Align Field Standards and Guides with the SWS

Definitions:

Field Standard: These are the foundational policies and resources that define the requirements for work in homes. At a minimum, they should include:

- **Work Quality Specifications (SWS)** - What are the criteria workers and inspectors can reference to determine whether a given measure is installed correctly?
- **Audit Procedures** - Already in the Annual Plan.
- **Health and Safety Measures** Which H&S measures are allowed on case-by-case basis and which are required in every home?
- **Deferral Policy** – What are the conditions that lead to deferral and how is the client notified?
- **Inspection Standards** How do you ensure that each unit reported as completed to DOE has received thorough, accurate final inspection confirming that the proper work was installed correctly?

Field Guide: This should be a jobsite manual that provides instruction to the crew on work installation. It should be built upon the field standards (the Work Quality Specifications, Allowable H&S Measures and Allowable Materials, specifically) and provide step-by-step, illustrated guidance on proper installation of the most common measures installed by the crews.

- The field guides and standards may be maintained in one, large document if that is the grantee's preference. However, the grantee will need to provide some means for clearly identifying where each of the field standards documents are located for quick reference and review.

Field Standards

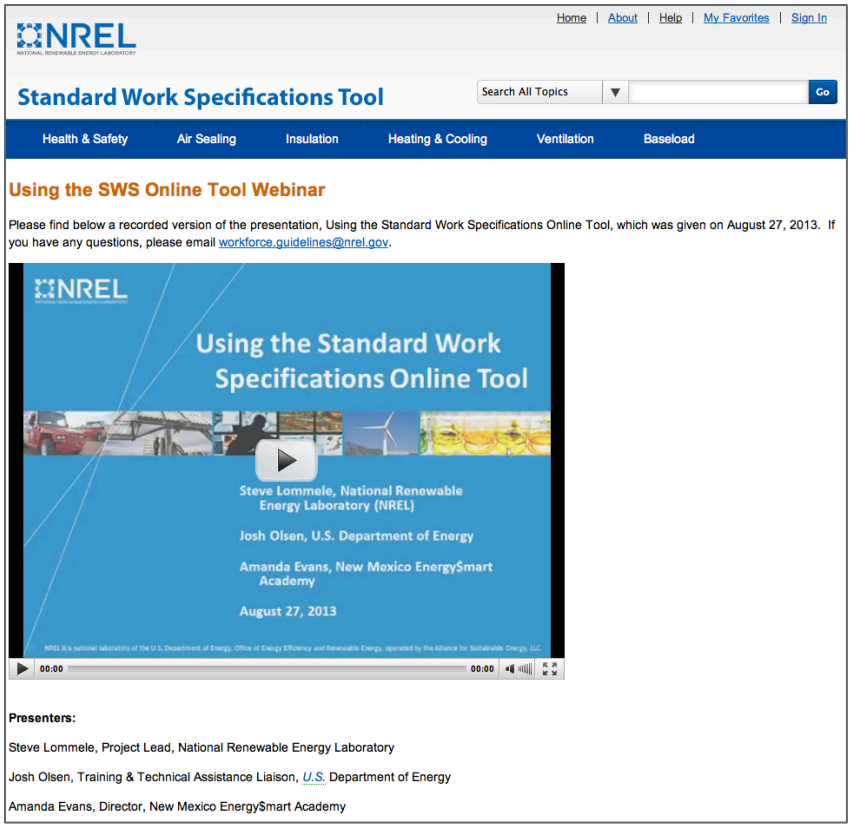
Ensure that the grantee work quality standards align with the SWS.

Option 1: Existing Standards

Use the SWS tool to select all relevant details and, using the export function, create a spreadsheet of those details. Align the SWS details with existing installation standards to demonstrate alignment.

