

Best Practice – Accuracy Checks on Manual J Calculations

Date: September 2018

Subject: Check for Accurate Manual J Calculations

Problem or Question: Our agency does not have a certified HVAC technician, or HVAC geek on our staff. How can we ensure that the Manual J calculations provided by our contractor are accurate and going to help reduce energy consumption for our clients?

Discussion:

What is a Manual J? (1) Manual J calculations are required by IRC so every contractor should be very familiar with them and how to run them; they are part of normal business for any HVAC contractor, not something excessive that the WAP program requires. (2) Manual J is just a calculation of the heating/cooling load on the house. The calculation is based on building information, location, and orientation. It is software where the contractor inputs information about the unit, and then the software does the calculation and produces the answer. As long as the information input is accurate, the calculation will take care of itself and there doesn't need to be any variance from the calculated load.

Acceptable Software:

The weatherization program requires that you/your contractor use ACCA approved software when running their Manual Js. At the time this Best Practice was posted, there are 7 ACCA approved software options, listed below:

- [Wrightsoft Right-J8](#)
- [Elite RHVAC](#)
- [Adtek Acculoads](#)
- [Florida Solar Energy Center's EnergyGauge](#)
- [Carmelsoft HVAC ResLoad-J](#)
- [Avenir MJ8 Editions of HeatCAD and LoopCAD](#)
- [Cool Calc Manual J](#)

If your contractor is not using one of these vendors, that contractor MUST switch and use an ACCA approved software for ALL weatherization jobs.

Why does it matter? The sizing of the equipment is extremely important for the air quality inside the house. The HVAC equipment not only produces the conditioned air for the house (hot/cold air), but it also addresses ventilation and humidity control inside the house. Properly sized HVAC equipment cycles (runs) at maximum equipment performance while producing the proper amount of conditioned air, all while maintaining the proper humidity level within the house. With an oversized HVAC, the system will "short cycle" which means the HVAC will run for short periods of time, which doesn't allow the equipment to reach its highest efficiency run-time. Short cycling typically means higher energy usage (since the equipment isn't running as efficiently) and poor humidity control. Analogy: short cycling is the equivalent of turning your car on/off at each stop (traffic/stop light/stop sign) on the way to work; that doesn't make sense at all: it isn't good for the engine and is terrible for your gas mileage. You don't do that to your car, why would you want to do that to the most expensive piece of equipment in the house? An undersized HVAC almost NEVER happens. If you have a contractor that installs a smaller piece of equipment than the Manual J calls for, you have found the industry unicorn, so give that person a hug and take a selfie with them. The impact of an undersized unit is that the unit will run all the time (high energy draw) and the humidity control will probably be too dry in the house. A well done post-weatherization house should make it very difficult to undersize an HVAC system.

Post weatherization: a house with highly improved air and thermal barriers (air sealing & insulation), well-sealed ducts, and highly reduced heat gain (exterior – solar screens, interior – lighting, refrigerator, CAZ zone offs) should be an efficient building that can maximize the benefit of a new, properly sized and Energy Star rated HVAC system. A replacement HVAC unit being installed in a post weatherization house should be the same size, or 0.5-1.0 ton smaller.

Quality Control Checks:

Having quality control on the Manual J calculations is key. The two most obvious options for QC are (1) Peer review from multiple HVAC contractors, and (2) data input checks.

- (1) If you have more than 1 HVAC guy, or more than 1 person that knows anything about Manual Js:
 - Have different contractors run Manual Js on the same house and compare results, or
 - Have the contractors “peer review” each other’s work for accuracy
- (2) Data Input verification by Subrecipient staff: this is where you can review the Manual J to check some pretty basic info that has a huge impact on the load calculation to ensure it was input accurately and therefore the load calculated is appropriate for the post-weatherized unit. Some data points you can find on the Manual J to ensure accuracy are:

- Design Conditions
 - Weather Station
 - Make sure the weather station is close to the house being evaluated.
 - Indoor Design temperatures
 - DOE guidance identifies an indoor design temperature of 78 in the summer and 68 in the winter for Texas
 - Temperature settings are huge in determining sizing. If you tell the software that the house is kept at 68 during the day in the summer in Texas, the load is going to be significantly larger, therefore your equipment size will be larger. The standard for Texas should 68 in the winter and 78 in the summer, or something realistic and relative to the specific client (if they run their house hotter/colder, etc)
 - Any variance from these temperature settings need to be thoroughly documented. 68/78 are the target temperatures for the clients to use; client education on why those temperatures are the goal is important.
- Construction Quality
 - This generically addresses the infiltration of the house. There are 4-5 options that range from Very Tight to Very Loose. The house, after being weatherized, should be “average” or tighter. Make sure that the option selected matches the final blower door reading. Remember to maximize air sealing measures and install them effectively to get the house as tight as possible.

In a Manual J, there is a section where you can verify a lot of construction information. This section is comparable to the NEAT Input Report in that it shows some very basic building component information that was entered into the software that greatly impacts the overall load of the house. In this section, you will find the following:

- Ceiling: This is where the final attic insulation levels are input. Make sure that the insulation level is accurate about the house post weatherization.
- Walls: This is where the final wall insulation levels are input. Make sure that the insulation level is accurate about the house post weatherization.

- Floors: This is where the final floor insulation levels are input. Make sure that the insulation level is accurate about the house post weatherization.
 - If the home is a slab home, there should be no load coming through the floor. If it is a pier and beam house, make sure that the insulation level is accurate about the house post weatherization.
- Windows: This is where information about the windows from the house post weatherization. Make sure information about replaced windows or added solar screens are input correctly.
- Doors: This is where information about the doors from the house post weatherization. Make sure information about replaced doors are input correctly.

It is possible that the "Construction Descriptions" section is not provided with each and every Manual J calculation received from your contractor. As a result, you might need to request this section at random for QC, or tell your contractor to include this section with every Manual J for QC, whatever you think works best for your staff and your contractor to get the best results.

Recommendation Summary: Manual J calculations are a requirement. Ensuring that they are run correctly and accurately is something that the contractor should do automatically. If something seems off, look further into it and verify what you can to ensure the best option is being installed in the client's home. It doesn't take an expert to verify data input; do some quality control checks to make sure the calculation is accurate!

Below are pictures of Manual J calculations to show more specific examples of where to look on the printouts to help with your QC checks.

Wrightsoft Software

The screenshot shows a 'Design Conditions' report with several callouts pointing to specific fields:

- Weather Station** points to the location 'Somewhere Cool, TX'.
- Indoor design temperatures** points to the 'Indoor' section, specifically the heating and cooling design temperatures.
- Construction Quality** points to the 'Infiltration' section, specifically the 'Construction quality' field set to 'Average'.

Design Conditions			
Location:			
Somewhere Cool, TX			
Elevation: 846 ft			
Latitude: 31°N			
Outdoor:	Heating	Cooling	
Dry bulb (°F)	30	98	
Daily range (°F)	-	21 (M)	
Wet bulb (°F)	-	74	
Wind speed (mph)	15.0	7.5	
Indoor:	Heating	Cooling	
Indoor temperature (°F)	68	72	
Design TD (°F)	38	26	
Relative humidity (%)	30	50	
Moisture difference (gr/lb)	11.8	33.9	
Infiltration:			
Method	Simplified		
Construction quality	Average		
Fireplaces	0		

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Basic Design Conditions

Weather Station

- Make sure the weather station is close to the house being evaluated.

Indoor Design temperatures

- DOE guidance identifies an indoor design temperature of 78 in the summer and 68 in the winter for Texas
- Temperature settings are huge in determining sizing. If you tell the software that the house is kept at 68 during the day in the summer in Texas, the load is going to be significantly larger, therefore your equipment size will be larger. The standard for Texas should be 68 in the winter and 78 in the summer, or something realistic and relative to the specific client (if they run their house hotter/colder, etc).
- Any variance from these temperature settings need to be thoroughly documented. 68/78 are the target temperatures for the clients to use; client education on why those temperatures are the goal is important.

