DOE Challenge Home Webinars
April 18, 2014

Building America Solution Center:
Meet Your New Best Friend

PNNL Team
Market Transformation Process

Research & Development

DOE Emerging Techs.
Funds basic research to develop new technologies

DOE Building America
Develops New Innovations and Best Practices Ready for Market

Market Stimulation

DOE Challenge Home
Recognizes Leading Builders Applying Proven Innovations

EPA ENERGY STAR
Recognizes Builders with Significantly Above Code Performance

Codes and Standards

IECC Code
Mandates technologies and practices proven reliable and cost-effective

Building America Solution Center
Serve the market transformation process by disseminating Building America content most critical for customers to apply proven innovations.
BASC Customer Focus

How to Specify

Architects/Engineers

Educators

Solution Center

 Builders/Remodelers

Labeling Programs

 How to Install Properly

HERS Raters

Code Officials

How to Prove Performance

How to Educate

How to Install Properly

How to Specify
What BASC ‘Is’ & ‘Is Not’

Is:

Content for Applying Proven Innovations:
• How to Specify
• How to Install Properly
• How to Prove Performance
• How to Educate

Is Not:
• Design Tool for Customized Energy Packages
BASC Content Innovation

**Key:**
- Pre-BASC
- BASC

- **Speed**
- **Up-To-Date**
- **Ease-of-Use**
- **Accessibility**
- **Customization**
BASC...this is just the beginning
Thank You

For More Information:

http://basc.energy.gov

Also Accessible via Building America Web Site:

http://www.buildingamerica.gov
DOE Challenge Home - Tech Training Webinars:
Resources for Verifying, Constructing, and Marketing Zero Energy Homes

Building America
Solution Center

Michael Baechler
Chrissi Antonopoulous
Pacific Northwest National Laboratory
World-Class Expert Guidance...

Building America Solution Center
BASC.energy.gov

...At Your Fingertips
The Building America Solution Center provides access to expert information on hundreds of high-performance construction topics, including air sealing and insulation, HVAC components, windows, indoor air quality, and much more. Click on the links below to explore the Solution Center.

As a community driven tool, we welcome your comments on how to continuously improve the Solution Center. If you are interested in submitting content, please become a registered user and see the criteria for submissions.

THANK YOU! Justin Mackowyak, ICF International, for your recent image contributions to the Solution Center.
Find What You Need

Building America Solution Center

Help

The U.S. Department of Energy’s Building America program strives to reduce energy use and peak energy loads in existing and new homes. Building America’s whole building systems approach also seeks to improve quality, comfort, safety, durability, and a healthy living environment.

The Building America Solution Center was designed to offer fast, online access to expert guidance on hundreds of high-performance construction topics and give users the tools to customize field kits to take the information you need to the job site.

What You Will Find

Within the Solution Center, building science measures are described in guides. Each guide provides an overview of a specific measure, including a scope of work, full description and tips for installation, climate considerations, training images, presentations and videos, code and program compliance, plus other external information related to the topic. Guides contain a variety of resources such as images, CAD files, case studies and references. With a few exceptions, each guide is organized into 8 tabs. The Solution Center is a new tool and not all information is fully populated. As new research is completed and users provide additional content, Solution Center guides are continuously updated.

What You Will Find

Guides

CAD Files

Case Studies

Images

References

Find What You Need

Focus with Search 

Register to Customize Your Solution Center Content

Join the Dialogue
Guides

- Guides: core organization of information in the Solution Center.
- Includes 8 tabs of specific information.
- How to install, how to specify, how to prove performance.

## Attic Knee Walls

### Scope

**Fully Aligned Air Barrier**

A. Install a top and bottom plate or blocking at the top and bottom of all knee wall cavities.

B. Back attic knee walls with a rigid air barrier or other supporting material to prevent insulation from sagging and create a continuous thermal barrier.

C. Seal all seams, gaps, and holes of the air barrier with caulk or foam.

D. Install insulation without misalignments, compressions, gaps, or voids in all knee wall cavities.

* ENERGY STAR recommends using a rigid air barrier, but it is not a requirement.
Solution Center Homepage

Building America Solution Center

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Register and Log In To:

- Provide feedback and content
- Customize content to your climate
- Build and track your Field Kits
- Save content that can be accessed in the field through Android and IOS mobile applications
- Help DOE understand how the tool is used
Create User Account or Log In

User account

Username Or E-mail Address *
You may login with either your assigned username or your e-mail address.

