

## Section 4: Non-Energy Saving Measures

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### Section Overview

All measures that are programmatically defined as “non-energy saving measures” shall be vetted for allowability in accordance with the policies outlined in this manual.

### Definitions | Energy Saving Measures Vs. Non-Energy Saving Measures

**Energy Savings Measures** are defined as measures that generate individual mmbtu savings projections and measure-level SIRs when entered in the Hancock Energy Software (HES).

**Non-Energy Savings Measures** are defined as measures that do not directly generate individual mmbtu savings projections or measure level SIRs when entered into HES.

Non-Energy Savings Measures include:

- ✚ Health & Safety Measures
- ✚ Incidental Repair Measures
- ✚ Ancillary Measures
- ✚ General Energy Waste Reduction Measures

This definition can be a little confusing because some of these Non-Energy Savings Measures will result in energy savings when installed. However, these measures are programmatically classified as non-energy saving in Vermont’s program because they do not generate individual mmbtu savings projections and measure-level SIRs for each job.

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### This section of the manual has two parts:

- ✚ **Part A:** Outlines measure and budget classification policies for all non-energy saving measures.
- ✚ **Part B:** Details technical policy and procedures for various non-energy saving measures.

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### WAP Funded Program Activity & Code Compliance | A balancing Act

Successful execution of the WAP requires differentiation between imminently dangerous conditions and preexisting code compliance issues.

It is a violation of the weatherization grant to perform corrective actions for preexisting code compliance conditions that are not identified within this policy manual as issues that WAP providers can, or shall, address using WAP funding during weatherization projects.



## Section 4: Non-Energy Saving Measures – Part A

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### Measure Classification | Impacts on Grants & Individual Jobs Health & Safety, Incidental Repair & Ancillary Costs

#### Health & Safety Measures

##### **For DOE grants only**

These measures are classified to a separate budget category. The maximum allowable budget for health and safety is based on a percentage of the overall DOE Unit Production Budget.

The DOE Unit Production budget is the sum of (1) Materials (2) Program Support-Onsite and (3) Program Support-Offsite.

The DOE Job cost average is calculated using the sum of the same budgets/costs that make up the DOE Unit Production Budget: (1) Materials (2) Program Support-Onsite and (3) Program Support-Offsite. Health & Safety costs are excluded from the makeup of the DOE Job Cost average and from the DOE Unit Production Budget.

There is no cap on allowable Health & Safety costs for an individual job. The cap is only for the grant as-a-whole, so in effect there is a maximum allowable H & S job cost average for each DOE grant that is managed separately from the regular DOE job cost average.

The total expenditures on Health & Safety classified measures cannot exceed the budgeted total specified within each DOE grant agreement.

The costs associated with Health & Safety measures cannot be charged to any other budget line of the DOE grant other than the Health & Safety budget line.

All Health & Safety costs are excluded from any measure-level or project-level SIR calculations.

##### **For Non-DOE grants only**

There is no Health & Safety budget line in Non-DOE grants. These measures are not classified to a separate budget category in the grants.

H & S costs are included in the makeup of the Non-DOE Job Cost average and the Non-DOE Unit Production Budget.

The Non-DOE Unit Production budget is the sum of (1) Materials (2) Program Support-Onsite and (3) Program Support-Offsite. The costs associated with H & S measures are included within two of the above three budget lines. Any Material costs that are associated with H & S measures get recorded as materials. Any labor costs that are associated with H & S measures get recorded as Program Support-Onsite.

There is no cap on allowable H & S costs for an individual job and there is no direct cap on overall H & S costs during the grant period.

All H & S costs are excluded from any measure-level or project-level SIR calculations.



## Section 4: Non-Energy Saving Measures – Part A

### Measure Classification | Impacts on Grants & Individual Jobs Health & Safety, Incidental Repair & Ancillary Costs

#### Health & Safety Measures

The following measures shall be classified as Health & Safety measures whenever they are completed during a weatherization project:

1. Lead-safe weatherization expenses (*must be recorded to a separate measure for every job within the Hancock Energy Software (HES) whenever lead safe weatherization work is performed*)
2. General safety devices: smoke alarms, and carbon monoxide alarms
3. General safety devices: fire extinguishers (*w/ solid fuel source in home only*)
4. Combustion appliance safety devices: Firematics, emergency switches, spill-switches, temperature/pressure relief system components and expansion tanks
5. CTE, repair or replace heating system (*whenever an SIR of 1.0 or greater cannot be attained, 100% of these measure costs must be recorded to an H & S measure in HES*)
6. Repair or replace chimneys, flues or SRJs (*this includes chimney liner installations*)
7. Forced hot air distribution systems (*any changes to the size or length of the duct system must be recorded to an H & S measure in HES*)