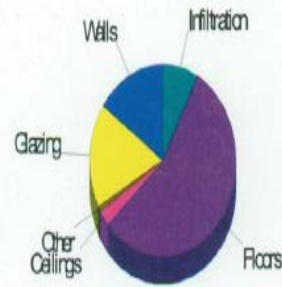
Construction Quality

- This is usually under the Infiltration header. This is basically asking the leakiness of the house. There are 4-5 options that range from Very Tight to Very Loose. The house, after being weatherized, should be "average" or tighter. Remember to maximize air sealing measures and install them effectively to get the house as tight as possible.

These pie charts are very indicative of the construction of the house. The pie charts show where the heating/cooling load from the house is coming from. Based on what you know about the house, determine if the higher load areas seem reasonable; if not, then investigate further.

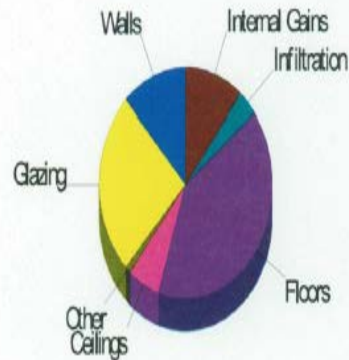
Heating

Component	Btuh/ft ²	Btuh	% of load
Walls	3.5	6829	15.2
Glazing	33.4	7940	17.7
Doors	11.1	357	0.8
Ceilings	1.0	1245	2.8
Floors	20.0	24948	55.6
Infiltration	1.6	3573	8.0
Ducts		0	0
Piping		0	0
Humidification		0	0
Ventilation		0	0
Adjustments		0	0
Total		44892	100.0



Cooling

Component	Btuh/ft ²	Btuh	% of load
Walls	2.0	3948	12.2
Glazing	35.1	8346	25.7
Doors	10.6	341	1.1
Ceilings	1.6	1952	6.0
Floors	10.5	13124	40.4
Infiltration	0.5	1186	3.7
Ducts		0	0
Ventilation		0	0
Internal gains		3550	10.9
Blower		0	0
Adjustments		0	0
Total		32447	100.0



The pie chart above indicates that the floor is where the biggest load is coming from (1) the floor, followed by (2) glazing (windows), then (3) walls. Based on what you know about this specific house, do these three factors seem like they would be the biggest load contributors? If so, then the calculation could be on track. Or, if that doesn't seem right, there are few scenarios where you would want to investigate further: if this is a slab house, or a pier and beam house with a properly insulated floor, that appear to be wrong and need to be investigated why the calculation shows this amount of load coming through the floor. You'd need to look at the data input about the floor. For glazing, does the house have new solar screens or are there existing low-e windows? If so, you might need to look into this, if not and the windows are single pane with limited shade, then it could be right. For the walls, are they insulated or are they empty? If they were empty, and you dense-pack insulated them, does this seem right?

Design Information

Weather: Somewhere Cool, TX

Winter Design Conditions		Summer Design Conditions	
Outside db	30 °F	Outside db	98 °F
Inside db	68 °F	Inside db	72 °F
Design TD	38 °F	Design TD	26 °F
		Daily range	M
		Relative humidity	50 %
		Moisture difference	34 gr/lb

Indoor Design Temperatures

Heating Summary		Sensible Cooling Equipment Load Sizing	
Structure	44892 Btuh	Structure	32447 Btuh
Ducts	0 Btuh	Ducts	0 Btuh
Central vent (0 cfm) (none)	0 Btuh	Central vent (0 cfm) (none)	0 Btuh
Humidification	0 Btuh	Blower	0 Btuh
Plumbing		Use manufacturer's data	y
Equipment		Rate/swing multiplier	
		Equipment sensible load	

Construction Quality: infiltration factor.

