WAWEB (NEAT/MHEA AUDIT) MANUAL

Iowa Weatherization Program

Iowa Department of Health and Human Services
Division of Community Access and Eligibility
Community Action Subdivision
Lucas State Office Building
Des Moines, Iowa 50319
Website: hhs.iowa.gov/programs/programs-and-services/caa

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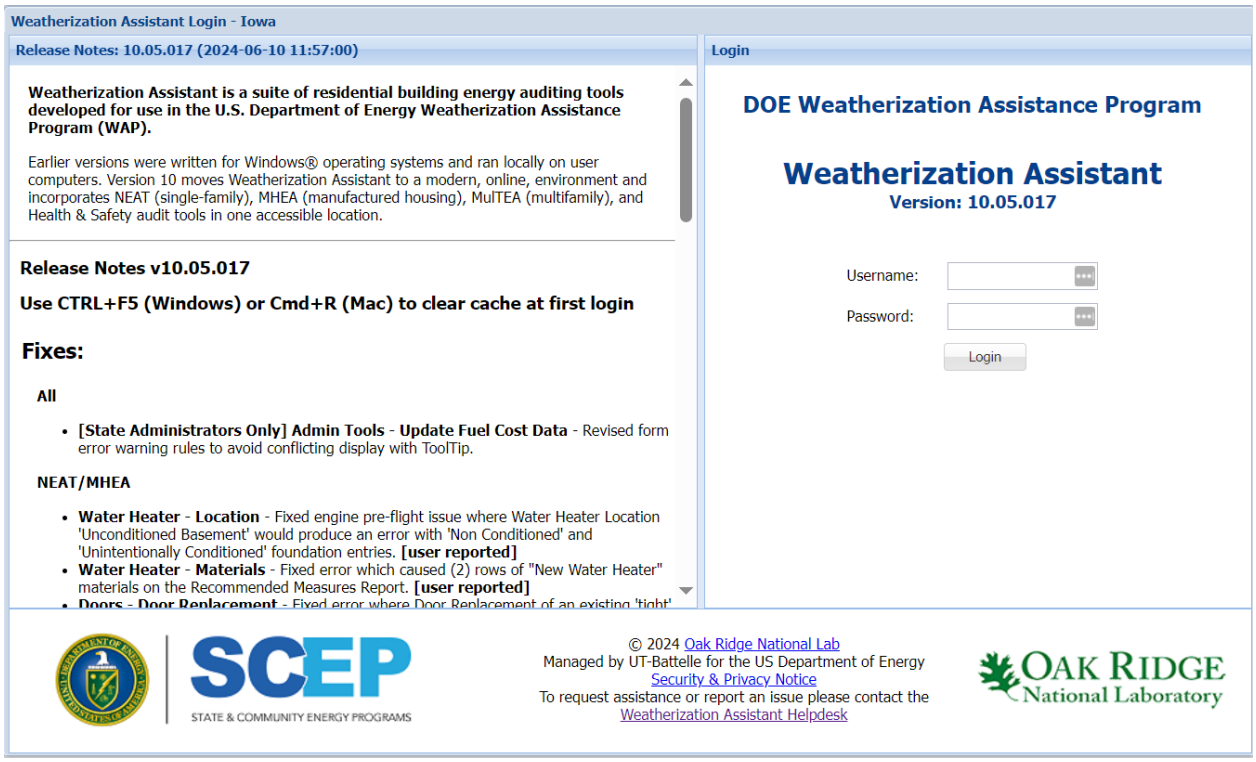
WAweb Login Page Form



The right side of the page is used to login into WAweb. Log into the web-based Weatherization Assistant with the Username and Password provided to you by the State of Iowa. Usernames and Passwords are case sensitive.

The left side of the login window provides updates made to the latest release of the software. It is recommended that you use CTRL+F5 (Windows) or Cmd+R (Mac) to clear cache at first login.

Also note, at the bottom of the page there is a link for the Weatherization Assistant Helpdesk with Oak Ridge National Laboratory (ORNL). Anytime you have a question about what or why the audit is doing something, this is where you go to ask your questions.

Navigation

Entering Data

There are three controls in the way the audit will accept input:

Field - it can either be numeric or alphabetical, typed in by using the keyboard.

Combo Box - generally has pre-selected items to choose from. They are boxes that look like fields but have a square box with an arrow pointing down at the far right of the field.

Check Box - check box is a small white box in which a check mark may or may not be visible. If a check is visible, it implies a yes response to the question associated with the box.

Navigation between Fields

You can use the [Tab] and [Shift-Tab] keys to cycle through the controls in forward or reverse order. Use the [Up Arrow] and [Down Arrow] to choose the pre-selection entries in the drop-down box. In some cases, the Enter key can also be used to navigate to the next field.

Buttons

New Button - use this button to create a new record.

Copy Button - this allows you to copy from one record to another, eliminating duplicate entries. Particularly useful when entering data in wall, window, and door sections of the audit, or you want to model two audits with same characteristics but want to see different outcomes.

Deleting Button - in All Accounts select the record you want to delete and then select the delete button. Caution: in some cases, you can delete a complete account, instead of deleting a single record.

OK Button - you need to push the OK button to save the data you entered in a field. Selecting OK saves the record and closes the form.

Apply Button -, you need to push the apply button to save the data you entered in a field. Selecting Apply saves the record but leaves the form open. If you don't hit apply after you enter the data, a pop-up message will appear asking you if you want to continue.

Cancel Button - selecting Cancel closes the form without saving the entries made.

Report Button - here is where you can preview, print, or snapshot file any report associated with the record.

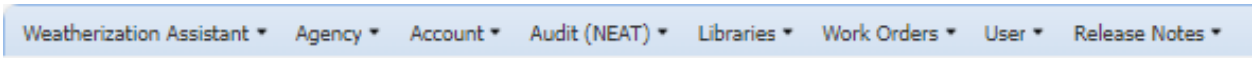
Getting Help – If at any time you are not sure what information you should be entering into a field, place your cursor inside the field you need help entering data and a pop-up will appear with a description of what data you need to enter that filed.

Required Fields - if a field is a required field and you move out of the field without entering a value, the field will turn red, and the audit will not let you move on without entering a value.

Recommended Fields – if a field is a recommended field, it is recommended that you enter a value into the field but is not required for you to move forward to the next data entry field. If you choose not to enter information into the recommended field the audit will still run with that field left blank.

Optional Field – Optional fields are just that, optional. Audit will run without entering information into them.

Navigation Bar



The navigation bar for the NEAT/MHEA audit tool is designed for ease of use, with intuitive tabs that make it easier to jump from section to section. You can toggle back and forth between sections to review or modify information as needed.

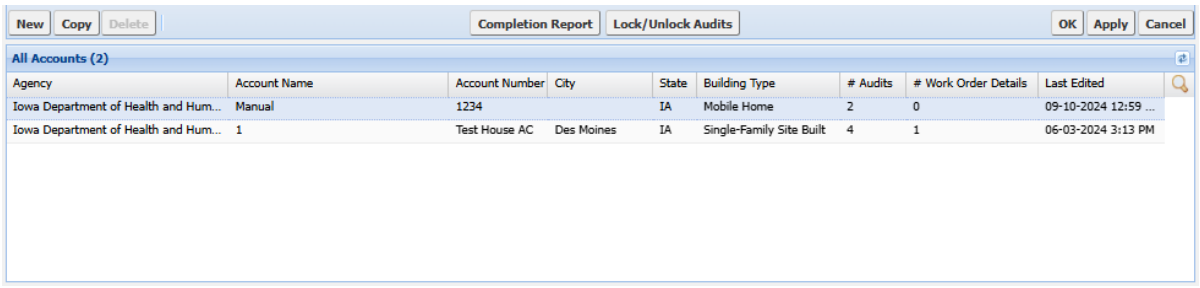
This navigation or menu bar provides access to the administrative forms (agency, contacts, cost centers, account, and user), audits (NEAT, MHEA, MulTEA, and the Health and Safety Audit), work orders, and libraries needed to run NEAT, MHEA, and MulTEA (Economic Parameter Set, Fuel Cost, Measure Cost Set, Key Parameter Set, Supply, and Defined Measure Set). The menu bar also provides a link to obtain more information about the Weatherization Assistant, access release notes, and log out.

Under “Account” is where you can create a new or select an existing account.

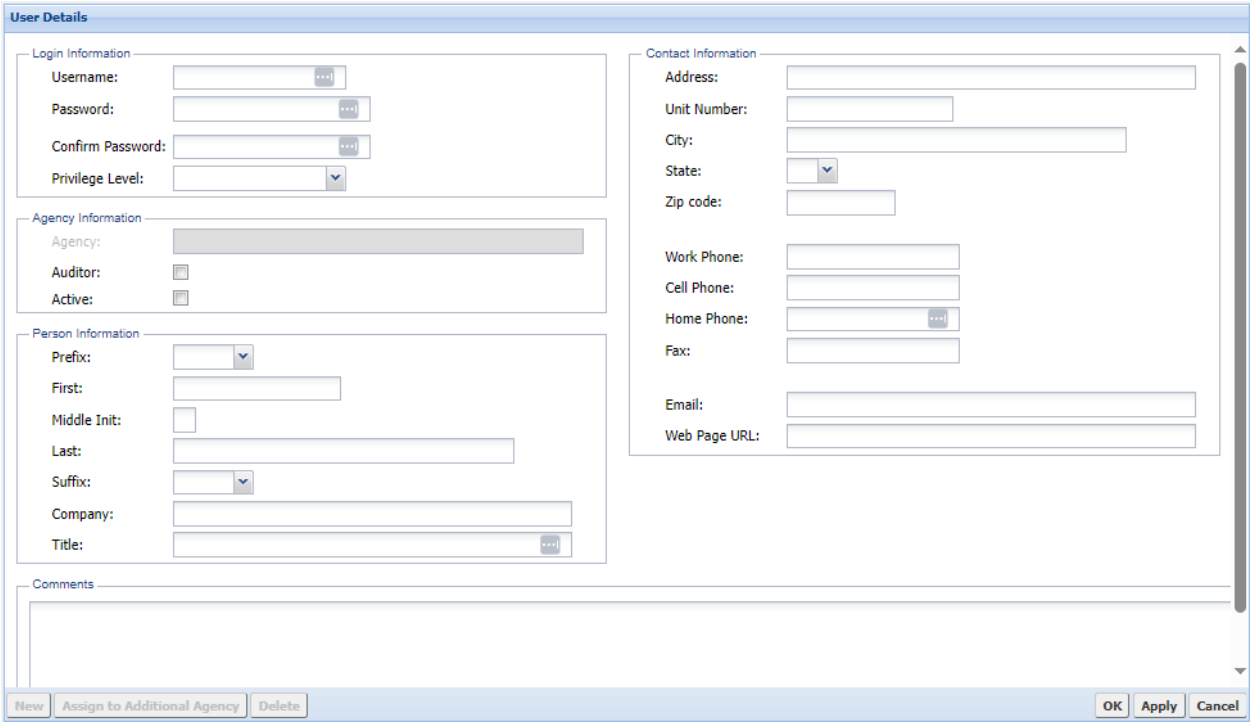
Task Bar/ All Accounts

At the bottom of the forms, you will find the task bar. The task bar contains New, Copy or Assign to Additional Agency, and Delete options to create or delete a record. Selecting OK saves the record and closes the form. Selecting Apply saves the record but leaves the form open. Selecting Cancel closes the form without saving the entries made.

Accounts is where you go to select the account you want to preview, or work on.


New
Copy
Delete
Completion Report
Lock/Unlock Audits
OK
Apply
Cancel
All Accounts (2)
Agency
Account Name
Account Number
City
State
Building Type
Audits
Work Order Details
Last Edited
Iowa Department of Health and Hum...
Manual
1234
IA
Mobile Home
2
0
09-10-2024 12:59 ...
Iowa Department of Health and Hum...
1
Test House AC
Des Moines
IA
Single-Family Site Built
4
1
06-03-2024 3:13 PM

User Details Form



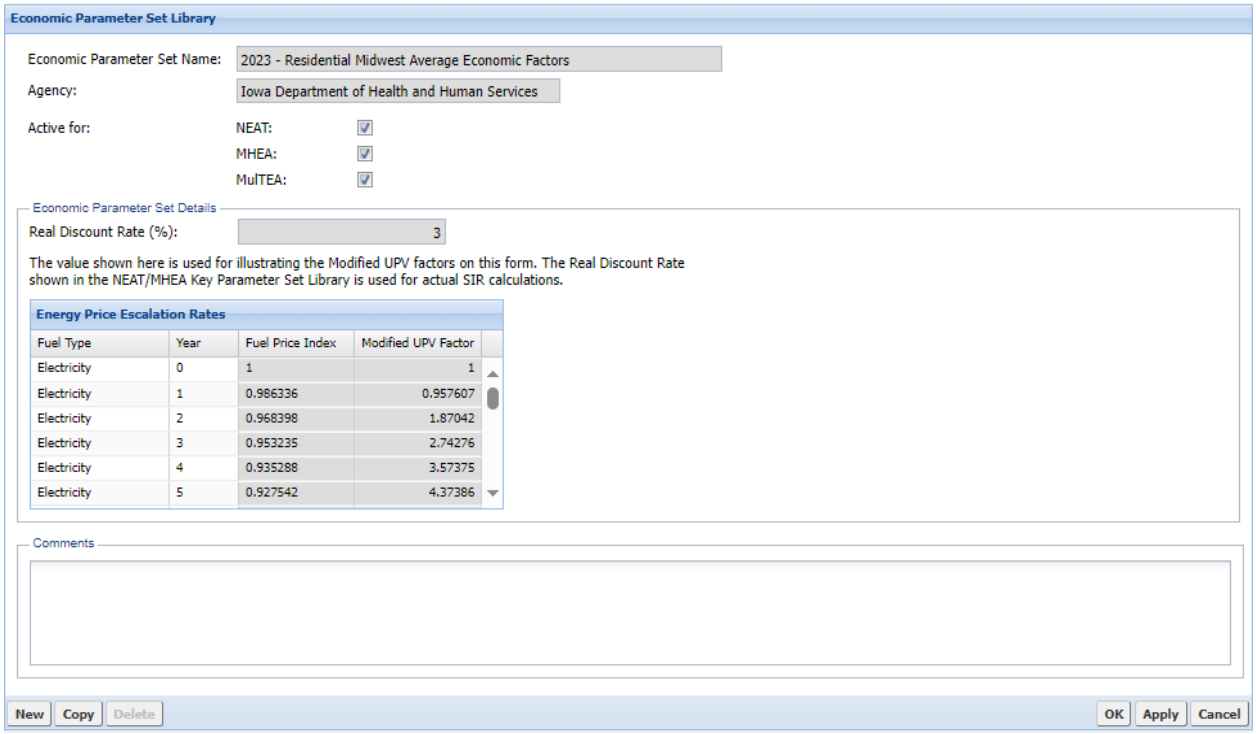
Login Information - is where you go to create a new user, give the user a password and privilege level. Note: Agency Administrators, and Lead Auditor have privileges that will allow them to make changes in Libraries, where the Auditor, Guest, DOE Read Only can only enter data or read data.

Agency information - is where you select the agency the user is associated with. Check the "Auditor", and the "Active" box if the user is going to enter audits into WAweb. By leaving the "Active box unchecked, the user will be an audit associated with the agency but will not be able to enter audits into WAweb.

Personal and Contact Information – Here is where you will enter the personal information of the user. The only fields that need information in is first and last names, and State. All other data fields are optional. It is recommended that you add a unique identifier to the last name to identify the privilege given to the user (agency administrator AA, Lead Auditor LA, Auditor, AA, etc.).

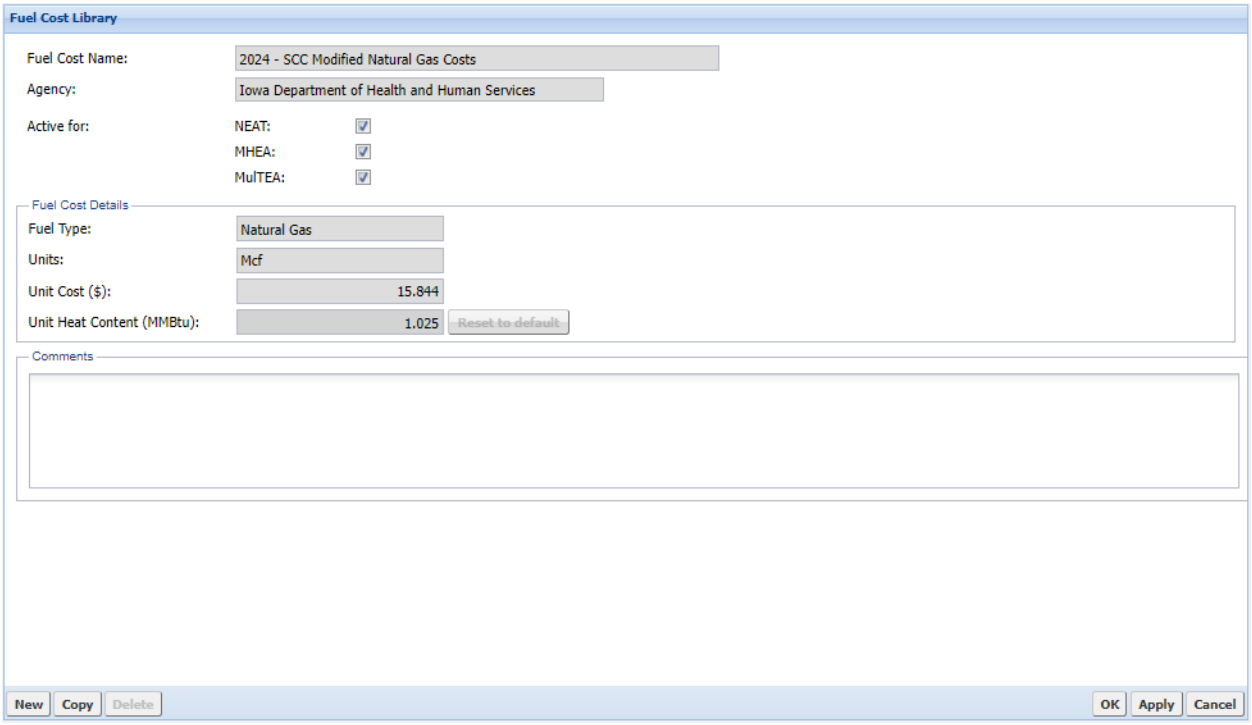
Libraries

NEAT/MHEA Economic Set Library



Economic Parameter Set - these libraries provide the fuel price indices and modified uniform present value factors required to perform economic calculations in NEAT, and MHEA. These are provided for 8 fuels for 30 years: electricity, natural gas, propane, fuel oil, kerosene, wood, coal, and other. **These libraries are set by ORNL and are not to be changed unless authorized by the State**.

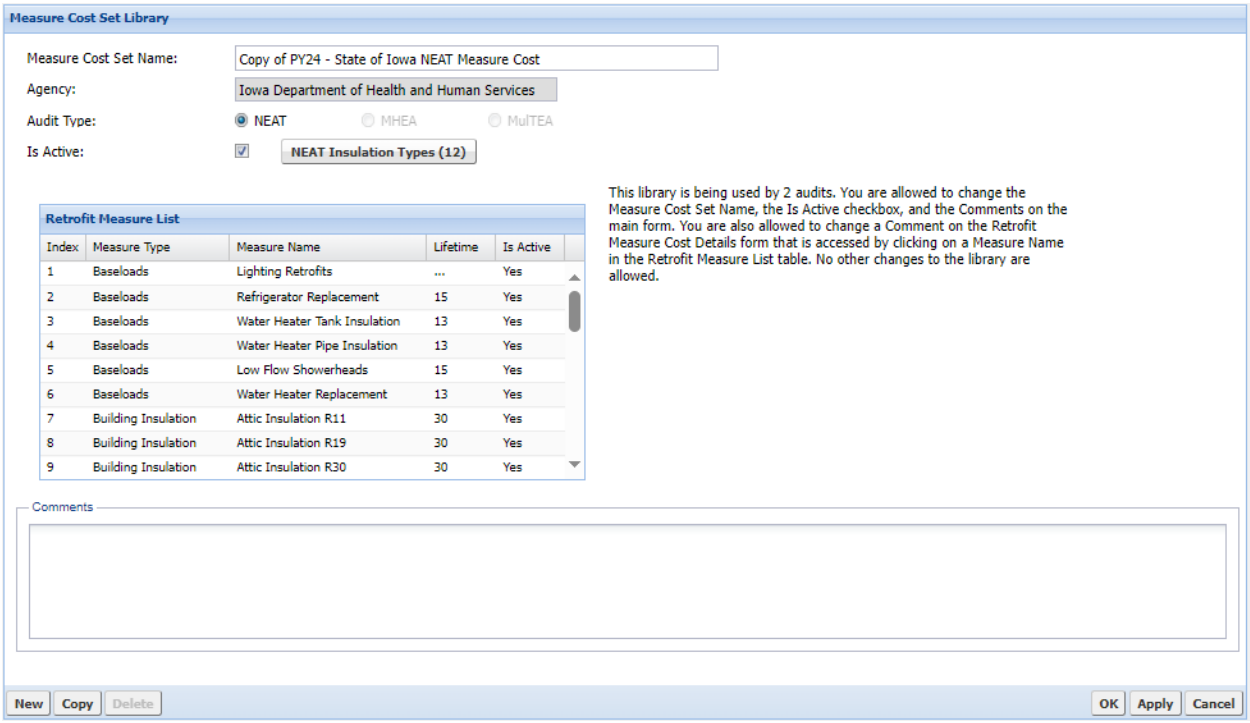
NEAT/MHEA Fuel Cost Library



Fuel Cost - these libraries provide the costs for eight fuels used in NEAT, and MHEA: electricity, natural gas, propane, fuel oil, kerosene, wood, coal, and other.

The costs in the Fuel Costs Library are preloaded by the State and should not be changed unless authorized by the State.

NEAT/MHEA Measure Cost Set Library

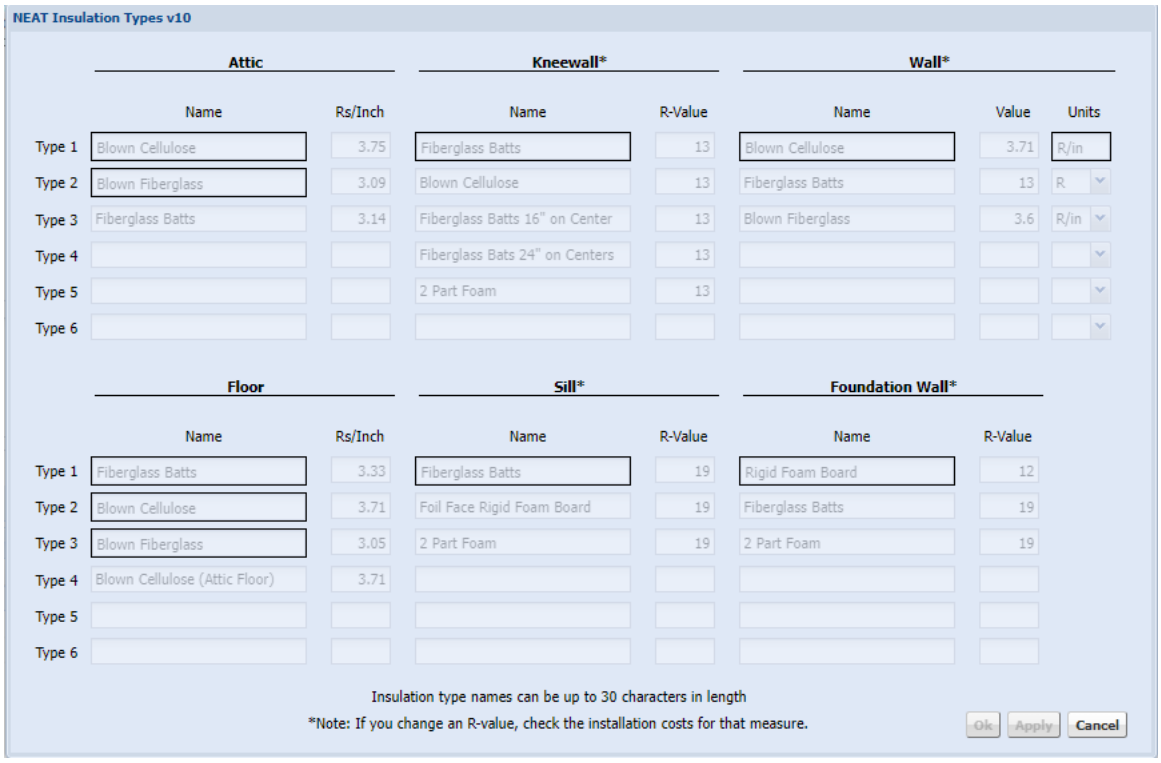


Measure Cost Set - these libraries collect overall measure cost information. They provide access to Retrofit Measure Cost Details forms, which collect material and installation cost details for individual retrofit measures programmed into NEAT, and MHEA for use in making economic calculations. They are provided separately for NEAT, and MHEA. For NEAT and MHEA measures that have site or system-specific costs, including air sealing, duct sealing, and replacement of HVAC equipment, water heaters, refrigerators, and lighting, costs are directly entered on the audit forms and not in the Measure Cost Set Library.

The costs in the library are preloaded by the State and should not be changed unless authorized by the State.

The NEAT Measure Cost Set Library also provides access to a form to enter NEAT insulation types.

NEAT Insulation Type



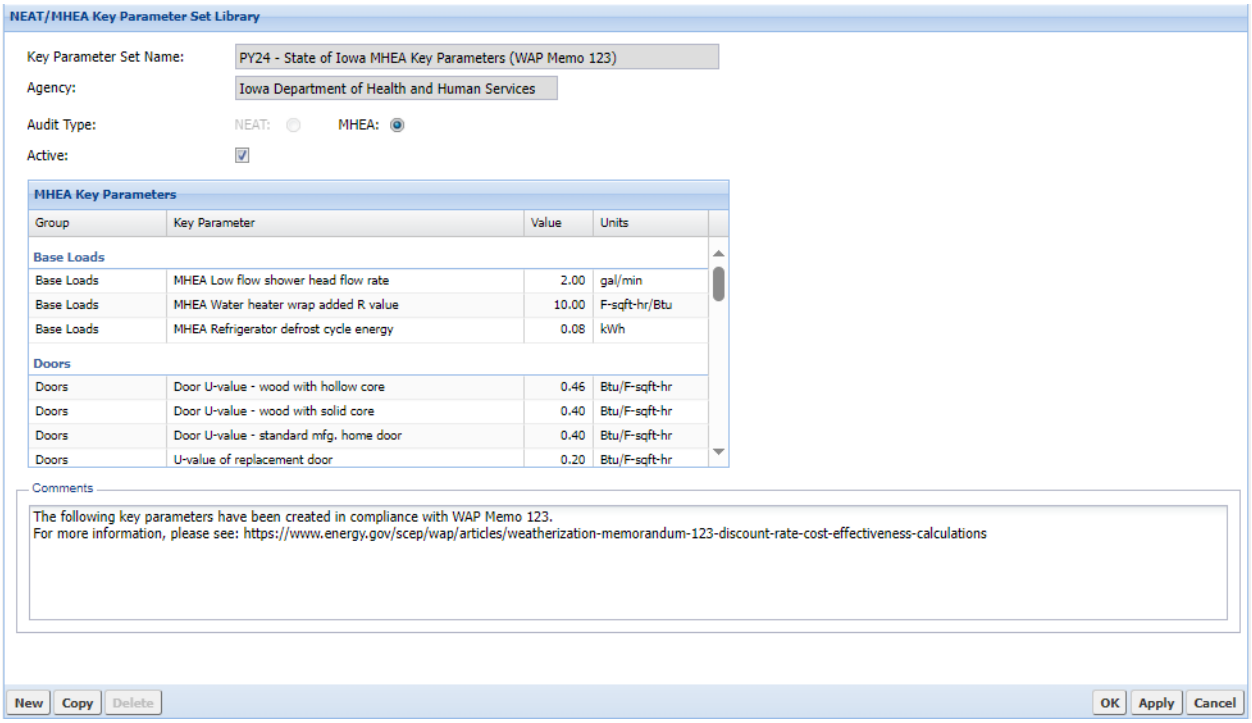
The NEAT Insulation Types form in the Setup Library allows you to define additional insulation types for each of these components to meet local needs.

When the Weatherization Assistant is initially installed, the added insulation types available for each of the shell components are displayed in greyed, outlined fields on the NEAT Insulation Types form. The names cannot be changed. Below these insulation type names are blank, editable fields into which you may enter the names of additional insulation types of your choosing. Once entered, these names will appear in the Library Measures Costs sections of the Setup Library in the building description forms of audits accessing the Setup Library, and in any reports that recommend a measure using these materials.

To the right of these material names are numeric fields giving the R-values per inch or total R-Value of the material you are defining. The R-values have dimensions h-ft2-F/Btu. Typical values corresponding to various insulation types may be found in building manufacturers' data sheets or in ASHRAE's (American Society of Heating, Refrigerating, and Air-Conditioning Engineers) Handbook of Fundamentals. Entries in these fields permit your defined insulation types to have the physical characteristics needed by the NEAT audit that you desire.

NEAT Insulation Types in the Library are preloaded by the State and should not be changed unless authorized by the State.

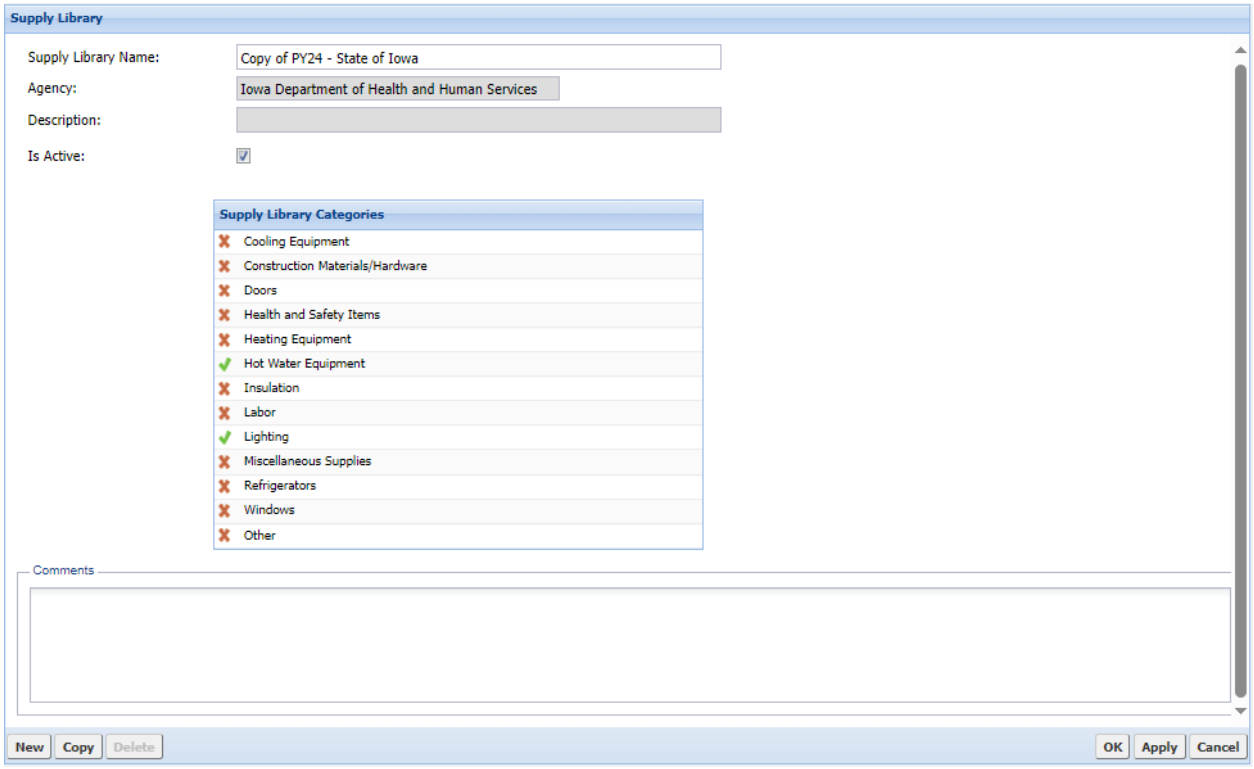
NEAT/MHEA Key Parameter Set Library



Key Parameter Set (NEAT and MHEA only) - these libraries provide flexibility to modify some of NEAT's and MHEA's inputs and assumptions. These forms are provided separately for NEAT and MHEA.