Examples include:

- ✓ Adding or removing sections of the return and/or supply ductwork
  - ✓ Increasing or decreasing the size e.g., diameter, of the ductwork used
  - ✓ With a dual furnace scenario - separating the distribution system from a no-longer or seldom used appliance that it was previously connected to
8. CTE, repair or replace water heater (*whenever an SIR of 1.0 or greater cannot be attained, 100% of these measure costs must be recorded to an H & S measure in HES*)
  9. Provide either combustion air to appliance or CAZ pressure relief to increase appliance draft performance
  10. Permanently disconnect ventless heaters
  11. Repair stove/oven
  12. Replace stove/oven (*not an allowable DOE expense, must use Non-DOE funding*)
  13. Mechanical ventilation (*any work related to installing exhaust fans and/or dryer venting that does not produce thermal energy saving benefits*)
  14. Installing poly or comparable on the ground (*including slip resistant runways*)



## Section 4: Non-Energy Saving Measures – Part A

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### Measure Classification | Impacts on Grants & Individual Jobs Health & Safety, Incidental Repair & Ancillary Costs

#### Incidental Repair Measures

These measures are non-energy saving measures, but they are classified and managed differently than Health & Safety measures. The following is applicable to all weatherization funding sources (*DOE & Non-DOE*).

- ✚ Incidental Repair costs are included in the makeup of the job cost average.
- ✚ Incidental Repair costs are excluded from any measure-level SIR calculation(s).
- ✚ Incidental Repair costs are included in the project-level SIR calculation.

Incidental Repairs help to determine if prospective weatherization projects can be performed cost-effectively. The costs associated with all the needed incidental repairs are added together with all the costs of the energy savings measures<sup>1</sup> for each project. Then, these combined project costs (for the energy savings measures plus the incidental repair measures) get used to calculate the Savings to Investment Ratio (SIR) for the overall project.

A project must have a project-level SIR of 1.0 or greater to proceed. This is the minimum allowable SIR. A project that does not meet the minimum SIR requirement cannot be completed with Weatherization funding.

When the project-level SIR is less than 1.0 the following actions should be taken:

- ✚ Evaluate whether or not any of the recommended incidental repair work is non-essential to the weatherization project. If some incidental repair work can be trimmed from the scope of work, determine if the SIR is a 1.0 or greater without that work being included.
- ✚ Reassess the energy saving measures included on the scope of work to see if they can be accomplished in a different way that yields a better project-level SIR.
- ✚ If changing the scope of work is not a viable option, additional non-weatherization project funding options should be pursued to enable the project to proceed and to avoid a project deferral.

In cases where the options listed above are not able to increase the project-level SIR above the needed threshold, the project may need to be deferred.

**Project deferral decisions shall be made in accordance with the policies outlined in Appendix F & Appendix G of this manual.**

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<sup>1</sup> Note the cost of the energy savings measures also includes their ancillary costs.



## Section 4: Non-Energy Saving Measures – Part A

### Measure Classification & Budget Allocations

#### Protocol Summary: Health & Safety, Incidental Repair & Ancillary Costs

#### Incidental Repair Measures

The following measures shall be classified as Incidental Repair measures whenever they are completed during a weatherization project:

1. Knob & tube wiring related measures
2. General electrical repair measures (*not knob and tube*)  
*For example: junction box installations, frayed or pest damaged wiring, etc.*
3. Required “Garage Isolation” measures  
*Only the remainder of the garage isolation measure costs that fail to screen as cost-effective energy saving measures are classified as incidental repairs.*
4. Required “Top of Building” Airsealing measures  
*Only the remainder of the “Top of Building” A.S. measure costs that fail to screen as cost-effective energy saving measures are classified as incidental repairs.*
5. Bulk water issues: roof repairs or install new/improve existing gutters
6. Bulk water issue: plumbing repairs to fix leaks
7. Bulk water issue: sump pits, sump pumps, trenching and drainage improvements
8. Remove heat lamp or replace heat lamp with alternative device
9. Forced hot air distribution systems:
  - ✓ Install new heat registers/grills
  - ✓ Patch or repair existing ducts
  - ✓ Site Built Homes Only | Duct Sealing & Insulation located within the pressure boundary
  - ✓ Site Built Homes Only | Duct Sealing & Insulation located outside of the pressure boundary can be classified as either General Energy Waste Reduction Measures or as Incidental Repair Measures.
10. Install fill pipes and/or vent pipes to the outdoors on fuel tanks
  - ✓ Only when none exists at all, not to improve existing conditions simply because the existing piping is not up to current code.
11. Most window and door improvement measures
  - ✓ See “HEAT” drop down measure lists and/or Section 3 of this manual, “Sides of Building”, for a list of allowable exceptions to the incidental repair measure classification for window/door improvements.