Password *
The password field is case sensitive.

Log in

User information

Username *
Spaces are allowed; punctuation is not allowed except for periods, hyphens, apostrophes, and underscores.

E-mail Address *
A valid e-mail address. All e-mails from the system will be sent to this address. The e-mail address is not made public.

Work Experience

Profession *
- Select a value -

Construction Type *
New and Existing Homes
New Homes
Existing Homes

Location

State *
Alabama
Alaska
Arizona
Arkansas

Climate Zone *
All Climate Zones
Zone 1
Zone 2
Zone 3

Create new account

Log in
Request new password
Log In to Provide Feedback

Attic Knee Walls
Please Register or Login to Provide Feedback.

Scope
Fully Aligned Air Barrier
A. Install a top and bottom plate or blocking at the top and bottom of all knee wall cavities.

Feedback on this Guide
Guide Title

Do you have suggestions to improve this guide?

Did this page resolve your question or help you learn?
- Yes
- Maybe
- No (please explain below)

Other Comments

Submit
Heavy Membranes at Eaves in Cold Climates

This measure may not be appropriate for your climate. Please see the climate tab for more information.

**Feedback**

**Scope**

**Water Managed Roof Assembly**

In 2009 IECC Climate Zones 5 and higher, self-sealing bituminous membrane or equivalent over sheathing at eaves from the edge of the roof line to > 2 feet up roof deck from the interior plane of the exterior wall.
Log In to Customize Field Kits

Building America Solution Center

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Field Kits

Building America Solution Center

San Francisco Challenge Home Project #1

Guides
- Cantilevered Floor
- Step and Kick-Out Flashing at Roof-Wall Intersections
- Double Walls
- Heavy Membranes at Valley and Roof Deck Penetrations
- Bathroom Fan Ratings
Fully Aligned Air Barrier

A. Install a rigid air barrier or other supporting blocking to separate the cantilever from the conditioned space.
B. Seal all seams, gaps, and holes of the air barrier with caulk or foam.
C. Install insulation without misalignments, compressions, gaps, or voids and align it with the sub-floor, the rigid air barrier (A), and the exterior face of the cavity.
D. Once insulated, enclose the cavity with a rigid air barrier material.

* ENERGY STAR highly recommends using a rigid air barrier, but it is not a requirement.

ENERGY STAR Notes:

An air barrier is defined as any durable solid material that blocks air flow between conditioned space and unconditioned space, including necessary sealing to block excessive air flow at edges and seams and adequate support to resist positive and negative pressures without displacement or damage. ENERGY STAR recommends, but does not require, rigid air barriers. Open-cell or closed-cell foam shall have a finished thickness >= 5.5 inches or 1.5 inches, respectively, to qualify as an air barrier unless the manufacturer indicates otherwise. If flexible air barriers such as house wrap are used, they shall be fully sealed at all seams and edges and supported using fasteners with caps or heads >= 1 inch in diameter unless otherwise indicated by the manufacturer. Flexible air barriers shall not be made of Kraft paper.
Insert Replacement Window

Please Register or Login to Provide Feedback.

Scope

As summarized within the Ensuring Success tab, before beginning this work, inspect the interior and exterior of the building, including each window, to identify impacts and potential risks with completing the work. Diagnose water and air infiltration pathways, and choose strategies most appropriate to address each leak.

Remove the existing window sash.

Remove the existing sash-weight and balance system and air seal and insulate the cavity. Windows must be custom ordered to size; however, they do not require as tight an installation tolerance as the replacement sash option.

Insulate and seal all voids and cracks between the replacement window assembly and the original window jambs, sill, and head.

Install the window insert according to manufacturer’s instructions.

Last Updated: 10/02/2013

PDF and Print are now available for all Guides
Building Components

- Topics by Building Component are displayed as images representing eight building-related component areas.
- Each component is further organized into Component Subcategories (e.g., air sealing, insulation, etc.)
Slab Edge Insulation

Please Register or Login to Provide Feedback.

Scope

Reduced Thermal Bridging

For slabs on grade in Climate Zone 4 and higher, 100% of the slab edge is insulated to ≥ R-5 at the depth specified by the 2009 IECC and aligned with thermal boundary of the walls.

