



CODES-ABC, Inc.

PETITION FOR DECLARATORY STATEMENT BEFORE THE FLORIDA BUILDING COMMISSION

Company: Codes - ABC, Inc.  
Address: 165 Wells Road, Ste. 406  
Orange Park, Florida 32073  
Name: Art Barthlow  
Title: President/CEO  
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**DS 2019-068**

Statute(s), Agency Rule(s), Agency Order(s) and/or Code Section(s) on which the Declaratory Statement is sought:

Florida Building Code, Energy Conservation, 6<sup>th</sup> Edition (2017)  
Portions of Chapters R1, R4

Air Conditioning Contractors of America  
Manual J—2011 Residential Load Calculation Eighth Edition  
Manual S—13 Residential Equipment Selection

**Background:**

Codes-ABC, Inc., a firm based in Orange Park, Florida, provides building plan reviews, code consulting and permit expediting services to residential and commercial customers. Their purpose is to provide building code compliance review and permitting services that improve the health and welfare of citizens primarily in Florida. Codes-ABC, Inc. holds multiple contracts with municipal clients to provide contract services to building departments that require accuracy in code compliance, review and subsequently, interpretation.

Regarding HVAC permit submittal documentation, license holder Art Barthlow is seeking clarification on Section R403.7.1 of the Florida Building Code, Energy Conservation, 6<sup>th</sup> Edition (2017) to ensure that his company Codes-ABC is executing the intent of the code as well as that of ACCA Manual J and S as cited within the standard, with respect to the Florida Building Code, Energy Conservation. The petitioner is performing a plan review under contract to the City of Green Cove Springs Building Department, for a new construction single family residence at address 428 S. Vermont Ave., Green Cove Springs, FL. The attached Manual J and S cooling and heating load calculation was submitted as part of the new construction documents that the Petitioner was contracted to review under his FS468 Building Official (1701) license. Petitioner seeks these clarifications as a "substantially-affected person."

There are several sections that require consideration in this clarification. They are outlined specifically below and as attached:

### **From the Florida Building Code, Energy Conservation, 6<sup>th</sup> Edition**

#### **Chapter R1 - SCOPE AND ADMINISTRATION**

**R101.5.1 Compliance materials.** The Florida Building Commission shall approve specific computer software, worksheets, compliance manuals and other similar materials that meet the intent of this code.

**R103.2 Information on construction documents.** Construction documents shall be drawn to scale upon suitable material. Electronic media documents are permitted to be submitted where *approved* by the *code official*. Construction documents shall be of sufficient clarity to indicate the location, nature and extent of the work proposed, and show in sufficient detail pertinent data and features of the *building*, systems and equipment as herein governed.

**R103.3 Examination of documents.** The *code official* shall examine or cause to be examined the accompanying construction documents and shall ascertain whether the construction indicated and described is in accordance with the requirements of this code and other pertinent laws or ordinances.

#### **Chapter R4 - RESIDENTIAL ENERGY EFFICIENCY**

**R403.7.1 Equipment sizing.** Heating and cooling equipment shall be sized in accordance with ACCA Manual S based on the equipment loads calculated in accordance with ACCA Manual J or other *approved* heating and cooling calculation methodologies, based on building loads for the directional orientation of the building. The manufacturer and model number of the outdoor and indoor units (if split system) shall be submitted along with the sensible and total cooling capacities at the design conditions described in Section R302.1. This Code does not allow designer safety factors, provisions for future expansion or other factors that affect equipment sizing. System sizing calculations shall not include loads created by local intermittent mechanical ventilation such as standard kitchen and bathroom exhaust systems. New or replacement heating and cooling equipment shall have an efficiency rating equal to or greater than the minimum required by federal law for the geographic location where the equipment is installed.

