation Code (IECC) among key states and industries. On the national level, the circle of supporters for energy codes is growing. Rising energy prices and growing concern over air quality are lending support to the adoption of stronger energy codes. In the northeast, both **Pennsylvania** and **New York** are currently in the process of implementing the 2000 IECC with State Energy Program grants. **New York** has almost completed final code language referencing **MEC*check***™ as an acceptable compliance path. Neighboring **New Jersey** has made considerable progress toward adopting the 1995 Model Energy Code (MEC). The state has expressed interest in considering the 2000 I-codes and ASHRAE Standard 90.1-1999 after the 1995 MEC is adopted.

New England states continue to upgrade building energy codes. **Maine** is putting the final touches on a voluntary statewide energy code based on the 2000 IECC. Key stakeholders are advocating making the code mandatory. In **Vermont**, the Residential Building Energy Standards (RBES) Task Force completed its recommendation for an upgrade to that state's energy code, including ventilation requirements. **Massachusetts** has trained over 1800 people as part of its new commercial energy code implementation efforts.

Great strides have been made in other regions as well, especially in the Southwest as that region deals with the effects of increasing air pollution. The **Arizona** state energy office is currently developing a voluntary statewide code. In **Texas**, the North Texas Council of Governments approved a non-attainment State Implementation Plan that includes the IECC as a mandatory building energy code. Builders in both Dallas-Fort Worth and Houston are supporting energy codes as part of an agreement with their regional EPA office.

The State Builders Association expressed renewed interest in statewide adoption of the National Association of Home Builders International Residential Code (IRC). Many homes built in the Southwest already exceed minimum code requirements, and code adoption without modifications could result in lower energy efficiency.

In the Midwest, Chicago is reviewing an amended version of the 2000 IECC that could eventually apply to the entire state of **Illinois**. **Minnesota** enacted legislation establishing dual energy code paths, and Indiana began developing a state energy code based on the 2000 IRC with strengthening amendments from the 2000 IECC.

Other states, such as **Kentucky**, **Ohio**, **Indiana**, and **Mississippi,** have expressed interest in reviewing the 2000 IECC for possible implementation. And finally, the Guam Energy Office recently announced the enactment of the Guam Energy Code, an energy-efficient amendment to Guam's current building code. The new energy-efficient amendment established minimum energy-efficient requirements for the design and construction of new buildings and their systems, buildings undergoing major renovations, and new systems and equipment in existing buildings. The Department of Public Works began enforcing the new code on November 1, 2000.

For more information on building energy codes and state activities, or to receive a free subscription to the Status of State Energy Codes newsletter, the bimonthly publication of the Building Codes Assistance Project (BCAP), contact BCAP at **bcap@ase.org** or via the Internet at **www.bcap-energy.org.**

# 2001 National Workshop Set for July

The 2001 National Workshop on State Energy Building Codes is scheduled July 16-19, 2001, at the Sheraton in Burlington, Vermont. The workshop will provide states, industry, code proponents, and stakeholder groups involved in the advocacy, adoption, implementation, enforcement, and use of building energy codes with an opportunity to learn about a variety of energy codes and standards-related topics and to network with their peers from across the nation.

Workshop attendees are expected to include Builders, Chief Code Officials, and staff from State Energy Offices, State Code Offices, Building Code Commissions, Utilities, Market Transformation organizations, voluntary programs, and energy advocacy groups. The workshop is also open to others whose work is impacted by building energy codes and who might be interested in the workshop topics.