***Funding source exclusion: Whenever a window or door improvement measure is completed and the measure is classified by the Vermont program as an incidental repair measure, the window/door work shall be paid for with Non- DOE funding. The rest of the project, minus the window/door work, can be DOE funded.***

12. Vermiculite remediation work

***Funding source exclusion: DOE funds cannot be used for Vermiculite remediation measures. The rest of the project can be DOE funded.***





## Section 4: Non-Energy Saving Measures – Part A

### Measure Classification & Budget Allocations

#### Protocol Summary: Health & Safety, Incidental Repair & Ancillary Costs

##### Ancillary Measures

These measures are lower-cost, non-energy saving measures that are integral components of an energy saving measure or a subset of energy saving measures within an overall projects’ scope of work. The following is applicable to all weatherization funding sources (*DOE & Non-DOE*).

-  Ancillary costs are included in the makeup of the job cost average.
-  Ancillary costs are included in measure-level SIR calculations.

Every energy-saving measure shall meet or exceed the current minimum SIR requirement to be completed during a project. The cost of all ancillary measures must be included in the SIR calculation for the energy saving measure.

Alternatively, the energy saving measure could be implemented without the ancillary components if that would enable the measure to meet the minimum SIR requirement and the installation could still be performed safely and meet all program standards.

##### Ancillary Measures

The following measures shall be classified as ancillary measures whenever they are completed during a weatherization project. The most applicable energy saving measure-group(s) to associate common ancillary items with are outlined in the table below:

Energy Saving Measure Group(s)	Ancillary Measure
Attic, Clg	Insulation dam- around chimney/flue
Attic, Clg	Insulation dam- general (18”-24” height)
Attic, Clg	Install vent baffle
Attic, Clg	Install gable vent
Attic, Clg, Wall	Cut access- no hatch present to attic or kneewall closet
Attic	Install or improve hatch less than 8 sq. ft.
Attic, Clg, Wall	Patch interior sheathing (less than 4 sq. ft.)
Attic, Clg, Wall	Patch interior sheathing (large area)
Attic, Clg, Wall	Install strapping
Wall	Install chair-rail
Rim	Expose rim- remove materials as needed
Fnd, Flr, Sill	Cut access- no hatch present to crawlspace
Sill	Expose sill- cut swath of ceiling materials
Fnd, Sill	Expose surface- remove brick, masonry, lath
Fnd, Floor, Rim, Wall	Apply fire retardant barrier over foam mats.



## Section 4: Non-Energy Saving Measures – Part B

### Non-Energy Saving Measures | Technical Requirements

#### General Safety Devices

<b>Smoke Alarms</b>	<ul style="list-style-type: none"> <li>✓ One installed on each floor</li> <li>✓ One installed in the immediate vicinity of each sleeping area</li> </ul>
<p><i>For complete information on material specifications, installation &amp; occupant education requirements refer to <b>Appendix E</b> of this manual.</i></p>	
<b>Carbon Monoxide Alarms</b>	<ul style="list-style-type: none"> <li>✓ One installed in the immediate vicinity of each sleeping area.</li> </ul>
<p><i>For complete information on material specifications, installation &amp; occupant education requirements refer to <b>Appendix E</b> of this manual.</i></p>	
<b>Fire Extinguishers</b>	<p>Installation of one per home is allowed by WAP <u>only when</u> a solid fuel sourced appliance is used within the home.</p>

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#### Combustion Appliances: Non-Allowable Installations

<b>Ventless Heaters</b>	
<b>Fixed Installation</b>	<b>Portable Models</b>
<p>Ventless heaters must be disabled prior to weatherization and <b>Wx Waiver 01</b> must be signed by client. If the ventless heater is not disabled <u>and</u> the waiver form is not signed then weatherization is to be deferred.</p>	<p>In the case of a portable ventless heater, the client shall be warned of the dangers for continued operation and sign <b>Wx Waiver 01</b>. If this waiver form is not signed by the client then weatherization is to be deferred.</p>
<p><i>With either type of ventless heater, <b>Wx Waiver 01</b> shall be provided to and signed by the client prior to performing any WAP funded activity beyond an initial energy audit.</i></p> <p style="text-align: center;">-----</p> <p><i>These waivers are included in <b>Appendix H</b> of this manual.</i></p>	



