1. General Policy

The United States Department of Energy (USDOE) Weatherization Assistance Program has sponsored the development of a database computer software tool to help weatherization authorities make decisions about the cost effectiveness of individual energy conservation measures. Separate audit methods were developed for site-built residential structures and for manufactured housing (i.e., mobile homes). The Weatherization Assistant 8.9 is a single-entry point for operating either type of audit or organizing other types of weatherization data. Step-by-step procedures and further guidance on the Weatherization Assistant 8.9 for NEAT/MHEA are found in the New Jersey Energy Audit Manual (NJ EA Manual). Memorandum of conditional approval for NJ Energy Audits from USDOE can be found at the end of this Chapter as an addendum.

Required Audits:

- Single Family: National Energy Audit Tool (NEAT)
- Mobile Homes: Manufactured Home Energy Audit (MHEA)
- Multi Families: Energy Audit using the Queens Information Package (EA-QUIP)

Mandatory Audit Features:

Site specific audits must be completed on all units weatherized with US DOE Annual & USDHHS (LIHEAP) funds. There are audit features that are mandatory and required to be adhered to by WAP agencies. The majority of these mandatory features are stated in the NJ EA Manual.

- For multi-family buildings, all EA-QUIP audits must be reviewed by State Monitor followed by a physical site assessment to confirm the work indicated on the audit is required for the multi-family project. If the project will be funded through LIHEAP WX, WAP Agency can proceed to a bid upon receiving written approval from State Monitor. If the project will be funded through DOE Annual funds, the project must be submitted to OLIEC for forwarding to USDOE for review and approval prior to any work commencing. WAP Agency must provide the following documents for submission to USDOE:
    - Short narrative describing existing building (size, no. of units, envelope, building age, mechanical systems) and proposed improvements.
    - Audit – EA-QUIP
        - Online EA-QUIP- WAP Agency must provide direct access to it with a password and user ID.
    - Field assessment notes and back-up calculations (if any).
    - Any other documentation that was used to define the Scope of Work for the Project.
    - Scope of Work for the Project including SIR for each measure and cumulative SIR.

1.1. Refrigerator Policy

The following policies and procedures will apply to the Replacement of Refrigerators. This list is not all-inclusive and may be amended to address other issues that become apparent

Refrigerator Replacement Policy

Client Education The client must be given adequate information and sign an Acceptance Form to avoid problems with the delivery of the new refrigerator. If the client receives the information and declines to accept a replacement refrigerator, they are still entitled to have other work done that is recommended by the energy audit. It is most important that clients know that the replacement is based on the efficiency of the existing unit so the community does not think everyone who applies will get a new unit.

Payment for Refrigerators and Other Related Costs

The cost of the refrigerator includes delivery. However, if the client does not accept delivery of the unit, there will be a charge for the attempted delivery. To avoid these additional charges, each delivery request should have a backup or alternative delivery site. The alternate site must know that they may not receive the unit "early" so if it is successfully delivered to the primary location the alternate is not disappointed.

Unless there is a serious documented emergency, a client who fails to be available for delivery will forfeit the unit.

The cost of the refrigerator includes the pickup of the existing unit and refrigerant recovery. If the household has two refrigerators and agrees to discard both to receive one larger new unit, the agency will pay additional fee to have the second refrigerator removed.

Replacement Justification

1. Before a refrigerator can be replaced it must be evaluated. WAP Agency will use the Line Logger database to measure the rate of consumption and maintain the results in the client file.
    a. Testing is required on **all** refrigerators replaced in dwellings containing 1-4 units.
    b. 10% of the total refrigerators proposed to be replaced in a multi-family dwelling, 5 units or more, must be evaluated.
    c. If no model number is available, then the unit must be metered.
2. Only one (1) new refrigerator per household. If the family has more than one refrigerator, two can be replaced with one large size refrigerator. If the household opts to have only one unit replaced, it will be replaced with a comparable size unit. Free standing freezer units are not included.
3. If two refrigerators exist and only one can be replaced, then the unit with the higher SIR must be replaced.

4. Refrigerators with water and ice makers are not permissible.
5. Bottom Freezer refrigerators are allowable if client is ADA compliant.
6. A new refrigerator cannot be installed where none currently exists.
7. The size of the refrigerator will be determined by the number of household members and amount of space available for the unit.
8. WAP Agency must insure, that the new refrigerator is installed with the correct hinge side.
9. Three colors are available (white, black, and eggshell/almond).
10. The WAP Agency will ensure that the client receives information regarding the make, model, and color of the refrigerator. The sub grantee will also have the client sign an acceptance form BEFORE the unit is delivered.
11. The client is to receive all instructional and warranty information for the refrigerator. Extended warranties beyond the manufacturer's warranty are not permitted.
12. If a client refuses to accept a refrigerator, does not allow the old unit to be removed, or fails to keep two (2) delivery appointments, no refrigerator will be delivered to the client.
13. If a new refrigerator is defective upon delivery, the sub grantee will notify respective vendor and request a replacement.
14. WAP Agency is required to pay for all refrigerators delivered within 60 days. Payment cannot be withheld because other Weatherization measures have not passed inspection.

Rental and Multi-Dwelling Units

1. If tenants pay for electricity and own the existing refrigerator, WAP Agencies are to use the procedures for single-family owner-occupied units.

2. If tenants do not pay for electricity directly and do not own the existing refrigerator, the replacement should not be considered a priority. If the landlord wants replacements AND the energy audit recommendation supports the measure, leveraging applies. Landlords must pay 50% of the cost for replacements. Any measures ranked higher must be installed before refrigerator replacements.

3. If tenants do not pay for electricity but own the refrigerators, replacement units may be considered AFTER the installation of measures that will reduce heating cost.

4. Refrigerator replacement is part of the average cost, must be recommended by the energy audit, and cannot be installed as a health and safety measure.

5. Replacement is also allowed in vacant units.

6. When a unit becomes vacant and the landlord received the refrigerator through the weatherization program, the refrigerator is to remain in the unit.

7. Copy of invoice for the refrigerator must be included in the client file.

1.2 Room Air Conditioning Policy

If the customer has non-working air conditioner(s) and has an "at-risk" occupant in the household with a medical condition documented by a physician that requires air conditioning, the sub-grantee must request Program State Monitor permission to replace the room air conditioner(s) under LIHEAP or DOE Health and Safety.

1. Verifying that Room Air Conditioner Qualifies for replacement under the WAP.

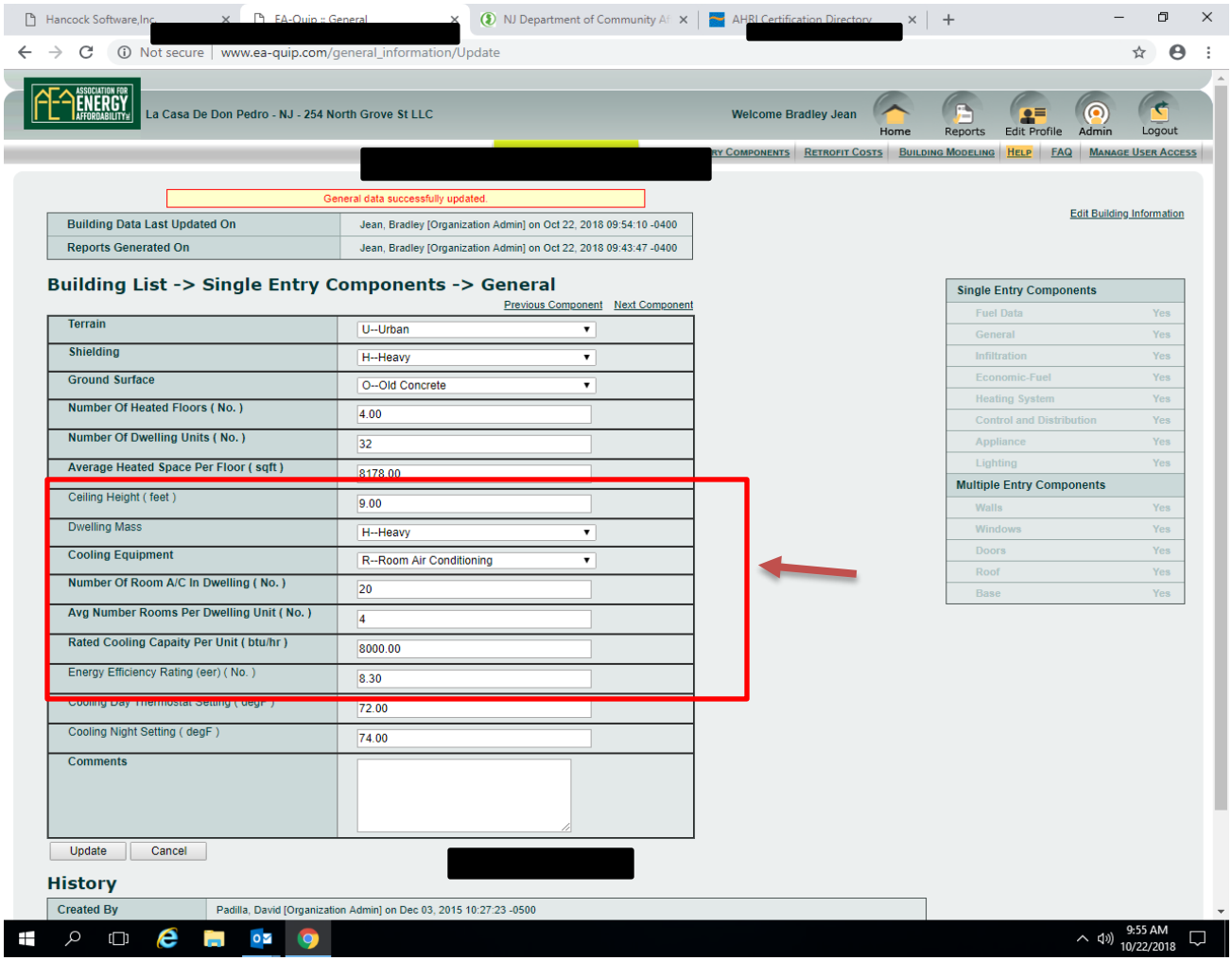
   i. Is the system replacement justified? EA-QUIP energy audits must recommend room air conditioner(s) with a Savings to Investment Ratio (SIR) of 1 or greater for replacement justification.

   ii. Replacement can only be assessed for existing room air conditioner(s). Maximum allowable replacement is 3 room A/C units.

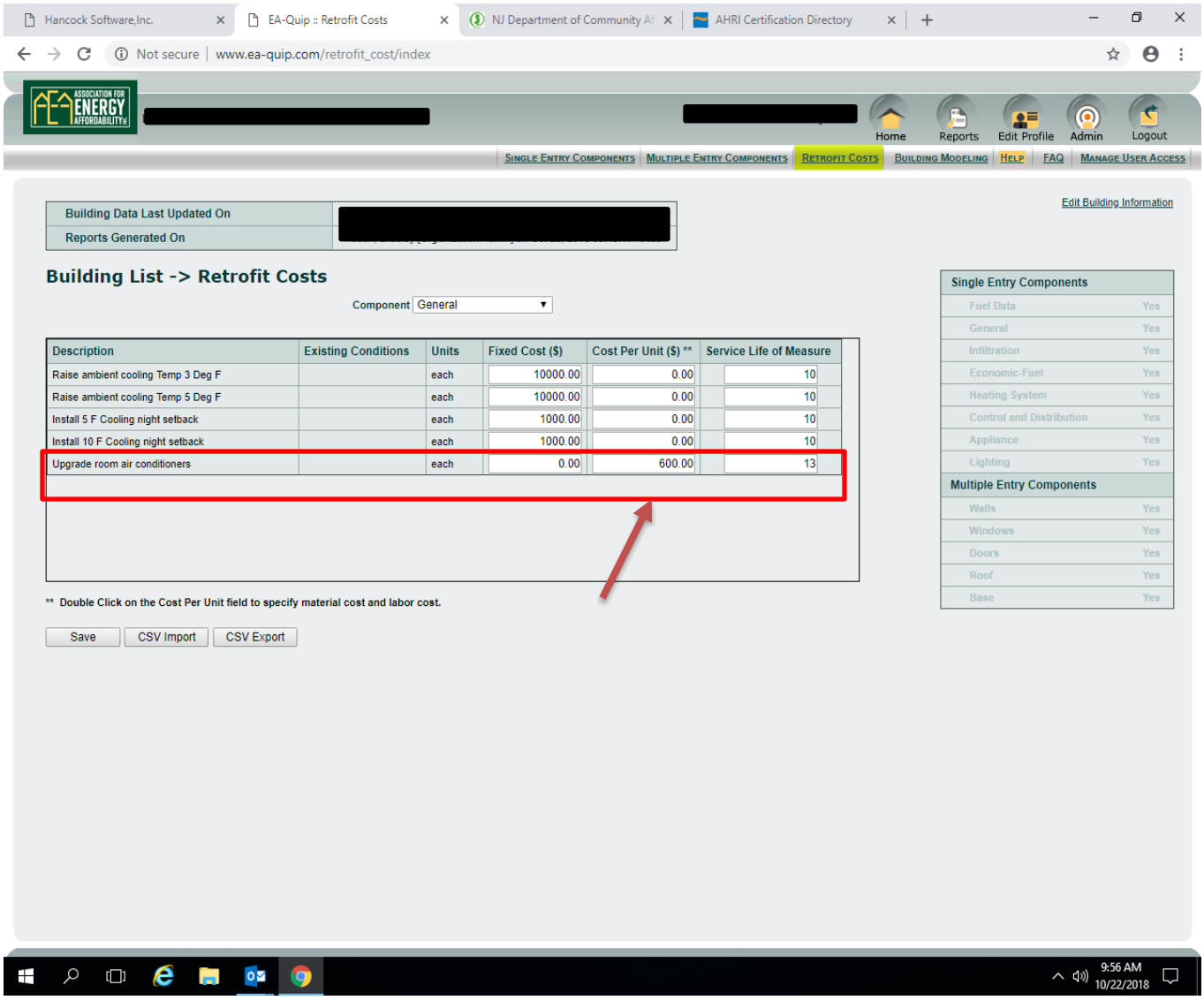
   iii. The agency must retain pre-and post-pictures of the replacement room A/C windows in the client file.

EAQUIP Room A/C Entry Process

1. The agency must enter Room Air Conditioning data with an average of the overall existing unit(s), btu/hour and EER.



2. Go to Retrofit Costs, choose Component “General” and enter in the material/labor cost for “Upgrade room air conditioners”.



3. EA. QUIP must recommend room air conditioner(s)on the Scope of Work Report with a Savings to Investment Ratio (SIR) of 1 or greater for replacement justification.

EA-QUIP **Scope of Work**

ASSOCIATION FOR ENERGY AFFORDABILITY

Based On System Defined Retrofits

Building Address: [redacted]

Auditor: Rigoberto Irizarry **Audit Date:** 08/09/2018

Description	Location	Initial Cost ($)	First Year Savings ($)	S.I.R
Replace apartment lighting	Lighting	3,000.00	2,620.83	10.40
Install 6" loose CELLULOSE	Primary (Roof)	12,576.00	3,652.70	4.30
LO-FLO showers & restrictors	Appliance	2,050.00	371.65	2.20
Install 386 kwh/yr REFRIGERATOR	Appliance	37,950.00	4,153.81	1.40
Upgrade room air conditioners	General	24,000.00	2,895.22	1.30
SEAL&INSULATE A/C Sleeve	Ac sleeves (Windows)	12,600.00	631.34	0.50
NEW Heating System	Heating system (90% - Condensing)	300,000.00	3,839.19	0.20
Total		**$392,176.00**	**$18,164.74**	**0.64**

EA-Quip Version 2.0 10/22/2018 13:41:38

Replacement Guidelines

i. The replacement of Room Air Conditioner(s) must meet or exceed current Energy Star requirements found on www.energystar.gov under "Products", then "Find ENERGY STAR Products".

ii. Replacement of room A/C units must meet Standard Work Specifications found at https://sws.nrel.gov/spec/533021. The SWS outlines the following criteria:

   a. Assessment

   b. Selection

   c. Installation

   d. Decommissioning

   e. Occupant education

iii. Replacement unit will provide same or better functionality than existing unit, but smaller duty unit will be provided if existing is oversized.

iv. Use the chart below to determine room A/C sizing.

Area to be cooled (square ft)	Capacity needed (BTUs per hour)
100 to 150	5,000
150 to 250	6,000
250 to 300	7,000
300 to 350	8,000
350 to 400	9,000
400 to 450	10,000
450 to 550	12,000
550 to 700	14,000
700 to 1,000	18,000
1,000 to 1,200	21,000
1,200 to 1,400	23,000
1,400 to 1,500	24,000
1,500 to 2,000	30,000

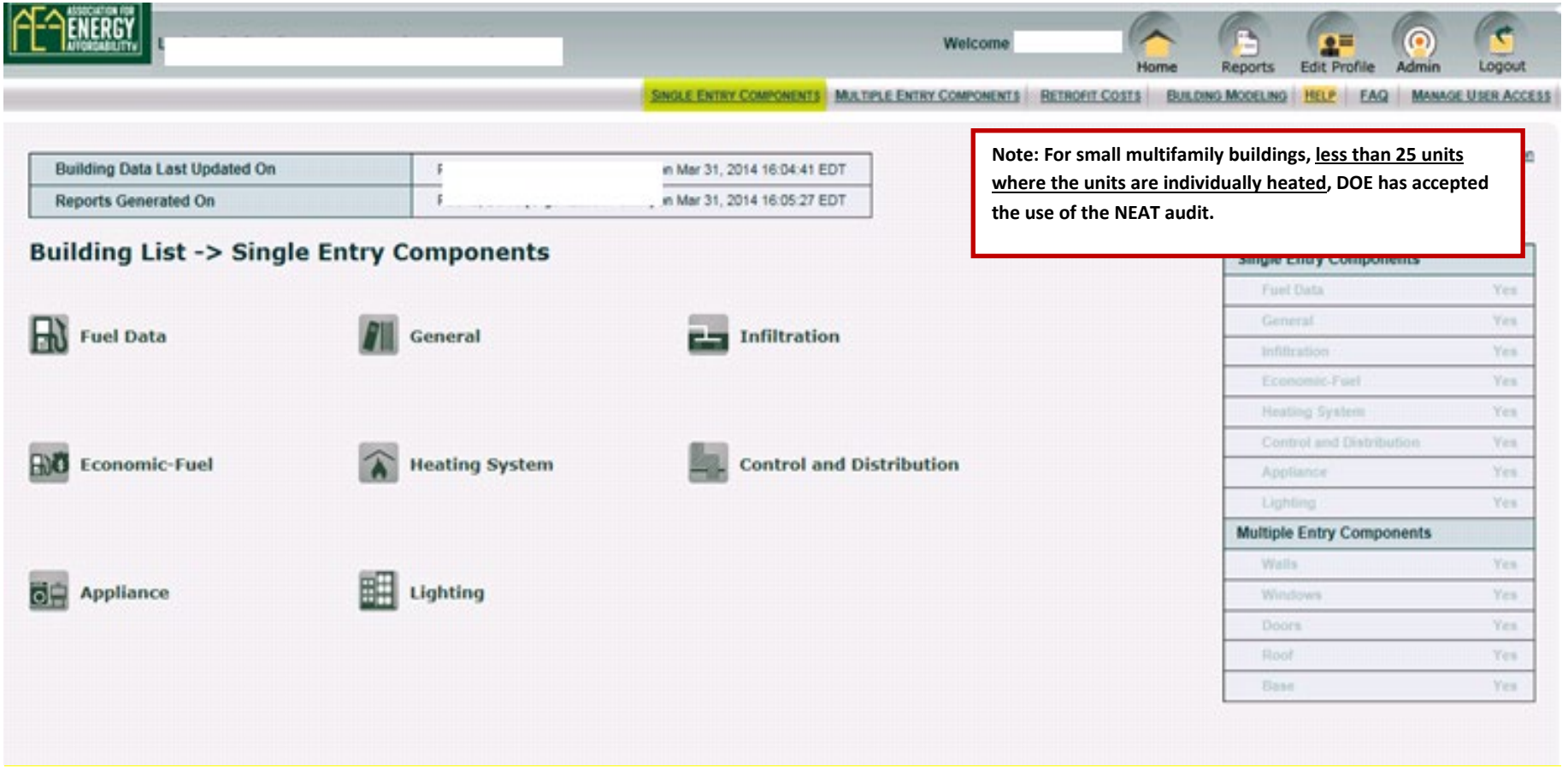
2.1 EA-QUIP

EA-QUIP is New Jersey's Weatherization audit tool which is used on 5 or more units. This audit determines economically optimal mixes of energy-saving measures for a given building and within a chosen budget, for which it uses retrofit and cost libraries. From the library of measures, the program chooses those which are applicable to the building under consideration and ranks them by decreasing savings-to-cost ratio. This ratio is defined for each retrofit as the life cycle savings (energy savings minus future maintenance and replacement costs over the user-selected time horizon for each retrofit) divided by the installed cost of the measure.

EA-QUIP provides preformatted energy and economics reports such as: Applicable Energy Conservation Measures rated by Life-Time savings per investment, Existing conditions, Energy savings, Savings and costs analysis, and an Investment Analysis report where measures are prioritized and ranked by saving to Investment Ratio (SIR). For energy auditors and energy policy makers who are more interested in the most desirable energy-saving combination of retrofits, EA-QUIP provides a three-stage automated process: the selection of retrofits, their economic optimization, and their predictive analysis**. [**Building Energy Software Tools Directory**]**

For multi-family buildings, all EA-QUIP audits must be reviewed by State Monitor followed by a physical site assessment to confirm the work indicated on the audit is required for the multi-family project. If the project will be funded through LIHEAP WX, WAP Agency can proceed to a bid upon State Monitor review being completed. If the project will be funded through DOE Annual funds, the project must be submitted to OLIEC for forwarding to USDOE for review and approval prior to any work commencing. WAP Agency must provide the following documents for submission to USDOE:

- Short narrative describing existing building (size, no. of units, envelope, building age, mechanical systems) and proposed improvements.
- Audit – EA-QUIP
  - Online EA-QUIP- WAP Agency must provide direct access to it with a password and userID.
  - If utilizing the old disc-based EA-QUIP, then WAP Agency must print out a hard copy and scan -printout MUST INCLUDE the comparison of modeled vs. actual energy use.
- Field assessment notes and back-up calculations (if any).
- Any other documentation that was used to define the Scope of Work for the Project.
- Scope of Work for the Project including SIR for each measure and cumulative SIR.


