



Weatherization Assistant User's Manual-Addendum

DOE Weatherization Assistance Program Mission Statement:
"To reduce energy costs for low-income families, particularly for the elderly, people with disabilities, and children, by improving the energy efficiency of their homes while ensuring their health and safety."

Documentation Standards

Weatherization Assistant (WA) and site drawing documentation should reflect the following standards.

- **Data Accuracy:** Data gathered by Energy Auditors and Quality Control Inspectors must ensure accurate energy modelling in the WA Software and must provide cost and materials estimates that allow contractors and crews to perform their work efficiently and effectively.
- **Sufficient Documentation:**
 - Documentation should provide colleagues and monitoring agencies familiar with the WAP program with sufficient information to understand the relevant conditions in a home and the scope of work.
 - Documentation should provide crews and contractors with sufficient information to clearly understand the scope of work and the materials required to perform that work.
 - Documentation requirements will avoid duplication of effort whenever possible.
- **Program Compliance:** Data should be gathered and documented such that each Weatherization Project can be performed according to Minnesota Weatherization Assistance Program (MN WAP) Policy.

Site Drawing Requirements

- Attic, Foundation and Wall dimensions
- Attic, Foundation and Wall Square footage calculations
- Information that will affect the scope of work
- Information needed by crews or contractors to perform their work properly

WA Manual

The ORNL WA Manual Version 8.10 forms the foundation for the use of WA in the MN WAP. Only additions, clarifications, and omissions are noted in this addendum.

Chapter 7. Clients

7.1 Client Information (pg. 7-2)

- **WAP Event eHEAT Downloads**
 - WAP Audit, Standalone, and Callback events must be downloaded from eHEAT into WA.
 - Some client information is uploaded from eHEAT in the WAP event upload.
 - After the WAP event is created, additional client information can be added.
- **Client Tab Required Fields** (* indicates items downloaded from eHEAT.)
 - Client ID*
 - Agency*

- Full Address including the county* (The “Other Geographic Identifier” is not required)
- Setup Library
- Type of Dwelling*
- Ownership*
- Primary and Secondary Fuel*
 - *Fuel Types present at the dwelling must be cross referenced with the information entered in eHEAT.*
- High Energy Use*
- High Energy Burden*
- Previously Weatherized (if applicable)
 - *SP’s must have a process in place to determine if a home has been previously weatherized before Sept 30, 1994.*
- Year Previously Weatherized (if applicable)
- Year Built
- Occupants Fields*
 - Occupants
 - Elderly
 - Disabled
 - Native American
 - Children
- Primary Language
- **Comments**
 - Document relevant client information not found elsewhere in WA
 - Document reasons for a Deferral/ Walk away
- **Photo Folder**
 - The pathname to a folder where relevant pictures are stored can be added here. Optional.

7.2 Status (pg. 7-9)

- Information on statuses is found in *Required Statuses, Appendix C* and on page 12 of this document.

7.3 Energy Index (pg. 7-11)

- *not required by MN WAP Program*

7.4 Contacts (pg. 7-14)

- Some Contact information is downloaded from eHEAT. Fields can be used to document additional customer contact information.

7.5 Audits (pg. 7-17)

- The Audit event download from eHEAT creates an audit in WA. Occasionally clients will have more than one audit in their audit tab for the following reasons.
 - The client had a previous audit on another dwelling and now are having an audit at a different dwelling
 - A copy audit was created

7.6 Work Orders (pg. 7-20)

- Work orders are detailed in section 13.

7.7 Surveys (pg. 7-24)

- Survey should include MN WAP required questions. SP specific questions may be added. This survey is included in the MN WAP version of WA 8.10.

7.8 Photos (pg. 7-27)

- *Due to data storage limitations at Commerce, this feature is turned off in the MN WA 8.10*

Reports Block – Client Tab

- The MN WAP version of WA 8.10 contains a suite of reports.