## Section 4: Non-Energy Saving Measures – Part B

### Non-Energy Saving Measures | Technical Requirements

#### Combustion Appliance Safety Devices

Vermont WAP protocols for the required safety related components of domestic water heating and space heating systems are outlined below:		
<b>Gas Fired</b>	V.	<b>Oil Fired</b>
<b>Required System Components</b>		
<p><b>All Systems:</b></p> <ul style="list-style-type: none"> <li>✓ Emergency Switch <i>(at top of stairwell or outside of a dedicated utility room)</i></li> <li>✓ A means for disconnecting the power source at or within sight of the appliance. <i>(the power cord for a plug-in type appliance or a breaker panel within sight of the appliance both meet this requirement)</i></li> </ul> <p><b>Hydronic Systems:</b></p> <ul style="list-style-type: none"> <li>✓ T &amp; P relief valve &amp; blow-off pipe <i>(within 6" of floor or down through floor/belly material)</i></li> <li>✓ Working expansion tank <i>(unless this part is not required by system manufacturer)</i></li> </ul>		<p><b>All Systems:</b></p> <ul style="list-style-type: none"> <li>✓ Emergency Switch <i>(at top of stairwell or outside of a dedicated utility room)</i></li> <li>✓ Firematic <i>(plug or wheel type)</i></li> </ul> <div style="border: 1px solid black; padding: 5px; background-color: #e0e0e0;"> <ul style="list-style-type: none"> <li>✓ Sleeved oil line above concrete <i>(unless the fuel tank itself is located below ground)</i></li> </ul> <p>It is not a requirement to replace the existing oil line for the sole reason that it is in contact with the ground as long as no portion of the oil line is underneath the ground/slab.</p> </div> <p><b>Hydronic Systems:</b></p> <ul style="list-style-type: none"> <li>✓ T &amp; P relief valve &amp; blow-off pipe <i>(within 6" of floor or down through floor/belly material)</i></li> <li>✓ Working expansion tank <i>(unless this part is not required by system manufacturer)</i></li> </ul>
<b>Optional Devices: Gas Appliances Only</b>		
<ul style="list-style-type: none"> <li>✓ Firematic installation is not required but installation is allowable.</li> </ul>		
<b>Optional Devices: Gas &amp; Oil Appliances</b>		
<ul style="list-style-type: none"> <li>✓ Spill switches are not required, but installation is allowable. Spill switch installation on Category 1 gas-fired appliances is encouraged, particularly if there is a wood stove or wood fireplace present in the home.</li> </ul>		





## Section 4: Non-Energy Saving Measures – Part B

### Non-Energy Saving Measures | Technical Requirements

#### Chimney & Flue Protocols

##### New Installations

When a new combustion appliance is installed by WAP the system installation must be fully code-compliant.

##### Preexisting Combustion Appliance Installations

###### Single Fuel Source

All chimneys and flue pipes must be clear of obstructions and in safe working order prior to any weatherization shell measures being completed. Chimney repairs and/or chimney liners can and shall be installed using WAP funding whenever an existing chimney and/or chimney liner is deemed unsafe. However, WAP funding cannot be used to install a chimney liner just because a chimney is not lined and is therefore deemed non-code compliant. Unlined chimneys that are free of obstructions and in working order shall not be lined using WAP funding just to meet code requirements if the appliance passes worst-case spillage and draft tests, passes WAP combustion testing protocols, and the preexisting chimney/flue condition presents no imminent danger to building occupants.

###### Multiple Fuel Sources w/ Shared Venting

###### Oil-Fired Appliances Mixed w/ Gas-Fired Appliances

Weatherization funding shall not be used to separate, or otherwise alter, the shared venting of oil and gas fired appliances with the following exception:

- One or all of the combustion appliances that share the same chimney fail worst-case spillage and draft tests and altering the preexisting shared venting setup is the least expensive way to ensure all the appliances in question are able to pass worst-case spillage and draft tests.

## Section 4: Non-Energy Saving Measures – Part B

### Non-Energy Saving Measures | Technical Requirements

#### Chimney & Flue Protocols



##### Preexisting Installations

###### Multiple Fuel Sources w/ Shared Venting

###### A Solid Fuel Mixed w/ Oil or Gas

Utilizing Weatherization funding to perform the actions outlined below is allowable:

To rectify a shared venting concern:



-  Action 1 | Disconnect an appliance and cap one of the openings to the shared chimney or flue
-  Action 2 | Install a different category water heater that does not need a chimney or install a water heater that utilizes a different fuel source.

