



Wahkiakum PUD is helping its residential customers reduce their monthly electric bills and make their homes more comfortable through its weatherization program. Attic, wall, and floor insulation can improve the thermal performance of an existing home. If properly installed, insulation will help maintain more constant and comfortable temperatures while preventing build-up of moisture and condensation. Qualifying homes may include single-family, multi-family and manufactured homes heated with electricity.

PROGRAM GUIDELINES

Customer eligibility:

- **Pre-approval is required for all utility rebate programs prior to installation** and expires sixty (60) days after approval – projects that require longer than sixty days to complete must obtain special approval from Wahkiakum PUD.
- Must be a current residential electric customer of Wahkiakum PUD.
- Customer must participate in onsite inspection(s) and documentation requirements as required by utility to verify eligibility and installation of materials/equipment.
- Funds for this program are limited. This program is offered on a first-come, first-served basis and is effective until funding is expended or the program ends. Wahkiakum PUD reserves the right to deny an application, modify or discontinue this program without prior notice at the PUD's sole discretion and reserves the right to determine eligibility and the right to verify equipment and materials installed. Incomplete projects may not qualify for rebates.

Pre-condition characteristics of the space:

- Existing qualifying manufactured home (1984 or newer), single-family home and multi-family home and used primarily for residential purposes.
- Home must be heated with one of the following (spaces without heating are not eligible):
 - Electric heating system (e.g. heat pump, zonal, plug-in heaters) serving $\geq 50\%$ of residence
 - Wood or pellet: Eligible when accompanied by any electric heating system
 - Oil/Gas/Propane: Eligible if integrated with an electric heat pump
 - Oil/Gas/Propane: Eligible if accompanied by a separate electric heat system **if** the oil, gas or propane heating system is decommissioned
- Rebates are available for:
 - Single-family homes: attics, floors and walls
 - Manufactured homes: attics and floors
 - Multifamily low-rise (5+ dwelling units within the same structure that is no more than 3 stories high): attics, floors and walls (eligible only if pre-existing value is R-0)
 - Multifamily mid/high-rise (5+ dwelling units within the same structure that is greater than 3 stories high.): roof and walls (eligible only if pre-existing value is R-0)
- Must have a minimum of one year of active, electric services (new construction is not eligible).

Post-condition, qualifying contractor and equipment selection:

- Installation contractor must be licensed to work in Washington State (self-install does not qualify); visit [WA State Department of Labor & Industries](http://www.wa.gov/department-of-labor-and-industries) or contact Wahkiakum PUD to confirm contractor eligibility.
- Insulation products must be rated by material R-values to qualify. Products that potentially achieve an R-value based on assembled requirements, reflectivity and/or emissivity do not qualify.
- Installation measures in single-family and manufactured homes must be installed according to [BPA's Weatherization Specifications and Best Practices Guide](#).
- Customer is responsible for checking with and fulfilling any state, county, city government and/or homeowner's association codes, ordinances, local conditions, restrictions, rules and regulations and obtaining any required building permits when installing measures.

REBATE RATES

Rebate amount cannot exceed the total cost of the project.

- Rebate rates range from \$0.09 - \$2.00 per square footage of insulation installed, based on primary building type, building component (attic, floor, wall) insulated, pre-existing insulation R-values and installed R-values. Project rebate rates will be captured during the pre-approval process.

DOCUMENTATION CHECKLIST

Prior to Installation

To receive pre-approval submit the following documents to Wahkiakum PUD before installation of equipment:

1. Wahkiakum PUD Residential Insulation Rebate Pre-qualification Request Form
2. **Single-family and Manufactured homes (if applicable):** Follow BPA's Weatherization Specifications and Best Practices Guide (www.wahkiakumpud.org/post/insulation)
3. **Ridged board insulation in unvented attic or exterior roof (if applicable):** Wahkiakum PUD must perform an in-progress inspection to verify the insulation board is properly installed and sealed before covering rigid board

After Installation

The following documentation must be provided to Wahkiakum PUD within 14 days of installation:

1. Notify utility and participate in onsite post-inspection as required to verify eligibility
2. **Knob-and-tube wiring (if applicable):** Insulation that is installed in contact with active knob-and-tube wiring must be approved in writing by a licensed electrician
3. Equipment/contractor invoice showing:
 - a. Physical address of installation
 - b. Order or purchase date
 - c. Size and quantity of product installed for each location (must itemize attic, floor & walls separately):
 - Location where new insulation installed (attic, walls and/or floors)
 - Square footage of each insulated location
 - R-values of pre and post-retrofit insulation for each insulated location
 - Type and quantity of product installed for each insulated location
 - Actual cost
4. Verification installation has cleared all required building permits (if applicable)

**To learn more, contact Wahkiakum PUD at
360-795-3266 or 360-465-2171 or visit www.wahkiakumpud.org**



Residential Insulation Rebate Pre-qualification Request Form

PRE-QUALIFICATION REQUEST: Pre-approval is required and expires sixty (60) days after approval.

