

Webinar questions should be directed to:

basc@pnnl.gov

Building America Solution Center

October 11, 2012

U.S. DEPARTMENT OF
ENERGY

Energy Efficiency &
Renewable Energy



**Building Science Solutions –
Faster and Better**

**Sam Rashkin
Michael Baechler
Linda Connell**

Building America Solution Center Overview

World Class Research...

U.S. DEPARTMENT OF
ENERGY

Energy Efficiency &
Renewable Energy

... at Your Finger Tips



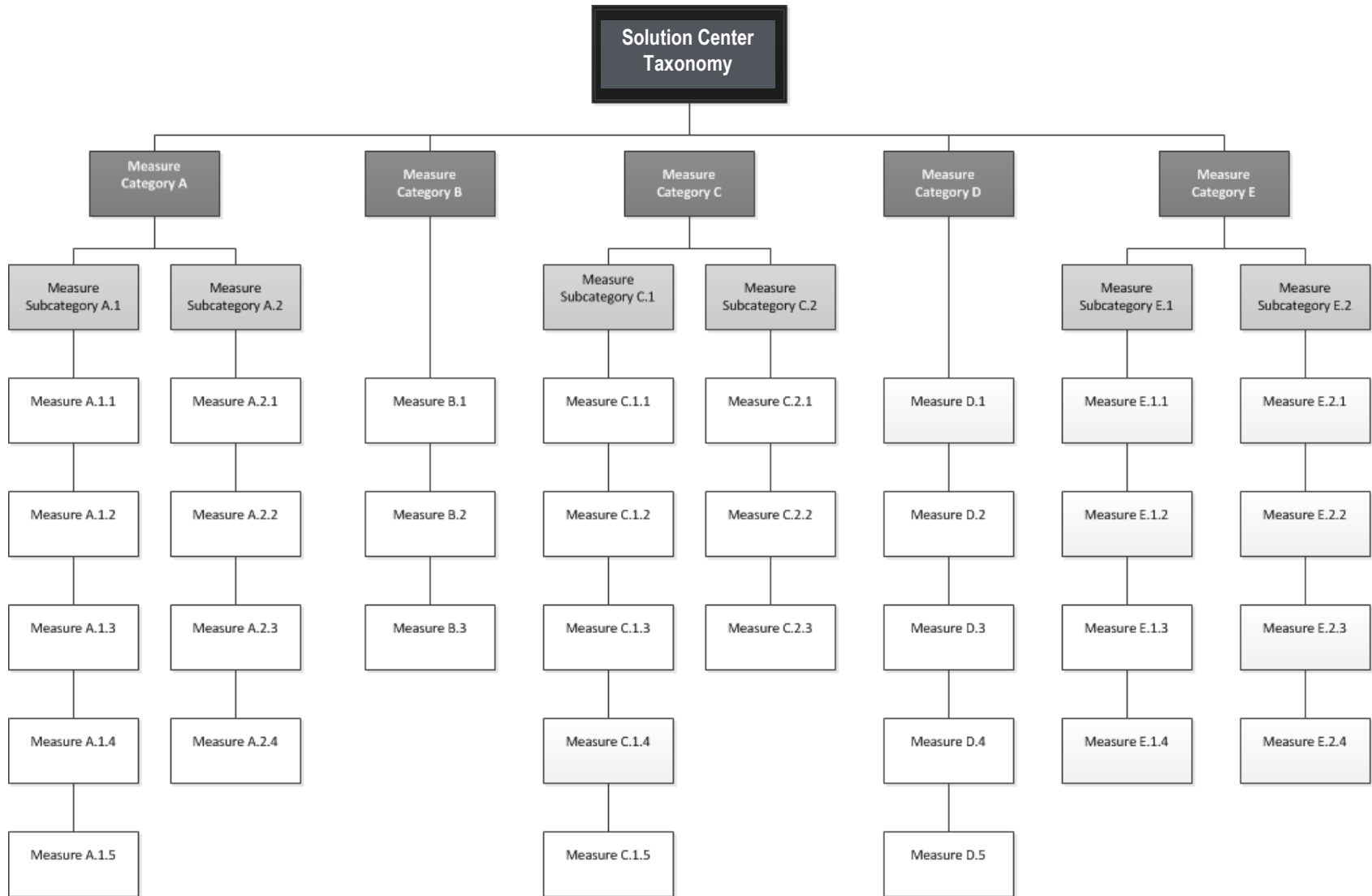
Is:

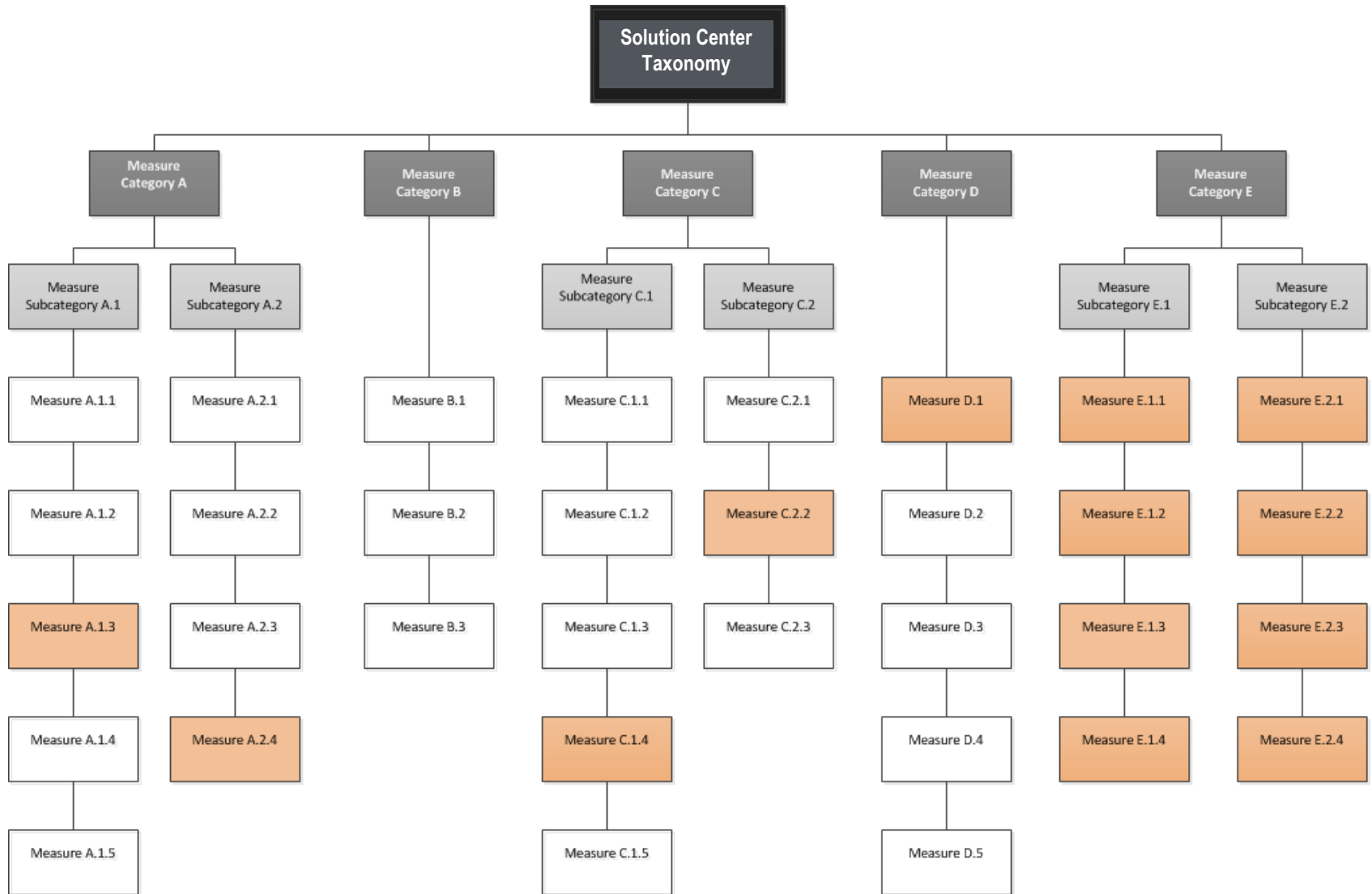
Easy Access to World-Class Research:

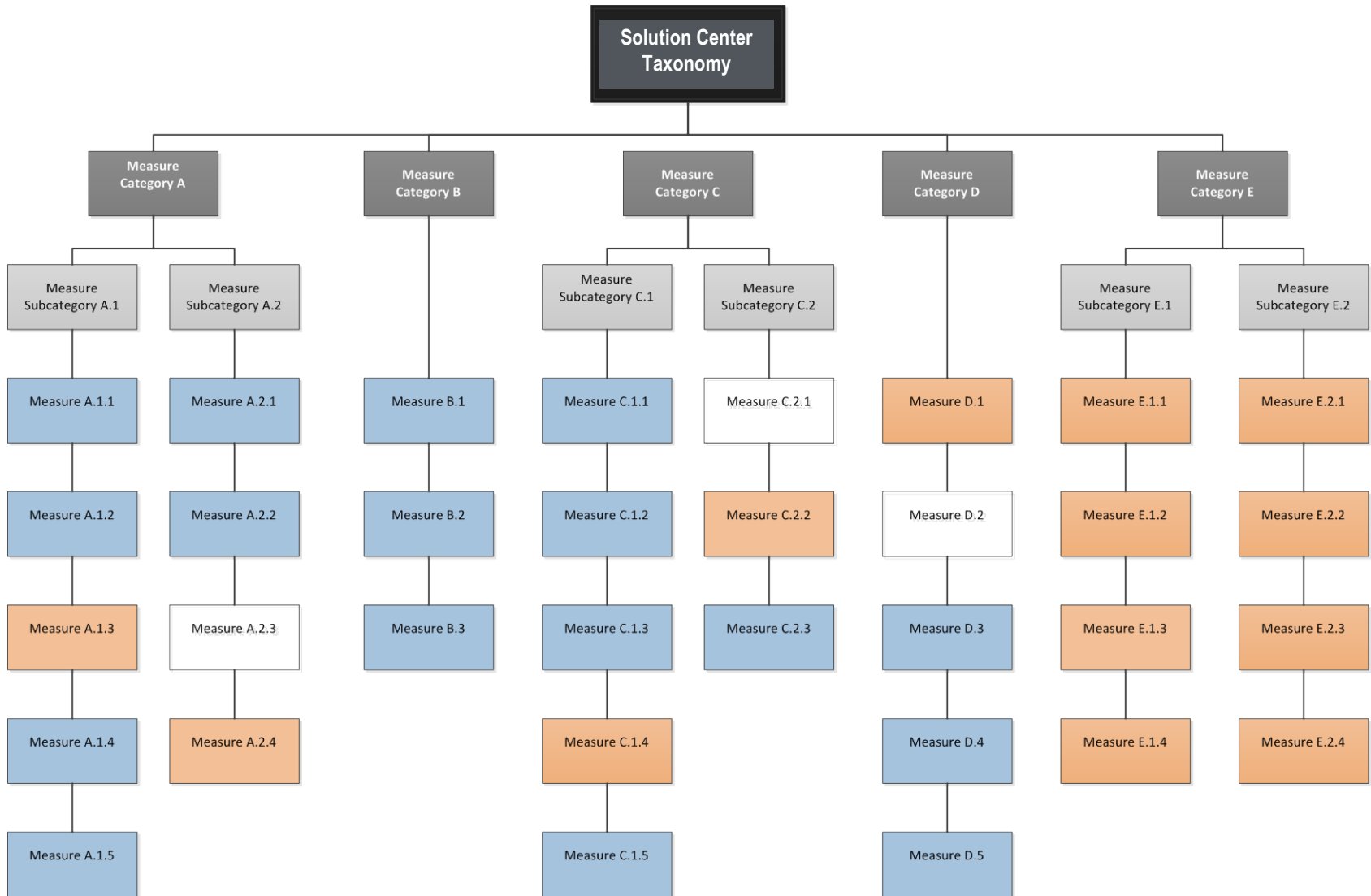
- Guidance for Applying Targeted Energy Measures
- Tool for Users to Prepare Customized Project Content
- Source for Proven Performance
- Link to Full References