Welcome
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SINGLE ENTRY COMPONENTS
MULTIPLE ENTRY COMPONENTS
RETROFIT COSTS
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HELP
FAQ
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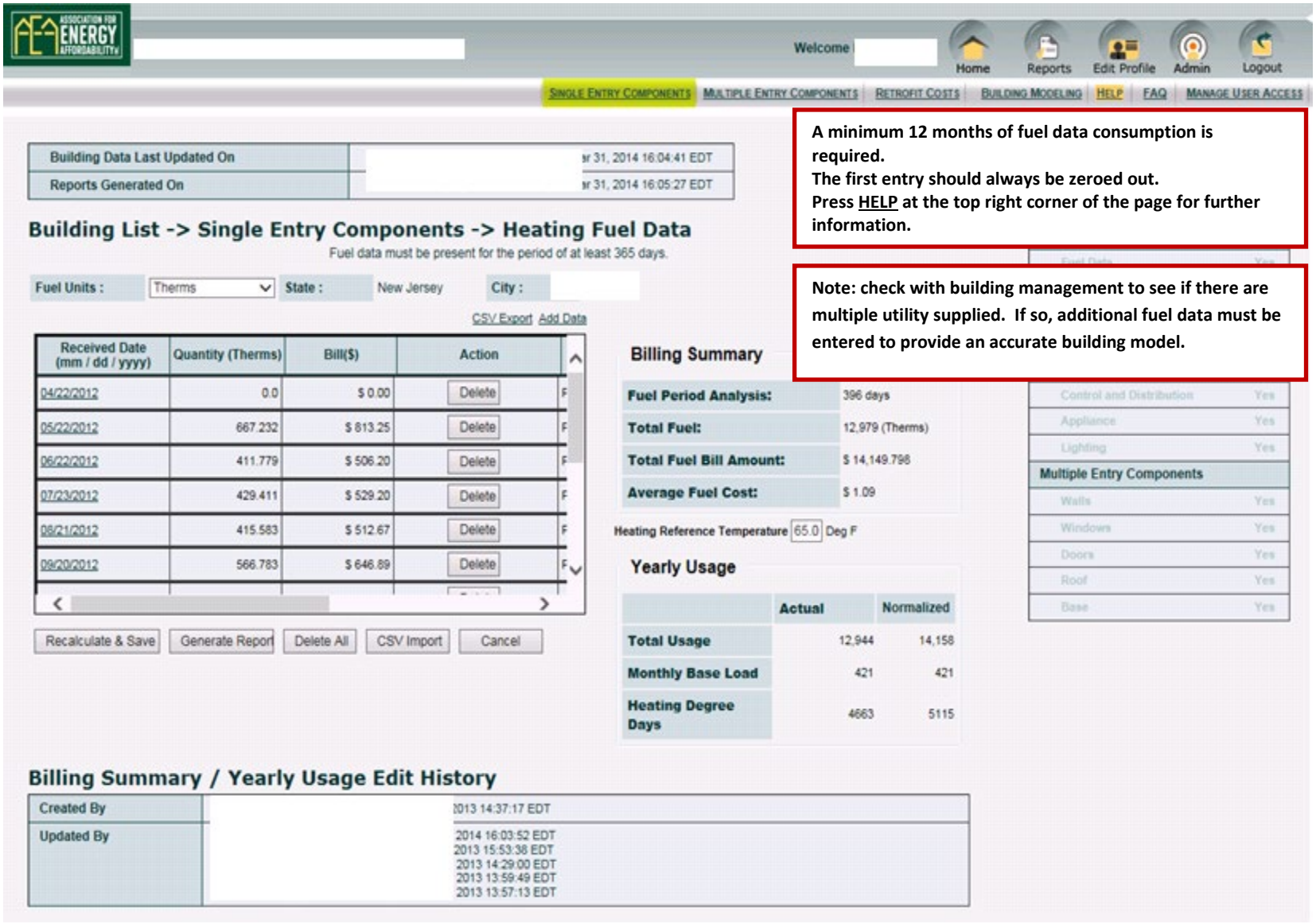
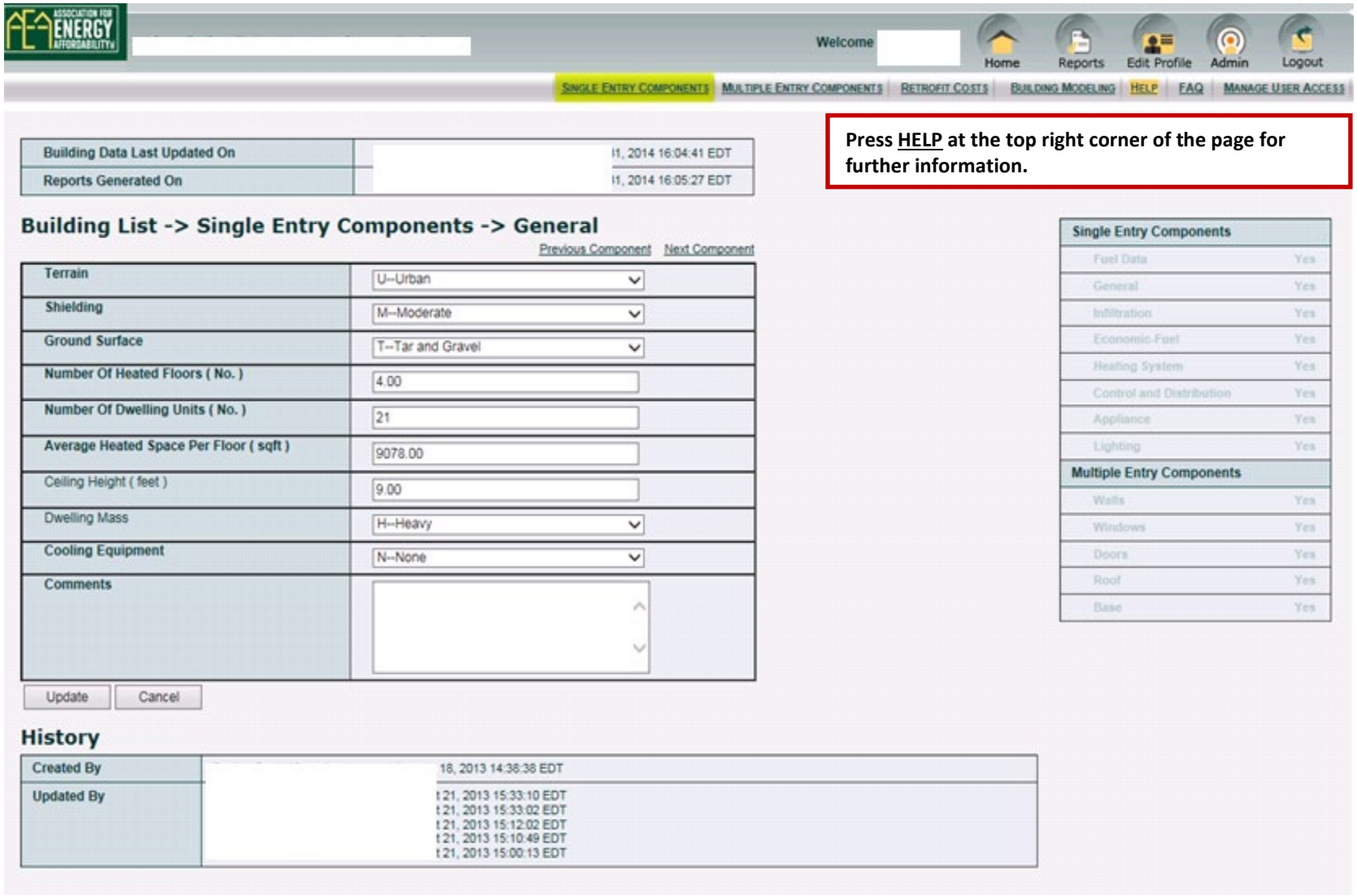
Building Data Last Updated On
Mar 31, 2014 16:04:41 EDT
Reports Generated On
Mar 31, 2014 16:05:27 EDT
Building List -> Single Entry Components
Fuel Data
General
Infiltration
Economic-Fuel
Heating System
Control and Distribution
Appliance
Lighting
Note: For small multifamily buildings, less than 25 units where the units are individually heated, DOE has accepted the use of the NEAT audit.
Fuel Data Yes
General Yes
Infiltration Yes
Economic-Fuel Yes
Heating System Yes
Control and Distribution Yes
Appliance Yes
Lighting Yes
Multiple Entry Components
Walls Yes
Windows Yes
Doors Yes
Roof Yes
Base Yes



A minimum 12 months of fuel data consumption is required.
The first entry should always be zeroed out.
Press HELP at the top right corner of the page for further information.