**R403.7.1.1 Cooling equipment capacity.** Cooling only equipment shall be selected so that its total capacity is not less than the calculated total load but not more than 1.15 times greater than the total load calculated according to the procedure selected in Section 403.7, or the closest available size provided by the manufacturer's product lines. The corresponding latent capacity of the equipment shall not be less than the calculated latent load. The published value

for AHRI total capacity is a nominal, rating-test value and shall not be used for equipment sizing. Manufacturer's expanded performance data shall be used to select cooling-only equipment. This selection shall be based on the outdoor design dry-bulb temperature for the load calculation (or entering water temperature for water-source equipment), the blower CFM provided by the expanded performance data, the design value for entering wet-bulb temperature and the design value for entering dry-bulb temperature. Design values for entering wet-bulb and dry-bulb temperatures shall be for the indoor dry bulb and relative humidity used for the load calculation and shall be adjusted for return side gains if the return duct(s) is installed in an unconditioned space.

**Exceptions:**

1. Attached single- and multiple-family residential equipment sizing may be selected so that its cooling capacity is less than the calculated total sensible load but not less than 80 percent of that load.
2. When signed and sealed by a Florida-registered engineer, in attached single- and multiple-family units, the capacity of equipment may be sized in accordance with good design practice.

**R403.7.1.2 Heating equipment capacity.**

**R403.7.1.2.1 Heat pumps.** Heat pump sizing shall be based on the cooling requirements as calculated according to Section R403.7.1.1, and the heat pump total cooling capacity shall not be more than 1.15 times greater than the design cooling load even if the design heating load is 1.15 times greater than the design cooling load.

**R403.7.1.2.2 Electric resistance furnaces.** Electric resistance furnaces shall be sized within 4 kW of the design requirements calculated according to the procedure selected in Section R403.7.1.

**R403.7.1.2.3 Fossil fuel heating equipment.** The capacity of fossil fuel heating equipment with natural draft atmospheric burners shall not be less than the design load calculated in accordance with Section R403.7.1.

**R403.7.1.3 Extra capacity required for special occasions.** Residences requiring excess cooling or heating equipment capacity on an intermittent basis, such as anticipated additional loads caused by major entertainment events, shall have equipment sized or controlled to prevent continuous space cooling or heating within that space by one or more of the following options:

1. A separate cooling or heating system is utilized to provide cooling or heating to the major entertainment areas.

2. A variable capacity system sized for optimum performance during base load periods is utilized.

**R403.8 Systems serving multiple dwelling units (Mandatory).** Systems serving multiple dwelling units shall comply with Sections C403 and C404 of the IECC—Commercial Provisions in lieu of Section R403.

### **From Manual J—2011 Residential Load Calculation Eighth Edition**

#### **N-8 Load Calculation Documentation**

The HVAC system designer shall produce and maintain electronic and/or hard-copy documentation of all required worksheets and forms. For the purpose of code compliance, the designer shall submit both of the following for evaluation:

- 1) A completed J1 Form.
- 2) Worksheet A

#### **6-3 Worksheet A (Design Conditions)**

*note this section is from the INFORMATIVE PORTION of Manual J*

MJ8<sub>AE</sub> Worksheet A provides a record of the indoor and outdoor design conditions used for the job. The following information shall be transcribed from Table 1A:

- Location and add job name:
- Indoor design temperature for heating and cooling
- Indoor humidity (RH) for heating and cooling
- Elevation and latitude
- Outdoor design temperature for heating (99% value)
- Outdoor design temperature for cooling(1% value)
- Grains difference value for cooling (for specified indoor RH value)
- Daily range classification.
- Worksheet A also holds the design values for heating temperature difference (HTD), cooling temperature difference (CTD) and the altitude correction factor (ACF):  
*HTD = Indoor dry-bulb for heating – 99% dry-bulb value*  
*CTD = 1% outdoor dry-bulb value – indoor dry-bulb for cooling ACF is read from Table 10A*

### **From Manual S—13 Residential Equipment Selection**

#### **N1-14 Documentation Requirements**

The practitioner shall produce and maintain electronic and/or hard-copy documentation. General requirements for common types of equipment are listed here.