A. Install slab edge insulation to extend to the top of the slab so it provides a complete thermal break.

Notes:

Consistent with the 2009 IECC, slab edge insulation is only required for slab-on-grade floors with a floor surface less than 12 inches below grade. Slab insulation shall extend to the top of the slab to provide a complete thermal break. If the top edge of the insulation is installed between the exterior wall and the edge of the interior slab, it shall be permitted to be cut at a 45-degree angle away from the exterior wall.
Program Checklists

• Building America Solution Center currently allows exploration of content specific to ENERGY STAR Version 3 checklists.

• DOE’s Zero Energy Ready Home checklist (formerly Challenge Home) is currently under development and will be available on May 9, 2014.

• The initial rollout of the Zero Energy Ready Home checklist will include a subset of checklist content, and will constantly be updated until the checklist is fully populated.

• Topics are displayed in the same order as they appear on the ENERGY STAR or Zero Energy Ready Home checklists.

• Users can drill down into the checklist to display Guides associated with each requirement.
ENERGY STAR Qualified Homes, Version 3 (Rev. 06)

Checklist Manager provides links to technical guides that align with each measure included in the checklists for ENERGY STAR Qualified Homes, Version 3 (Rev. 6). The numbers and titles included in the Checklist Manager follow the same order as the four ENERGY STAR Inspection Checklists for National Program Requirements. To view programmatic footnotes, see the original program checklists. Portions of the programmatic footnotes have been added to the Scope tabs in the guides. For additional ENERGY STAR program requirements and information, visit the ENERGY STAR Website.

ENERGY STAR Windows

Please Register or Login to Provide Feedback.

Scope

ENERGY STAR Windows

Prescriptive Path: Fenestration shall meet or exceed ENERGY STAR requirements

A. Select windows, doors, and skylights to meet ENERGY STAR program requirements for windows, doors, and skylights.
B. Note that the U-value and the Solar Heat Gain Coefficient (SHGC) for doors apply to the whole door, not just the glazing portion.
Zero Energy Ready Home Checklist

Building America Solution Center

Zero Energy Ready Home

Checklist Manager provides links to technical guides that align with each measure included in the checklists for DOE’s Zero Energy Ready Home. The numbers and titles included in the Checklists Manager follow the same order and have the same names as those in the Zero Energy Ready National Program Requirements. To view programmatic footnotes, see the current program requirements. Portions of programmatic footnotes have been added to the Scope tabs in the guides. Visit the DOE Zero Energy Ready Home program website to learn more about training and marketing tools, to find a builder, or to become a partner. The Building America Solution Center is an ever-expanding and improving technical resource for builders and installers. Not all measures may be populated at this time.

Checklist measures with black type are not currently populated and do not link to content. Visit often to see the latest guides, resources, and additional content.

- Exhibit 1: Mandatory Requirements for All Labeled Homes
- Exhibit 2: Target Home
- Exhibit 3: Benchmark Home Size
Zero Energy Ready Home Checklist

Building America Solution Center

Zero Energy Ready Home

Checklist Manager provides links to technical guides that align with each measure included in the checklists for DOE’s Zero Energy Ready Home. The numbers and titles included in the Checklist Manager follow the same order and have the same names as those in the Zero Energy Ready National Program Requirements. To view programmatic footnotes, see the current program requirements. Portions of programmatic footnotes have been added to the Scope tabs in the guides. Visit the DOE Zero Energy Ready Home program website to learn more about training and marketing tools, to find a builder, or to become a partner. The Building America Solution Center is an ever-expanding and improving technical resource for builders and installers.

Checklist measures with black type are not currently populated. Latest guides, resources, and additional content.

Refrigerators

Zero Energy Ready Home (Rev. 03, Exhibit 1) Item 5 requires that

- All installed refrigerators ... are ENERGY STAR qualified.

See the latest ENERGY STAR specifications.

Search the Database of State Incentives for Renewables & Efficiency (DSIRE) for possible state, local, and federal tax incentives and rebates for energy-efficient refrigerators.

Always look for the ENERGY STAR label on a refrigerator.
Building Science Publications visualizes the entire Building America library and BASC references. It allows a user to explore the classification of content, and to drill down to specific Publications.
Building Science Publications: CATEGORY BLOCKS

- Search by categories
Click an image to enlarge in a sliding window.