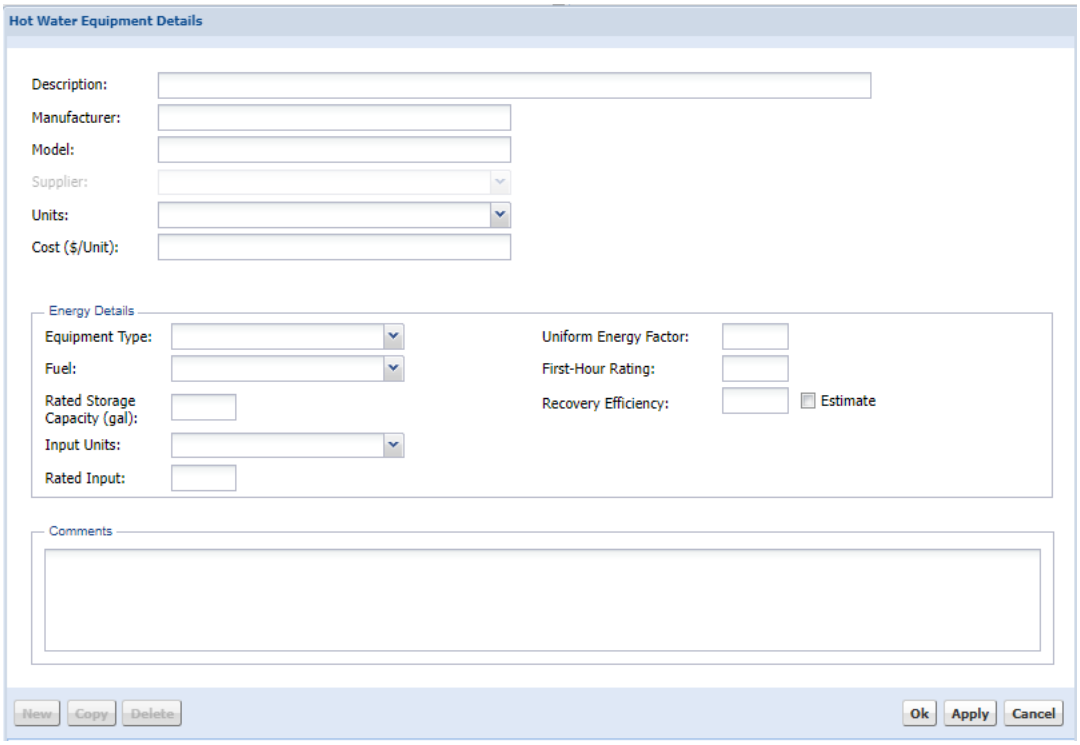
This Library is preloaded by the State and should not be changed unless authorized by the State.

NEAT/MHEA Supply Library



Supply (NEAT and MHEA only) - these libraries provide the ability to identify materials used within our program and their cost. Although primarily used in creating work orders, information entered for refrigerators, water heaters, and lighting can be accessed from within an audit. For each material, you can enter material properties, costs, and energy-related information. It is here that agencies will enter the water heaters they are going to model for replacement, lighting they are going to model for replacement, and refrigerators they are going to model for replacement.

NEAT/MHEA Hot Water Equipment Details



Hot Water Equipment – This Library is created by the Agencies.

Agencies need to have a minimum of 7 water heater entries. All "Energy Detailed fields need to be filled in. Information can be found on http://www.ahridirectory.org/

The seven water heaters that need to be loaded by the agencies are: 40-gallon natural gas power vent, 40-gallon propane power vent, 40-gallon electric, 50-gallon Hybrid electric, 40-gallon natural gas direct vent mobile home, 40-gallon propane direct vent mobile home, and 40-gallon electric mobile home. Agencies are encouraged to enter more water heaters that reflect the ones their program is installing.

Description - Add the description of the water heater you are entering to the library (example: 40-gallon natural gas power vent).

Manufacture - Optional. Add the Manufacture of the water heater you are entering to the library.

Model - Optional. Add the Model of the water heater you are entering to the library.

Units - From the drop-down menu choose "each".

Costs ($/unit) - Enter the installation cost (material, and labor) of the water heat.

Energy Detail

Equipment type - From the drop-down menu choose the type of the water heater you are entering.

Fuel – From the drop-down menu choose the fuel type of the water heater you are entering.

Rated Storage Compacity (gal) – Enter the gallon or the water heater you are entering.

Input units – From the drop-down menu choose the input units of the water heater you are entering.

Rated input – Enter the number the water heater is rater at.

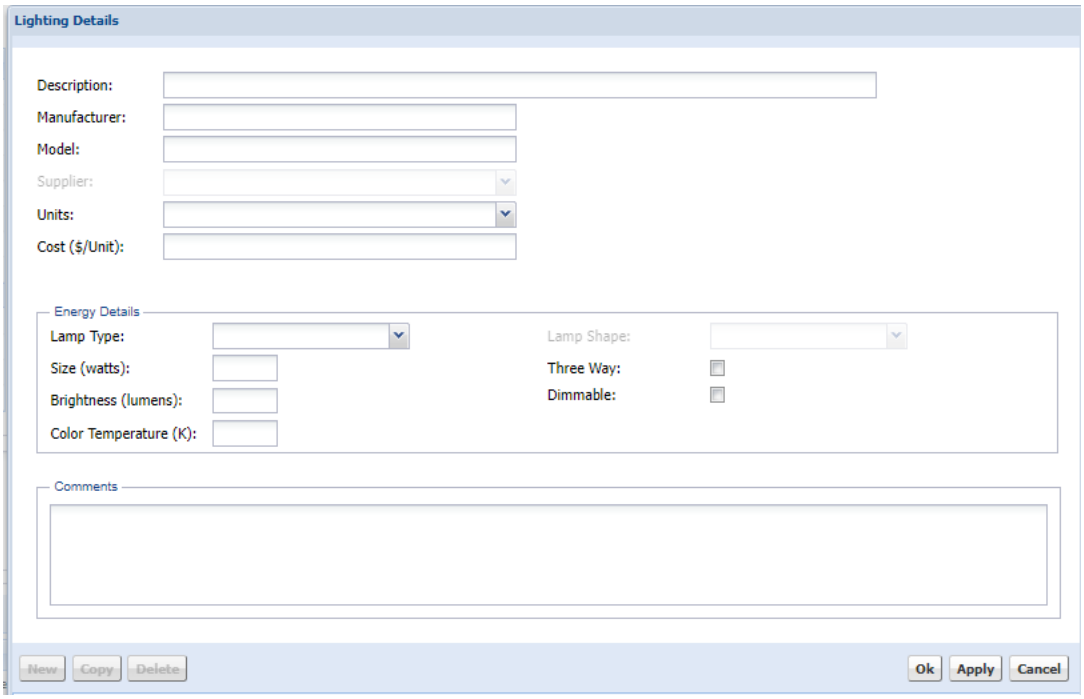
Uniform Energy Factor – Enter the energy factor of the water heater.

First-Hour Rating – Enter the first hour recovery rating.

Recovery Efficiency – Enter the recovery efficiency of the water heater

Estimate – Do not check this box.

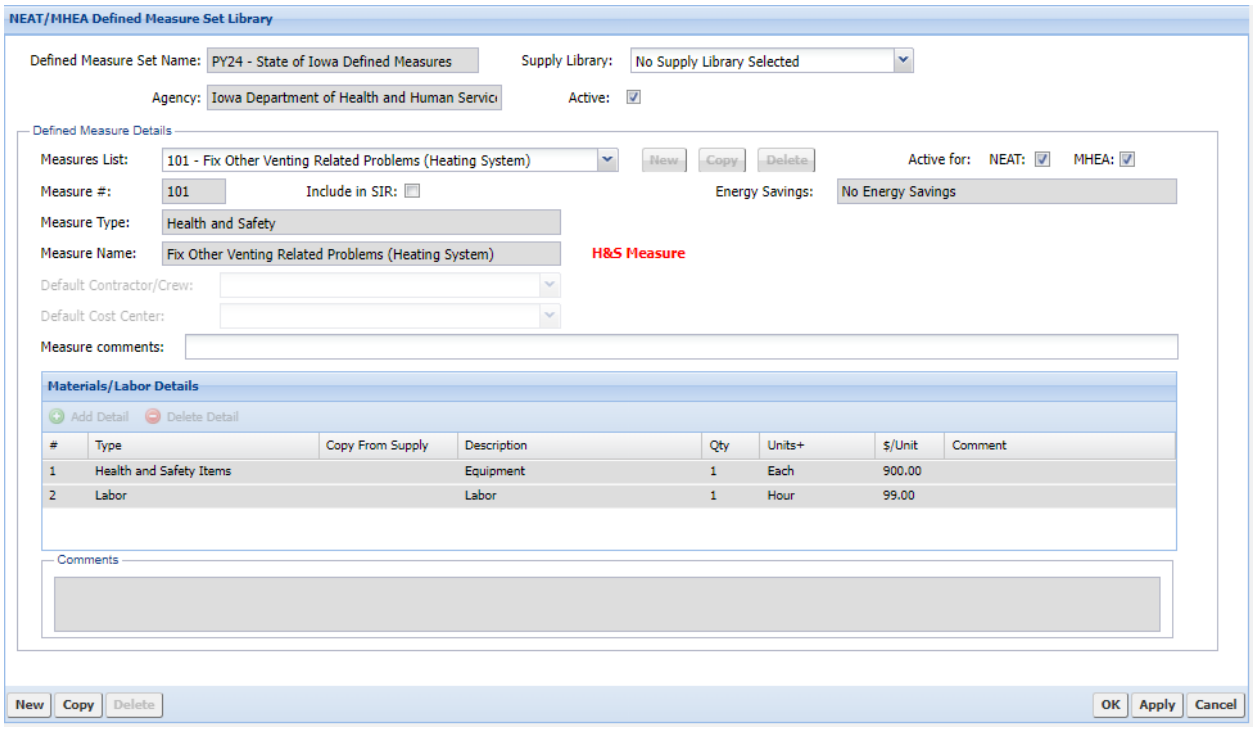
NEAT/MHEA Lighting Details



This is the Lighting detail form for LED replacement light bulbs. The Description will auto-fill from the lighting details selection. Lamp Type is a required field.

Lighting Library is preloaded by the State and should not be changed unless authorized by the State.

NEAT/MHEA Defined Set Library



Defined Measure Set (NEAT and MHEA only), these libraries provide the ability to predefine weatherization activities, including 50 predefined health and safety measures (not used by our program), that are not addressed within the NEAT and MHEA library measures but are commonly encountered during an audit.

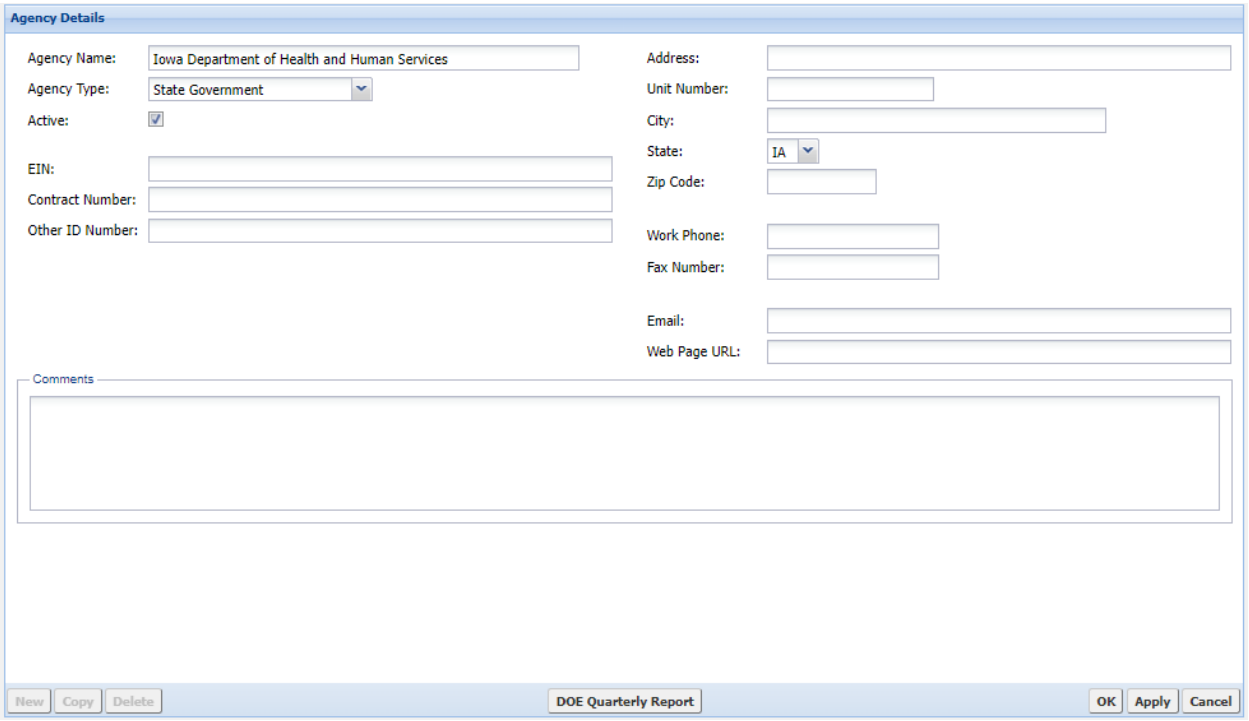
Defining the measures on this form enables copying them to any audit as an itemized cost. The defined measures consist of all repair and H&S materials that we use to support the Energy Conservation Measure ECM, and the Health & Safety of the home.

Defined Measure Library is preloaded by the State and should not be changed unless authorized by the State.

Agency Form

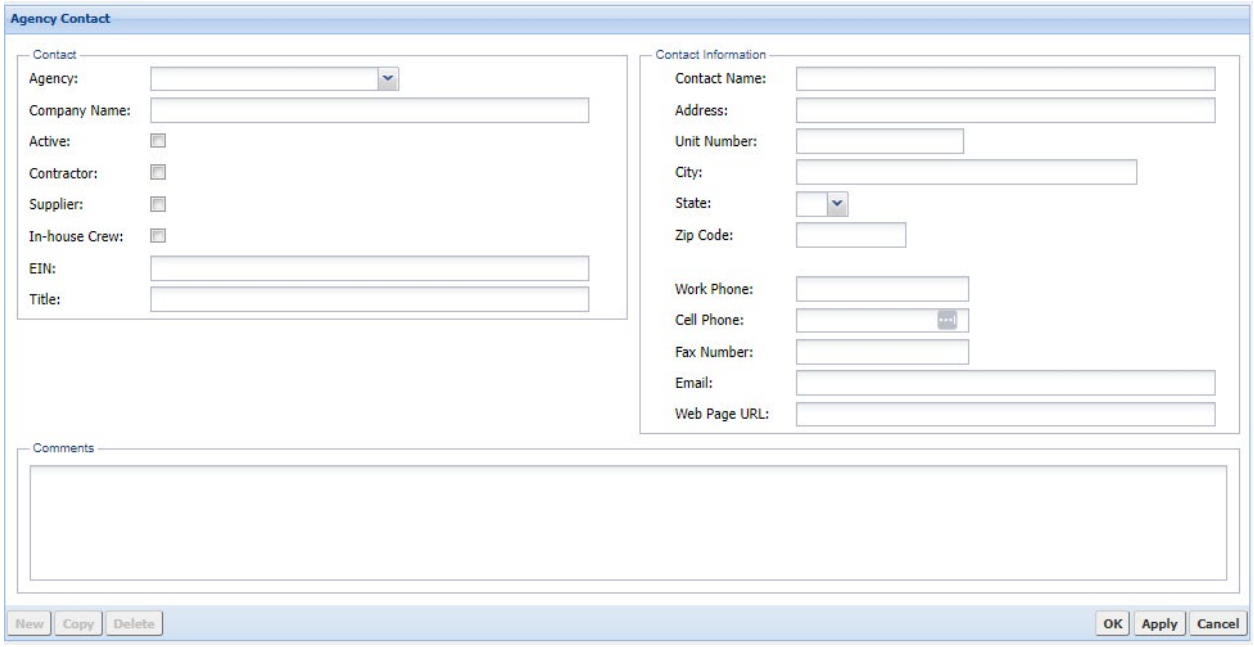
The three agency forms below are: Agency Details, Agency Contacts, and Agency Cost Center; they can be accessed by selecting Agency on the menu bar and choose from the drop-down menu.

Agency Details



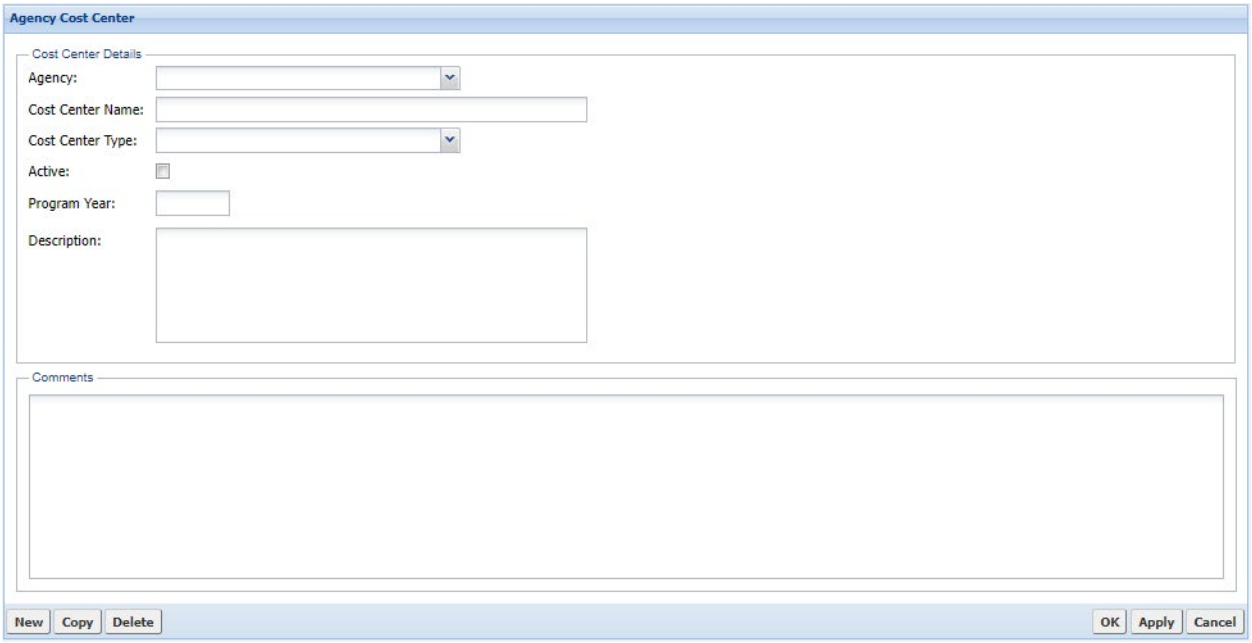
Agency Details - to see the agency record to which you have been assigned (Guests are not allowed access to the Agency Details form). The agency may have been created by ORNL or your state. If you are an Agency Administrator, you can add, edit, or update the information as needed. The only required fields on this form are Agency Name, Agency Type, and State. Make sure the Active checkbox is selected to have the agency name listed on the Agency drop-down field on the Audit form for NEAT, and MHEA. **Agency Detail is set-up by the State and should not be changed unless authorized by the State**.

Agency Contact



Agency Contacts - (relevant to NEAT and MHEA only) is used to enter information on any person associated with the agency, including contractors, suppliers, and in-house crew members. This allows the recommended measures to be assigned to different contractors and suppliers added to supply libraries.

Agency Cost Center



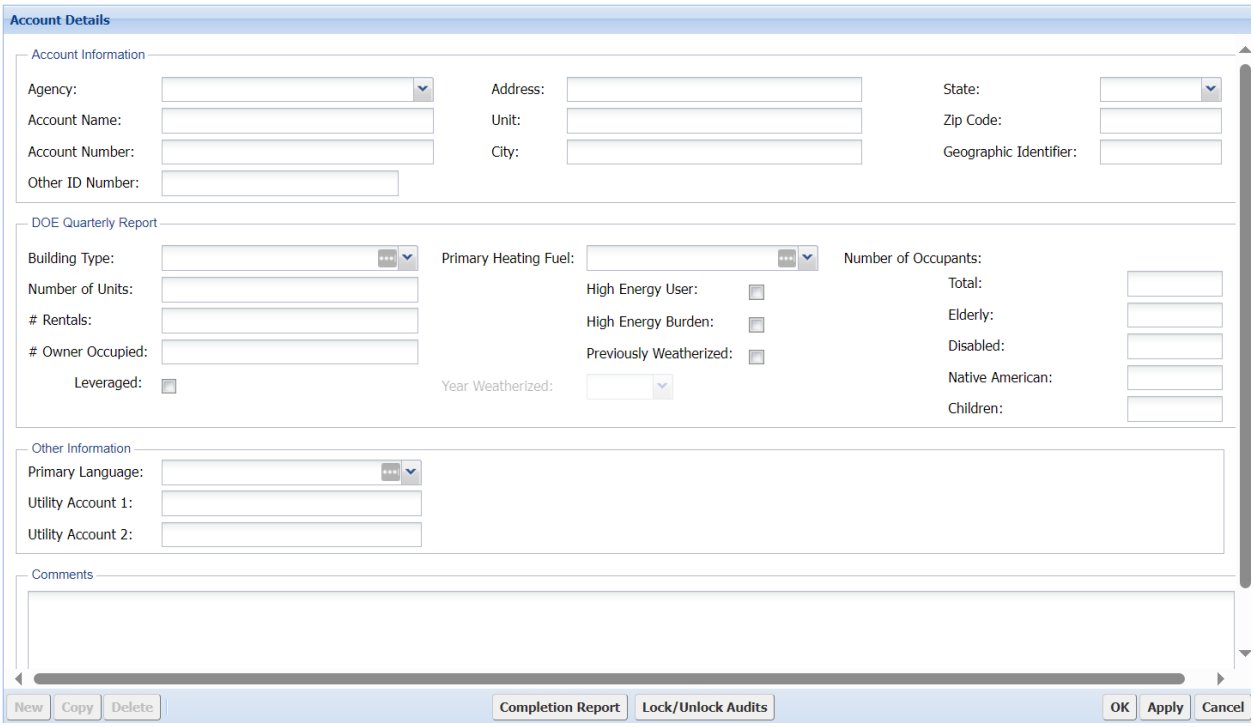
Agency Cost Center - (relevant to NEAT and MHEA only) is used to set up cost centers or funding sources, to which the cost for individual recommended measures can be assigned. We currently don't use this form.

Account Form

Access and fill in a new Account form before you run NEAT/MHEA Audit. You must set up an account for a house, building, or project before you can run an audit. The information in the DOE Quarterly Report field set is data used by Weatherization Assistance Program Grantees in reporting results to DOE and is optional within Weatherization Assistant, as are the Primary Language and Utility Account fields.

To create a new account, at the navigation bar select Account, select View Account on the menu bar and then select “New” (State Administrators and Guests are not allowed to create an account).

Account Details



Account Information

Agency – Choose from the drop-down menu the agency that is affiliated the audit

Account Name – Enter an account name. It is not recommended to enter the client’s name. However, the field will accept the client’s name.

Account Number – File number.

State – The state the house is located in.

Zip Code – Five-digit Zip code of property including the four-digit number after the five-digit zip code.

Use website ZIP Code™ Lookup | USPS to find the four-digit code for the address you are working on.

Optional fields are: Other ID number, Address, Unit , City, and Geographic Identifier. Information can be entered into these fields but are not necessary for the audit to run.

Doe Quarterly Report - The required fields are:

Building Type – From the drop-down menu choose the building type that best describes the building you are auditing.

Number of Occupants (total) – enter the number of occupants on the LIHEAP application.

Leveraged - Check is box if any other funding sources are being used to help weatherized the home.

Recommended fields (unless a rental unit) are:

Number of units – Enter the number of units in the building.

 # Rentals - Enter the number of units rented by other occupants.

 # Owner Occupied – Enter the number of units that are occupied by the owner.

Note: these fields are used when modeling a rental, or muti-unit dwelling. They should be filled out if you are modeling a rental, or multi-unit property.

Primary heating fuel – from the drop-down menu choose the primary fuel of the home.

High Energy User – Check this box if the client is a high energy user. A high energy user is a low-income household whose residential energy expenditure exceeds the median level of residential expenditures for all low-income households in the State.

High Energy Burden – Check this box if the client is a high energy burden. A high energy burden is a low-income household whose residential energy burden (residential (energy) expenditures divided by the annual income of that household) exceeds the median level of the energy burden for all low-income households in the State.

Previously Weatherized – Check this box if house was previously weatherized.

Year Weatherized – If house was previously weatherized enter the year it was weatherized.

Optional fields are the remaining Number of Occupants (Elderly, Disabled, Native American, and Children), high energy user, high energy burden.

Other Information, all fields are optional.

Primary Language – From the drop-down menu choose the primary language of the client.

Utility Account 1- Enter the name of the utility

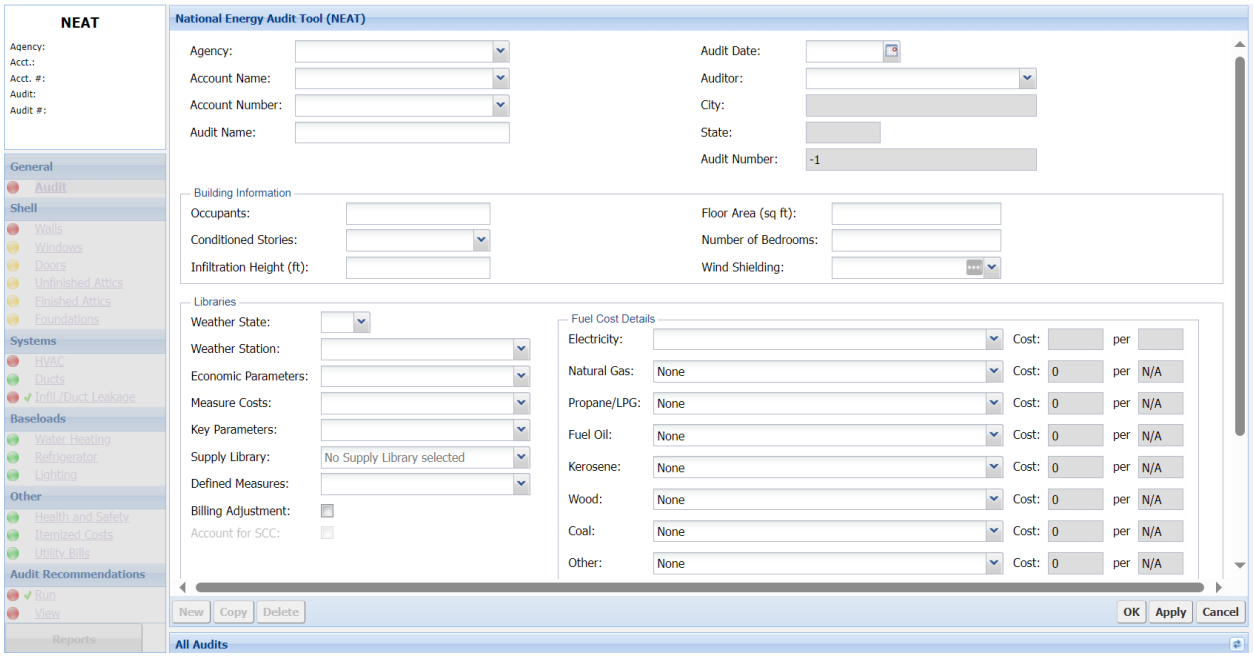
Utility Account 2 – Enter the name of the utility.

Audit (NEAT) Form

To create a new NEAT audit, select Audit (NEAT) on the menu bar and then select National Energy Audit Tool NEAT and then select “new” on the Audit form to create a new audit (State Administrators and Guests are not allowed to create an audit). Select Copy to create a new audit from an existing audit.

You may want to create a new audit using Copy to make multiple audits runs for a house (e.g., to evaluate different retrofit options or replacement equipment for a given house) but still see the results of previous runs.

When creating a new audit using New, fill in the Audit form first before entering information on the other forms. Also, you will need to fill in the Wall form before completing the Window and Door forms. In general, completing forms in top to bottom order from the Audit Dock is the best practice for Audit input.



Audit form - is used to enter general audit information and select weather files and libraries needed to run the audit. All the fields on this form that are not disabled or read-only are required. At the top of the form, select your Agency and then select the account using either the Account Name or Account Number field (the other data field will be auto filled using information from the Account form). Enter an Audit Name and the Audit Date, and then select the Auditor Name (auditor names provided in the drop-down list will include all users for the Agency that are marked as Active and Auditor on the User form). The City and State fields will be auto filled using information from the Account form. The Audit Number will be automatically assigned by NEAT.

Building information

Occupants - Number of occupants on the LIHEAP application.

Conditioned Stories - Numbers of floors heated/cooled including basement. Include a basement if it is heated or cooled and most of its wall area is above-grade or walls are mostly below grade but has a door leading to the outside.

Infiltration Height - The vertical distance between the lowest and highest point defined in the pressure boundary.

Floor Area - Enter Sq/ft. of floored area that is conditioned. If more of the home is heated than cooled entered the total area of the heated area. The value should be total floor area not footprint. (two story with footprint of 1200 Sq/ft., enter 2400 Sq/ft.).

Number of Bedrooms - Enter number of bedrooms in house. If rooms are slept in but are not a designated sleeping area do not include (basement with bed)

Wind Shielding - Choose from one of the drop-down options.

Libraries:

Weather State - Select the closes State to the house you are modeling.

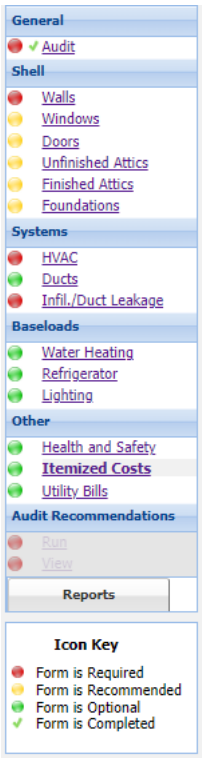
Weather Station - Select the closest city to the house you are modeling.

Economic Parameter Set, Measure Cost Set, Key Parameter Set, Supply Library, and Defined Measure Set - Choose from the drop down the library associated with your Agency. In some cases, there might be more than one Library listed, so make sure you are choosing the correct Library.

Fuel Cost Detail - Select for the drop down the library fuel cost associated with your Agency.

Finally, for NEAT to adjust energy savings estimates and recommend measures based on the actual pre-weatherization energy consumption of the home, select the Billing Adjustment checkbox.

General Ledger



The General Ledger is located at the left side of the NEAT audit tool. All sections of the ledger will remain shaded gray until an audit is created. The “Apply” button will need to be clicked on to populate the ledger.

Red Dot – Form is required for the audit to run.

Yellow Dot – Form is recommended. Although data is not required to run audit it is recommended you enter data into yellow dot fields.

Green Dot – Form is optional. Although data is not required to run audit, there are some optional fields that if applicable to the house you are working on you need to enter data into (ducts, water heater, refrigerator, lighting, and itemized costs). Note: ducts on the ledger are a green dot and is considered an optional field. However, if you enter a heating that delivers air through a duct system, the ducts field will turn red and becomes a required field.

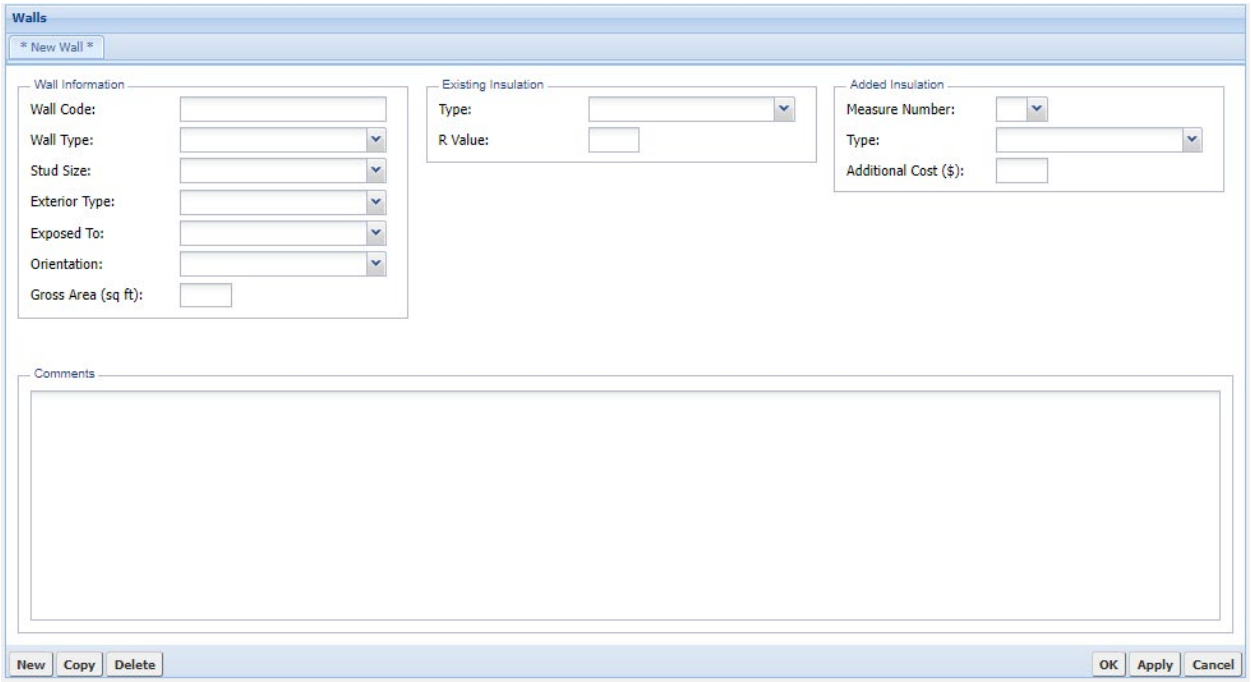
Check Mark – Form is completed. When all required information is entered into the form there will be a check mark placed next to the dot to indicate the form is completed.