Is Not:

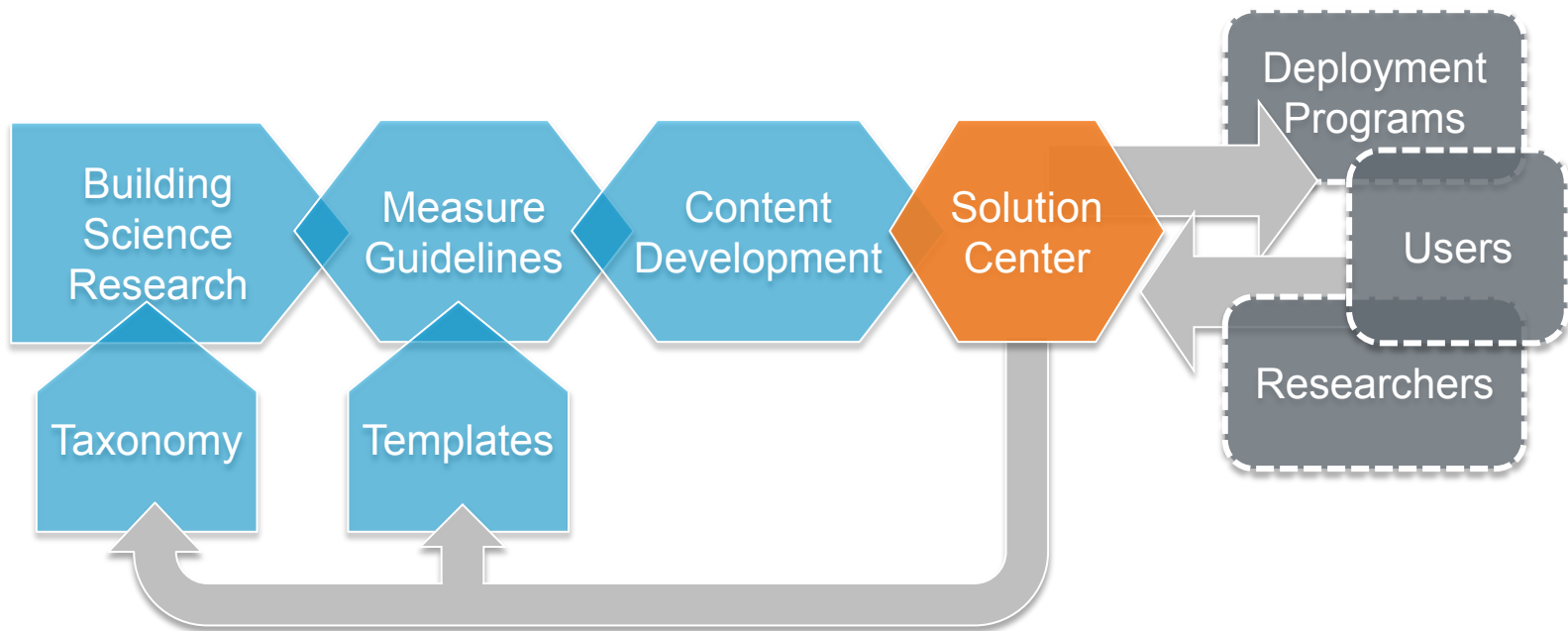
- Design Tool for Customized Energy Packages







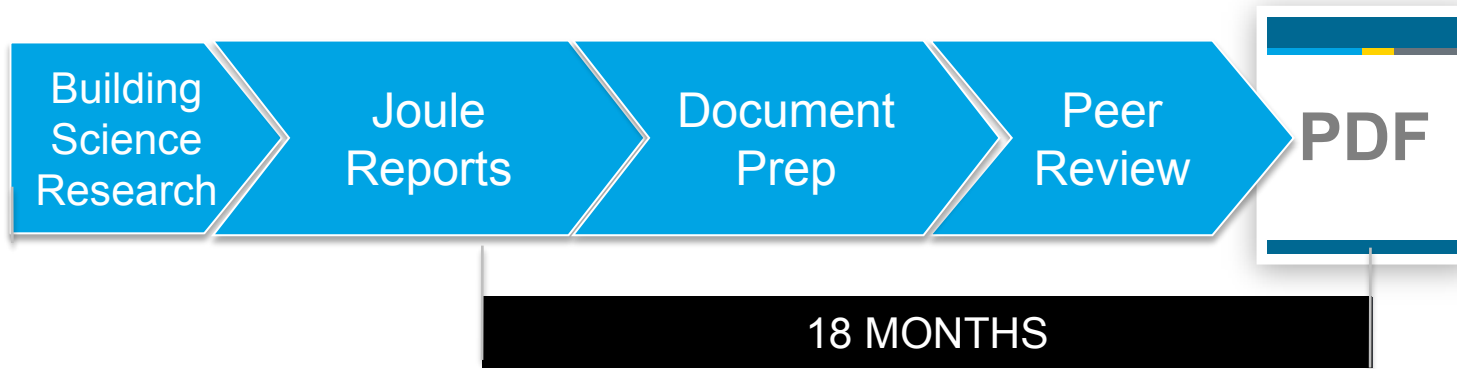
Content Development Process



Future Audience Engagement Becomes *Community Driven*



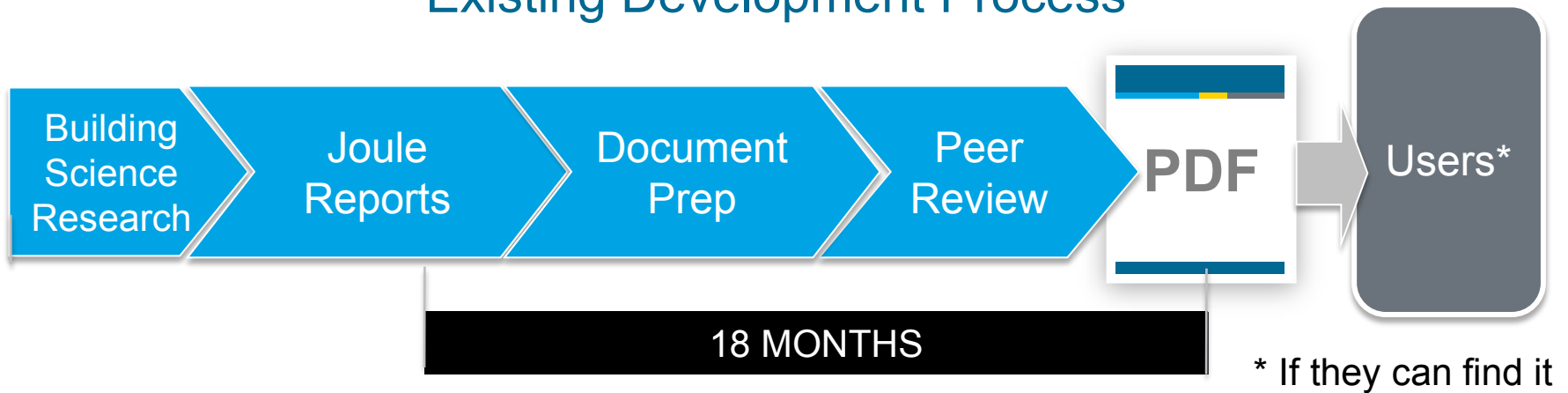
Existing Development Process



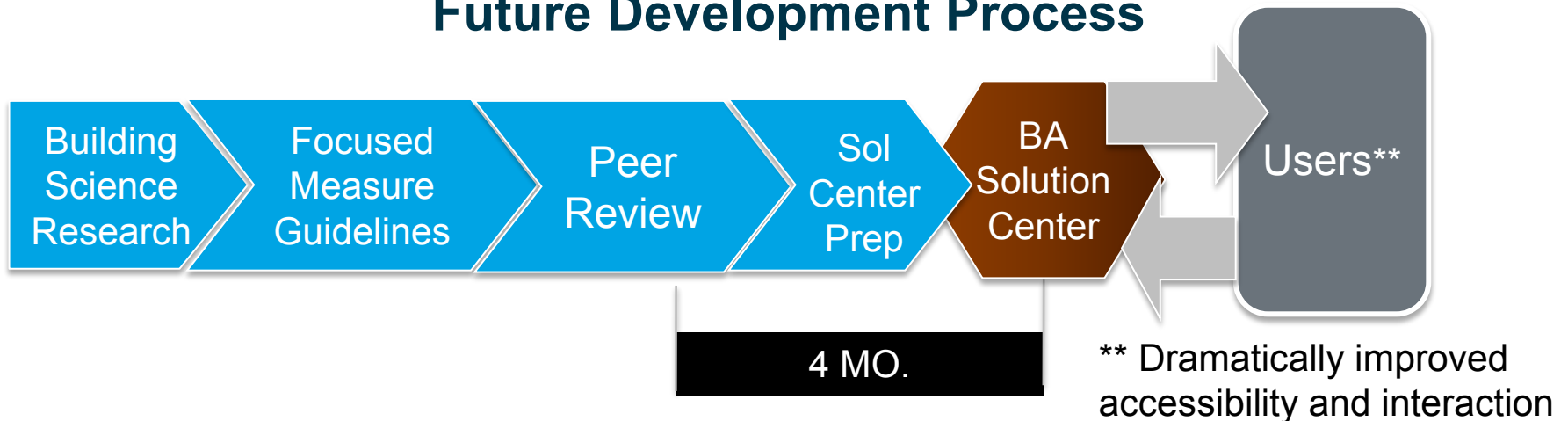
Future Development Process



Existing Development Process




Future Development Process



“Fully Aligned Attic Barriers ...In section A it says “...*include barrier at interior edge of attic eave in all climate zones using a wind baffle that extends to the full height of the insulation*”. Either I'm not understanding the direction or there is a type-o. Shouldn't it say “*exterior edge*”?...