To provide additional back-drafting protection in homes with this type of shared venting scenario:

-  Action 3 | Install spill switches on Category 1 gas appliances

Note the three allowable actions listed above are not WAP program requirements if the combustion appliances pass worst-case spillage and draft tests, pass WAP combustion testing protocols, and the preexisting chimney/flue condition presents no imminent danger to building occupants.

The following actions to rectify this type of shared venting concern are only allowable using WAP funding when certain conditions are met.

-  Action 4 | Install a different category heating system
-  Action 5 | Perform significant venting alterations (greater than \$500.00)

Condition 1 | WAP funding can be used for Actions 4 or 5 to rectify a shared venting concern when performing those measures will be less expensive than performing any combination of Actions 1, 2, or 3.

-- or --

Condition 2 | WAP funding can be used for Actions 4 or 5 to rectify a shared venting concern when performing Actions 1, 2 or 3 is not likely to address the issue.



## Section 4: Non-Energy Saving Measures – Part B

### Non-Energy Saving Measures | Technical Requirements

#### Distribution Systems | Heating, Hot Water & Misc. Plumbing

##### Forced Air Systems

Ductwork shall be thoroughly evaluated during all Weatherization projects.

#### Evaluation requirements

##### Initial Evaluation at the Energy Audit:

All ductwork shall be thoroughly inspected by an energy auditor. Every furnace shall be evaluated for short-cycling by monitoring the fan limit controls whenever they are accessible. **In addition, a heat rise test shall also be completed on all forced hot air duct systems.**

##### Findings that Require WAP Corrective Actions:

If the unit short cycles or the heat-rise is outside of the manufacturers recommended range, **then the supply and/or return ductwork must be improved by WAP.** If the appliance-specific heat rise information is not available, then use a 45 to 70 degree range as the acceptable heat rise.

##### Final Evaluation at the Quality Control Inspection:

- ✓ Scenario A: Another evaluation for short-cycling and another heat-rise test is required by a quality control inspector if a problem with the distribution system was identified at the time of the energy audit and/or distribution system improvements beyond basic duct sealing measures were completed during the project.
- ✓ Scenario B: If no problems were identified during the energy audit, and the only distribution system improvements performed during the project were standard duct sealing measures, then another short cycling evaluation and heat rise test is not required during the QCI.

#### Additional Policy Guidance

The content of the archived Weatherization Technical Bulletin # 22 was incorporated into this TEC manual as Appendix I in 2012. This bulletin provides detailed guidance on procedures for evaluating furnace ductwork.



**Section 4: Non-Energy Saving Measures – Part B**

**Non-Energy Saving Measures | Technical Requirements**  
**Distribution Systems | Heating, Hot Water & Misc. Plumbing**  
**Site-Built Homes | Forced Air - Heat Distribution Systems**

<b>Duct Sealing &amp; Insulation</b>		
Technical Protocols for ducts located <b>inside</b> of the pressure boundary		
Return Side	Vs.	Supply Side
<p>All physically accessible joints on the return side of heat distribution systems need to be verified* as “leak-free” prior to completion of every weatherization project.</p> <p>When duct sealing measures are necessary, duct mastic shall be used to perform the work with the aid of mesh tape.</p> <ul style="list-style-type: none"> <li>✓ Use of mesh tape is only allowable in tandem with duct mastic, not alone.</li> <li>✓ Use of any other kind of tape for duct sealing purposes is not allowable.</li> </ul> <p>*The effectiveness of the duct sealing performed on return ducts inside the pressure boundary should be thoroughly evaluated and verified with smoke sticks (<i>or equivalent visual aids</i>) while the air handler is running.</p>		<p>Sealing the supply side of heat distribution systems is allowed. It is not required.</p> <p>This is a very low priority measure that should only be performed after all required weatherization measures have been performed.</p>
<p>Any ductwork that is located <b>inside</b> of the pressure boundary shall not be insulated using WAP funding.</p>		

**The measures covered in the table above can no longer be classified as General Energy Waste Reduction Measures. Instead, these measures shall be classified as Incidental Repair Measures on every project (effective 2019).**





**Section 4: Non-Energy Saving Measures – Part B**

**Non-Energy Saving Measures | Technical Requirements  
Distribution Systems | Heating, Hot Water & Misc. Plumbing  
Site-Built Homes | Forced Air - Heat Distribution Systems**