Also note the Icon Key at the bottom for reference. Selecting “Run” for Audit Recommendations is not available until all required items are checked off.

After running the audit, the recommendation report should open automatically for you to view and see what measures the audit has recommended. If at any time you want to review the audit input and recommendation reports after you have closed out of the reports, select the Reports button and choose from the list the report you want to reopen. It is from the reports button you can also save or print the reports.

Shell forms – Shell forms are used to describe the walls, windows, doors, attics, and foundations of a house. The forms are used to describe all the shell components in the house that define the thermal boundary, select retrofit options, and describe any additional costs associated with the installation of the retrofit unique to the house being audited that are not described in the Measure Cost Set Library. You must enter one wall description on the Wall form to meet the minimum requirements of NEAT; the remaining shell forms are optional. These forms are used to describe a horizontally or vertically attached house, where no heat is lost to the outside through some of the envelope components. In most buildings, though, multiple wall descriptions will be entered on the Wall form and entries will be made on the Window, Door, Attics, and Foundation forms. On the Wall, Attics, and Foundation forms, a Measure # field is provided to specify if multiple segments of a shell component should be combined into groups when evaluating retrofit measures. Select different measure numbers for segments that you want to evaluate as separate measures.

Walls



Wall From is used to describe all the walls of the house that define the thermal boundary. Walls that differ by orientation, exposure (i.e., to the ambient conditions, buffered space such as a garage or attic), construction, or insulation level should be described separately because the cost of insulating the walls and the energy savings from insulating the walls will differ. To describe all the exterior walls of a house most efficiently, you may combine multistoried walls or separate wall segments that have the same orientation and construction.

Wall Code Information

Wall Code - Enter a unique code for each wall in the audit. The wall code identifies wall sections to you and the Weatherization Assistant. An ideal code is suggested to be less than 5 characters. (E.g., E1 as East Wall 1). The remaining fields, other than gross area, have drop-downs for selection.

Wall type, Stud size, Exterior type, Exposed To, and Orientation - Choose from the drop-down lists that best describes the wall you are modeling.

Gross Area - Add the Sq/ft of the wall you are modeling.

Existing Insulation

Type - Choose from the drop-down lists the type of insulation that exists in the wall cavity.

R-Value - If there is insulation present you will need to enter the R-value of the existing insulation.

Added Insulation

Measure number - When modeling like kind walls use the same measure number. Wall(s) having different characteristics, select a different measure number for each different wall you are modeling. If you are modeling a buffer wall to be insulated, select the same measure number as you would if the walls were like kind.

Type - Choose from the drop-down list the type of insulation you want to add. If cavities are full (R-13), do not choose “none” choose blown cellulose.

Additional Cost – This field is used to add or subtract any additional cost associated with the wall you are modeling (additional labor, and ancillary costs).

Pressure Points – When addressing pressure points create a new form.

Wall Information Section

Wall Code - Give it a unique name. Enter all the same information as you had on the same wall that the pressure points are located on (W1, E2, S3, etc.). Change the square footage to match the area of the cavities you are going to fill (36” x the joist size).

Existing Insulation Section

Type - Choose from the drop-down “none”.

Added Insulation Section

Measure # - Choose the same measure number as the wall the pressure point is located on.

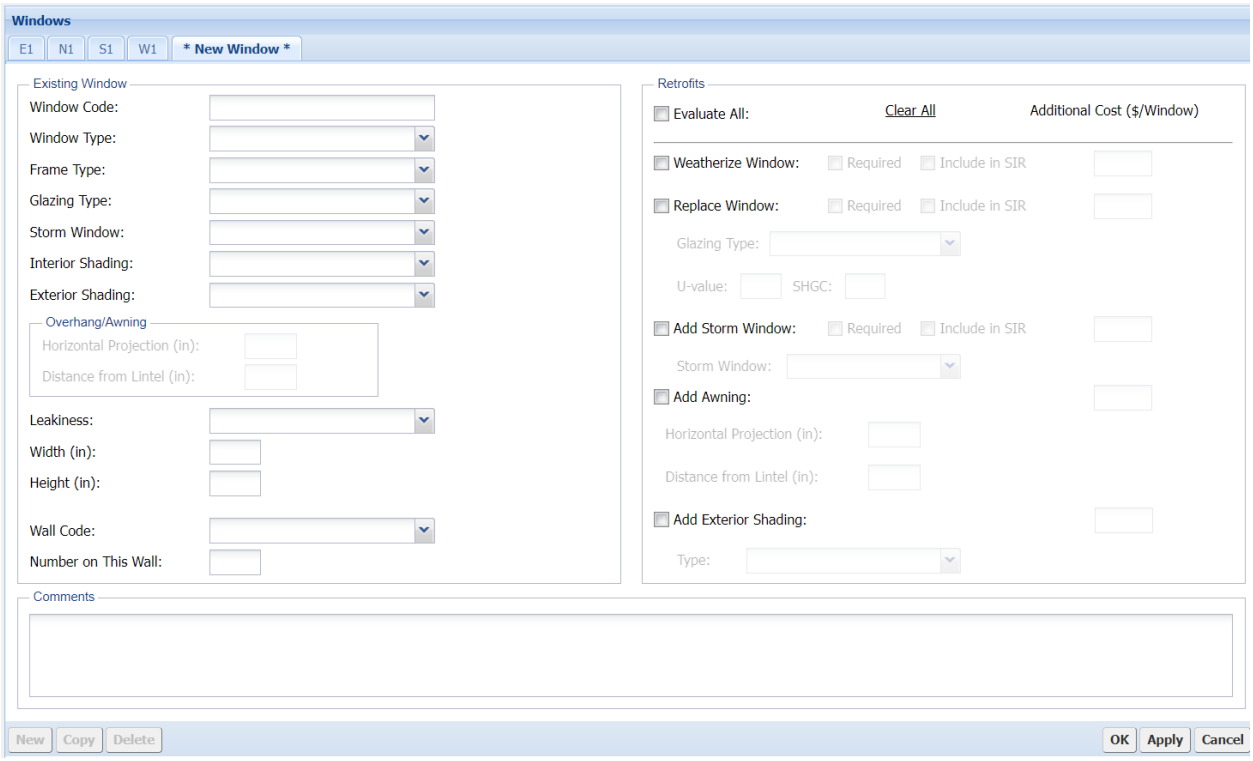
Type - From the dropdown list choose the pressure point floor joist size that best describes the pressure point cavities depth you are modeling.

Pressure Points

Infiltration Measure - If walls are already insulated and the audit is not calling for more wall insulation to be added, calculate the cost to seal the pressure points and enter that cost in the Infiltration Reduction field in the Infiltration/Duct Leakage form and add a comment to the comment field.

Kneewalls - Do not model kneewalls in the wall form.

Windows Form



Window form is used to describe all the windows on the walls that are exposed to the outside. If windows are of same likeness and you are not modeling the window for replacement you can add those windows together by adding all the width and heights together and divide by the number of windows on that wall.

Existing Window

Window Code - Enter a unique code for each window in the audit. The window code identifies window sections to you and the Weatherization Assistant.

Window Type, Frame Type, Glazing Type, Storm Window, Interior Shading, Exterior Shading, Leakiness, and Wall Code - Choose from the drop-down lists that best describes the window you are modeling.

Exterior Shading if you select overhang or awning from the drop down in the exterior shading field, the Overhang/Awning field will appear, and you will need to add numbers in inches to the Horizontal Projection and Distance from Lintel field. Note: If the distance from the Lintel to the overhang is greater than 24” you do not need to model the window with an overhang. If the windows are like kind windows

on the same side of the house and some have overhangs within the 24” of the lentils and the other don’t, you will need to model those windows separately.

When selecting the leakiness of the window refer to Microsoft Word - Window leakiness - December 2014.docx for the correct selection.

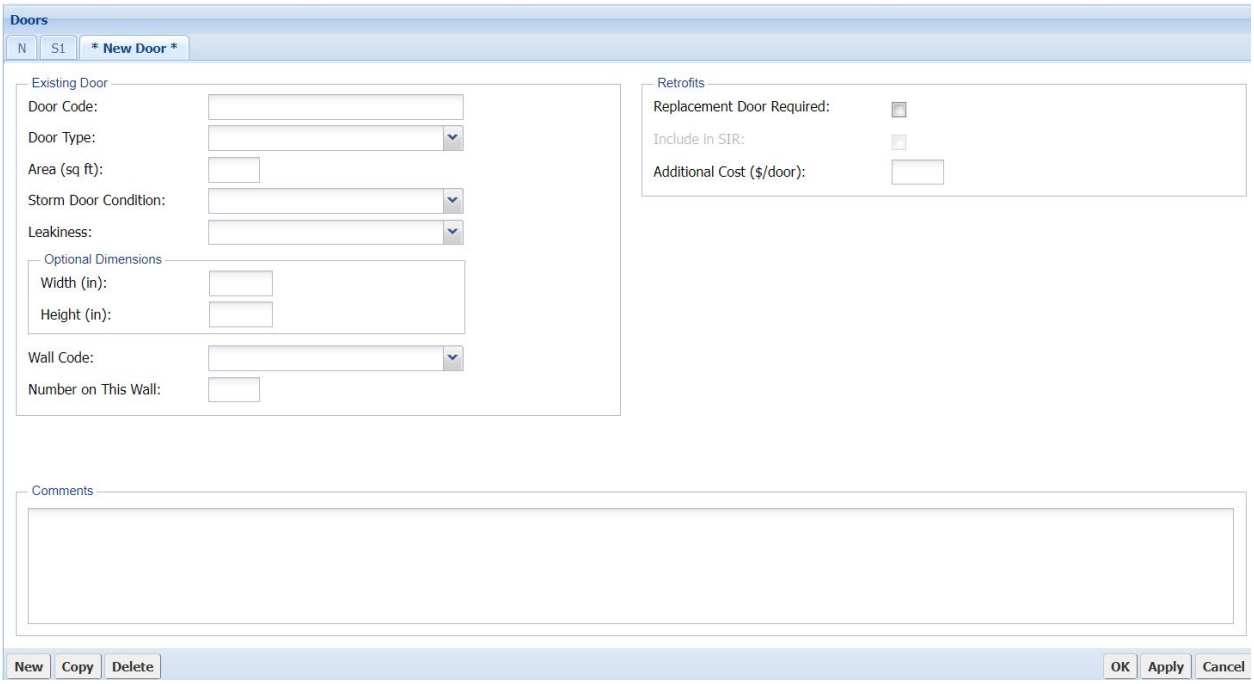
Width & Height - Enter the width and height of windows in the width and height fields. Enter total number of windows on the wall in the number on this wall field.

Window Retrofit

When replacing a window, you need to make sure you are modeling the window by itself. You need to check the Replacement Window box, (do not check the Required box, or Include in SIR), choose the glazing type of the new window from the drop box, and add the U-value and SHGC (window manufacture) of the window you are replacing. Run the audit to see if the window can be replaced as an energy conservation measure ECM. If the audit doesn’t call for the window to be replaced as an ECM, you can then replace the window as a health and safety measure. Note: good documentation of why the window needs to be replaced (documentation, pictures, etc.) must be in the file. Windows can’t be replaced if there isn’t anything wrong with the window. Make all attempts to repair the window before you model the window to be replaced.

Additional cost - Add any additional ancillary costs to this field. If there are any additional repair cost associated with the replacement of the window (repairing sill, window frame, stool, etc.), you will need to enter those costs as an itemized cost in the Itemized cost tab and make the SIR box is checked, and make sure you tie the repair to the ECM of the window replacement if the audit calls for the window to be replaced as an ECM.

Doors Form



The doors form is where you enter your doors.

Existing doors

Door Code - Enter a unique code for each wall in the audit.

Door type, Storm door condition, Leakiness, and Wall Code - Choose from the drop-down lists that best describes the door you are modeling.

Area - Enter the Sq/ft of the door you are modeling.

Width & Heights - Enter width and height of door to width and height field.

Number on This Wall - Enter total number of doors on the wall in the number on this wall field.

Door Retrofit

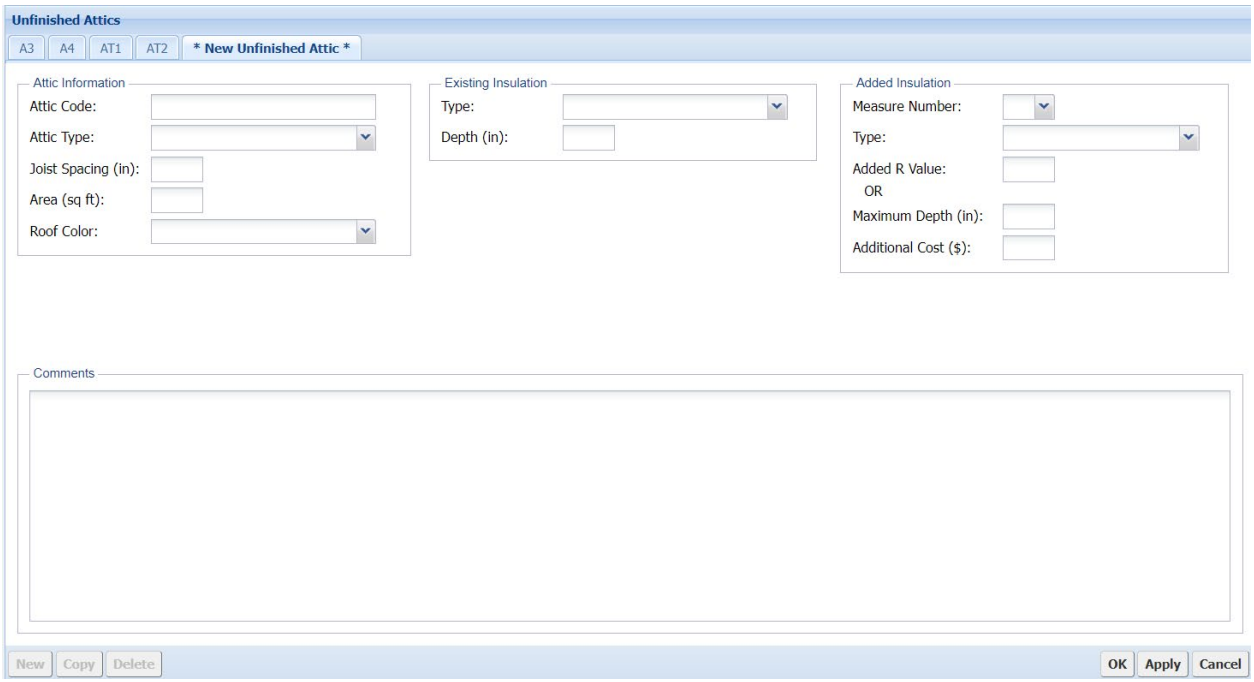
When replacing a door, you need to make sure you are modeling the Door by itself. Do not check the Replacement Door Required box. Run the audit to see if the door can be replaced as an energy conservation measure ECM. If the audit doesn't call for the door to be replaced as an ECM, you can then replace the door as a health and safety measure. Note: good documentation of why the door needs to be replaced (documentation, pictures, etc.) must be in the file. Doors can't be replaced if

there isn’t anything wrong with the door. Make all attempts to repair the door before you model the door to be replaced.

Additional Cost - Add any additional ancillary costs to this field. If there are any additional cost associated with the replacement of the door (door frame, threshold, etc.), you will need to enter those costs as an itemized cost in the Itemized cost tab and make the SIR box is checked, and make sure you tie the repair to the ECM of the door replacement if the audit calls for the door to be replaced as an ECM.

Note: The audit will not allow you to model a door on a buffer wall. So, if you need to replace a door on a buffer wall you will need to replace it as a health and safety measure.

Unfinished Attic Form



Unfinished and Finished Attic forms are used to describe the attics in the house. The Unfinished Attic form is used to describe typical attic areas such as those built using ceiling joists and roof rafters or trusses and cathedral or flat ceilings. If an attic built from joists or trusses has flooring installed over the joists (e.g., plywood so that items may be stored in the attic), then it is Floored. Cathedral and flat ceilings are attic areas where the roof and interior ceiling are parallel. You must model all attics separately even if they are like kinds.

Attic Information

Attic Code - Enter a unique attic code for each attic space within the audit. An ideal code is suggested to be less than 5 characters.

Attic Types, and Roof Color - Choose from the drop-down lists that best describes the attic you are modeling.

Joist Space (in") - Enter the distance between the joist as a number in the joist spacing field.

Area - Enter the Sq/ft. of the attic in the area field.

Adding comments about the attic space location should be considered if a more complex roof system exists. Also commenting about hazards is recommended.

Existing Insulation

Type - Choose from the drop-down lists the type of insulation that exists in the attic. Include in the comment section details whenever existing insulation depth is adjusted to achieve equivalent existing R-value.

Depth - Add depth of existing insulation in depth field. All attics must have pictures of existing insulation and the depth of the existing insulation.

Added Insulation

Measure number - When modeling like kind attics use the same measure number. Attic(s) having different characteristics, select a different measure number for each different attic you are modeling.

Type - Choose from the drop-down selection the insulation you want the audit to model to add to the attic. Regardless of the level of existing insulation, always model the attic to receive more insulation.

Added R Value – Unfloored attic(s) leave this field blank.

For and open blow attic, first run the audit without any value in the added R-value or Max depth field. If after running the audit you don't achieve an R- value of 49 with existing insulation (existing insulation plus what the audit called for you to add) you can go back and add a value to the added R-value field that will bring the overall attic insultation depth to an R49, and re-run the audit to see if it will call for the amount you requested. If the individual SIR of the amount you requested is 1 or greater you can add that amount of insulation to the attic. If the audit doesn't call for the amount you requested or the individual SIR of that amount you requested is less than 1, you need to re-run the audit again with no number in the R-value and Max Depth fields and allow the audit to call for insulation that is cost effective. Either way, there must be a comment added to the comment section that you re-ran the audit to achieve the added R-value amount.

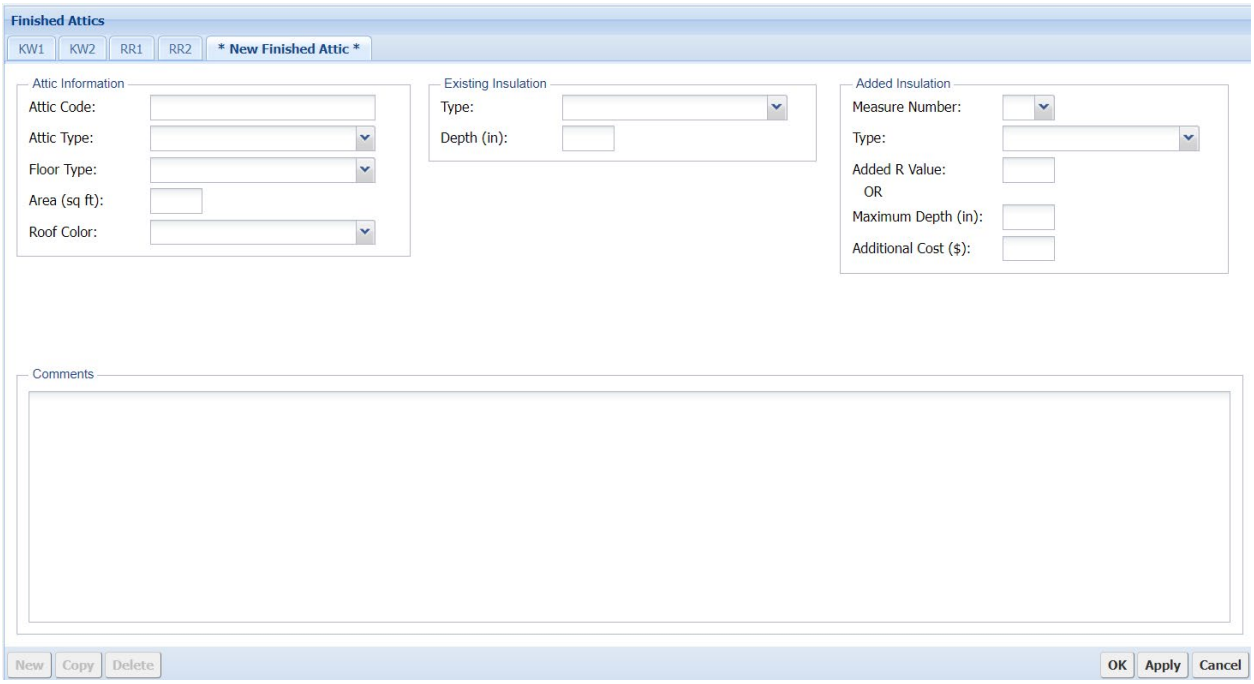
Floored attic, you must add a value to the Max Depth. This is the distance between the ceiling board and the attic floor.

Additional Cost - This field is used to add or subtract any additional cost associated with the attic you are modeling (additional labor, and ancillary costs).

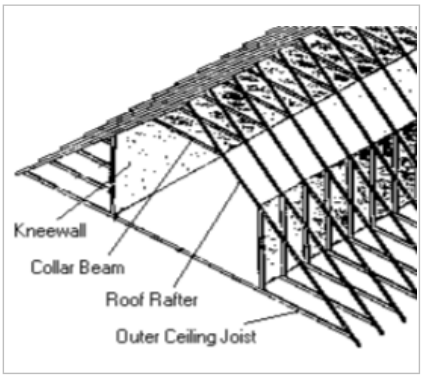
Note, attics that have significant difference in insulation levels, auditors must separate attics into two different attics or use https://www.redcalc.com/parallel-path-r-value/ to determine a weighted average.

Do not model "Outer Ceiling Joist in the unfinished attic form.

Finished Attic Form



The Finished Attic form is used to describe attic areas that result when a portion of the attic is included in the conditioned space of the home: outer ceiling joist, collar beam, knee wall, and roof rafter. You must model all attics separately even if they are like kinds. Most finished attics will have all 4 component types that need to be modeled.



Components of a finished attic.

Attic Information

Attic Code - Enter a unique attic code for each attic space within the audit. An ideal code is suggested to be less than 5 characters.

Attic Types, Floor Type, and Roof Color - Choose from the drop-down lists that best describes the attic you are modeling. Adding comments about the attic space location should be considered if a more complex roof system exists. Also commenting about hazards is recommended.

Area - Enter the Sq/ft. of the attic in the area field.

Existing Insulation

Type - Choose from the drop-down lists the type of insulation that exists in the attic.

Include in the comment section details whenever existing insulation depth is adjusted to achieve equivalent existing R-value. All attics must have pictures of existing insulation and the depth of the existing insulation.

Depth - Add depth of existing insulation in depth field.

Added Insulation

Measure Number - When modeling like kind attics use the same measure number. attic(s) having different characteristics, select a different measure number for each different attic you are modeling.

Type - Choose from the drop-down selection the insulation you want the audit to model to add to the attic. Regardless of the level of existing insulation, always model the attic to receive more insulation.

Added R Value – Unfloored attic(s) leave this field blank.

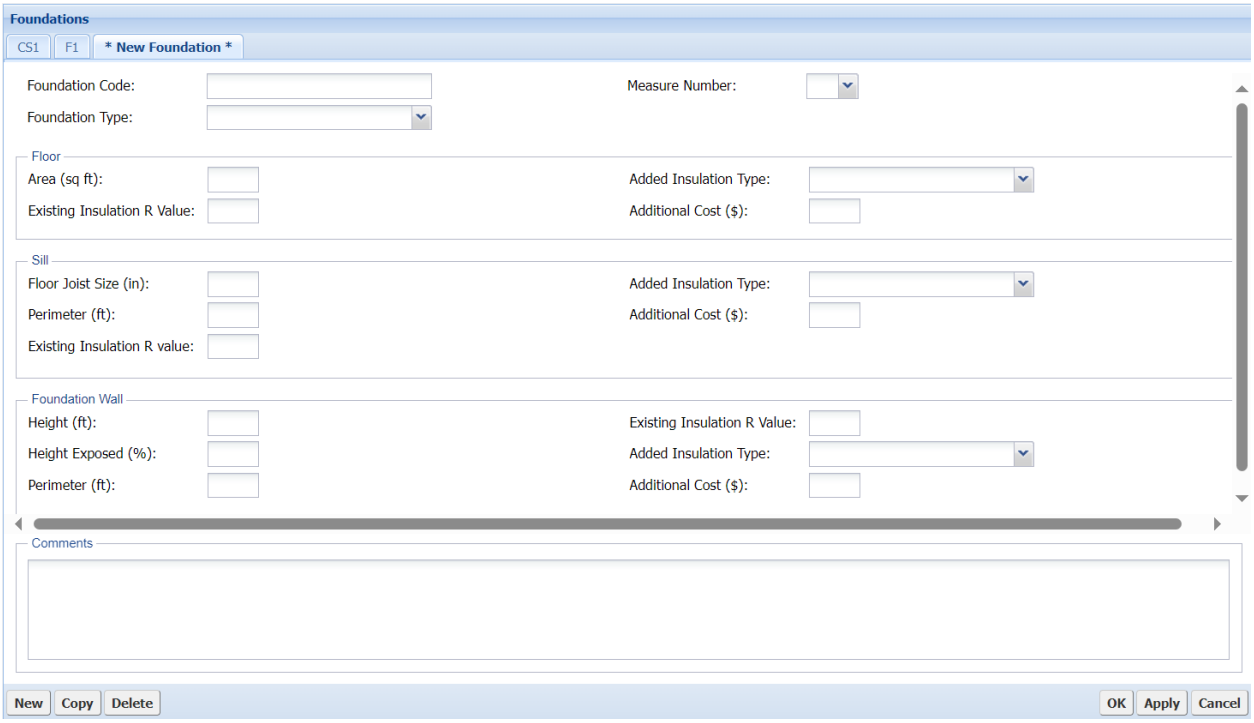
For and open blow attic, first run the audit without any value in the added R-value or Max depth field. If after running the audit you don't achieve an R- value of 49 with existing insulation (existing insulation plus what the audit called for you to add) you can go back and add a value to the added R-value field that will bring the overall attic insultation depth to an R49, and re-run the audit to see if it will call for the amount you requested. If the individual SIR of the amount you requested is 1 or greater you can add that amount of insulation to the attic. If the audit doesn't call for the amount you requested or the individual SIR of that amount you requested is less than 1, you need to re-run the audit again with no number in the R-value and Max Depth fields and allow the audit to call for insulation that is cost effective. Either way must be a comment added to the comment section that you re-ran the audit to achieve the added R-value amount.

Floored attic, you must add a value to the Max Depth. This is the distance between the ceiling board and the attic floor.

Additional Cost - This field is used to add or subtract any additional cost associated with the attic you are modeling (additional labor, and ancillary costs).

Note: when modeling a home with walk-up attic, model that wall(s), stairs as a kneewall in the floored attic form.

Foundation Form



Foundation form is used to describe the foundations of the house, including basements, crawlspaces, slab-on-grade floors, and floors exposed directly to the outside air. Foundations can be insulated by insulating the floor, sill box, and/or wall of the foundation depending on what type of foundation it is, the intended use of the foundation space, and what areas of the foundation are currently insulated. For basements and crawlspaces, NEAT will never recommend both floor insulation and sill and/or wall insulation for the same foundation.

When a single condition, or unconditioned foundation has two or more areas of wall, or floor insulation that differ significantly should be modeled separately from one another. For example, if existing insulation is adequate for some areas but have fallen in others. Typically, these would be input as separate foundations, one insulated and one not.

Foundation Code - Enter a unique code to identify the foundation.

Foundation Type- Select from the following options: conditioned, non-conditioned, vented non-conditioned, unintentionally conditioned, uninsulated slab, insulated slab, and exposed floor. Crawlspaces are typically vented non-conditioned, and basements are conditioned, non-conditioned, or unintentionally conditioned. The first four choices are used to describe a type of enclosed foundation space. A conditioned space is a temperature regulated space, either intentionally, or unintentionally, an unconditioned space is not temperature regulated but may or may not be Vented directly to the outdoors. If the thermal/pressure boundary is at the foundation walls & sills, then the space should be

modeled as Conditioned. If the boundary is instead at the subfloor, then the space should be modeled as Unconditioned.

Exposed floors are used to describe a floor that is exposed directly to the outside air, such aa secondary story floor overhang or the floor of a house built on stilts or with pier and beam construction.

Measure number - When modeling like kind foundations use the same measure number. Foundation(s) having different characteristics, select a different measure number for each different attic you are modeling.

Floor

Area - Enter the Sq/ft. of the foundation in the area field.

Existing Insulation R Value – Enter the R Value of existing insulation.

Sill

Floor Joist Size - In inches enter the size of the floor joist. Add any R-value of any existing insulation in the floor. Choose from the drop down list the insulation you want the audit to model. If you choose "None" which means the condition prohibits insulation, you must note what the conditions are in the comment section.

Perimeter - Is the length of the sill perimeter unit of feet which is exposed to the outdoor air and is un-insulated.

Existing Insulation R Value – Enter the R Value of existing insulation.

Foundation Walls

Height - Enter the height of the foundation wall you are modeling.

Height Exposed % - Enter the height in a percentage that is exposed to the outside. If heights aren't uniformed entered and average height.

Perimeter - Is the length of the sill perimeter unit of feet which is exposed to the outdoor air.

Existing Insulation R Value – Enter the R Value of existing insulation.

Added Insulation Types - Choose from the drop down list the insulation you want the audit to model. Regardless of the level of existing insulation, always model the foundation to receive more insulation.

If you are model a condition basement wall for insulation, select “condition basement wall” in the drop-down list.

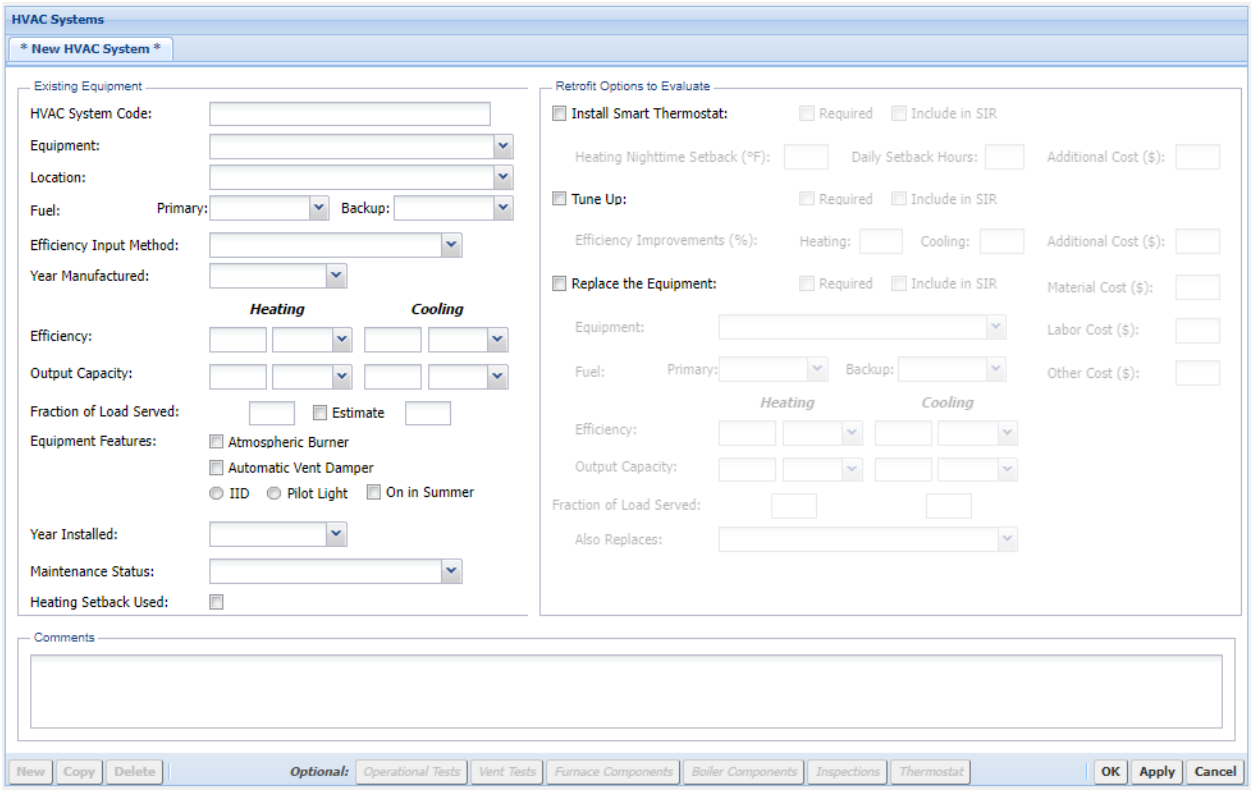
Additional Cost - This field is used to add or subtract any additional cost associated with the foundation you are modeling (additional labor, and ancillary costs).