- Reports required for the audit file are found in the MN WAP Policy Manual Section 4.3

Chapter 8 NEAT and MHEA Introduction

8.1 Starting a New Audit and Accessing Previous Audits (pg. 8-1)

8.2 Audit Information (pg. 8-2)

- **WAP Event eHEAT Downloads**
 - Some audit information is uploaded from eHEAT in the WAP event upload.
 - After the WAP event is created, additional audit information can be added.
- **Audit Information Tab required fields** (* Indicates items downloaded from eHEAT)
 - Audit name*
 - Client ID*
 - Auditor
 - Set Up Library
 - Fuel Cost Library
 - Supply Library
 - Weather File
- **NEAT Specific Entries**
 - Conditioned Stories (required)
 - Floor Area (required)
 - Impute Cooling: *This box should not be checked*
- **MHEA Specific Entries**
 - Length (required)
 - Width (required)
 - Exterior Wall Height (required)
 - Wind Shielding (required)
 - Home Leakiness (required)
 - Outdoor Water Heater Closet (if applicable)
- **Photo Folder**
 - The pathname to a folder where relevant pictures are stored can be added here. Optional.
- **Reports Block - Audit Tab**
 - MN WAP version of WA 8.10 contains a suite of reports
 - Reports required for the audit file are found in the MN WAP Policy Manual.
- **Economic Summary Block**
 - This reflects only the data from the recommended measures tab, not changes at the work order level. The Client Measure and Job SIRs Report found in the client tab report block is the standard by which cost effectiveness is judged.

Chapter 9. NEAT Building Description

9.1 Shell – Walls (pg. 9-2)

- Walls of the same wall type, stud size, exterior type, exposure, orientation, and R value, and added insulation type can be grouped into single walls.
- Site drawings, wall codes, or wall comment field should explain which wall sections from the dwelling make up each “wall” in NEAT.
- SPs typically have a variety of added insulation types in their setup library to account for differences in the price of insulating walls with different types of cladding.

- Information provided to crews and contractors insulating walls should include all information necessary for them to perform the measure efficiently and effectively.

9.2 Shell – Windows (pg. 9-7)

- Whether to model a prime window for repair or replacement is up to the auditor's discretion based on the documented existing conditions.
- Single pane windows without storm windows must be evaluated for storm window installation.
- A storm window with no prime should be modelled as a single pane window. It should be evaluated for replacement as a doors/ windows measure. If there is no SIR for replacement, it should be evaluated for sash replacement as an Infiltration Reduction measure.
- Window repair or replacement measures must be done according to the Allowed Activities and Measures Chart
- Not every window crack results in air leakage. Window glazing should only be repaired or replaced when glazing is either missing, or a crack, hole, or the window itself allows air leakage.
- Any deviation from the leakiness definitions found in the WA Manual should be justified in the window comment section.

9.3 Shell – Doors (pg. 9-14)

- Leakiness classification criteria from the WA manual must be followed.

9.4 Shell – Unfinished Attics (pg. 9-19)

- **Averaging R-values.** Attic insulation R-value levels can be averaged within a single attic using the following approved methods. Copies of the calculations of the average R-value must be included in the household file.
 - Weighted R-value Calculator—CHP (Appendix C)
 - RED equivalent R-value Calculator
<http://www.residentialenergydynamics.com/REDCalcFree/Tools/ParallelPathEquivalentRValue.aspx>
- **Batt Insulation De-rating.** Batt insulation can be de-rated according to the Effective R-values for Batt Insulation chart found on page 8 of the Building Performance Institute Technical Standards For the Building Analyst Professional.
http://www.bpi.org/Web%20Download/BPI%20Standards/Building%20Analyst%20Professional_2-28-05nNC-newCO.pdf
- **Combining Multiple Attics.** Attics having the same R-value and attic type can be combined in the WA software into a single attic. The combined attic areas and their square footages must be noted in the audit documentation and/or the WA software. If combining attics of the same attic type with dissimilar R-values, the above approved methods of averaging R-values must be employed.
- **Floored Cavities with Open Blow.** When modelling attics that have densepacked floor cavities with open blow insulation above them, calculate the total R value of the two assemblies and model as an unfloored attic. Proper dense pack of the floored cavity will take priority over additional open blow.