<b>Duct Sealing &amp; Insulation</b>
Technical Protocols for ducts located <b>outside</b> of the pressure boundary
Return Side & Supply Side
<p>Any ductwork that is located <b>outside</b> of the pressure boundary shall be:</p> <ol style="list-style-type: none"> <li>1. Sealed with duct mastic as needed with the aid of mesh tape.</li> <li>2. Verified* as “leak free”.</li> <li>3. Insulated to R-8 minimum.</li> </ol> <p>*The effectiveness of the duct sealing performed outside the pressure boundary shall be verified with smoke sticks <i>(or equivalent visual aids)</i> while the air handler is running prior to insulating the ducts.</p>

**The measures in the table above can be classified as either General Energy Waste Reduction Measures or as Incidental Repair Measures (effective 2019).**

**Mobile Home | Forced Air - Heat Distribution Systems**

-  Whenever a workscope is developed for a mobile home project using the DOE approved priority-list, all duct sealing & insulation measures shall be classified as General Energy Waste Reduction Measures.
-  Whenever a workscope is developed for a mobile home project by performing a site-specific energy model, these measures shall be classified as Energy Saving Measures that generate a Savings to Investment Ratio.



## Section 4: Non-Energy Saving Measures – Part B

### Non-Energy Saving Measures | Technical Requirements

#### Distribution Systems | Heating, Hot Water & Misc. Plumbing

This section covers protocols for distribution system improvement measures classified as incidental repair measures.

#### Hydronic Heat Distribution System Improvements

Baseboard heating units, sections of radiant heat tubing and radiators are not to be installed or repaired by WAP unless:

- ✚ A unit of baseboard, section of radiant heat tubing or a radiator is leaking
- ✚ The improvement is intended to correct a short-cycling problem

When the type of repairs outlined above are necessary to fix or prevent water leaks in order to protect a WAP investment from water damage they are to be classified as incidental repair measures.

#### Domestic Hot Water & Misc. Plumbing Distribution Systems

Any miscellaneous plumbing repairs that are undertaken to fix or prevent water leaks in order to protect a WAP investment from water damage are to be classified as incidental repair measures. In addition to DHW supply lines, this policy is applicable to cold water piping and to drainage lines.

#### Measure Classification | Heating/DHW Appliances v. Distribution Systems

The incidental repair measure classification outlined on this page is specific to distribution systems.


Whenever a boiler or water heater is repaired or replaced for any non-energy efficiency upgrade reason, i.e., it does not produce at least a 1.0 SIR, the replacement of the appliance itself shall be classified as a health and safety measure.



## Section 4: Non-Energy Saving Measures – Part B

### Non-Energy Saving Measures | Technical Requirements

#### Indoor Air Quality & Building Durability

Bulk Water & Moisture Control					
Damp Basements/Crawlspaces	V. Wet Basements/Crawlspaces				
<p>Every basement and crawlspace with an earthen floor that can be categorized as damp—no recurring flooding or standing water issues—shall have six mil. poly sheeting (<i>or equivalent</i>) installed over the ground.</p>  <p>If a ground source moisture barrier cannot be installed over a damp earthen floor (<i>or there is an inaccessible/non-viewable crawlspace</i>) there are two allowable options, one of which must be followed to proceed with a weatherization project:</p> <ol style="list-style-type: none"> <li>A. Inform client about importance of reducing ground source moisture levels, have client sign <b>Wx Waiver 02; Option A</b>, and defer the project until obstacles to ground moisture barrier installation have been removed.</li> <li>B. Inform client about importance of reducing ground source moisture levels, have client sign <b>Wx Waiver 02; Option B</b> and proceed with weatherization activities.</li> </ol>	<p>A ground source moisture barrier shall not be installed over an earthen floor if a basement/crawlspace area is prone to flooding or standing water on the ground is a typical condition.</p> <p>If however, any of the following measures are reasonably anticipated to transform the basement from a wet to a damp classification, then those actions shall be performed to control the bulk water issues and then the standard protocol for damp basements and crawlspaces shall be followed.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%; padding: 5px;">Sump Pumps</td> <td style="padding: 5px;">The installation of a sump pump (<i>and any required system trenching</i>) to reduce moisture problems is an allowable WAP expense.</td> </tr> <tr> <td style="padding: 5px;">Gutter Systems</td> <td style="padding: 5px;">Installing new <u>or</u> improving existing gutter systems are allowable WAP expenses.</td> </tr> </table> <p>Weatherization must be deferred in accordance with the deferral policy outlined in Appendix F of this manual when the scope of actions required to control bulk water issues in a wet basement or crawlspace zone is more extensive than the measures identified in this section or within section 2 of this policy manual.</p>	Sump Pumps	The installation of a sump pump ( <i>and any required system trenching</i> ) to reduce moisture problems is an allowable WAP expense.	Gutter Systems	Installing new <u>or</u> improving existing gutter systems are allowable WAP expenses.
Sump Pumps	The installation of a sump pump ( <i>and any required system trenching</i> ) to reduce moisture problems is an allowable WAP expense.				
Gutter Systems	Installing new <u>or</u> improving existing gutter systems are allowable WAP expenses.				
<p><b>Ground Source Moisture Barrier: Installation Details</b></p> <ul style="list-style-type: none"> <li>✓ The installation of rolled roofing (<i>or comparable</i>) over a ground source moisture barrier in heavily trafficked areas is encouraged to provide improved traction and prevent slip and falls.</li> <li>✓ Ground source moisture barrier must be overlapped at all seams by a minimum of 12 inches.</li> <li>✓ When directly exposed to wind effects or the ground slope is likely to cause movement of the moisture barrier then it must be fastened to the ground with durable fasteners or ballast(s).</li> </ul>					