Note: check with building management to see if there are multiple utility supplied. If so, additional fuel data must be entered to provide an accurate building model.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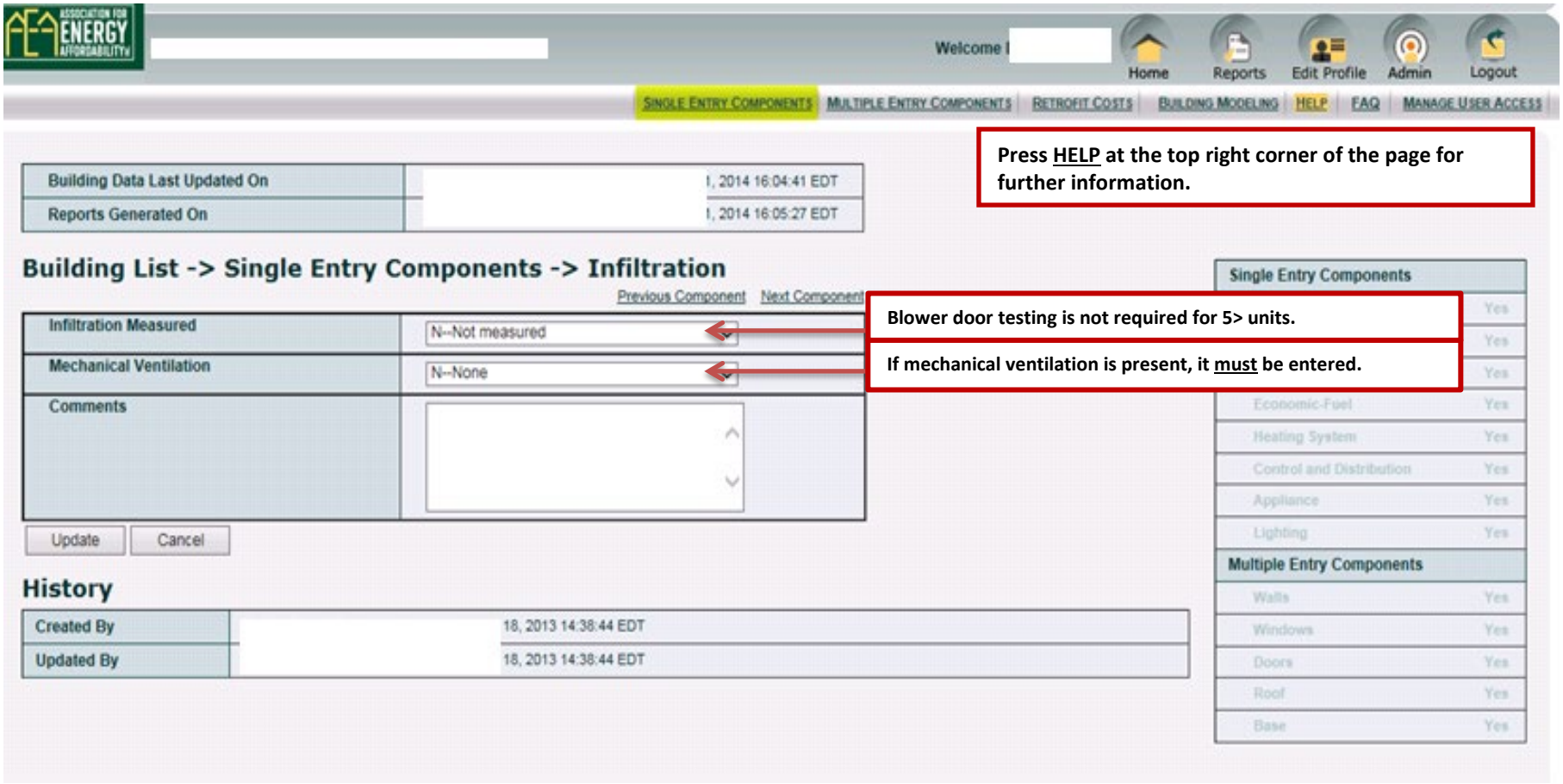
Building Data Last Updated On
Reports Generated On
Press HELP at the top right corner of the page for further information.
Building List -> Single Entry Components -> General
Previous Component
Next Component
Terrain
U--Urban
Shielding
M--Moderate
Ground Surface
T--Tar and Gravel
Number Of Heated Floors (No.)
4.00
Number Of Dwelling Units (No.)
21
Average Heated Space Per Floor (sqft)
9078.00
Ceiling Height (feet)
9.00
Dwelling Mass
H--Heavy
Cooling Equipment
N--None
Comments
Update
Cancel
History
Created By
Updated By
Single Entry Components
Fuel Data
General
Infiltration
Economic-Fuel
Heating System
Control and Distribution
Appliance
Lighting
Multiple Entry Components
Walls
Windows
Doors
Roof
Base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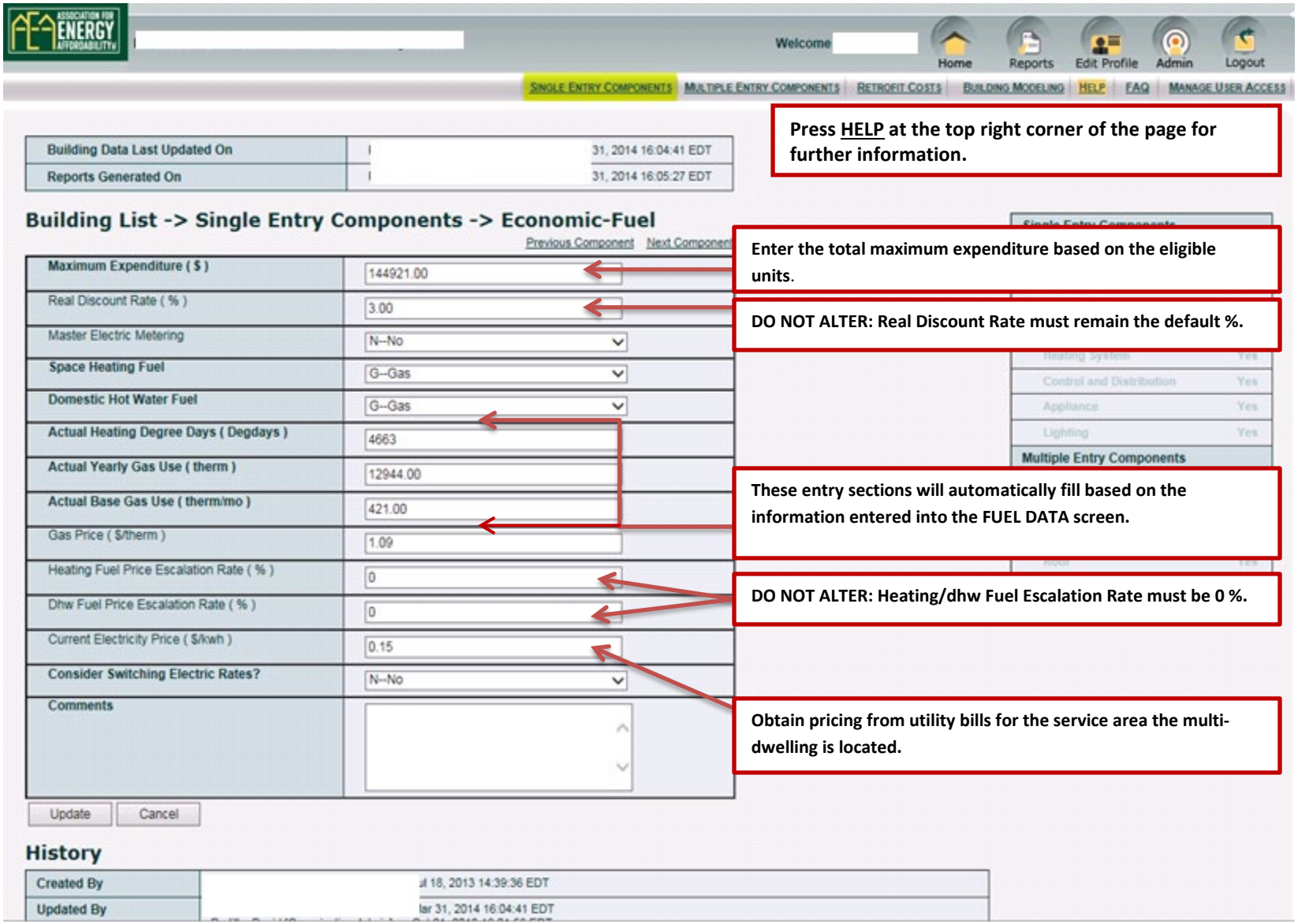
BUILDING MODELING
HELP
FAQ
MANAGE USER ACCESS
Press HELP at the top right corner of the page for further information.
Building Data Last Updated On
Reports Generated On
Building List -> Single Entry Components -> Infiltration
Previous Component
Next Component
Infiltration Measured
N--Not measured
Mechanical Ventilation
N--None
Comments
Blower door testing is not required for 5> units.
If mechanical ventilation is present, it must be entered.
Update
Cancel
History
Created By
Updated By
Single Entry Components
Multiple Entry Components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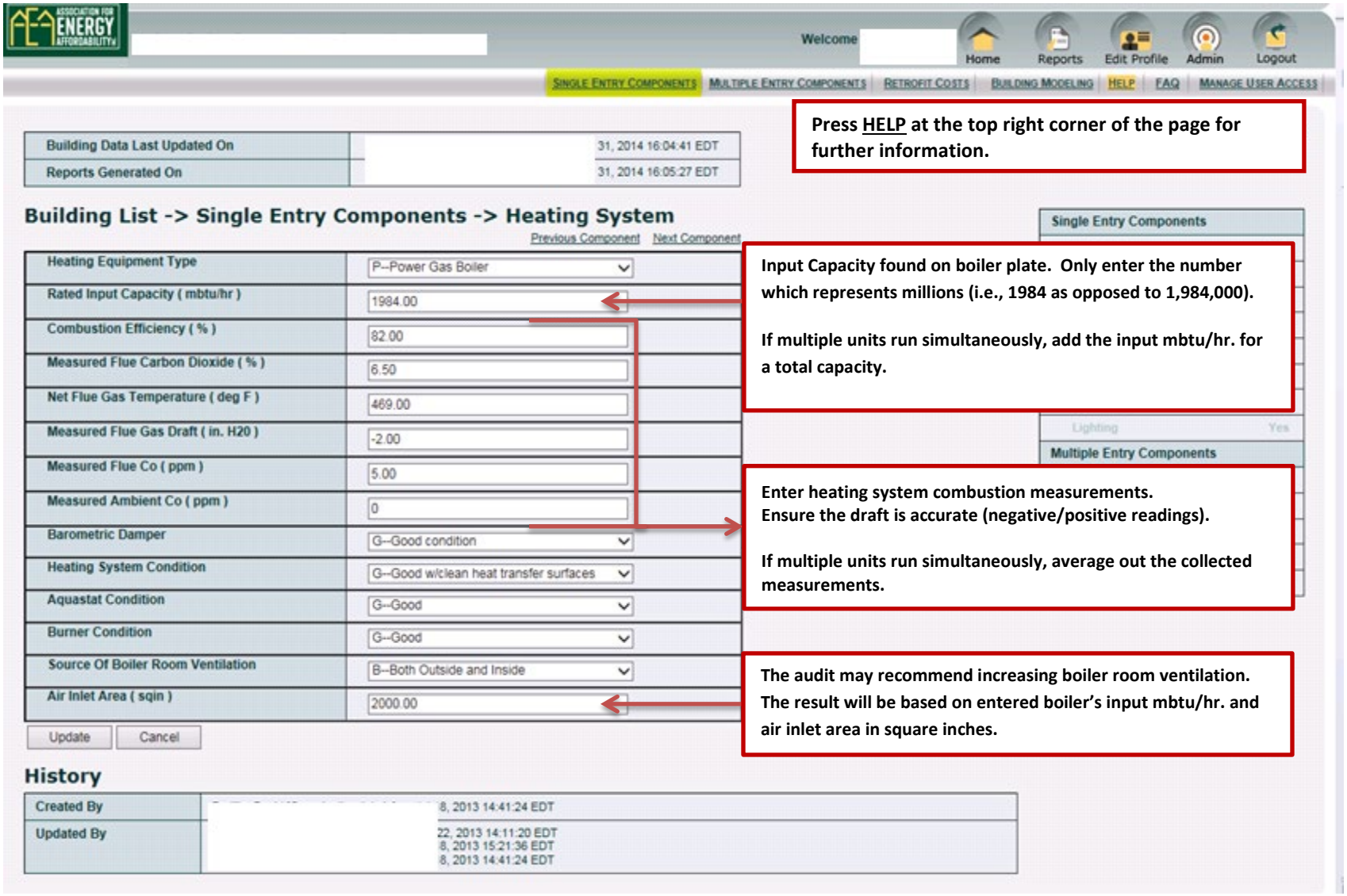
MANAGE USER ACCESS
Press HELP at the top right corner of the page for further information.
Building Data Last Updated On
31, 2014 16:04:41 EDT
Reports Generated On
31, 2014 16:05:27 EDT
Building List -> Single Entry Components -> Economic-Fuel
Previous Component
Next Component
Maximum Expenditure ($)
144921.00
Enter the total maximum expenditure based on the eligible units.
Real Discount Rate (%)
3.00
DO NOT ALTER: Real Discount Rate must remain the default %.
Master Electric Metering
N--No
Space Heating Fuel
G--Gas
Domestic Hot Water Fuel
G--Gas
Actual Heating Degree Days (Degdays)
4663
Actual Yearly Gas Use (therm)
12944.00
Actual Base Gas Use (therm/mo)
421.00
These entry sections will automatically fill based on the information entered into the FUEL DATA screen.
Gas Price ($/therm)
1.09
Heating Fuel Price Escalation Rate (%)
0
Dhw Fuel Price Escalation Rate (%)
0
DO NOT ALTER: Heating/dhw Fuel Escalation Rate must be 0 %.
Current Electricity Price ($/kwh)
0.15
Consider Switching Electric Rates?
N--No
Comments
Obtain pricing from utility bills for the service area the multi-dwelling is located.
Update
Cancel
History
Created By
Updated By
Multiple Entry Components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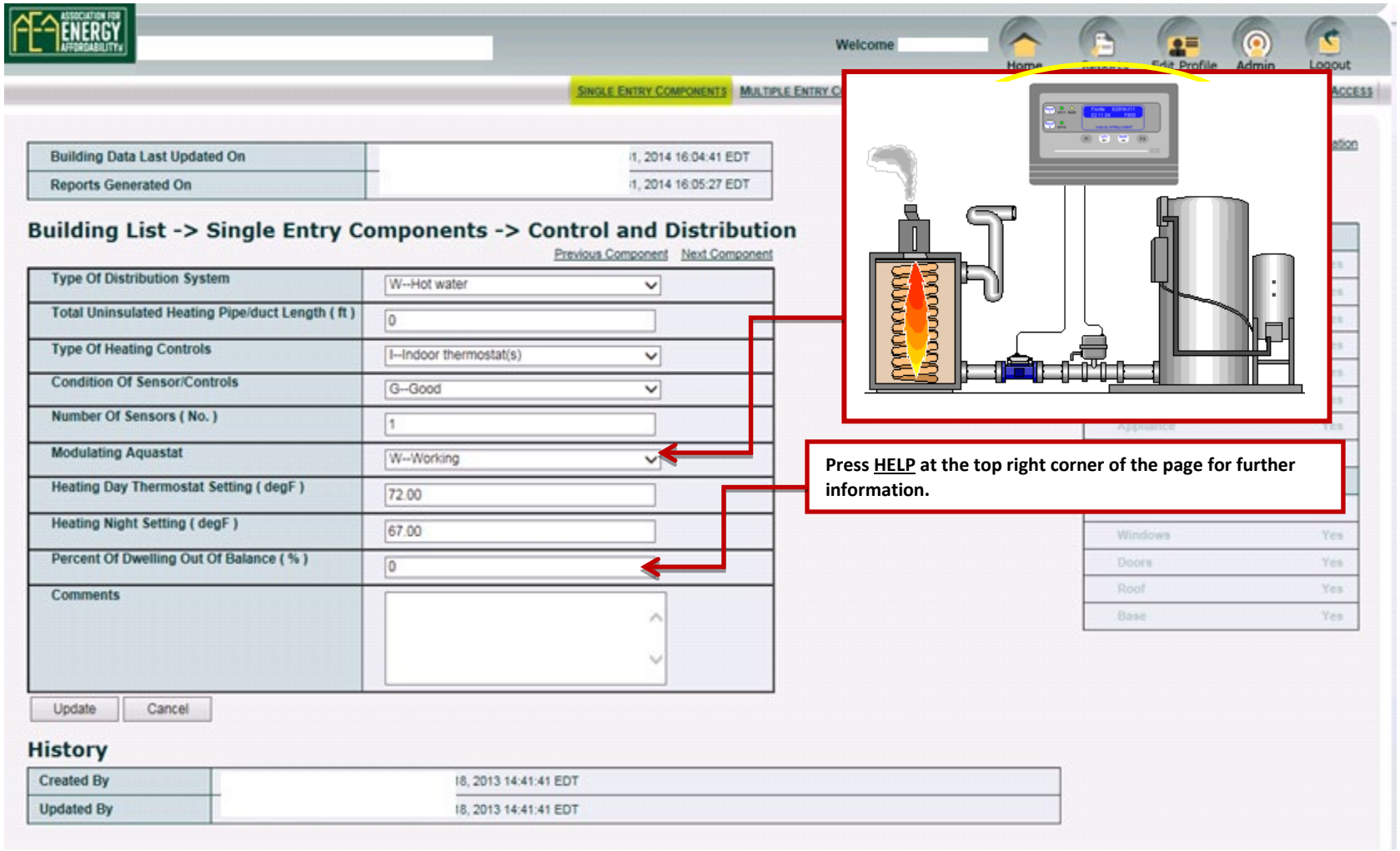
BUILDING MODELING
HELP
FAQ
MANAGE USER ACCESS
Building Data Last Updated On
31, 2014 16:04:41 EDT
Reports Generated On
31, 2014 16:05:27 EDT
Building List -> Single Entry Components -> Heating System
Previous Component
Next Component
Heating Equipment Type
P--Power Gas Boiler
Rated Input Capacity (mbtu/hr)
1984.00
Combustion Efficiency (%)
82.00
Measured Flue Carbon Dioxide (%)
6.50
Net Flue Gas Temperature (deg F)
469.00
Measured Flue Gas Draft (in. H20)
-2.00
Measured Flue Co (ppm)
5.00
Measured Ambient Co (ppm)
0
Barometric Damper
G--Good condition
Heating System Condition
G--Good w/clean heat transfer surfaces
Aquastat Condition
G--Good
Burner Condition
G--Good
Source Of Boiler Room Ventilation
B--Both Outside and Inside
Air Inlet Area (sqin)
2000.00
Update
Cancel
History
Created By
8, 2013 14:41:24 EDT
Updated By
22, 2013 14:11:20 EDT
8, 2013 15:21:36 EDT
8, 2013 14:41:24 EDT
Single Entry Components
Lighting
Yes
Multiple Entry Components
Press HELP at the top right corner of the page for further information.
Input Capacity found on boiler plate. Only enter the number which represents millions (i.e., 1984 as opposed to 1,984,000).
If multiple units run simultaneously, add the input mbtu/hr. for a total capacity.
Enter heating system combustion measurements.
Ensure the draft is accurate (negative/positive readings).
If multiple units run simultaneously, average out the collected measurements.
The audit may recommend increasing boiler room ventilation. The result will be based on entered boiler's input mbtu/hr. and air inlet area in square inches.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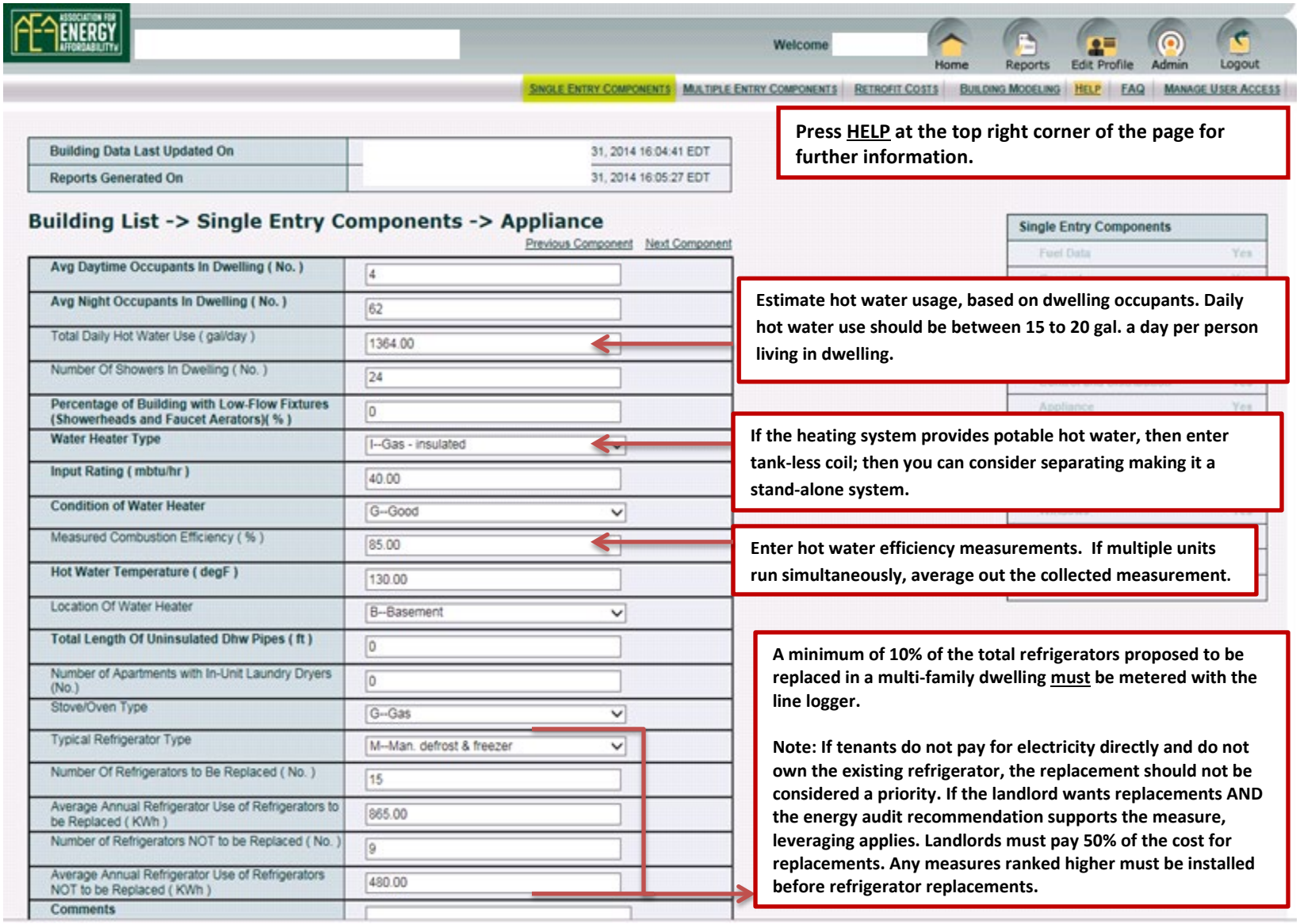
SINGLE ENTRY COMPONENTS
MULTIPLE ENTRY C
ACCESS
Building Data Last Updated On
1, 2014 16:04:41 EDT
Reports Generated On
1, 2014 16:05:27 EDT
Building List -> Single Entry Components -> Control and Distribution
Previous Component
Next Component
Type Of Distribution System
W--Hot water
Total Uninsulated Heating Pipe/duct Length (ft)
0
Type Of Heating Controls
I--Indoor thermostat(s)
Condition Of Sensor/Controls
G--Good
Number Of Sensors (No.)
1
Modulating Aquastat
W--Working
Heating Day Thermostat Setting (degF)
72.00
Heating Night Setting (degF)
67.00
Percent Of Dwelling Out Of Balance (%)
0
Comments
Update
Cancel
History
Created By
18, 2013 14:41:41 EDT
Updated By
18, 2013 14:41:41 EDT
Windows Yes
Doors Yes
Roof Yes
Base Yes
Press HELP at the top right corner of the page for further information.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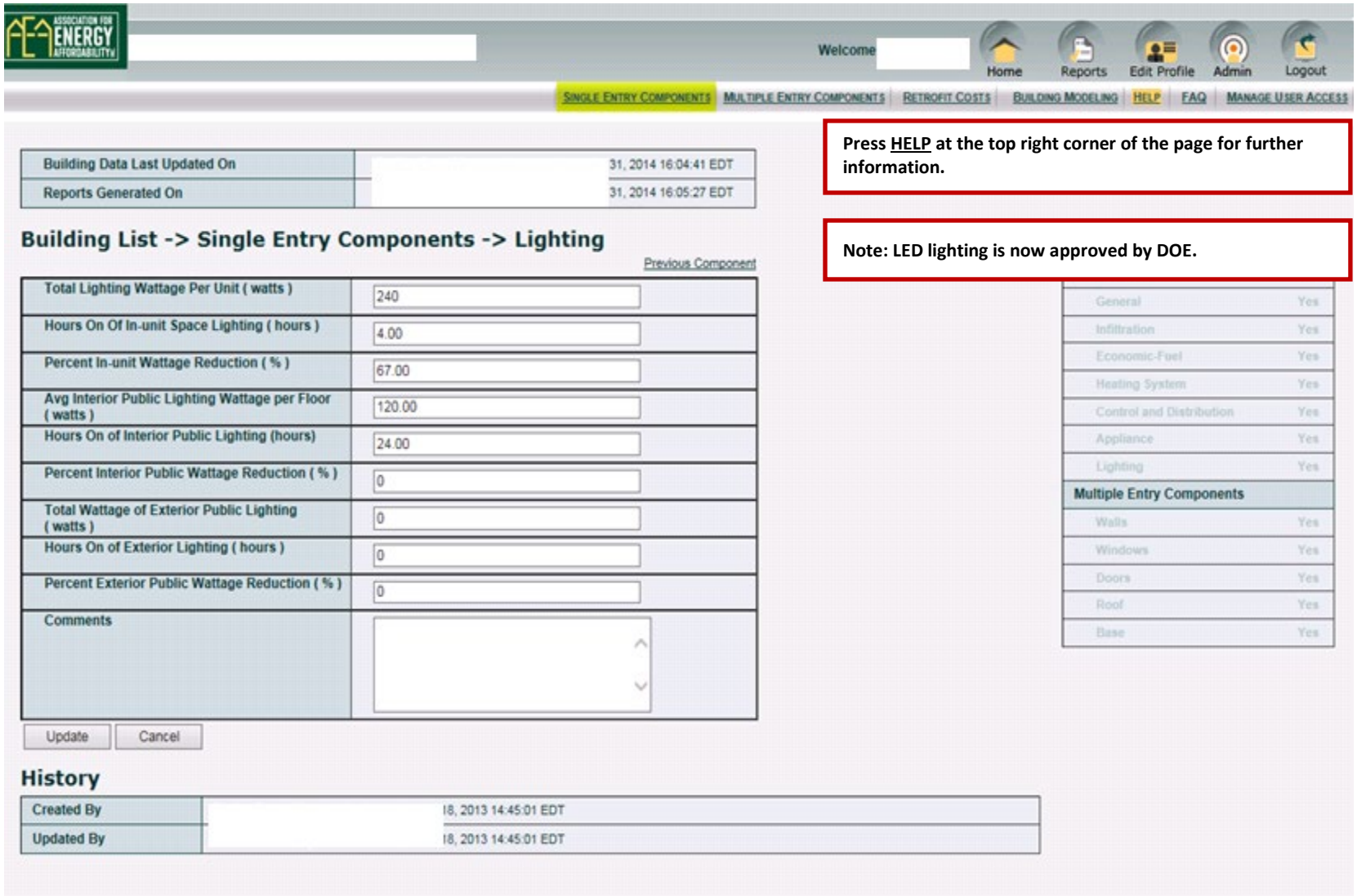
Building Data Last Updated On
31, 2014 16:04:41 EDT
Reports Generated On
31, 2014 16:05:27 EDT
Building List -> Single Entry Components -> Appliance
Previous Component
Next Component
Avg Daytime Occupants In Dwelling (No.) 4
Avg Night Occupants In Dwelling (No.) 62
Total Daily Hot Water Use (gal/day) 1364.00
Number Of Showers In Dwelling (No.) 24
Percentage of Building with Low-Flow Fixtures (Showerheads and Faucet Aerators)(%) 0
Water Heater Type I--Gas - insulated
Input Rating (mbtu/hr) 40.00
Condition of Water Heater G--Good
Measured Combustion Efficiency (%) 85.00
Hot Water Temperature (degF) 130.00
Location Of Water Heater B--Basement
Total Length Of Uninsulated Dhw Pipes (ft) 0
Number of Apartments with In-Unit Laundry Dryers (No.) 0
Stove/Oven Type G--Gas
Typical Refrigerator Type M--Man. defrost & freezer
Number Of Refrigerators to Be Replaced (No.) 15
Average Annual Refrigerator Use of Refrigerators to be Replaced (KWh) 865.00
Number of Refrigerators NOT to be Replaced (No.) 9
Average Annual Refrigerator Use of Refrigerators NOT to be Replaced (KWh) 480.00
Comments
Single Entry Components
Press HELP at the top right corner of the page for further information.
Estimate hot water usage, based on dwelling occupants. Daily hot water use should be between 15 to 20 gal. a day per person living in dwelling.
If the heating system provides potable hot water, then enter tank-less coil; then you can consider separating making it a stand-alone system.
Enter hot water efficiency measurements. If multiple units run simultaneously, average out the collected measurement.
A minimum of 10% of the total refrigerators proposed to be replaced in a multi-family dwelling must be metered with the line logger.
Note: If tenants do not pay for electricity directly and do not own the existing refrigerator, the replacement should not be considered a priority. If the landlord wants replacements AND the energy audit recommendation supports the measure, leveraging applies. Landlords must pay 50% of the cost for replacements. Any measures ranked higher must be installed before refrigerator replacements.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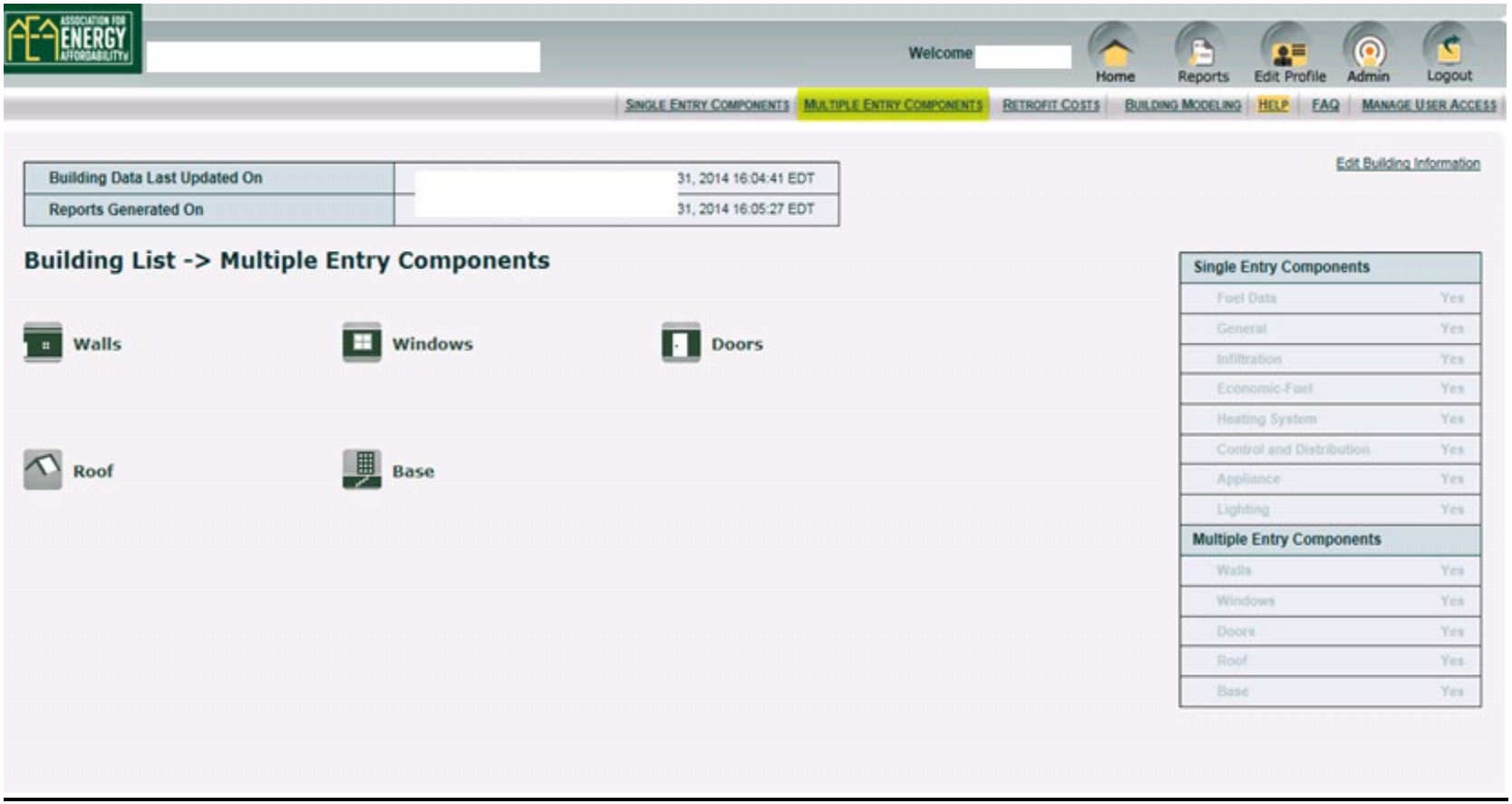
Press HELP at the top right corner of the page for further information.
Note: LED lighting is now approved by DOE.
Building Data Last Updated On
31, 2014 16:04:41 EDT
Reports Generated On
31, 2014 16:05:27 EDT
Building List -> Single Entry Components -> Lighting
Previous Component
Total Lighting Wattage Per Unit (watts)
240
Hours On Of In-unit Space Lighting (hours)
4.00
Percent In-unit Wattage Reduction (%)
67.00
Avg Interior Public Lighting Wattage per Floor (watts)
120.00
Hours On of Interior Public Lighting (hours)
24.00
Percent Interior Public Wattage Reduction (%)
0
Total Wattage of Exterior Public Lighting (watts)
0
Hours On of Exterior Lighting (hours)
0
Percent Exterior Public Wattage Reduction (%)
0
Comments
Update
Cancel
History
Created By
18, 2013 14:45:01 EDT
Updated By
18, 2013 14:45:01 EDT
General Yes
Infiltration Yes
Economic-Fuel Yes
Heating System Yes
Control and Distribution Yes
Appliance Yes
Lighting Yes
Multiple Entry Components
Walls Yes
Windows Yes
Doors Yes
Roof Yes
Base Yes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MULTIPLE ENTRY COMPONENTS
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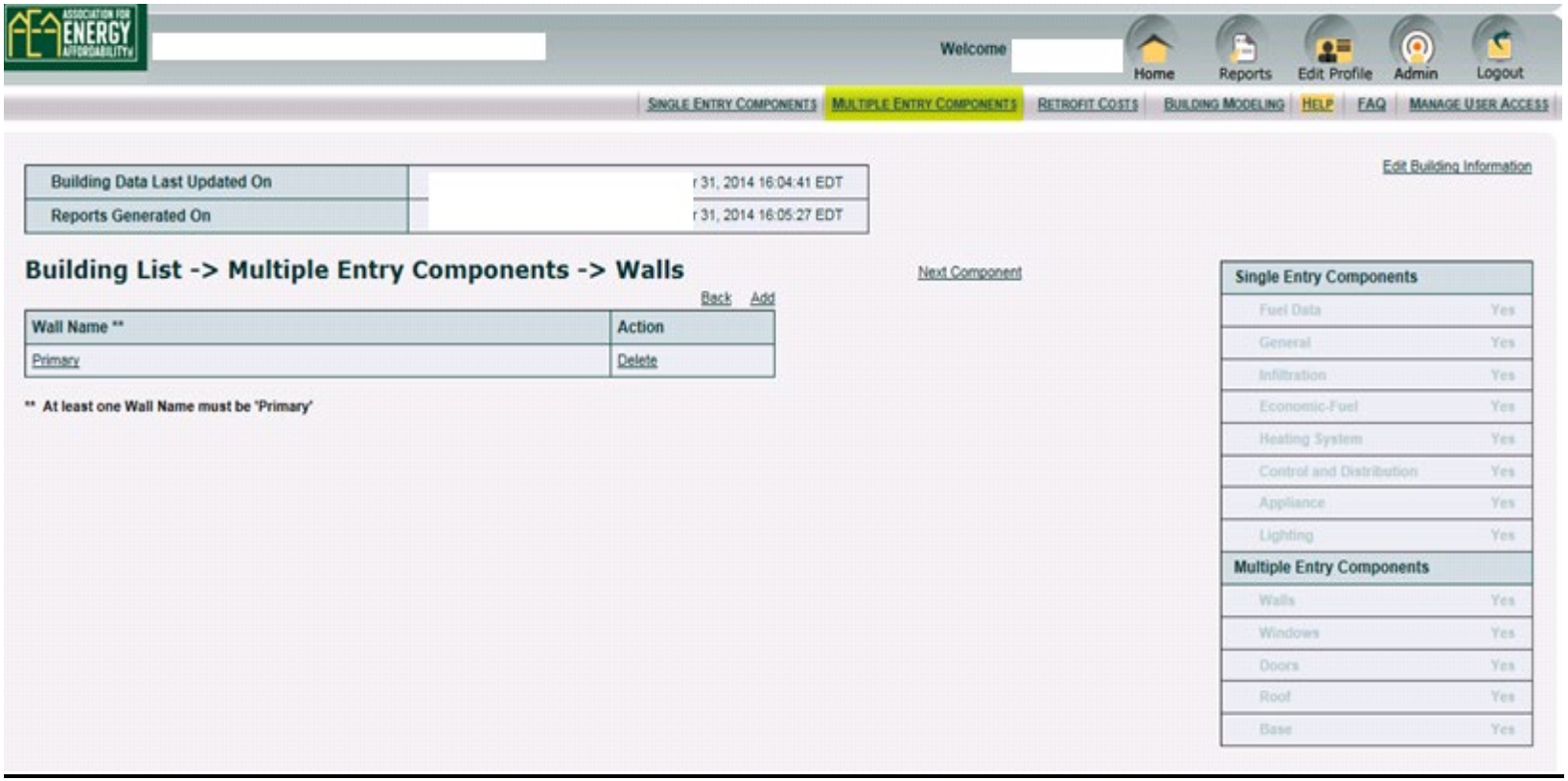
Building Data Last Updated On
31, 2014 16:04:41 EDT
Reports Generated On
31, 2014 16:05:27 EDT
Edit Building Information
Building List -> Multiple Entry Components
Walls
Windows
Doors
Roof
Base
Single Entry Components
Fuel Data Yes
General Yes
Infiltration Yes
Economic-Fuel Yes
Heating System Yes
Control and Distribution Yes
Appliance Yes
Lighting Yes
Multiple Entry Components
Walls Yes
Windows Yes
Doors Yes
Roof Yes
Base Yes