9.5 Shell – Finished Attics (pg. 9-24)

9.6 Shell – Foundations (pg. 9-26)

- Rim joists that are not accessible should not be included in the perimeter to insulate calculation.
- All foundations that can feasibly be insulated per code requirements should be modelled for added insulation.
- Fiber glass rim joist insulation that has mildew should be removed and rims modelled as perimeter to insulate.

9.7 Heating – General Description Data (pg. 9-34)

- Replacement furnace test results should be placed in the inspection column of the primary furnace. A separate furnace tab should *not* be created in NEAT for a replacement furnace. (MHEA does have replacement furnace tab, while NEAT does not).
- Manufacturer and Model number *are* required.

9.8 Required Heating System Details Sub-Form (pg. 9-39)

- Input Units and Input Rating. Required. Refer to Replacement Policy for requirement.
- Output Capacity: Refer to Replacement Policy for requirement.
- Steady State Efficiency: Refer to Replacement Policy for requirement.
- Automatic Vent Damper – Evaluate: Do not evaluate, just document their existence.
- Follow the Heating Plant Replacement and Clean and Tune Policy. For homes that fit the criteria of the Heating Plant Replacement Policy, Replacement must be evaluated before Clean and Tune.
- Flame retention head retrofits for oil burners are not an allowed measure in the MN WAP.

9.9 Cooling (pg. 9-54)

- Cooling data may be entered, but is not required.

Chapter 10. MHEA Building Description

Mobile homes built over conditioned masonry foundations should be modelled in NEAT. In these cases it is still essential that heating plants and water heaters be designed for mobile home use.

10.1 Shell – Walls (pg. 10-2)

10.2 Shell – Windows (pg. 10-5)

- Frame type is required.
- Whether to model a prime window for repair or replacement is up to the auditor’s discretion based on the documented existing conditions.
- Single pane windows without storm windows should be evaluated for storm window installation.
- Window repair or replacement measures must be done according to the Allowed Activities and Measures Chart
- Not every window crack results in air leakage. Window glazing should only be repaired or replaced when glazing is either missing, or a crack, hole, or the window itself allows air leakage.
- Any deviation from the leakiness definitions found in the WA Manual should be justified in the window comment section.

10.3 Shell – Doors (pg. 10-13)

10.4 Shell – Ceiling (pg. 10-16)

10.5 Shell – Floor (pg. 10-20)

- Use the MHEA Floor Repair Modelling Tool to calculate insulation height. Use instructions below to model mobile home floor repairs. This ORNL approved method enables auditors to accurately model R value improvements resulting from mobile home belly repair thereby ensuring accurate energy modeling and allowing for cost justified belly repair.

NOTES:

- Pink cells = input
- Yellow cells = output
- "R value of undamaged area" means the designed R value of the insulation in the mobile home floor cavity.
- MHEA and the calculator assume that the belly and wing each make up 50% of the total floor .
- In addition to the belly insulation R value, the calculator assumes an R value for the floor assembly.

MHEA INSTRUCTIONS:

Red Boxes - Enter the designed insulation height (example: for 6 inches, select "2x6").

Blue Boxes - Use these exact settings in every case.

Orange Boxes - Enter calculated values from the "Averaged insulation (inch)" fields above.

Enter all other fields as instructed in the current WA Manual.

