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

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.
<table>
<thead>
<tr>
<th>Section 1, Page 1</th>
<th>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.</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1005.2 Accessible Floors—Loose Fill Installation</td>
<td>Desired Outcome: Consistent, thermal boundary between conditioned and unconditioned space controls the heat flow</td>
</tr>
<tr>
<td>Topic: Attics Subtopic: Attic Floors</td>
<td>Insulation will be adequately marked for depth a minimum of every 300 square feet of attic area, with measurement beginning at the air barrier</td>
</tr>
<tr>
<td></td>
<td>All electrical boxes will be flagged to be seen above the level of the insulation</td>
</tr>
<tr>
<td></td>
<td>Open electrical junctions will have covers installed</td>
</tr>
<tr>
<td></td>
<td>Insulation dams and enclosures will be installed as required</td>
</tr>
<tr>
<td></td>
<td>Existence of air barrier material in line with the knee walls will be installed or verified when dense packing</td>
</tr>
<tr>
<td></td>
<td>Air barrier material will not bend, sag, or move once dense packed</td>
</tr>
<tr>
<td></td>
<td>All insulation will be installed to the depth indicated on the manufacturer coverage chart for desired R-value</td>
</tr>
<tr>
<td></td>
<td>A signed and dated attic card will be provided that includes:</td>
</tr>
<tr>
<td></td>
<td>Insulation type</td>
</tr>
<tr>
<td></td>
<td>Installed thickness and settled thickness</td>
</tr>
<tr>
<td></td>
<td>Coverage area</td>
</tr>
<tr>
<td></td>
<td>R-value</td>
</tr>
<tr>
<td></td>
<td>Number of bags installed in accordance with manufacturer specifications</td>
</tr>
</tbody>
</table>
Creating New Field Standards Using the SWS Tool

Filter your favorites by Housing Type:

- Single-Family Homes
- Manufactured Housing
- Multifamily Homes

- State of Mind Work Quality Standards
  - 2.0201.1 Combustion Appliance Zone (CAZ) Testing
    Health and Safety > Combustion Safety > Combustion Safety Testing-General
  - 2.0301.1 Smoke Alarm
    Health and Safety > Safety Devices > Combustion Safety Devices
  - 2.0301.2 Carbon Monoxide Alarm or Monitor
    Health and Safety > Safety Devices > Combustion Safety Devices
  - 2.0403.1 Vented Crawl Spaces—Ground Moisture Barrier
    Health and Safety > Moisture > Vapor Barriers
  - 2.0403.2 Closed Crawl Spaces—Ground Moisture Barriers
    Health and Safety > Moisture > Vapor Barriers
  - 2.0403.3 Closed Crawl Spaces—Vapor Retarders on Walls
    Health and Safety > Moisture > Vapor Barriers
  - 2.0501.2 Radon—Basements and Crawl spaces
    Health and Safety > Radon > Air Sealing
  - 3.1001.1 Penetrations and Chases
    Air Sealing > Attics > Penetrations and Chases
  - 3.1002.1 Interior with Sloped Ceiling
    Air Sealing > Attics > Open Stairwells
  - 3.1003.1 New Ceiling Below Original—Old Ceiling Intact or Repairable
    Air Sealing > Attics > Dropped Ceilings and Soffits
  - 3.1201.1 Double-Hung Wood Windows
    Air Sealing > Windows and Doors > Maintenance, Repair, and Sealing
  - 3.1201.2 Single-Unit Window and Fixed Frame with Wood Sash
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

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

If manufactured panels are being used as attic hatch, it is recommended that additional sheets of R-8 (68mm) polyurethane be added on top of the product 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.

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 seal when closed.

Section 1: Top of Building

**Attic Hatch (Standard Assembly)**

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

**Backup Plan:**

- Making the stairwell the thermal boundary increases the number of surfaces that need to be insulated and reduces the existing R-value between the house and attic. When the stairwell area in addressed in this manner, it is often difficult to get an effective seal that keeps warm air out of the attic. For these reasons, creating the walls of the stairwell, the stair, and the door at the bottom of the stairwell is strongly discouraged. If building a hatch assembly at the top of the stairwell is not possible, this weatherization practice is allowable.

**Preferred Thermal Boundary**

- Better Results

**Less Surface Area**

- R-21 Minimum

**Assembly Requirements:**

- R-21 represents the minimum allowable insulation value for hatch applications.
- Higher-R values should be specified for wherever roof clearances allow.
- The sides of a hatch assembly/insulation dam shall be sealed air tight.
- Insulation must continue up to the dam to the height of the 5-lin.
- If the door is above the settled depth of any blown-in insulation then the entire surface of the assembly shall be insulated separately with either R-8 (polyisocyanurate) or closed-cell spray foam.
Aligning Existing Field Guides - Step 2: Select Relevant SWS and Export to Excel
### Aligning Existing Field Guides - Step 3: Create an SWS Reference Table

<table>
<thead>
<tr>
<th>Field Guide Topic</th>
<th>Applicable SWS Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Attic Access Air Sealing and Insulation</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Topic</strong></td>
<td>Attics</td>
</tr>
<tr>
<td><strong>Subtopic</strong></td>
<td>Open Stairwells</td>
</tr>
<tr>
<td><strong>Section 1, Pages 5-7</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Desired Outcome</strong></td>
<td>Stairwell sealed to prevent air leakage and moisture movement between the attic and the conditioned space</td>
</tr>
</tbody>
</table>

#### Single-Family Homes

<table>
<thead>
<tr>
<th>Title</th>
<th>Specification(s)</th>
<th>Objective(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1002.2a</td>
<td>An inspection will be conducted for mold, water leaks, and water damage before sealing an open stairwell</td>
<td>Repair moisture-related issues</td>
</tr>
<tr>
<td>Pre-inspection</td>
<td>Repairs will be completed before work begins</td>
<td></td>
</tr>
<tr>
<td>3.1002.2b</td>
<td>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</td>
<td>Prevent air leakage through stairwell between conditioned space and attic</td>
</tr>
<tr>
<td>Option 1: bring stairwell inside</td>
<td>OR</td>
<td>Ensure the insulated panel is lightweight and easy for the occupant to use on an ongoing basis</td>
</tr>
<tr>
<td></td>
<td>Airtight seal will be provided between level of new closure or cap and interior ceiling around perimeter</td>
<td>Support insulation</td>
</tr>
<tr>
<td></td>
<td>Access will be gained as needed (e.g., pull flooring)</td>
<td>Bring the stairwell inside of the thermal boundary</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ensure the new closure ties into the existing air barrier on all sides</td>
</tr>
</tbody>
</table>
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.

### 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.
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

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

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

Wall cavities capped and air-sealed.

NOTES

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

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

3 FIRE RATING

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

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

4 RIGID SHEATHING

Install and fasten rigid sheathing over soffit/dropped ceiling.

5 SEAL SHEATHING

6 SEAL FRAMING

Notes:

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