...Again, I don't mean to be overly critical. I think this site is awesome. As time goes on, we will almost certainly be using this site as a training tool, particularly for people newer to the industry.”




MOBILE FIELD KIT

The Building America Field Kit allows you to save items to your profile for review or use on-site.

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or

[Log In](#)

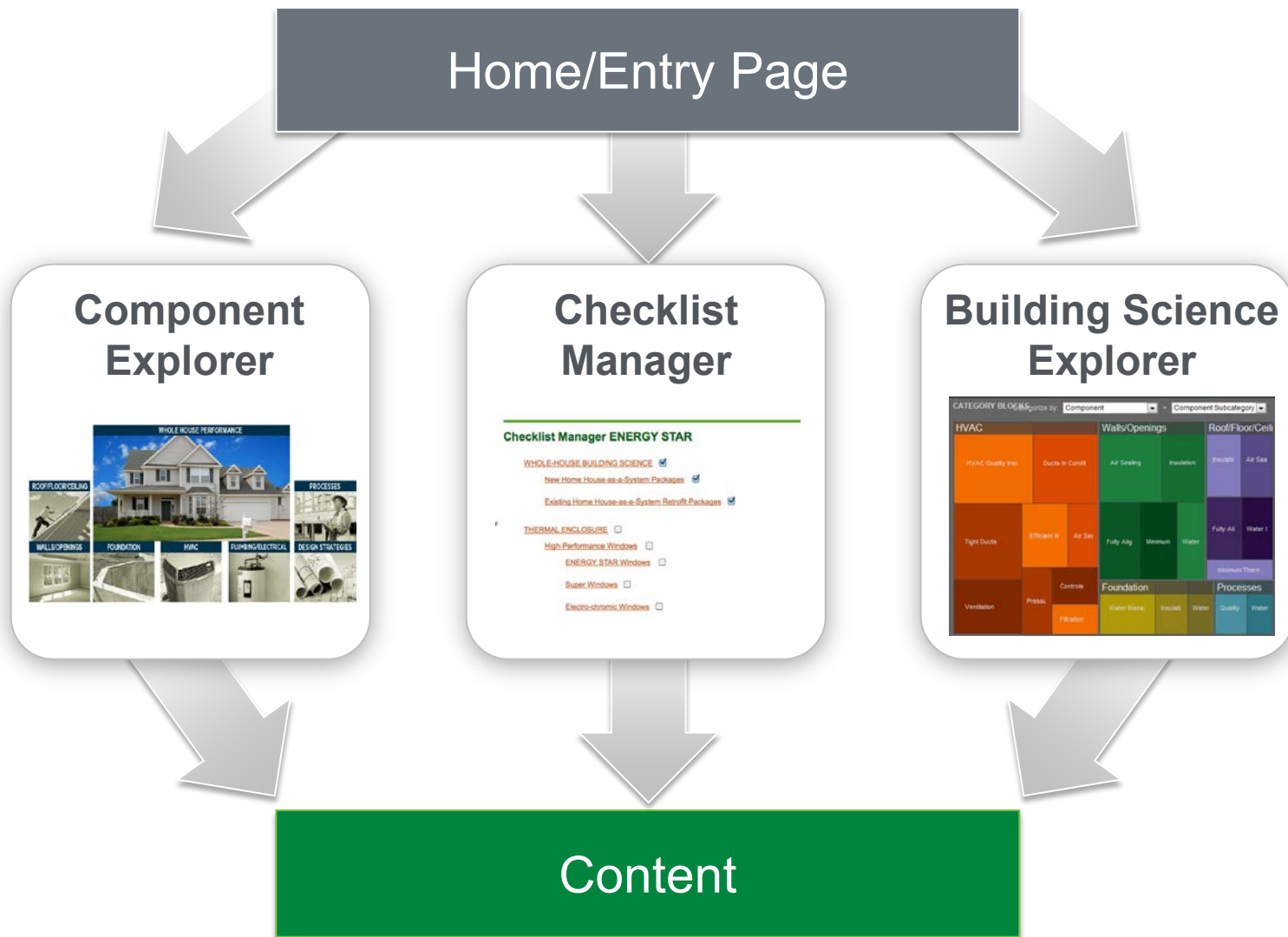


DEMO'S FIELD KIT

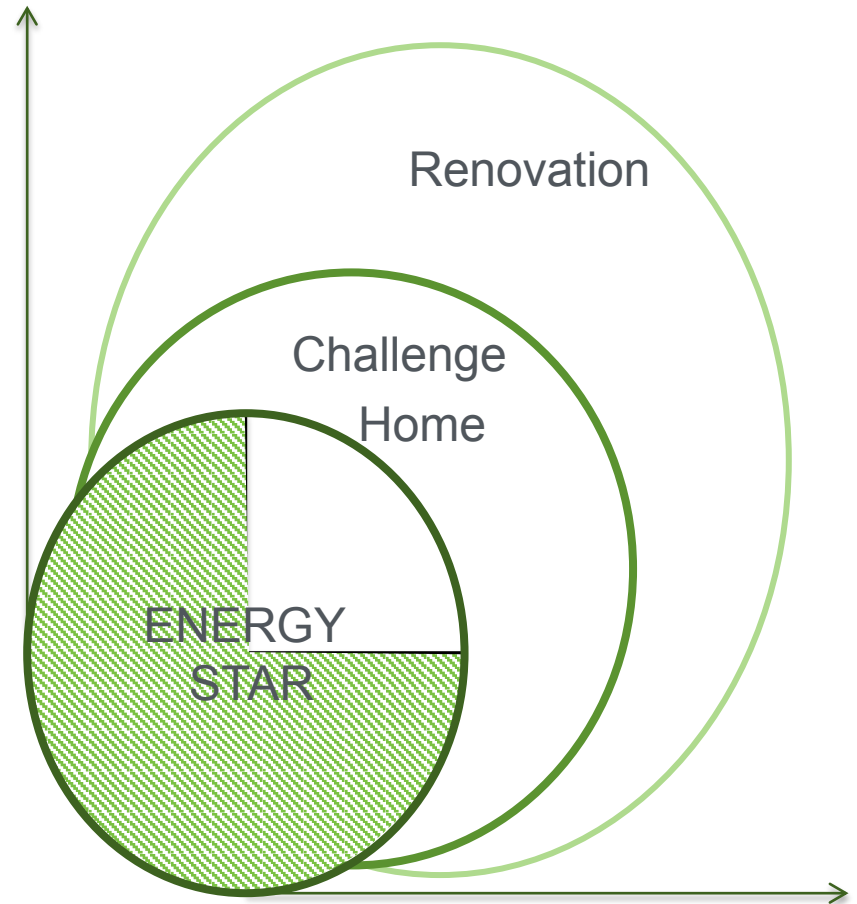
The Building America Field Kit allows you to save items to your profile for review or use on-site.

You have 3 items in your Field Kit.

[View Field Kit](#)



- Support ENERGY STAR Version 3.
- Initial content based on existing Building America and ENERGY STAR resources.
- Future Development
 - DOE Challenge Home
 - Existing home renovation



Building America Solution Center Tour

Solution Center Tour

Customization

Building America Solution Center

Search

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EERE » BTP » Building America » Solutions Center »

Bread Crumbs

- Solutions Center Home
- Component Explorer
- Checklist Manager
- Building Science Explorer
- Browser
 - Guides
 - Case Studies
 - Image Gallery
 - CAD Files
- References

Component

Checklist

Building Science

Browser

Recent Content

...At Your Fingertips

The U.S. Department of Energy's Building America program strives to develop integrated energy systems that dramatically reduce annual energy use and peak energy loads in existing and new homes while also improving overall building quality, comfort, safety, and durability.

RECENTLY ADDED RESOURCE GUIDES

- [Sealed Duct Boots - PVC Ducts](#)
Posted: August 09, 2012
- [Sealed Duct Boots - Fiber Board Ducts](#)
Posted: August 09, 2012
- [Sealed Duct Boots - Metal Ducts](#)
Posted: August 09, 2012
- [More Resource Guides ▶](#)

RECENTLY ADDED REFERENCES

- [2012 IRC—International Residential Code for One and Two Family Dwellings](#)
Posted: September 12, 2012
- [2009 IRC—International Residential Code for One and Two Family Dwellings](#)
Posted: September 12, 2012
- [Energy Renovations: Volume 17: Insulation - A Guide for Contractors to Share with Homeowners](#)
Posted: July 12, 2012
- [More References ▶](#)



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SEARCH

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or

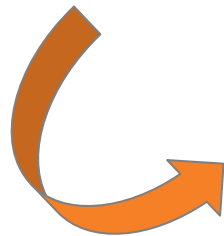
Log In





DEMO'S FIELD KIT

The Building America Field Kit allows you to save items to your profile for review or use on-site.



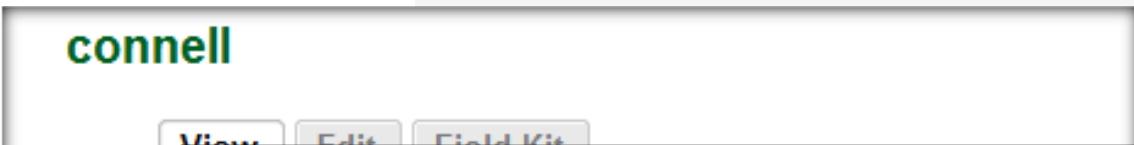
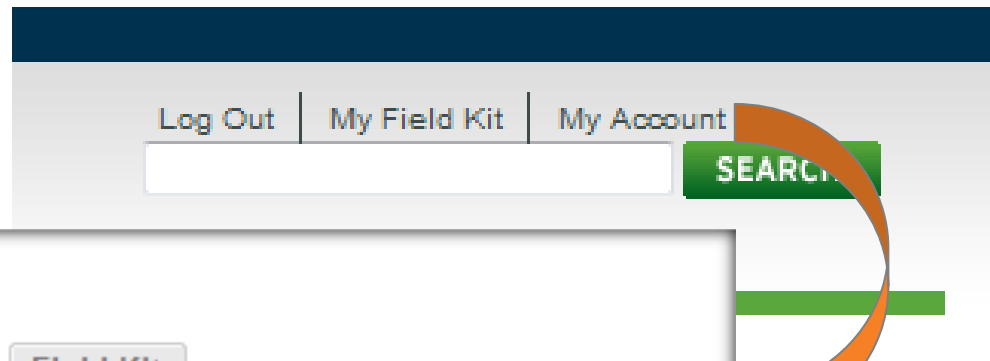
demo's Field Kit

[View](#) [Edit](#) [Field Kit](#)

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Type	Title
CAD File	Air barrier at garage band joist - 1 inch rigid insulation with 1x3 wood furring
CAD File	2 foot plan layout with wall elevation
CAD File	2-stud corner with 1x4 backer
Image	Air barrier is present between the dropped ceiling/soffit and the attic
Image	Neatly cut holes have been properly sealed with caulk and foam
Resource Guide	Walls Behind Fireplaces
Resource Guide	Garage Rim/Band Joist Adjoining Conditioned Space
Resource Guide	Cantilevered Floor
Resource Guide	Jump Ducts
Resource Guide	Step and Kick-Out Flashing at Roof-Wall Intersections

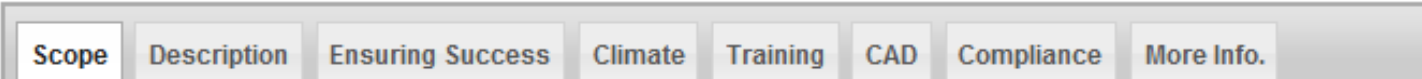
- Look for the Field Kit icon to add content
- **COMING:** Mobile access to your Field Kit.