## Section 4: Non-Energy Saving Measures – Part B

### Non-Energy Saving Measures: Technical Requirements

#### Electrical Hazards

##### Knob & Tube Wiring Policies

**This section outlines acceptable courses of action when knob and tube wiring is identified during a weatherization project:**

1. Tenting/damming around the wiring is acceptable in flat attic areas as long as blown insulation will not be in contact with or installed above/over the knob and tube.
  - ✚ In a case where there is already insulation in contact with the knob & tube wiring in a flat attic area and the surface containing the knob & tube will remain the pressure/thermal boundary, the pre-existing insulation needs to be removed so effective tenting/damming can be practiced. Otherwise, the wiring will need to be removed before proceeding with the weatherization project.
  - ✚ This policy is applicable in both unfloored attics and in floored attics.
2. When (a) there is preexisting knob & tube wiring under a decked attic floor and (b) the thermal envelope will be moved up to the roofline and (c) WAP will not be weatherizing the attic floor at all, then the wiring will not need to be removed by WAP.
  - ✚ In this scenario, none of the preexisting insulation that is already in contact with the wiring needs to be removed by WAP because the weatherization project is not addressing that surface at all.
3. It is not a WAP requirement to remove preexisting knob and tube wiring when it is located within closed-cavity building surfaces (walls, floors or sloped ceilings) that will not be insulated during the project for these reasons:
  1. The closed cavity building surface already contains insulation, and
  2. Performing an insulation upgrade will not meet minimum SIR requirements.









## Section 4: Non-Energy Saving Measures – Part B

### Non-Energy Saving Measures: Technical Requirements

#### Electrical Hazards

##### Knob & Tube Wiring Policies

4. Preexisting knob and tube wiring does not have to be removed by WAP when it is located in an area of the building that will not receive any weatherization improvement measures during the project. For example:
  -  Knob & tube located at the roof and gable end walls of an attic when the attic floor is the pressure/thermal boundary.
  -  Knob & tube located at the basement ceiling when the basement perimeter is the pressure/thermal boundary.
5. Leaving preexisting knob and tube wiring in the building is not allowed when:
  -  Sloped ceiling bays that are (a) part of the pressure/thermal boundary and (b) are void of insulation would have to remain uninsulated because insulation could not be installed without contacting the knob & tube wiring.
  -  The execution of required “Top of Building” airsealing measures would not be possible due to the location of the knob & tube wiring.

##### Knob & Tube Wiring Protocol Summary

###### Measure Screening Requirements

All WAP funded knob & tube improvements shall be allocated as incidental repair measure costs and be included in project-level SIR calculations. The project as-a-whole must screen as cost-effective inclusive of these incidental repair costs.

###### How to Proceed if Project Fails to Screen Due to Incidental Costs

If the project cannot absorb the needed incidental repair costs without falling below the minimum required project-level SIR, then the project cannot be completed with Weatherization funding alone. Additional project funding options should be pursued to avoid a deferral. If no other funding options exist, the project will need to be deferred in accordance with Appendix G of this manual.

###### Client Notification

If knob and tube wiring is found anywhere in the building and WAP will be either deferring a project or leaving some of the knob and tube in place in accordance with this policy, it **must be communicated to the client in writing**. The written communication must specify whether or not there is/was any preexisting insulation in contact with the knob and tube. This acknowledgement must be signed by the client and a copy retained in the client file.



## Section 4: Non-Energy Saving Measures – Part B

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### Non-Energy Saving Measures: Technical Requirements

#### General Electrical Hazards | Not Knob & Tube

##### **Wiring Connections**

All wiring connections within one foot of a surface that will be airsealed and/or insulated by WAP must be housed in a properly covered junction box.