Infiltration		Latent Cooling Equipment Load Sizing	
Method		Structure	1975 Btuh
Construction quality	Simplified Average	Ducts	0 Btuh
Fireplaces	0	Central vent (0 cfm) (none)	0 Btuh
		Equipment latent load	1975 Btuh
		Equipment Total Load (Sen+Lat)	34423 Btuh
		Req. total capacity at 0.70 SHR	3.9 ton

Infiltration		Latent Cooling Equipment Load Sizing	
Area (ft ²)	2044	Structure	1975 Btuh
Volume (ft ³)	16352	Ducts	0 Btuh
Air changes/hour	0.32	Central vent (0 cfm) (none)	0 Btuh
Equiv. AVF (cfm)	87	Equipment latent load	1975 Btuh

Recommended HVAC Size

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Sq Footage and Volume should match BD/DB Sheet

From this table, you can verify basic information quickly:

Weather station - Is that close to the house?

Indoor design temperatures – The default temperatures are 68 in the winter, 78 in the summer. Are the correct temperatures used? If not, is there a valid reason, specific to that client, why another temperature is being used?

Construction Quality – Air infiltration factor. The selection of “average” in this example, does that feel right based on your final post weatherization blower door? Ask your contractor what “average” means to them, to make sure your final blower door is properly represented in this selection.

Square Footage & Volume – Should match the square footage and volume you have documented throughout the assessment and on the blower door sheet.

HVAC size – This is the “answer” to the calculation. This is what the software is recommending to be installed in the house. If this recommended size is bigger than the existing HVAC being replaced, you should absolutely investigate further. If it is the same size, this could be right, but you should still ensure data input is accurate for post WAP work. Ideally, the size will be smaller than the existing because of the efficiency improvements made to the rest of the house through the WAP program.

Design Conditions									
Location: Somewhere Cool, TX Elevation: 040 ft Latitude: 31°N			Indoor: Indoor temperature (°F) Design TD (°F) Relative humidity (%) Moisture difference (gr/lb)		Heating 68 38 30 11.8		Cooling 72 26 50 33.9		
Outdoor: Drybulb (°F) Daily range (°F) Wet bulb (°F) Wind speed (mph)		Heating 30 - - 15.0		Cooling 98 21 (M) 74 7.5		Infiltration: Method: Simplified Construction quality: Average Fireplaces: 0			
Construction descriptions									
	Or	Area ft²	U-value Btu/ft²·F	Insul R ft²·F/Btu	Htg HTM Btu/ft²	Loss Btu	Clg HTM Btu/ft²	Gain Btu	
Walls									
12C-0bw: Frm wall, brk 4" ext, r-13 cav ins, 1/2" gypsum board int									
n		467	0.091	13.0	3.49	1633	2.02	944	
fnsh, 2"x4" wood frm, 16" o.c. stud									
e		496	0.091	13.0	3.49	1733	2.02	1002	
s		501	0.091	13.0	3.49	1751	2.02	1012	
w		490	0.091	13.0	3.49	1712	2.02	990	
all		1954	0.091	13.0	3.49	6829	2.02	3948	
Partitions (none)									
Windows									
1D-c2om: 2 glazing, clr outr, air gas, mtl no brk frm mat, clr innr, 1/4" gap, 1/8" thk; 50% blinds 45°, medium; 6.67 ft head ht									
n		117	0.870	0	33.4	3898	31.6	3686	
s		115	0.870	0	33.4	3842	36.8	4227	
w		6	0.870	0	33.4	200	72.3	434	
all		238	0.870	0	33.4	7940	35.1	8346	
Doors									
11P0: Door, mtl pur core type									
n		32	0.290	10.5	11.1	357	10.6	341	
Ceilings									
16B-38ad: Attic ceiling, asphalt shingles roof mat, r-38 cell ins, 1/2" gypsum board int fnsh									
		1247	0.026	38.0	1.00	1245	1.57	1952	
Floors									
20P-0t: Fir floor, wd fir, 1" thkns, tile flr fnsh, amb ovr									
		833	0.521	0	20.0	16665	10.5	8767	
		414	0.521	0	20.0	8283	10.5	4357	
		1247	0.521	0	20.0	24948	10.5	13124	

Indoor Design Temperatures

Somewhere Cool, TX

Construction Quality: infiltration factor.