Heavy Membranes at Eaves in Cold Climates

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

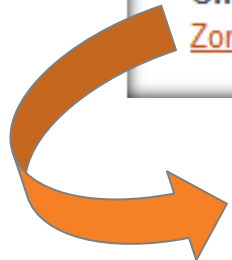
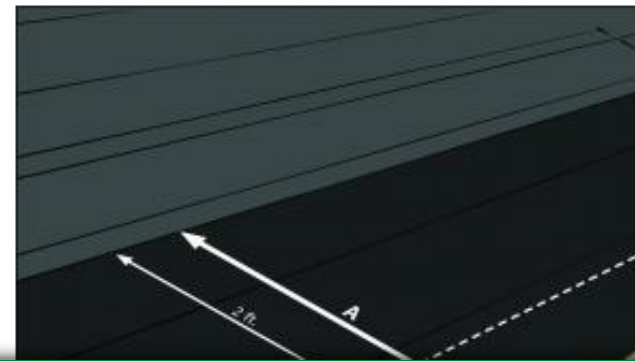
[Feedback](#)



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.



Attic Knee Walls

Please [Register](#) or [Login](#) to Provide Feedback.

Scope Description Ensuring Success Climate

Scope

Fully Aligned Air Barrier

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

Attic Knee Walls

[Feedback](#)

Scope Description Er

Scope

Fully Aligned Air Barrier

A. Install a top and bottom plate or blocking

Feedback

Measure or page name

Do you have suggestions to improve this measure content?

Did this page resolve your question or help you learn?

- Yes
 Maybe
 No (please explain below)

Other Comments

Submit

- Build and track your Field Kit
- Customize content to your climate
- Track your searches
- Provide comments and content
- Help DOE understand how the tool is used

Login | Register

air barrier

Solution Center Search | Search Help

- Search is based on keywords, titles, components and component subcategories
- Search Help provides techniques for advanced searches

Search

Enter your keywords

Search results

1. **Sealing Air Barrier Penetrations**

Lstiburek, J. 2009. Sealing **Air Barrier** Penetrations. Information Sheet 405. Prepared by the Building Science ... Building America Program. Link: Sealing **Air Barrier** Penetrations Authors: Lstiburek ...

chrissi - 2012-07-30 12:50

2. **Fluid-Applied Air and Vapor Barrier**

Air Barrier Association of America (ABAA). 2012. Fluid-Applied **Air** and Vapor **Barrier** . ABAA 07262. **Air Barrier** Association of America, ...

chrissi - 2012-07-31 09:18

3. **Closed Cell, Medium-Density Spray Polyurethane Foam Air Barrier**

Air Barrier Association of America (ABAA). 2011. Closed Cell, Medium-Density Spray Polyurethane Foam **Air Barrier** . ABAA 07263. **Air Barrier** Association of America, Walpole, MA. ...

Search results include Guides, Images, Case Studies, References, and anything else associated with a Guide

Navigation Terminology: Taxonomy

- The Solution Center is organized around a single, hierarchical taxonomy.
- All content is associated with at least one taxonomy term, but can be associated with many terms.
- All Guides fall into a parent (highest level) taxonomy category.
- When a Guide is loaded, an icon is used to identify this parent.



Thermal Enclosure



HVAC



Water Management

Attic Knee Walls

Please [Register](#) or [Login](#) to Provide Feedback.

**Taxonomy:
Thermal
Enclosures**



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Scope Description Ensuring Success Climate Training CAD Com

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.



The screenshot shows the 'Building America Solution Center' website. At the top, the breadcrumb trail reads: [EERE](#) » [BTP](#) » [Building America](#) » [Solution Center](#) » [Resource Guides](#) » [Fully Aligned Air Barriers](#) » [Floor Above Garage](#). Below the breadcrumbs is a sidebar menu with items like 'Solutions Center Home', 'Component Explorer', 'Checklist Manager', 'Building Science Explorer', 'Browser', 'Guides', 'Case Studies', 'Image Gallery', 'CAD Files', and 'References'. The main content area is titled 'Floor Above Garage' and includes a 'Feedback' link. Below this is a tabbed interface with tabs for 'Scope', 'Description', 'Ensuring Success', 'Installation', 'Training', 'CAD', 'Compliance', and 'More Info.'. The 'Scope' tab is active, showing the title 'Fully Aligned Air Barriers' and two instructions: 'A. Install a continuous rigid air barrier on top of supporting material to separate the garage from the conditioned space.*' and 'B. Seal all seams, gaps, and holes of the air barrier with caulk or foam and complete the air barrier.' To the right of the text is a 3D architectural diagram of a ceiling assembly with yellow insulation and grey structural elements, with white arrows pointing to specific components.

Bread crumbs take you to EERE, BTP, Building America, and the Solution Center Home page.

Bread crumbs also help you know how you got here....

- The Component Explorer displays images representing eight building-related component areas
- Each component is further organized into Component Subcategories (e.g., air sealing, insulation, etc.)
- After selecting a subcategory, all guides associated with that subcategory are displayed.



Component Explorer (cont.)



Foundation

[Water Managed Foundation](#)
[Minimum Thermal Bridging](#)
[Insulation](#)
[Air Sealing](#)
[Fully Aligned Air Barriers](#)

Click a component to display subcategories
Click subcategories to display Guides

Component Explorer

Foundation » Insulation

[IECC Code Level Insulation](#)

[Insulation Installation \(RESNET Grade\)](#)

[Slab Edge Insulation](#)

Slab Edge Insulation

Please [Register](#) or [Login](#) to Provide Feedback.

Scope

Description

Ensuring Success

Climate

Training

CAD

Compliance

More Info.

Scope

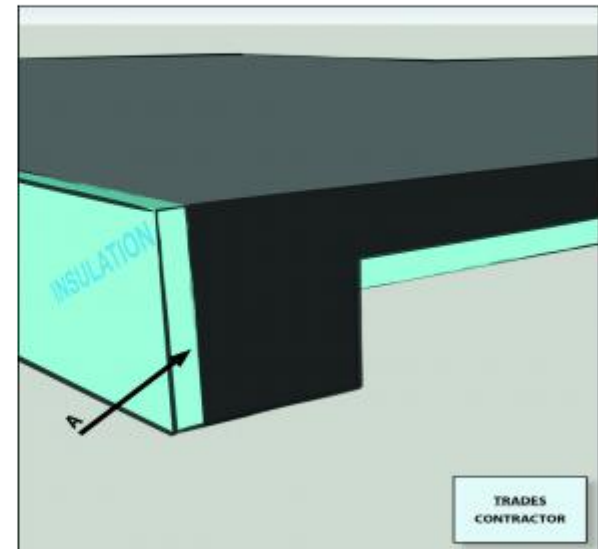
Reduced Thermal Bridging

For slabs on grade in [Climate Zone 4 and higher](#), 100% of the slab edge is insulated to \geq 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.



- The Checklist Manager currently allows exploration of content specific to ENERGY STAR Version 3 checklists.
- The Checklist Manager does not provide pathways to additional, non-related data .
- Topics are displayed in the same order as they appear on the ENERGY STAR checklists.
- Users can drill down into the checklist to display Guides associated with each requirement.
- Checklists supporting other programs will be added in the future.

Checklist Manager

ENERGY STAR Qualified Homes, Version 3 (Rev .05)

▼ Thermal Enclosure System Rater Checklist

Prescriptive Path: Fenestration shall meet or exceed ENERGY STAR requirements

ENERGY STAR Windows

[Read more](#)

ENERGY STAR Windows

Please [Register](#) or [Login](#) to Provide Feedback.

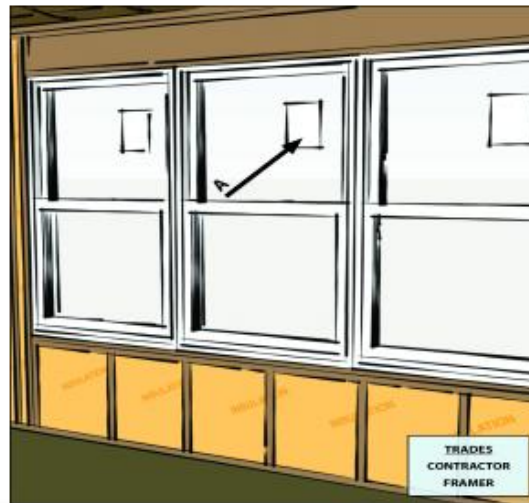
Scope Description Ensuring Success Climate Training CAD Compliance More Info.

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.



- **COMING:** Additional checklists will be added
 - DOE Challenge Home Checklists
 - Existing homes




Checklist Manager

ENERGY STAR Qualified Homes, Version 3 (Rev .05)

- ▶ Thermal Enclosure System Rater Checklist
- ▶ HVAC System Quality Installation Rater Checklist
- ▶ Water Management System Builder Checklist
- ▶ HVAC System Quality Installation Contractor Checklist

Scope	Description	Ensuring Success	Climate	Training	CAD	Compliance	More Info.
<p>Scope</p> <p>Fully Aligned Air Barrier</p> <ul style="list-style-type: none">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.							



The diagram illustrates the construction of a knee wall cavity. It shows a cross-section of the wall and ceiling. Three horizontal arrows labeled A, B & C, and D point to specific components: A points to the top plate/blocking, B & C point to the air barrier and supporting material, and D points to the insulation. A legend in the bottom right corner identifies the trades as FRAMER and INSULATOR.

Scope: Clearly defines and bounds the building topic in a way builders and remodelers can use to contractually obligate their subcontractors.