Systems forms

Systems forms are used to describe the HVAC equipment, ducts, and infiltration and duct leakage associated with a house. You must enter one heating system and enter infiltration data on the Infiltration/Duct Leakage form to meet the minimum requirements of NEAT. The remaining forms are optional unless deemed required based on other inputs. For example, the Duct form may be required depending on HVAC entries. The selections made in the HVAC form, especially with regards to heating, will determine whether the Duct form remains optional or becomes required.

If the thermal/pressure boundary is placed at the foundation walls, the space is deemed conditioned. If the thermal/pressure boundary is placed at the subfloor, the space is deemed unconditioned.

HVAC System Form



HVAC/Cooling form is used to describe the heating and cooling equipment installed in the house and select retrofit options. In NEAT, you can describe as many equipment as are required to describe the heating and cooling sources in the house. At least one equipment that provides heating must be described in this form. The selected equipment may provide either heating or cooling or both.

Inputs related to equipment type and fuel will filter out other necessary inputs, as well as the retrofit options that will be available for evaluation. For example, choosing a central heat pump will disable the retrofit option for installing a smart thermostat, and selecting a space heater will disenable tune up as a retrofit option. The Replace the Equipment retrofit option is always enabled for possible selection and is used to specify if the measure replaces one or more existing equipment described in other HVAC sub-forms. Selecting a measure as required will disable other measures that are mutually exclusive to the required measure. Unlike in Weatherization Assistant Version 8, heating/cooling equipment inputs are not limited to primary and secondary systems. Each type of existing heating and/or cooling equipment in the home may be entered as separate records. Weatherization Assistant Version 10 determines the primary system based on the Fraction of Load Served value that is either input or estimated by the software. Inputs made on any optional forms (e.g., other field measurements or health and safety observations) are informational only and are not used in running the audit analysis.

Existing Equipment

HVAC System Code (heating and cooling) - Enter a unique code to identify the foundation

Equipment (heating and cooling) - Choose from the drop-down lists the (furnace, boiler, space heater, heat pump, air conditioner, or evaporative cooler) that best describes the HVAC, or cooling equipment you are modeling.

Location (heating and cooling) - Choose from the drop-down lists the location that best describes the location of the equipment you are modeling.

Fuel (heating and cooling) - Choose from the drop-down lists the fuel that best describes the fuel of the heating equipment you are modeling.

Efficiency Input Method (heating and cooling) - Chose from the drop-down list that best describes the equipment you are modeling.

> Heating, choose either site measured, or name plate. Note all working furnaces must be tested and the steady state efficiency SSE must be used to model the heating equipment for replacement. If the heating equipment is not working, you can then use the name plate to model the furnace for replacement.
>
> Cooling, choose either name plate efficiency, or year manufactured. If you choose Year Manufacture the Year Manufactured field will populate and then enter the year the appliance was manufactured.

Efficiency – Enter a number and Chose from the drop-down list that best describes the equipment you are modeling.

Heating, you must test for steady state efficiency on all furnaces, unless the unit is broken or functioning poorly, then you may enter the original AFUE of the unit. Enter the existing heating equipment efficiency as a percentage as measured SSE, or annual fuel utilization efficiency AFUE if the heating equipment was not working. If not found on the furnace, the AFUE can be calculated by taking the input capacity x AFUE = output capacity. For example, an input of 75 KBTU with a fan-induced furnace (AFUE can be assumed to be 80% for this type). Output capacity = 75 x 0.8 = 60 KBTU

Cooling, enter a number in SEER the efficiency of the cooling equipment.

Output capacity – Enter a number and Chose from the drop-down list that best describes the equipment you are modeling.

Heating equipment is a value either entered in kBtu/hr, Btu/hr, or kW. This number can also be found on some name plates of the equipment.

Cooling equipment it is a value either entered in kBtu/hr, Btu/hr, or Tons. This number can also be found on some name plates of the equipment.

Fraction of Load Served (heating and cooling) - Enter value that is either input or estimated by the software. Example, if there is one heating equipment that serves the entire envelope of the house you would enter 1 in the field. If you had two heating equipment that served 50% of the entire envelope of the house, you would enter 0.50 for each heating equipment entered.

Equipment features - Check the boxes if the heating equipment you are modeling have an atmospheric burner, automatic vent damper, IID, pilot light and if it is on in the summer.

Year installed (heating and cooling) - Choose from the drop down list the year the heating or cooling equipment was installed. If unknown, you can look it up by using the serial number.

Maintenance status - Choose from the drop-down list that best describes the maintenance status of the heating equipment you are modeling.

Heating setback used - Check the box if the heating equipment is using a setback thermostat.

Retrofit Options to Evaluate

All entries on this section of the form will be ghosted until you check on of the three boxes. Once the box is checked the fields under that checked box will appear and you can start entering your data into those fields.

The Required boxes - This box is checked after you have run the audit the first time and the measure was not called for as Energy Conservation Measure ECM. By checking the required box, it should push the measure to be replaced or installed as a Health & Safety measure.

The Include in SIR boxes - When this box is checked with the required box the audit will call for that measure as a repair measure if the individual SIR is below one, or it will call for the measure to be an ECM measure if the individual SIR is 1 or above. We do not allow the auditor to call for a measure to be installed, so this is not a state-preferred method.

Install Smart Thermostat

At Energy Auditor's discretion, a set-back thermostat may be installed if the NEAT/MHEA Audit calls for it. The Energy Auditor must first determine if the client is capable of re-setting the thermostat. See Section 2023.05 for more information.

Heating Nighttime/Daily Setback - Enter the number the thermostat will be setback at nighttime and a number the thermostat will be setback in the daytime.

Additional Cost - If there is any additional cost associated with the cost or installation of the thermostat other than what is entered in the measure library enter the cost here.

Tune-Up

Efficiency Improvement (%) - 1-2% is typical. 2-5% possible if the unit is old, has not been recently tuned, and is tuned using diagnostic equipment.

Additional Cost - If there is any additional cost associated with the cost or installation of the thermostat other than what is entered in the measure library enter the cost here.

Replace the Equipment

Equipment - Choose from the drop-down list the heating equipment that best describes the heating system you are modeling for replacement.

Fuel - Choose from the drop down list, the fuel type of the heating equipment you are replacing.

Material, Labor, and Other Cost - Is where you will enter the cost to replace the new heating equipment, and any other cost associated with the replacement of the equipment. Note: The Other Cost field will only accept the value of $500 or less. If costs associated with the replacement is greater than $500, add that material and labor cost to the material and labor of the heating system.

Efficiency - Enter the heating equipment efficiency as a percentage as measured SSE.

Output Capacity - For a heating equipment it is a value either entered in kBtu/hr or Btu/hr.

Fraction of load served - This is copied from the existing equipment and selected Also Replaces equipment.

Also Replaces - If more than one heating equipment has been entered into the audit, this is where you can choose from the drop-down list, the other equipment you want to model to be replaced.

Note: If the existing heating equipment has a health and safety issue, you must first model the heating equipment as an ECM before you can replace the heating equipment as a Health & Safety measure.

Nonexistent Unit - If the unit is nonexistent and will be replaced as a health and safety measure (regardless of the funding source) the auditor must first enter into the energy audit the furnace that is going to be installed into the home, and then run the energy audit with the other measures to ensure that other Energy Conservation Measure (ECM) are truly cost effective.

Inoperable Unit - If the unit is inoperable and the auditor wants to model the furnace for replacement, the auditor must enter the furnace into the audit as it was originally designed and installed (capacity, AFUE, and % of condition space).

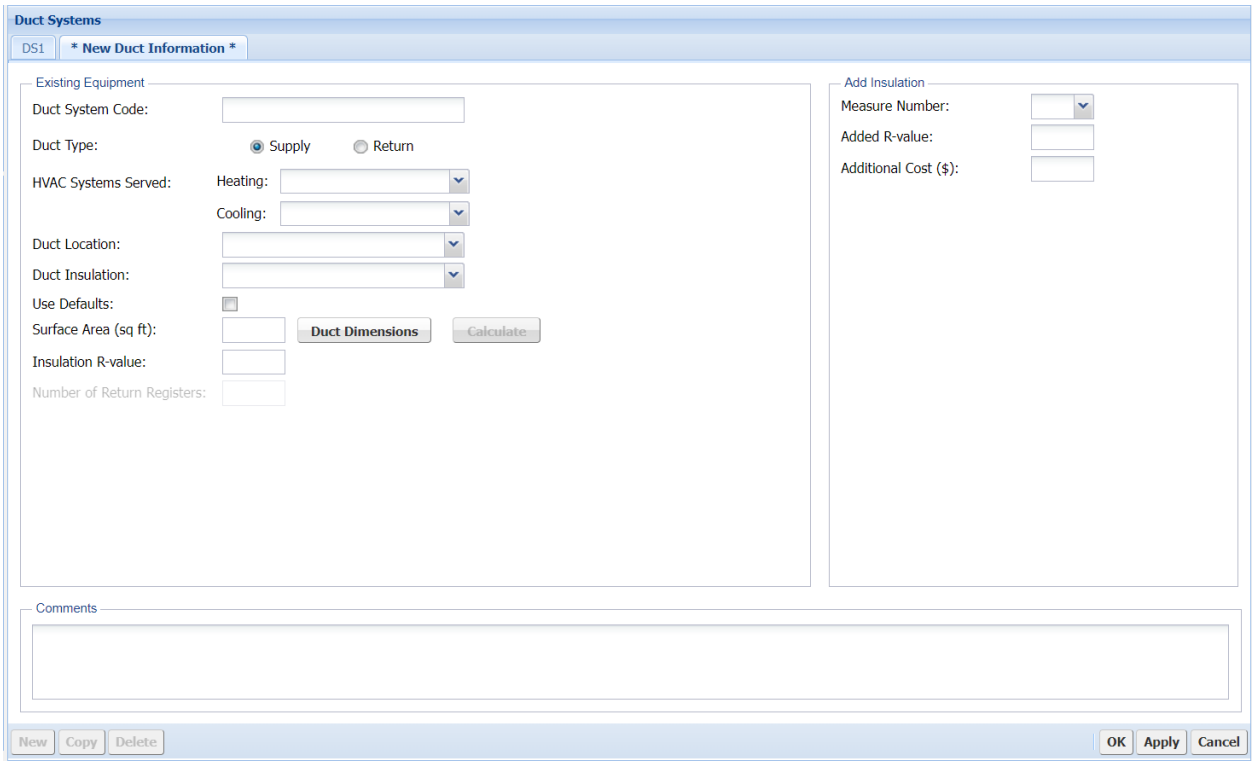
The auditor can use the data from the data plate to determine the AFUE, this can be done by dividing the design output by the input.

Electric furnaces AFUE should be entered as 100%.

Heat Pump - Determine the actual HSPF. Use the serial number to determine this.

Comment – In the Comment field, enter all material and labor associated with replacement of the heating system.

Ducts System Form



Duct form is used to describe the supply and return ducts for ducted HVAC equipment. A duct system with varying characteristics (e.g., location, insulation) must be described as multiple segments. All ducted HVAC equipment must be selected as served by at least one supply duct.

Existing Equipment

Duct System Code - Enter a unique duct system code,

Duct Type - Select the duct type you want the audit to model to insulate.

HVAC System Served, Duct Location, Duct Insulation - Choose from the drop-down lists that best describes the duct(s) you are modeling. Enter the measured duct surface area and insulation R-value.

Note: when selecting “conditioned space” as the option in the duct location drop-down list the audit will not evaluate any duct insulation.

Use Defaults – Recommended. If sufficient details relating to duct size and/or surface area and insulation R-value are unknown, then Weatherization Assistant Version 10 can estimate the values by selecting Use Defaults.

Surface Area sq/ft – Enter the surface area of the entire duct system.

Duct Dimensions Button – By clicking this button you can calculate the surface area of the duct system.

Insulation R Value – Add the existing R Value on the existing duct work.

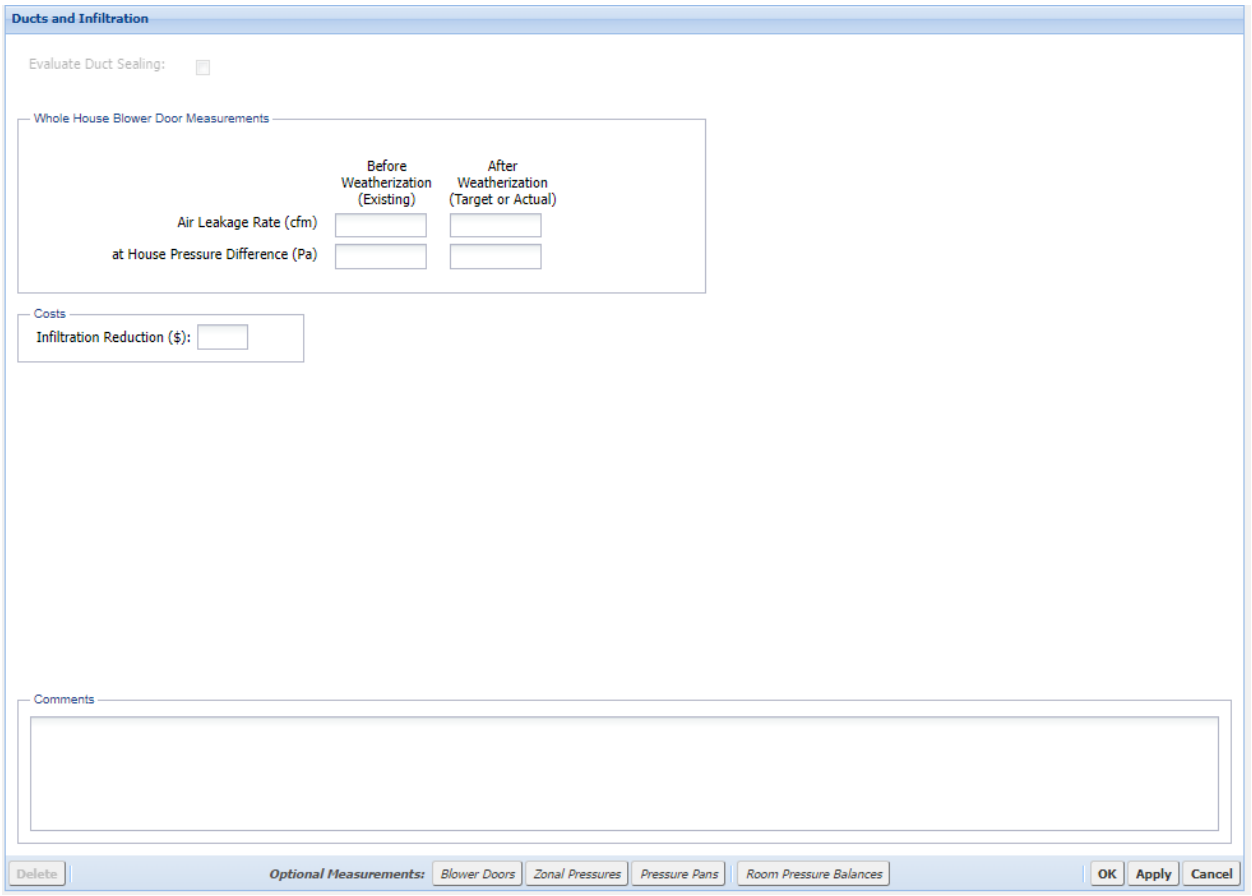
Add Insulation

Measure Number - When modeling like kind ducts use the same measure number. Duct(s) having different characteristics, select a different measure number for each different duct system you are modeling.

Added R Value – Enter the R Value you want the duct(s) insulated too.

Additional Cost - This field is used to add or subtract any additional cost associated with the foundation you are modeling (additional labor, and ancillary costs).

Ducts and Infiltration Form



Ducts/Infiltration form is used to enter air and duct leakage data to evaluate the effectiveness of infiltration reduction work and duct sealing. The data input fields on the Ducts/Infiltration form change depending on whether duct sealing will be evaluated and, if so, which method—whole house blower door, blower door subtraction or duct blower measurements—will be used. To evaluate infiltration reduction as a retrofit measure, you must, at a minimum, enter the pre-weatherization whole-house air leakage rate (usually measured), an estimated or target rate after weatherization, house pressure differences for these rates, and the cost of the infiltration reduction work.

Evaluate Duct Sealing Button – Select this button and choose the “Duct Leakage Method” you want to use to evaluate duct sealing when ducts are located outside the thermal boundary.

Whole House Blower Door Measurement

Air Leakage Rate – Enter the blower door reading you got at the evaluation and then use the chart below to determine the estimated blower door reading (target) from the per blower door reading (evaluation number) and volume of the home.

Costs

Infiltration Reduction – Enter the cost of all the infiltration work you want done on the home. Any recommended materials or components associated with infiltration reduction costs must be itemized in detail in the comments box.

A set of optional forms (Blower Doors, Zonal Pressures, Pressure Pans, and Room Pressure Balances) can be used to enter measurements made during the infiltration and duct leakage measurements or health and safety observations related to the HVAC systems. Information entered on these optional forms is not used in running an audit.

The chart on the next page is an average CFM reduction recorded for several years based on the volume of the house. Across the top of the chart is the house volume. Down the left side is the pre-WX blower door reading. Follow the pre-blower door reading across to the closest volume number of the house. This is the average post-CFM reduction.

Note: If post-weatherization blower door targets are not met, the QCI should use the blower door along with smoke, smoke pencils and/or infrared cameras to determine where missed opportunities exist.

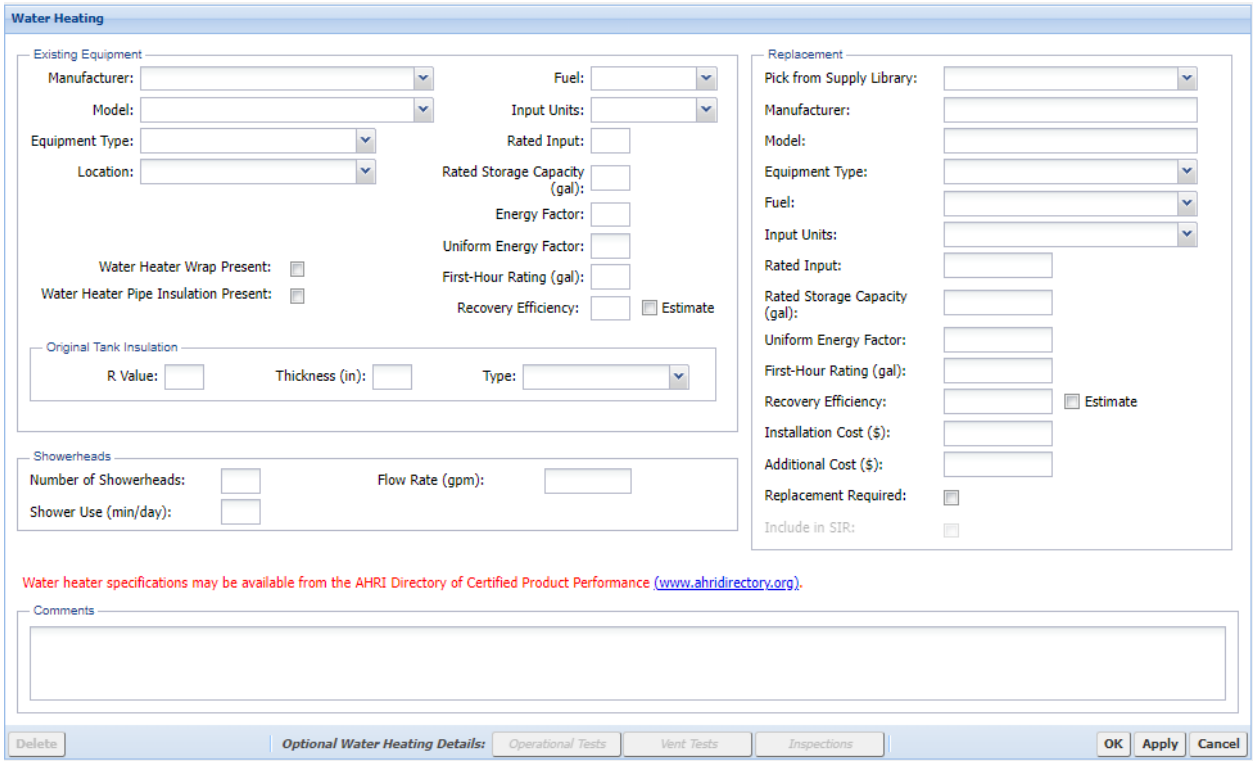
ESTIMATED POST-WX BLOWER DOOR READINGS
based on volume of house

House Volume	6000	8000	10000	12000	14000	16000	18000	20000	22000	24000	26000
Pre-wx blower door											
1000	700	800	850	950	1000	1000	1000	1000	1000	1000	1000
1200	800	900	950	1050	1100	1150	1200	1200	1200	1200	1200
1400	900	1000	1050	1150	1200	1250	1350	1400	1400	1400	1400
1600	1000	1100	1150	1200	1300	1350	1450	1500	1600	1600	1600
1800	1100	1200	1250	1300	1400	1450	1550	1600	1700	1750	1800
2000	1200	1250	1350	1400	1500	1550	1650	1700	1800	1850	1950
2200	1300	1350	1450	1500	1600	1650	1750	1800	1900	1950	2050
2400	1400	1450	1550	1600	1700	1750	1850	1900	2000	2050	2150
2600	1500	1550	1650	1700	1800	1850	1950	2000	2100	2150	2250
2800	1600	1650	1750	1800	1900	1950	2050	2100	2200	2250	2350
3000	1700	1750	1850	1900	2000	2050	2150	2200	2300	2350	2400
3200	1800	1850	1850	2000	2100	2150	2250	2300	2350	2450	2500
3400	1900	1950	2050	2100	2200	2250	2350	2400	2450	2550	2600
3600	2000	2050	2150	2200	2300	2350	2400	2500	2550	2650	2700
3800	2100	2150	2250	2300	2400	2450	2500	2600	2650	2750	2800
4000	2200	2250	2350	2400	2450	2550	2600	2700	2750	2850	2900
4200	2300	2350	2400	2500	2550	2650	2700	2800	2850	2950	3000
4400	2400	2450	2500	2600	2650	2750	2800	2900	2950	3050	3100
4600	2450	2550	2600	2700	2750	2850	2900	3000	3050	3150	3200
4800	2550	2650	2700	2800	2850	2950	3000	3100	3150	3250	3300
5000	2650	2750	2800	2900	2950	3050	3100	3200	3250	3350	3400

Baseload Forms

Baseloads forms are used to describe water heating retrofits, refrigerator replacement, and lighting retrofits. These forms are optional and are used to evaluate specific retrofit measures.

Water Heating Form



Water Heating form is used to enter information necessary to evaluate four water heating retrofit measures: tank insulation, pipe insulation, low-flow showerheads, and water heater replacement. You may describe the existing water heater by selecting from the list of manufacturer and model number, which will autofill the energy use characteristics of the water heater, or by directly entering the data on the form. To evaluate a water heater replacement, you may either select a water heater you have already described in the Supply Library, which will autofill the data, or directly enter the data on the form.

Existing Equipment

Manufacturer - Choose from the drop-down list the manufacturer of the water heater you are modeling.

Model - Choose from the drop-down list the model of the water heater you are modeling.

Equipment Type - Choose from the drop-down list that best describes the type of equipment you are modeling.

Location - Choose from the drop-down list the location that best describes the location the water heater is in.

Fuel - Choose from the drop-down list the fuel of the water heater you are modeling.

Input Units - Choose from the drop-down list either KBtu per hour for gas, or KW for electric.

Rated Input - Enter the numeric value of the water heater you are modeling.

Rated Storage Capacity - Enter the gallons of the water heater you are modeling.

Energy Factor, Uniform Energy Factor, First-Hour Rating (gal), and Recovery Efficiency - Will autofill if you select the water heater from the manufacturer and model list, otherwise you will need to look up the values. This can be done by using the AHRI Directory website. http://www.ahridirectory.org/

Water Heater Wrap Present - Check the box if water lines have 6'ft of pipe wrap on both hot and cold side of the water line. By leaving the box unchecked the audit will model to install pipe wrap.

Water Heater Pipe Insulation Present - Check box and choose the insulation type of the existing insulation and fill in a value either in R-value, or Thickness. You only need one value for the audit to run.

Showerheads

Showerheads replacement is allowable with non-DOE funds.

Number of Showerheads - Enter in the number of showerheads you are going to model for replacement.

Shower Use - Enter in minutes per day showers are taken.

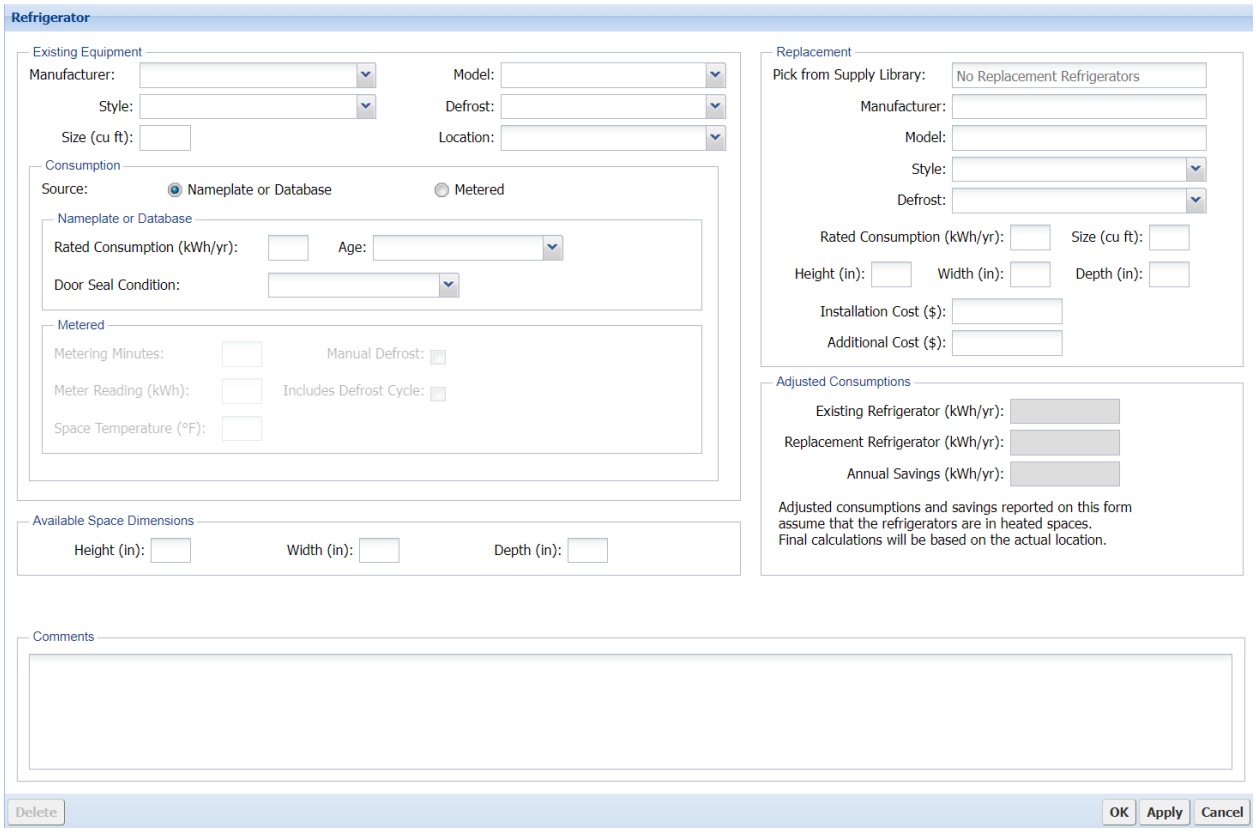
Flow Rate - Measure the gallons per minute the showerheads use and enter the number here.

Replacement

All agencies should have a minimum of 7 water heaters entered in the Supply Library. When modeling a water heater for replacement choose from the Pick from Supply Library drop-down list the water heater you want to model for replacement. All the information should autofill, do not check the Replacement Required box and run the audit to see if the water heater will be replaced as an Energy

Conservation Measure ECM. If the water heater does not appear on the Recommend Measure report, and the water heater has a Health & Safety issue, then go back to the water heater form and check the Replacement Required box, do not check the Include in SIR box. Rerun the audit, the water heater should now be replaced as a health & safety measure. **Replacement of a water heater is always to be modeled as an energy conversation measure ECM first before you replace it as a health and safety measure.**

Refrigerator Form



Refrigerator form is used to enter information necessary to evaluate a refrigerator replacement. Here, you may specify the energy use characteristics of the existing and replacement refrigerators. For the existing refrigerator, you may either select from the list of manufacturers and model numbers, which will autofill the energy use characteristics of the refrigerator or directly enter the data on the form. For the replacement refrigerator, you may either select a refrigerator you have already described in the Supply Library, which will autofill the data, or directly enter the data on the form.

Existing Equipment

Manufacture, Style, Model, Defrost, and Location - Choose from the drop-down list that best describes the appliance you are modeling.

Size (cu/ft) – Enter the size of the appliance.

Consumption

Source – Choose the method you are going to use to model the appliance, either “Name Plate”, or “Metered”. Depending on the method you choose, the greyed-out section below the source will populate and you can then fill in the appropriate information.

Nameplate or Database

If you selected to model the replacement using the nameplate.

Rated Consumption – Enter the kilowatt hours per year the energy the appliance uses.

Age – Choose from the drop-down box the age of the appliance that best describes the refrigerator.

Door Seal Condition - Choose from the drop-down box the door seal condition of the refrigerator that best describes the appliance.

Metered

If you selected to model the replacement using metered method.

Metering Minutes – Enter the minutes the appliance was metered.

Meter Reading – Enter the kilowatt hours the appliance was metered.

Manual Defrost – Check this box if you must manually defrost the appliance.

Includes Defrost Cycle – Check this box if the appliance was metered during it defrost cycle.

Available Space

Height, Width, and Depth - Enter the height, width, and depth of the appliance.

Replacement

Pick from Supply Library – If you have entered replacement appliances in the “Supply Library”, pick from the pre-loaded appliances that best describes the appliance you want to model for replacement.

Manufacturer – Enter the name of the manufacturer.

Model – Enter the model of the appliance.

Style, and Defrost - Choose from the drop-down box that best describes the appliance.

Rate Consumption – Enter in kilowatt hours per year the energy the appliance uses.

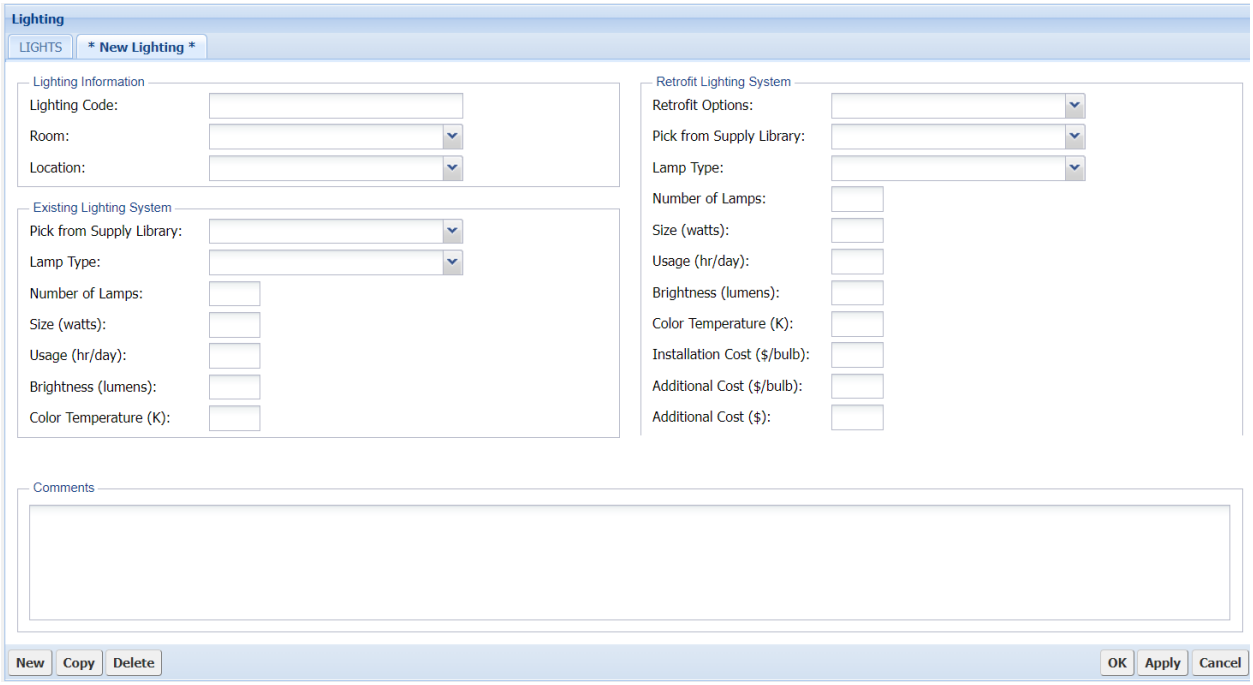
Size (cu/ft) – Enter the size of the appliance.