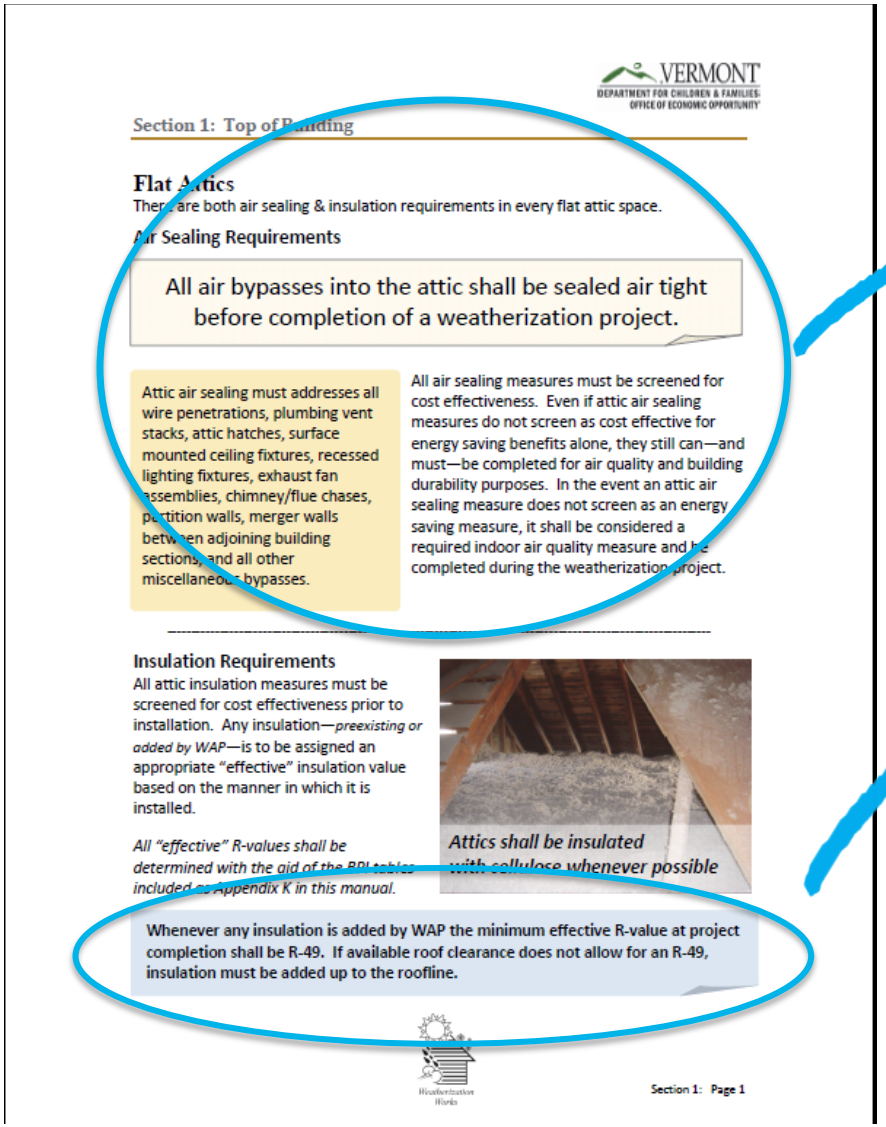
Option 2: New SWS-based Standards

Use the SWS tool to create a customized list of details specific to your program.



Access the webinar at: **https://sws.nrel.gov/webinar**

Field Standards and Guides in One Document



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Section 1: Top of Building

Flat Attics

There are both air sealing & insulation requirements in every flat attic space.

Air Sealing Requirements

All air bypasses into the attic shall be sealed air tight before completion of a weatherization project.

Attic air sealing must addresses all wire penetrations, plumbing vent stacks, attic hatches, surface mounted ceiling fixtures, recessed lighting fixtures, exhaust fan assemblies, chimney/flue chases, partition walls, merger walls between adjoining building sections, and all other miscellaneous bypasses.

All air sealing measures must be screened for cost effectiveness. Even if attic air sealing measures do not screen as cost effective for energy saving benefits alone, they still can—and must—be completed for air quality and building durability purposes. In the event an attic air sealing measure does not screen as an energy saving measure, it shall be considered a required indoor air quality measure and be completed during the weatherization project.