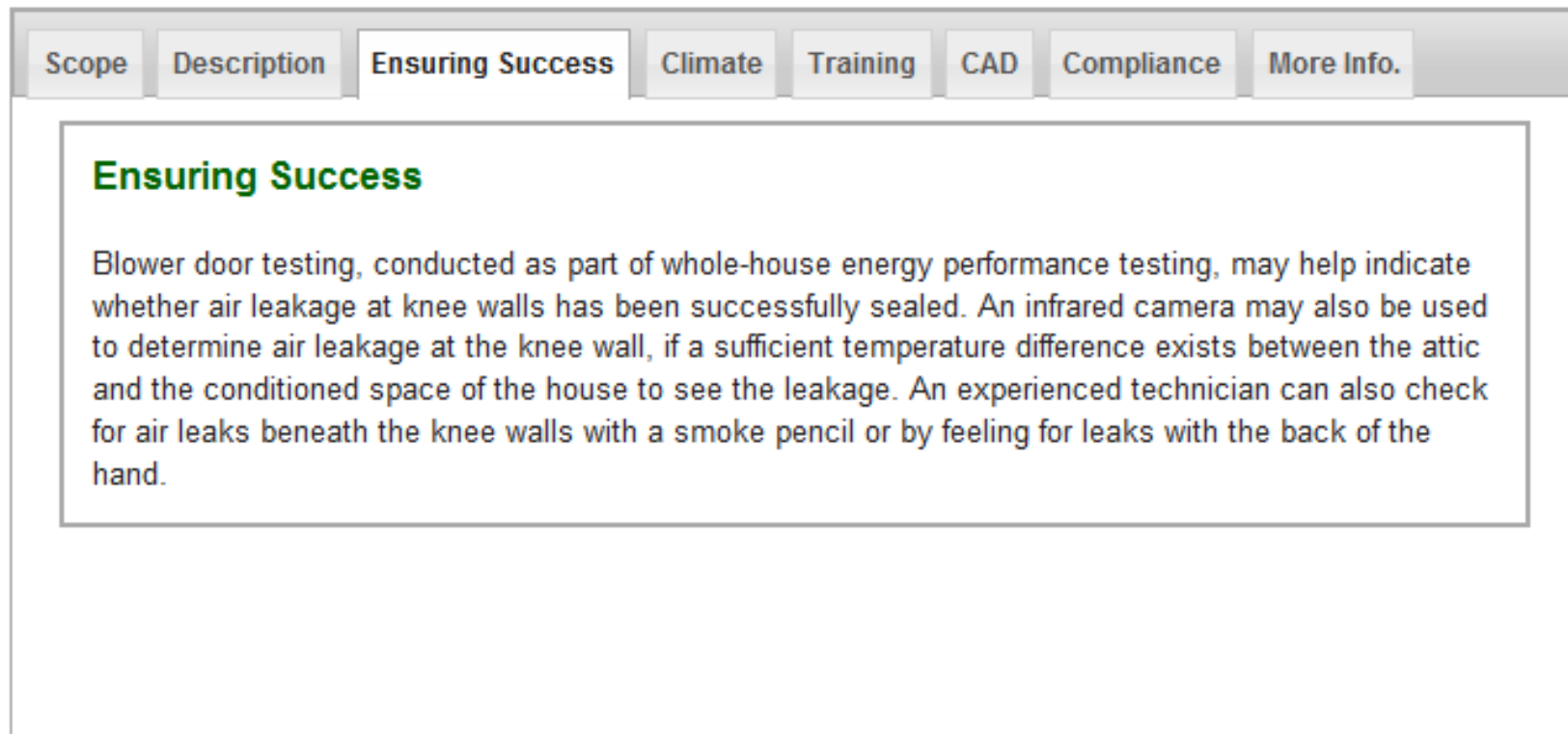
Description:
Provides an explanation of the building topic and specific “how-to” steps for implementing.

Scope Description Ensuring Success Climate Training CAD Compliance More Info.

Description

In two-story homes with covered porches, builders may sometimes forget to sheathe the wall area that will be hidden when the porch ceiling is installed, because the porch is framed before the wall sheathing is installed. If there is no exterior sheathing, blown insulation cannot be installed. Even if batt insulation is installed, if there is no exterior sheathing that is caulked in place to serve as an air barrier, the insulation is subject to wind washing from outside air, especially if the porch ceiling is vented or is not air tight.

The diagram illustrates a cross-section of a two-story house with a covered porch. The house has a dark grey roof and a light grey exterior wall with four windows. The porch is on the left side, with a grey porch ceiling and a white porch floor. A pink line highlights the exterior wall area where the porch ceiling meets the house wall. An arrow points to this area with the label "Missing Air Barrier". Another arrow points to the interior wall area with the label "Drywall Insulation". The text "Two-Story House" is written above the roofline, "Porch Ceiling" is written above the porch, and "Porch" is written below the porch floor.



The screenshot shows a web interface with a navigation menu at the top. The menu items are: Scope, Description, Ensuring Success (which is highlighted), Climate, Training, CAD, Compliance, and More Info. Below the menu is a content box with the following text:

Ensuring Success

Blower door testing, conducted as part of whole-house energy performance testing, may help indicate whether air leakage at knee walls has been successfully sealed. An infrared camera may also be used to determine air leakage at the knee wall, if a sufficient temperature difference exists between the attic and the conditioned space of the house to see the leakage. An experienced technician can also check for air leaks beneath the knee walls with a smoke pencil or by feeling for leaks with the back of the hand.

Ensuring Success: A big-picture discussion of health, safety, durability, performance issues, test-in/test-out requirements, and scheduling and sequencing considerations.

Scope Description Ensuring Success **Climate** Training CAD Compliance More Info.

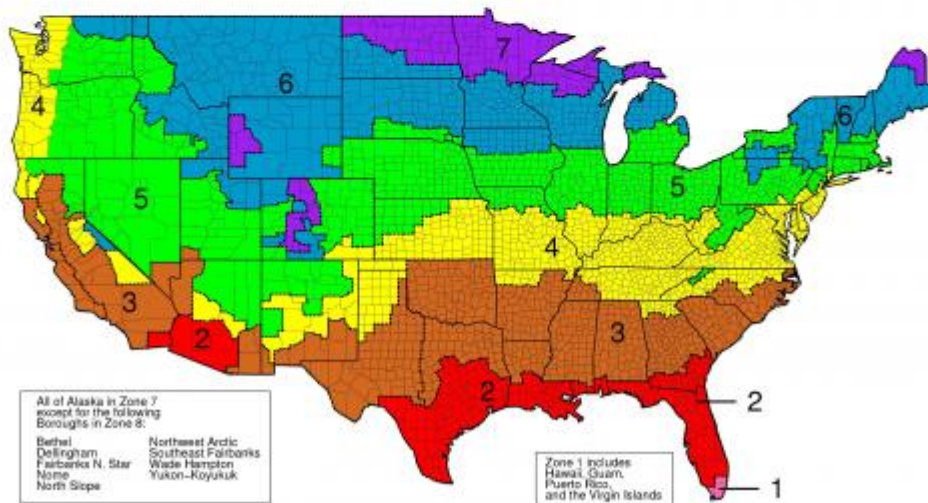
Climate

ENERGY STAR Version 3. (Rev. 5)

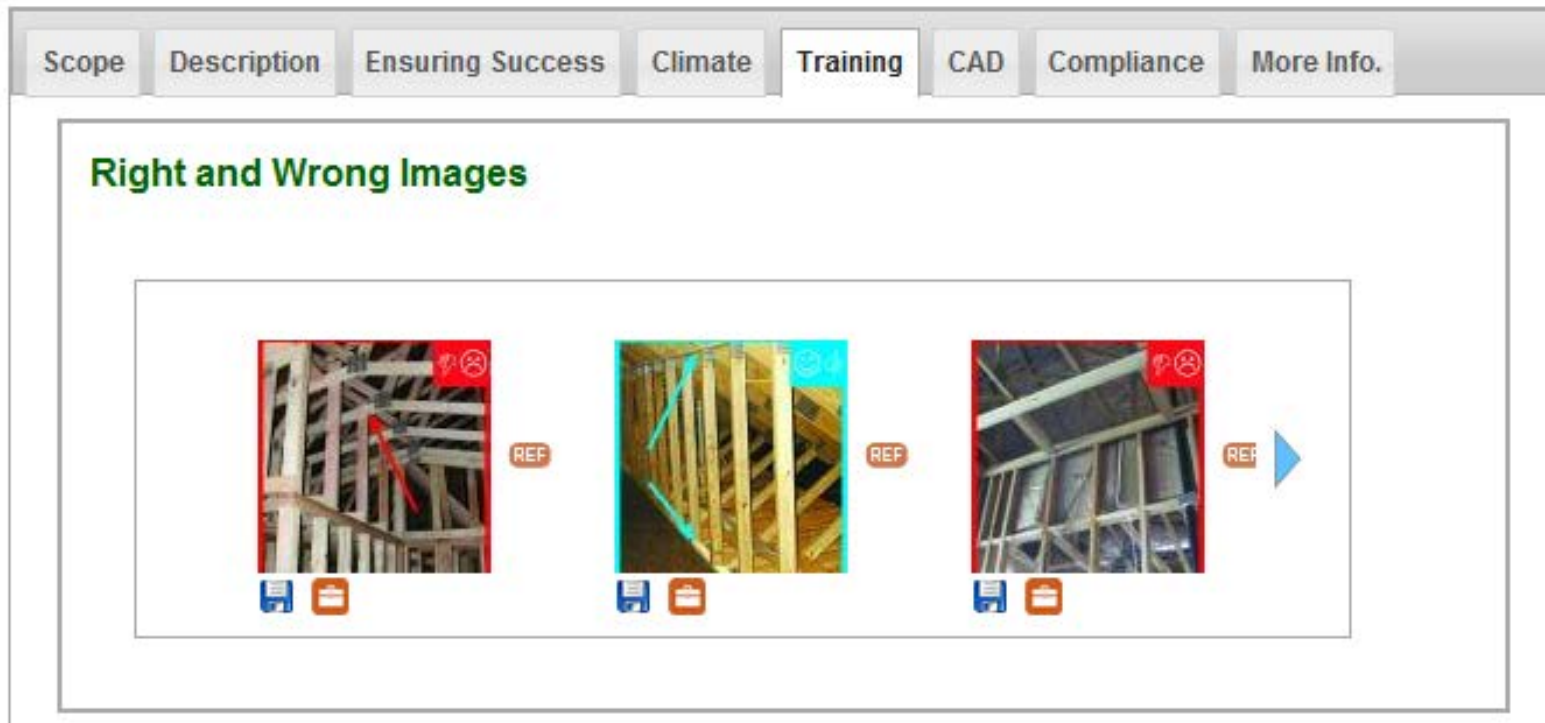
Thermal Enclosure Checklist, Fully-Aligned Air Barriers. A complete air barrier shall be provided that is fully aligned with the insulation at exterior surface of walls in all climate zones; and also at interior surface of walls for Climate Zones 4-8.

DOE Challenge Home

Exhibit 2: DOE Challenge Home Target Home. Infiltration (ACH50): Zones 1-2: 3; Zones 3-4: 2.5; Zones 5-7: 2; Zone 8: 1.5. Envelope leakage shall be determined by an approved verifier using a RESNET-approved testing protocol.