Welcome
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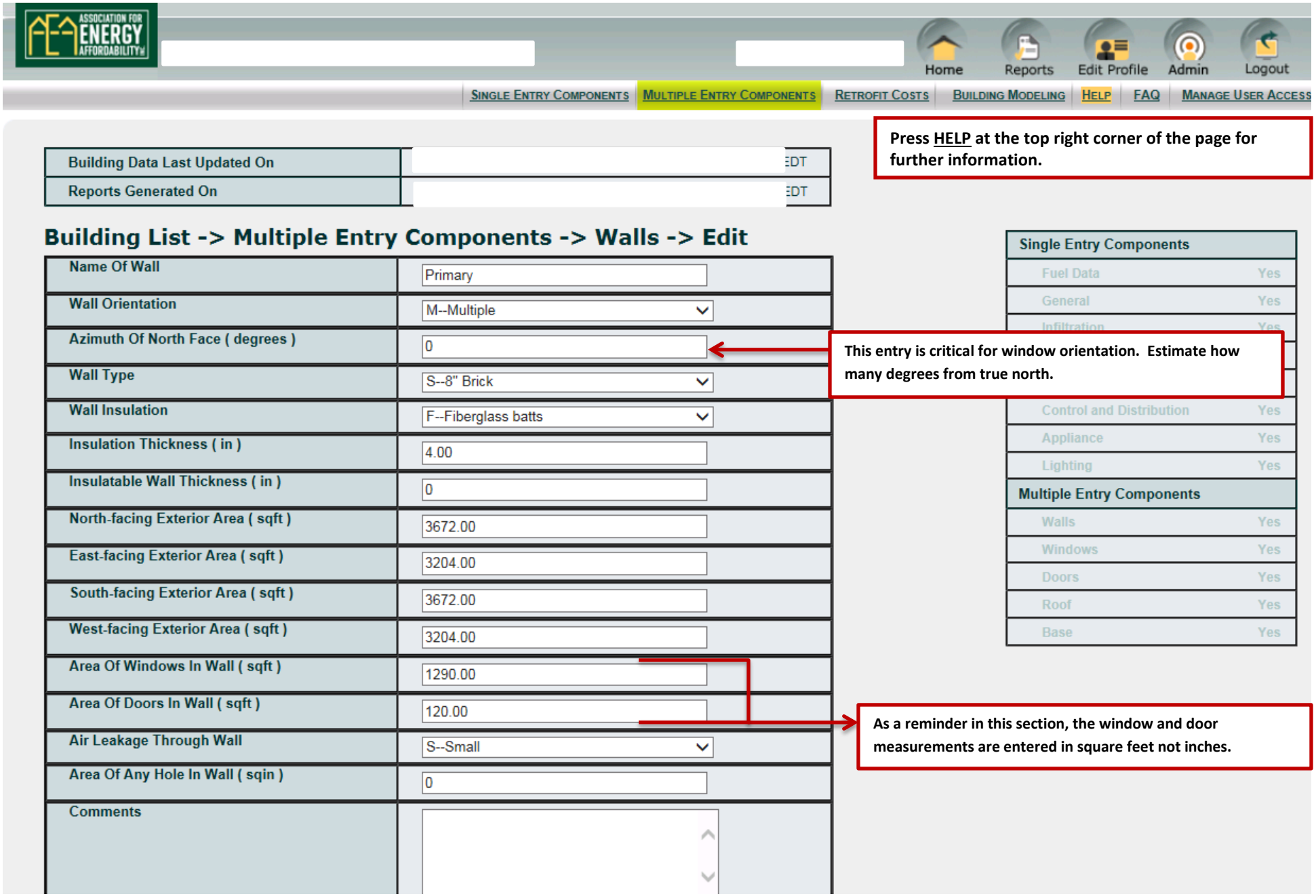
SINGLE ENTRY COMPONENTS
MULTIPLE ENTRY COMPONENTS
RETROFIT COSTS
BUILDING MODELING
HELP
FAQ
MANAGE USER ACCESS
Building Data Last Updated On
r 31, 2014 16:04:41 EDT
Reports Generated On
r 31, 2014 16:05:27 EDT
Edit Building Information
Building List -> Multiple Entry Components -> Walls
Next Component
Back
Add
Wall Name **
Action
Primary
Delete
** At least one Wall Name must be 'Primary'
Single Entry Components
Fuel Data Yes
General Yes
Infiltration Yes
Economic-Fuel Yes
Heating System Yes
Control and Distribution Yes
Appliance Yes
Lighting Yes
Multiple Entry Components
Walls Yes
Windows Yes
Doors Yes
Roof Yes
Base Yes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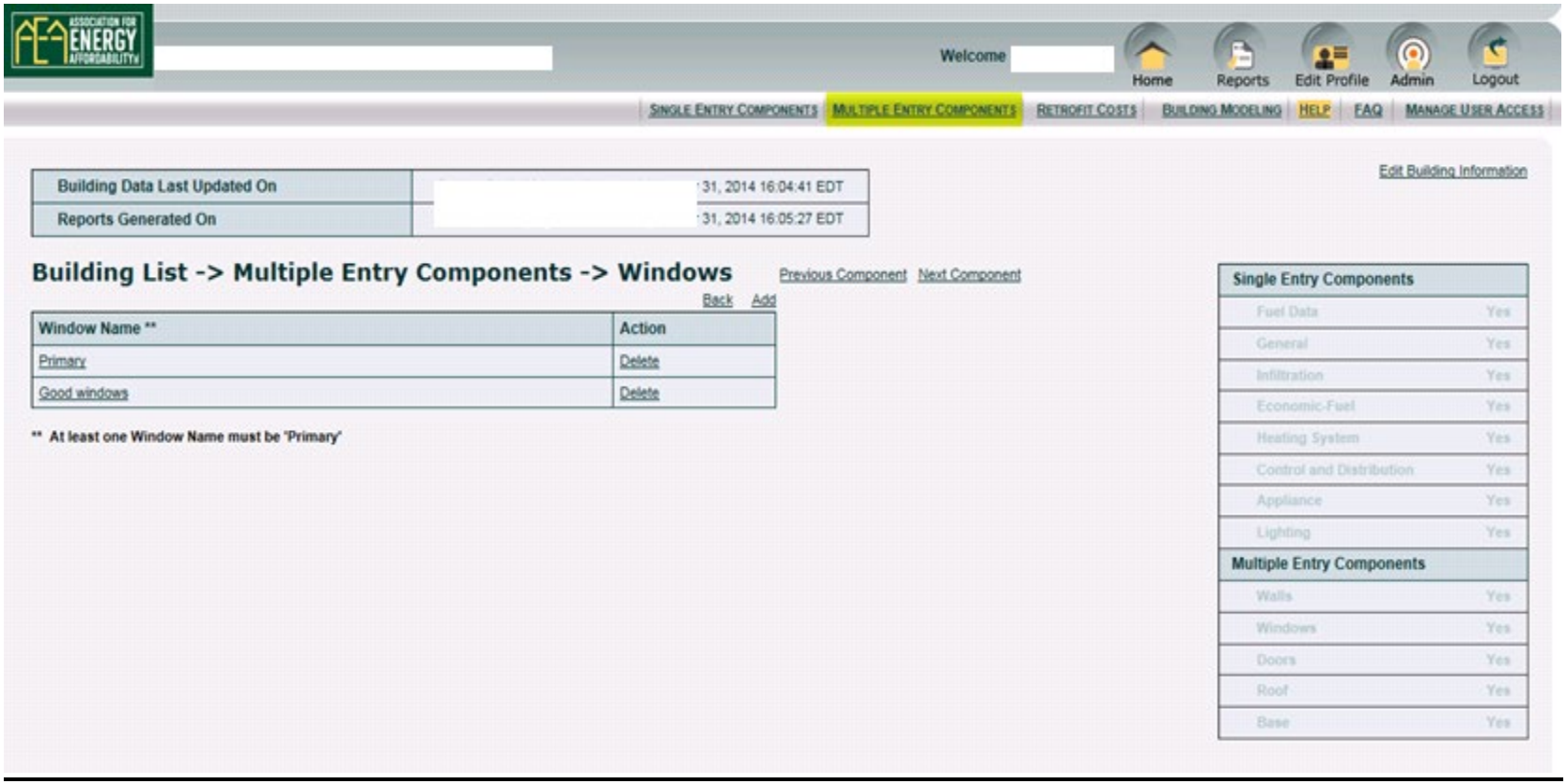
MANAGE USER ACCESS
Press HELP at the top right corner of the page for further information.
Building Data Last Updated On
Reports Generated On
Building List -> Multiple Entry Components -> Walls -> Edit
Name Of Wall
Primary
Wall Orientation
M--Multiple
Azimuth Of North Face (degrees)
0
Wall Type
S--8" Brick
Wall Insulation
F--Fiberglass batts
Insulation Thickness (in)
4.00
Insulatable Wall Thickness (in)
0
North-facing Exterior Area (sqft)
3672.00
East-facing Exterior Area (sqft)
3204.00
South-facing Exterior Area (sqft)
3672.00
West-facing Exterior Area (sqft)
3204.00
Area Of Windows In Wall (sqft)
1290.00
Area Of Doors In Wall (sqft)
120.00
Air Leakage Through Wall
S--Small
Area Of Any Hole In Wall (sqin)
0
Comments
This entry is critical for window orientation. Estimate how many degrees from true north.
Single Entry Components
Fuel Data Yes
General Yes
Control and Distribution Yes
Appliance Yes
Lighting Yes
Multiple Entry Components
Walls Yes
Windows Yes
Doors Yes
Roof Yes
Base Yes
As a reminder in this section, the window and door measurements are entered in square feet not inches.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Building Data Last Updated On
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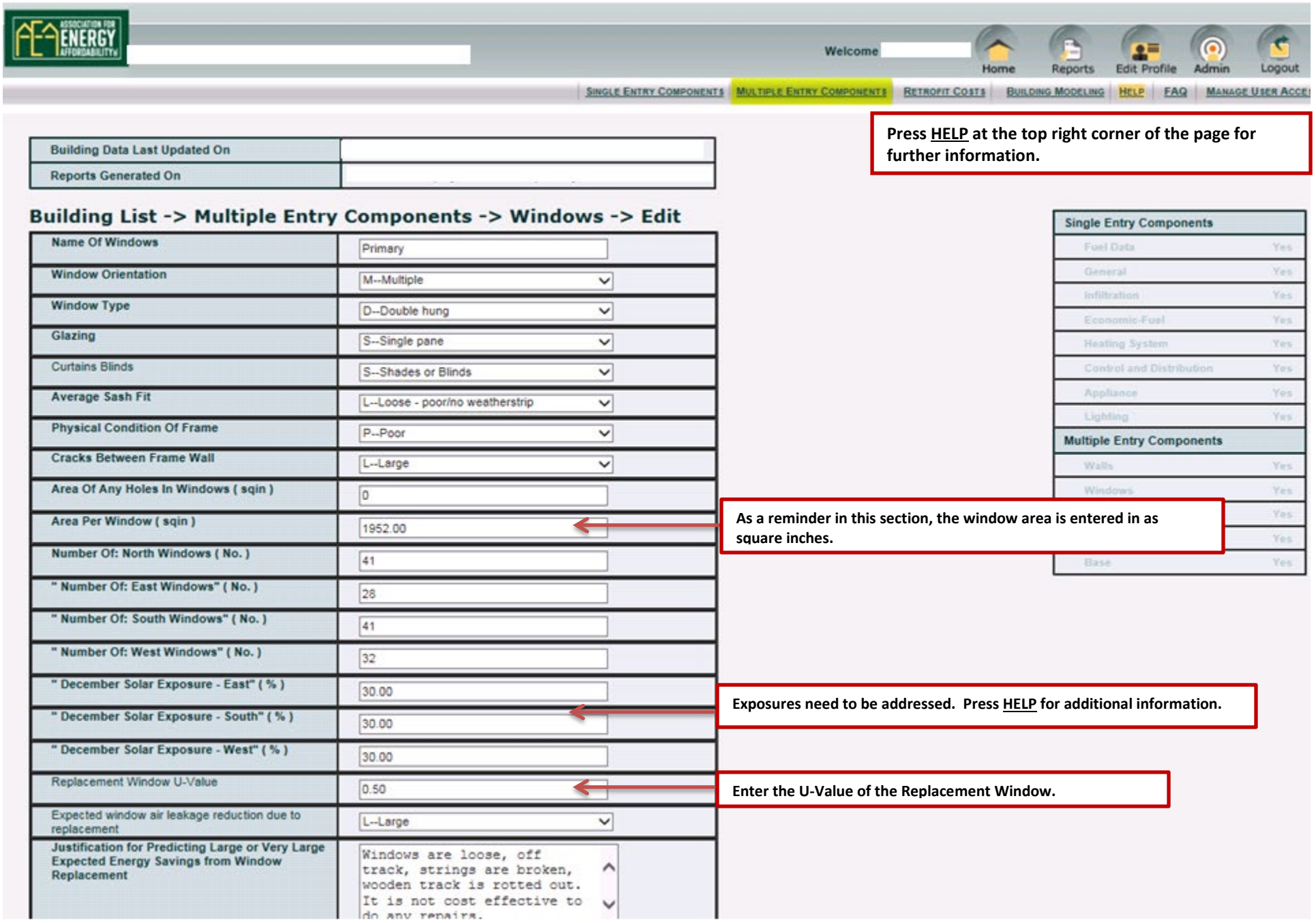
Edit Building Information
Building List -> Multiple Entry Components -> Windows
Previous Component
Next Component
Back
Add
Window Name **
Action
Primary
Delete
Good windows
Delete
** At least one Window Name must be 'Primary'
Single Entry Components
Fuel Data Yes
General Yes
Infiltration Yes
Economic-Fuel Yes
Heating System Yes
Control and Distribution Yes
Appliance Yes
Lighting Yes
Multiple Entry Components
Walls Yes
Windows Yes
Doors Yes
Roof Yes
Base Yes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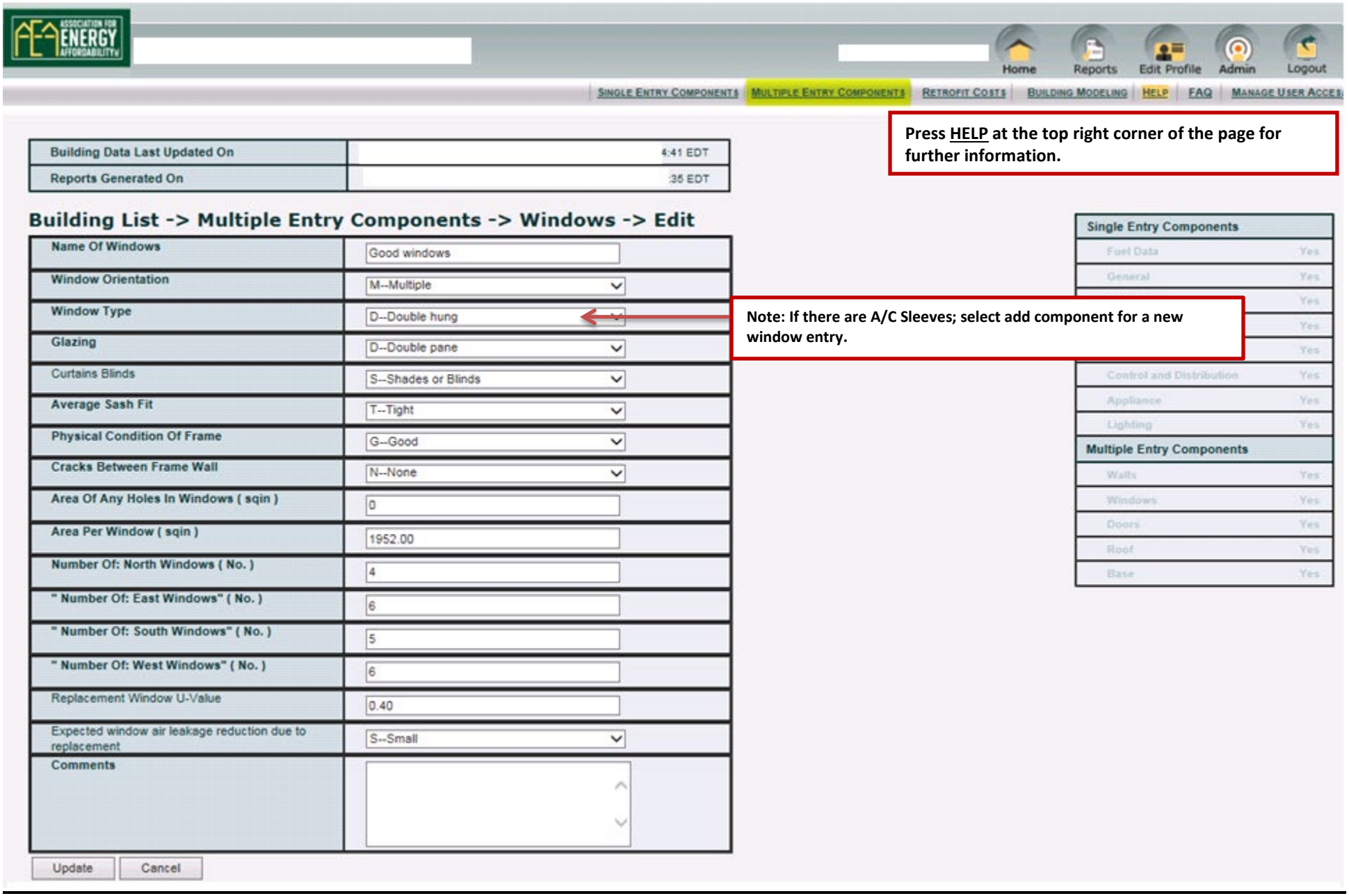
Building Data Last Updated On
Reports Generated On
Press HELP at the top right corner of the page for further information.
Building List -> Multiple Entry Components -> Windows -> Edit
Name Of Windows: Primary
Window Orientation: M--Multiple
Window Type: D--Double hung
Glazing: S--Single pane
Curtains Blinds: S--Shades or Blinds
Average Sash Fit: L--Loose - poor/no weatherstrip
Physical Condition Of Frame: P--Poor
Cracks Between Frame Wall: L--Large
Area Of Any Holes In Windows (sqin): 0
Area Per Window (sqin): 1952.00
Number Of: North Windows (No.): 41
" Number Of: East Windows" (No.): 28
" Number Of: South Windows" (No.): 41
" Number Of: West Windows" (No.): 32
" December Solar Exposure - East" (%): 30.00
" December Solar Exposure - South" (%): 30.00
" December Solar Exposure - West" (%): 30.00
Replacement Window U-Value: 0.50
Expected window air leakage reduction due to replacement: L--Large
Justification for Predicting Large or Very Large Expected Energy Savings from Window Replacement: Windows are loose, off track, strings are broken, wooden track is rotted out. It is not cost effective to do any repairs.
Single Entry Components
Fuel Data Yes
General Yes
Infiltration Yes
Economic-Fuel Yes
Heating System Yes
Control and Distribution Yes
Appliance Yes
Lighting Yes
Multiple Entry Components
Walls Yes
Windows Yes
Base Yes
As a reminder in this section, the window area is entered in as square inches.
Exposures need to be addressed. Press HELP for additional information.
Enter the U-Value of the Replacement Window.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MULTIPLE ENTRY COMPONENTS
RETROFIT COSTS
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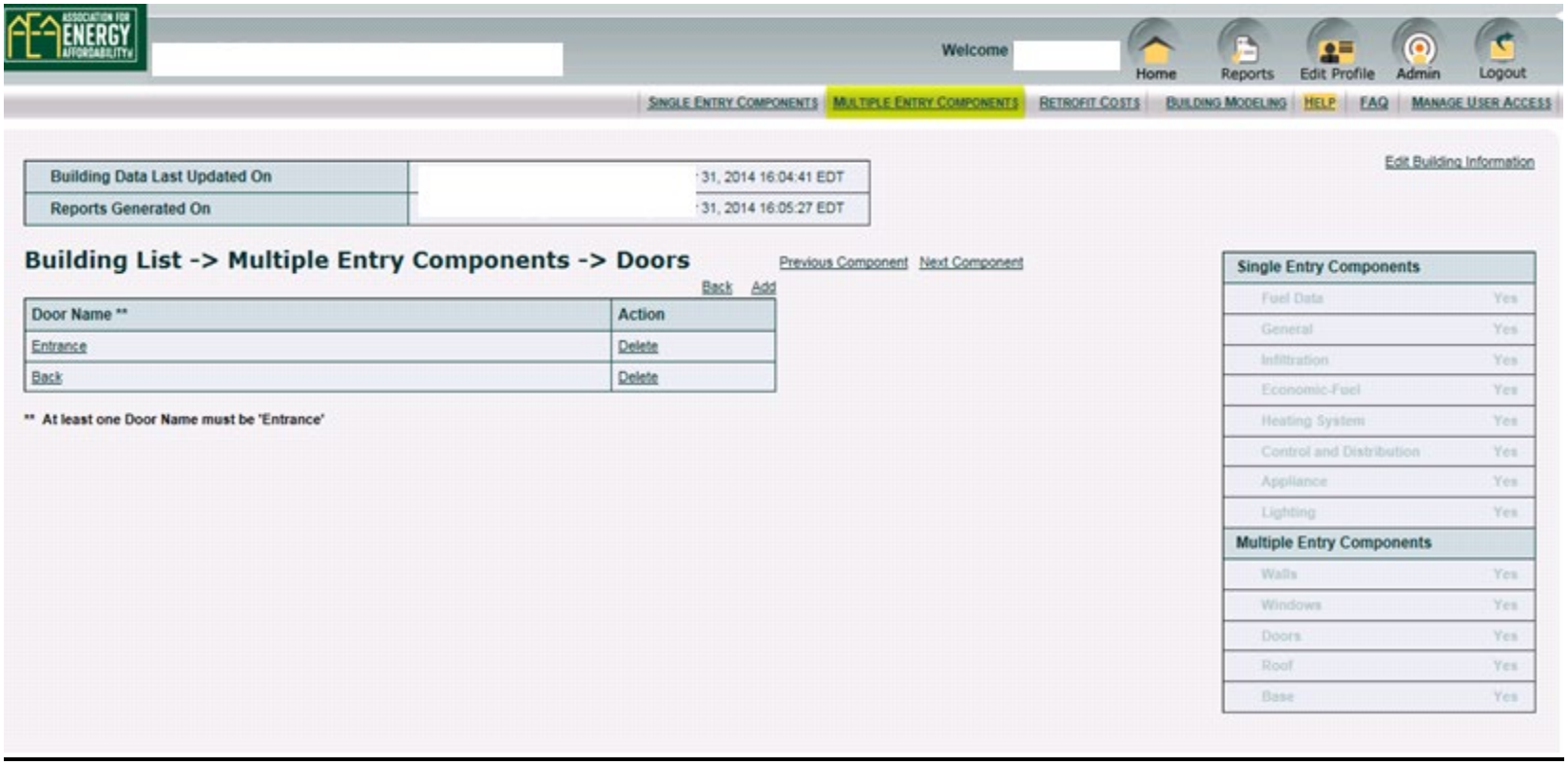
HELP
FAQ
MANAGE USER ACCESS
Press HELP at the top right corner of the page for further information.
Building Data Last Updated On 4:41 EDT
Reports Generated On :35 EDT
Building List -> Multiple Entry Components -> Windows -> Edit
Name Of Windows: Good windows
Window Orientation: M--Multiple
Window Type: D--Double hung
Glazing: D--Double pane
Curtains Blinds: S--Shades or Blinds
Average Sash Fit: T--Tight
Physical Condition Of Frame: G--Good
Cracks Between Frame Wall: N--None
Area Of Any Holes In Windows (sqin): 0
Area Per Window (sqin): 1952.00
Number Of: North Windows (No.): 4
" Number Of: East Windows" (No.): 6
" Number Of: South Windows" (No.): 5
" Number Of: West Windows" (No.): 6
Replacement Window U-Value: 0.40
Expected window air leakage reduction due to replacement: S--Small
Comments
Update
Cancel
Note: If there are A/C Sleeves; select add component for a new window entry.
Single Entry Components
Fuel Data Yes
General Yes
Yes
Yes
Yes
Control and Distribution Yes
Appliance Yes
Lighting Yes
Multiple Entry Components
Walls Yes
Windows Yes
Doors Yes
Roof Yes
Base Yes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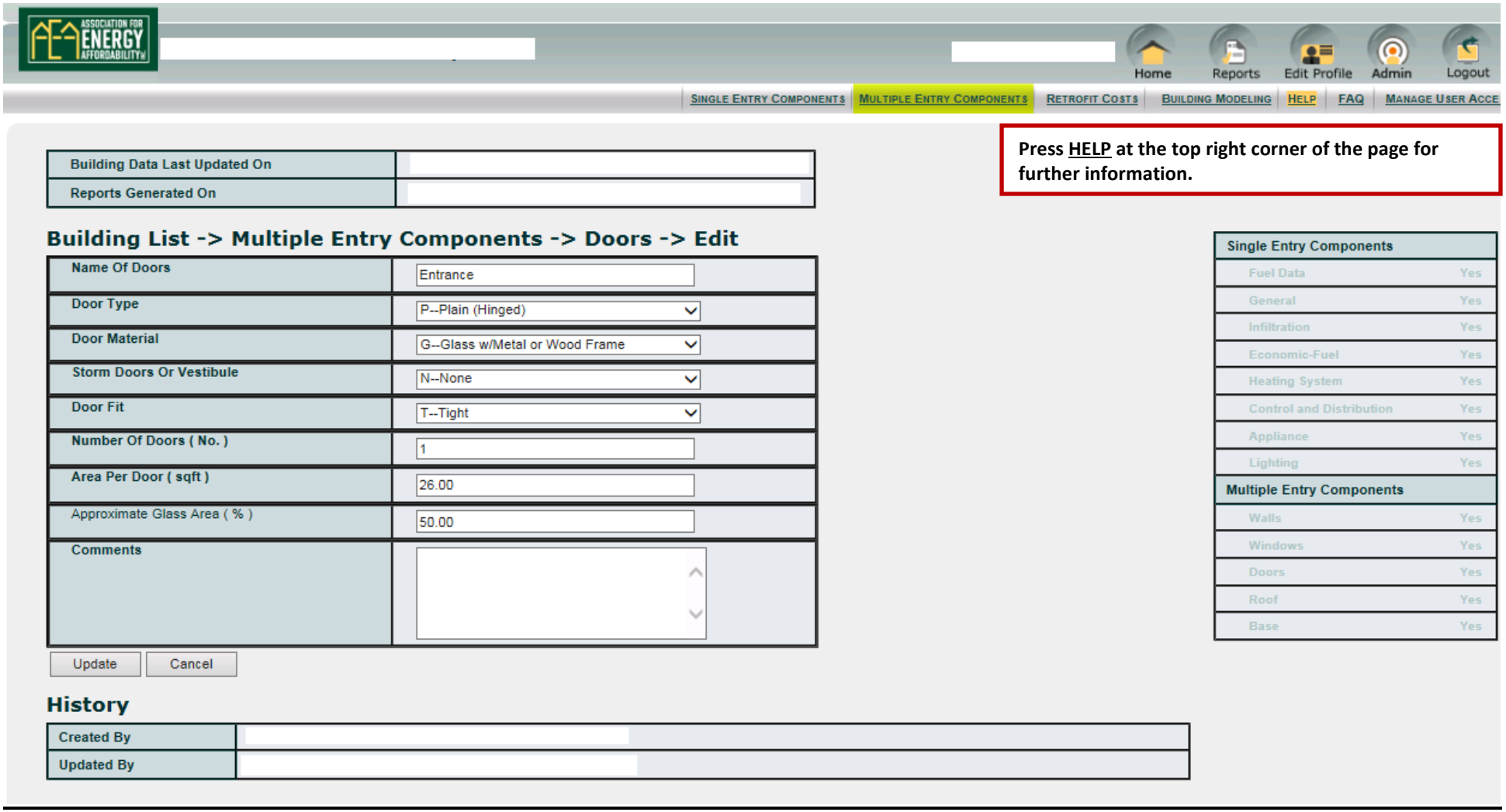
Reports Generated On
31, 2014 16:05:27 EDT
Building List -> Multiple Entry Components -> Doors
Previous Component
Next Component
Back
Add
Door Name **
Action
Entrance
Delete
Back
Delete
** At least one Door Name must be 'Entrance'
Single Entry Components
Fuel Data
Yes
General
Yes
Infiltration
Yes
Economic-Fuel
Yes
Heating System
Yes
Control and Distribution
Yes
Appliance
Yes
Lighting
Yes
Multiple Entry Components
Walls
Yes
Windows
Yes
Doors
Yes
Roof
Yes
Base
Yes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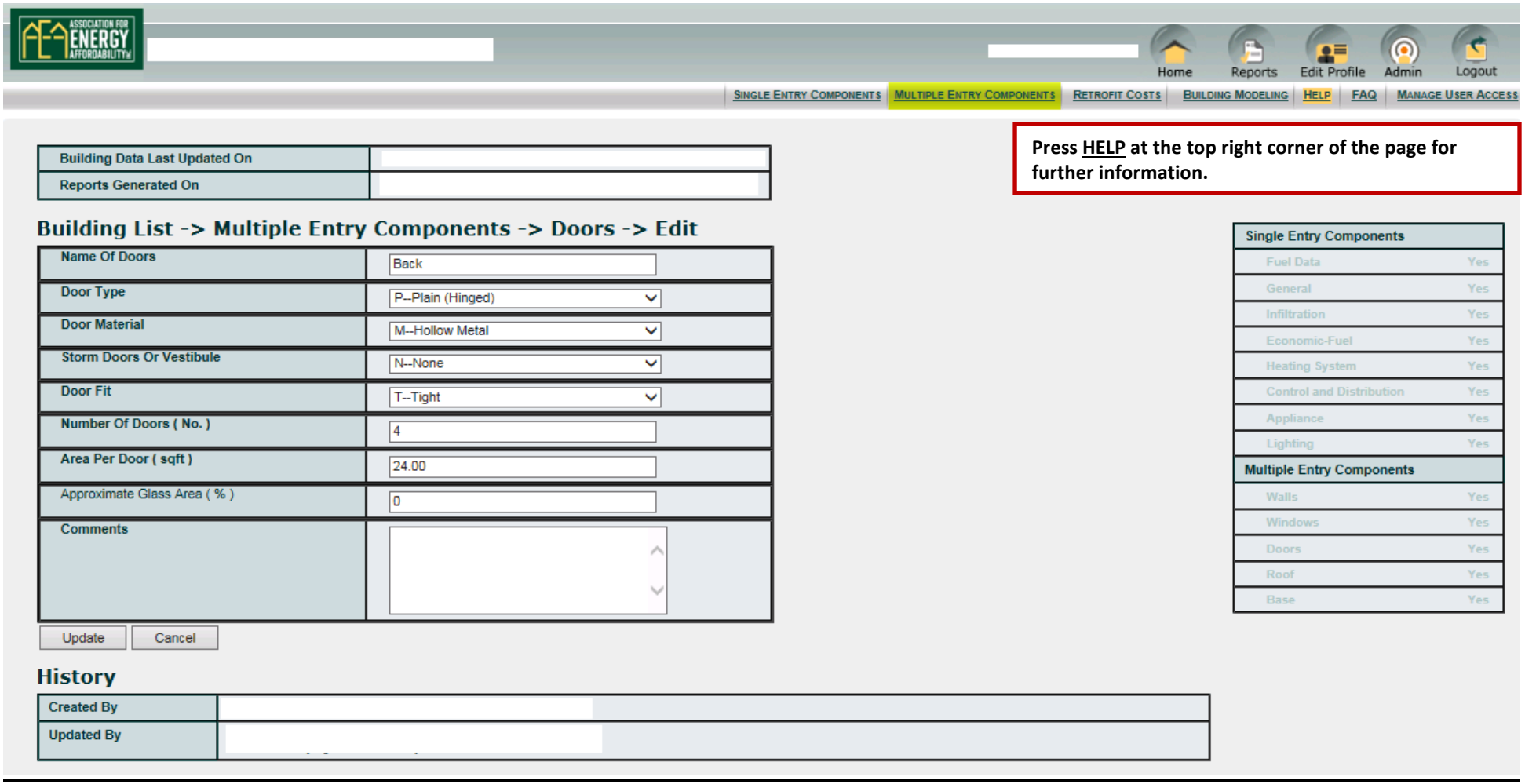
MANAGE USER ACCE
Building Data Last Updated On
Reports Generated On
Press HELP at the top right corner of the page for further information.
Building List -> Multiple Entry Components -> Doors -> Edit
Name Of Doors
Entrance
Door Type
P--Plain (Hinged)
Door Material
G--Glass w/Metal or Wood Frame
Storm Doors Or Vestibule
N--None
Door Fit
T--Tight
Number Of Doors (No.)
1
Area Per Door (sqft)
26.00
Approximate Glass Area (%)
50.00
Comments
Update
Cancel
Single Entry Components
Fuel Data Yes
General Yes
Infiltration Yes
Economic-Fuel Yes
Heating System Yes
Control and Distribution Yes
Appliance Yes
Lighting Yes
Multiple Entry Components
Walls Yes
Windows Yes
Doors Yes
Roof Yes
Base Yes
History
Created By
Updated By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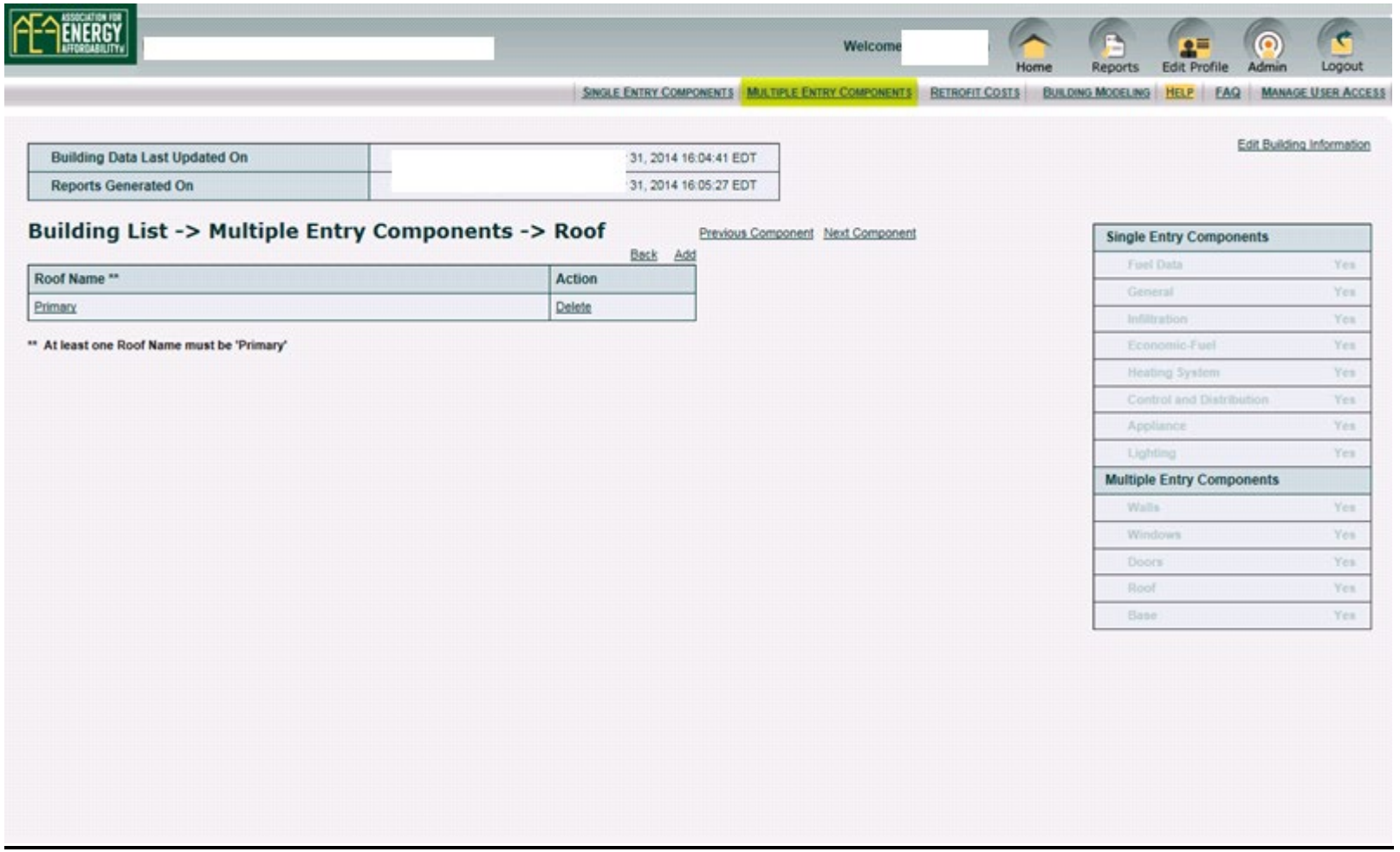
Building Data Last Updated On
Reports Generated On
Press HELP at the top right corner of the page for further information.
Building List -> Multiple Entry Components -> Doors -> Edit
Name Of Doors
Back
Door Type
P--Plain (Hinged)
Door Material
M--Hollow Metal
Storm Doors Or Vestibule
N--None
Door Fit
T--Tight
Number Of Doors (No.)
4
Area Per Door (sqft)
24.00
Approximate Glass Area (%)
0
Comments
Update
Cancel
Single Entry Components
Fuel Data Yes
General Yes
Infiltration Yes
Economic-Fuel Yes
Heating System Yes
Control and Distribution Yes
Appliance Yes
Lighting Yes
Multiple Entry Components
Walls Yes
Windows Yes
Doors Yes
Roof Yes
Base Yes
History
Created By
Updated By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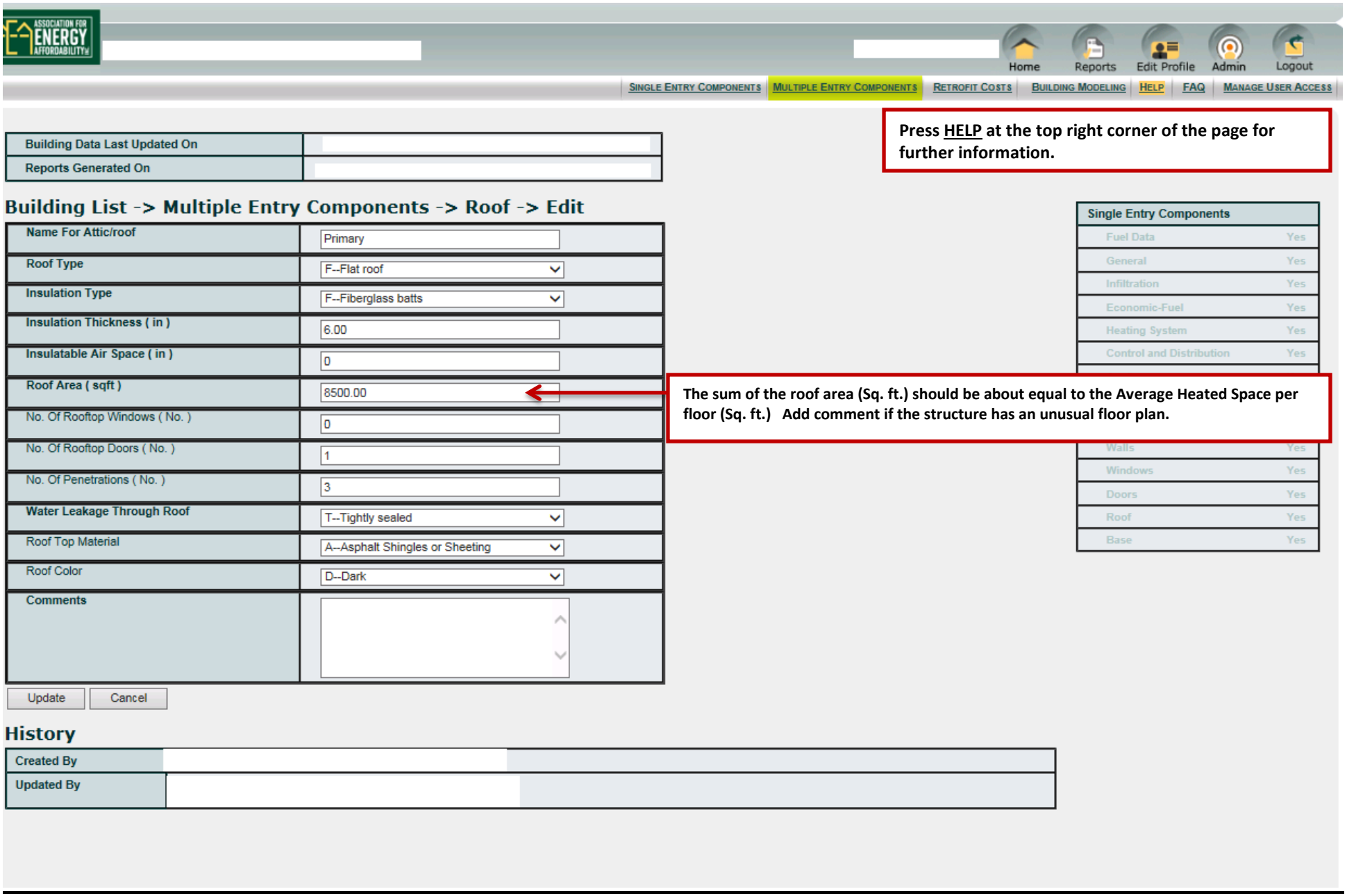
Building List -> Multiple Entry Components -> Roof
Previous Component
Next Component
Back
Add
Roof Name **
Action
Primary
Delete
** At least one Roof Name must be 'Primary'
Single Entry Components
Fuel Data
Yes
General
Yes
Infiltration
Yes
Economic-Fuel
Yes
Heating System
Yes
Control and Distribution
Yes
Appliance
Yes
Lighting
Yes
Multiple Entry Components
Walls
Yes
Windows
Yes
Doors
Yes
Roof
Yes
Base
Yes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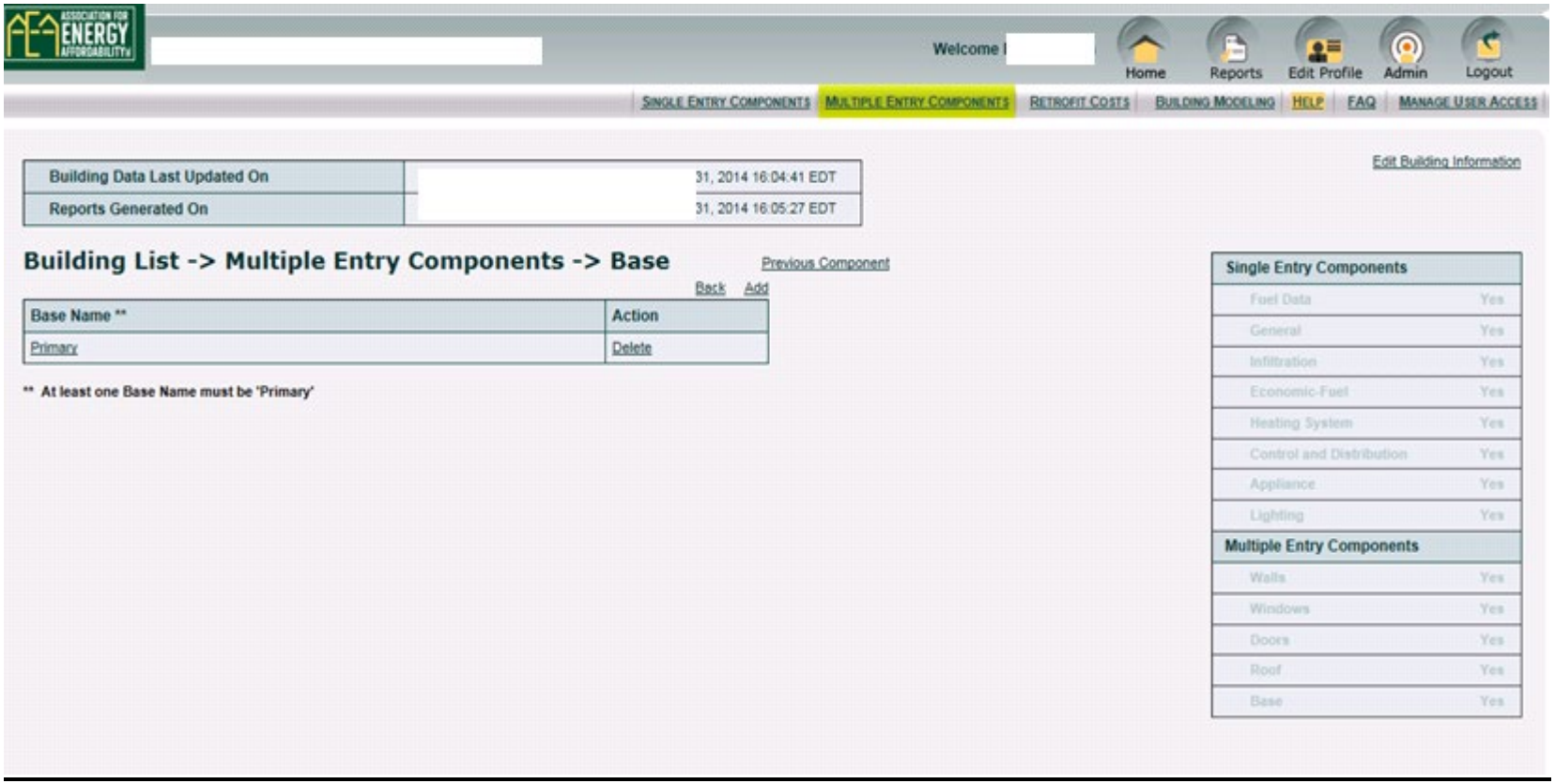
Reports Generated On
Press HELP at the top right corner of the page for further information.
Building List -> Multiple Entry Components -> Roof -> Edit
Name For Attic/roof
Primary
Roof Type
F--Flat roof
Insulation Type
F--Fiberglass batts
Insulation Thickness (in)
6.00
Insulatable Air Space (in)
0
Roof Area (sqft)
8500.00
No. Of Rooftop Windows (No.)
0
No. Of Rooftop Doors (No.)
1
No. Of Penetrations (No.)
3
Water Leakage Through Roof
T--Tightly sealed
Roof Top Material
A--Asphalt Shingles or Sheeting
Roof Color
D--Dark
Comments
Update
Cancel
The sum of the roof area (Sq. ft.) should be about equal to the Average Heated Space per floor (Sq. ft.) Add comment if the structure has an unusual floor plan.
Single Entry Components
Fuel Data Yes
General Yes
Infiltration Yes
Economic-Fuel Yes
Heating System Yes
Control and Distribution Yes
Walls Yes
Windows Yes
Doors Yes
Roof Yes
Base Yes
History
Created By
Updated By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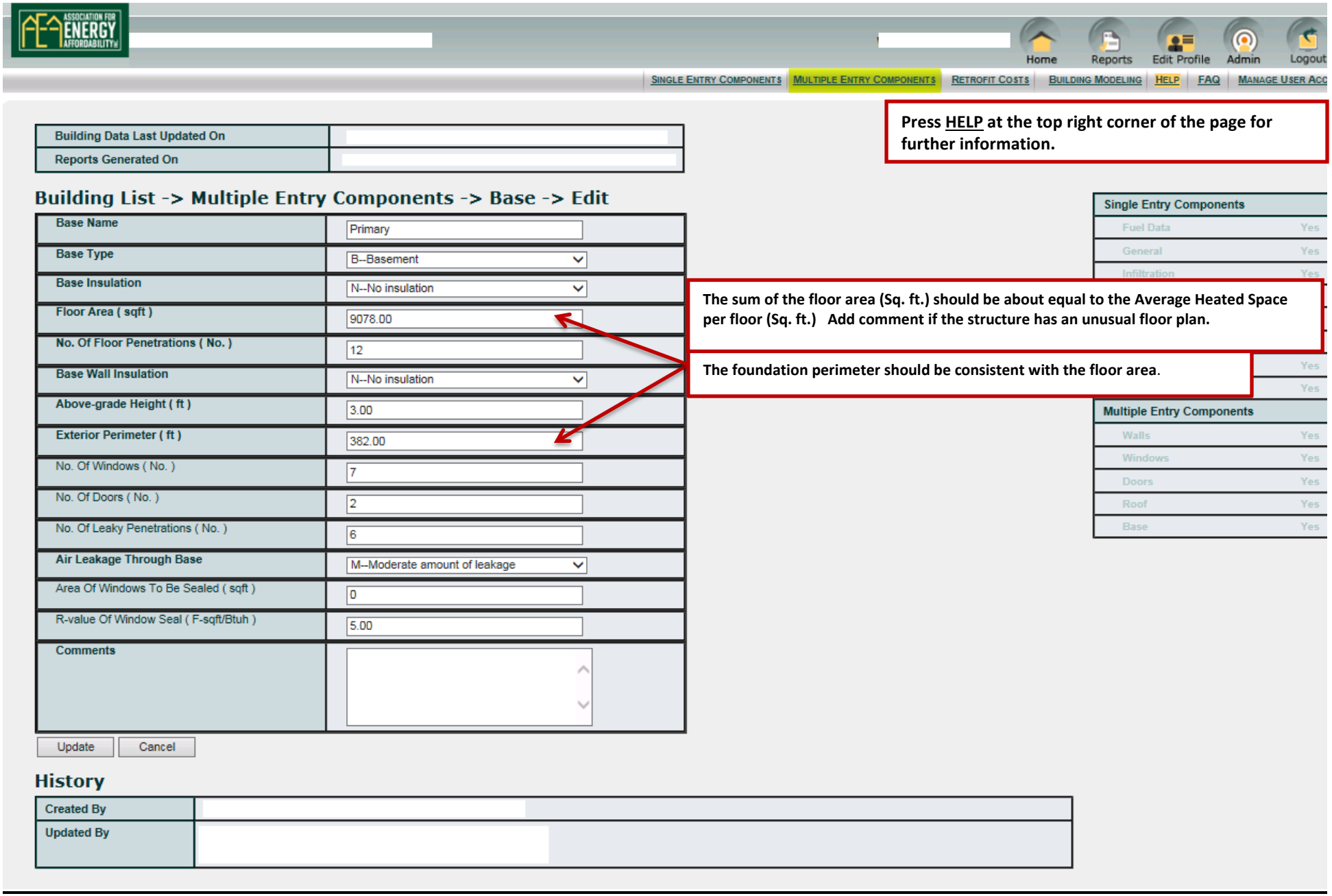
Building List -> Multiple Entry Components -> Base
Previous Component
Back
Add
Base Name **
Action
Primary
Delete
** At least one Base Name must be 'Primary'
Single Entry Components
Fuel Data Yes
General Yes
Infiltration Yes
Economic-Fuel Yes
Heating System Yes
Control and Distribution Yes
Appliance Yes
Lighting Yes
Multiple Entry Components
Walls Yes
Windows Yes
Doors Yes
Roof Yes
Base Yes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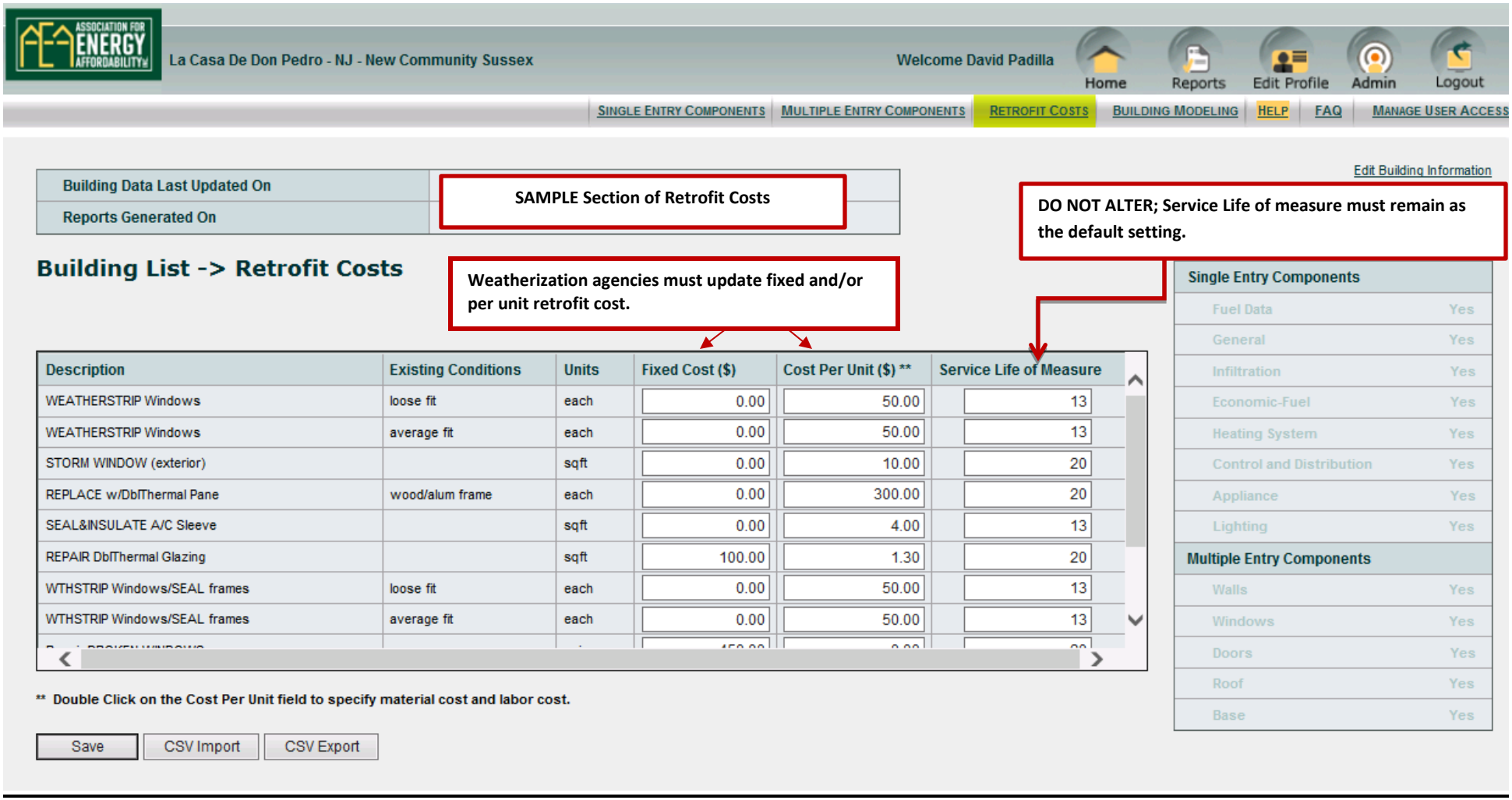
Press HELP at the top right corner of the page for further information.
Building Data Last Updated On
Reports Generated On
Building List -> Multiple Entry Components -> Base -> Edit
Base Name
Primary
Base Type
B--Basement
Base Insulation
N--No insulation
Floor Area (sqft)
9078.00
No. Of Floor Penetrations (No.)
12
Base Wall Insulation
N--No insulation
Above-grade Height (ft)
3.00
Exterior Perimeter (ft)
382.00
No. Of Windows (No.)
7
No. Of Doors (No.)
2
No. Of Leaky Penetrations (No.)
6
Air Leakage Through Base
M--Moderate amount of leakage
Area Of Windows To Be Sealed (sqft)
0
R-value Of Window Seal (F-sqft/Btuh)
5.00
Comments
Update
Cancel
The sum of the floor area (Sq. ft.) should be about equal to the Average Heated Space per floor (Sq. ft.) Add comment if the structure has an unusual floor plan.
The foundation perimeter should be consistent with the floor area.
Single Entry Components
Fuel Data Yes
General Yes
Infiltration Yes
Yes
Yes
Multiple Entry Components
Walls Yes
Windows Yes
Doors Yes
Roof Yes
Base Yes
History
Created By
Updated By