10.6 Addition (pg. 10-26)

- Walls
 - Site drawings, wall codes or wall comment field should explain which wall sections from the dwelling make up each “wall” in NEAT.
 - SPs typically have a variety of added insulation types in their setup library to account for differences in the price of insulating walls with different types of cladding.
 - Information provided to crews and contractors insulating walls should include all information necessary for them to perform the measure efficiently and effectively.
- Floors
 - Mobile home addition floors should be modelled as outlined in the WA Manual. The key feature of the addition floor tab is the “depth available for insulation” field. This feature enables the auditor to dictate the amount of insulation added, unlike the

main floor section. The method and tools for averaging R values found in section 9.4 can be used on addition floors as needed to calculate the existing insulation height.

10.7 Heating – Primary, Secondary, and Replacement (pg. 10-37)

- BTU Capacity required.
- Make and model number are required.
- In the case of furnace replacement, when there are existing furnace return ducts in the floor, these ducts should be sealed and return air provided through the furnace compartment door/ opening and the cold air return insulated—per the design of new mobile home furnaces.
- Do not use the Evaluate All feature. Follow the Heating Plant Replacement and Clean and Tune Policy. For homes that fit the criteria of the Heating Plant Replacement Policy, Replacement must be evaluated before Clean and Tune.

10.8 Cooling – Primary, Secondary, and Replacement (pg. 10-43)

Chapter 11. NEAT and MHEA Common Elements

11.1 Status (Audit) (pg. 11-1)

- Information on statuses is found in *Required Statuses, Appendix C* and on page 12 of this document.

11.2 Ducts/Infiltration – Air and Duct Leakages (pg. 11-3)

- All duct sealing work should follow the Duct Sealing Guidance, Appendix C. Air sealing of ducts outside the thermal envelope is an air sealing measure.
 - For site built homes, do not check the “evaluate duct leakage” box.
 - To evaluate mobile home duct leakage, follow the Modelling Duct Leakage in MHEA tool, (Appendix C).
- Choosing a target CFM:
 - The target should be based on reducing air infiltration as much as is feasibly possible within the confines of the SIR and the existing conditions.
 - The target CFM must be attainable and realistic. It should be aggressive enough that crews are challenged to seek out and complete every feasible air sealing opportunity in a home.
 - The target CFM should account for insulation measures such as dense packing walls and insulating rim joists that may result in significant infiltration reduction.
 - The target CFM should be based on historical results for air sealing in a Service Provider’s service territory for a given housing type, condition, and size.
- Choosing Infiltration Reduction cost estimates
 - Infiltration reduction cost estimates should provide weatherization crews with the means to achieve the target CFM.
- Quality Control Inspectors will review air sealing targets, infiltration reduction goals, final blower door numbers, and work completed to assess that all feasible air sealing work was completed in order to ensure there were no missed air sealing opportunities.
- Before Weatherization (Existing) Air Leakage Rate and House Pressure Difference: Required.

11.3 Duct/Infiltration – Optional Forms (pg. 11-18)

11.4 Base Loads – Water Heating (pg. 11-24)

- All water heaters must be modelled for replacement to see if an SIR of one or greater for replacement can be achieved.
- Manufacturer and Model: Required unless tag is unreadable or missing.
- Tank Insulation R-value: Required (see Field Guide for procedure for determining tank insulation R-value).
- Use the following ORNL approved method to evaluate on demand water heaters in WA.

- In the supply library, enter the following after clicking on the Energy Details button:
 - Fuel type – per manufacturer
 - Capacity – Enter a tank size (gallons) for the size of a storage water heater that the on demand unit might replace, or the size of a storage water heater that you would install if you did not put in an on demand unit. It should be a typical size such as 30 or 40 gallons). This is used to calculate amount of water used by the house, so it does not have a large effect.
 - Input (units and value) – If it is known use the input from the new on demand unit. Otherwise use the value for a storage water heater that this on demand unit might replace or the value for a storage water heater that would be installed if an on demand unit were not installed. The value will have no impact since it will be multiplied by zero in the calculations.
 - Energy Factor – per manufacturer.
 - Recovery Efficiency – Set to be a little higher than the energy factor (e.g., if EF=0.66, then enter RE=0.661). Do NOT make it equal to the EF, as this incorrectly indicates to NEAT and MHEA that the water heater is a heat pump water heater.
 - Life – use standard life of 15 years, unless a different life span is justified. Any deviation from the standard life span should be documented in the file.
- Analyze as you would any other water heater: On the water heating form, enter the existing water heater. For the replacement unit, select the on demand unit entered into the Supply Library.