Insulation Requirements

All attic insulation measures must be screened for cost effectiveness prior to installation. Any insulation—*preexisting or added by WAP*—is to be assigned an appropriate "effective" insulation value based on the manner in which it is installed.

All "effective" R-values shall be determined with the aid of the RPI tables included as Appendix K in this manual.

Attics shall be insulated with cellulose whenever possible

Whenever any insulation is added by WAP the minimum effective R-value at project completion shall be R-49. If available roof clearance does not allow for an R-49, insulation must be added up to the roofline.

Weatherization Works

Section 1: Page 1

Installation Policies

Define requirements for what work is to be performed under what circumstances.

Work Quality Standards

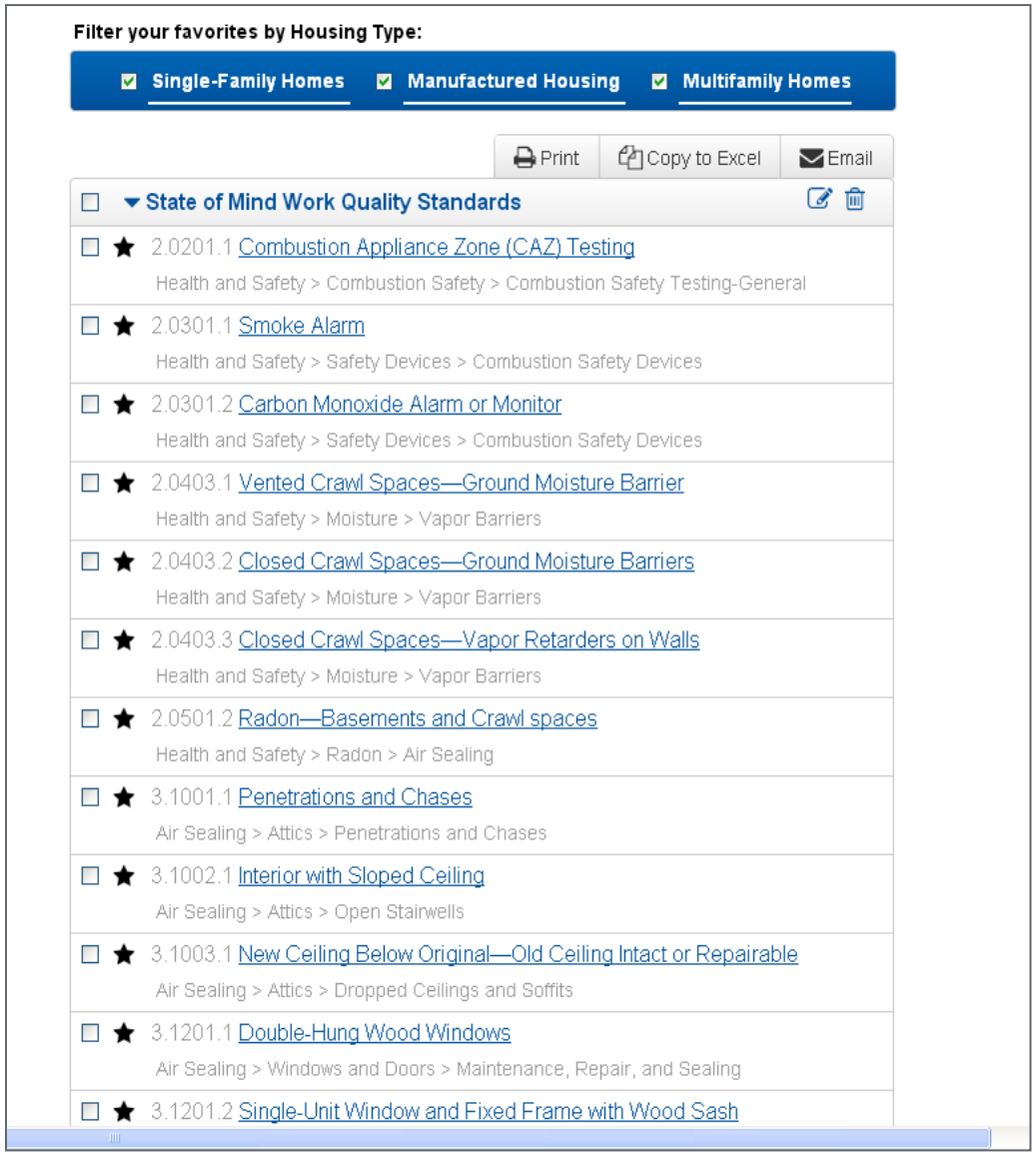
Defines how the work is to be installed in order to be effective.