Homeowner name		Homeowner phone	
Physical address		PUD account number	
Mailing address			
Year building built		Square footage of heated space	Estimated cost
Home type	☐ Single-family home ☐ Manufactured Home ☐ Multi-Family (low-rise: 3 stories or less) ☐ Multi-Family (high-rise: greater than 3 stories)		

INSTALLATION INFORMATION & NEW EQUIPMENT

Installation company				
Company phone		Contractor license number		
Existing heat source (check all that apply)	☐ ductless or ducted heat pump ☐ electric heat pump ☐ baseboard cadet or ceiling ☐ plug-in space heaters ☐ electric forced air furnace ☐ wood or pellet stove ☐ electric heat pump integrated with nonelectric heating (e.g., oil, propane, et.) ☐ electric heat system with decommissioned nonelectric heating system* ☐ Other _____ <i>* if system is not integrated with an electric heat pump, the entire separated non-electric space heating system must be decommissioned, removed, all penetrations sealed, and all fuel (gas, electric, oil) connections to the decommissioned heating system disconnected.</i>			
What is being installed (label knee walls as "walls")	Location 1 ☐ Attic ☐ Floor ☐ Wall Square footage _____ Current R-Value _____ Proposed R-Value _____	Location 2 ☐ Attic ☐ Floor ☐ Wall Square footage _____ Current R-Value _____ Proposed R-Value _____	Location 3 ☐ Attic ☐ Floor ☐ Wall Square footage _____ Current R-Value _____ Proposed R-Value _____	Location 4 ☐ Attic ☐ Floor ☐ Wall Square footage _____ Current R-Value _____ Proposed R-Value _____

SIGNATURE and DISCLAIMER

Applicant is responsible for adhering to Program Guidelines. Wahkiakum PUD hereby disclaims any and all implied warranties (including but not limited to implied warranties of merchantability or fitness for a particular purpose) and shall not be responsible for any representation or promise with respect to the equipment, materials or labor required for the installation of energy efficiency measures on the premises, or the cost of such equipment, materials and labor. By signing this form, I understand that Wahkiakum PUD will make the final determination of any incentive that I may receive. Programs are subject to change without notice.

 I acknowledge installation must be installed according to BPA's Weatherization Specifications and Best Practices Guide (view at <https://www.wahkiakumpud.org/post/insulation>).

Homeowner signature:  **Date:** _____

Optional Release: By owner signing below I release my utility rebate to be paid directly to the installation contractor:


To obtain pre-approval, submit forms to Wahkiakum PUD:

By Fax: 360-795-8441 or Email: cs@wahkiakumpud.org

By Mail: PO Box 248, Cathlamet WA 98612

In Person: 45 River Street, Cathlamet WA 98612

Questions? Contact Wahkiakum PUD:

Phone: (360) 795-3266 or (360) 465-2171

Online: www.wahkiakumpud.org

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Attic Insulation Preparation Checklist

This **Attic Insulation Preparation Checklist** includes Prep and Installation measures that will result in a quality project. This checklist includes Residential Weatherization Specifications & Best Practices Guide sections: 4 through 4.1.5. This checklist calls out both utility weatherization program requirements, which are **bolded**, as well as best practices, which are not bolded.

Check with the local serving utility what incentives are available and what the required qualifications, specifications, and documentation are for its program

4 ATTIC AND ROOF CAVITY INSULATION

Comply with the following bolded preparation and installation requirements for attic and roof-cavity insulation. Additional recommended best practice steps are included as well.

4.1 PREPARATION FOR ATTIC AND ROOF CAVITY INSULATION

Before insulating, contractors must prepare an attic so that weatherization measures are as effective as possible, are durable and long-lasting, and create no negative unintended consequences.

4.1.1 GENERAL ATTIC/ROOF PREPARATION

- ☐ **Remove all degradable and absorbent scrap materials from the attic that might eventually rot and damage the structure, especially wood and cardboard.**
- ☐ **Repair any water leaks and moisture damage prior to performing work.**
- ☐ Ensure the ceiling material is intact and able to support insulation weight.

4.1.2 ATTIC INSULATION SHIELDS

- ☐ **Attach rigid, non-combustible shields to the ceiling structure to maintain a 3-inch clearance around the perimeter of recessed light fixtures and other heat producing fixtures that aren't IC rated.**
- ☐ **Exhaust fans without light fixtures and exhaust fans with IC-rated fixtures are not considered heat-producing fixtures, and do not require shielding.**
- ☐ **Insulation shields must extend at least 4 inches above the level of the new insulation, and any insulation must be removed from the top and inside of the insulation shield.**
- ☐ **Contractors may install non-combustible insulation (labeled as meeting ASTM E-136) with no clearance around flues and chimneys if permitted by a local code official.**



Attic Insulation Preparation Checklist

4.1.3 INSULATION DAMS AND BAFFLES

- ☐ **Insulation dams maintain the insulation's full R-value to the edge of an insulated space, and prevent blown insulation from blocking vents or sloughing where insulation levels differ or spilling into uninsulated areas.**
- ☐ **Insulation dams must use one of the following two methods:**
 - **Build dams with rigid materials such as plywood, OSB, foam board, or cardboard.**
 - **Permanently secure the dam to attic framing.**
- ☐ **Rigid dams must extend 4 inches above the final level of the insulation.**
- ☐ **Use durable materials like OSB or plywood for areas where occupants may need access.**
- ☐ **Dams made of batts are a good solution when attic framing doesn't allow for construction of a rigid dam. Create dams with fiberglass batts laid flat that are at least 15 inches wide and that create an R-value equal to the R-value of the remainder of the attic.**
- ☐ **Whenever fibrous insulation is installed where occupants might access for storage or maintenance, contractors must cover the fibrous insulation with a vapor-permeable air barrier (for example: house wrap, drywall).**
- ☐ **Damming shall be installed around mechanical and storage platforms in the attic to prevent loose-fill insulation from spilling onto the floored attic and to provide access for maintenance or replacement of equipment and access to storage.**

4.1.4 BAFFLES FOR EAVE AND SOFFIT VENTS

Comply with the bolded requirements when installing eave baffles. Additional recommended best practice steps are included as well.

- ☐ **Remove any existing insulation or other debris from the eave or soffit vents.**
- ☐ **Baffles must be rigid and air impermeable.**
- ☐ **Baffles must extend at least 4 inches above the final level of insulation.**
- ☐ **Maintain an opening between the baffle and the roof sheathing equal to or greater than the area of the soffit vent.**



Attic Insulation Preparation Checklist

4.1.4 BAFFLES FOR EAVE AND SOFFIT VENTS (cont.)

- ☐ Install the baffle far enough into the rafter bay to reach the exterior side of the top plate in order to achieve the best R-value possible above the top plate.
- ☐ Fasten the baffles to the roof rafters with no less than 9/16-inch galvanized staples or roofing nails.