La Casa De Don Pedro - NJ - New Community Sussex
Welcome David Padilla
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SINGLE ENTRY COMPONENTS
MULTIPLE ENTRY COMPONENTS
RETROFIT COSTS
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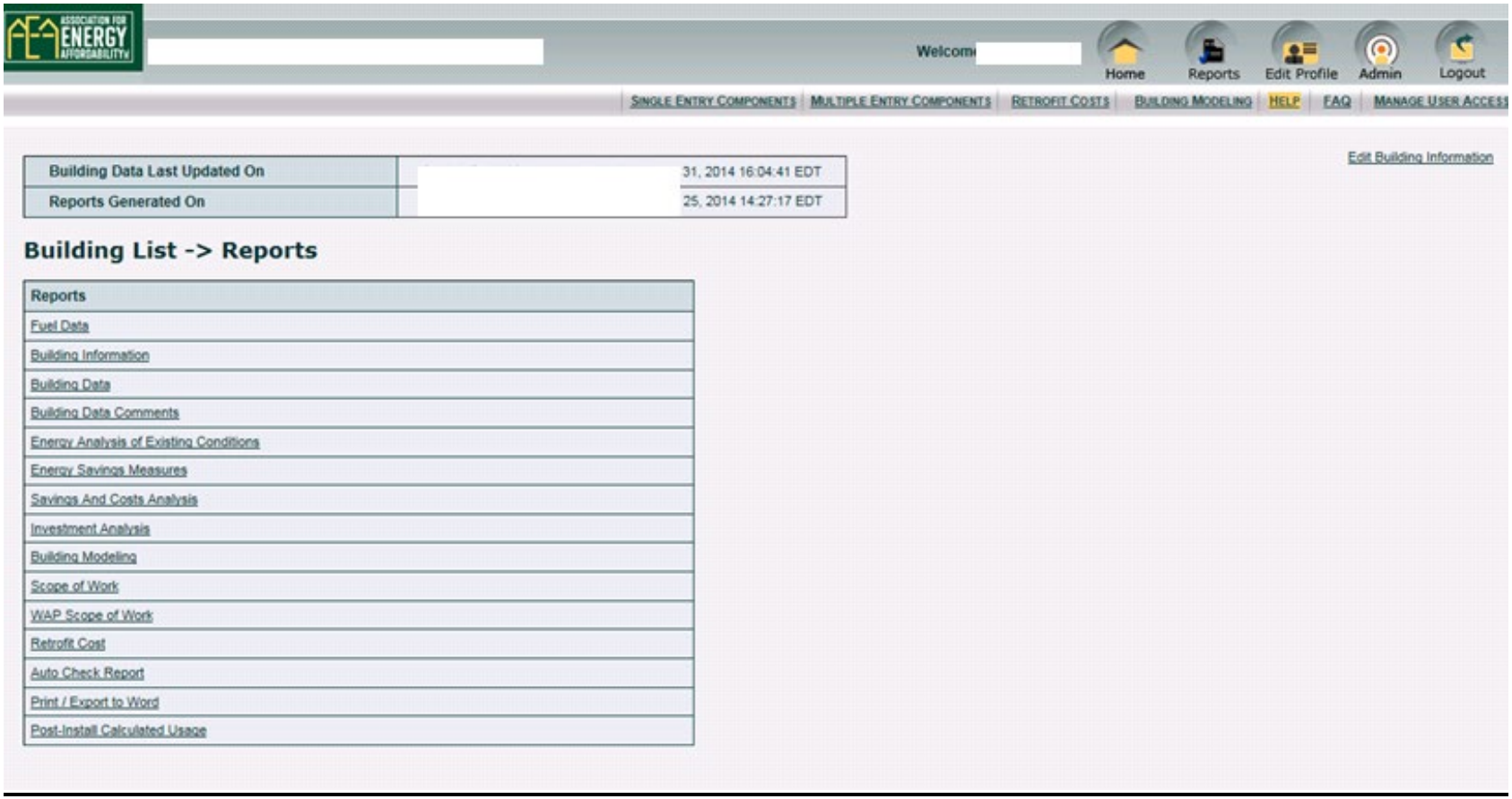
Edit Building Information
Building Data Last Updated On
Reports Generated On
SAMPLE Section of Retrofit Costs
DO NOT ALTER; Service Life of measure must remain as the default setting.
Building List -> Retrofit Costs
Weatherization agencies must update fixed and/or per unit retrofit cost.
Description
Existing Conditions
Units
Fixed Cost ($)
Cost Per Unit ($) **
Service Life of Measure
WEATHERSTRIP Windows loose fit each 0.00 50.00 13
WEATHERSTRIP Windows average fit each 0.00 50.00 13
STORM WINDOW (exterior) sqft 0.00 10.00 20
REPLACE w/DblThermal Pane wood/alum frame each 0.00 300.00 20
SEAL&INSULATE A/C Sleeve sqft 0.00 4.00 13
REPAIR DblThermal Glazing sqft 100.00 1.30 20
WTHSTRIP Windows/SEAL frames loose fit each 0.00 50.00 13
WTHSTRIP Windows/SEAL frames average fit each 0.00 50.00 13
** Double Click on the Cost Per Unit field to specify material cost and labor cost.
Save
CSV Import
CSV Export
Single Entry Components
Fuel Data Yes
General Yes
Infiltration Yes
Economic-Fuel Yes
Heating System Yes
Control and Distribution Yes
Appliance Yes
Lighting Yes
Multiple Entry Components
Walls Yes
Windows Yes
Doors Yes
Roof Yes
Base Yes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25, 2014 14:27:17 EDT
Building List -> Reports
Reports
Fuel Data
Building Information
Building Data
Building Data Comments
Energy Analysis of Existing Conditions
Energy Savings Measures
Savings And Costs Analysis
Investment Analysis
Building Modeling
Scope of Work
WAP Scope of Work
Retrofit Cost
Auto Check Report
Print / Export to Word
Post-Install Calculated Usage