##### **Damaged Wiring**

Any visibly compromised electrical wiring (frayed, rodent-damaged, etc.,) must be repaired. Electrical repairs must follow incidental repair policy.



## Section 4: Non-Energy Saving Measures – Part B

### Non-Energy Saving Measures: Technical Requirements

#### Lead Safe Weatherization | Vermont's WAP Protocols

This appendix provides clarification to the Vermont WAP network on specific protocols to follow with regards to the EPA RRP Final Rule.

#### Background & Reference Materials:

For the complete listing of requirements please refer to the Electronic Code of Federal Regulations “40 CFR Part 745”. Sections 745.82, 745.84 and 745.86 provide particularly valuable information. *These three sections are included with this guidance in Appendix J.*

#### Vermont WAP Protocols & Record Keeping:

It is required to complete and upload the form below to the HES file for each individual project regardless of whether or not lead safe practices are required during the energy audit or the construction phase of a weatherization project.

- ✓ Signature Page/Pre-Renovation Form verifying the informational packet entitled, “Renovate Right: Important Lead Hazard Information for Families, Child Care Providers, and Schools” was provided to the client.

#### Lead Testing:

A lead test is required only if disturbing more than six square feet interior per room or 20 square feet total on the exterior. Whenever lead testing is required, the test results must to be recorded on the dedicated “Lead Test Form”. *This form is included with this guidance in Appendix J.*

Any completed lead test form should be uploaded to the HES file regardless of the test results. Written documentation to an owner and/or tenant regarding the results of a lead test does not need to be provided unless the results are requested by the owner and/or tenant.

#### Certifications:

It is not a requirement to include individual print outs of the certifications for an agency or for individual renovators working on a specific project within each project file. Those certifications only need to be maintained on file in the weatherization office so they could be viewed upon request. However, daily documentation of each worker that performed “LEAD SAFE” work on each individual project is required. This documentation is accomplished using the daily labor log report and by performing labor details data entry in HES.



## Section 4: Non-Energy Saving Measures – Part B

### Non-Energy Saving Measures: Technical Requirements

#### Lead Safe Weatherization | Vermont's WAP Protocols

##### Additional WAP Requirements:

It is a requirement to record the following information and upload it within each individual HES project file where “Lead Safe Weatherization Practices ” are necessary:

1. Always utilize the separate measure coding for all “LEAD SAFE” costs in HES.
2. Use the “LEAD SAFE” measure coding on all relevant program paperwork, crew labor logs, etc., through the final labor details entries recorded in HES.
  - 📄 Crew labor logs and entries made to the ‘Labor Details’ screen in HES must clearly indicate who performed “LEAD SAFE” tasks on the project.
3. Complete the “Renovation Checklist” for each project. *This form is included with this guidance in Appendix J.*
  - 📄 The fourth line on this form “Name of Assigned Renovator” must indicate the same person signing off/dating at the bottom of the form.
4. Photograph the containment areas that are setup at the job and the signage that is posted at the job. Upload these photos to the individual HES project file for future reference.

#### WAP Client Discretion & Opting Out

A weatherization client cannot opt out of any “Lead Safe” requirements for their project under any circumstance. All applicable rules apply to every weatherization project or the project is not to be completed.



## Section 4: Non-Energy Saving Measures – Part B

### Non-Energy Saving Measures: Technical Requirements

#### Potential Asbestos Containing Materials (ACMs)

**This section is applicable to any potential asbestos containing materials (ACMs) except for Vermiculite. Vermiculite policies are outlined separately in Appendix G.**

**Potential ACMs in Friable Condition** | If potential asbestos containing material is present in the home and it is in a friable condition or it is observably frayed, breaking apart or unraveling, then blower door testing is not-required by the WAP during the project. Any blower door testing that is performed must be positively pressured blower door testing unless the potential ACM that is in a friable condition gets tested by a qualified asbestos professional prior to performing the blower door test and the test results indicate the material does not contain asbestos.

**Potential ACMs in Non-Friable Condition** | If potential asbestos containing material is present inside the home and it is not in a friable condition and it is not observably frayed, breaking apart or unraveling, then blower door testing is required by the WAP during the project.

**ACM Abatement & Repair** | Only a qualified asbestos professional shall perform the abatement of, or repairs to, a potential ACM.

**Reducing the WAP Scope of Work due to the Presence of Potential ACMs** | A WAP provider must get written permission from the OEO to proceed with performing a weatherization project that omits standard required measures from the scope of work due to the presence of a potential ACM. The “Atypical Project Approval” form shall be used to request this permission for individual projects. Approvals must be uploaded by the WAP provider to the HES job file.