### Documentation for Load Calculations

Archive load calculation input and output. This shall be the survey data collected prior to performing a load calculation, plus software reports that show computer input decisions and input values for envelope loads and system loads, plus software output reports that show the line item loads for the block loads calculations and the line item totals for the block load calculations.

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### Question

- 1) Does the Manual J and S calculation as submitted for permitting need to include the following as part of the printout?
    - a) Worksheet A information
    - b) Input summary including building envelope component values
    - c) Heat Load summary for each system
  - 2) Is a 'short form' as submitted an acceptable calculation for Manual J?
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### Summary

- 1) Petitioner respectfully believes the answer to the first question is **YES**. Section **N1-14** of ACCA Manual S cites both the inputs of the building (envelope) as well as the outputs which cross reference the results of the calculations of the J1 form of ACCA Manual J, cited in **N-8**. While the actual formatting of the information can vary, the information must be included in the permitting submittal, in addition to the requirements set out in Section **R403.7.1** and **R403.8**. The code's intent is that the generated heating and cooling load match the submitted plans. The envelope survey data is an integral part of confirming that intent and therefore must be submitted for review as indicated by the Manual J and S standard.
- 2) Petitioner respectfully believes the answer to the second question is **NO**. The short form often submitted does provide the cited "completed Manual J and Worksheet A", but does not include the survey input and outputs that Manual S cites that code officials need to execute Section **R103.3** of the FBC Energy Conservation. Without the envelope input data, as identified in **N1-14**, there is no way to confirm that the load is unique to the house being examined. (Therefore, the code official is within their right to request the envelope data as cited by Section **R103.2** in order to confirm the calculation is unique for plans they are reviewing, as in Question 1.)

Respectfully submitted,

CODES-ABC

By:  \_\_\_\_\_

ART BARTHLOW

President/CEO

attachment

# Air Conditioning Contractors of America • Manual S 2nd Edition (2014) Residential Equipment Selection

Project Information			
Name	Antonio Jorge		
Address	428 S. Vermont Ave.		
City	Green Cove Springs		
State	Florida	Zip Code	32043
System ID	Entire House		

Design Information	
Outdoor Design Temperature - Summer	95
Indoor Design Temperature - Summer	80
Indoor Design %RH - Summer	50
Outdoor Design Temperature - Winter	40
Project Location Elevation	

Proposed Equipment	System Type	Air-Air, Cooling Only, Single-Speed Compressor, Mild Winter or Latent Load				
	Manufacturer		Furnace #		AFUE	
	Manufacturer	Lennox	AHU/Coil #	CBA25UHV-036-230	SEER	15.0
	Manufacturer	Lennox	Condenser #	ML14XP1-036-230A	HSPF	8.50
	Manufacturer		Package #		Fan Speed	Med

Manual J Load Calculations	Heat	Total	Sensible	Latent	SHR
	Loss	BTUH	BTUH	BTUH	
	35743.66	36000	21153.74	14846.26	0.588

To interpolate capacities, enter the listed capacities from the manufacturers cooling performance charts that are less than the design temperatures here

Out DB per OEM Chart	95		Design CFM	Return Air (F wb)	Total BTUH	Sensible BTUH	Latent BTUH	SHR
In DB per OEM Chart	80							
Capacity from MFG table			1260	68	35,000	27,900	7,100	0.80
Interpolated Capacity				63	33,233	31,783	1,450	0.96
Capacity from MFG table				62	32,880	32,560	320	0.99

To interpolate capacities, enter the listed capacities from the manufacturers cooling performance charts that are greater than the design temperatures here

Out DB per OEM Chart	105		Design CFM	Return Air (F wb)	Total BTUH	Sensible BTUH	Latent BTUH	SHR
In DB per OEM Chart	80							
Capacity from MFG table			1260	68	33,000	27,300	5,700	0.83
Interpolated Capacity				63	31,667	30,633	1,033	0.97
Capacity from MFG table				62	31,400	31,300	100	1.00