Walls are R13

Window U-value

Door R Value

Attic Sq Ft

Ceiling has R38

Floor has R0

Floor Sq Ft

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This is the "Construction Descriptions" table that is very helpful for data input quality control checks.

Walls: Make sure that the insulation level is accurate about the house post weatherization. The example shows that all the walls have existing R13. It also lists that the walls are 2x4 construction, 16" on center, with 1/2" sheetrock on the interior. All these factors impact the load as well, so double check this information as well!

Windows: Make sure information about replaced windows or added solar screens are input correctly. The example has some codes to signify the glazing and window type; you'd have to ask the contractor for those codes to know what "1D-c2om: 2 glazing" actually means. You can see all the windows have a U-value of 0.870, which is the equivalent of R1.5. Based on the windows in the house, does this seem accurate? Also note that there is 238 total sq ft of windows on this house, lots of windows to impact the load.

U-value is something you can check with simple math. Energy Star windows have a U-value of 0.35-0.40; the lower the U-value, the better insulation factor for the window. U-value of single pane glass is around 1.22.

R value = 1/U value. EX: U-value of 0.35 = $1/0.35 = R2.38$. EX2: U-value of 1.22 = $1/1.22 = R0.82$

Ceiling: Make sure that the insulation level is accurate about the house post weatherization. The example shows that the ceiling has an R38. It also shows that the ceiling square footage is 1247, but the total house square footage is 2044 from previous page. Is it a 2 story house, part of the house with flat roof, or data input error?

Floors: Make sure that the insulation level is accurate about the house post weatherization. The example shows that the floor has an R0. It also shows that the floor square footage is 1247, which matches the attic, but the total house square footage is 2044 from previous page.

Doors: Make sure information about replaced doors are input correctly. The example has some codes to signify the door type; you'd have to ask the contractor for those codes to know what "11P0 door: mtl pure core type" actually means. You can see the door is evaluated with an R-value of 10.5. Based on the doors in the house, does this seem accurate? Also note that there is on 32 total sq ft of doors on this house, a lot less square footage than the windows.

Typical R value ranges for doors will be between 3.7 – 15. A door with an R15 is a 2" thick, solid core, metal door filled with foam (not a normal door for WAP houses).

Elite Software



Prepared By:

Thursday,

Rhvac is an ACCA approved Manual J and Manual D computer program.
Calculations are performed per ACCA Manual J 8th Edition, Version 2, and ACCA Manual D.



For Elite Software, the 8th edition is no longer supported by Elite. Make sure to update the software to the 9th edition as soon as possible.

General Project Information

Project Title:
 Project Date:
 Client Name:
 Company Name:

Weather Station

Design Data

Reference City: Cool Place, TX
 Building Orientation: Front door faces North
 Daily Temperature Range: Medium
 Latitude: 32 Degrees
 Elevation: 537 ft.
 Altitude Factor: 0.981
 Elevation Sensible Adj. Factor: 1.000
 Elevation Total Adj. Factor: 1.000
 Elevation Heating Adj. Factor: 1.000
 Elevation Heating Adj. Factor: 1.000

Building Orientation

	Outdoor Dry Bulb	Outdoor Wet Bulb	Outdoor Rel.Hum	Indoor Rel.Hum	Indoor Dry Bulb	Grains Difference
Winter:	22	20.45	80%	n/a	70	n/a
Summer:	99	74	31%	50%	75	23

Check Figures

Total Building Supply CFM:	1,271	CFM Per Square ft.:	0.688
Square ft. of Room Area:	1,848	Square ft. Per Ton:	474
Volume (ft ³) of Cond. Space:	12,936		

Building Loads

Total Heating Required Including Ventilation Air:	56,761 Btuh	56.761 MBH
Total Sensible Gain:	38,580 Btuh	82 %
Total Latent Gain:	8,186 Btuh	18 %
Total Cooling Required Including Ventilation Air:	46,766 Btuh	3.90 Tons (Based On Sensible + Latent)

Sq Footage & Volume

HVAC Size

Basic Design Conditions

Weather Station

- Make sure the weather station is close to the house being evaluated.