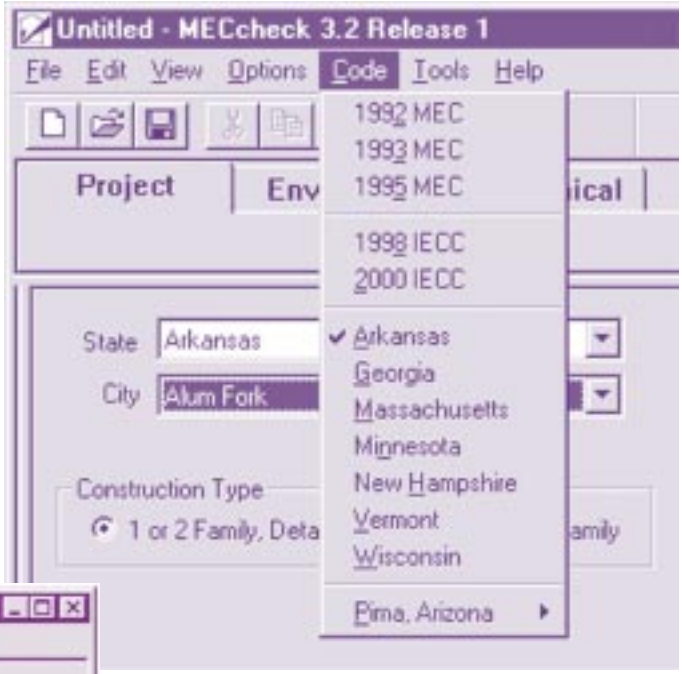
Watch for Workshop Updates at **www.eren.doe.gov/buildings/codes_standards/buildings/2001natl_workshop.html.**

Do you have questions on energy code-related subjects and their application "In the Field?" Send your questions or ideas for future discussions to:

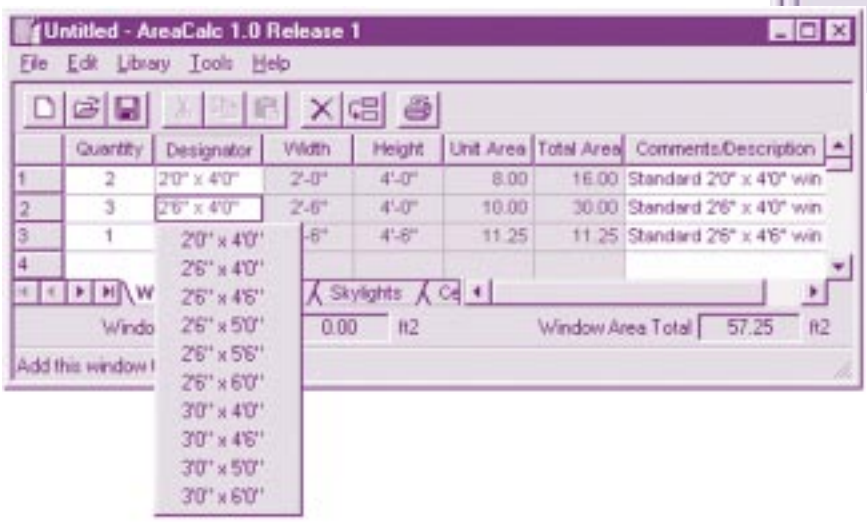
Ruth Taylor
Editor, Setting the Standard
Pacific Northwest National Laboratory
P.O. Box 999, MS K5-20 • Richland, WA 99352
Fax: 509-372-4484 • E-mail: ruth.taylor@pnl.gov

# MEC*check*™ 3.2 to Include AreaCalc Tool

Look for **MEC*check***™ 3.2 in January 2001. This new version will include several state-customized versions that can be selected from the Code menu.




**MEC*check***™ 3.2 will also include a Tools menu that will launch AreaCalc, a tool designed to simplify building area take-offs. AreaCalc provides a separate spread-sheet-like interface for each of the **MEC*check***™ building assemblies-ceilings, skylights, walls, windows, doors, floors, basement and crawlspace walls, and slab floors. It is particularly useful for summing up the total area of windows in a building. Window descriptions are maintained in a library created by the user. Including a window is as easy as selecting the window from a menu and indicating how many windows of that type are to be installed. The areas of all windows are summed, and the total is displayed.