Out DB per OEM Chart	95		Design CFM	Return Air (F wb)	Total BTUH	Sensible BTUH	Latent BTUH	SHR	
In DB per OEM Chart	80								
Interpolated Equipment Capacity			1260	63	33,233	31,783	1,450	0.96	
Excess Latent Capacity Calculation					-8,898				
Mfg. Equipment Match-Up Adjustment Factor					1.00	1.00			
Altitude Adjustments					1.00	1.00			
Capacity @ Design Conditions					33,233	31,783	1,450	0.96	
Equipment Capacity as a % of Design					92.3%	150.2%	9.8%		

Oversizing Limits		115%		150%	
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Heat Pump Data (if applicable)	Capacity @ 47 °F db	Capacity @ 17 °F db	Balance Point	Supplimental Heat Required	Altitude Adjustments	
					1.00	
					Cap. @ 47 °F db	Cap. @ 17 °F db
	30,900	19,600	44.1	2.19	30900	19600

Select Furnace or Boiler Option	Input Capacity	Output Capacity	Altitude Adjustment	Furnace Capacity	% of Load	Oversizing Limits
Furnace Data (if applicable)			1.00			200%

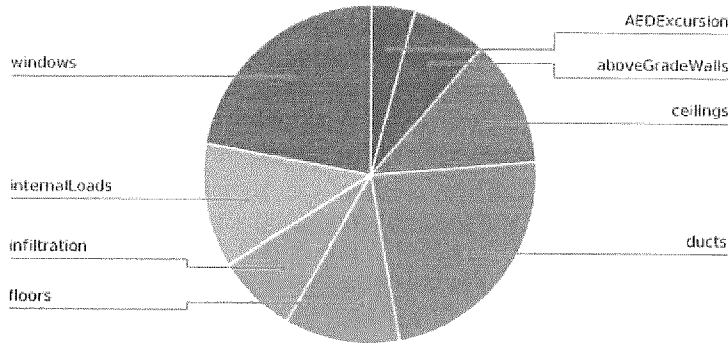
Electric Furnace	KW Proposed		KW Required		% of Load	Oversizing Limits
	2.12		2.19		97%	175%

201900477

Project Name: Tony George  
 Address: 428 Vermont Avenue, Green Cove Springs, FL  
 Form Type: HVAC System  
 HVAC System Name: New System

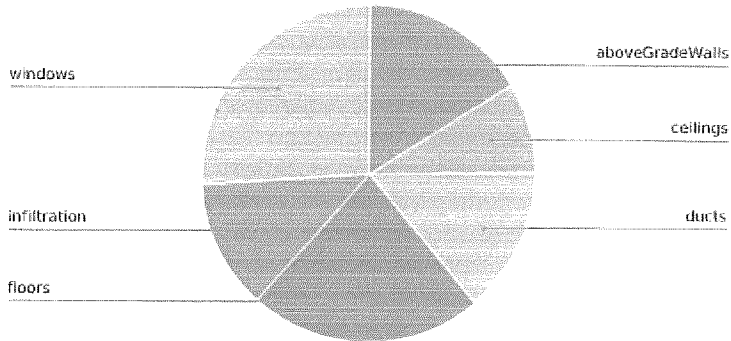
JACKSONVILLE NAS, FL					
Summer Outdoor F:	93	Summer Indoor F:	78	Design Grains:	46
Winter Outdoor F:	36	Winter Indoor F:	70	Cooling RH:	80%
				Daily Range:	Medium
				Elevation (Ft):	21

LOAD CALCULATION TOTALS					
Heating BTU:	29943	Cooling BTU:	34431	SHR:	0.920
				CFM:	1595