Address continuous soffit ventilation with one of the following methods:

- ☐ Where a continuous soffit vent exists, install a baffle in each rafter bay.
- ☐ Install baffles, equally spaced along the soffit. Seal the unbaffled rafter bays with a rigid, moisture-resistant material.
- ☐ Where one or more existing ventilation openings need to be relocated, the existing opening(s) shall be closed off with solid sheathing or other weather-resistant material and sealed and patched to match the existing finishes (e.g., exterior roofing, siding or soffit).

4.1.5 PIPE INSULATION

Exposed water pipes in attics may freeze or lose energy to the cold air.

- ☐ If water or hydronic pipes won't be covered by at least one inch of attic insulation, wrap the pipes according to "11 Hydronic and Water-Pipe Insulation." Insulate the walls to a minimum of R-11 for a 2x4 cavity, and R-21 for a 2x6 cavity.

ADDITIONAL INFORMATION

Free resources, additional training and one-on-one support are available through Comfort Ready Home. Visit [ComfortReadyHome.com](https://www.comfortreadyhome.com) to contact your [Comfort Ready Home Field Specialist](#) or visit the [Online Learning Center](#) for on-demand training.



Attic Insulation Installation Checklist

This **Attic Insulation Installation Checklist** includes Prep and Installation measures that will result in a quality project. This checklist includes Residential Weatherization Specifications & Best Practices Guide sections: 4 and 4.5. This checklist calls out both utility weatherization program requirements, which are **bolded**, as well as best practices, which are not bolded.

Check with the local serving utility what incentives are available and what the required qualifications, specifications, and documentation are for its program

4 ATTIC AND ROOF CAVITY INSULATION

Comply with the following bolded preparation and installation requirements for attic and roof-cavity insulation. Additional recommended best practice steps are included as well.

4.5 ATTIC INSULATION: INSTALLATION

Attic insulation must be carefully installed to effectively reduce energy waste and improve the comfort of a home. Take care to thoroughly insulate the entire attic area. Flaws such as voids or gaps allow heat to be transferred into the attic. Leave no voids or low levels of insulation

4.5.1 BLOWN ATTIC INSULATION

Install loose-fill insulation to the surface between the conditioned space and attic with a uniform R-value. Comply with these bolded steps when installing loose-fill attic insulation. Additional recommended best practice steps are included as well.

- ☐ Setup a dust control enclosure for all interior access locations that limits insulation and construction dust exposure to the occupant and occupant belongings.
- ☐ Determine material selection and type (fiberglass, cellulose, mineral wool and batt vs loose fill) based on access, existing insulation, framing spacing, material weight, and ceiling condition prior to installing insulation.
- ☐ Calculate the number of bags of blown insulation needed to achieve the R-value specified on the work order from the table on the bag's label or by using a density/R-value calculator.
- ☐ **Install one insulation depth ruler for every 300 square feet of attic area. Depth rulers should face the attic entrance.**
- ☐ Install flags to mark all electrical junction boxes that can be seen above the final level of the insulation.
- ☐ Adjust the blower to move as much insulation as possible through the blower hose with the available air pressure. The more that the insulation is packed together while flowing through the blowing hose, the greater the insulation's installed density will be.



Attic Insulation Installation Checklist

4.5.1 BLOWN ATTIC INSULATION (cont.)

- ☐ Insulating the eaves fully can be difficult, but substandard insulation in these areas can reduce the effectiveness of the entire insulation project by 10%.
- ☐ **Pack insulation against the eave baffle or roof deck to achieve the highest possible R-value in places where the full intended thickness of insulation won't fit.**
- ☐ When filling a tight eave space, push the hose out to the edge of the ceiling. Allow the insulation to fill and pack before pulling the hose back toward you.
- ☐ Fill the edges of the attic first, near the eaves or gable end, then fill the center.
- ☐ **Install insulation to a consistent depth. Level the insulation if necessary.**
- ☐ Post an Installer Record at the electrical panel, circuit box, or other location approved by the homeowner as a record of work performed.

4.5.2 BATT-TYPE INSULATION

Comply with the bolded requirements when installing eave baffles. Additional recommended best practice steps are included as well.

- ☐ **Install batts in contact with the surface between the conditioned space and attic, cut to fit, placed tightly together with no gaps except those required for clearance around heat-producing fixtures.**
- ☐ **Install baffles and shields prior to installing batt-type insulation.**
- ☐ **Cover the exterior of the top plates of exterior walls. You may compress the batts at the eaves if necessary to cover the top plates.**
- ☐ Be careful not to push vent baffles out of position. Maintain an opening for fresh air.
- ☐ Where practical, place one layer of batts between the joists and add a layer either perpendicular to or offset from the first layer to cover the seams and minimize voids in the insulation.
- ☐ If the batt contains a facing material, install it in contact with the conditioned space barrier.



Attic Insulation Installation Checklist

4.5.3 FOAM INSULATION

In an open attic, a sloped roof cavity, or an attic knee wall, both spray and rigid foam are acceptable types of insulation, provided they meet the following requirements.

- ☐ The foam insulation must meet the minimum requirements for R-value.
- ☐ Contractors must install the foam insulation in contact with the surface that separates attic and conditioned space.
- ☐ The foam insulation must comply with thermal-barrier and ignition-barrier code requirements for “foam plastics,” as defined by the local building code or allowed by local building officials.
- ☐ In colder climates (high elevations in the Northwest or east of the Cascade Mountain range) install Spray Polyurethane Foam (SPF) to a thickness of at least a class II vapor retarder or have at least a class II vapor retarder coating or covering in direct contact with the underside of the SPF.