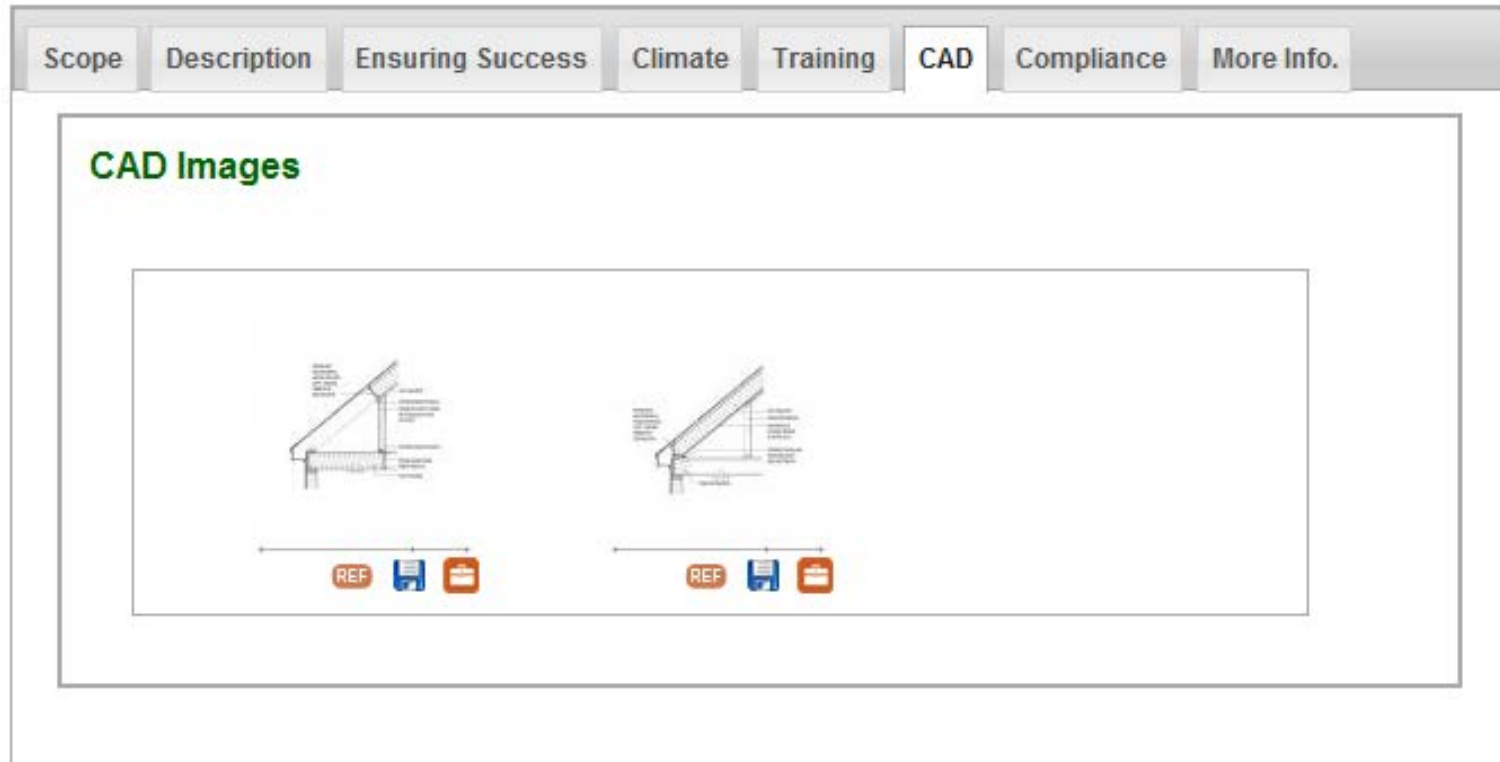


Climate: Cites climate-specific codes, standards, ENERGY STAR, and Challenge Home guidance.



Training: Includes educational resources such as Right/Wrong photographs of proper and improper installation.

COMING: Videos and presentations




CAD: Includes Architectural CAD files of the building topic in DWG and PDF forms.

Scope	Description	Ensuring Success	Climate	Training	CAD	Compliance	More Info.
<h2>Compliance</h2> <p><u>ENERGY STAR Version 3, (Rev. 5)</u> <i>Thermal Enclosure Checklist, Fully-Aligned Air Barriers.</i> A complete air barrier shall be provided that is fully aligned with the insulation at exterior surface of walls in all climate zones; and also at interior surface of walls for Climate Zones 4-8. All insulated vertical surfaces are considered walls (e.g., exterior walls, knee walls) and must meet the air barrier requirements for walls.</p> <p><u>DOE Challenge Home</u> <i>Exhibit 2: DOE Challenge Home Target Home.</i> Certified under ENERGY STAR Qualified Homes Version 3. Infiltration (ACH50): Zones 1-2: 3; Zones 3-4: 2.5; Zones 5-7: 2; Zone 8: 1.5. Envelope leakage shall be determined by an approved verifier using a RESNET-approved testing protocol. Building envelope assemblies, including exterior walls and unvented attic assemblies (where used), shall comply with the relevant vapor retarder provisions of the 2012 International Residential Code.</p> <p><u>ASTM E1677-11</u> <i>Standard Specification for Air Barrier (AB) Material or System for Low-Rise Framed Building Walls.</i> This specification covers minimum performances and specification criteria for an air barrier material or system for framed, opaque walls of low-rise buildings. The provisions are intended to allow the user to design the wall performance criteria and increase air barrier specifications for a particular climate location, function, or design.</p>							

Compliance: Provides specific compliance references from applicable codes and standards.

The screenshot shows a web interface with a navigation bar at the top containing tabs for 'Scope', 'Description', 'Ensuring Success', 'Climate', 'Training', 'CAD', 'Compliance', and 'More Info.'. The 'More Info.' tab is selected. Below the tabs, there are two main content sections: 'Case Studies' and 'References'. The 'Case Studies' section lists one entry: '1. David Weekley Homes: Eagle Springs & Waterhaven, Houston, TX' with a summary and a 'Link to Document' with a PDF icon. The 'References' section lists one entry: '1. 2009 IECC—International Energy Conservation Code' with a summary and a 'Link to Document'.

Case Studies

1. **David Weekley Homes: Eagle Springs & Waterhaven, Houston, TX**
PNNL. 2012. Building America Case Study: David Weekley Homes, Eagle Springs & Waterhaven, Houston, TX, PNNL-SA-87333, prepared by the Pacific Northwest National Laboratory for the U.S. Department of Energy.
[Link to Document](#) 

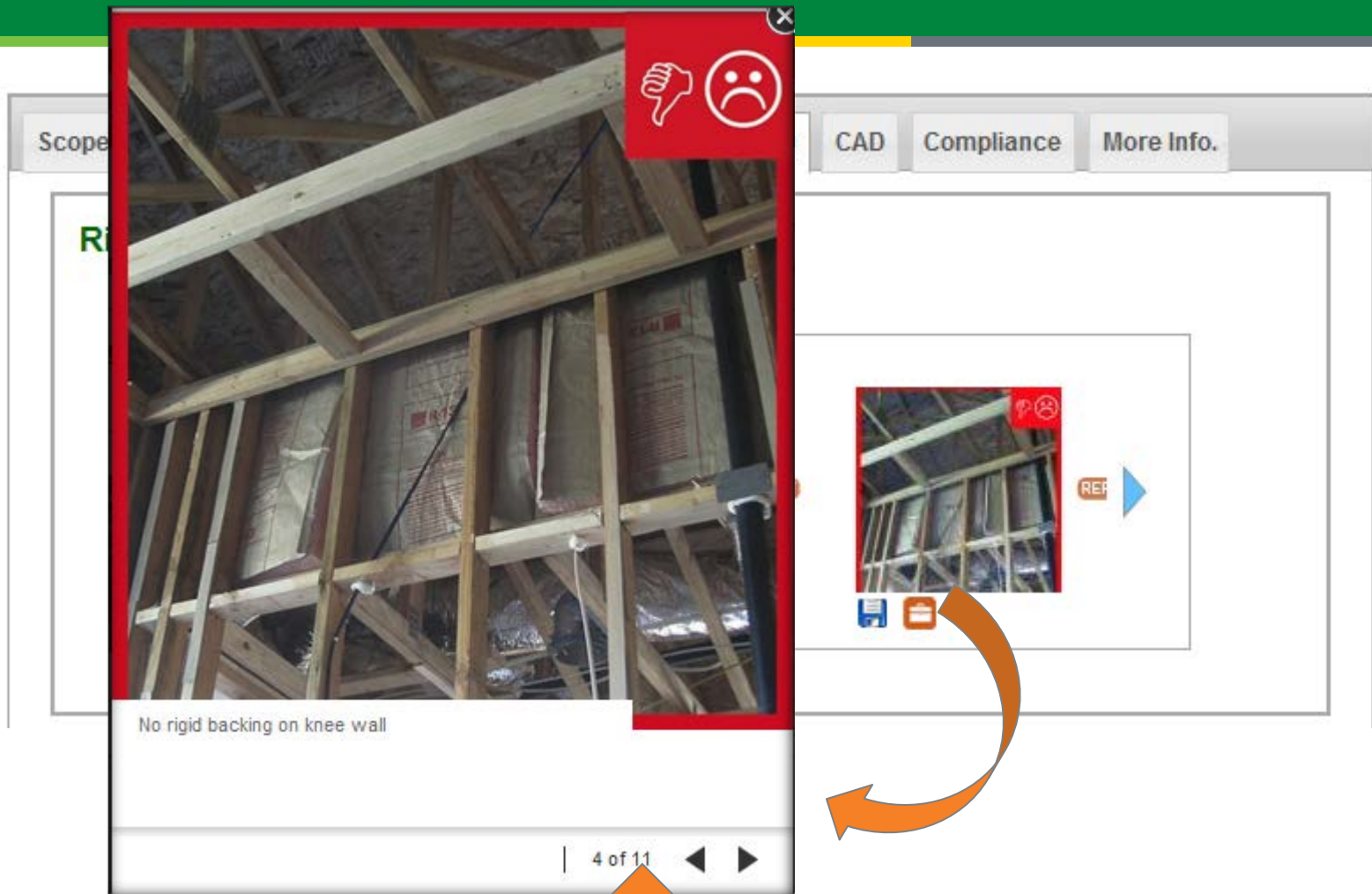
References

1. **2009 IECC—International Energy Conservation Code**
2009 IECC, International Energy Conservation Code. International Code Council, Washington, D.C.
[Link to Document](#)

More Info:

- References - Full citations with links for content.
- Case Studies - Summaries of Building America teams and builders who have applied best practices.
- Resources - Relevant information not previously cited as references.
- **COMING: Innovations**

Guides (cont.)



Click on any image within the Guide to enlarge it in a sliding window.
Scroll through all images in the Guide.