Cooling Loads

Name	Area	Sensible	Latent
AbDExcursion	0.00	1437.12	0.00
aboveGradeWalls	1459.50	2505.82	0.00
belowGradeWalls	0.00	0.00	0.00
blowerMotor	0.00	0.00	0.00
ceilings	1741.90	4215.40	0.00
ducts	0.00	7624.58	408.18
floors	1741.90	3853.95	0.00
infiltration	0.00	1033.96	1633.44
internalLoads	0.00	3320.00	800.00
skylights	0.00	0.00	0.00
ventilation	0.00	0.00	0.00
windows	264.00	7598.49	0.00
winterHumidification	0.00	0.00	0.00
Totals		31589.32	2841.63

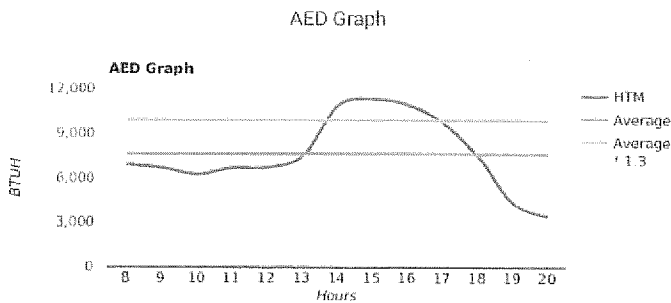


Heating Loads

Name	Area	Heat Loss
AEDExcursion	0.00	0.00
aboveGradeWalls	1459.50	4813.43
belowGradeWalls	0.00	0.00
blowerMotor	0.00	0.00
ceilings	1741.90	2605.88
ducts	0.00	4221.52
floors	1741.90	6782.95
infiltration	0.00	3710.75
internalLoads	0.00	0.00
skylights	0.00	0.00
ventilation	0.00	0.00
windows	264.00	7809.12
winterHumidification	0.00	0.00
Totals		29943.66

Warning (1) This application has glass areas that produced relatively large cooling loads for part of the day. Zoning may be required to overcome spikes in solar load for one or more rooms. A zoned system may be required or some rooms may require sunscreens (provided by individual motorized, thermostatically controlled dampers).

Warning (2) The sensible load for this application peaks during late fall or early winter. This behavior is caused by glass that faces SouthEast, South or SouthWest. Some rooms may be noticeably cooler or warmer than the temperature set point if zoning is not provided. Simultaneous heating and cooling may be required.



Approved ACCA MJ8 Calculations

Calculations are based on the ACCA Manual J 8th Edition and are approved by ACCA. All computed calculations are estimates on building use, weather data, and inputted values such as R-Values, window types, duct loss, etc. Equipment selections should meet both the latent and sensible gain as well as building heat loss. See Cool Calc Manual S Report for equipment sizing verification.



Project Name: Tony George  
 Address: 428 Vermont Avenue, Green Cove Springs, FL  
 Form Type: HVAC System  
 HVAC System Name: New System

## COMPONENT LOADS

### Above Grade Walls

Construction Nr.	Exposure	Area	Heating HTM	Cooling HTM	Heating BTU	Sensible BTU	Latent BTU
12B 0b w	N	219.30	3.30	1 / 2	723.25	376.52	0.00
12B 0b w	NE	532.80	3.30	1 / 2	1757.17	914.76	0.00
12B 0b w	S	172.80	3.30	1 / 2	569.89	296.68	0.00
12B 0b w	SW	534.60	3.30	1 / 2	1763.11	917.85	0.00

### Below Grade Walls

(none)

### Blower Motor

(none)

### Ceilings

Construction Nr.	Area	Heating HTM	Cooling HTM	Heating BTU	Sensible BTU	Latent BTU
16B 21 ad	1741.90	1.50	2.42	2605.88	4215.40	0.00

### Ducts

EHLF	ESGF	ELG	Heating BTU	Sensible BTU	Latent BTU
0.16	0.34	488.18	0.00	0.00	0.00