The user can customize the input screen to display information such as window-to-wall ratio, gross/net wall area, and a variety of other totals. Skylight and door areas can be similarly computed. AreaCalc can assist in creating a window schedule, or just speed up the tedious process of summing assembly areas. The user may choose to have the AreaCalc assemblies transferred directly into **MEC*check***™, where the code compliance results for those assemblies will be displayed.

# Free **MEC*check***™ Training at NAHB 2001

Come to the National Home Builders Association (NAHB) International Builder's Show a day early and join us for free hands-on training on **MEC*check***™. Learn the major requirements of the 2000 IECC and how to determine compliance using **MEC*check***™. The training will be held at a conference hotel in Atlanta, Georgia, on February 8, 2001, from 9:00 am to 4:30 pm.

You must register to attend. Logistical information will be provided when registration is confirmed. Six AIA Learning Unit Hours can be earned by attending the training.

Register on the web at **www.eren.doe.gov/buildings/codes_standards/buildings** or via the BSGP hotline at **1-800-270-CODE (2633)**, option 2, or e-mail to **training@bsgp.pnl.gov**.

## Do you want this newsletter via e-mail?

If you would like to receive this newsletter via e-mail, please send a message to **STS@BSGP.PNL.GOV** with "subscribe STS" in the subject line.

**Software Tip:**
In **COM*check-EZ***™, if you want to consider building orientation in your analysis, you can use the "options" button at the top of the screen to reveal the orientation column on the envelope input screen. This will allow you to assign walls and associated windows and doors to a specific orientation.

# Calendar

**January 2001**

**26** ASHRAE Winter Meeting, Code Interaction Subcommittee – Atlanta, GA

**27-30** ASHRAE Winter Meeting, Standard 90.1, Commercial and MF High-Rise – Atlanta, GA

**30-31** ASHRAE Winter Meeting, Standard 90.2, Residential Low-Rise – Atlanta, GA
See **www.ashrae.org**

**February 2001**

**9-12** National Association of Home Builders (NAHB) International Builders Show
Georgia World Congress Center – Atlanta, GA
See **www.buildersshow.com**

**March 2001**

**18-20** 3rd Annual National Green Building Conference, The Westin Seattle – Seattle, WA
See **www.nahbrc.org** or call: **888-602-HOME (4663)**

**19-30** International Code Council Code Hearings, Doubletree Hotel – Portland, OR
See **www.intlcode.org/calendar/portland.html**

**22-24** Building Energy 2001 Conference, Tufts University, Somerville, MA
See **www.nesea.org/buildings/be2000.html**

**April 2001**

**19-20** NCSBCS, Bringing Information Technology to the Building Regulatory Process – Gaithersburg, MD
See **www.ncsbcs.org**

**May 2001**

**17-19** American Institute of Architects (AIA) National Convention, Colorado Convention Center – Denver, CO
See **www.aiaconvention2001.com**

**July 2001**

**16-19** 2000 National Workshop on State Building Energy Codes, sponsored by the U.S. Department of Energy – Burlington, VT
See **www.eren.doe.gov/buildings/codes_standards/buildings/2001ntl_workshop.html**

*Setting the Standard* is published three times a year by the Building Standards and Guidelines Program of the U.S. Department of Energy Office of Building Technology, State and Community Programs 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. Send comments and contributions to Ruth Taylor at Pacific Northwest National Laboratory (ruth.taylor@pnl.gov).

Editor: Ruth Taylor Hotline: **(800) 270-CODE (2633)** Internet: **http://www.eren.doe.gov/buildings/codes_standards/buildings**

December 2000 DOE/GO-10099-702

Printed with a renewable-source ink on paper containing at least 50% wastepaper, including 20% postconsumer waste.

Address Corrections:
K.R. Taylor
Pacific Northwest National Laboratory
PO Box 999-MSIN K5-20
Richland, Washington 99352

Address Correction Requested