4.5.4 VAPOR RETARDERS

- ☐ If fiberglass batts with a vapor-retarder are installed in an attic with no existing insulation, the vapor retarder must touch the attic side of the drywall or plaster ceiling.
- ☐ If insulation already exists in an attic, don't install batts with a vapor retarder on top of the existing insulation.

4.5.5 INTERIOR ATTIC ACCESS DOORS

Access doors must be insulated and sealed in a durable and effective manner. Comply with the following **bolded** requirements for interior access doors to the attic when insulating the attic.

- ☐ **Permanently attach weatherstripping to the attic-access door or frame to create an effective air seal between the door frame and the door.**
- ☐ **Repair air leaks or replace the door prior to insulating.**

Insulate vertical access doors to at least R-11 and horizontal access doors to at least R-30 using one of these three methods.
- ☐ **Attach batt-type insulation to the door with twine, wire or vapor-permeable house wrap. Attach the twine, wire, or house wrap to the door in order to secure the batt. A vapor-permeable air barrier material must cover the fiberglass door insulation if occupants enter the attic for storage or maintenance. A vapor-permeable air barrier material must cover the fiberglass door insulation if occupants enter the attic for storage or maintenance.**



Attic Insulation Installation Checklist

4.5.5 INTERIOR ATTIC ACCESS DOORS (cont.)

- ☐ **Attach foam board using construction adhesive to achieve R-30 or greatest attainable R-value that still allows the door to function.**
- ☐ **Install a dam around the attic hatch opening to maintain the full level of ceiling insulation to the edge of the opening and to prevent insulation from falling into the living space. Comply with one of the following options to build a dam.**
- ☐ **Frame the opening with dimension lumber, OSB or plywood. Permanently attach the framing and extend it at least 4 inches above the final level of insulation. Don't use cardboard or foam board to dam around access hatches. Cardboard and foam board aren't durable materials where they are readily accessible to occupants.**
- ☐ **Place a minimum of 15-inch wide insulation batt laid flat, with an R-value equal to that specified for the attic, tightly around the perimeter of the access opening. Install the dam with no gaps or voids. Maintain a consistent level of insulation in all outward directions from the access opening, including corners.**
- ☐ **Whenever fibrous insulation is installed where occupants might access for storage or maintenance, contractors must cover the fibrous insulation with a vapor-permeable air barrier (for example: house wrap).**

4.5.6 PULL-DOWN STAIRS

Comply with these bolded requirements when a pull-down-stair assembly separates the attic from the conditioned space of the house. Additional recommended best practice steps are included as well.

- ☐ **Weatherstrip and insulate all pull-down stairs in heated areas to a minimum of R-10.**
- ☐ Often, the most effective way to seal and insulate a pull-down stair is to build a box over the top using rigid foam insulation. This box should be sealed at the edges and have latches to hold it in place.
- ☐ **Contractors may install new pull-down stair assemblies with a minimum R-5 insulation rating. The insulation must be between conditioned space and the attic stair assembly and gaskets or weatherstripping must minimize air leakage.**

4.5.7 EXTERIOR ATTIC ACCESS DOORS

- ☐ **Any outside access door with continuous exposure to the outdoors must be weatherproof and animal- proof.**



Attic Insulation Installation Checklist

4.5.8 WALLS IN ATTIC AREAS

Comply with all of these **bolded requirements for open walls in attic areas**. Additional recommended best practice steps are included as well.

- ☐ Seal all penetrations through the wall with caulk or foam.
- ☐ **Install wall insulation prior to installing ceiling insulation. This insulation must be a minimum of R-11 in a 2x4 cavity, and R-21 in a 2x6 cavity.**
- ☐ **When adding new insulation over existing wall insulation, completely fill the cavity.**
- ☐ **If you install a vapor retarder, install it in contact with the heated surface. Heated surface is commonly referred to as the air barrier.**
- ☐ **Cover new attic wall insulation with a durable, vapor-permeable air barrier material to prevent air penetration of the insulation and to ensure that the insulation is held in full contact with the wall.**
- ☐ **Fasten the air-barrier material so that it permanently supports the knee wall insulation.**
- ☐ **Insulate knee wall access door and hatches to R-11 and weatherstrip them to create an effective air seal. Pre-manufactured foam-core doors are an acceptable option. If side attic area will be accessed (used for storage), cover the insulation with a vapor-permeable material.**

4.5.9 FLOORED ATTICS

Comply with these requirements when insulating under floor boards of floored attics.

- ☐ Cavities below decked storage areas must be insulated to the highest practical level.
- ☐ Light fixtures below decked storage areas must be IC-rated.
- ☐ Insulate under attic floorboards with tightly packed blown fibrous insulation.

To fill the cavities, lift the boards or drill holes no more than 4 feet apart. Avoid over-filling the cavities because the pressure can damage the ceiling materials below.

- ☐ If installing insulation in non-decked areas of the attic, prevent loose-fill insulation from falling onto the storage deck using a dam according to **“4.1.3 Insulation Dams and Baffles.”**



Attic Insulation Installation Checklist

4.5.9 FLOORED ATTICS (cont.)



Sweep or vacuum spilled insulation off the storage decking after installation.

ADDITIONAL INFORMATION

Free resources, additional training and one-on-one support are available through Comfort Ready Home. Visit [ComfortReadyHome.com](https://www.comfortreadyhome.com) to contact your [Comfort Ready Home Field Specialist](#) or visit the [Online Learning Center](#) for on-demand training.