### Floors

Construction Nr.	Area	Heating HTM	Heating BTU	Sensible BTU	Latent BTU
19A 0cp	1741.90	3.89	6782.96	3853.95	0.00

### Infiltration

NCFM Heating	NCFM Cooling	Heating BTU	Sensible BTU	Latent BTU
99.29	52.26	3710.75	1033.96	1633.44

### Internal Loads

Heating BTU	Sensible BTU	Latent BTU
0.00	920.00	800.00
0.00	2400.00	0.00

### Ventilation

(none)

### Windows

Construction Nr.	Exposure	Area	Heating HTM	Heating BTU	Sensible BTU Avg.	Sensible BTU Peak	Latent BTU
1G	S	6.00	29.58	177.48	117.48	187.98	0.00
1G	S	12.00	29.58	354.96	249.84	402.95	0.00
1G	SW	12.00	29.58	354.96	409.84	816.31	0.00
1G	SW	60.00	29.58	1774.80	2098.42	4851.54	0.00
1G	SW	36.00	29.58	1064.88	1291.00	2430.92	0.00
1G	N	6.00	29.58	177.48	125.62	156.54	0.00
1G	N	24.00	29.58	709.92	502.49	626.17	0.00
1G	NE	12.00	29.58	354.96	311.62	545.95	0.00
1G	NE	60.00	29.58	1774.80	1558.12	2729.75	0.00
1G	NE	36.00	29.58	1064.88	934.87	1637.85	0.00

### Winter Humidification

(none)

Project Name: Tony George  
Address: 428 Vermont Avenue, Green Cove Springs, FL  
Form Type: HVAC System  
HVAC System Name: New System



ROOM LOADS						
Room Name	Heating	Sensible	Latent	Cooling	CFM	
Entire house	29943.60	77145.65	1633.44	28779.09	1370.00	

Project Name: George  
 Address: 428 Vermont Avenue, Green Cove Springs, FL  
 Form Type: HVAC System  
 HVAC System Name: entire house system

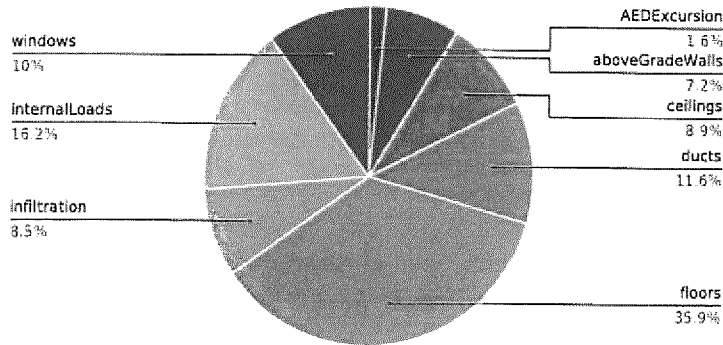


JACKSONVILLE HAS, FL

Summer Outdoor F: **93** Summer Indoor F: **75** Design Grains: **46** Daily Range: **Medium**  
 Winter Outdoor F: **60** Winter Indoor F: **65** Cooling RH: **65** Elevation (F): **10**