Height, Width, and Depth - Enter the height, width, and depth of the appliance.

Installation Cost – Enter the cost of the appliance.

Additional Cost – Enter any additional cost associated with the installation of the appliance (delivery, set-up, etc.).

Lighting Form



Lighting form is used to describe lighting replacement retrofits.

For the existing and/or retrofit lighting system, you may either select lighting you have already described in the Supply Library, by using the “pick from supply library” and choose from the list the bulbs that best describes the bulbs that you want to model for replacement or directly enter the data on the form.

Lighting Information

Lighting Code – Enter a unique lighting code

Room – Choose from the drop-down list that best describes the room the lighting is in.

Location - Choose from the drop-down list that best describes the location the lighting is in.

Existing Lighting System

Pick from Supply Library – If light is pre-load in the Supply Library, choose from the drop-down list that best describes the existing lighting

Lamps Type - Choose from the drop-down list that best describes the lamp type.

Number of Lamps – Enter the number of bulbs that you are modeling for replacement (20 max)

Size (watts) – Enter the wattage of the existing bulbs you are modeling for replacement.

Usage – Enter amount of time the light is on per day (1.5hrs min).

Retrofit Lighting

Pick from Supply Library - If light is pre-loaded in the Supply Library, choose from the drop-down list that best describes the lighting you are modeling to replace existing bulbs with.

The preferred method of the state is to choose from the Supply Library.

Retrofit Options, and Lamp Type - Choose from the drop-down list that best describes lighting you are modeling to replace.

Size (watts) - Enter the wattage of the bulbs you are modeling for replacement.

Usage - Enter amount of time the light is on per day (1.5hrs min).

Installation Cost – enter the cost to install lighting (7 dollars per bulb)

Additional Cost ($/bulb) – If the installation of the replacement bulb costs mor than 7 dollars, enter the remaining cost here. Note you will only get reimbursed 7 dollars per bulb.

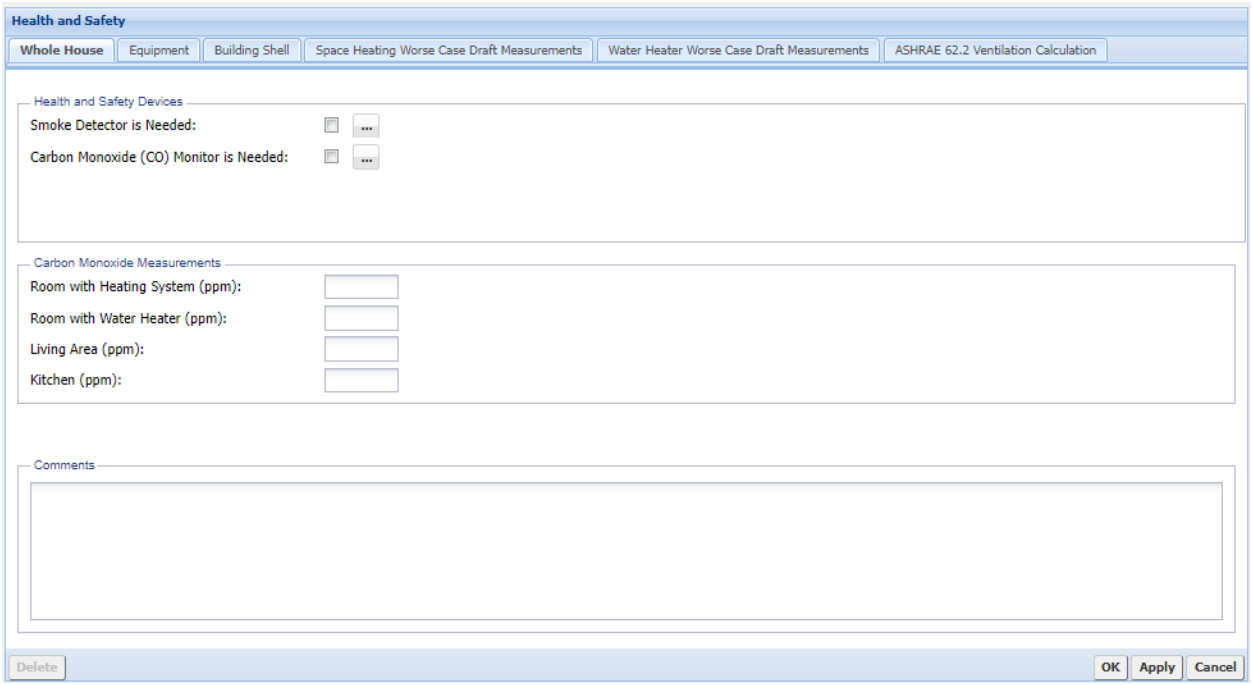
Additional cost ($) - Enter any additional cost associated with the installation of the lighting.

Note brightness(lumens) and color temperature (K) are optional fields and don't need to be fill-out for the audit to run.

Health and Safety Forms

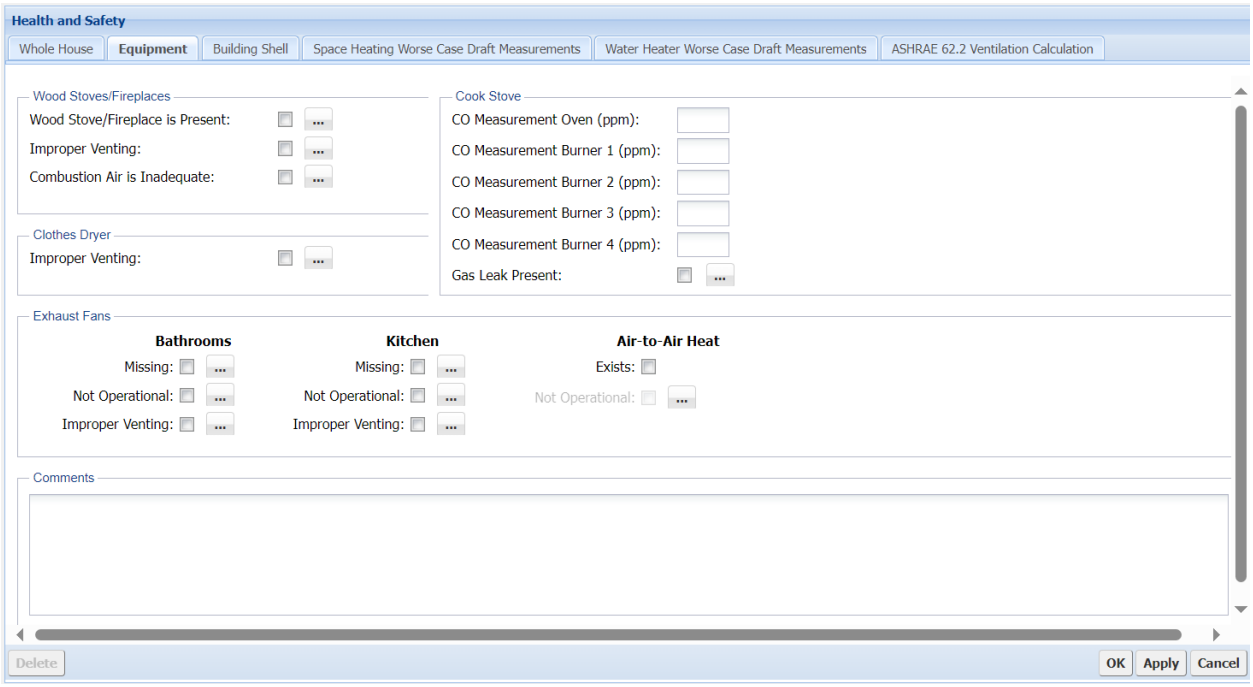
Health and Safety form (0ptional) can be used to enter health and safety measurements and observations that you have made of the house. Items on this form help identify potential health and safety hazards related to the whole house, equipment, and shell; record worst-case draft measurements for space heating equipment and the water heater; and determine ventilation requirements to comply with ASHRAE Standard 62.2.

Whole House Form



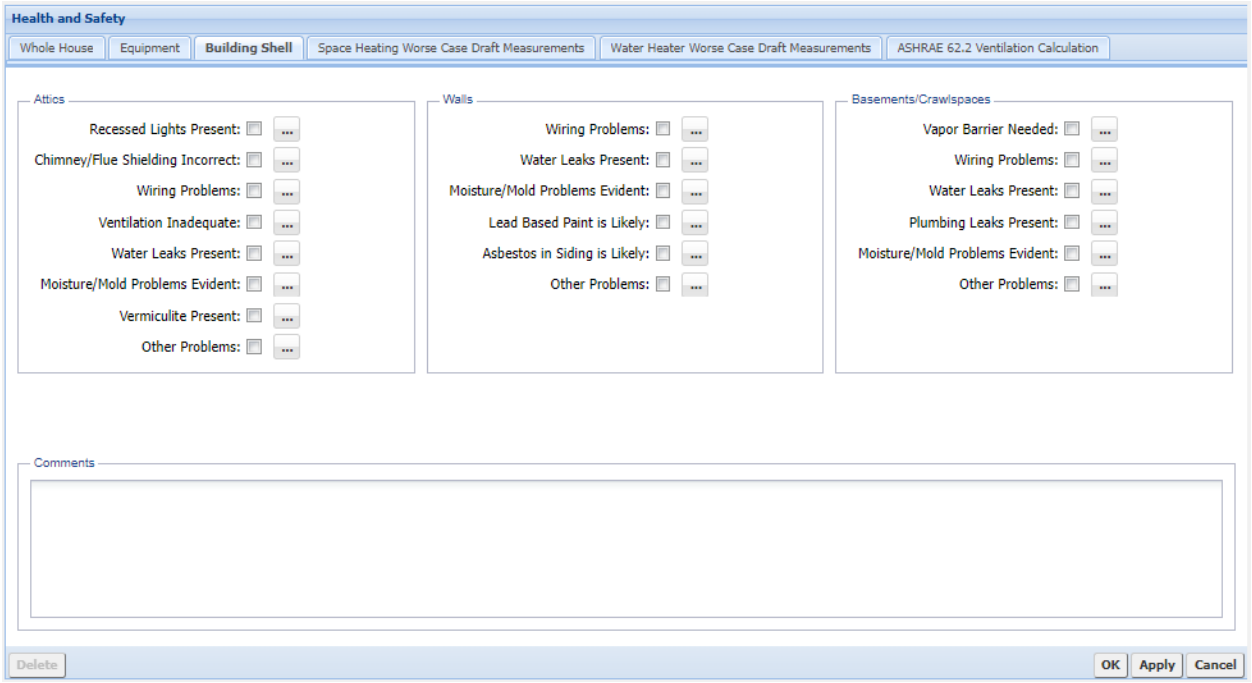
The Whole House form can be used to identify the need for smoke detectors and carbon monoxide monitors and to record the carbon monoxide concentrations in various rooms of the house. The carbon monoxide concentration (ambient) should be recorded for rooms having combustion-based space heating or water heating, a kitchen having a gas/propane cook stove, and the living area.

Equipment Form



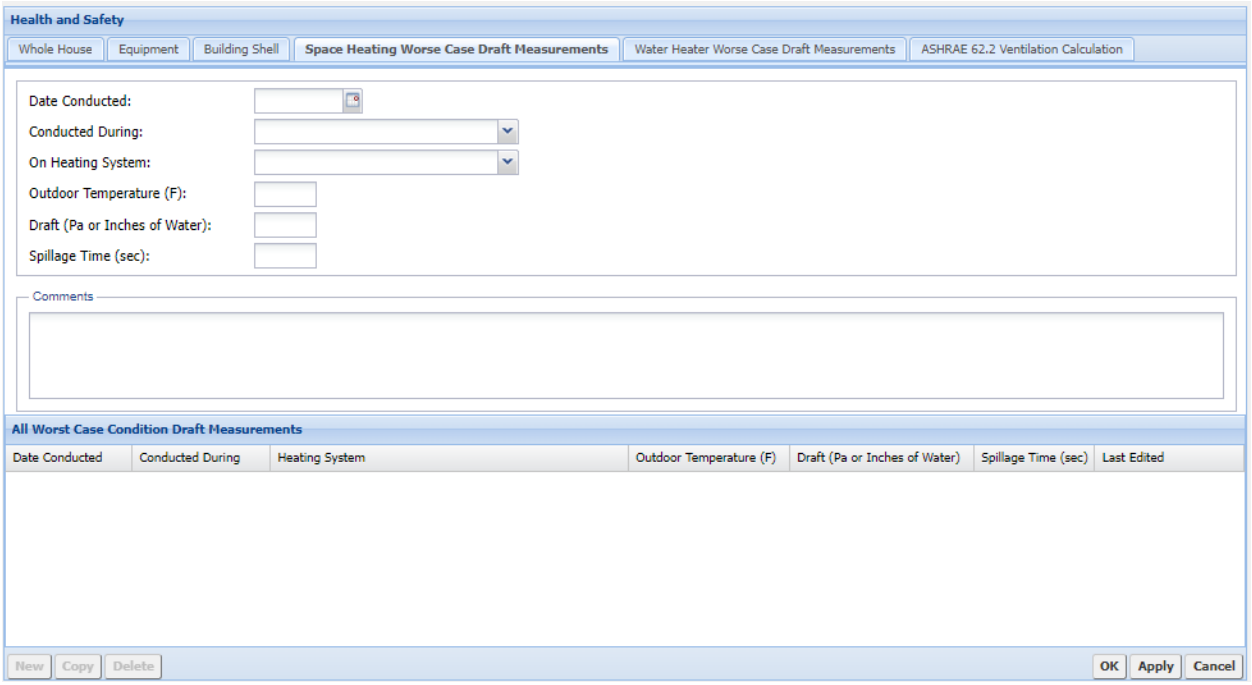
The Equipment form can be used to identify health and safety issues related to equipment in the house. Worst condition draft measurements may be recorded for any combustion-based heating systems described under the Heating tabs of NEAT and MHEA and any water heaters. Improper venting is a concern for wood stoves, fireplaces, clothes dryers, and exhaust fans. Wood stoves and fireplaces may also have inadequate combustion air and bathroom(s), or kitchen exhaust fans may be missing or not operational. Individual burner and oven carbon monoxide measurements can be recorded for a gas cook stove and a gas leak associated with the gas stove may also be identified. The existence of an air-to-air heat exchanger may be indicated.

Building Shell Form



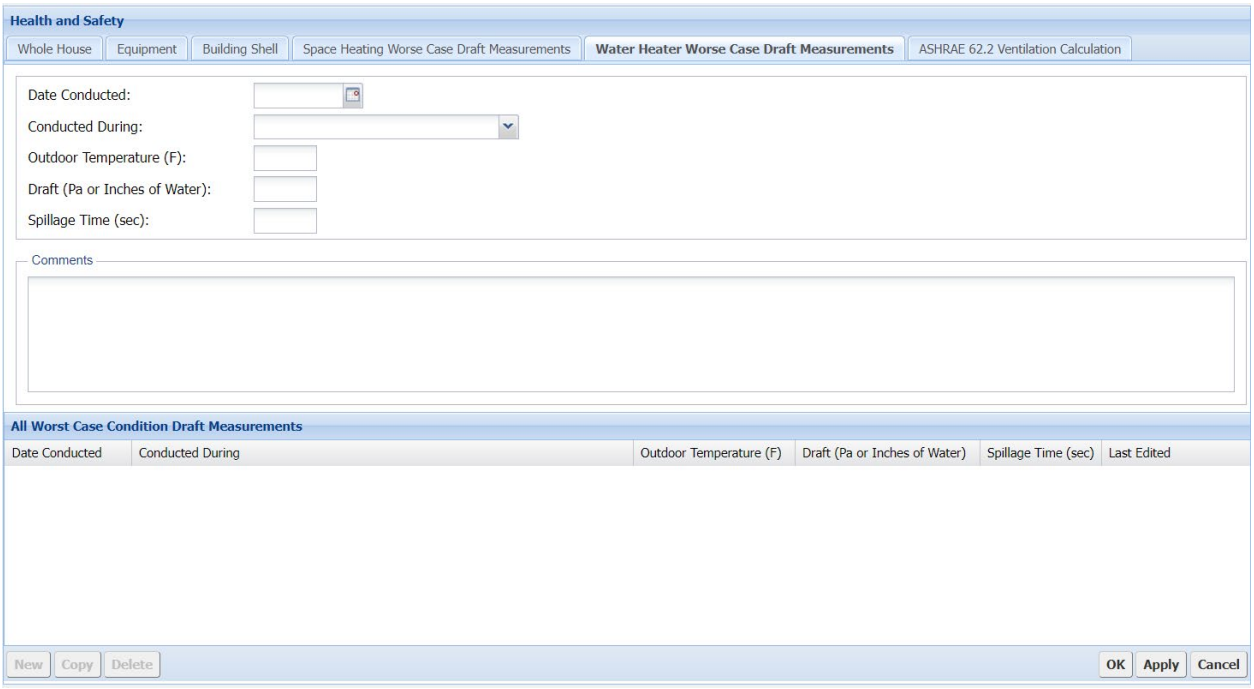
The Building Shell form can be used to identify health and safety issues in the attics, walls, and basement/crawlspaces of the house. The health and safety issues that can be identified include wiring problems, water leaks, plumbing leaks, moisture/mold problems, the presence of lead-based paint in walls, asbestos in vermiculite attic insulation or wall siding, and recessed lighting, as well as problems associated with the ventilation and the chimney/flue, and the need of a vapor barrier in the basement. All areas can also be described as having Other Problems, which could be explained in the comments.

Space Heating Worse Case Draft Measurements Form



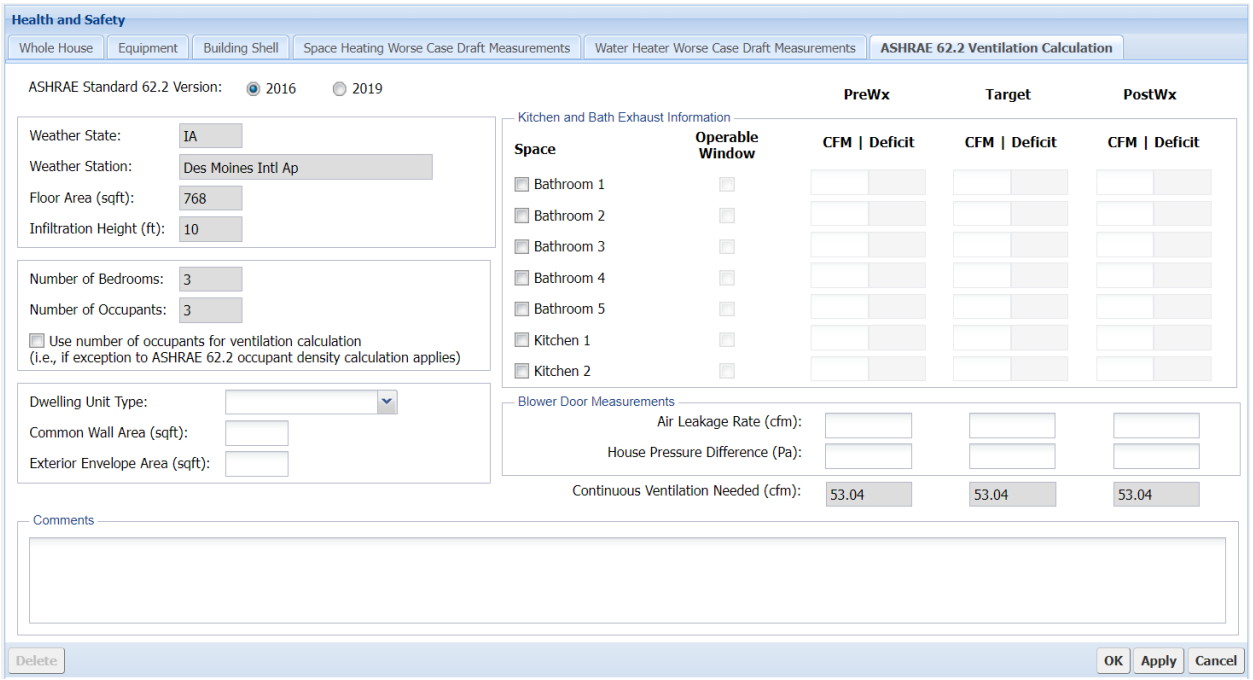
When conducting worse case draft test for water heater and/or space heating systems, select the appropriate time of the test from the “Conducted During” drop-down. Draft measurement will not apply. Spillage time will be 2 minutes for warm vent, and 5 minutes for cold.

Water Heater Worse Case Draft Measurements Form



When conducting worse case draft test for water heater and/or space heating systems, select the appropriate time of the test from the “Conducted During” drop-down. Draft measurement will not apply. Spillage time will be 2 minutes for warm vent, and 5 minutes for cold.

ASHRAE 62.2 Ventilation Calculation



The Ventilation form is used to check compliance with ASHRAE Standard 62.2 and provides recommendations to achieve compliance. Indicate if the exception to the ASHRAE Standard 62.2 whole-building mechanical system requirement applies to the dwelling unit. Then, select the ASHRAE Standard 62.2 version with which to check compliance. The options are 2016 or 2019. Iowa is using ASHRAE Standard 62.2 2016.

Weather State, Weather Station, Floor Area, Infiltration Height, Number of Bedroom, and Number of Occupants - Are read-only fields that you entered on the Audit form and that are pertinent to the ventilation calculations are displayed.

Use Number of Occupants for Ventilation Calculation - Check the box if the exception to the ASHRAE 62.2 occupant density calculation applies. **Iowa checks the box**.

Dwelling Unit Types - Choose from the drop-down list that best describes the dwelling you are modeling. Choosing Detached or Vertically Attached no entry is needed in the common wall, and exterior envelope area fields.

Common Wall Area (sq/ft) - If horizontally attached is your choice in Dwelling Unit Type, enter the area of the common wall field.

Exterior Envelope Area (sq/ft) - If horizontally attached is your choice in Dwelling Unit Type, enter the area of the exterior envelope area field.

Kitchen and Bath Exhaust Information

Enter observations and measurements about the kitchen and bath exhausts; these inputs will be used in calculating the mechanical ventilation requirement as well as recommending any prescriptive measures.

Space – Check the box of the number of bathroom(s) and Kitchen(s) that inside the dwelling.

Operable Window – Check this box if the is one operable window in the bathroom(s), and Kitchen(s).

PreWx, Target, and PostWx CFM/Deficit

CFM – Enter the cfm (as measured) of the fan.

Deficit – Once you check a bathroom or kitchen box, there will be a value auto filled in the deficit field (50 cfm for bath, and 100 cfm for kitchen). After entering a value in the cfm field and if you check the operable window box the audit will deduct those values from the value in the deficit field. If the cfm, and operable window (if applicable) value is larger than the number in the deficit field there is no addition cfm needed for that area. If there is a number remaining in the deficit field after deducting the cfm and operable window (if applicable) values, that is the deficiency number need for that area.

Blower Door Measurements

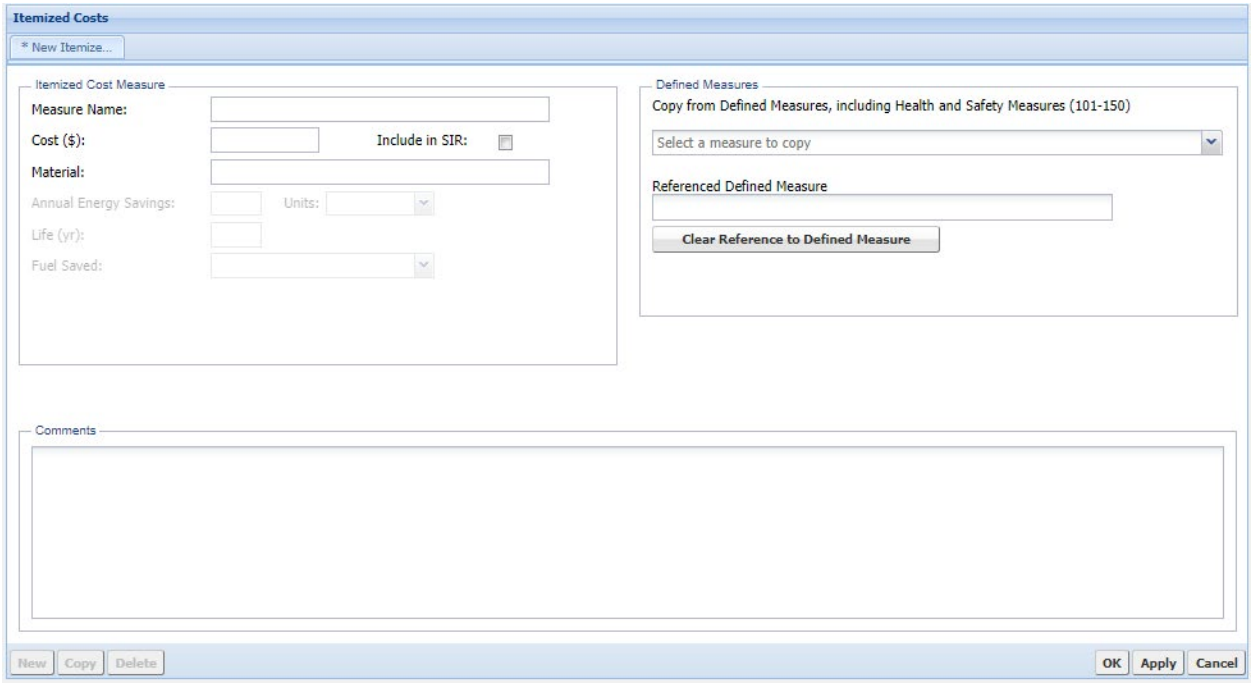
Air Leakage Rate (cfm) – PostWx and Target number will be auto filled from the values entered in the Infiltration/Duct Leakage form. PostWx field will need to be fill in after the final blower door number has been ran.

House Pressure Difference (Pa) – PostWx and Target number will be auto filled from the values entered in the Infiltration/Duct Leakage form. PostWx field will need to be fill in with the pressure the final blower door number was ran at (50pa).

Continuous Ventilation Needed (cfm) – Read only field and if there is a number in the field that is the number of whole house ventilation needed in the home.

Currently Iowa Weatherization does not use this form, but rather uses RED CALC.

Itemized Costs Form

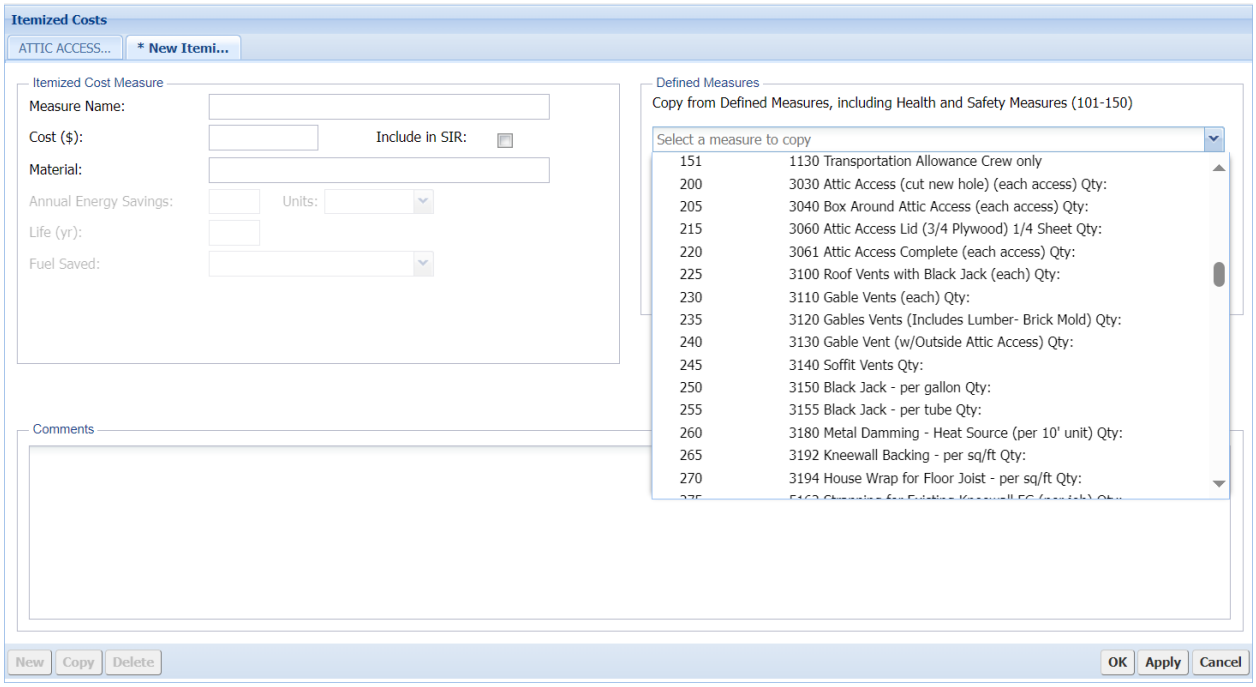


Itemized Costs form can be used to enter necessary repair and health and safety measures associated with recommended energy measures and their costs.

Itemized cost records may be created in three ways.

1) By selecting from “Copy from Defined Measure drop-down box one of the pre-loaded repair or health and safety measure.
2) You can use this form to enter your own energy saving measures (that you define) not addressed under the Defined Measure Library.
3) For an energy saving measure. You must determine and enter the associated annual energy savings.

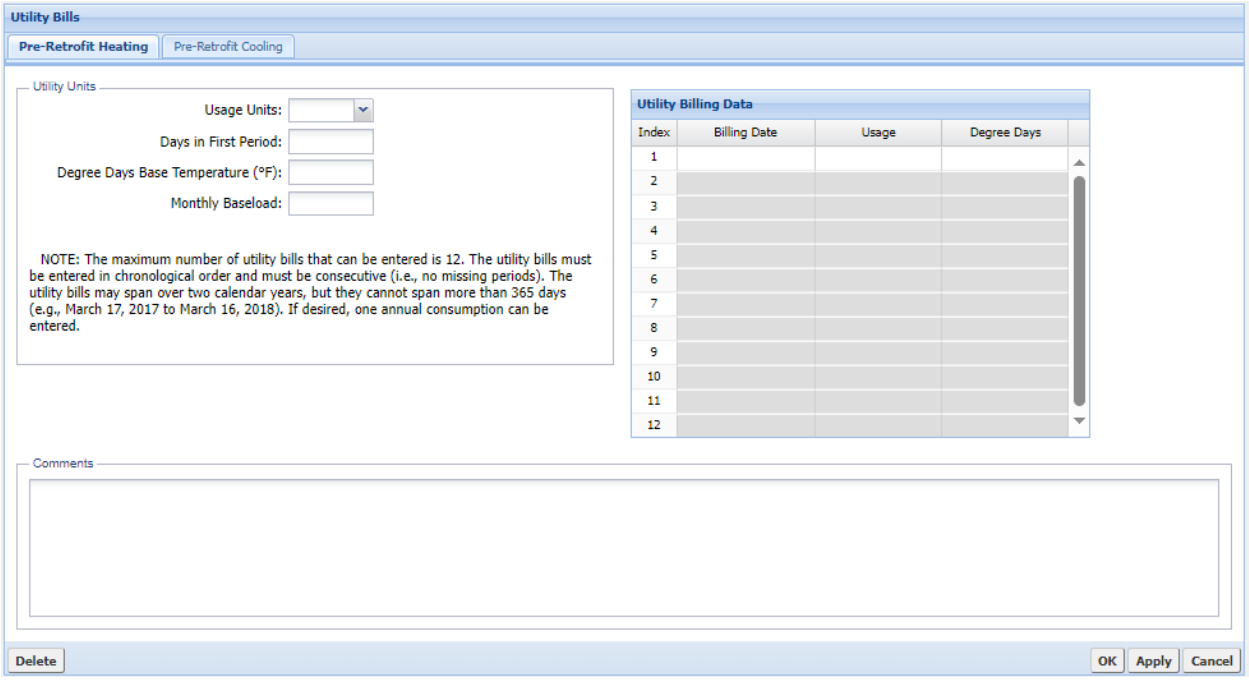
Itemized Costs Copy from Defined Measures Form



Use the drop-down box to choose the applicable measure. NEAT and MHEA provide you with a mechanism to predefine measures that you commonly encounter by defining them in the Setup Library, then copying them into any audit to which they apply. NEAT and MHEA also allow you to copy from a library of predefined standard repair and health and safety measures that is a part of all setup libraries.