EA-QUIP **Building Modeling**

ASSOCIATION FOR ENERGY AFFORDABILITY

Building Address:

Building Modeling report and Fuel Usage Chart must be submitted to the Office of Low-Income Energy Conservation for review and approval by the U.S. Department of Energy.

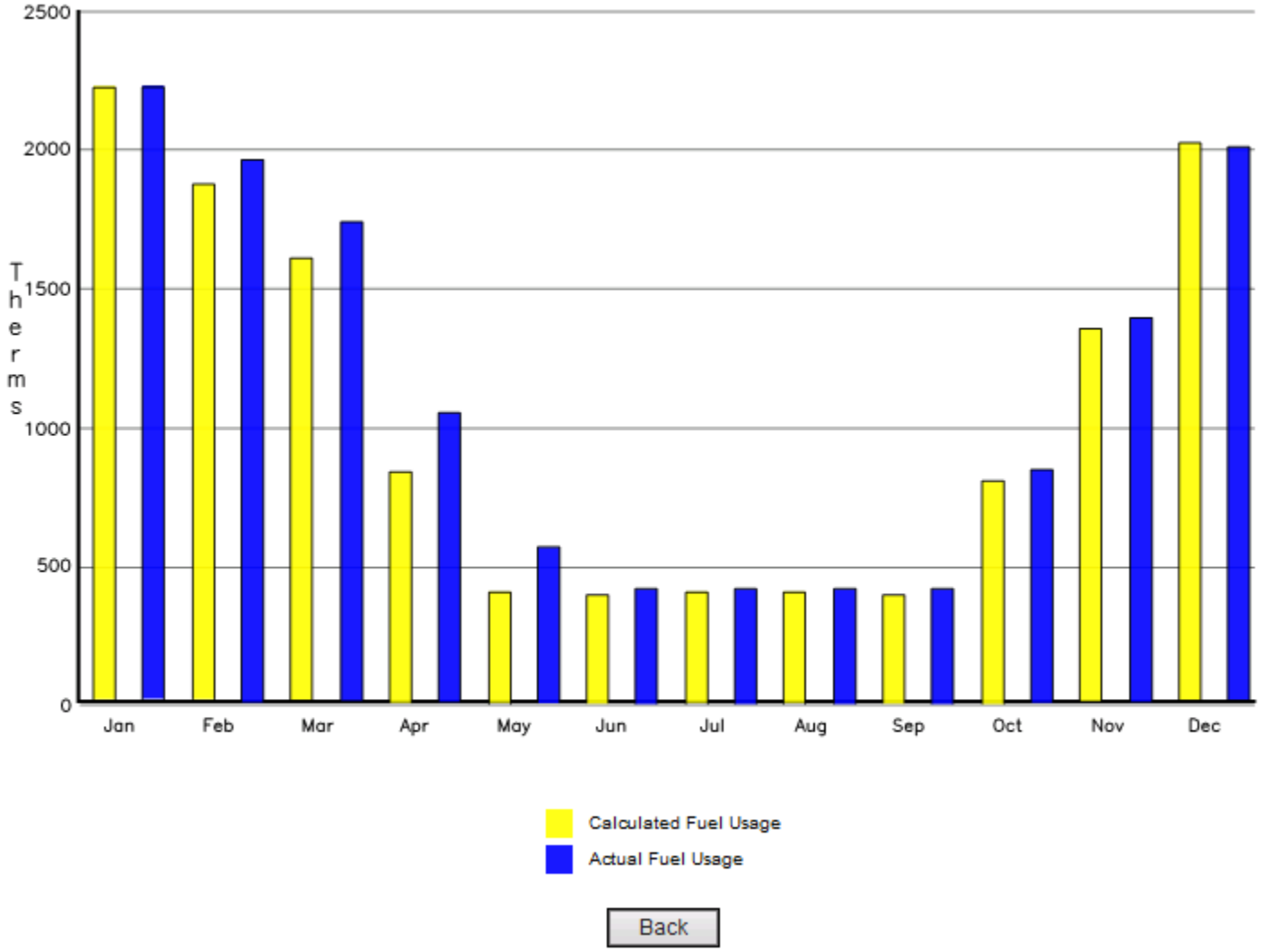
Auditor

Month	Calculated Fuel Use	Actual Fuel Use	DayTime Heat On-Time	NightTime Heat On-Time	Total Heating Load	Solar Gain	Infiltration	NH Electric **
	Therms	Therms	%	%	MMBtu	MMBtu	ac/hr	MWh
January	2,232.00	2,234.00	18.50	8.90	146.00	6.00	0.28	2.5
February	1,874.00	1,970.00	17.30	8.00	120.00	10.00	0.28	2.3
March	1,610.00	1,743.00	13.80	4.90	93.00	19.00	0.27	2.5
April	840.00	1,053.00	7.50	0.00	34.00	25.00	0.21	2.4
May	409.00	569.00	0.00	0.00	-9.00	34.00	0.19	2.5
June	396.00	421.00	0.00	0.00	-33.00	34.00	0.14	2.4
July	409.00	421.00	0.00	0.00	-41.00	33.00	0.14	2.5
August	409.00	421.00	0.00	0.00	-30.00	26.00	0.12	2.5
September	396.00	421.00	0.00	0.00	-9.00	19.00	0.14	2.4
October	810.00	847.00	6.60	0.00	30.00	13.00	0.18	2.5
November	1,355.00	1,400.00	12.90	2.50	73.00	7.00	0.22	2.4
December	2,024.00	2,010.00	17.40	7.10	128.00	6.00	0.28	2.5
Sum	**12,764.00**	**13,510.00**			**502.00**	**232.00**		**29.4**
Average	**1,063.67**	**1,125.83**	**7.83**	**2.62**	**41.00**	**19.33**	**0.21**	**2.45**

(**) NH Electric (Non-Heating Electric Use): includes EAEM (EA-Quip Applicable Electric Measures), cooling use and domestic use of electric.

See below fuel usage chart. Calculated and actual fuel usage should be about equal, it the audit was done properly.

Display Chart


2500
2000
1500
1000
500
0
Therms
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Calculated Fuel Usage
Actual Fuel Usage
Back

EA-QUIP **Fuel Data**

Building Address:

Fuel Data report must be submitted to the Office of Low-Income Energy Conservation for review and approval by the U.S. Department of Energy.

Auditor:

State: New Jersey **City:**

Fuel Units: Therms

Heating Reference Temperature: 65 DegF

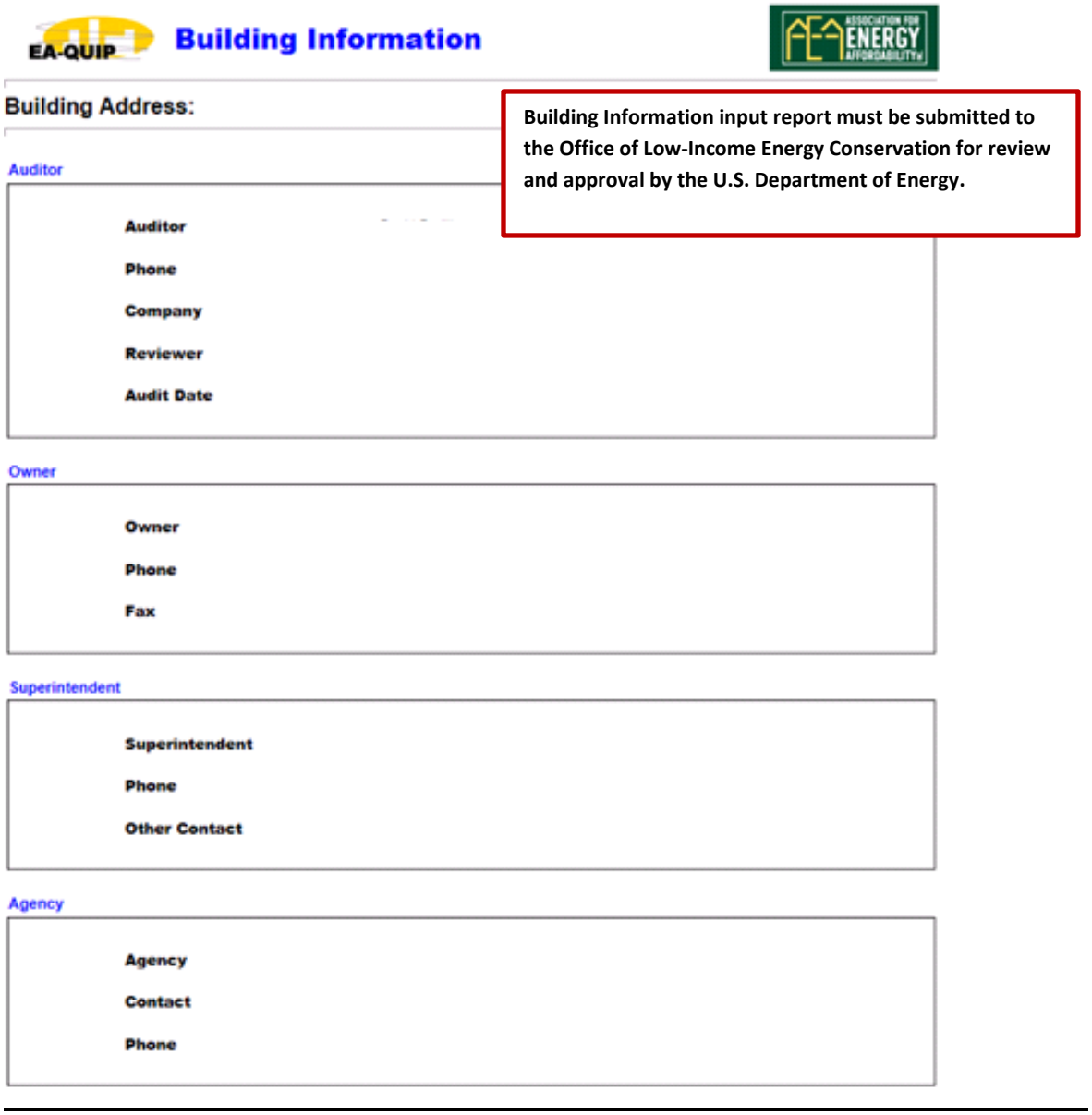
Billing Summary

Fuel Period Analysis:	396 Days
Total Fuel:	12,979.352 Therms
Total Fuel Bill Amount:	$14,149.80
Average Fuel Cost:	$1.09

Yearly Usage

	Actual	Normalized
Total Usage:	12,944	14,158
Monthly Base:	421	421
Heating Degree Days (HDD):	4,663	5,115

Date	Quantity (Therms)	Bill Amount ($)
04/22/2012	0.0	0
05/22/2012	667.232	813.25
06/22/2012	411.779	506.20
07/23/2012	429.411	529.20
08/21/2012	415.583	512.67
09/20/2012	566.783	646.89
10/19/2012	878.26	945.04
11/19/2012	1280.525	1294.24
12/20/2012	1378.293	1600.80
01/23/2013	1645.07	1814.08
02/20/2013	1501.24	1568.23
03/22/2013	1906.56	1977.23
04/23/2013	1150.28	1152.62
05/23/2013	748.336	789.35



EA-QUIP **Building Information**

ASSOCIATION FOR ENERGY AFFORDABILITY

Building Address:

Building Information input report must be submitted to the Office of Low-Income Energy Conservation for review and approval by the U.S. Department of Energy.

Auditor

Auditor

Phone

Company

Reviewer

Audit Date

Owner

Owner

Phone

Fax

Superintendent

Superintendent

Phone

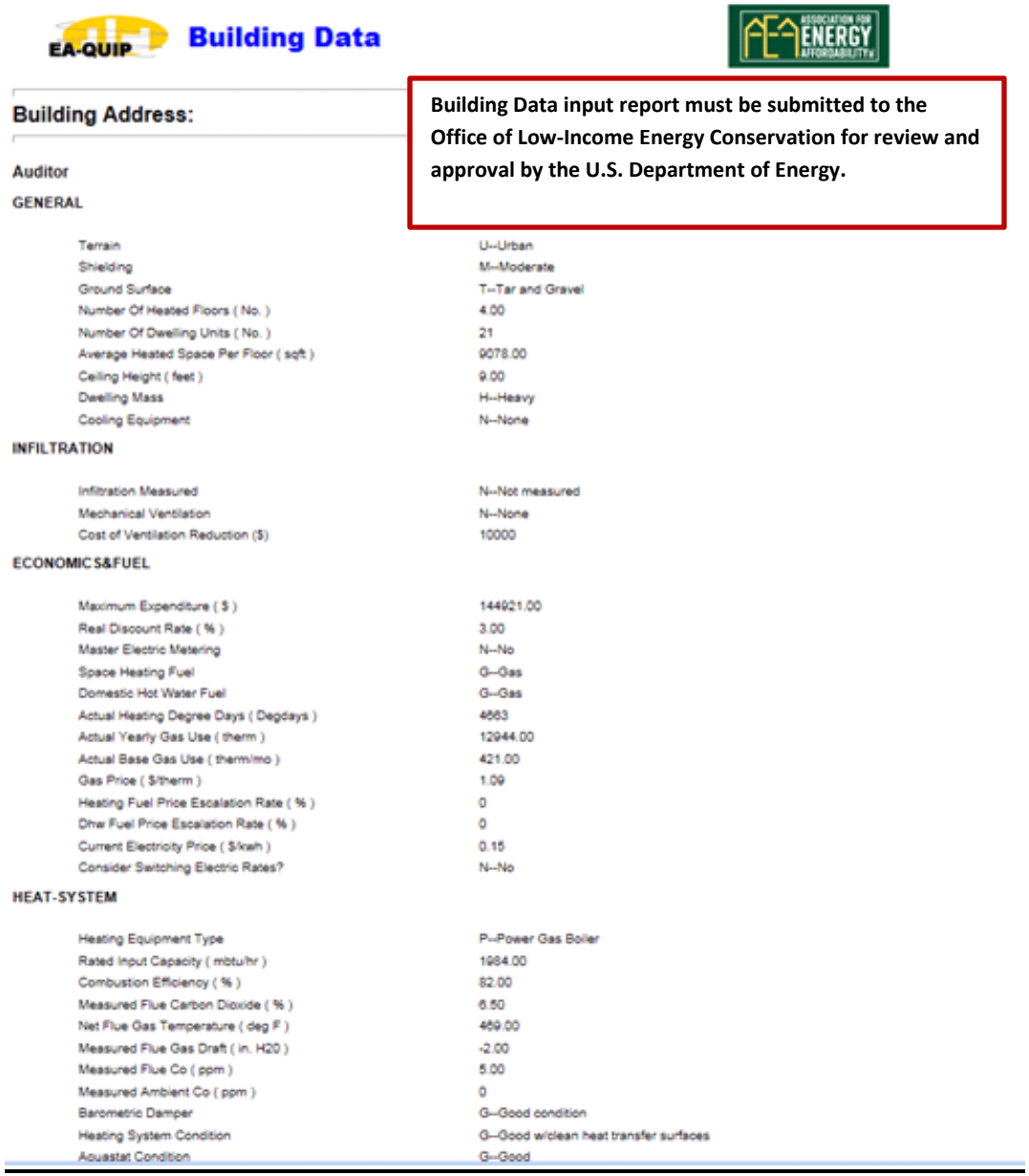
Other Contact

Agency

Agency

Contact

Phone



EA-QUIP **Building Data**

Building Address:

Building Data input report must be submitted to the Office of Low-Income Energy Conservation for review and approval by the U.S. Department of Energy.

Auditor

GENERAL

Terrain	U--Urban
Shielding	M--Moderate
Ground Surface	T--Tar and Gravel
Number Of Heated Floors (No.)	4.00
Number Of Dwelling Units (No.)	21
Average Heated Space Per Floor (sqft)	9078.00
Ceiling Height (feet)	9.00
Dwelling Mass	H--Heavy
Cooling Equipment	N--None

INFILTRATION

Infiltration Measured	N--Not measured
Mechanical Ventilation	N--None
Cost of Ventilation Reduction ($)	10000

ECONOMICS&FUEL

Maximum Expenditure ($)	144921.00
Real Discount Rate (%)	3.00
Master Electric Metering	N--No
Space Heating Fuel	G--Gas
Domestic Hot Water Fuel	G--Gas
Actual Heating Degree Days (Degdays)	4663
Actual Yearly Gas Use (therm)	12944.00
Actual Base Gas Use (therm/mo)	421.00
Gas Price ($/therm)	1.09
Heating Fuel Price Escalation Rate (%)	0
Dhw Fuel Price Escalation Rate (%)	0
Current Electricity Price ($/kwh)	0.15
Consider Switching Electric Rates?	N--No

HEAT-SYSTEM

Heating Equipment Type	P--Power Gas Boiler
Rated Input Capacity (mbtu/hr)	1984.00
Combustion Efficiency (%)	82.00
Measured Flue Carbon Dioxide (%)	6.50
Net Flue Gas Temperature (deg F)	469.00
Measured Flue Gas Draft (in. H20)	-2.00
Measured Flue Co (ppm)	5.00
Measured Ambient Co (ppm)	0
Barometric Damper	G--Good condition
Heating System Condition	G--Good w/clean heat transfer surfaces
Aquastat Condition	G--Good

Energy Analysis Of Existing Conditions

Energy Analysis report must be submitted to the Office of Low-Income Energy Conservation for review and approval by the U.S. Department of Energy.

Building Address:

Auditor:

Seasons

The HEATING season is from October through May. The COOLING season is from June through September.