Building Orientation – The orientation of the house will impact the load based on which side of the building is facing east or west and the amount of windows facing those directions. Ensure that the orientation is the same as the documentation from the initial assessment.

Square Footage & Volume – Should match the square footage and volume you have documented throughout the assessment and on the blower door sheet.

HVAC size – This is the “answer” to the calculation. This is what the software is recommending to be installed in the house. If this recommended size is bigger than the existing HVAC being replaced, you should absolutely investigate further. If it is the same size, this could be right, but you should still ensure data input is accurate for post WAP work. Ideally, the size will be smaller than the existing because of the efficiency improvements made to the rest of the house through the WAP program.

Miscellaneous Report

System 1	Outdoor Dry Bulb	Outdoor Wet Bulb	Outdoor Rel.Hum	Indoor Rel.Hum	Indoor Dry Bulb	Grains Difference
Input Data						
Winter:	22	20.45	80%	n/a	70	n/a
Summer:	99	74	31%	50%	75	22.65

Duct Sizing Inputs

	Main Trunk	Runouts
Calculate:	Yes	Yes
Use Schedule:	Yes	Yes
Roughness Factor:	0.00300	0.01000
Pressure Drop:	0.1000 in.wg./100 ft.	0.1000 in.wg./100 ft.
Minimum Velocity:	650 ft./min	450 ft./min
Maximum Velocity:	900 ft./min	750 ft./min
Minimum Height:	0 in.	0 in.
Maximum Height:	0 in.	0 in.

Outside Air Data

	Winter	Summer
Infiltration Specified:	0.380 AC/hr 82 CFM	0.200 AC/hr 43 CFM
Infiltration Actual:	0.000 AC/hr	0.000 AC/hr
Above Grade Volume:	X 12,936 Cu.ft. 0 Cu.ft./hr	X 12,936 Cu.ft. 0 Cu.ft./hr
	X 0.0167	X 0.0167
Total Building Infiltration:	0 CFM	0 CFM
Total Building Ventilation:	431 CFM	431 CFM

---System 1---

Infiltration & Ventilation Sensible Gain Multiplier: 25.89 = (1.10 X 0.981 X 24.00 Summer Temp. Difference)

Infiltration & Ventilation Latent Gain Multiplier: 15.10 = (0.68 X 0.981 X 22.65 Grains Difference)

Infiltration & Ventilation Sensible Loss Multiplier: 51.78 = (1.10 X 0.981 X 48.00 Winter Temp. Difference)

Winter Infiltration Specified: 0.380 AC/hr (82 CFM), Construction: Average

Summer Infiltration Specified: 0.200 AC/hr (43 CFM), Construction: Average

Construction Quality

Construction Quality – Air infiltration factor. The selection of “average” in this example, does that feel right based on your final post weatherization blower door? Ask your contractor what “average” means to them, to make sure your final blower door is properly represented in this selection.

Total Building Summary Loads						Page 8
Component Description	U Value	Area Quan	Sen Loss	Lat Gain	Sen Gain	Total Gain
1D-cv-o: Glazing-Double pane operable window, clear, vinyl frame, u-value 0.57, SHGC 0.56		146.8	4,018	0	4,168	4,168
11N: Door-Metal - Polystyrene Core		34.8	585	0	426	426
12C-0sw: Wall-Frame, R-13 insulation in 2 x 4 stud cavity, no board insulation, siding finish, wood studs		1134.4			3,149	3,149
16A-13: Roof/Ceiling-Under Attic with Insulation on Attic Floor (also use for Knee Walls and Partition Ceilings), Unvented Attic, No Radiant Barrier, Any Roofing Material, Any Roof Color, R-13 insulation		1848	6,209	0	10,219	10,219
19A-15p: Floor-Over enclosed unconditioned crawl space, No insulation on exposed walls, sealed or vented space, passive, R-15 blanket		1848	3,878	0	1,939	1,939
Subtotals for structure:			19,645	0	19,901	19,901
People:				400	460	860
Equipment:				300	1,200	1,500
Lighting:					0	0
Ductwork:			14,787	973	5,703	6,676
Infiltration: Winter CFM: 0, Summer CFM: 0			0	0	0	0
Ventilation: Winter CFM: 431, Summer CFM: 431			22,329	6,513	11,165	17,677
AED Excursion:			0	0	151	151
Total Building			56,761	8,186	38,580	46,766
Check Figures						
Total Building Supply CFM:					1,271	0.688
Square ft. of Room Area:					1,848	474
Volume (ft ³) of Cond. Space:					12,936	
Building Loads						
Total Heating Required Including Ventilation Air:		56,761 Btuh		56.761 MBH		
Total Sensible Gain:		38,580 Btuh		82 %		
Total Latent Gain:		8,186 Btuh		18 %		
Total Cooling Required Including Ventilation Air:		46,766 Btuh		3.90 Tons (Based On Sensible + Latent)		