Manufactured Homes Roof Insulation Checklist

This **Manufactured Homes Roof Insulation Checklist** includes Prep and Installation measures that will result in a quality project. This checklist includes Residential Weatherization Specifications & Best Practices Guide sections: 5 through 5.2 and 5.3.1 through 5.3.3. This checklist calls out both utility weatherization program requirements, which are **bolded**, as well as best practices, which are not bolded.

Check with the local serving utility what incentives are available and what the required qualifications, specifications, and documentation are for its program

5 MANUFACTURED HOMES: CEILING AND ROOF INSULATION

Insulate to the maximum level possible. Check with local code or the local serving utility weatherization programs for minimum insulation levels.

5.1 GENERAL REQUIREMENTS FOR INSULATING CEILING AND ROOFS

Comply with these general bolded requirements for insulating the roof cavities and attics of manufactured homes. Additional recommended best practice steps are included as well.

- ☐ Verify that the installation area is free of active water leaks and pest intrusions.
- ☐ Consider setting up a dust control enclosure for all interior access locations that limits insulation and construction dust exposure to the resident and resident's belongings.
- ☐ **Seal all ceiling penetrations before insulating ceiling cavities.**
- ☐ **If the ceiling cavity contains a non-ducted return-air system, seal the opening to the attic and provide return air, either through ductwork or vent to the main area of the home.**
- ☐ **For vented roof cavities, comply with all applicable requirements in “4 Attic and Roof-Cavity Insulation.”**
- ☐ **Insulate ceiling cavities under flat or crowned metal roofs by completely filling them with blown-in fiberglass insulation.**
- ☐ **Seal all existing attic ventilation except existing roof jacks.**
- ☐ **Insulate attics under pitched roofs to R-38 when possible and ventilate the attic to comply with “4.2 Passive Attic Ventilation.”**
- ☐ **Exhaust fans and ducts along with dryer ducts, located in the roof cavity, must comply with requirements in “4.3 Exhaust Fans.”**
- ☐ If practical, in cooler climates, install insulation on the exterior roof surface to reduce the potential for moisture condensation in the roof cavity.



Manufactured Homes Roof Insulation Checklist

5.2 EXTERIOR ROOF INSULATION

Contractors must comply with the below bolded insulation requirements when adding exterior roof insulation. Additional recommended best practices steps are included as well.

☐ Verify that the roof structure is sound and can support additional weight of insulation and roofing materials installation.

☐ **Install exterior roof insulation to a minimum of R-7.**

☐ **Fully insulate the ceiling cavity below and eliminate all vents. Don't install insulation over vented ceiling cavities or over cavities containing air spaces.**

☐ **Roof systems must effectively drain water away from the structure. All penetrations through the roof covering and all joints between the roof covering and vertical surfaces must be flashed (for example: walls, chimneys and plumbing vents).**

Other methods of installing exterior roof insulation must be approved by the local serving utility in writing prior to beginning the work.

☐ If installing multiple layers of rigid roof insulation, offset the seams of the various roof product installations a minimum of 12 inches.

5.3.1 PREPARING TO BLOW A MANUFACTURED HOME ROOF

☐ **Reinforce weak areas in the ceiling and seal all penetrations.**

☐ **Take steps to maintain safe clearances between insulation and recessed light fixtures and ceiling fans. See "4.1 Preparation for Attic and Roof-Cavity Insulation" for more information.**

5.3.2 RAMADA ROOFS

A ramada roof is a free standing (self-supporting) covering over a manufactured home. Comply with these requirements when adding insulation under a ramada roof and on top of the manufactured home's original roof.

☐ **The ramada roof must be weatherproof and joined to the manufactured home (per local code) to create an enclosed attic cavity. This prevents the entry of weather and pests.**

☐ **The attic cavity must meet the ventilation requirements of the site-built specifications.**



Manufactured Homes Roof Insulation Checklist

5.3.2 RAMADA ROOFS (cont.)

- ☐ **Extend all exhaust-fan ducts, plumbing vent stacks, etc. to the outside and install a termination in accordance with local code requirements.**
- ☐ **Open the original roof cap of the manufactured home to allow a full fill of insulation inside the attic cavity.**
- ☐ **Install the insulation above the original roof to provide an installed level of R-38. Don't seal the openings in the original roof.**
- ☐ **Seal all ceiling penetrations before the insulation is installed.**

5.3.3 BLOWING A MANUFACTURED HOME ROOF FROM THE TOP

- ☐ Cut 10-inch square holes at the roof's apex on top of every second truss. Each square hole permits access to two truss cavities.
- ☐ Use a 2-inch or 2-1/2-inch diameter fill-tube. Insert the fill-tube and push it forcefully out toward the edge of the cavity.
- ☐ Blow fiberglass insulation into each cavity.
- ☐ Stuff the area under each square hole with a piece of unfaced fiberglass batt so that the finished roof patch will stand a little higher than the surrounding roof.
- ☐ Patch the hole with a 14-inch-square piece of stiff galvanized steel, sealed with roof cement and screwed into the existing metal roof.
- ☐ Cover the first patch with a second patch 18-inch square piece of foil-faced butyl rubber.

ADDITIONAL INFORMATION

Free resources, additional training and one-on-one support are available through Comfort Ready Home. Visit ComfortReadyHome.com to contact your *Comfort Ready Home Field Specialist* or visit the [Online Learning Center](#) for on-demand training.



Underfloor Insulation Checklist

This **Underfloor Insulation Checklist** includes Prep and Installation measures that will result in a quality project. This checklist includes Residential Weatherization Specifications & Best Practices Guide sections: 6 and 6.3. This checklist calls out both utility weatherization **program requirements, which are bolded**, as well as best practices, which are not bolded.

Check with the local service utility what incentives are available and what the required qualifications, specifications, and documentation are for its program.