Physical

Total Living Space (sqft):	36312.00		Heating	Cooling
Number of Apartments:	21	Season Infiltration (cfm):	1341.20	802.45
Dwelling Volume (cuft):	326808.0	Air Exchange Rate (ach):	0.25	0.15

(BTU/Hr/degF)	Overall	Roof	Wall	Win & Doors	Base
Conduction	4078.46	388.24	766.58	2359.84	563.79
Infiltration	826.76	265.83	99.13	423.00	38.80
Total	4905.22	654.07	865.71	2782.84	602.59

(sqft)	North	East	South	West	Horizontal
Wtr Solar Aperture	331.71	252.76	337.55	279.17	86.76
Smr Solar Aperture	331.71	252.76	337.55	279.17	86.76

System & Economics

	Heating	Cooling	Water Heater	Electric
Day/Night Temp (degF)	72/67.0	78/80	130	-n/a-
Real Fuel Escalation(%)	0.00	0.00	0.00	0.00

EA-QUIP

Energy Savings Measures

Based On User Selected Retrofits

ASSOCIATION FOR ENERGY AFFORDABILITY

Building Address:

Auditor **Audit Date:**

Original Operating Cost: $17,210.81 /yr **Savings In Operating Cost:** $5,501.13 /yr

	Heating	Cooling	Water Heater	EAEM (*)
Original Building (MMBtu/yr)	794.83	0.00	374.50	101.63
Retrofitted Building(MMBtu/yr)	478.16	0.00	353.39	60.22
Energy Savings	39.84%	0.00%	5.64%	40.75%

(*) EAEM (EA-Quip Applicable Electric Meausures): lighting and refrigerators eligible for replacement, range and dryers if electric.

Description	Location	Heating (%)	Cooling (%)	Water Heater (%)	Other Electric (%)
REPLACE w/LowE argon-filled Thermal Pane	Primary (Windows)	39.63	-	-	-
WTHSTRIP Windows/SEAL frames	Primary (Windows)	3.49	-	-	-
Replace apartment lighting	Lighting	-1.33	-	-	16.56
Install 386 kwh/yr REFRIGERATOR	Appliance	-1.95	-	-	24.13
LO-FLO showers & restrictors	Appliance	-	-	5.64	-

EA-QUIP

Energy Savings Measures

Based On System Defined Retrofits

ASSOCIATION FOR ENERGY AFFORDABILITY

Building Address:

Auditor: **Audit Date:**

Original Operating Cost: $17,210.81 /yr **Savings In Operating Cost:** $5,501.13 /yr

	Heating	Cooling	Water Heater	EAEM (*)
Original Building (MMBtu/yr)	794.83	0.00	374.50	101.63
Retrofitted Building(MMBtu/yr)	478.16	0.00	353.39	60.22
Energy Savings	39.84%	0.00%	5.64%	40.75%

(*) EAEM (EA-Quip Applicable Electric Meausures): lighting and refrigerators eligible for replacement, range and dryers if electric.

Description	Location	Heating (%)	Cooling (%)	Water Heater (%)	Other Electric (%)
Replace apartment lighting	Lighting	-1.33	-	-	16.56
LO-FLO showers & restrictors	Appliance	-	-	5.64	-
Install 386 kwh/yr REFRIGERATOR	Appliance	-1.95	-	-	24.13
REPLACE w/LowE argon-filled Thermal Pane	Primary (Windows)	39.63	-	-	-
WTHSTRIP Windows/SEAL frames	Primary (Windows)	3.49	-	-	-

EA-QUIP

Savings And Costs Analysis

Based On User Selected Retrofits

ASSOCIATION FOR ENERGY AFFORDABILITY

Building Address:

Auditor: **Audit Date:**

Investment Cost:	$54,773.90	**Investment Limit:**	$144,921.00
Original Operating Cost:	$17,210.81 /yr	**Savings In Operating Cost:**	$5,498.56 /yr

	Energy Factor	EAEM + Cooling (*)
Original Building	6.91 BTU/sqft/HDD	29,776.04 kWh/yr
Retrofitted Building	4.91 BTU/sqft/HDD	17,643.78 kWh/yr
% Savings	**28.89 %**	**40.75 %**

*) EAEM(EA-Quip Applicable Electric Measures): lighting and refrigerators eligible for replacement, range and dryers if electric.

Description	Location	First Year savings ($)	Initial Cost ($)	Simple Payback (yrs)	Cumulative Cost ($)
REPLACE w/LowE argon-filled Thermal Pane	Primary (Windows)	3433.27	39400.74	11.5 yr	39400.74
WTHSTRIP Windows/SEAL frames	Primary (Windows)	302.71	7100.00	23.5 yr	46500.74
Replace apartment lighting	Lighting	623.78	105.00	0.2 yr	46605.74
Install 386 kwh/yr REFRIGERATOR	Appliance	908.64	8100.00	8.9 yr	54705.74
LO-FLO showers & restrictors	Appliance	230.16	68.16	0.3 yr	54773.90

Savings And Costs Analysis

Based On System Defined Retrofits

Savings and Costs Analysis (System Defined Retrofit) report must be submitted to the Office of Low-Income Energy Conservation for review and approval by the U.S. Department of Energy.

Building Address:

Auditor:

Investment Cost:	$54,773.90	**Investment Limit:**	$144,921.00
Original Operating Cost:	$17,210.81 /yr	**Savings In Operating Cost:**	$5,498.56 /yr

	Energy Factor	EAEM + Cooling (*)
Original Building	6.91 BTU/sqft/HDD	29,776.04 kWh/yr
Retrofitted Building	4.91 BTU/sqft/HDD	17,643.78 kWh/yr
% Savings	**28.89 %**	**40.75 %**

(*) EAEM(EA-Quip Applicable Electric Measures): lighting and refrigerators eligible for replacement, range and dryers if electric.

Description	Location	First Year savings ($)	Initial Cost ($)	Simple Payback (yrs)	Cumulative Cost ($)
Replace apartment lighting	Lighting	623.78	105.00	0.2 yr	105.00
LO-FLO showers & restrictors	Appliance	230.16	68.16	0.3 yr	173.16
Install 386 kwh/yr REFRIGERATOR	Appliance	908.64	8100.00	8.9 yr	8273.16
REPLACE w/LowE argon-filled Thermal Pane	Primary (Windows)	3433.27	39400.74	11.5 yr	47673.90
WTHSTRIP Windows/SEAL frames	Primary (Windows)	302.71	7100.00	23.5 yr	54773.90

EA-QUIP

Investment Analysis

ASSOCIATION FOR ENERGY AFFORDABILITY

Based On User Selected Retrofits

Building Address:

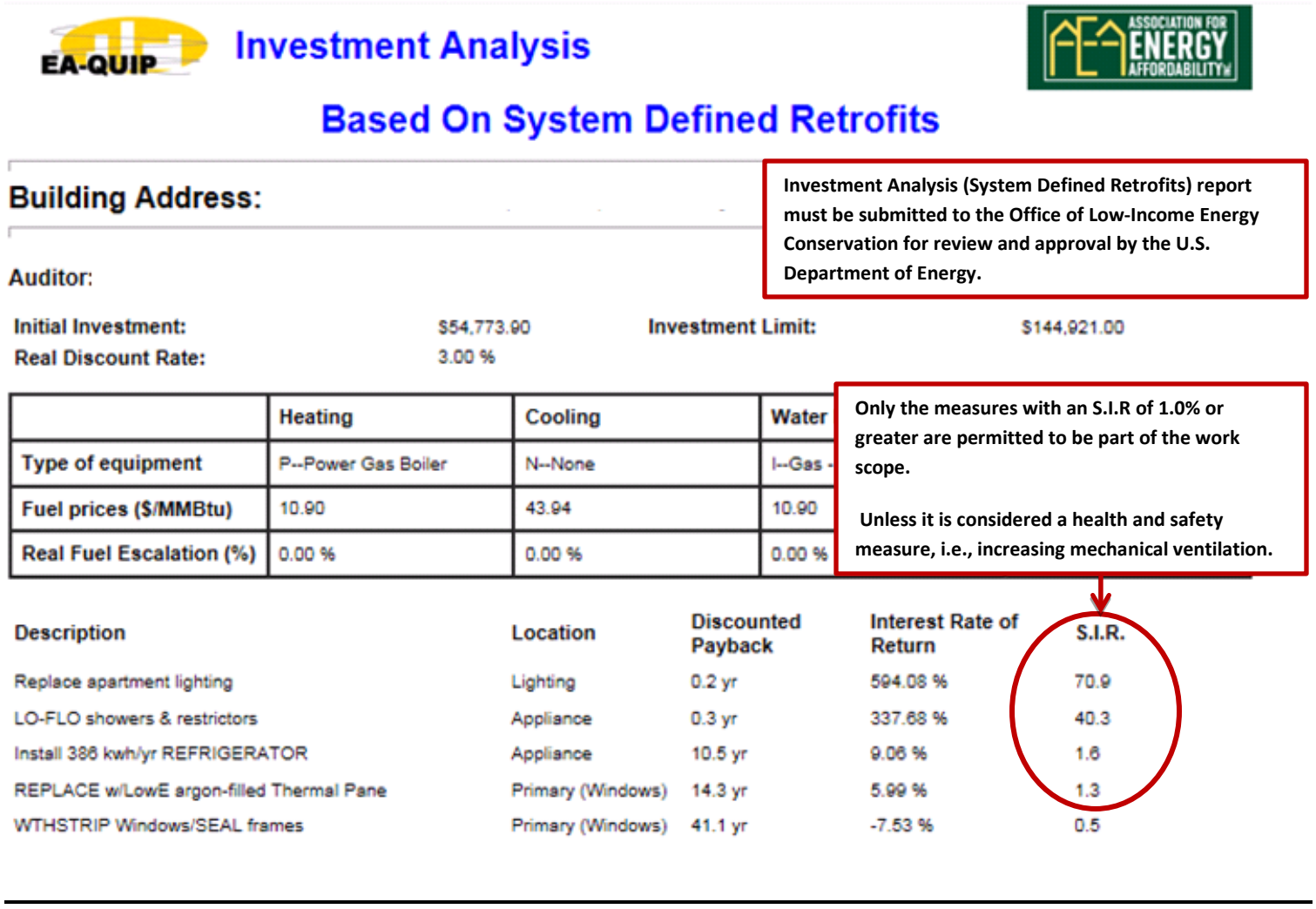
Auditor: **Audit Date:**

Initial Investment: $54,773.90 **Investment Limit:** $144,921.00

Real Discount Rate: 3.00 %

	Heating	Cooling	Water Heater	Other Electric
Type of equipment	P--Power Gas Boiler	N--None	I--Gas - insulated	
Fuel prices ($/MMBtu)	10.90	43.94	10.90	43.94
Real Fuel Escalation (%)	0.00 %	0.00 %	0.00 %	0.00 %

Description	Location	Discounted Payback	Interest Rate of Return	S.I.R.
Replace apartment lighting	Lighting	0.2 yr	594.08 %	70.9
LO-FLO showers & restrictors	Appliance	0.3 yr	337.68 %	40.3
Install 386 kwh/yr REFRIGERATOR	Appliance	10.5 yr	9.06 %	1.6
REPLACE w/LowE argon-filled Thermal Pane	Primary (Windows)	14.3 yr	5.99 %	1.3
WTHSTRIP Windows/SEAL frames	Primary (Windows)	41.1 yr	-7.53 %	0.5



EA-QUIP

Investment Analysis

Based On System Defined Retrofits

Building Address:

Auditor:

Investment Analysis (System Defined Retrofits) report must be submitted to the Office of Low-Income Energy Conservation for review and approval by the U.S. Department of Energy.

Initial Investment:	$54,773.90	**Investment Limit:**	$144,921.00
Real Discount Rate:	3.00 %		

	Heating	Cooling	Water
Type of equipment	P--Power Gas Boiler	N--None	I--Gas -
Fuel prices ($/MMBtu)	10.90	43.94	10.90
Real Fuel Escalation (%)	0.00 %	0.00 %	0.00 %

Only the measures with an S.I.R of 1.0% or greater are permitted to be part of the work scope.

Unless it is considered a health and safety measure, i.e., increasing mechanical ventilation.

Description	Location	Discounted Payback	Interest Rate of Return	S.I.R.
Replace apartment lighting	Lighting	0.2 yr	594.08 %	70.9
LO-FLO showers & restrictors	Appliance	0.3 yr	337.68 %	40.3
Install 386 kwh/yr REFRIGERATOR	Appliance	10.5 yr	9.06 %	1.6
REPLACE w/LowE argon-filled Thermal Pane	Primary (Windows)	14.3 yr	5.99 %	1.3
WTHSTRIP Windows/SEAL frames	Primary (Windows)	41.1 yr	-7.53 %	0.5

EA-QUIP **Retrofit Costs**

ASSOCIATION FOR ENERGY AFFORDABILITY

Building Address:

Retrofit Costs report must be submitted to the Office of Low-Income Energy Conservation for review and approval by the U.S. Department of Energy.

Auditor:

GENERAL

Description	Existing Conditions	Units	Fixed Cost	Cost Per Unit	Service Life of Measure
Raise ambient cooling Temp 3 Deg F		each	10000.00	0.00	10
Raise ambient cooling Temp 5 Deg F		each	10000.00	0.00	10
Install 5 F Cooling night setback		each	1000.00	0.00	10
Install 10 F Cooling night setback		each	1000.00	0.00	10
Upgrade room air conditioners		each	0.00	360.00	13

INFILTRATION

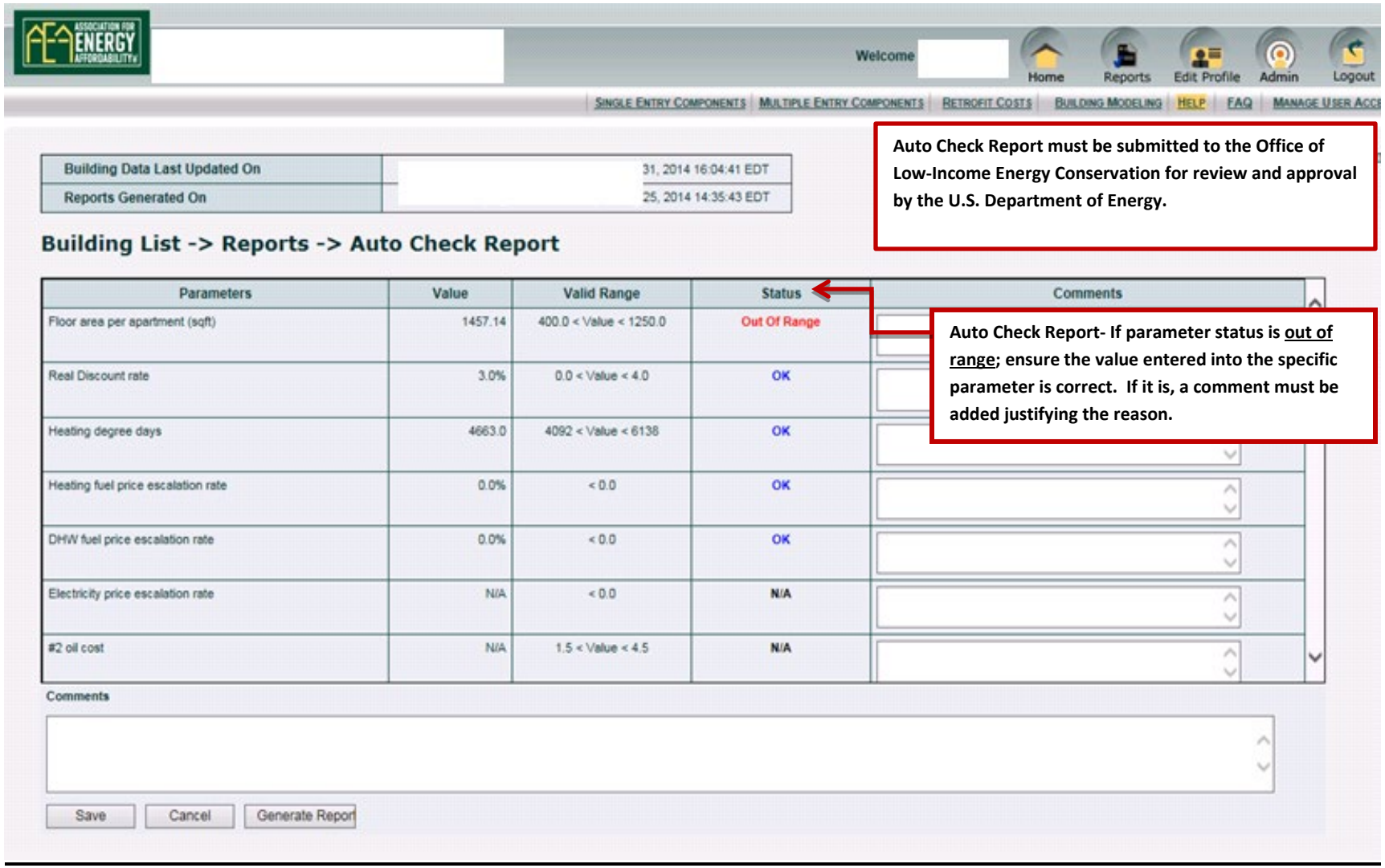
Description	Existing Conditions	Units	Fixed Cost	Cost Per Unit	Service Life of Measure
SEAL house (Blower Door)		each	500.00	0.00	13

ECONOMIC-FUEL

Description	Existing Conditions	Units	Fixed Cost	Cost Per Unit	Service Life of Measure
SWITCH electric rates		each	0.00	0.00	0

HEATING SYSTEM

Description	Existing Conditions	Units	Fixed Cost	Cost Per Unit	Service Life of Measure


Welcome
Home
Reports
Edit Profile
Admin
Logout
SINGLE ENTRY COMPONENTS
MULTIPLE ENTRY COMPONENTS
RETROFIT COSTS
BUILDING MODELING
HELP
FAQ
Building Data Last Updated On
31, 2014 16:04:41 EDT
Reports Generated On
25, 2014 14:35:43 EDT
Building List -> Reports -> Auto Check Report
Auto Check Report must be submitted to the Office of Low-Income Energy Conservation for review and approval by the U.S. Department of Energy.
Parameters
Value
Valid Range
Status
Comments
Floor area per apartment (sqft) 1457.14 400.0 < Value < 1250.0 Out Of Range
Real Discount rate 3.0% 0.0 < Value < 4.0 OK
Heating degree days 4663.0 4092 < Value < 6138 OK
Heating fuel price escalation rate 0.0% < 0.0 OK
DHW fuel price escalation rate 0.0% < 0.0 OK
Electricity price escalation rate N/A < 0.0 N/A
#2 oil cost N/A 1.5 < Value < 4.5 N/A
Auto Check Report- If parameter status is out of range; ensure the value entered into the specific parameter is correct. If it is, a comment must be added justifying the reason.
Comments
Save
Cancel
Generate Report

EA-QUIP

Post-Install Calculated Usage

ASSOCIATION FOR ENERGY AFFORDABILITY

Post-Install Calculated Usage report must be submitted to the Office of Low-Income Energy Conservation for review and approval by the U.S. Department of Energy.

Building Address:

Auditor:

Month	Post-Install Calculated Fuel Usage	Pre-Install Actual Fuel Usage	DayTime Heat On-Time	NightTime Heat On-Time	Total Heating Load	Solar Gain	Infiltration	NH Electric **
	Therms	Therms	%	%	MMBtu	MMBtu	ac/hr	MWh
January	1,524.00	2,234.00	13.90	3.70	88.00	6.00	0.17	1.5
February	1,287.00	1,970.00	13.10	3.10	72.00	10.00	0.16	1.4
March	1,075.00	1,743.00	10.60	0.00	54.00	19.00	0.16	1.5
April	625.00	1,053.00	4.40	0.00	17.00	25.00	0.12	1.4
May	391.00	569.00	0.00	0.00	-9.00	34.00	0.11	1.5
June	379.00	421.00	0.00	0.00	-27.00	34.00	0.08	1.4
July	391.00	421.00	0.00	0.00	-33.00	33.00	0.08	1.5
August	391.00	421.00	0.00	0.00	-24.00	26.00	0.07	1.5
September	379.00	421.00	0.00	0.00	-9.00	19.00	0.08	1.4
October	626.00	847.00	4.10	0.00	16.00	13.00	0.10	1.5
November	927.00	1,400.00	9.00	0.00	43.00	7.00	0.13	1.4
December	1,393.00	2,010.00	13.20	2.40	76.00	6.00	0.16	1.5
Sum	**9,388.00**	**13,510.00**			**264.00**	**232.00**		**17.5**
Average	**782.33**	**1,125.83**	**5.69**	**0.77**	**22.00**	**19.33**	**0.12**	**1.46**

(**) NH Electric (Non-Heating Electric Use): includes EAEM (EA-Quip Applicable Electric Measures), cooling use and domestic use of electric.

2.2 Buy down and Leveraging

In recent years, the Department of Energy (DOE) has increased the focus on leveraging activities and specifically, since 2010, allowed a provision to include buy downs for multifamily weatherization in the Program. This provision creates flexibility for programs to install measures that save energy but don't achieve the necessary Savings-to-Investment Ratio (SIR) by allowing the agencies to secure funding to apply to the cost of the measure, bringing down the cost of the measure to meet the SIR requirement.

Buy Down – aligns with a private interest and the funding source retains the decision-making authority in identifying the building being selected for installation of the measure(s). Buy down is only available in multifamily dwellings (including small buildings with 2-4 units) because a contribution is required for a buy down to occur. For a measure to qualify for the buy down, the package of measures, including the full cost (the pre-buy down cost) of the measure, which is to be bought down, must have an SIR $\geq$ 1.0. In the event contributions are made by a landlord that exceeds the agreement and there is no stipulation the funds be expended on a specific building(s), then those funds would be considered *leveraged* funds and could follow the modified auditing approach below.

Leveraging – aligns with the intention of supplementing the weatherization resources and the funding source does not identify specific buildings for the investment. For WAP, funds that are considered "leveraged" indicates the funding source has transferred decision-making authority to the WAP agency to determine which buildings will receive the measure(s). If funds are *leveraged* and the funding source does not identify specific buildings but transfers decision-making authority to the agency to determine which buildings will receive the measure(s), DOE will allow agencies to simplify the auditing process and run the audit once with the leveraged cost included.

In instances where the funds are being used to reduce the cost of a measure to meet the programs SIR requirement (e.g., furnaces or solar systems), agencies may enter the "discounted" cost for the measure into the audit tool (as if they were purchasing the item "on sale") and document the discounted costs and funding sources in the file. This approach is appropriate only in cases where the measure being "discounted" remains the last measure in the package of measures being installed.

Any instances wherein the measure isn't last on the list, the audit shall by reviewed on a case-by-case by the assigned State Monitor prior to implementation. In the examples of high efficiency furnaces being made available at a discounted price, WAP agencies would enter the actual cost incurred by WAP into the audit tool, not the full cost as required with a buy down.

3. Priority List Policy
   DOE has set forth cold climate region 3 Priority Lists (PLs) for the following housing types, Single Family (SB), Manufactured Home (MH) and Low-rise Multi-family (LRMF) projects.

   Each PL has guidelines for implementation, if the housing type does not comply with the requirements for use or there are measures needed not represented on the approved PL measure list. (HESWAP Measure list attached). Then the auditor must use the Weatherization Assistant (WA) 8.9v for Single family and Manufactured Housing. For Low-rise multifamily 5 to 24 units the auditor must use EA. Quip or if the conditions are met the WA 8.9v NEAT audit.

   Single family (SB-PL)- wood framed, site-built home cannot exceed 3 stories in height above grade. The primary heating system cannot be sealed combustion natural gas furnace with an AFUE greater than or equal to 90% or a heat pump manufactured after 2006.

   Manufactured Homes (MH-PL) single or double-wide must have been manufactured prior to 2010 and have unconditioned sub-spaces that are accessible (for example the flooring system) The PL cannot be implemented if the primary heating system is a natural gas furnace with an AFUE greater than or equal to 80% and if there is an attached conditioned addition.

   The above PL's cannot be used if the job needs incidental repair measures exceeding the monetary limit of $500 meeting the definition and allowable measures in WAP Policy Chapter 4, section 4. Ancillary and Incidental Repair Measures.

   Low-rise Multifamily (LRMF-PL) wood framed, low-rise structure must have five or more dwelling units per building and cannot exceed 3 stories above grade in height. Incidental Repair Measure costs cannot exceed 10% of the total cost of PL energy conservation measures.

The 3 cited PL's have optional measures that have cost limitations. Optional Hot Water General Waste measures cannot exceed $250. These measures include faucet aerators, low flow shower heads, water heater insulation wrap, and water pipe insulation wrap 6 ft out from tank.

Optional Refrigerator replacements must have an Energy Guide rating of < 400 kwh/year and cannot exceed the total cost of $850 including safe disposal of the old refrigerator.

If the auditor determines the PL will be used based on requirements set forth in this policy, the auditor must use the DOE approved PL Check Lists located in the Appendix Weatherization Forms under Chapter 4 Energy Audits (https://www.nj.gov/dca/divisions/dhcr/offices/docs/wap/Priority%20List%20Checklists%20%26%20Required%20Documents_DOE%20Comments_8.25.22.pdf) The Combustion Safety and Heating Improvement Survey located in Chapter 6 Heating Systems of the Appendix (https://www.nj.gov/dca/divisions/dhcr/offices/docs/wap/Updated%20Combustion-Safety%20&%20Heating%20Improvement%20Survey.pdf) and the Educational Notification & Health and Safety Assessment form located in Chapter 3 Health and Safety of the Appendix (https://www.nj.gov/dca/divisions/dhcr/offices/docs/wap/Heating%20Improvement%20Survey.pdf).