This table has all the construction info about house. This table is titled "Total Building Summary Loads". This is a very important spot to do data input quality control checks.

Windows: Make sure information about replaced windows or added solar screens are input correctly. The example has some codes to signify the glazing and window type; you'd have to ask the contractor for those codes to know what "1D-cv-o" actually means. You can see all the windows have a U-value of 0.57, which is the equivalent of R1.75. Based on the windows in the house, does this seem accurate? Also note that there is 146.8 total sq ft of windows on this house, something that can be verified against assessment documentation.

U-value is something you can check with simple math. Energy Star windows have a U-value of 0.35-0.40; the lower the U-value, the better insulation factor for the window. U-value of single pane glass is around 1.22.

R value = 1/U value. EX: U-value of 0.35 = 1/0.35 = R2.38. EX2: U-value of 1.22 = 1/1.22 = R0.82

Doors: Make sure information about replaced doors are input correctly. The example lists the door as a metal polystyrene core, which can be verified against assessment documentation.

Typical R value ranges for doors will be between 3.7 – 15. A door with an R15 is a 2” thick, solid core, metal door filled with foam (not a normal door for WAP houses).

Walls: Make sure that the insulation level is accurate about the house post weatherization. The example shows that all the walls have existing R13.

Ceiling: Make sure that the insulation level is accurate about the house post weatherization. The example shows that the ceiling has an R13. It also shows that the ceiling square footage is 1848. The R value and square footage can be verified.

Floors: Make sure that the insulation level is accurate about the house post weatherization. The example shows that the floor has an R15. It also shows that the floor square footage is 1848. The R value and square footage can be verified.