6 UNDERFLOOR INSULATION

Comply with the bolded requirements when insulating the floor-joint cavities above a crawlspace or unconditioned basement. Additional recommended best practice steps are included as well.

6.3 INSTALLING UNDERFLOOR INSULATION

Insulate the floor to the maximum amount practical. Check with local code or the local serving utility weatherization programs for minimum insulation requirements.

6.3.1 INSTALLING FIBERGLASS BATT INSULATION

Comply with these bolded requirements when installing fiberglass batts in floor-joint spaces of the underfloor. Additional recommended best practice steps are included as well.

- ☐ **Cut batts to fit around water pipes, drain pipes, or other obstructions so no gaps or voids exist.**
 - ☐ Faced and unfaced batts are both acceptable. **If the installed batt has a vapor retarder facing (Kraft paper or foil-Kraft), the facing must be installed against the floor sheathing.** Kraft-faced fiberglass batts provide a vapor retarder. Foil-faced fiberglass batts provide a vapor barrier.
 - ☐ **Support fiberglass batts so that the batts remain in contact with the sub-floor, and remain in place for the life of the home. You can compress the insulation in order to achieve continuous contact with the bottom of the floor.**
 - ☐ **Support batts no more than 3 inches from the ends. Small batt pieces also need support.**
 - ☐ **Use one of the following materials to support floor insulation.**
 - **Wood lath—Wood lath needs to be a minimum of ¼ x 1 inch for spans up to 48 inches. Spans greater than 48 inches must use at a minimum nominal 1x2 lumber.**
 - **Twine—Twine must be non-stretching polypropylene or polyester.**
 - **Wire—Wire must be stainless steel, copper or an equivalent material of similar corrosion resistance, with a minimum diameter of 0.040 inch (size 18 AWG).**
- Self-supporting wire hangers aren't acceptable.**



Underfloor Insulation Checklist

6.3.1 INSTALLING FIBERGLASS BATT INSULATION (cont.)

Fasteners for floor-insulation support materials must meet the following requirements.

- ☐ **Staples must be driven with a power-actuated stapler to achieve at least 5/8 inch penetration. Hand stapling isn't a durable fastening technique and isn't allowed.**
- ☐ **Fasteners for lath, twine or wire may be hot-dipped galvanized nails, screws or corrosion-resistant staples that are at least 18-gauge and long enough to penetrate wood at least 5/8 inch.**
- ☐ **Faced and unfaced batts are both acceptable. Kraft-faced fiberglass batts provide a vapor retarder. Foil-faced fiberglass batts provide a vapor barrier.**

TABLE 5 SPACING REQUIREMENTS FOR UNDERFLOOR FIBERGLASS BATT SUPPORTS

Spans	Maximum Spacing
24 inches or less	☐ 18 inches apart
48 inches	☐ 12 inches apart
60 inches	☐ 8 inches apart
72 inches	☐ 6 inches apart

- ☐ **Fasten support systems to the underside of floor joists.**
- ☐ **Joists may be skipped, but the maximum span of skipped joists cannot exceed 48 inches.**
- ☐ **The spacing must be 12 inches or less.**
- ☐ **It is recommended to only consider using fasteners rated with a 20-year service life.**



Underfloor Insulation Checklist

6.3.2 INSTALLING BLOWN INSULATION

Comply with the below **bolded requirements** when blowing insulation into the floor-joist spaces of a **site built home**. Additional recommended best practice steps are included as well.

- ☐ **Blow only fiberglass or rock wool loose-fill insulation in a floor cavity.**
- ☐ **Use an insulation restrainer, like one of these below, to hold the blown insulation in the floor cavity.**
 - **Webbing or netting designed for restraining blown insulation.**
 - **A vapor-permeable polyolefin house wrap material.**
 - **Foam board insulation, especially in cold damp locations to prevent moisture condensation in the fibrous insulation.**
 - **Blow insulation through V-shaped holes in the restrainer.**
- ☐ **Use wood strips to support the flexible or semi-flexible retainer material unless that material with its fasteners can support the floor insulation permanently without sagging.**
- ☐ Use a fill tube for installing the blown insulation. Insulation must travel no more than 12 inches from the end of the fill tube.
- ☐ Seal all penetrations in the insulation restrainer with tape.
- ☐ For floors above garages, cut strips from drywall to access the tube for blowing insulation.

6.3.3 INSTALLING SPRAY FOAM FLOOR INSULATION

- ☐ **Foam insulations must meet thermal and ignition barrier requirements for “foam plastics,” as detailed by the local building code and enforced by local building officials.**
- ☐ **Spray foam insulation typically needs no support.**
- ☐ **When installing fiberglass batts or blown fiberglass underneath foam, as additional floor insulation or as an ignition barrier, support the fiberglass insulation. See “[6.3.1 Installing Fiberglass Batt Insulation](#)” or “[6.3.2 Installing Blown Insulation](#)” for more information.**



Underfloor Insulation Checklist

6.3.4 WALLS BETWEEN CONDITIONED SPACE AND UNDERFLOOR SPACES

Comply with the following bolded requirements when installing underfloor insulation.

Additional recommended best practice steps are included as well.

- ☐ **If the floor joist cavities are open between the conditioned and unconditioned spaces, block with a rigid material and seal with caulk or foam. Air seal the walls including any cavities between the floor joists.**
- ☐ **Insulate the walls to a minimum of R-11 for a 2x4 cavity, and R-21 for a 2x6 cavity.**
- ☐ **When no wall exists, construct an insulated and airtight wall.**
- ☐ If only framing exists, consider using faced insulation and installing a vapor-permeable air barrier on the crawlspace side. Alternatively, install drywall on the conditioned space side, netting on the crawlspace side, and blow in fiber insulation.

6.3.5 RIM JOIST INSULATION

Follow these best practices when installing rim-joist insulation in conditioned basements.