This is what needs to be aligned with the SWS.

Aligning Existing Work Quality Standards with SWS

Section 1, Page 1	Attic insulation values must be equal to or greater than R-49. If roofline doesn't allow sufficient depth, insulation must be added to roofline.	4.1005.2 Accessible Floors—Loose Fill Installation Topic: Attics Subtopic: Attic Floors Desired Outcome: Consistent, thermal boundary between conditioned and unconditioned space controls the heat flow Subfloor or drywall will be removed to access cavities as necessary, including inaccessible knee-wall attic floor spaces Insulation will be adequately marked for depth a minimum of every 300 square feet of attic area, with measurement beginning at the air barrier All electrical boxes will be flagged to be seen above the level of the insulation Open electrical junctions will have covers installed Insulation dams and enclosures will be installed as required Existence of air barrier material in line with the knee walls will be installed or verified when dense packing Air barrier material will not bend, sag, or move once dense packed All insulation will be installed to the depth indicated on the manufacturer coverage chart for desired R-value A signed and dated attic card will be provided that includes: Insulation type Installed thickness and settled thickness Coverage area R-value Number of bags installed in accordance with manufacturer specifications

Creating New Field Standards Using the SWS Tool



Field Guides

All Field Guides should reference the relevant details from the SWS applicable to the topic or process being discussed.

- The SWS is a menu of *possible* measures - not everything in the SWS need to be in the field guide.
- Conversely, the SWS doesn't contain everything that can possibly be done in the WAP - field guides can and should contain information not in the SWS.
- The field guide is meant to be a tool for the grantee and written for their individual needs, the intent is that when a topic is being presented that is contained in the SWS - that the instruction at least meet the minimum specifications of the SWS.
- Local codes or the authority having jurisdiction still apply where relevant unless the SWS goes above and beyond the code- in which case the codes minimum would be met by the SWS and more.

Aligning Existing Field Guides

Using the SWS tool, create a reference table for each chapter or section of the field guide. The table should list the topic and the relevant SWS.

Creating New Field Guides

All new field guides should integrate the relevant SWS into the topics being discussed where reasonable. The desired outcomes and minimum specifications should be part of the instructional material.

Aligning Existing Field Guides - Step 1: Identify Topics

Air Sealing and Insulating Attic Access

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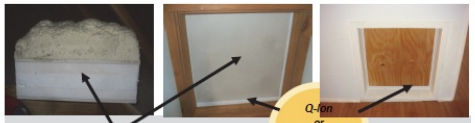
Section 1: Top of Building

Flat Attics *(continued)*
Attic Hatch (Standard Assembly)

Whenever roof clearance allows a hatch assembly must be installed *(unless continued access into the attic from a ceiling hatch is not desired by the client)*. A durable insulation dam shall be installed around all attic hatch openings. The dam must extend at least 2" higher than the settled insulation depth at the completion of the weatherization project.

Attic hatch panels shall have a minimum effective R-value of 21.
Higher R- values are strongly encouraged whenever roof clearance allows.



If **manufactured panels** are being used as attic hatches, it is recommended that additional sheets of HI-R *(polyisocyanurate)* be added on top of the prebuilt panel with the edges sealed and taped.

Alternatively, additional inches of closed-cell spray foam can be applied to the top of the manufactured panel as shown above.

Use of felt weather-stripping is not allowable.