The health and safety assessment is of paramount importance. All relevant health and safety measures must be installed as per the New Jersey DOE approved Health and Safety Plan.

The final inspection protocols will remain the same. Required diagnostic testing for CAZ including combustion testing must be performed wherever combustion appliances exist, in every building and dwelling unit where weatherization is to be performed. Mandatory blower door and pressure pan testing (only if duct work is

located outside the thermal boundary) must be completed at the preliminary as well as the final inspection.

The PL implemented for sole grant cannot exceed the Average Cost Per Unit (ACPU) limit as defined in WAP Policy Chapter 7 WAP Agency's Grant Management and Program Operations, section 3.15.

Any measure listed as "mandatory" may only be skipped if it is physically impossible to install or the requirements for that measure are already satisfied.

The PL can be used with dual funding if the job meets the requirements in policy Chapter 7 WAP Agency's Grant Management and Program Operations, section 3.22 Dual Funding. Measures ranked higher on the regional PL must be charged to DOE grant funds whereas the lower and/or optional PL measures, dependent on monetary resources can be applied to LIHEAP and/or DOE grant funds.

DOE funds can be spent on "optional" measures only if all applicable mandatory measures are installed as well.

If DOE funds are used for the project but another funding source is used for a mandatory measure, that measure must still meet the requirements of the DOE WAP PL.

4. Compliance Review

The State Monitors will be randomly selecting three to four completed energy audits for review every quarter. State Monitors will provide feedback to WAP agencies through a completed Audit Reviews Summary of Finding(s) Form which can be found in the Appendix. This serves several purposes:

1. Ensuring NJ homes are being weatherized based on quality and accurate audits.
2. Providing feedback on the quality of the energy audits which will identify weaknesses and need for training for field staff.
3. Reviews foster sharing of expertise among State Monitors and strengthening quality of monitoring.

WAP Agencies are required to correct deficiencies in audits within 30 calendar days of the receipt of the Audit Reviews Summary of Finding(s) Form.

5. Incidental Repair Measures (IRM) and Ancillary Items

Incidental Repair Measure (IRM) is a repair necessary for the effective performance or preservation of newly installed weatherization materials, but not part of a standard installation. IRM installations must be associated with a specific Energy Conservation Measure (ECM) or group of ECMs. IRMs must be justified by written and photo documentation in the client file. The cost of all IRMs is added to the cost of the package of ECMs, when calculating the total package SIR for the whole project. The total package of ECMs must yield a cumulative SIR of 1.0 or greater to be an allowable expenditure of WAP funds.

Ancillary (ANCIL) items necessary for the proper installation of ECMs as required by the National Renewable Energy Laboratory (NREL) Standard Work Specifications, manufacturer specifications, and/or the Authority having Jurisdiction (AHJ) to a finished product in a typical installation where no unusual or extensive repairs are needed. Ancillary items typically refer to small items such as hardware, fasteners, adhesives, sealant, etc. The cost of the ancillary items and their installation must be included with in the cost of the individual ECM.

The following chart provides allowable ancillary and incidental repair measures used in the WAP.

Energy Conservation Measure (ECM)	**Ancillary Items** (Additional cost must be included for individual ECM)	**Incidental Repair Measures** (Measure must be entered into Itemized Cost of the energy audit)
Attic Insulation	• Eave baffles • Damming hatch • Dams for heat producing devices • Dams separating open attic from floored attic. • Insulation air-sealing backing	• Attic vents • Repair, replace, or reinforce the ceiling to support the weight of insulation. • Install solid core door at walk-up attic entry. Separating conditioned from non-conditioned areas.
Wall Insulation	• Fasteners for patches • Interior blow patch, sand prime wall	• Repair, replace, or reinforce the wall to support the pressure of dense pack

Belly Insulation (mobile)	• Repair/replace rodent barrier • Flexible patches • Fasteners	• Skirting
Crawlspace Insulation	• Restrainer materials Wood lath, twine, wire supports, fasteners	• Foundation vents
Rim Joist Insulation/Sill plate air-sealing (Basement into house envelope)		• Install solid core door leading to exterior cellar door. Separating conditioned from non-conditioned area.
Air-Sealing	• Fasteners for patches	• Unusually large coverage such as 1 sheet of sheetrock, patching
Attic Hatch Install	• Fasteners, primer, etc.	• Demolition and/or framing for new hatch
Knee-wall or crawlspace access door Install	• Hinges • Laches • Primer	• Demolition of deteriorated existing framing. • New trim/stop
Replacement Windows	• Fasteners • Interior and exterior caulk	• Replace broken stops • Repair or replace rotten jambs and wall framing
Replacement Doors	• Hinges • Doorknobs • Dead bolt • Primer	• Repair or replace damaged framing

6. ADDENDUM

(8-89)
EFG (07-90)

United States Government **Department of Energy**

Memorandum

DATE: September 1, 2022
REPLY TO
ATTN OF: EE-5W

SUBJECT: Supplemental Conditional Approval of the New Jersey Energy Audit Procedures for Site-Built Single Family, Manufactured Housing, & Low-Rise Multifamily for the Weatherization Assistance Program – Adding Priority Lists

TO: Felix Vazquez-Guemarez & Michael Peterson, Project Officers, Weatherization Assistance Program, U.S. Department of Energy

EFFECTIVE: 9/1/2022

To ensure that energy audit procedures of sufficient technical rigor are used in the U.S. Department of Energy's (DOE's) Weatherization Assistance Program (WAP), Grantees must submit their energy audit procedures to DOE for approval every five years for review and approval in alignment with §440.21 and Weatherization Program Notice (WPN) 19-4.

Based on review of the submitted material, New Jersey's Energy Audit Tool and/or Priority List and their procedures are approved as follows:

Table 1 – Energy Audit Tool Approvals

Tool	Building Type	Comments	Expiration Date
WA v8.9 (NEAT)	Site-Built Housing (SBH) (1-4 Units)	See Tables 3, 4 & 5 and Attachments 1 & 2	2/21/2027
WA v8.9 (MHEA)	Manufactured Housing (MH)	See Tables 3, 4 & 5 and Attachments 1 & 2	2/21/2027
N/A	Small Multifamily (SMF) (5-24 Units)	NJ has no SMF EA approval. See Table 2 and Attachment 3 for LRMF PL details.	N/A

N/A	Large Multifamily (LMF) (25+ Units)	NJ has no LMF EA approval.	N/A

Table 2 – Priority List Approvals		
Building Type	**Housing Characteristics That Priority List Applies To**	**Expiration Date**
Site-Built Housing (SBH) (1-4 Units)	DOE Region 3 Priority List – Attachment 3	2/21/2027
Manufactured Housing (MH)	DOE Region 3 Priority List – Attachment 3	2/21/2027
Low-Rise Multifamily (LRMF)	DOE Region 3 Priority List – Attachment 3	2/21/2027
Large Multifamily (LMF) (25+ Units)	NJ has no Priority List approval for LMF	N/A

Per the procedure allowed by 10 CFR 440.21b and set forth in WPN 19-4 the following materials/audit procedures have been approved for use in New Jersey's program in addition to those allowed by 10 CFR 440 Appendix A:

Table 3 - Special Materials/Audit Procedures Approvals	
Item	**Comments**
Light Emitting Diode (LED) Lighting	Approved 5/11/2017
Spray Polyurethane Foam (SPF) Insulation	Approved 12/18/2018
Heat Pump Domestic Water Heaters	Approved 10/14/2021
Refrigerators (Energy Star or Equivalent)	Approved 10/14/2021
Lifetime Changes (see Attachment 1)	Approved 10/14/2021

Per the procedure allowed by 10 CFR 440.20 and set forth in WPN 19-4 the following General Heat Waste Reduction measures are approved for use in New Jersey's program, not to exceed $250 in total costs:

Table 4 – Approved General Heat Waste (GHW) Measures	
Item	**Comments**
Grantee has no approved GHW measures. All Energy Conservation Measures (ECM) must be modeled for energy savings.	

The following conditions apply to these audit approvals:

Table 5 - Approval Conditions	
Building Type (SBH, MH, SMF, LMF)	**Conditions Explanation**
SBH, MH	NJ Submitted a Corrective Action Plan (CAP) which DOE has accepted and attached for record (see Attachment 2).

This approval of the State of New Jersey energy audit procedures (Energy Audit Tool and/or Priority List) expires on the dates outlined in Tables 1 and 2 above. As of the effective date of this memo, all previous energy audit or priority list approvals for these housing type(s) are no longer valid. The Grantee must submit its energy audit procedures to DOE for reapproval at least 6 months prior to their expiration date.

Please forward this memorandum to the Grantee agency and answer any questions they may have concerning its contents.

Erica Burrin
Erica Burrin
Program Manager
Weatherization and Intergovernmental Program
Energy Efficiency and Renewable Energy

Attachment 1 – Approved Lifetimes for New Jersey's Energy Audit Tools
Attachment 2 – New Jersey Corrective Action Plan Submittal
Attachment 3 – Approved Regional Priority Lists – 9/1/2022

Attachment 1 - Approved Lifetimes for New Jersey's Energy Audit Tools

New Jersey Weatherization Assistance Program
Approved Maximum Lifetimes of Weatherization Measures
As per Attachment 9 of WPN 19-4

NEAT Measures Considered

New Jersey Weatherization Assistance Program requires all sub-grantees to enable for evaluation the Measures listed below on the NEAT audit tool with the DOE- approved Life Expectancy in the audit.

Measures Considered	Life Expectancy
Attic insulation R-11	30 Years
Attic insulation R-19	30 Years
Attic insulation R-30	30 Years
Attic insulation R-38	30 Years
Attic insulation R-49	30 Years
Fill Ceiling Cavity	30 Years
Floor Insulation R-11	30 Years
Floor Insulation R-19	30 Years
Floor Insulation R-30	30 Years
Floor Insulation R-38	30 Years
Wall Insulation	30 Years
Kneewall Insulation (airtight cavity)	30 Years
Replace heating system (fossil fuel systems only)	20 Years
High Efficiency Fossil Fuel Boiler	20 Years
High Efficiency Fossil Fuel Furnace	20 Years

MHEA Measures Considered

New Jersey Weatherization Assistance Program requires all sub-grantees to enable for evaluation the Measures listed below on the MHEA audit tool with the DOE- approved Life Expectancy in the audit

Measures Considered	Life Expectancy
Wall Fiberglass Batt Insulation	30 Years
Wall Fiberglass Batt Insulation in Addition	30 Years
Wall Cellulose Loose Insulation	30 Years
Wall Cellulose Loose Insulation in Addition	30 Years
Wall Fiberglass Loose Insulation	30 Years
Wall Fiberglass Loose Insulation in Addition	30 Years
Floor Cellulose Loose Insulation	30 Years
Floor Cellulose Loose Insulation in Addition	30 Years
Floor Fiberglass Loose Insulation	30 Years
Floor Fiberglass Loose Insulation in Addition	30 Years
Roof Cellulose Loose Insulation	30 Years
Roof Cellulose Loose Insulation in Addition	30 Years
Roof Fiberglass Loose Insulation	30 Years
Roof Fiberglass Loose Insulation in Addition	30 Years
Replace Heating System (Fossil Fuel Furnaces only)	20 Years

Attachment 2- New Jersey Corrective Action Plan Submittal

Proposed Corrective Actions and Milestones:

- Desktop Monitor Training (Grantee) – Q3 2021
  - Specific training for DCA staff
  - 3-day, online training
  - Monitors will review past audits from NJ WAP Network during training, using online tools and other aids to verifying the data collection and modeling
  - Additional coaching beyond in-person training may be needed
- Auditor Training (Subgrantees) – Q4 2021 These are scheduled.
  - Comprehensive training for Service Provider Energy Auditor/QCI
  - 3-4-day, in-person, in-field training
- Developing an Audit Review Tracking Tool to be used by DCA – Q3 2021
  - Create an online spreadsheet/database to evaluate each audit and track the audits that will be submitted for review
- Mandatory Audit Submission – Q3 2021
  - Require every auditor to submit all 5 SB and 5 MH audits to DCA for review
  - DCA will review the audits, providing feedback and required corrections, if any
  - Auditor will make corrections and re-submit, if needed, or continue with job
  - After submitting three consecutive SB audits that are determined to be proficient by the Audit Review Tool, auditor will be provisionally cleared to create energy models without requirement of review, pending DOE approval
- DOE review of those three consecutively proficient audits for each provisionally cleared auditor to become fully cleared and proceed without the need for submitting further audits – Q3 2022
  - DOE will have access to online Audit Review Tracking Tool
  - As each auditor is provisionally cleared, DOE will be notified
  - The three consecutively proficient audits and DCA reviews will be evaluated for approval
- Creating a State Specific WA 8.9 Manual – Q4 2021
  - Rework Oklahoma WA Manual to fit New Jersey program
  - Mobile friendly for ease of use

Attachment 3 – Approved Regional Priority Lists – 9/1/2022

Region 3 (Cold) – Single-Family Site-Built PL

1. Mandatory: Install all applicable Health and Safety (H&S) measures per the Grantee's DOE-approved H&S Plan.
2. Mandatory: Light Emitting Diode (LED) lighting replacement of all existing screw-based incandescent, halogen, or compact fluorescent lighting used for a minimum of one hour per day.
    - Lighting Replacement SWS
3. Mandatory: Air Sealing – seal the exterior pressure boundary surfaces at all the following locations: attic top-plates; ceiling, wall, and floor bypasses, penetrations, and holes; sill box to floor intersection if on unconditioned crawlspace or basement, or entire sill box area if conditioned foundation.
    - Target value is 1 cfm/ft2 of conditioned floor area.
    - Air sealing SWS
4. Mandatory: Duct Sealing – seal all accessible ducts located outside the thermal boundary.
    - Target value is 1 Pascal per register as measured with a Pressure Pan.
    - Duct sealing SWS
5. Mandatory: Duct Insulation – insulate all accessible uninsulated ducts located outside the thermal boundary to R-8 or R12 if exposed to the exterior.
    - General Duct insulation SWS
6. Mandatory: Ceiling insulation
    - Unconditioned Attic
        i. Mandatory: insulate all accessible attics to R-60 or to capacity if less.
            - Attic Floors - Unconditioned Attics SWS
        ii. Mandatory: insulate all uninsulated enclosed attics to capacity (e.g., floored or cathedral).
            - Attic Floors - Unconditioned Attics SWS
    - Finished Attic / Kneewall Attic / Bonus Room
        i. Mandatory: Insulate all attic flats (collar beam & outer ceiling joists) to R-60 or to capacity if less.
            - Attic Floors - Unconditioned Attics SWS
        ii. Mandatory: Insulate all uninsulated attic enclosed roof rafter slopes to maximum capacity possible.
            - Inaccessible Ceilings – Dense Pack SWS
        iii. Mandatory: Insulate all uninsulated knee walls to R-15 or to capacity, whichever is greater.
            - Attic Knee Walls SWS
7. Mandatory: Wall Insulation
    a. Mandatory: – Insulate any exterior wall cavity with no existing insulation to full dense-packed capacity.
    b. Optional: – Insulate any partially insulated exterior wall cavities (e.g., 3.5" cavity with 2" of existing batt) using dense-pack insulation.
        - Dense Pack Insulation SWS

8. Mandatory: Foundation Insulation – (skip measure if foundation is slab)
    a. Conditioned or Unvented Foundations
        - Mandatory: Insulate accessible rim/band joist (sill box) to R-30 or to capacity, if less.
        - Optional: Insulate accessible above-grade foundation walls to R-15 continuous insulation or R-19 cavity insulation or to capacity, if less.
        - Rim/Band Joist SWS, Conditioned Subspaces: Walls SWS
    b. Unconditioned or Vented Foundations
        - Mandatory: Insulate all floors over unconditioned foundations to R-30 or to full joist capacity, if less. Must include complete ground moisture barrier over any exposed dirt floors.
        - Floors SWS, Ground Vapor Retarders SWS

8. Optional: - (**$250** per home DOE WAP funds cap)
    - Faucet aerators (≤2.2 GPM) – Low-Flow Devices SWS
    - Showerhead (≤2.5 GPM) - Low-Flow Devices SWS
    - Domestic Water Heater (DWH) tank insulation (R-10 minimum) – Tank Insulation SWS
    - DWH pipe insulation (6' of both hot and cold-water lines nearest the DWH, and any accessible hot water lines beyond that to R-3) – Pipe Insulation SWS
9. Optional: Replace up to (1) refrigerator per home, with a label rating of less than 400kWh/yr and maximum installed cost of **$850** per unit when the existing refrigerator:
    - Was manufactured before 2001, OR
    - Uses >1000 kWh/yr based upon energy use metering or industry accepted resource.
        - Refrigerator Replacement SWS
10. Optional: Primary Heating and Air-Conditioning System Replacements
        - Heating & Cooling: Equipment Installation SWS

    i) Replace existing ducted electric resistance forced-air furnace and air conditioning combination with a heat pump of minimum 10/HSPF & COP @5°F >1.75 (at maximum capacity operation) which includes an EC air handler motor.
    ii) Replace existing combination of non-ducted fixed electric resistance heat (e.g., electric baseboard, and PTAC units), and non-ducted air conditioning (i.e., window or room A/C, including PTAC) with a minimum 10/HSPF & COP @5°F >1.75 (at maximum capacity operation) mini-split heat pump system.
    i) Replace existing ducted heat pump system that is manufactured before 2006 with a heat pump rated a minimum of 10/HSPF & COP @5°F >1.75 (at maximum capacity operation) which must include an EC air handler motor.
    iii) Replace existing window A/C manufactured before 2014 with a minimum 12 CEER or higher unit of the same or lesser BTU capacity.
    iv) If the home has any other existing combination of heating/cooling systems other than as described above, then an energy model may be run that assumes items 1-8 have been completed and determine if an alternative heating/cooling system replacement is cost effective for this specific home.

Region 3 (Cold) – Manufactured Home PL

1. Mandatory: Install all applicable Health and Safety (H&S) measures per the Grantee's DOE-approved H&S Plan.
2. Mandatory: Light Emitting Diode (LED) lighting replacement of all existing screw-based incandescent, halogen, or compact fluorescent lighting used for a minimum of one hour per day.
    - Lighting Replacement SWS
3. Mandatory: Air Sealing – seal the primary pressure boundary surfaces at the following locations: attic top-plates (if accessible); all penetrations and holes through the ceiling, exterior walls, and floor.
    a. Target value is 1 cfm/ft2 of conditioned floor area.
        - Air sealing SWS
4. Mandatory: Duct Sealing – seal all accessible ducts. At a minimum, seal all end caps, crossovers, duct boot connections, holes or penetrations, and furnace connections.
    a. Target value is 1 Pascal per register.
        - Duct sealing SWS
5. Mandatory: Ceiling insulation (both flat and vaulted ceilings) – fill ceiling to capacity with blown insulation.
        - Attic Floors – Unconditioned Attics SWS
6. Mandatory: Floor/Belly Insulation – Fill all belly cavities to capacity and proper density (1.25-1.75 pounds per cubic foot) with blown insulation after air sealing floor and ducts.
    a. MH Belly Insulation SWS, Ground Vapor Retarder SWS
7. Mandatory: Replace all single-paned metal-framed windows with Low-E double-paned windows having a U-value of 0.33 or less. Single pane windows with storm windows are not eligible for replacement using DOE funds.
        - Window Replacement SWS
8. Optional: - (**$250** per home DOE WAP funds cap)
    a. Faucet aerators (≤2.2 GPM) – Low-Flow Devices SWS
    b. Showerhead (≤2.5 GPM) - Low-Flow Devices SWS
    c. Domestic Water Heater (DWH) tank insulation (R-10) – Tank Insulation SWS
    d. DWH pipe insulation (6' of both hot and cold-water lines nearest the DWH, and any accessible hot water lines beyond that to R-3.) – Pipe Insulation SWS
9. Optional: Replace up to (1) refrigerator per home, with a label rating of less than 400kWh/yr and maximum installed cost of **$850** per unit when the existing refrigerator:
    a. Was manufactured before 2001, OR
    b. Uses >1000 kWh/yr based upon energy use metering or industry accepted resource.
        - Refrigerator and Freezer Replacement SWS
10. Optional: Primary Heating and Air-Conditioning System Replacements
        - Heating & Cooling: Equipment Installation SWS

    i) Replace existing window A/C manufactured before 2014 with a 12 CEER or higher unit of the same or lesser BTU capacity.
    ii) If the home has any other existing combination of heating/cooling systems other than as described above, then an energy model may be run that assumes items 1-7 have been completed and determine if an alternative heating/cooling system replacement is cost effective for this specific home.

Region 3 (Cold) – LRMF PL

1. Mandatory: Install all applicable Health and Safety (H&S) measures per the Grantee's DOE-approved H&S Plan.
2. Mandatory: Light Emitting Diode (LED) lighting replacement of all existing screw-based incandescent, halogen, or compact fluorescent lighting used for a minimum of one hour per day.
    - Lighting Replacement SWS
3. Mandatory: Air Sealing – seal the primary pressure boundary surfaces at the following locations: attic top-plates; attic ceiling; exterior wall, and floor penetrations, and holes; sill box to floor intersection if on unconditioned crawlspace or basement, or entire sill box area if conditioned foundation.
    - Air sealing SWS
4. Mandatory: Duct Sealing – seal all accessible ducts located outside the thermal boundary.
    - Duct sealing SWS
5. Mandatory: Duct Insulation – insulate all accessible uninsulated ducts located outside the thermal boundary to R-8 or R12 if exposed to the exterior.
    - General Duct insulation SWS
6. Mandatory: Ceiling insulation – insulate all accessible attics to R-60 or to capacity if less.
    - Attic Floors - Unconditioned Attics SWS
7. Mandatory: Wall Insulation
    - Mandatory – where the total gross area of any uninsulated exterior wall is >10%, insulate the missing areas to capacity with dense pack insulation.
    - Optional – Insulate any partially insulated exterior wall cavities (e.g., 3.5" cavity with 2" of existing batt) using dense-pack insulation.
        - Dense Pack Insulation SWS
8. Mandatory: Foundation Insulation – (skip measure if foundation is slab)
    c. Conditioned or Unvented Foundations
        - Mandatory: Insulate accessible rim/band joist (sill box) to R-30 or to capacity, if less.
        - Optional: Insulate accessible above-grade foundation walls to R-15 continuous insulation or R-19 cavity insulation or to capacity, if less.
        - Rim/Band Joist SWS, Conditioned Subspaces: Walls SWS

    d. Unconditioned or Vented Foundations
        - Mandatory: Insulate all floors over unconditioned foundations to R-30 or to full joist capacity, if less. Must include complete ground moisture barrier over any exposed dirt.
        - Floors SWS, Ground Vapor Retarders SWS
9. Optional: - (**$250** per dwelling unit DOE WAP funds cap)
    - Faucet aerators (≤2.2 GPM) – Low-Flow Devices SWS
    - Showerhead (≤2.5 GPM) - Low-Flow Devices SWS
    - Domestic Water Heater (DWH) tank insulation (R-10) – Tank Insulation SWS
    - DWH pipe insulation (6' of both hot and cold-water lines nearest the DWH, and any accessible hot water lines beyond that to R-3) – Pipe Insulation SWS

10. Optional: Replace up to (1) refrigerator per dwelling unit, with a label rating of less than 400kWh/yr and maximum installed cost of **$850** per unit when the existing refrigerator:
    - Was manufactured before 2001, OR
    - Uses >1000 kWh/yr based upon energy use metering or industry accepted resource.
        - Refrigerator and Freezer Replacement SWS
11. Optional: LED lighting replacement of fluorescent tube lighting - Lighting Replacement SWS
12. Optional: Primary Heating and Air-Conditioning System Replacements
    - Heating & Cooling: Equipment Installation SWS

    ii) Replace existing ducted electric resistance forced air furnace and air conditioning combination with a heat pump of minimum 10/HSPF & COP @5°F >1.75 (at maximum capacity operation) which includes an EC air handler motor.

    iii) Replace existing combination of non-ducted fixed electric resistance heat (e.g., electric baseboard, and PTAC units), and non-ducted air conditioning (i.e., window or room A/C, including PTAC) with a minimum 10/HSPF & COP @5°F >1.75 (at maximum capacity operation) mini-split heat pump system.

    iv) Replace existing ducted heat pump system that is manufactured before 2006 with a heat pump rated a minimum of 10/HSPF & COP @5°F >1.75 (at maximum capacity operation) which must include an EC air handler motor.

    v) Replace any existing window A/C system manufactured before 2014 with a new 12 CEER or higher unit.

    vi) If the building has any other existing combination of heating/cooling systems other than as described above, then an energy model may be run in compliance with the Grantee's DOE-approved audit process which assumes items 1-8 have been completed and determine if an alternative heating/cooling system replacement is cost effective for this specific building.