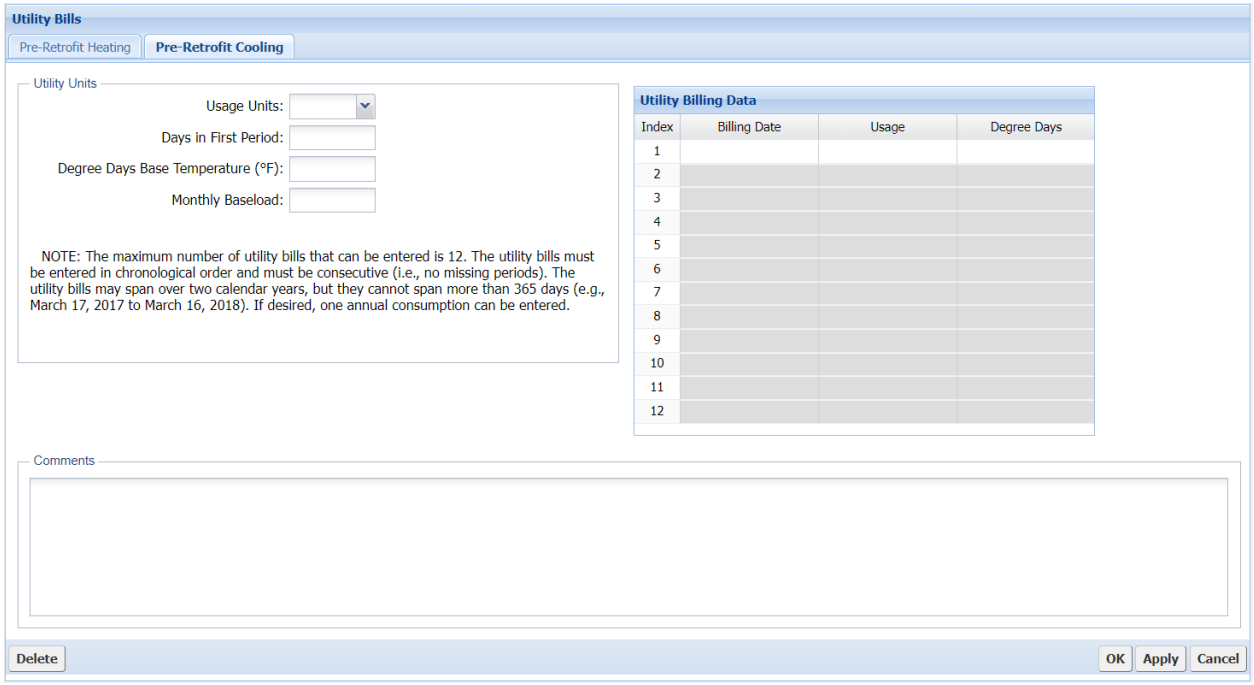
Use the "Clear Reference to User Defined Measure" button to eliminate the reference of the existing item definition on the Itemized Costs form to the pre-defined item in your Setup Library.

Utility Bills - Pre-Retrofit Heating Form



The State does not use utility bills.

Utility Bills - Pre-Retrofit Cooling Form

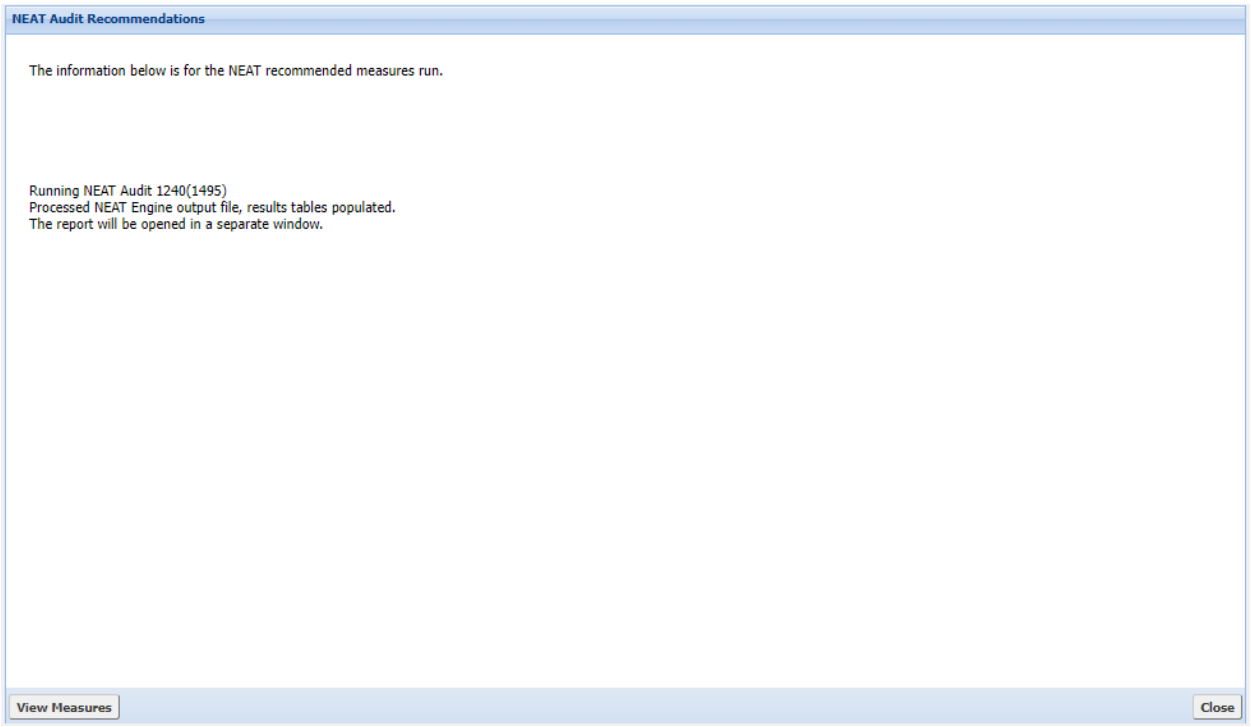


The State does not use utility bills.

Work Orders

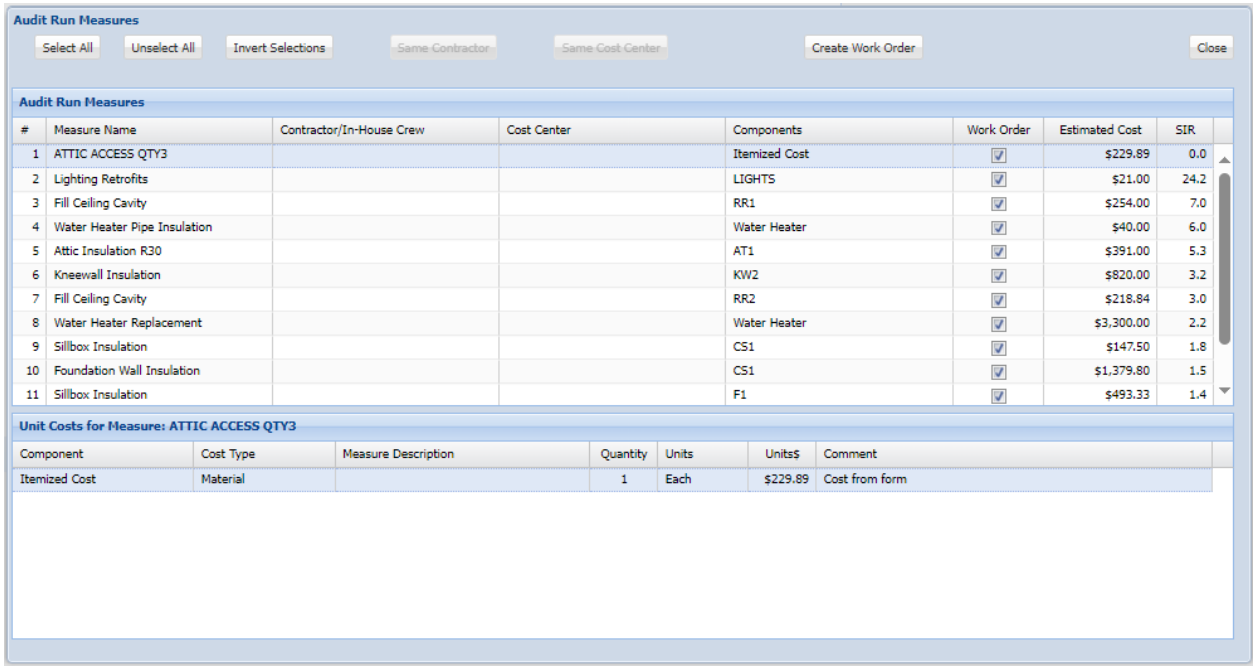
Work Orders – View Measures Form

As of now Iowa does not create work orders from WAweb. Refer to Section 1015 of the *Iowa* Weatherization Assistance Program Work Standards for guidance regarding work orders.



Select View Measures to open the Audit Run Measures form, which displays a table of run measures for which work orders could be created, and a navigation bar at the bottom, which displays a breakdown of the itemized cost for the selected measure.

Create Work Order Form



Work Order - Use the checkboxes under the Work Order column to select the audit measures for which you want to create work orders.

Contractor/In-House Crew or Cost Center - Select the contractor/in-house crew or cost center from the drop-down list that is displayed when a field under the column is selected.

Measure Name. Navigate through the audit measures by selecting any of the measures to display the cost details of that measure in the navigation bar Unit Costs for Measure

To create work orders for each of the measures checked in the rows, select Create Work Order at the top of the form.

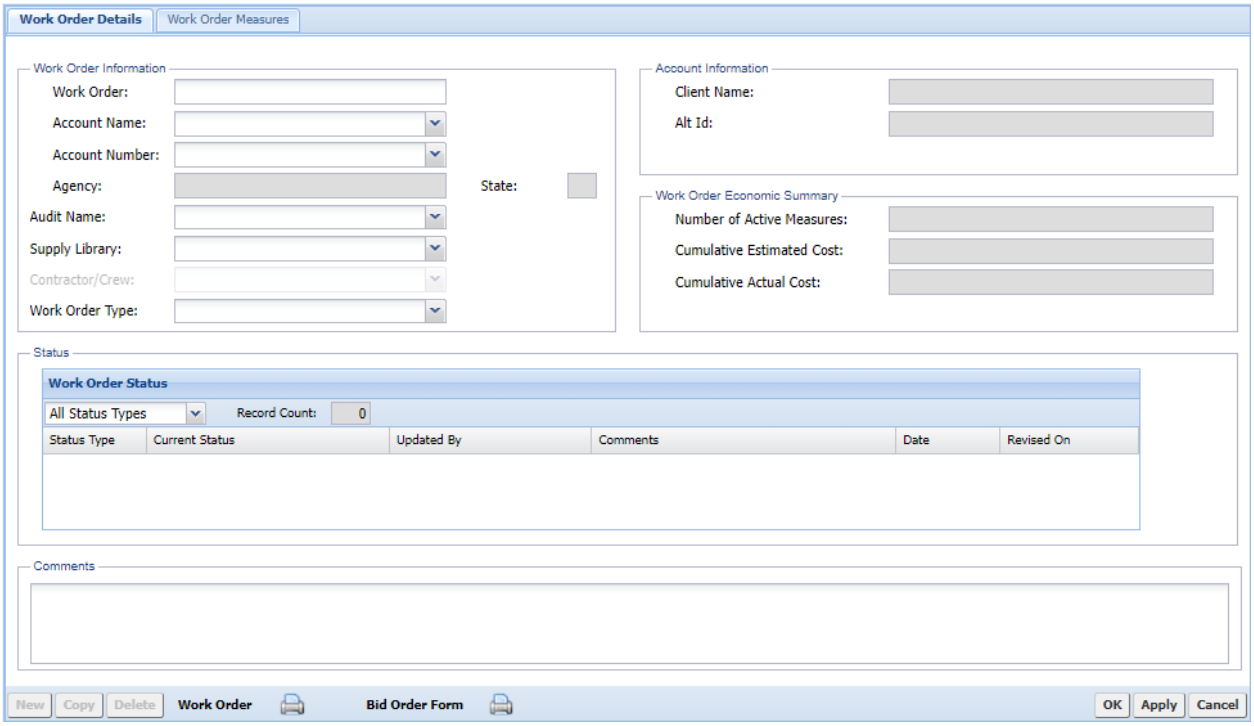
The pop-up window will appear when you select Create Work Order; the window describes that the work order was created successfully and how many work orders were created.

If work orders were already created for that audit, another pop-up window will be displayed with three options. Choose how to proceed with the work order by selecting one of three options:

1) Save the previously generated Work Order and create new ones,
2) Replace the previously generated Work Order with new ones, or
3) Cancel the creation of Work Orders. After selecting an option, select OK and the selected action (i.e., work order) will be created.

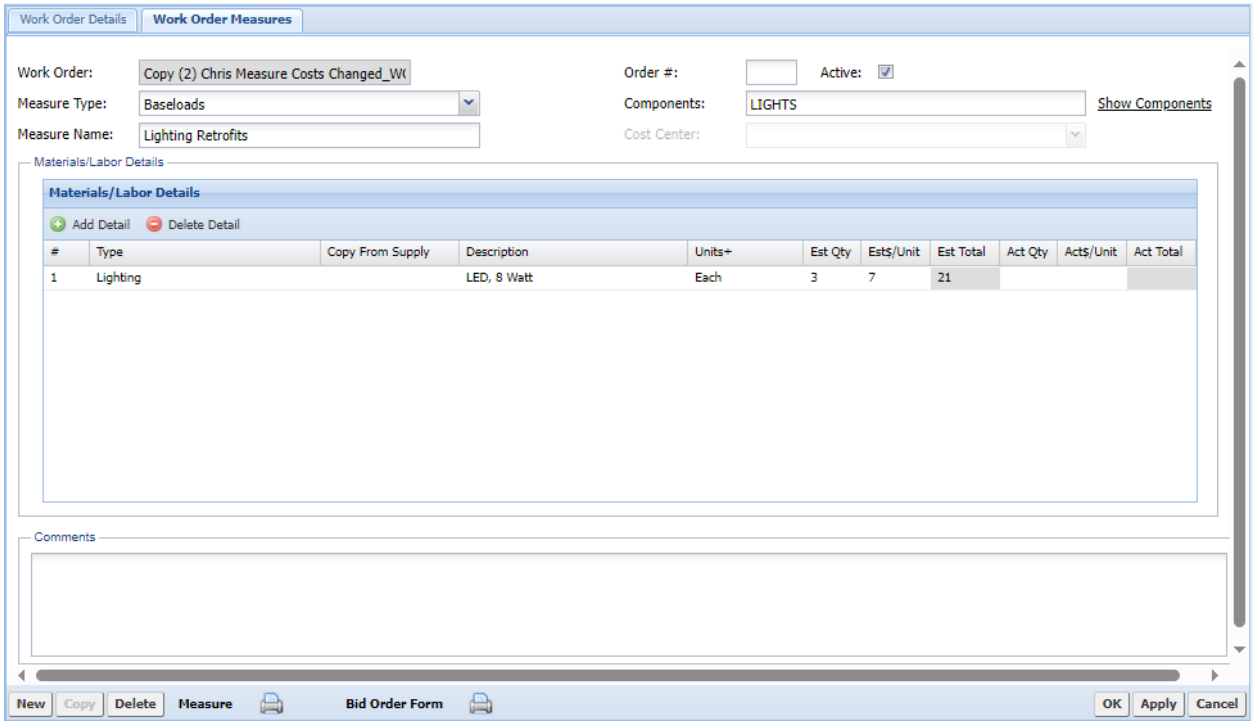
To view the created work order(s) select Work Orders on the navigation bar and then select View Work Orders on the menu bar and then locating the work order from the All-Work Orders navigation bar located at the bottom of the form.

Work Order Detail Form



The Work Order Details form provides groups of data input or selection fields such as Work Order Information, Account Information, and Work Order Economic Summary. The Status information describes the current status of the work order. Start by filling in the Work Order Information fields by providing a work order name and then choose either the Account Name or Account Number. This will autofill the Agency and State fields. Choose a Supply Library containing inventory items from which selections may be made (optional). You can also choose the supplier of materials for the work order from the drop-down list for Contractor/Crew field (optional; a Contractor/Crew list could be created by selecting Agency → Contacts on the menu bar and filling in the details). The last field to complete under Work Order Information is the Work Order Type, which designates whether the work order relates to Weatherization, Re-Weatherization, Emergency Repair or Replacement, Response to Client Request or another type of work. Once these are completed and saved, a record for the work order will be created in the All-Work Orders navigation block at the bottom of the form.

Work Order Measures Form

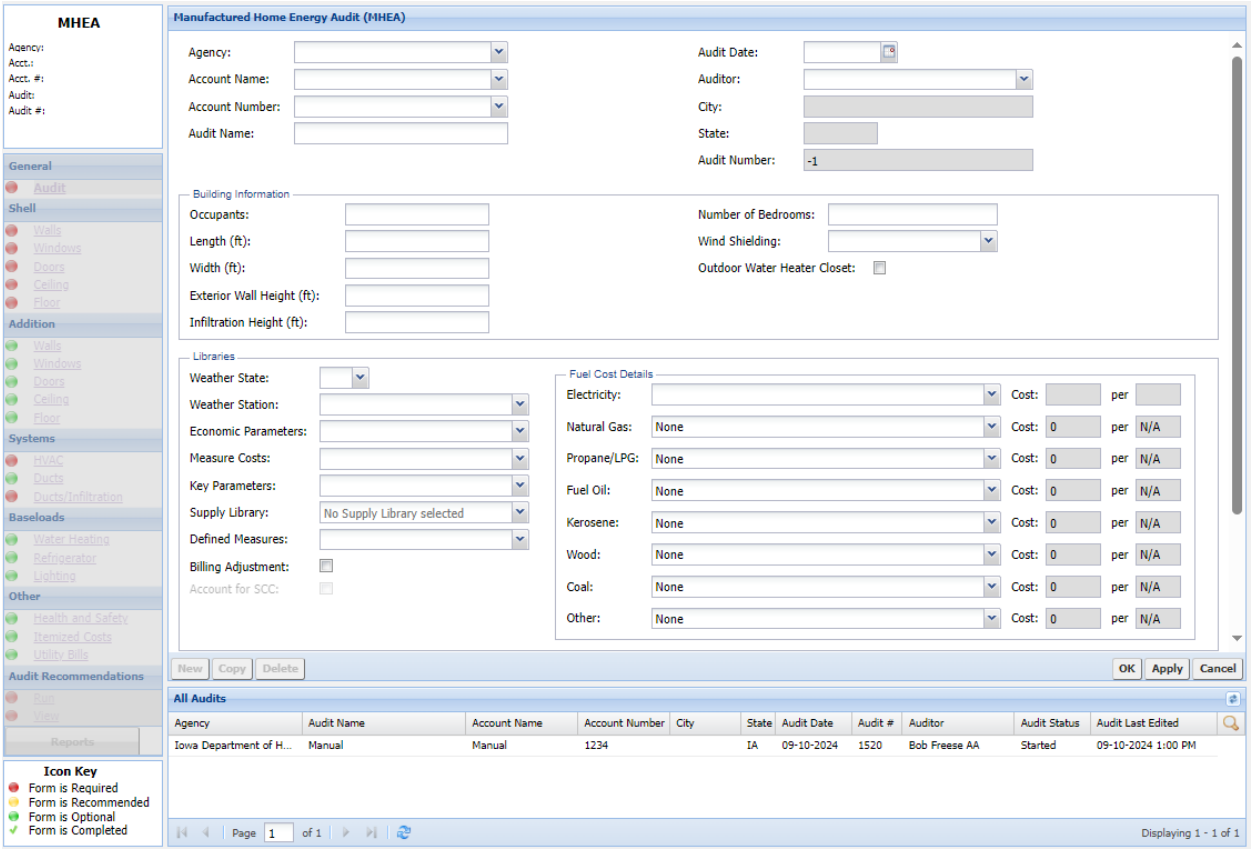


The Work Order Measures form includes a record of all the measures of the active work order. The Work Order Measures form includes a read-only field with the work order name and other input fields to choose the Measure Type (Base Loads, Building Insulation, Client Education, Doors and Windows, General Heat Waste and Air Infiltration, General Repairs, Health and Safety, HVAC Systems, or Other); provide a name for the measure; and input an integer value for the Order # to identify the work order by a unique code, for a Component field to identify a name or code of all building components to which the measure will be applied, and for a Cost Center field, which provides a drop-down list of the funding sources to which the actual cost of the measure will be charged. Keep the active checkbox selected to include the measure in the work order. A Materials/Labor Details sub-form in the middle of the form page is used to add or remove a record for the measure that describes measure cost, units, and quantity. This can be done manually by editing the records in each row or by choosing from the Supply Library in the drop-down under the Copy From Supply column.

MHEA Audit

To create a new MHEA audit, select Audit then select MHEA on the menu bar and then select New on the Audit form (State Administrators and Guests are not allowed to create an audit). Select Copy to create a new audit from an existing audit. You may want to create a new audit using Copy to make multiple audit runs for a home (e.g., to evaluate different retrofit options or replacement equipment for a given home) but still see the results of previous runs.

When creating a new audit using New, fill in the Audit form first before entering information on the other forms.



Audit form is used to enter general audit information and select weather files and libraries needed to run the audit. All the fields on this form that are not disabled or read-only are required. At the top of the form, select your Agency and then select the account using either the Account Name or Account Number field (the other data field will be auto filled using information from the Account form). Enter an Audit Name and the Audit Date, and then select the Auditor Name (auditor names provided in the drop-down list will include all users for the Agency that are marked as Active and Auditor on the User form). The City and State fields will be auto filled using information from the Account form. The Audit Number will be automatically assigned by MHEA.

Building information

Occupants - Number of occupants on the LIHEAP application.

Length, Width, Exterior Wall Height, Infiltration Height, and Number of bedrooms - Enter a value in the length, width, exterior wall height, infiltration height, and number of bedrooms.

Wind Shielding - Choose from the drop-down list the shielding that best describes the shielding of the mobile home.

Check the box if there is an outdoor water heater closet door present.

Libraries

Weather State - Select the closes State to the house you are modeling.

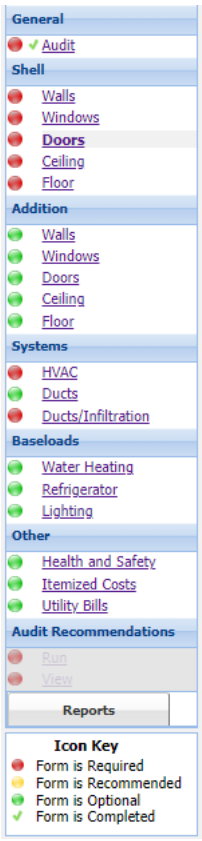
Weather Station - Select the closest city to the house you are modeling.

Economic Parameter Set, Measure Cost Set, Key Parameter Set, Supply Library, and Defined Measure Set - Choose from the drop down the library associated with your Agency. In some cases, there might be more than one Library listed, so make sure you are choosing the correct Library.

Fuel Cost Detail - Select for the drop down the library fuel cost associated with your Agency.

Finally, for MHEA to adjust energy savings estimates and recommend measures based on the actual pre-weatherization energy consumption of the home, select the Billing Adjustment checkbox.

General Ledger



The General Ledger is located at the left side of the NEAT audit tool. All sections of the ledger will remain shaded gray until an audit is created. The “Apply” button will need to be clicked on to populate the ledger.

Red Dot – Form is required for the audit to run.

Yellow Dot – Form is recommended. Although data is not required to run audit it is recommended you enter data into yellow dot fields.

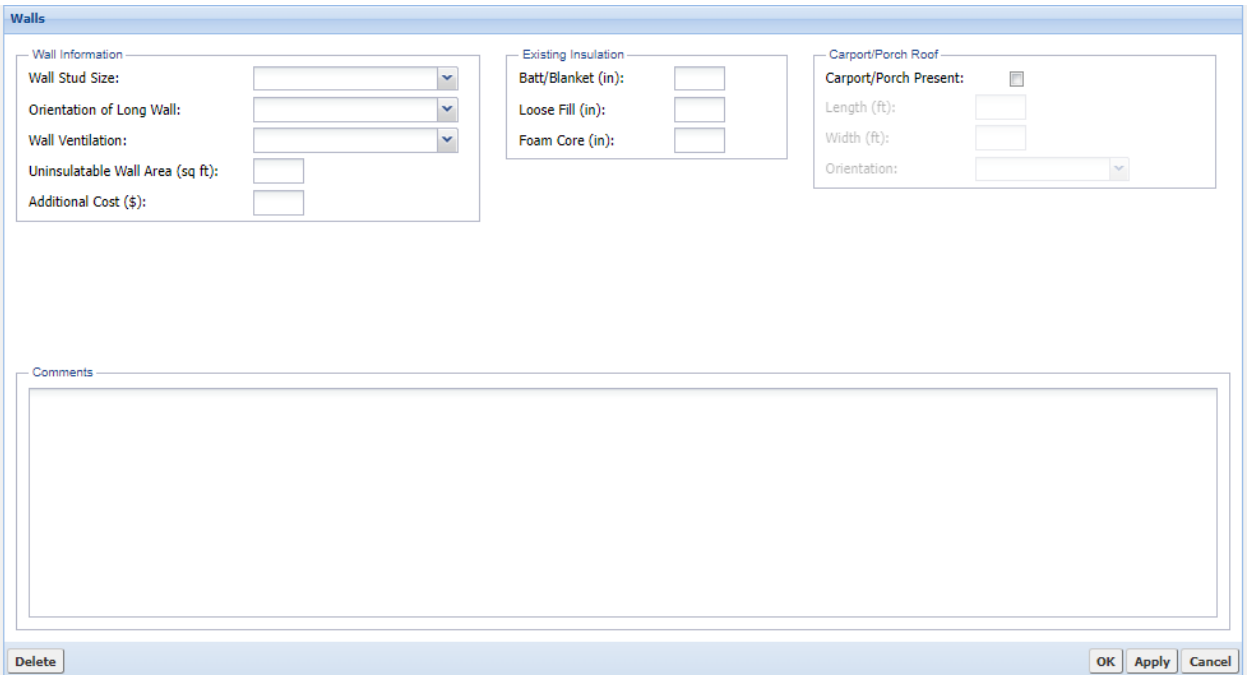
Green Dot – Form is optional. Although data is not required to run audit there are some optional fields that if applicable to the house you are working on you need to enter data into (ducts, water heater, refrigerator, lighting, and itemized costs). Note: ducts on the ledger are a green dot and is considered an option field. However, if you enter a heating that delivers air through a duct system, the ducts from will turn red and becomes a required field.

Check Mark – Form is completed. When all required information is entered into the form there will be a check mark placed next to the dot to indicate the form is completed.

Also note the Icon Key at the bottom for reference. Selecting “Run” for Audit Recommendations is not available until all required items are checked off.

After running the audit, the recommendation report should open automatically for you to view and see what measures the audit has recommended. If at any time you want to review the audit input and recommendation reports after you have closed out of the reports, select the Reports button and choose from the list the report you want to reopen. It is from the reports button you can also save or print the reports.

Wall Form



The Wall form is required and is used to describe the four primary walls of the home that enclose the conditioned space of the home. MHEA assumes that a manufactured home is rectangular in shape, the walls are wood-frame construction, and the walls facing different orientations have identical construction characteristics; therefore, MHEA uses only one form to describe all four primary walls.

Wall Stud Size - Select the stud size used in framing the walls. The choices are 2×2, 2×3, 2×4, and 2×6. MHEA uses this information to calculate the wall R-value and the volume of wall cavity available for added insulation. Required.

Orientation of Long Wall - Select the closest cardinal compass direction that one of the long walls of the home faces. The choices are North, South, East, and West. For this entry, MHEA considers North the same as South and East the same as West, but you might adopt a convention such as entering the orientation of the front wall as the long wall. MHEA uses this information to calculate solar loads on the home. Required.

Wall Ventilation - Indicate whether the walls are vented or not vented. The walls of the mobile home may be intentionally ventilated to remove accumulated moisture by having corrugated metal siding open at the bottom to provide space for air to flow between the exterior and interior wall materials. Small holes in the siding at the bottom and top of the exterior wall surface may be visible, allowing the air to circulate. MHEA degrades the wall R-value for ventilated walls. Required.

Uninsulatable Wall Area - Enter a numeric value.

Additional Cost - This field is used to add or subtract any additional cost associated with the walls you are modeling (additional labor, and ancillary costs).

Existing Insulation

Batt/Blanket, Loose Fill, or Foam Core - MHEA assumes that exterior walls of the mobile home may have Enter the thickness of existing insulation type in inches. Enter 0 for insulation types that do not exist. MHEA uses this information to calculate the wall R-value and the volume of wall cavity available for additional insulation. A default value of 3.5 inches exists. Required.

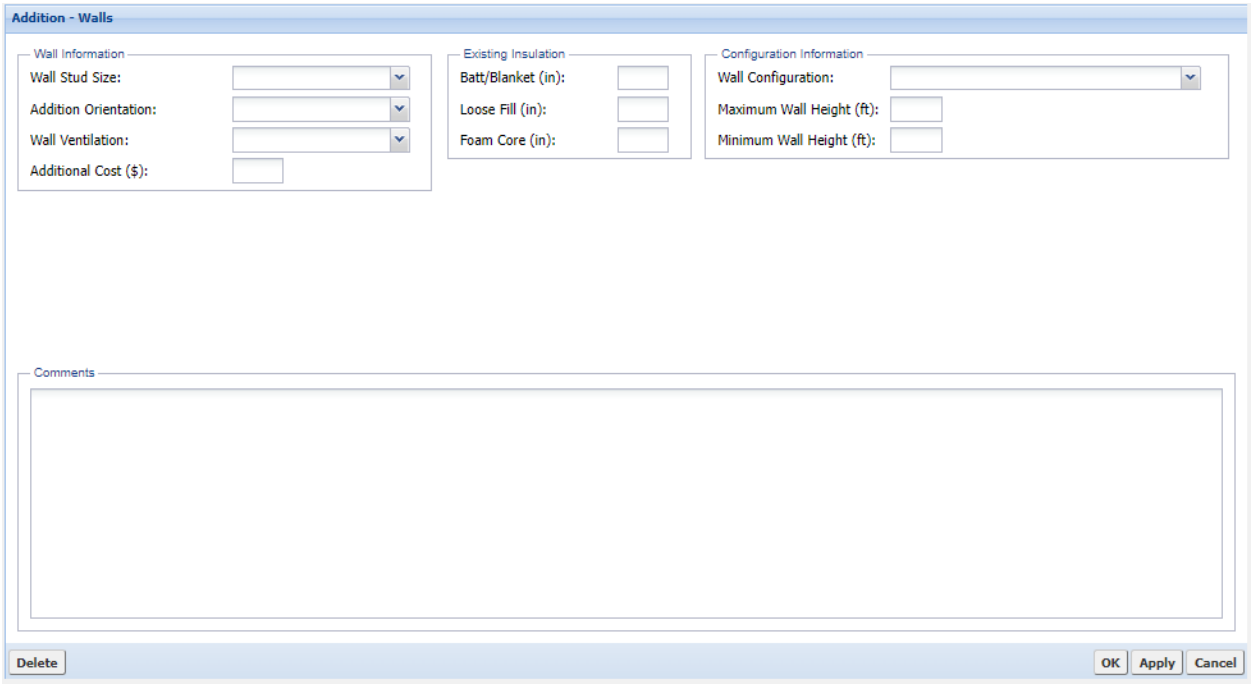
Carport/Porch Roof

Carport/Porch Roof Present – Check box if carport, or porch roof is present. A carport/ porch roof is a shelter with no walls that extends out from one wall of the mobile home. Often, this shelter is used to park a car or shade an outdoor sitting area.

Length, and Width - Enter the length and width of this carport/porch roof in feet. The length is the dimension parallel to the mobile home.

Orientation - Choose from the drop-down list the orientation of the carport/porch.

Addition Walls Form



Addition forms are used to describe the walls, windows, exterior doors, ceiling, and floor of a conditioned room attached to the manufactured home. MHEA assumes that the manufactured home addition is rectangular in shape with wood-frame construction and has three exposed walls, a flat, shed or gable roof, and a crawlspace, slab on grade, or exposed floor Use these forms to describe all the shell components in the addition through which heat flows, select retrofit options, and describe any additional costs associated with the installation of the retrofit unique to the house being audited that are not described in the Measure Cost Set Library. If there is no addition, you do not need to access the addition forms. However, if entry is begun on any one of the addition forms, then the Walls form, Ceiling form, and Floor form must be completed. The Window and Door forms are optional.