➤ *Shower head evaluation and faucet aerator evaluation is optional.*

11.5 Base Loads – Refrigerators (pg. 11-29)

- All Refrigerator data should be entered in WA and all existing fridges modelled for replacement.
- Includes defrost cycle box should be checked when metering

11.6 Base Loads – Lighting Systems (pg. 11-35)

- All incandescent bulbs used over one hour per day should be modelled in WA.
- Light bulbs of the same wattage can be grouped together with an average usage or separated by usage.

11.7 Health and Safety (pg. 11-38)

- Whole House
 - CO and Smoke Alarms must be brought up to MN Code. SPs must communicate to Crews/ Contractors the number and location of all necessary CO and Smoke Alarm replacements.
 - Ambient CO levels should be recorded for furnace room, water heater room, kitchen and living space should be recorded in WA.
- Equipment
 - Worst Case Draft is not a testing requirement in the MN WAP. CAZ Depressurization testing and spillage testing are required in its place.
 - Cook Stove CO levels should be recorded in the equipment tab
- Building Shell
 - If a box is checked in the building shell tab, comments must be recorded in the comments field or in a corresponding itemized cost tab.

11.8 Itemized Costs (pg. 11-41)

- Any itemized cost that has an SIR attached to it must be preapproved by Commerce.
- Review Allowable Measures Chart (AMC) to ensure each itemized cost fits in the proper funding category.

11.9 Utility Bills (pg. 11-49)

- *This analysis is not required by the MN WAP.*

11.10 Photos (Audit) (pg. 11-53)

- Due to data storage limitations at Commerce, this feature is turned off in the MN WA 8.10

11.11 Measures (Audit) (pg. 11-54)

11.12 Optional Heating System Details (pg. 11-59)

- Heating system details are not optional. All tabs applicable to the existing heating system(s) must be completed.
- Draft testing is not required by the MN WAP program. CAZ Depressurization testing and spillage testing are required in its place.

11.13 Optional Water Heater Details (pg. 11-63)

- Water heater system details are not optional. All tabs applicable to the existing water heater system(s) must be completed.
- Draft testing is not required by the MN WAP program. CAZ Depressurization testing and spillage testing are required in its place.

Chapter 12. NEAT and MHEA Results

12.1 Running an Audit and Viewing the Results (pg. 12-1)

12.2 Recommended Measures Report (pg. 12-2)

Chapter 13. Work Orders

13.1 Work Order Information (pg. 13-2)

- Audit Name must remain the same
- Contractors/ crews field must be filled in with appropriate contractor
- Work order type must be indicated from the WA dropdown list.

13.2 Status (Work Order) (pg. 13-7)

- Information on statuses is found in *Required Statuses, Appendix C* and on page 12 of this document.

13.3 Measures (Work Order) (pg. 13-9)

- Measures should be completed in order of the measures list, with mechanical work being performed before building shell work and air sealing performed before other building shell measures.
- Measure type field is required.
- Those components automatically brought in from the audit should be kept.
- Cost center field is required.
- Materials/ Labor details in the work orders should be numbered, so that the labor and materials details of each item are grouped together.
- Materials/ Labor type is not optional
- Units must stay consistent between actual and estimated costs.
- Comments can be used to clarify details.
- Quantities and units of estimated costs must be entered in the data fields.
- Quantities and units of actual costs must be entered in the data fields.

13.4 Photos (Work Order) (pg. 13-24)

- The pathname to a folder where relevant pictures are stored can be added here. Optional.