WORD PATTERNS

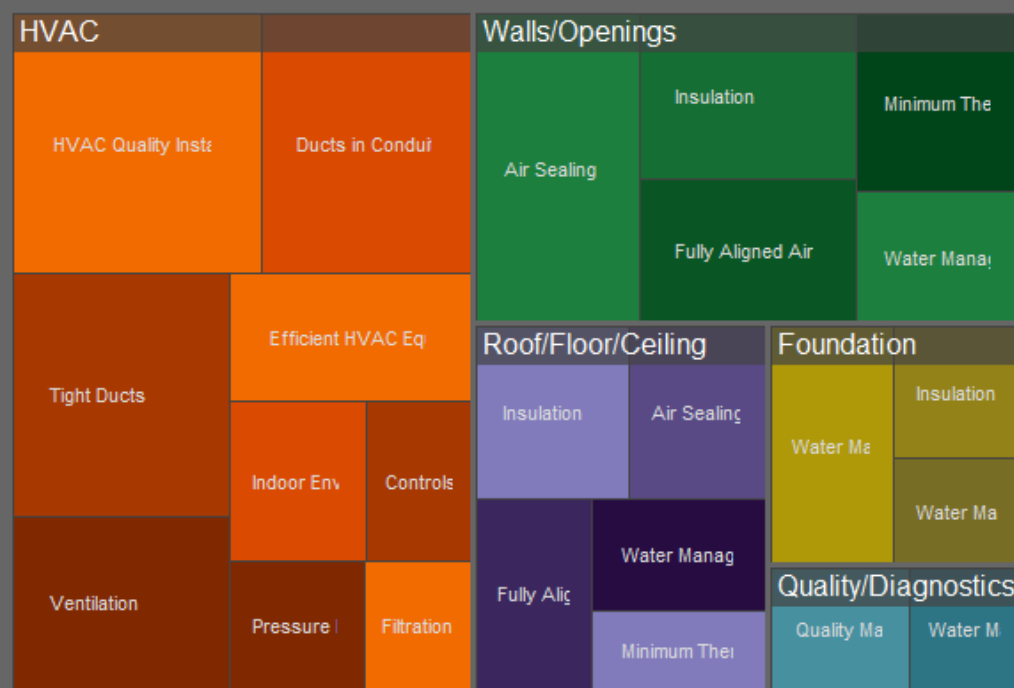
air wall foam barrier	40
wall thermal walls energy	31
duct leakage ducts floor	15
air insulation install seal	14
system exhaust fans hvac	12

CATEGORIES

Taxonomy	Component	Component Subcategory	Keywords
Ducts	HVAC	Installation	checklist
Grade	Walls/Op	Sealing	checklist
Cracks	Foundati	Space	checklist
Foundati	Roof/Flo	Ducts	sealing
Space/E	Quality/D	Insulation	Walls

CATEGORY BLOCKS

Categorize by: >



ARTICLES

- [Export](#)
- All Other Ceilings
 - Attic Access Panels/Doors...
 - Attic Eave Minimum Insula...
 - Attic Knee Walls
 - Back-Draft Dampers at Sh...
 - Bathroom and Kitchen Ex...
 - Bathroom Exhaust
 - Bathroom Fan Ratings
 - Building Cavities Not Used...
 - Cantilevered Floor
 - Capillary Break Beneath...
 - Common Exhaust Duct No...

Building Science Explorer visualizes the content and its semantic mark-up. It allows a user to explore the classification of content, and to drill down to specific Guides.

Building Science Explorer: CATEGORY BLOCKS

The screenshot displays the 'CATEGORY BLOCKS' interface. At the top, there is a 'Categorize by:' section with a dropdown menu currently set to 'Component'. A secondary dropdown menu is open, showing options: 'Taxonomy', 'Component' (highlighted in blue), 'Component Subcategory', and 'Keyword'. To the right of this menu is a 'Component Subcategory' dropdown menu, which is pointed to by a large orange arrow from the right edge of the image. The main area is a grid of colored blocks representing different building science categories. The 'HVAC' category is the largest, containing blocks for 'HVAC Quality Instz', 'Ducts in Condui', 'Air Sealing', 'Insulation', 'Minimum The', 'Fully Aligned Air', 'Water Mana', 'Tight Ducts', 'Efficient HVAC Eq', 'Indoor Env', 'Controls', 'Ventilation', 'Pressure I', and 'Filtration'. Other categories include 'Roof/Floor/Ceiling' (with 'Insulation' and 'Air Sealing'), 'Foundation' (with 'Water Ma' and 'Insulation'), and 'Quality/Diagnostics' (with 'Quality Ma' and 'Water M').

Change content categorizations

Building Science Explorer: CATEGORY BLOCKS

The screenshot displays the 'CATEGORY BLOCKS' interface. At the top, there are two dropdown menus: 'Categorize by: Component' and 'Component Subcategory'. The main area is a grid of colored blocks representing different building science categories. An orange arrow points from the 'Insulation' block in the 'Roof/Floor/Ceiling' category to the 'Articles' list on the right. The 'Articles' list is titled 'ARTICLES' and has an 'Export' button at the top. The list contains the following items:

- Attic Access Panels/Doors...
- Attic Eave Minimum Insula...
- Cantilevered Floor
- Dropped Ceiling/Soffit Bel...
- Floor Above Garage
- Floor Above Unconditione...
- Insulation Below Attic Platf...
- All Other Ceilings
- Attic Knee Walls
- Back-Draft Dampers at Sh...
- Bathroom and Kitchen Ex...
- Bathroom Exhaust

Select categories to highlight articles linked to that category

WORD PATTERNS

air wall foam barrier	40
wall thermal walls energy	31
duct leakage ducts floor	15
air insulation install seal	14
system exhaust fans hvac	12

CATEGORY BLOCKS

CATEGORIES

Taxonomy	COUNT	Component	COUNT	Component	COUNT	Keyword	COUNT
Flex Ducts	11	HVAC	46	HVAC Qua...	42	ENERGY ...	45
Walls Abo...	9	Walls/Openings	39	Air Sealing	32	ENERGY ...	45
Cracks	7	Foundation	12	Ducts in C...	31	ENERGY ...	21
Water Man...	7	Roof/Floor/C...	12	Tight Ducts	28	Air sealing	16
Penetratio...	6	Quality/Diagn...	3	Insulation	23	Walls	15
Fiber Boar...	5			Fully Align...	15	Fully-align...	14
Kitchen Ex...	5			Ventilation	14	Duct leakage	12
Metal Ducts	5			Minimum T...	12	Reduced t...	12
PVC Ducts	5			Efficient H...	10	Distributio...	10
Water Man...	5			Water Man...	10	Flex ducts	10
Walls	4			Water Man...	9	Water-ma...	9
Water Man...	4			Indoor Env...	5	Duct insul...	8

ARTICLES

[Export](#)

- Attic Access Panels/Doors...
- Attic Eave Minimum Insula...
- Cantilevered Floor
- Dropped Ceiling/Soffit Bel...
- Floor Above Garage
- Floor Above Unconditione...
- Insulation Below Attic Platf...
- All Other Ceilings
- Attic Knee Walls
- Back-Draft Dampers at Sh...
- Bathroom and Kitchen Ex...
- Bathroom Exhaust

Select maximize icons to switch views.

Building Science Explorer: CATEGORIES

Taxonomy	COUNT ▲	Component	COUNT ▲	Component	SCOUNT ▲	Keyword	COUNT ▲
Floors	3	Roof/Floor/Ceiling	7	Insulation	7	ENERGY ...	7
Attic Access ...	1			Air Sealing	5	Fully-align...	4
Ceilings	1			Fully Aligned ...	4	Floors	3
Reduced The...	1			Minimum The...	2	Reduced t...	2
Reduced The...	1					Air sealing	1
						Other ope...	1
						Ceilings	1
						Attic access	1
						Attic eave ...	1
						Cantilever...	1
						Dropped c...	1
						Floor abov...	1

- After selecting Insulation, the related content is displayed
- E.g. seven guides related to Insulation can be found under the Component Explorer Roof/Floor/Ceiling component

Building Science Explorer: WORD PATTERNS



Word Patterns explores word grouping in the content tagging.

Building Science Explorer: ARTICLES

ARTICLES							Export
Title ^	Taxonomy	Construction Type	Component	Component Subcategory	Energy Star	ENERGY STAR	
Sealed Duct...	PVC Ducts	New Homes	HVAC	Tight Ducts,...	ENERGY ST...	Duct b OPEN	
Ducted Re...	Sealed Duct Boots - PVC Ducts	New Homes	HVAC	HVAC Qualit...	ENERGY ST...	Bedrooms pr...	
Shafts (e.g.,...	Penetrations...	New Homes	Walls/Openi...	Air Sealing	ENERGY ST...	Duct / flue s...	
Insulated He...	Walls, Advan...	New Homes	Walls/Openi...	Minimum Th...	ENERGY ST...	All headers...	
Insulated Co...	Walls, Advan...	New Homes	Walls/Openi...	Minimum Th...	ENERGY ST...	All corners in...	
Dropped cei...	Ceilings	New Homes	Roof/Floor/C...	Insulation, F...	ENERGY ST...	Dropped ceil...	
Cantilevered...	Floors	New Homes	Roof/Floor/C...	Insulation, F...	ENERGY ST...	Cantilevered...	
Garage Rim/...	Walls Above...	New Homes	Walls/Openi...	Air Sealing,...	ENERGY ST...	Garage rim /...	
Skylight Shaf...	Walls Above...	New Homes	Walls/Openi...	Air Sealing,...	ENERGY ST...	Skylight shaf...	
Obvious Ven...	Ventilation C...	New Homes	HVAC	HVAC Qualit...	ENERGY ST...	Function of v...	
Attic Knee W...	Walls Above...	New Homes	Walls/Openi...	Air Sealing,...	ENERGY ST...	Attic knee walls	
Continuously...	Ventilation C...	New Homes	HVAC	HVAC Qualit...	ENERGY ST...	Continuously...	
Thermostat...	Ventilation C...	New Homes	HVAC	HVAC Qualit...	ENERGY ST...	Air flow is pr...	
Total Duct L...	PVC Ducts	New Homes	HVAC	Tight Ducts,...	ENERGY ST...	Total Rater-...	
Total Duct I...	Fiber Board	New Homes	HVAC	Tight Ducts	ENERGY ST...	Total Rater	

Articles takes you directly to the Guides (Insulation selected)

Browse content by media type

Browser

Guides



Case Studies



Image Gallery



CAD Files



References



Resource Guides

[All Other Ceilings](#)

CAD Files

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References

[2009 IECC—International Energy Conservation Code](#)

Author: International Code Council

Organization: International Code Council

2009 IECC, International Energy Conservation Code. International Code Council, Washington, D.C.

[2009 IRC—International Residential Code for One and Two Family Dwellings](#)