A moisture meter verifies that the moisture of the framing is below the recommended 18%.
Browser: Image Gallery

- Images can be displayed full size. Use save icon to save to file.
- Select the Field Kit icon to add or remove from your Field Kit
- Use the “Information” icon to locate the source of the image
Browser: CAD Files

- Click the CAD file image to load in a slider window
- CAD files can also be saved in PDF or DWG file formats
View the Solution Center from a Mobile Device

- View the Solution Center from any mobile device with internet or cellular data plan.
- Log in to save images, CAD files and guides to Field Kits.

http://basc.energy.gov
Mobile Access to Field Kits using Solutions

- Access saved Field Kits remotely without an internet connection
Mobile Access to Field Kits using Solutions

- Tap media thumbnails to enlarge images or CAD files
- View media and Guides in portrait or landscape
Mobile Access to Field Kits using Solutions

Case Studies
1. Technology Solutions Case Study: Preventing Thermal Bypass
2. New Whole-House Solutions Case Study: Pine Mountain Builders, Pine Mountain, Georgia

References and Resources
1. ENERGY STAR Qualified Homes, Version 3 (Rev. 07) Inspection Checklist for National Program Requirements
2. Thermal Enclosure System Rater Checklist Guidebook
3. DOE Challenge Home National Program Requirements
4. Guide to Insulated Sheathing
5. Fastening Furring Strips to a Foam-Sheathed Wall
6. Rigid Insulating Sheathing Assumed Order of Work
7. Water Management of Noninsulating and Insulating Sheathings
8. Insulated Siding as Home Insulation: Guide for Users and Energy Raters
9. How to Install Western Red Cedar Siding
10. Tennessee Valley Authority’s Campbell Creek Energy Efficient Homes Project: 2010 First Year Performance Report

- Flip through all tabs of saved Guides
Mobile Apps

• The Android “Solutions” app is now available.
• The iOS “Solutions” app will soon be available.
• Creating user accounts and saving Field Kits, Images and CAD files allows users to access their saved content without an internet or cellular connection.
• The Android version of Solutions is currently available on the Solution Center website: basc.pnnl.gov/solutions
Building America Solution Center Wrap-Up
• At its core, the Solution Center is web-accessible, structured data base of Building America best practices.
• The user interface consists of a number of tools to find focused content and to support partnering programs.
• Registered users gain access to more customized and mobile information.
• Initial content has been based on legacy information.
• The first priority was developing tools and content to support ENERGY STAR Version 3.
• New content is flowing from Building America for the Zero Energy Ready Home and existing homes.
• The Solution Center is a living database that is continuously populated and updated.
Major Upgrades to Customization and Accessibility

• The Solution Center now supports creation and management of multiple Field Kits.
• PDF and Print functionality is available for all guides.
• The Solution Center can now be viewed through any mobile device with internet access.
• “Solutions” app for Android is now available.
• iOS app will be rolled out May 9th.
• Both apps allow synchronization and access to saved Field Kits with or without cell or Wi-Fi coverage.
Other Major Upgrades

- Building Science Publications now provides access to the entire Building America library and all BASC references.
- DOE’s Zero Energy Ready Home Checklist will be rolled out May 9th.
- We plan to launch an existing home checklist in fall.
- New Help page and acknowledgements.
Three Updated Mechanisms for Comments from Registered Users

- Submit specific comments on each guide using the “FEEDBACK” links within the guides.
- Links for general comments and content submission guidelines are available on the Homepage.
- Email comments to:

  basc@pnnl.gov
Access the Building America Solution Center at:

https://basc.energy.gov

Also accessible through the Building America Website at:

http://www.buildingamerica.gov
World-Class Expert Guidance...

Building America Solution Center
BASC.energy.gov

...At Your Fingertips
The Home of the Future….Today
DOE Challenge Home Resources

Website
- www.buildings.energy.gov/challenge/
- Events:
  - Upcoming in-person ZERH Training
  - Technical Training webinars
  - Conference Presentations
- Partner Locator
- Program Specifications
- Webinar Recordings (coming soon)

Building America Solution Center
- http://basc.pnnl.gov/
Thank You

For More Information:
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