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Section 1: Top of Building

Flat Attics *(continued)*
Attic Access (Walk up Staircase)

Whenever possible a hatch panel shall be located at the top of the staircase.

Less Surface Area

Preferred Thermal Boundary

Better Results

Backup Plan:
Making the stairwell the thermal boundary increases the number of surfaces that need to be addressed and reduces the ending R-values between the house and attic. When the stairwell area is addressed in this manner, it is often difficult to get an effective airseal that keeps warm air out of the attic. For these reasons, treating the walls of the stairwell, the stairs, and the door at the bottom of the staircase is strongly discouraged. If building a hatch assembly at the top of the stairwell is not possible, this weatherization practice is allowable.

If the weight of a large hatch assembly presents a concern, the hatch panel should be divided into sections or a pulley system should be installed. Both hatches pictured above meet the minimum R-21 requirement and provide a good tight airseal when closed.

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Section 1: Top of Building

Flat Attics *(continued)*
Attic Access (Pull Down Stairs)

Unless the thermal boundary has been moved up to the roofline, a high quality attic hatch assembly shall be built and installed to enclose pull-down staircases.

The assembly is to include a durable insulation dam, a Q-Ion (*or comparable quality weatherstrip*) and a removable top panel.

Assembly Requirements:

- ✓ R-21 represents the minimum allowable insulation value for hatch assemblies.
- ✓ Higher R-values should be strived for whenever roof clearances allow.
- ✓ The sides of a hatch assembly/insulation dam shall be sealed air tight.
- ✓ Insulation must continue up the dam to the height of the Q-Ion.
- ✓ If the Q-Ion is above the settled depth of any blown-in insulation then the sides of the assembly shall be insulated separately with either HI-R (polyisocyanurate) or closed-cell spray foam.

Section 1: Page 7

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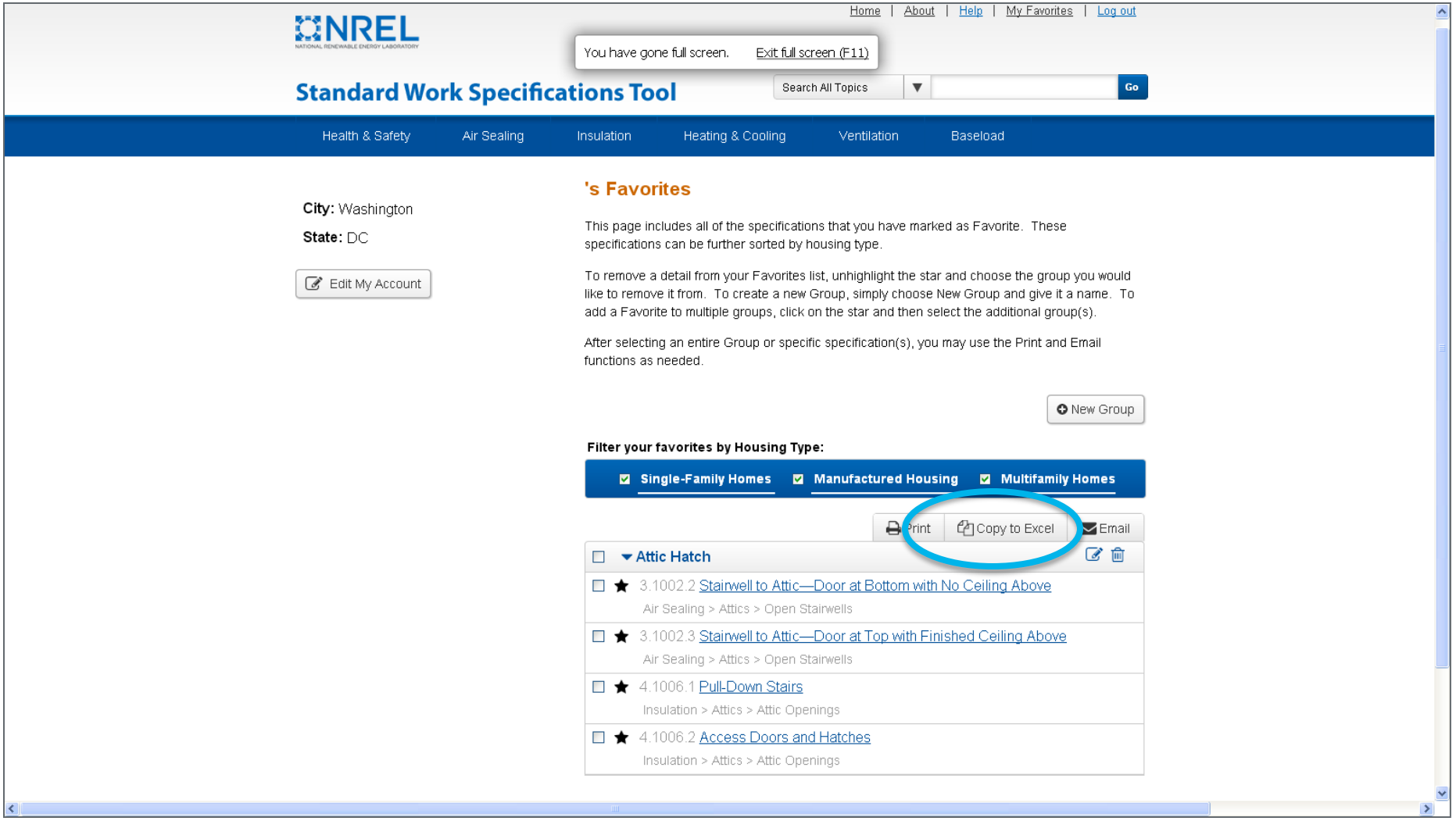
Aligning Existing Field Guides - Step 2: Select Relevant SWS and Export to Excel