- ☐ Install rim joist insulation in conditioned basements only.
- ☐ The best practice is to seal the rim joist and insulate it with an air-impermeable insulation, to avoid condensation on the rim joist. Use one of these two methods.
 - Spray high-density polyurethane foam.
 - Install foam board sealed with one-part polyurethane foam.
- ☐ If foam isn't used, seal each joist bay for air leakage prior to installing insulation. Use at least R-13 or greater fiberglass batts, cut to fit and securely fastened.
- ☐ Fibrous insulation exposed to the living space should be covered with a vapor-permeable air barrier.
- ☐ Seal the sill plate to the foundation wall using an appropriate caulk product.

ADDITIONAL INFORMATION

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Manufactured Homes Underfloor Insulation Checklist

This **Manufactured Homes Underfloor Insulation Checklist** includes Prep and Installation measures that will result in a quality project. This checklist includes Residential Weatherization Specifications & Best Practices Guide sections: 7 through 7.3. This checklist calls out both utility weatherization program requirements, which are **bolded**, as well as best practices, which are not bolded.

Check with the local serving utility what incentives are available and what the required qualifications, specifications, and documentation are for its program

7 MANUFACTURED HOMES: UNDERFLOOR INSULATION

Check with local code or the local serving utility weatherization programs for minimum insulation levels. Comply with the requirements in this section when insulating the underfloor area of manufactured homes.

7.1 PREPARATION FOR UNDERFLOOR INSULATION

Before installing either blown or fiberglass batt underfloor insulation, take these steps to prepare the home.

- ☐ Remove debris and moisture-susceptible material from the crawlspace.
- ☐ Repair and seal any leaks or openings in the HVAC ducts and plenums before installing underfloor insulation.
- ☐ Ensure that all air sealing, ground cover, insulation, and belly repair materials have a 30-year or greater service life.
- ☐ Verify that the underfloor will be free of uncovered/unsafe electrical junctions that may be covered by insulation and/or belly material.
- ☐ **Install a ground cover in the crawlspace.**
- ☐ **If the floor contains a non-ducted return system, seal the opening to the crawlspace and provide return air, either by installing new return ducts or by installing a vent between the furnace-closet door and the main area of the home.**
- ☐ **Extend all water drains to the outside of the crawlspace, including condensate drains from air conditioning equipment.**
- ☐ **Extend all exhaust ducts, such as those for kitchen ranges and dryers, to the outside of the crawlspace.**
- ☐ **Seal the ducts and their termination fittings to prevent exhausted air from returning to the crawlspace or to the manufactured home when skirting exists.**
- ☐ Secure water pipes up and as close to the floor joists as possible, so insulation will fill in beneath them.



Manufactured Homes Underfloor Insulation Checklist

7.1 PREPARATION FOR UNDERFLOOR INSULATION (cont.)

- ☐ Seal all plumbing penetrations through the rodent barrier or floor before installing underfloor insulation
- ☐ Water pipes that aren't contained within the thermal envelope by underfloor insulation must be insulated and may be evaluated for heating cable as described in "6.1.5 Water Pipes in Crawlspaces."
- ☐ If the home has skirting, install a ground-cover moisture barrier before insulating the underfloor as detailed in "6.1.3 Ground-Moisture Barrier" and ventilate according to "6.1.4 Crawlspacse Ventilation."
- ☐ Be careful not to cover or block any fresh air intake for fireplaces or woodstoves.
- ☐ Avoid installing insulation between plumbing pipes and the living space if freezing could be an issue.
- ☐ Secure water pipes up, as close to the floor joists as possible, so insulation will fill in beneath them. If this is not possible, insulate the pipes separately or insulate the belly underneath the pipes, leaving the space above the pipes un-insulated to allow heat from the home to warm the pipes and prevent freezing. Install building-paper and insulation under the pipes, if necessary, to include the pipes in the heated envelope of the home.

7.2 BLOWN UNDERFLOOR INSULATION

In order to successfully install blown insulation, the rodent barrier must be in good or repairable condition.

Contractors must comply with the below bolded requirements installing for blown floor insulation. Additional recommended best practices steps are included as well.

- ☐ Determine if an installation through the rim or through the belly or rodent barrier will deliver the best result.
- ☐ Materials for insulation, air sealing and belly repair should have a minimum 30-year service life.
- ☐ Use expanding foam or other sealants to seal accessible floor penetrations.
- ☐ **Materials used to patch the rodent barrier must be vapor-permeable, durable and capable of supporting the insulation.**
- ☐ **Repair large holes in the rodent barrier to prevent insulation from falling into the crawlspace from the floor cavity.**
- ☐ **Stitch-staple repair materials to the rodent barrier, adhere patches with adhesive, or otherwise permanently affix the patches.**



Manufactured Homes Underfloor Insulation Checklist

7.2 BLOWN UNDERFLOOR INSULATION (cont.)

- ☐ **Blow only fiberglass insulation in the floor cavity of a manufactured home.**
- ☐ Blow the fiberglass material using a fill tube through V-shaped cuts in the rodent barrier.
- ☐ Install insulation to a density between 1.25 and 1.75 pounds of blown fiberglass per cubic foot. Do not attempt to dense-pack or overfill this area.

7.3 FIBERGLASS BATT UNDERFLOOR INSULATION

- ☐ **In homes where the rodent barrier is damaged or missing over significant sections, install fiberglass batts in the floor joists. Batts installed in the floor joists must meet requirements in “[6.3 Installing Underfloor Insulation](#).”**

Comply with these bolded insulation requirements when adding fiberglass batts to the floor-joist cavity of a manufactured home. Additional recommended best practice steps are included as well.