Wall Stud Size - Select the stud size used in framing the walls. The choices are 2×2, 2×3, 2×4, and 2×6. MHEA uses this information to calculate the wall R-value and the volume of wall cavity available for added insulation.

Addition Orientation - From the drop-down list indicate the orientation of the addition wall. The addition orientation is the same orientation (direction the wall faces) as the manufactured home wall to which the addition is attached.

Wall Ventilation - Indicate whether the walls are vented or not vented. The walls of the mobile home may be intentionally ventilated to remove accumulated moisture by having corrugated metal siding open at the bottom to provide space for air to flow between the exterior and interior wall materials.

Additional Cost - This field is used to add or subtract any additional cost associated with the walls you are modeling (additional labor, and ancillary costs).

Existing Insulation

Batt/Blanket, Loose Fill, or Foam Core - MHEA assumes that exterior walls of the mobile home may have Batt/Blanket, Loose Fill, or Foam Core insulation. Enter the thickness of existing insulation type in inches. Enter 0 for insulation types that do not exist. MHEA uses this information to calculate the wall R-value and the volume of wall cavity available for additional insulation.

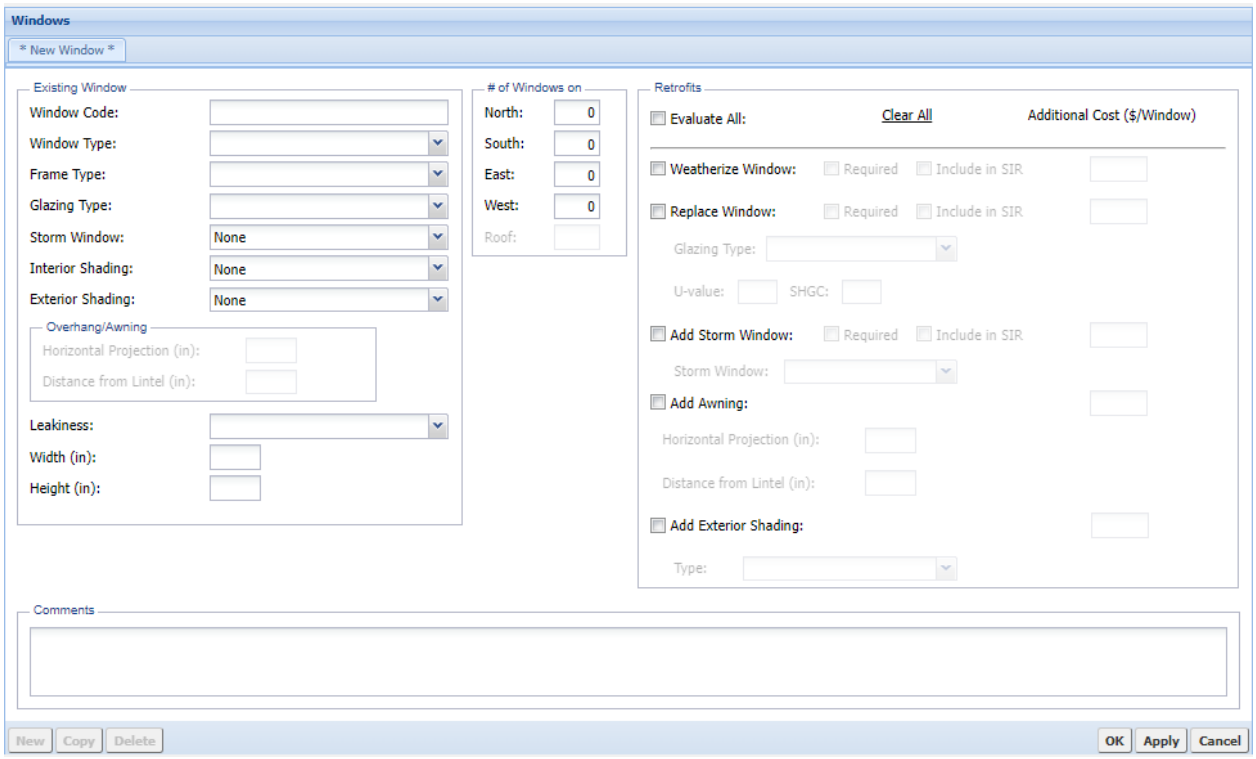
Wall Configuration - Enter the approximate wall configuration by selecting the appropriate description: Maximum Wall Height at Interior Wall, Maximum Wall Height in Center of Addition or All Addition Walls the Same Height.

Maximum Wall Height (ft) - Enter the maximum height, in feet, of the addition walls. If the walls are of varying height, enter the maximum and minimum wall heights. If the walls are all the same height, enter the same value in both the maximum and minimum height fields.

Minimum Wall Height (ft) - Enter the minimum height, in feet, of the addition walls. If the walls are of varying height, enter the maximum and minimum wall heights. If the walls are all the same height, enter the same value in both the maximum and minimum height fields.

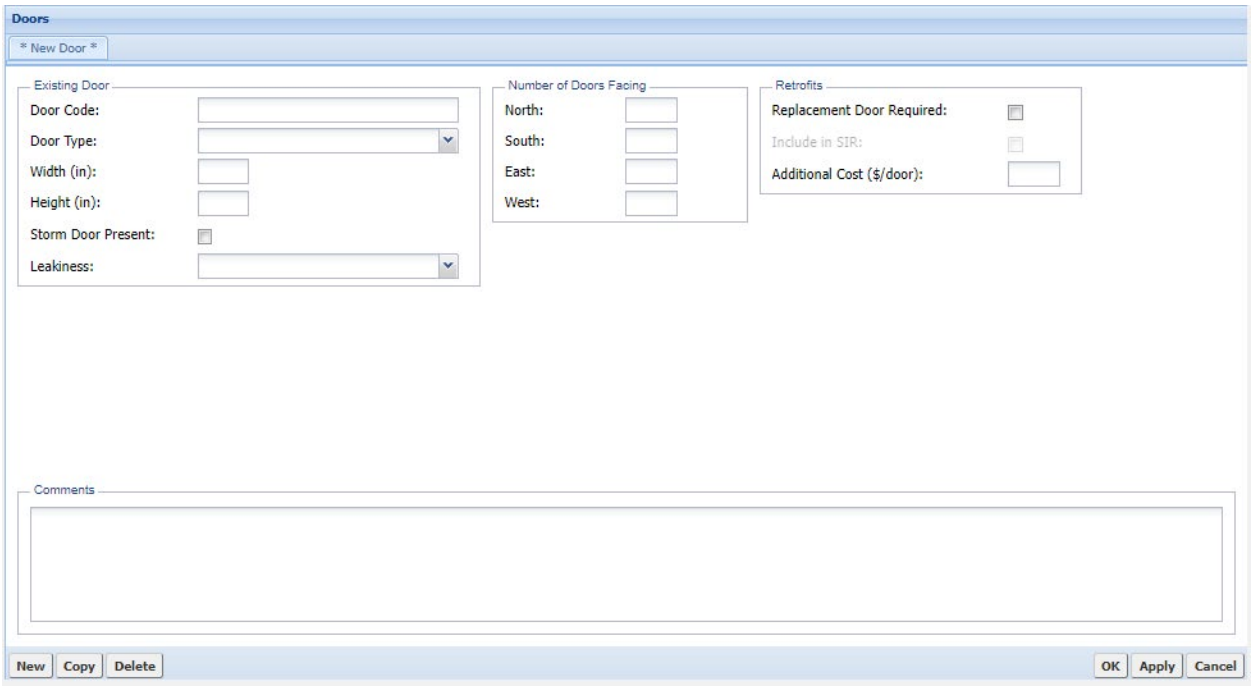
Comment - Enter any comments associated with the floors here.

Windows/Addition Windows Form



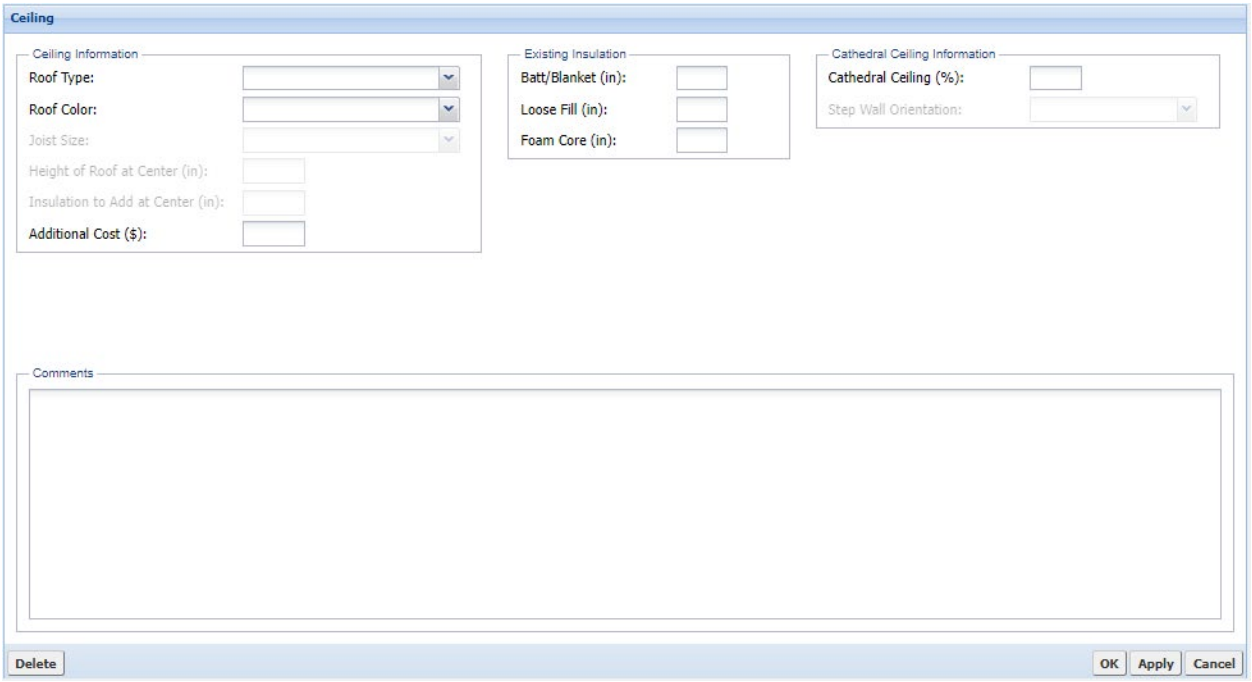
Window form (required) is used to describe all the windows of the home. The number of each type of window is entered by its orientation. Refer to the NEAT Window section of this manual to learn how to enter windows into the MHEA window/addition window form.

Doors/Addition Doors Form

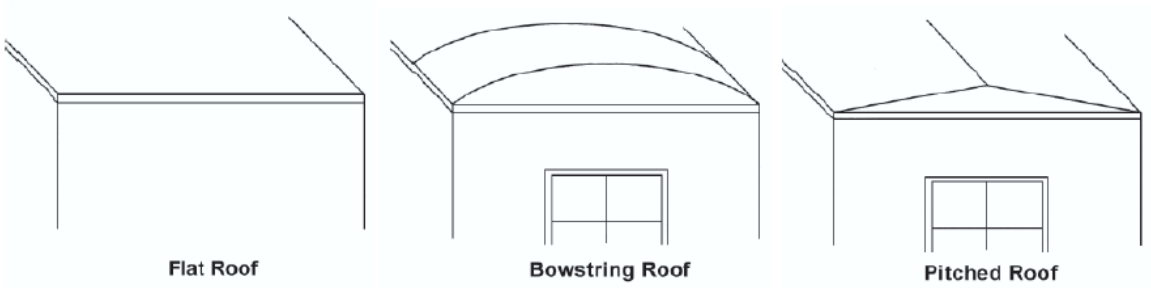


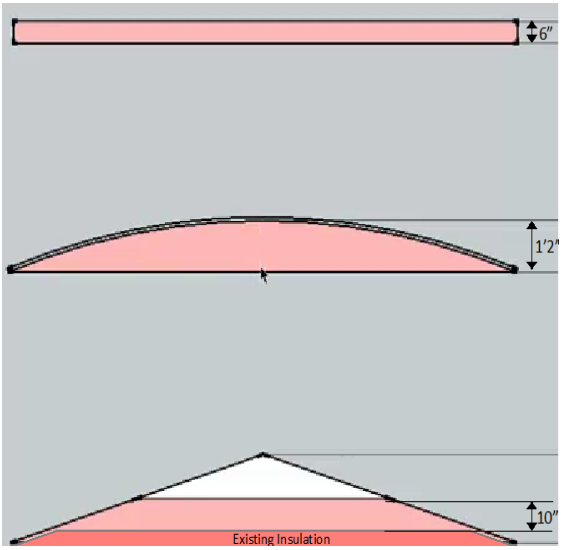
Door form (required) is used to describe all the exterior doors of the home. The number of each type of door entered is entered by its orientation. Refer to the NEAT Window section of this manual to learn how to enter windows into the MHEA door/addition door form.

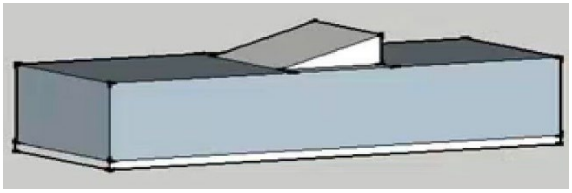
Ceiling/Roof Form



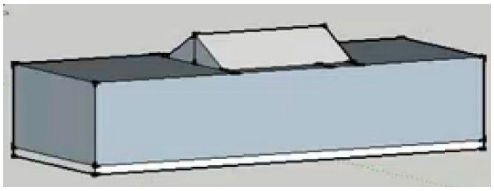
Ceiling form (required) is used to describe the ceiling (i.e., the roof) in the home. To describe a roof, you must first select the roof type from the following options: Flat, Bowstring, and Pitched, enter the joist size for flat roofs, height of roof at center for bowstring roofs, or desired amount of insulation to add at center for pitched roofs; select the roof color; and describe the cathedral ceiling if one exists (see below for different roof types, and cathedral ceiling configurations).







Cathedral



Cathedral

Roof Type - Select the type of roof on the manufactured home: Flat, Bowstring, or Pitched.

Note: The ceiling screen will change depending on the roof type you enter.

Flat

Joist Size - Choose the appropriate joist size: 2x4, 2x6, or 2x8.

Bowstring

Height of Roof at Center - For bowstring roofs, enter the maximum height of the roof above the ceiling, in inches, disregarding any existing insulation.

Pitched

Insulation to Add at Center - Enter the number of inches of insulation you wish to consider adding to the existing insulation (if any). MHEA will not consider adding more than 12 inches of insulation.

Roof Color - From the drop-down list, enter the color of the roof: White, Reflective or Shaded, or Normal or Weathered. This field is important to complete because the color of the roof affects how solar energy impacts the heating and cooling loads of the addition.

Existing Insulation Section

Batt/Blanket - Enter the amount of existing insulation.
Loose Fill - Enter the amount of existing insulation.
Foam Core - Enter the amount of existing insulation.

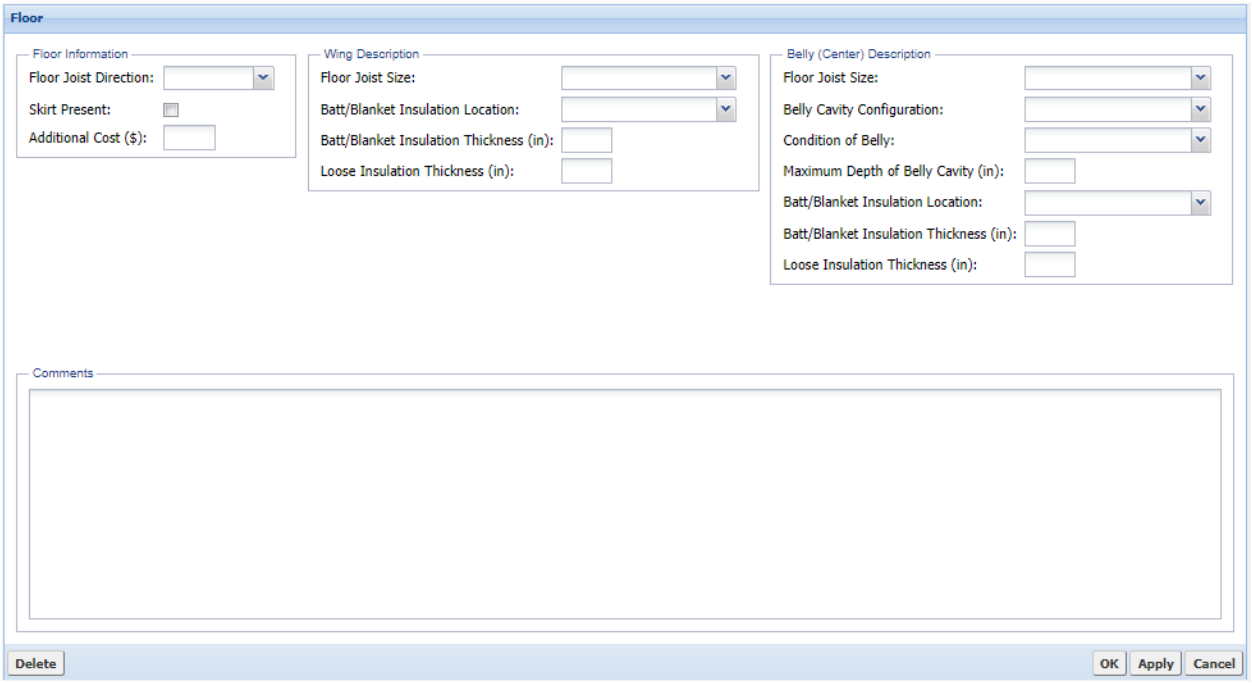
Cathedral Ceiling Information

Cathedral Ceiling - Enter the percentage of floor area that is below an elevated portion of the ceiling.

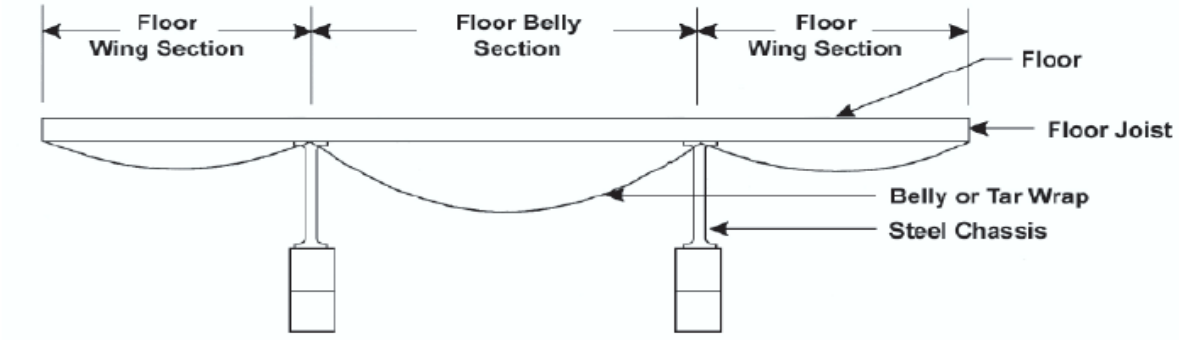
Additional Cost - This field is used to add or subtract any additional cost associated with the roof you are modeling (additional labor, and ancillary costs).

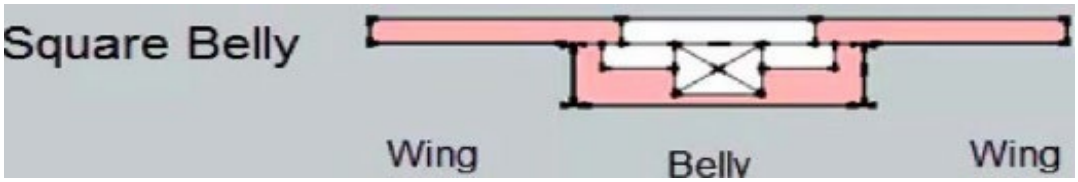
Comment - Enter any comments associated with the ceiling here.

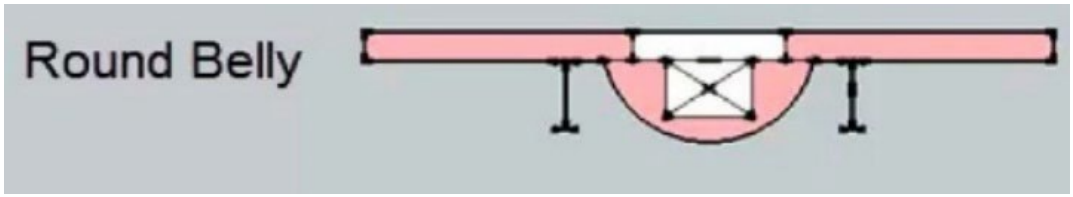
Floor Form

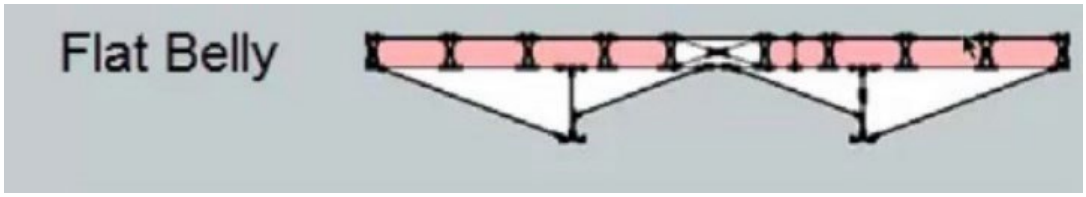


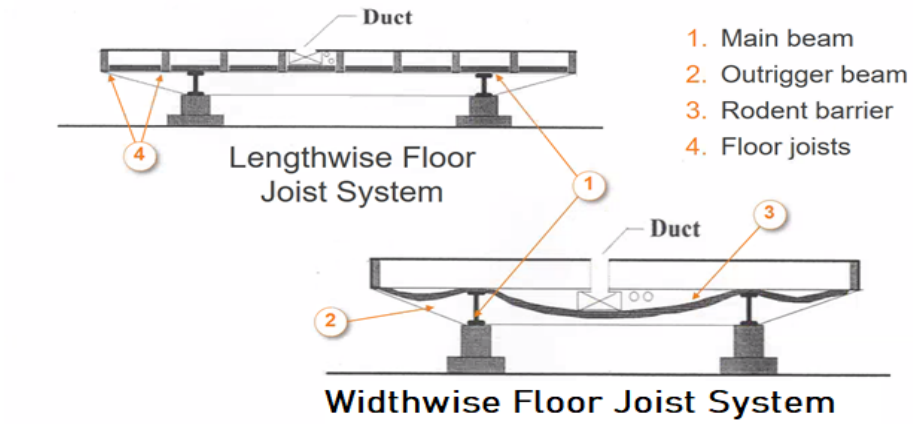
Floor form (required) is used to describe the floor of the home, defined in MHEA to comprise wing and belly sections. The wing and belly sections are protected from outside elements (including water, wind, and rodents) using an insulation wrap attached to the underside of the floor joists. The space available for adding insulation depends on the direction and size of the floor joists, the location and thickness of the existing insulation in the wing and belly sections, and the belly cavity configuration. The manufactured home may also have skirting installed around the perimeter of the floor. The floor joists could be placed along the length or width of the floor area.







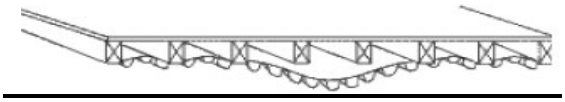




Insulation Attached to Flooring

Insulation Between Floor Joists

Insulation Attached under Floor Joists



Insulation Draped Below Floor Joists

(Belly Section Only)

Floor Information

Floor Joist Direction - Enter the direction the floor joists are running. Use the drop-down box to make your selection: Lengthwise or Widthwise.

Skirt Present - Check this checkbox if a skirt is present.

Additional Cost - This field is used to add or subtract any additional cost associated with the floor you are modeling (additional labor, and ancillary costs).

Wing Description

Floor Joist Size - From the drop-down list, enter the size of the floor joist. Sizes to select from are: 2X4, 2X6, or 2X8.

Batt/Blanket Insulation Location - Indicate where the batt/blanket insulation is located in the wing sections. Refer to the illustration above. Select from the drop-down list: Attached to Flooring, Between Joists, Attached Under Joists, or None.

Batt/Blanket Insulation Thickness - Enter the amount of existing batt\blanket and loose-fill insulation. By entering a value greater than 0 inches, you are implying that the insulation exists. If you enter a thickness of 0 inches, MHEA assumes insulation of that type does not exist.

Loose Insulation Thickness - Enter the amount of existing batt\blanket and loose-fill insulation. By entering a value greater than 0 inches, you are implying that the insulation exists. If you enter a thickness of 0 inches, MHEA assumes insulation of that type does not exist.

Belly (Center) Description

Floor Joist Size - From the drop-down list, enter the size of the floor joist. Sizes to select from are: 2x4, 2x6, or 2x8.

Belly Cavity Configuration - Enter the configuration of the belly center cavity. The belly cavity is the deep section that runs the length of the home and usually houses the main supply air duct. Make your selection from the drop-down list: Square, Rounded, or Flat.

Condition of Belly - Enter the condition of the existing belly wrap. Choose from: Good, Average, or Poor.

Maximum Depth of Belly Cavity - Enter the maximum depth of the belly (in inches) as measured from the underside of the flooring to the lowest part of the belly.

Batt/Blanket Insulation Location - Indicate where the batt/blanket insulation is located in the wing sections. Refer to the illustration above. Select from the drop-down list: Attached to Flooring, Between Joists, Attached Under Joists, or None.

Batt/Blanket Insulation Thickness - Enter the amount of existing batt\blanket and loose-fill insulation. By entering a value greater than 0 inches, you are implying that the insulation exists. If you enter a thickness of 0 inches, MHEA assumes insulation of that type does not exist.

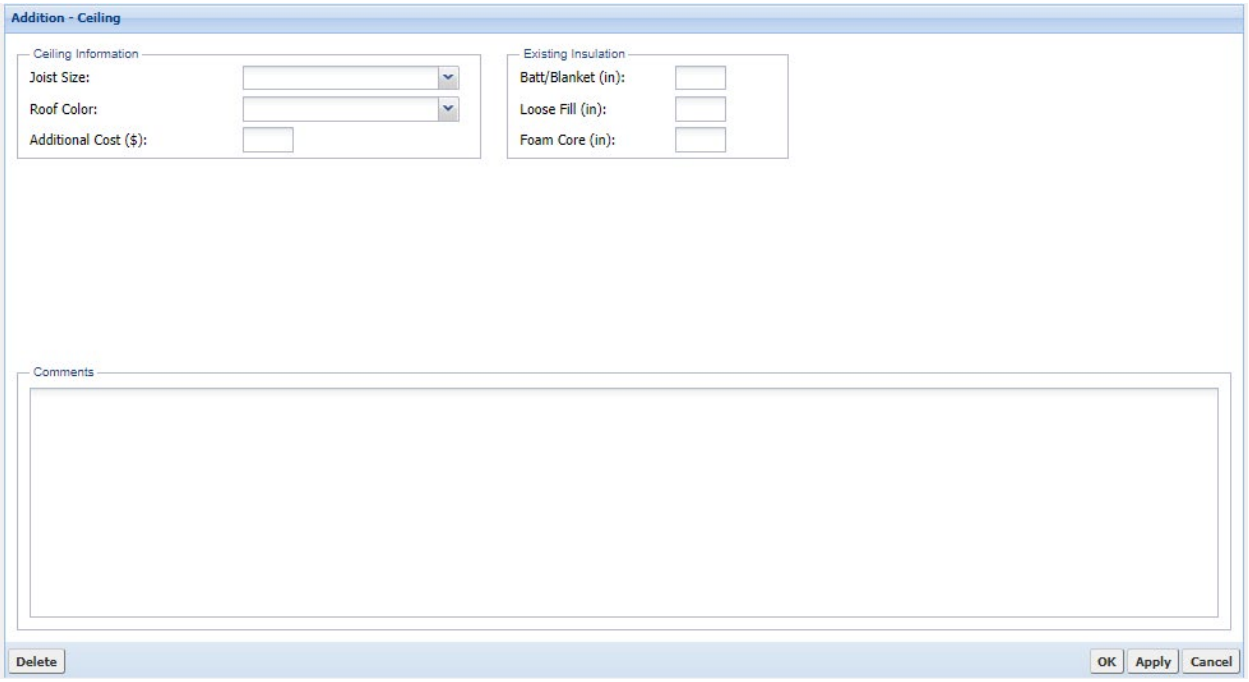
Loose Insulation Thickness - Enter the amount of existing batt\blanket and loose-fill insulation. By entering a value greater than 0 inches, you are implying that the insulation exists. If you enter a thickness of 0 inches, MHEA assumes insulation of that type does not exist. If insulation is partially missing, derate it as appropriate. Refer to the table below or Parallel Path R-Value - Residential Energy Dynamics (redcalc.com).

Table VI-1 -- Effective R-values of Batt Insulation

	"Good"	"Fair"	"Poor"	
Measured Batt Thickness (inches)	Effective R-value (2.5 per inch)	Effective R-value (1.8 per inch)	Effective R-value (0.7 per inch)	1. Measure the insulation thickness. 2. Determine the condition of the installation using the following criteria: □ Good – No gaps or other imperfections □ Fair – Gaps over 2.5% of the insulated area. This equals 3/8 inch spacing along a 14.5 inch batt. □ Poor – Gaps over 5% of the insulated area. This equals ¾ inch space along a 14.5 inch batt. *3.* Look up the effective R-value of the installed insulation using the condition and measured inches.
0	0	0	0	
1	3	2	1	
2	5	4	1.5	
3	8	5	2	
4	10	7	3	
5	13	9	3.5	
6	15	11	4	
7	18	13	5	
8	20	14	5.5	
9	23	16	6	
10	25	18	7	
11	28	20	8	
12	30	22	8.5	

Comment - Enter any comments associated with the floors here.

Addition Ceiling Form



Ceiling Information

Joist Size - From the drop-down list, enter the size of the floor joist. Sizes to select from are: 2x4, 2x6, or 2x8.

Roof Color - Using the drop-down box, enter the color of the roof: White, Reflective or Shaded, or Normal or Weathered. This field is important to complete because the color of the roof affects how solar energy impacts the heating and cooling loads of the addition.

Existing Insulation

Batt/Blanket - Enter the amount of existing insulation.

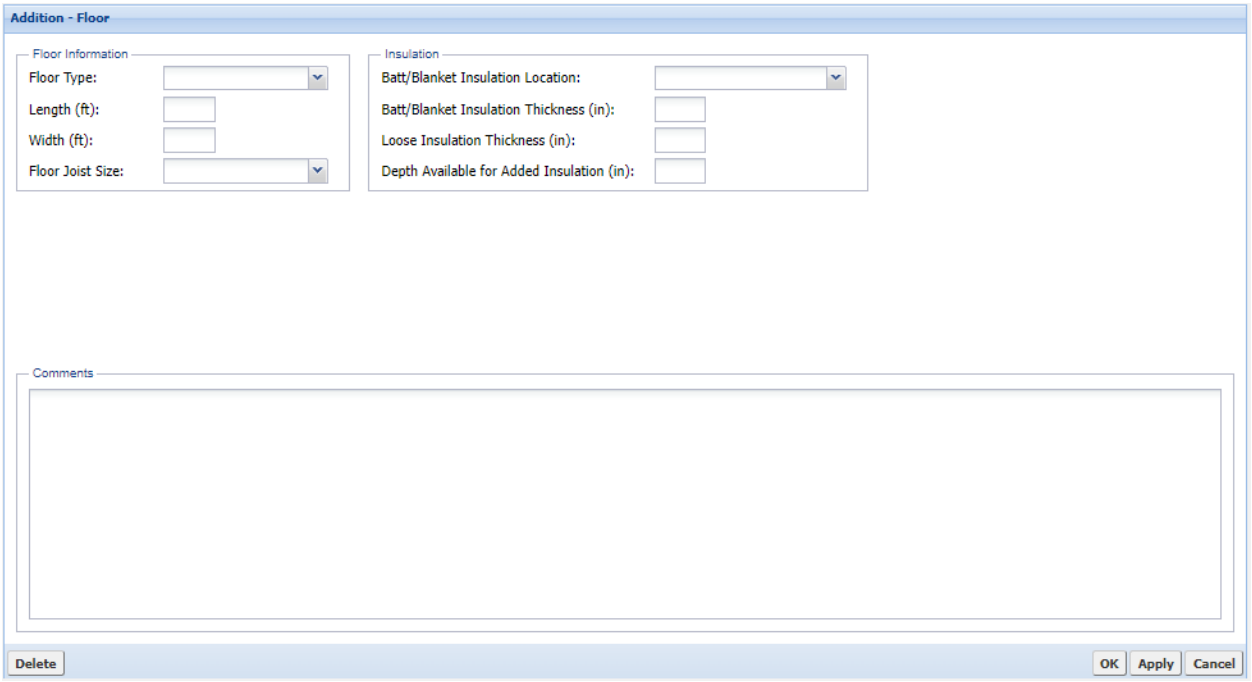
Loose Fill - Enter the amount of existing insulation.