Chapter 14. Setup Library

14.1 Setup Library Information (pg. 14-2)

14.2 Key Parameters (pg. 14-5)

14.3 Fuel Costs (pg. 14-21)

14.4 Fuel Price Indices (pg. 14-24)

14.5 Library Measures (pg. 14-26)

14.6 User Defined Measures (pg. 14-31)

- Descriptions & Comments can be added to clarify details.

14.7 NEAT Insulation Types (pg. 14-42)

Chapter 15. Supply Library

15.1 Supply Library (pg. 15-1)

15.2 Materials/ Labor Forms

- Manufacturer and model numbers are required (15-6)

15.3 Energy Details Sub-form

- Rated U values are listed by door manufacturers (15-12)
- Life of doors is set by Commerce (15-12)
- Fuel type is not optional, do not change (15-12)
- Efficiency and capacity is not optional (15-12)
- Life of a furnace is set by Commerce, do not change (15-12)
- Insulation type, R value, density, and suitability for what type of installation is required. (15-12)
- Bag size of insulation is required. (QCI will need to know this).

EnergyDetails >>

Insulation Type	Loose [blown or pumped]	Suitable for	<input checked="" type="checkbox"/> Attics
R Value	4.6		<input checked="" type="checkbox"/> Walls
R Value Units	R-value per inch of thickness	Installed Density (lb/cuft)	<input type="checkbox"/> Sill Boxes
Bag Size (lb)	30		<input type="checkbox"/> Foundations

Figure 15.12. The Energy Details sub-form for Insulation.

- Lamp type, life, lumens, watts, color temperature, 3-way or dimmer are required. (15-15)
- Capacity, KWH per year, life expectancy, dimensions, style, and whether refrigerator defrosts automatically are required (15-16)

Weatherization Assistant Status Descriptions

Black -- Required, Blue -- Optional, Green -- Generated Automatically

Client Tab*	
Status	Description
No Work Done, File Closed/Locked On (If Applicable)	Indicates no work will be done on a home. Used for homes that are in an indefinite, long-term delayed status. Will not appear on Jobs in Progress Reports. <i>Optional.</i>
Audit Tab	
Status	Description
Site Visit Completed On	Date onsite audit. Start date for job length.
Recommendations Generated On	Date of most recent audit run. <i>Generated automatically.</i>
Audit Complete and Locked On	Indicates all work orders have passed inspection and all invoice have been approved or paid.
Walk Away	Date a job was walked away from. Used only a house is deferred with no chance of returning such as home that is scheduled to be demolished. <i>Optional.</i>
Delayed On (If Applicable)	Date of delay/ deferral. Used when a home is delayed/ deferred. <i>Optional.</i>
Work Order Tab –General	
Status	Description
Work Order Created from Audit On	Date a work order is created. <i>Generated automatically.</i>
Work Order Issued On	Date a work order issued
Work started On	Date work on a work order begins. <i>Optional.</i>
Work Completed On	Date a crew or contractor completed on-site work.
Work Order Cancelled On (If Applicable)	Date work order is cancelled.
Rework Completed On (If Applicable)	Date a crew or contractor completed on-site rework
Work Order Tab–Inspection	
Status	Description
Passed On	Date all measures in this work order are passed by a Quality Control Inspector.
Failed On (If Applicable)	Date any measures in this work order were failed by a Quality Control Inspector.
Work Order Tab–Payment	
Status	Description
Invoice Received On	Date invoice is received from contractor or in the case of crew-based agencies, when fiscal begins accounting process. <i>Optional.</i>
Invoice Approved On	Date when the invoice and associated work is approved for payment.
Invoice Paid On	Date when an invoice is paid.
Not Required (If Applicable)	Indicates payment is not required for the measures in this work order.
Other (If Applicable)	Used when a final inspection could not be completed per Policy Manual 4.6.4, (include justification in Client or Audit tab comments).

*The client tab shows all audit and work order statuses as well as client statuses.