- ☐ **Install fiberglass batts to achieve a minimum of R-22 or the maximum R-value achievable with no air space between the insulation and the subfloor. Contractors may compress the batts in order to maintain continuous contact with the bottom of the floor.**
- ☐ The insulation should be supported by lath, twine, or insulation supports and covered with a new rodent barrier whenever possible
- ☐ As with all batt insulation installations, materials should be cut, split, or notched to go around wires, pipes, ducts and framing blocks. Insulation should not have gaps, voids, or be overly compressed when installed.
- ☐ **Protect insulation with a vapor-permeable covering or perimeter skirting.**
- ☐ **Skirting must be as close to the ground as practical and prevent the entry of animals.**

ADDITIONAL INFORMATION

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Wall Insulation Checklist

This **Wall Insulation Checklist** includes Prep and Installation measures that will result in a quality project. This checklist includes Residential Weatherization Specifications & Best Practices Guide sections: 8 through 8.3. This checklist calls out both utility weatherization program requirements, which are **bolded**, as well as best practices, which are not bolded.

Check with the local serving utility what incentives are available and what the required qualifications, specifications, and documentation are for its program

8 WALL INSULATION: SITE-BUILT HOMES

Comply with the following bolded requirements when adding insulation to the exterior walls of a home. Additional recommended best practice steps are included as well.

8.1 INSULATING UNFINISHED WALLS

Comply with the following bolded requirements when insulating unfinished walls. Additional recommended best practice steps are included as well.

- ☐ Consider setting up a dust control enclosure for all interior access locations that limits insulation and construction dust exposure to the occupant and occupant's belongings.
- ☐ Verify walls are free of active water leaks, fuel leaks (i.e., gas, oil, propane), and pest intrusions.
- ☐ **Insulate walls to a minimum of R-11 for masonry or for nominal 4 inch walls and to a minimum of R-21 for nominal 6 inch walls.**
- ☐ **Consider moisture when selecting insulation materials for below-grade masonry or concrete walls. Don't insulate below-grade masonry or concrete walls with fiberglass batts.**

8.2 INSTALLING BLOWN INSULATION

- ☐ If the walls are balloon framed, blocking should be installed at the top and bottom of the walls at each floor.
- ☐ Set expectations with residents as to the final look and condition of the surfaces and surrounding areas addressed by insulating walls. If final painting or siding repair may be necessary, alert residents in advance when possible.

Follow these steps to insulate finished frame walls.

- ☐ Remove one or two courses of siding around the house.
- ☐ Drill 2-to-3-inch diameter holes to access stud cavity.



Wall Insulation Checklist

8.2 INSTALLING BLOWN INSULATION (cont.)

- ☐ Probe all wall cavities through holes, before you insulate them with the fill tube, to identify fire blocking, diagonal bracing and other obstacles.
- ☐ To install dense-pack wall insulation, use a blower equipped with separate controls for air and material feed. Mark the fill tube in one-foot intervals to help you verify when the tube reaches the top of the wall cavity
- ☐ **Insulate the wall to the highest practical R-value. Fill all cavities in all exterior walls, including small cavities above, below and on the sides of windows and doors.**
- ☐ Don't insulate wall cavities containing supply plumbing, since freezing may occur. Repair any damage to interior walls resulting from wall insulation.
- ☐ To prevent settling, configure your insulation blowing equipment to achieve at least 3.5 pounds per cubic foot (pcf) density when installing cellulose insulation and at least 2.2 pounds per cubic foot density when installing fiberglass insulation designed for dense-pack application. Fiberglass dense-pack should be at least 2.2 pcf.
- ☐ Start with several full-height, unobstructed wall cavities so you can measure the insulation density and calibrate the blower. An 8-foot cavity (2-by-4 on 16-inch centers) should consume a minimum of 10 pounds of cellulose or 6 pounds of fiberglass. A "bag count" can be performed to ensure proper insulation density has been achieved. The **RED Calc Free** tool can help estimate the number of bags of insulation and the installed density.
- ☐ Insert the hose all the way to the top of the cavity. Start the machine, and back the hose out slowly as the cavity fills. Next, fill the bottom of the cavity starting near the bottom plate and working back toward the hole.
- ☐ **Block wall-mounted heaters to prevent contact with insulation. If you can't install blocking, don't fill the cavity with insulation.**
- ☐ **Seal all fill holes with a non-shrinking, unvented plug.**
- ☐ **Holes that will be covered by siding must be plugged and must be completely covered by the siding. If a plug is partially exposed, for example by falling between two pieces of shake siding, the plug must be covered by a properly-lapped building paper, such as 15-pound asphalt felt, polyolefin house wrap or stucco building paper.**
- ☐ **Holes drilled through the siding must be plugged, sealed, weatherproof and ready to paint. If the surface of the plug is below the surface of the siding, the hole must be filled with non-shrinking filler.**



Wall Insulation Checklist

8.3 EXTERIOR CONTINUOUS WALL INSULATION

Comply with these requirements when installing exterior insulation.

- ☐ When applying rigid insulation to the exterior stud surfaces of an open cavity frame wall, fit the insulation together tightly to minimize air leakage.
- ☐ During the exterior retrofit, install a code-approved water-resistive barrier using building paper.
- ☐ Incorporate the window flashing into the water-resistive barrier to provide a continuous drainage plane.
- ☐ Install siding according to the insulation or siding manufacturer instructions or as approved by the utility.
- ☐ Rigid insulation board should be installed so that seams do not align with seams in sheathing. A minimum 8 inch offset of seams is recommended.
- ☐ Flashing for windows and doors should be integrated with the Water Resistive Barrier (WRB) to protect the wall assembly from bulk moisture.
- ☐ Furring strips or other spacing may be installed in a vertical orientation over insulation and attached to the structural sheathing and/or framing in order to create a drainage plane. Wall cladding and trim should then be attached to the furring strips.

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