Foam Core - Enter the amount of existing insulation.

Additional Cost - This field is used to add or subtract any additional cost associated with the roof you are modeling (additional labor, and ancillary costs).

Comment - Enter any comments associated with the ceiling here.

Addition Floor Form



Floor Information

Floor Type - Enter the type of floor. From the drop-down list to make your selection from: Crawl Space, Slab on Grade, or Exposed Floor.

Length - Enter the dimensions of the addition floor. The floor length is the dimension parallel to the wall shared with the manufactured home.

Width - Enter the dimensions of the addition floor. The floor width is the dimension perpendicular to the wall shared with the manufactured home.

Floor Joist Size - From the drop-down list, enter the size of the floor joist. Sizes to select from are: 2x4, 2x6, or 2x8.

Existing Insulation

Batt/Blanket Location - Indicate where the batt/blanket insulation is located in the addition. Using the drop-down box, select from: Attached to Flooring, Between Joists, Attached Under Joists, or None.

Batt/Blanket Insulation Thickness - Enter the amount of existing batt/blanket and loose-fill insulation.

Loose Fill Insulation Thickness - Enter the amount of existing batt/blanket and loose-fill insulation.

Depth Available for Adding Insulation - Enter the depth of space available for added insulation, in inches, in this section.

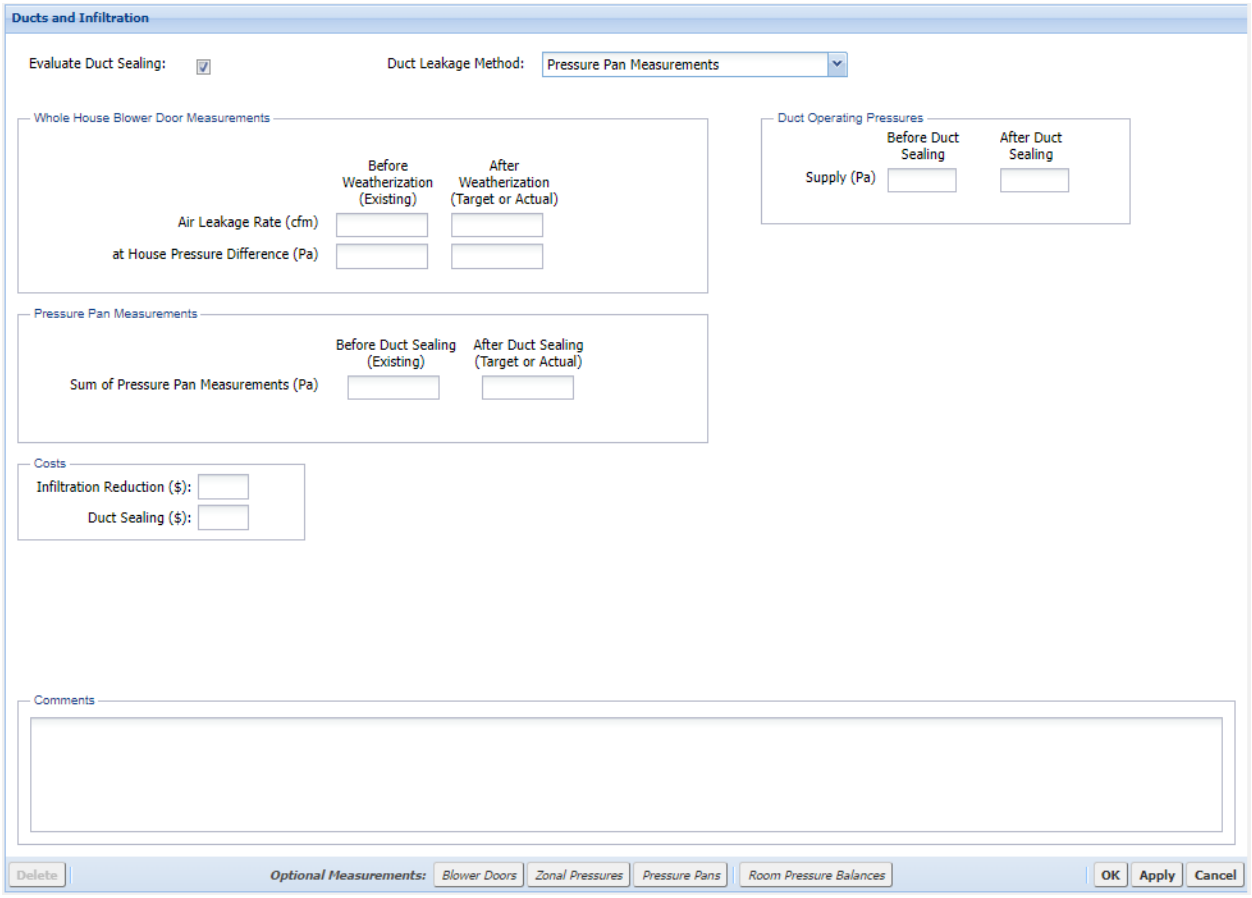
Comment - Enter any comments associated with the floor here

Ducts and Infiltration

Ducts/Infiltration form (required) is used to enter air and duct leakage data to evaluate the effectiveness of infiltration reduction work and duct sealing. The data input fields on the Ducts/Infiltration form change depending on whether duct sealing will be evaluated and, if so, which method—whole house blower door, blower door subtraction, or duct blower measurements—will be used. To evaluate infiltration reduction as a retrofit measure, you must, at a minimum, enter the pre-weatherization whole-house air leakage rate (usually measured), an estimated or target rate after weatherization, house pressure differences for these rates, and the cost of the infiltration reduction work.

Some correspondence has been found to exist between the sum of pressure pan measurements from all the supply registers in a manufactured home and the duct leakage to the outside. The pressure pan measurements, that is, the duct-to-house pressure difference at each supply register, are taken with the blower door depressurizing the house to 50 Pascal and a pressure pan attached to a manometer. No pressure difference indicates that the supply duct leading to the register is at the same pressure as the house and that little or no leaks to the outside exist in that branch of the ducts. The sum of these measurements from all supply registers corresponds to the total leakage of the ducts to the outside. This method of estimating duct leakage is normally appropriate only for manufactured homes.

Duct Leakage Method: Pressure Pan Measurements Form



Evaluate Duct Sealing – You must check this checkbox.

Duct Leakage Method - From the drop-down list indicate what method you want to use to check the duct leakage. You must select Pressure Pan Measurements.

Note: By selecting “Pressure Pan Measurements”, the infiltration screen will change. You will then need to fill in the required fields for this screen.

Whole House Blower Door Measurement

Air Leakage Rate, enter the beginning blower door reading in the Before Weatherization (Existing) column. Enter the estimated ending blower door reading in the After Weatherization (Target or Actual) column. The Iowa Weatherization Program requires inputs for pre- and post-weatherization blower door readings for the MHEA Audit. The initial reading must be actual data obtained at the time of evaluation. For the post- reading use the chart Estimated Post WX Blower Door Readings in the NEAT Ducts/ Infiltration section.

At House Pressure Difference - Enter 50 Pascals.

Duct Operating Pressures Section

Before Duct Sealing Supply - Enter the supply duct static pressure under normal conditions with the HVAC fan operating before implementing any duct-sealing measures.

Example, if there are 8 ducts in the mobile home take a static pressure measurement of all 8 ducts (make sure you have the pressure probe in the center of the duct with no restriction are in the duct [hand]), take the average of all the ducts added together and put that number in before duct sealing field. 8 ducts. Static pressures 5,6,5,6,5,6,5,6=48/8=6pa average.

After Duct Sealing Supply (Pa) - Enter the supply duct static pressure under normal conditions with the HVAC fan operating after implementing any duct-sealing measures. Because duct sealing is done after the audit is run, note use the Before Duct Sealing reading, add 5Pa to that number and enter it into this field.

Example, before duct sealing number was 6+5=13, so enter 13 into the After Duct Sealing field

Pressure Pan Measurements Section

Sum of Pressure Pan Measurements (Pa) Before Duct Sealing - Enter the sum of the pressure pan readings before duct sealing is done.

Example, 8 ducts all pressure pan measurements are 10. So, the sum of all the duct leakage would be 80. Put 80 in the Sum of Pressure Pan Measurements field.

Sum of Pressure Pan Measurements (Pa) After Duct Sealing - Enter the sum of the pressure pan readings after the duct sealing is done. Because duct sealing is done after the audit is run. Since you can determine what those numbers will be, but the standards say duct seal should be seal to 1pa, or less. So, in the After Duct Sealing field enter the number of ducts in the mobile home. In this case would be 8. If during the QCI inspection, the final duct number was not achieved, the QCI inspector should make sure all duct sealing was done correctly or ensure there were no ducts that were missed.

Costs Section

Infiltration Reduction - Enter the estimated costs for all infiltration measures. Costs must be entered to get SIR credit for infiltration work.

Duct Sealing - Enter the total (labor and material) cost to seal the ducts. Run the audit first to see if the audit will allow duct sealing to be considered as a retrofit measure, by giving duct sealing an individual SIR of 1.0 or greater on the Recommended Measures Report. If duct sealing does not appear on the Recommended Measures Report, return to the Air and Duct Leakage Sub-tab and remove the duct sealing cost. Enter the cost in the Itemized Costs tab as a health and safety measure and enter 0 in the duct sealing field. Use non-DOE funds to pay for the duct sealing.

Comment - Enter material associated with the infiltration costs.

Other MHEA forms

HVAC, refer to NEAT section on how to enter information.

Ducts, refer to NEAT section on how to enter information.

Water Heating, refer to NEAT section on how to enter information.

Refrigerator, refer to NEAT section on how to enter information.

Lighting, refer to NEAT section on how to enter information.

Health & Safety, refer to NEAT section on how to enter information.

Itemized Costs, refer to NEAT section on how to enter information.

Utility Bills, refer to NEAT section on how to enter information.

Work Orders, refer to NEAT section on how to enter information.

Reports, refer to NEAT section on how to enter information.

NEAT Recommended Measures Report

RUNNING NEAT AND VIEWING RESULTS

Audit recommendations – You can run NEAT after you have entered all the information for the house on the data input forms. The Run on the Audit Dock link will be activated as soon as all the required data input forms have been completed. When you select Run, the status of the run will be displayed, and the Recommended Measures Report will be opened in a separate window. Once an audit has been run, the link to View will be activated. You can select View to see a NEAT recommended Measures Report that has already been created and saved from a previous run.

NEAT Recommended Measures Report. The title page identifies your Agency, Account, Audit, and Audit Run; provides key information you have entered on the Agency, Account, and Audit forms; and provides additional information about the audit run to track the audit results.

After the title page, the report lists all the recommended measures along with their estimated energy and cost savings, measure costs and SIRs, and primary material quantities needed to perform them.

AGENCY INFORMATION

Agency:	Iowa WAP Office
Address: Phone Number:	321 E 12th St., Des Moines IA 50319

ACCOUNT INFORMATION

Account Name:	1234
Account Number:	1234

AUDIT INFORMATION

Audit Name:	Manual
Other ID Number:	
Audit Number:	5761
Auditor:	Trainer Five October
Comments:	
Audit Date:	30, 2024

RETROFIT MEASURE RUN DETAILS

Comments:	
Run On:	March 6, 2025, 2:21 PM
Engine Version:	v10.06.002

Building Information

Occupants:	3
Conditioned Stories:	1
Infiltration Height:	8
Floor Area (sq ft):	1500
Number of Bedrooms:	3

LIBRARIES

Weather Station:	Des Moines Intl Ap
Weather State:	IA
Economic Parameters:	2023 - Residential Midwest Average Economic Factors
Measure Costs:	Copy of 2 Default (ORNL) NEAT Measure Cost v10 Library 2
Key Parameters:	Default NEAT Key Parameters (WAP Memo 123)
Supply Library:	Default (ORNL) Supply Library - Empty
Defined Measures:	Copy of Default Defined Measures
Billing Adjustment:	No

Fuel Cost Details:

Electricity:	2024 - Average US Residential Electricity Costs	$0.25/kWh
Natural Gas:	2024 - Average US Residential Natural Gas Costs	$15/Mcf
Propane:	None	
Fuel Oil:	None	
Kerosene:	None	
Wood:	None	
Coal:	None	
Other:		

Annual Energy and Cost Savings

Index	Recommended Measure	Components	Heating		Cooling		BaseLoad		Total	
			(MMBtu)	($)	(kWh)	($)	(kWh)	($)	(MMBtu)	($)
1	Lighting Retrofits	L1	0.0	$0	0	$0	152	$38	0.5	$38
2	Fill Ceiling Cavity	Copy of a2	21.4	$314	422	$105	0	$0	22.9	$419
3	Kneewall Insulation	kw1	4.3	$64	93	$23	0	$0	4.7	$87
4	Sillbox Insulation	f1	2.8	$42	-4	-$1	0	$0	2.8	$41
5	Fill Ceiling Cavity	a2	9.6	$140	189	$47	0	$0	10.2	$187
6	Fill Closed Floor Cavity	Floored Attic	18.9	$277	-29	-$7	0	$0	18.8	$269
7	Wall Insulation	w1	3.9	$57	139	$35	0	$0	4.4	$92
8	Wall Insulation	e1,n1	7.8	$114	219	$55	0	$0	8.5	$168
9	Wall Insulation	s1	3.0	$43	129	$32	0	$0	3.4	$75
10	Water Heater Pipe Insulation	Water Heating	0.0	$0	0	$0	219	$11	0.8	$11
11	Attic Insulation R30	a1	10.1	$148	199	$50	0	$0	10.8	$198
12	Lighting Retrofits	l1	0.0	$0	0	$0	152	$38	0.5	$38
13	Fill Ceiling Cavity	a3	2.2	$32	46	$12	0	$0	2.3	$43
14	Tune Up Heating System	h1	3.1	$46	0	$0	0	$0	3.1	$46
15	General Air Sealing	Ducts/Infiltration	4.5	$66	20	$5	0	$0	4.6	$71
16	Water Heater Replacement	Water Heating	0.0	$0	0	$0	192	$10	0.7	$10
17	Door Replacement	d2	-0.2	-$3	-10	-$3	0	$0	-0.3	-$6

Economics

Index	Recommended Measure	Components	Measure Savings ($/yr)	Measure Cost ($)	Measure SIR *
Incidental Repairs					
1	3030 Attic Lid Qty:1	Itemized Cost	$0	$51	0.00
Weatherization Measures					
2	Lighting Retrofits	L1	$38	$0	1,994.00
3	Fill Ceiling Cavity	Copy of a2	$419	$309	18.28
4	Kneewall Insulation	kw1	$87	$76	15.42
5	Sillbox Insulation	f1	$41	$40	13.16
6	Fill Ceiling Cavity	a2	$187	$253	9.99
7	Fill Closed Floor Cavity	Floored Attic	$269	$575	6.00
8	Wall Insulation	w1	$92	$234	5.43
9	Wall Insulation	e1,n1	$168	$435	5.29
10	Wall Insulation	s1	$75	$222	4.73
11	Water Heater Pipe Insulation	Water Heating	$11	$30	3.20
12	Attic Insulation R30	a1	$198	$900	2.96
13	Lighting Retrofits	l1	$38	$400	1.99
14	Fill Ceiling Cavity	a3	$43	$405	1.44
16	General Air Sealing	Ducts/Infiltration	$71	$1,000	0.50
Health and Safety Measures or Other Funding Sources					
15	Tune Up Heating System	h1	$46	$125	0.88
17	Water Heater Replacement	Water Heating	$10	$2,500	0.03
18	Door Replacement	d2	-$6	$195	-0.43
19	smoke detector is needed qty 2	Itemized Cost	$0	$100	0.00
Total			$1,787	$7,851	4.74

*Total [Package] SIR excludes Health and Safety measures.

Materials

Index	Material	Type	Quantity	Units
1	Wall Insulation	Blown Cellulose - 2x4 Filled	883	SqFt
2	Attic Insulation R30	Blown Cellulose	1,000	SqFt
3	Kneewall Insulation	Fiberglass Batts	100	SqFt
4	Sillbox Insulation	Fiberglass Batts	58	SqFt
5	Tune Up Heating System	HVAC System	1	Each
6	Water Heater Pipe Insulation	R-1.85 (1/2") Water Pipe Insulation	1	Each
7	Door Replacement	Exterior Door	1	Each Door
8	Fill Closed Floor Cavity	Blown Cellulose	500	SqFt
9	General Air Sealing	General Air Sealing	1	Each Measure
10	Attic Insulation	Blown Cellulose 4.5 in.	500	SqFt
11	Attic Insulation	Blown Cellulose 5.5 in.	500	SqFt
12	Attic Insulation	R11 Dense Pack 2.5 in.	150	SqFt
13	Replacement Lighting	LED Lamp 8.0 watts	4	Each
14	Replacement Lighting	LED Lamp 8.0 watts	4	Each
15	New Water Heater		1	Each

House Loads and Energy Consumptions				
	Before Weatherization		After Weatherization	
	Heating	Cooling	Heating	Cooling
Annual Load (MMBtu/yr)	139.5	37.2	62.4	18.7
Annual Energy (MMBtu/yr)	159.6	9.7	70.0	4.9
Design Day Heat Loss/Gain (kBtu/hr)	99.2	31.2	41.6	11.6
Design Day Output Required (kBtu/hr)(ton)	99.2	2.8	41.6	1.1

Peak Heating Load				
Component Type	Component Name	Area or Volume (Infiltration)	Before Weatherization Load (Btu/h)	After Weatherization Load (Btu/h)
Wall (Btu/h)	e1	232	4,677.9	1,441.2
Wall (Btu/h)	n1	199	4,021.6	1,239.0
Wall (Btu/h)	s1	220	4,442.3	1,368.6
Wall (Btu/h)	w1	232	4,677.9	1,441.2
Window (Btu/h)	ew1	8	253.8	253.8
Window (Btu/h)	ew1	8	253.8	253.8
Window (Btu/h)	nw1	21	634.4	634.4
Door (Btu/h)	d1	20	508.9	508.9
Door (Btu/h)	d2	20	508.9	453.8
Attic (Btu/h)	a1	1,000	6,733.2	1,842.3
Attic (Btu/h)	a2	500	7,973.6	1,898.2
Attic (Btu/h)	Copy of a2	500	22,282.8	1,847.3
Attic (Btu/h)	a3	150	2,280.1	822.9
Attic (Btu/h)	kw1	100	4,456.6	542.7
Foundation (Btu/h)	f1	1,500	21,628.6	20,546.0
Foundation (Btu/h)	Floored Attic	500	7,394.2	1,808.1
Infiltration (Btu/h)	Inf	12,000	6,481.7	4,666.8
Total heat loss (Btu/h)	Tot	0	99,210.1	41,569.0
Duct loss (Btu/h)	Duct	0	0.0	0.0
Output required (Btu/h)	Output	0	99,210.1	41,569.0

Peak Cooling Load				
Component Type	Component Name	Area or Volume (Infiltration)	Before Weatherization Load (Btu/h)	After Weatherization Load (Btu/h)
Wall (Btu/h)	e1	232	1,169.5	360.3
Wall (Btu/h)	n1	199	1,005.4	309.8
Wall (Btu/h)	s1	220	1,110.6	342.2
Wall (Btu/h)	w1	232	1,169.5	360.3
Window (Btu/h)	ew1	8	346.5	346.5
Window (Btu/h)	ew1	8	346.5	346.5
Window (Btu/h)	nw1	21	440.4	440.4
Door (Btu/h)	d1	20	127.2	127.2
Door (Btu/h)	d2	20	127.2	113.5
Attic (Btu/h)	a1	1,000	3,350.2	964.1
Attic (Btu/h)	a2	500	3,699.4	965.4
Attic (Btu/h)	Copy of a2	500	8,521.5	940.2
Attic (Btu/h)	a3	150	1,063.8	413.4
Attic (Btu/h)	kw1	100	1,704.3	272.7
Foundation (Btu/h)	f1	1,500	1,869.1	1,704.7
Foundation (Btu/h)	Floored Attic	500	1,510.9	259.4
Infiltration (Btu/h)	Inf	12,000	1,692.2	1,310.8
People (Btu/h)	People	3	776.0	776.0
Appliances (Btu/h)	Appl	1	1,200.0	1,200.0
Total Sensible (Btu/h)	TotS	0	31,230.2	11,553.3
Ducts (Btu/h)	Ducts	0	0.0	0.0
Total (with ducts) (Btu/h)	TotW	0	31,230.2	11,553.3
Size (tons)	Size	0	2.6	1.0
Latent Load (inf) (Btu/h)	LatentI	0	1,979.3	1,533.2
Latent Load (occ) (Btu/h)	LatentO	0	690.0	690.0
Latent Load (tot) (Btu/h)	LatentT	0	2,669.3	2,223.2
Total Load (Btu/h)	Total	0	33,899.5	13,776.5
Size (tons)	Size	0	2.8	1.1

Special Notes

Door infiltration constrained to 50 % of whole house total reduced by an average of 0.0 %

NEAT assumes that infiltration reduction will be performed in parallel to measures selected by the audit and according to guidelines chosen by the auditor. NEAT can evaluate the cost-effectiveness of infiltration reduction efforts, but it will not direct

The audit strongly suggests, but does not necessarily require, the use of existing infiltration reduction procedures using a blower-door. The blower-door establishes if infiltration reduction is necessary, then helps locate leaks and monitor progress in

NOTE: Heat loss and Output required are only guides to sizing equipment. NOTE:

See NEAT User's Manual for further sizing details.

Comments		
Form	Code	Comment
Ducts/Infiltration	Ducts/Infiltration	3170 Bypass blocks - qty: 50 - Cost: $800 6120 Caulk - latex - qty: 8 - Cost: $120 6020 WS with carrier (D1) - qty: 1 - Cost: $80
Itemized Costs	3030 Attic Lid Qty:1	ECM=Attic Insulation

MHEA Recommended Measures Report

Running MHEA and Viewing Results

Audit recommendations – You can Run MHEA after you have entered all the information for the home on the data input forms. The Run on the Audit Dock link will be activated as soon as all the required data input forms have been completed. When you select Run, the status of the run will be displayed, and the Recommended Measures Report will be opened in a separate window. Once an audit has been run, the link to View will be activated. You can select View to see a MHEA Recommended Measures Report that has already been created and saved from a previous run.

Below shows the title page of the MHEA Recommended Measures Report. The title page identifies your Agency, Account, Audit, and Audit Run; provides key information you have entered on the Agency, Account, and Audit forms; and provides additional information about the audit run to track the audit results.

After the title page, the report lists all the recommended measures along with their estimated energy and cost savings, measure costs and SIRs, and primary material quantities needed to perform them.

AGENCY INFORMATION	
Agency:	Iowa WAP Office
Address: Phone Number:	321 E 12th St., Des Moines IA 50319 5552223333
Email:	

ACCOUNT INFORMATION	
Account Name:	9876
Account Number:	9876
Other ID Number:	
Comments:	

AUDIT INFORMATION

Audit Name:	Manual
Audit Number:	5856
Auditor:	Trainer Five October
Audit Date:	30, 2024
Last Edited On:	March 5, 2025, 5:14 PM

RETROFIT MEASURE RUN DETAILS

Run On:	March 5, 2025, 5:14 PM
Comments:	
Engine Version:	v10.06.002
Run Identifier:	20250305.101416289

Building Information

Occupants:	1
Length (ft):	70
Width (ft):	14
Exterior Wall Height (ft):	7
Wind Shielding:	Normal Shielding
Home Leakiness:	
Outdoor Water Heater Closet:	No

LIBRARIES

Weather Station:	Des Moines Intl Ap
Weather State:	IA
Economic Parameters:	2023 - Residential Midwest Average Economic Factors
Measure Costs:	Copy of Default (ORNL) MHEA Measure Cost v10 Library
Key Parameters:	Default MHEA Key Parameters (WAP Memo 123)
Supply Library:	Default (ORNL) Supply Library - Empty
Defined Measures:	Copy of Default Defined Measures
Billing Adjustment:	No

Fuel Cost Details

Electricity:	2024 - Average US Residential Electricity Costs Costs	$0.25/kWh
Natural Gas:	2024 - Average US Residential Natural Gas Costs	$15/Mcf
Propane:	None	
Fuel Oil:	None	
Kerosene:	None	
Wood:	None	
Coal:	None	
Other:		

Annual Energy and Cost Savings

Index	Recommended Measure	Components	Heating		Cooling		BaseLoad		Total	
			(MMBtu)	($)	(kWh)	($)	(kWh)	($)	(MMBtu)	($)
1	Duct Sealing	Duct	52.2	$764	0	$0	0	$0	52.2	$764
2	Floor Cellulose Loose Insulation	Floor	14.3	$209	-148	-$37	0	$0	13.8	$172
3	General Air Sealing	General Air	4.5	$66	-38	-$9	0	$0	4.4	$56
4	Replace HVAC System	h1	5.0	$73	0	$0	0	$0	5.0	$73
5	CO Monitor is Needed	Itemized Cost	0.0	$0	0	$0	0	$0	0.0	$0
6	Door Lock	Itemized Cost	0.0	$0	0	$0	0	$0	0.0	$0

Economics

Index	Recommended Measure	Components	Measure Savings ($/yr)	Measure Cost ($)	Measure SIR *
Incidental Repairs					
6	Door Lock	Itemized Cost	$0	$100	0.00
Weatherization Measures					
1	Duct Sealing	Duct	$764	$100	52.95
2	Floor Cellulose Loose Insulation	Floor	$172	$573	3.70
3	General Air Sealing	General Air	$56	$250	1.50
Health and Safety Measures or Other Funding Sources					
4	Replace HVAC System	h1	$73	$2,000	0.47
5	CO Monitor is Needed	Itemized Cost	$0	$100	0.00
Total			$1,065	$3,123	7.61

*Total [Package] SIR excludes Health and Safety measures.

Materials

Index	Material	Quantity	Units
1	Seal Ducts	1	Each
2	Floor Cellulose Loose Insulation	39	Bag
3	General Air Sealing	1	Each
4	Replace HVAC System	1	Each

House Energy Consumptions

	Before Weatherization			After Weatherization		
	Heating (MMBtu)	Cooling (kWh)	Baseload (kWh)	Heating (MMBtu)	Cooling (kWh)	Baseload (kWh)
Annual Energy	117.1	5,054.8	0.0	41.1	5,240.4	0.0

Peak Heating Load

Component Type	Before Weatherization Load (Btu/h)	After Weatherization Load (Btu/h)
Wall	7,179.5	7,179.5
Floor	7,926.1	3,159.0
Roof	5,434.7	5,434.7
Windows	2,665.2	2,665.2
Doors	362.0	362.0
Infiltration	5,132.7	3,573.2
Duct Loss	0.0	0.0
Total	28,700.2	22,377.2

Special Notes

MHEA assumes that infiltration reduction will be performed in parallel to measures selected by the audit and according to guidelines chosen by the auditor. MHEA can evaluate the cost-effectiveness of infiltration reduction efforts, but it will not direct

The audit strongly suggests, but does not necessarily require, the use of existing infiltration reduction procedures using a blower-door. The blower-door establishes if infiltration reduction is necessary, then helps locate leaks and monitor progress in

Pre-weatherization heating load may not be met in all months.

Pre-weatherization cooling load may not be met in all months.

Loads may not be met in month(s): 1 7

Post-weatherization cooling load may not be met in all months.

Loads may not be met in month(s): 7

Manual J sizing based on 70F indoor and -4F outdoor temp Base

case duct loss fraction (%): 0

Retrofit case duct loss fraction (%): 0 Sizing

Comments

Form	Code	Comment
Itemized Costs	Door Lock	ECM=Infiltration

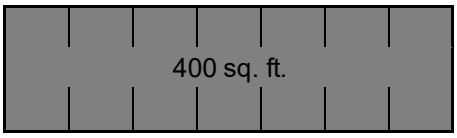
WALL INSULATION SCENARIO

Wall cavity is completely filled with insulation.
Wall cavity is completely empty, no insulation in it.

Please keep in mind that to complete any measure, it must have an individual SIR of 1.0 or greater after the audit is run.

SCENARIO #1

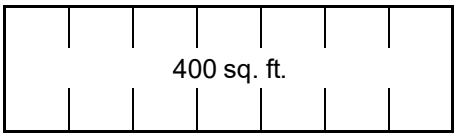
Wall – 400 sq. ft., 2x4 walls. Applies to one- or two-story house



Model wall as completely full in wall section of the audit

SCENARIO #2

Wall – 400 sq. ft., 2x4 walls. Applies to one- or two-story house



Model wall as completely empty in wall section of the audit

SCENARIO #3

Wall – 400 sq. ft., 2x4 walls. Applies to one- or two-story house 400 sq. ft.

Model: First calculate the square footage of insulated area and of empty area. Enter into the audit as two different walls with the same orientation. Give each a different measure number.

Scenario #3 Example:

Wall 1

Orientation: North

Gross Area: 230 sq. ft.

Measure: 1

Existing insulation: None

Added insulation: Blown cellulose

Wall 2

Orientation: North

Gross Area: 170 sq. ft.

Measure: 2

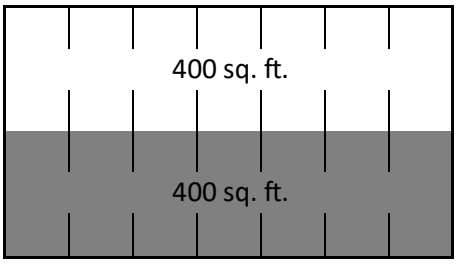
Existing insulation: Fiberglass batt

R-Value: 11

Added insulation: Blown cellulose

SCENARIO #4

Wall – 800 sq. ft., 2x4 walls – two-story house



Model: Enter into the audit as two separate walls with same orientation. Give each a different measure number.

Scenario #4 Example:

Wall 1

Orientation: North

Gross Area: 400 sq. ft.

Measure: 1

Existing insulation: None

Added insulation: Blown cellulose

Wall 2

Orientation: North

Gross Area: 400 sq. ft.

Measure: 2

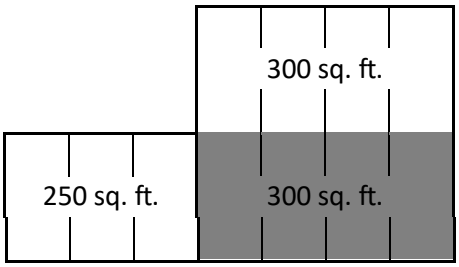
Existing insulation: Fiberglass batt

R-Value: 11

Added insulation: Blown cellulose

SCENARIO #5

Two-story with an addition. Main dwelling 600 sq. ft., 2x4 walls. Addition 250 sq. ft., 2x4 walls.



Two ways to model

#1 Add sq. ft. of empty cavities together and model together

Scenario #5 Example A:

Wall 1

Orientation: North

Gross Area: 550 sq. ft.

Measure: 1

Existing insulation: None

Added insulation: Blown cellulose

Wall 2

Orientation: North

Gross Area: 300 sq. ft.

Measure: 2

Existing insulation: Fiberglass batt

R-Value: 11

Added insulation: Blown cellulose **OR**

#2 Model existing dwelling and addition separately.

Scenario #5 Example B:

Wall 1

Orientation: North

Gross Area: 300 sq. ft.

Measure: 1

Existing insulation: None

Added insulation: Blown cellulose

Wall 2

Orientation: North

Gross Area: 300 sq. ft.

Measure: 2

Existing insulation: Fiberglass batt

R-Value: 11

Added insulation: Blown cellulose

Wall 3

Orientation: North

Gross Area: 250 sq. ft.

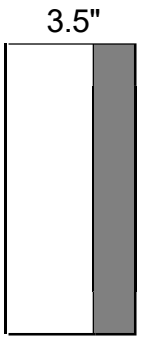
Measure: 1

Existing insulation: None

Added insulation: Blown cellulose

SCENARIO #6

Wall is insulated top to bottom, but not entire depth of wall cavity. 400 sq. ft., 2x4 walls. 1” fiberglass batt.



Side view of the wall cavity

Determine if the wall can be re-insulated. If it can:

Orientation: North

Gross Area: 400 sq. ft.

Measure: 1

Existing insulation: Fiberglass batt

R-Value: 3

Added insulation: Blown cellulose

After the audit is run, check to see if audit calls for wall to be insulated with an SIR of 1.0 or greater. If so, re-insulate.

If not, determine amount of labor and material costs it would take to re-insulate and

add that cost to the infiltration costs and re-run audit. If the infiltration cost SIR is 1.0 or greater, re-insulate the wall. If not, wall cannot be re-insulated.