Aligning Existing Field Guides - Step 3: Create an SWS Reference Table

Field Guide Topic	Applicable SWS Details		
	3.1002.2	**Stairwell to Attic—Door at Bottom with No Ceiling Above**	
	Topic	Attics	
Attic Access Air Sealing and Insulation	**Subtopic**	Open Stairwells	
Section 1, Pages 5-7	**Desired Outcome**	Stairwell sealed to prevent air leakage and moisture movement between the attic and the conditioned space	
	Single-Family Homes		
	Title	**Specification(s)**	**Objective(s)**
	3.1002.2a	An inspection will be conducted for mold, water leaks, and water damage before sealing an open stairwell	Repair moisture-related issues
	Pre-inspection		
		Repairs will be completed before work begins	
	3.1002.2b	Materials will be installed in line with the ceiling level with an airtight and operable insulated panel weighing no more than 15 pounds, or a pre-fabricated kit may be used for repeated access	Prevent air leakage through stairwell between conditioned space and attic
	Option 1: bring stairwell inside		
		OR	Ensure the insulated panel is lightweight and easy for the occupant to use on an ongoing basis
		Airtight seal will be provided between level of new closure or cap and interior ceiling around perimeter	Support insulation
		Access will be gained as needed (e.g., pull flooring)	Bring the stairwell inside of the thermal boundary
			Ensure the new closure ties into the existing air barrier on all sides

Creating New Field Guides: Incorporate SWS

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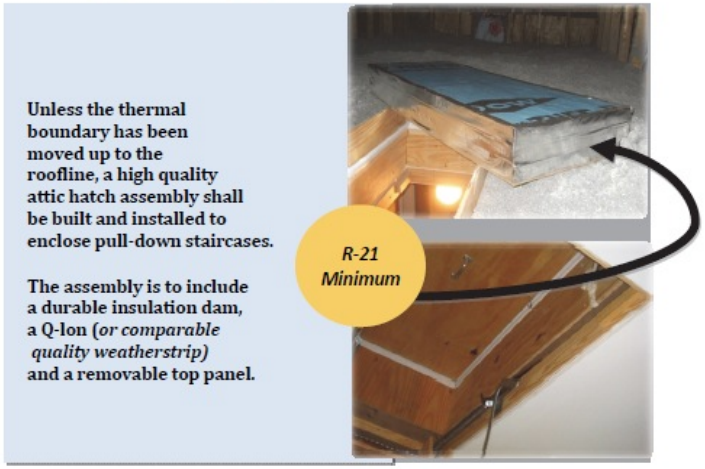
Section 1: Top of Building