Author: International Code Council

Organization: International Code Council

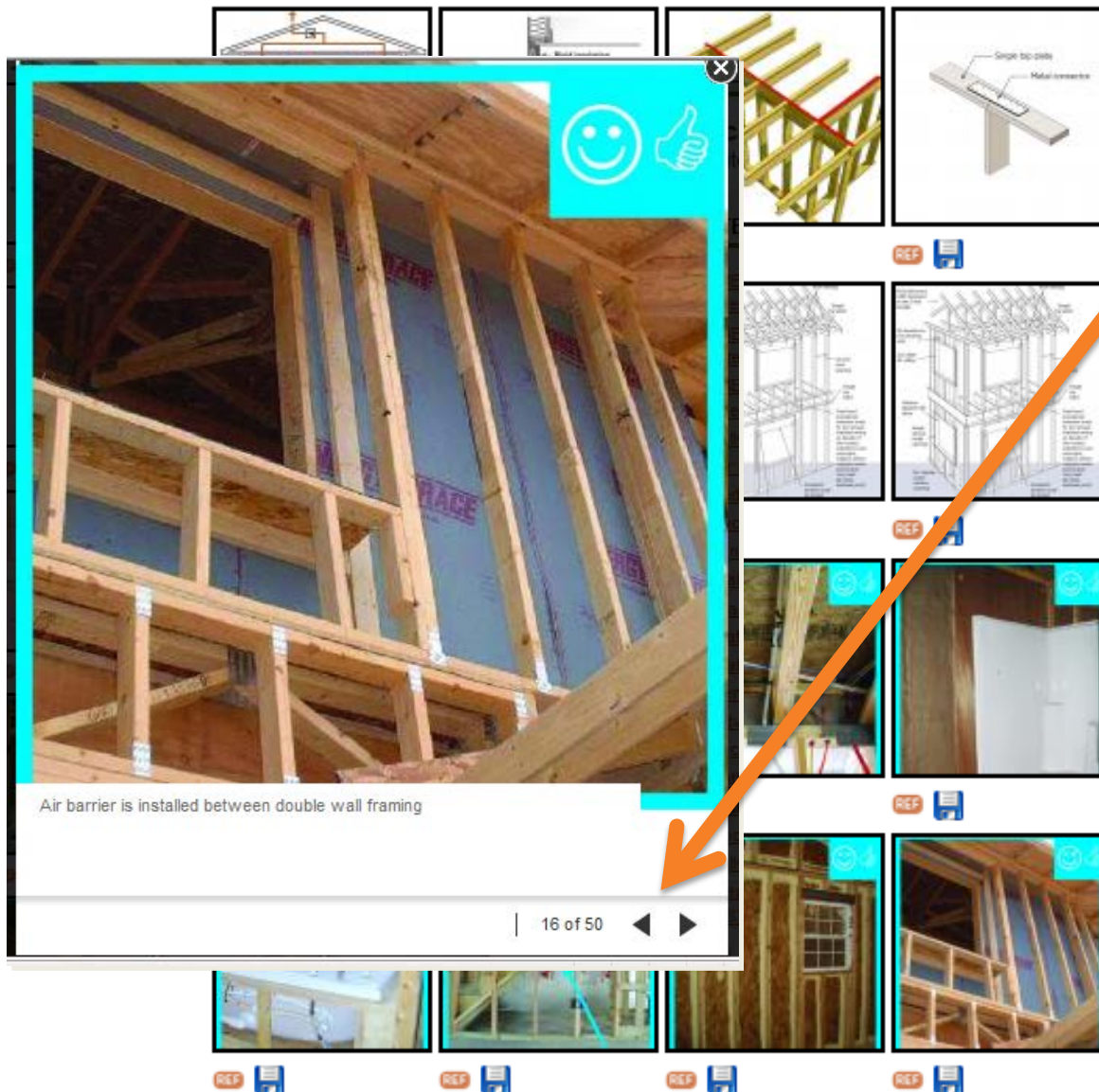
2009 IRC, International Residential Code for One and Two Family Dwellings. 2009. Fifth Printing. International Code Council, Washington, D.C.

[2012 IECC—International Energy Conservation Code](#)

Author: International Code Council

Organization: International Code Council

2012 IECC, International Energy Conservation Code. International Code Council, Washington, D.C.



- Click an image to enlarge in a sliding window.

High Performance Building Details: Garage Band Joist Air Barrier

Consortium for Advanced Residential Buildings (CARB). 2010. *High Performance Building Details: Garage Band Joist Air Barrier*. Prepared by Steven Winter Associates for the U.S. Department of Energy, Building America Program.

Link:

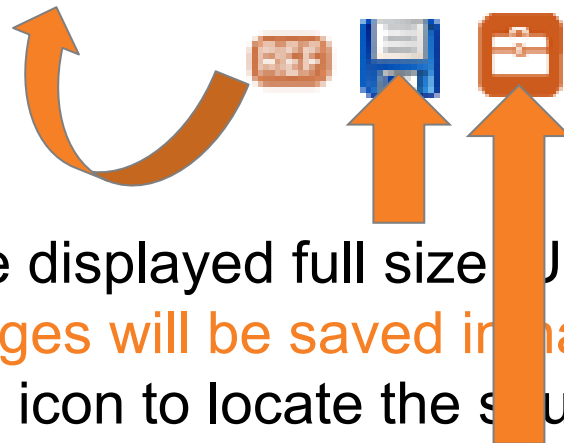
[High Performance Building Details: Garage Band Joist Air Barrier](#) 

Authors:

[Consortium for Advanced Residential Buildings](#)

Organization:

[Consortium for Advanced Residential Buildings](#)



- Images can be displayed full size. Use Save As to save to file.
- **COMING:** Images will be saved in native/original format
- Use the “REF” icon to locate the source of the image
- Select the Field Kit icon to add to your Field Kit

The screenshot displays a CAD file browser interface. On the left, a large technical drawing is shown, detailing a cross-section of a cabinet soffit assembly. The drawing includes labels for 'CONTINUOUS BEAD OF SEALANT', 'PROVIDE INTERIOR SHEATHING AT EXTERIOR WALL AND CEILING PRIOR TO SOFFIT ASSEMBLY', 'WOOD FRAME SOFFIT ASSEMBLY', and 'INTERIOR CABINETRY'. Below the drawing, a title block contains the text 'AIR SEAL AT CABINET SOFFIT // SINGLE-STORY', 'GreenBuildingAdvisor.com', 'Scale: 1/12"=1'-0"', and the drawing number '5-01027'. At the bottom of the browser, a navigation bar shows '11 of 50' with left and right arrow icons. On the right side, a grid of smaller thumbnails represents other CAD files, each with a 'REF' icon. An orange arrow points from one of these thumbnails to the main drawing area.

- Click the CAD file image to load in a slider window.

Building Plans for the ENERGY STAR Thermal Bypass Checklist

Green Building Advisor. 2011. Building Plans for the ENERGY STAR Thermal Bypass Checklist. Green Building Advisor, Newtown, Connecticut, The Tanton Press.

Link:

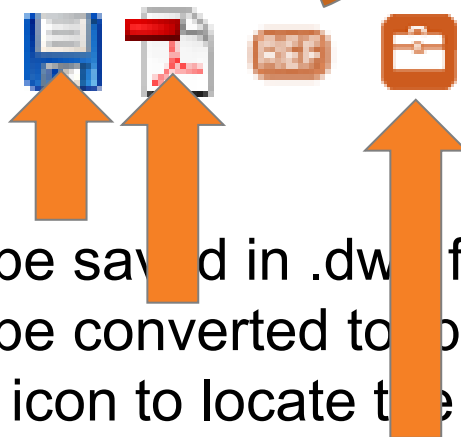
[Building Plans for the ENERGY STAR Thermal Bypass Checklist](#)

Authors:

[Green Building Advisor](#)

Organization:

[Green Building Advisor](#)



- CAD files can be saved in .dwt format
- CAD files can be converted to pdf
- Use the “REF” icon to locate the source of the CAD file
- Save CAD files directly to your Field Kit

Faceted Search

All Browser media can be searched using faceted search or simply browsed.

Search filters include:

- Taxonomy
- Component Subcategory
- Climate Zone
- Keywords
- Author
- Organization

CURRENT SEARCH

Search found 112 items

[all items]

FILTER BY TAXONOMY

[Walls Above Grade \(9\)](#)

[Cracks \(7\)](#)

[Water Managed Site and Foundation \(7\)](#)

[Flex Ducts \(6\)](#)

[Penetrations to Unconditioned Space/Exterior \(6\)](#)

[Kitchen Exhaust \(5\)](#)

FILTER BY CLIMATE ZONE:

[Zone 5 \(111\)](#)

[Zone 6 \(111\)](#)

[Zone 7 \(111\)](#)

[Zone 8 \(111\)](#)

[Zone 4 \(110\)](#)

FILTER BY COMPONENT SUBCATEGORY

[HVAC Quality Installation \(42\)](#)

[Ducts in Conduit Space \(31\)](#)

[Tight Ducts \(28\)](#)

Resource Guides

[Back-Draft Dampers at Shared Common Exhaust Duct](#)

[Bathroom Exhaust](#)

[Common Exhaust Duct Not Shared by Fans in Separate Dwellings](#)

[Kitchen Exhaust](#)

[Proper Clothes Dryer Venting](#)

CURRENT SEARCH

Search found 5 items

[all items]

[\(-\) Kitchen Exhaust](#)

FILTER BY TAXONOMY

[\(-\) Kitchen Exhaust](#)

FILTER BY CLIMATE ZONE:

[Zone 1 \(5\)](#)

[Zone 2 \(5\)](#)

[Zone 3 \(5\)](#)

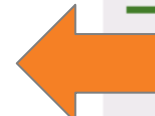
[Zone 4 \(5\)](#)

[Zone 5 \(5\)](#)

[Zone 6 \(5\)](#)

[Zone 7 \(5\)](#)

[Zone 8 \(5\)](#)



Recently added Guides automatically show up on the home page.

RECENTLY ADDED GUIDES

[Sealed Duct Boots - PVC Ducts](#)

Posted: August 09, 2012

[Sealed Duct Boots - Fiber Board Ducts](#)

Posted: August 09, 2012

[Sealed Duct Boots - Metal Ducts](#)

Posted: August 09, 2012

[More Resource Guides](#) ▶

All Guides can be quickly accessed as a list.

Recently added References automatically show up on the home page.

RECENTLY ADDED REFERENCES

[Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings \(ANSI/ASHRAE 62.2-2010\)](#)

Posted: September 17, 2012

[2012 IRC—International Residential Code for One and Two Family Dwellings](#)

Posted: September 12, 2012

[2009 IRC—International Residential Code for One and Two Family Dwellings](#)

Posted: September 12, 2012

[More References](#) ▶

All References can be quickly accessed as a list.

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 are emphasized to give them more relevant information.
- The first priority has been developing tools and content to support ENERGY STAR Version 3.
- Initial content has been based on legacy information. New content will flow from Building America research.
- The Solution Center is a living database that will be continually populated and updated.

- Review comments submitted: 1 December 2012
- Public launch: January 2013
- DOE Challenge Home upgrade: October 2013
- Existing home renovation: 2014
- Content will be continuously populated and updated

Three Mechanisms for Comments for Registered Users

- Submit specific comments on each guide using the “FEEDBACK” links within the guides.
- A general comments and content submission feature will be added by Monday, 15 October.
- Email comments to:

basc@pnnl.gov

Access the Building America Solution Center at:

<http://basc.pnnl.gov>