Additional Tables

Component Description

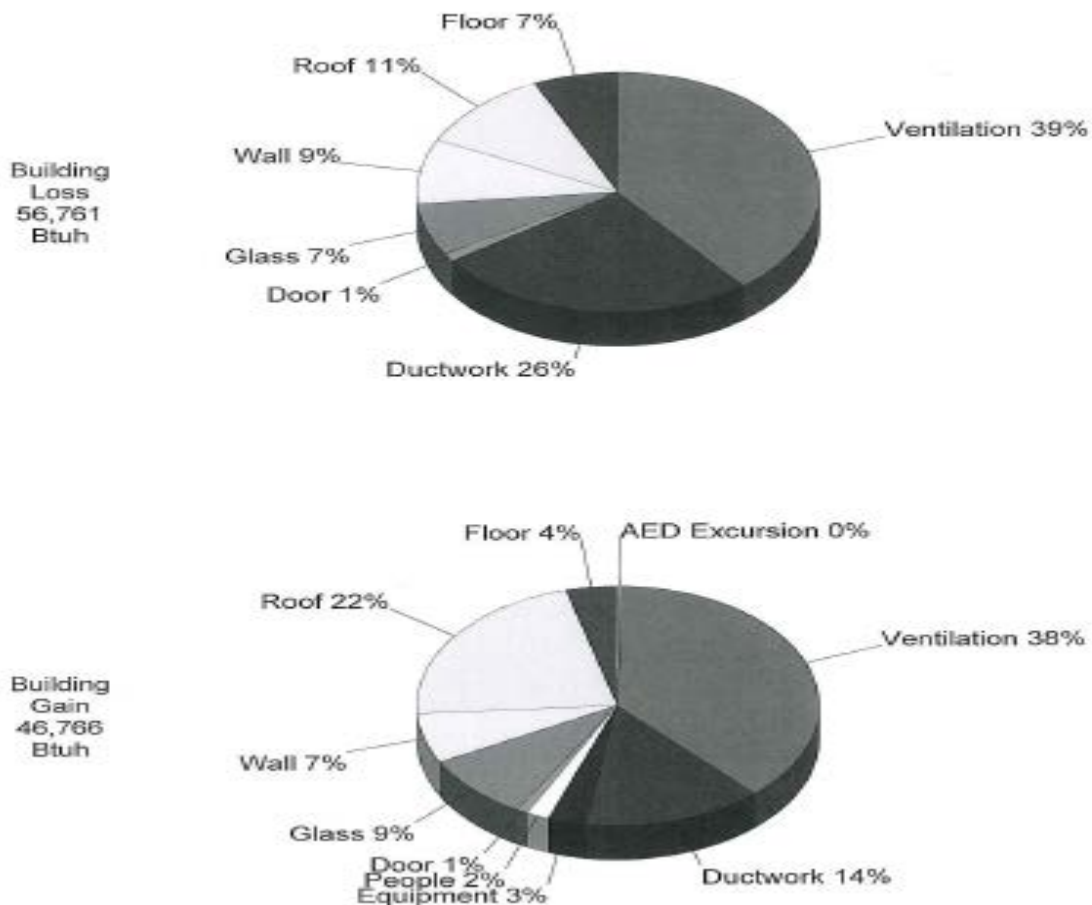
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Component Description	Area Quon	Sen Loss	Lat Gain	Sen Gain	Total Gan
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Additional tables this software provides will look remarkably similar to the “Total Building Summary Load” table. An example above is the “System 1 Summary Load” table. These additional tables should have repetitive information from the Building Summary Load regarding the building/construction of the home. You should see the same information about the windows, doors, walls, roof, ceiling, etc. If you see variations between the data in each table that is something to further investigate why the variance exists.

There are also going to be some additional pie charts provided that will look remarkably similar to the “Total Building Summary Load” pie charts. Follow the same process with the pie charts as you do with the tables: these additional charts should reveal repetitive information about the what is contributing to the overall load of the house based on the building/construction of the home. You should see the same information about the windows, doors, walls, roof, ceiling, etc. If you see variations between the data in each chart that is something to further investigate why the variance exists.



These pie charts are very indicative of the construction of the house. The top pie chart shows where the heated air is lost: (1) ventilation (air leakage), (2) ductwork, (3) roof, and then (4/5) floor/windows. The bottom pie chart shows the sources of internal heat gain: (1) ventilation (air leakage), (2) roof, (3) ductwork, and then (4) windows. Based on what you know about the house, determine if the higher load areas seem reasonable; if not, then investigate further.

Both pie charts above indicate that ventilation (air leakage) and duct sealing account for more than 50% of the load. Your final blower door is the driving force behind the ventilation portion. If your final blower door is tight, ask your contractor what data was input to get that answer, if your blower door didn't get the reduction you expected, maybe this seems right. Remember, air seal as tight as possible; maximize this measure for the longest lasting impact possible! The same principle applies for duct sealing – if your duct blaster shows tight readings at the final, then ask your contractor about the data input for this measure. Same as air infiltration, you want to duct seal as tight as possible; maximize this measure for the longest lasting impact possible!

You'd use the same principle/logic with all of the top measures identified. For the roof, is the insulation level input accurate, if so, can/should you add more insulation, or not? Same for the floor, is the insulation level input accurate, if so, can/should you add more insulation, or not? For the windows, does the house have new solar screens or are there existing low-e windows? If so, you might need to look into this, if not, then it could be right.