Flat Attics *(continued)*
Attic Access (Pull Down Stairs)



Assembly Requirements:

- ✓ R-21 represents the minimum allowable insulation value for hatch assemblies.
- ✓ Higher R-values should be strived for whenever roof clearances allow.
- ✓ The sides of a hatch assembly/insulation dam shall be sealed air tight.
- ✓ Insulation must continue up the dam to the height of the Q-lon.
- ✓ If the Q-lon is above the settled depth of any blown-in insulation then the sides of the assembly shall be insulated separately with either HI-R (polyisocyanurate) or closed-cell spray foam.

Section 1: Page 7

4.1006.2
Access hatches will be insulated with non-compressible insulation to the same R-value as adjoining insulated assembly

Attic hatches rough opening will be surrounded with a durable protective baffle that is higher than the level of the surrounding attic floor insulation

Access hatch frames will be sealed using caulk, gasket, weatherstrip, or otherwise sealed with an air barrier material, suitable film, or solid material

Options will include installing a latch or lock or frictionally engaged components of a pre-fabricated unit above the opening that do not require a latch

The measure must include a protective baffle or insulation barrier

Insulation will be permanently attached and in complete contact with the air barrier

Completed measure will meet a minimum expected service life of 20 years

Purpose of insulation and proper hatch operation will be communicated to occupant

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SWS Field Guide Template Tool

Weatherization Works

STANDARD WORK SPECIFICATIONS

3.1003.6 B-C CAPPING SOFFITS

DESIRED OUTCOME: Soffit is capped to prevent air leakage or moisture movement between the attic and conditioned space

SELECTED STANDARD WORK SPECIFICATIONS

TITLE	SPECIFICATION(S)	OBJECTIVE(S)
3.1003.6b Soffit general	Air flow will be blocked at soffit in locations where access allows	Provide continuous air barrier across soffit openings
3.1003.6c Option 1: Bring soffit inside (seal at tops)	Entire opening will be spanned with rigid material in line with the ceiling level Material will be cut to fit and fastened as required	Prevent air leakage from wall to attic Reduce opening to what can be sealed with sealant Ensure closure is permanent and supports any load (e.g., wind, insulation) Bring soffit into thermal boundary

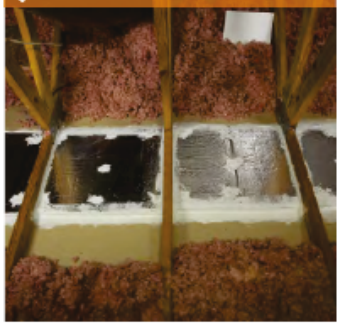
** Materials and tools listed are only recommendations and may not include everything needed to complete job.*

Wall cavities within the SOFFIT/ DROPPED CEILING are open to the attic.

Wall cavities capped and air-sealed.

✗ BEFORE

✓ AFTER



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STANDARD WORK SPECIFICATIONS

3.1003.6 B-C CAPPING SOFFITS

Prepare work area.

1 PREPARE

Install support material (e.g., 2X) for spans wider than 24 inches.

2 INSTALL SUPPORT

NOTICE: If air sealant is a foam plastic, it must be covered with an approved thermal barrier (e.g. rockwool, slag wool).

3 FIRE RATING

Install and fasten rigid sheathing over soffit/dropped ceiling.

4 RIGID SHEATHING

Seal all cracks, seams, and holes of rigid material with an appropriate material based on hole size.

5 SEAL SHEATHING

Seal all cracks, seams, and holes of adjacent framing with an appropriate material based on hole size.

6 SEAL FRAMING

Notes:

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