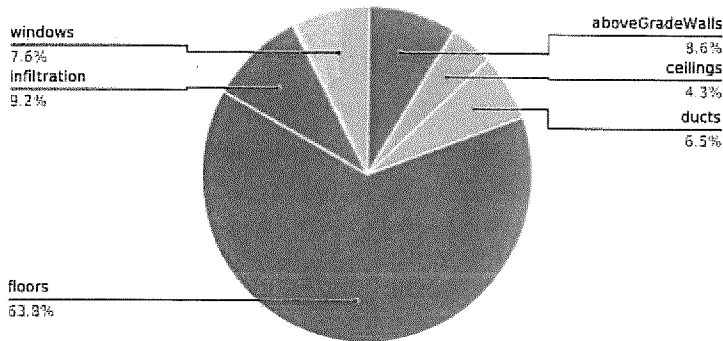
LOAD CALCULATION TOTALS

Heating BTU: **35743** Cooling BTU: **28026** SHR: **0.900** CFM: **1270**



Cooling Loads

Name	Area	Sensible	Latent
AEDExcursion	0.00	459.02	0.00
aboveGradeWalls	1308.40	2022.26	0.00
belowGradeWalls	0.00	0.00	0.00
blowerMotor	0.00	0.00	0.00
ceilings	1742.90	2492.35	0.00
ducts	0.00	2841.60	408.43
floors	1742.90	10065.25	0.00
infiltration	0.00	919.60	1452.78
internalLoads	0.00	3550.00	1000.00
skylights	0.00	0.00	0.00
ventilation	0.00	0.00	0.00
windows	234.00	2815.04	0.00
winterHumidification	0.00	0.00	0.00
Totals	-	25165.12	2861.21

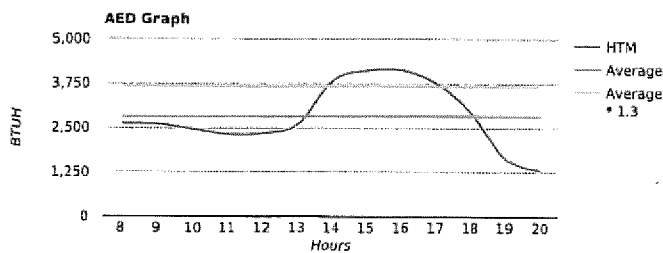


Heating Loads

Name	Area	Heat Loss
AEDExcursion	0.00	0.00
aboveGradeWalls	1308.40	3069.51
belowGradeWalls	0.00	0.00
blowerMotor	0.00	0.00
ceilings	1742.90	1540.72
ducts	0.00	2313.49
floors	1742.90	22814.56
infiltration	0.00	3300.34
internalLoads	0.00	0.00
skylights	0.00	0.00
ventilation	0.00	0.00
windows	234.00	2705.04
winterHumidification	0.00	0.00
Totals	-	35743.66

Warning (1): This application has glass areas that produced relatively large cooling loads for part of the day. Zoning may be required to overcome spikes in solar load for one or more rooms. A zoned system may be required, or some rooms may require zone control (provided by individual, motorized, thermostatically controlled dampers)

AED Graph



Approved ACCA MJ8 Calculations

Calculations are based on the ACCA Manual J 8th Edition and are approved by ACCA. All computed calculations are estimates on building use, weather data, and inputted values such as R-Values, window types, duct loss, etc. Equipment selections should meet both the latent and sensible gain as well as building heat loss. See Cool Calc Manual S Report for equipment sizing verification.

Project Name: George  
 Address: 428 Vermont Avenue, Green Cove Springs, FL  
 Form Type: HVAC System  
 HVAC System Name: entire house system



### COMPONENT LOADS

#### Above Grade Walls

Construction Nr.	Exposure	Area	Heating HTM	Cooling HTM	Heating BTU	Sensible BTU	Latent BTU
12C-4s w	NE	480.80	2.35	1.55	1127.96	743.12	0.00
12C-4s w	SE	157.20	2.35	1.55	368.79	242.97	0.00
12C-4s w	SW	141.60	2.35	1.55	332.19	218.86	0.00
12C-4s w	SW	329.20	2.35	1.55	772.30	508.81	0.00
12C-4s w	NW	199.60	2.35	1.55	468.26	308.50	0.00

#### Below Grade Walls

(none)

#### Blower Motor

(none)

#### Ceilings

Construction Nr.	Area	Heating HTM	Cooling HTM	Heating BTU	Sensible BTU	Latent BTU
16B-3B ad	1742.90	0.88	1.43	1540.72	2492.35	0.00

#### Ducts

EHLF	ESGF	ELG	Heating BTU	Sensible BTU	Latent BTU
0.07	0.13	408.43	0.00	0.00	0.00

#### Floors

Construction Nr.	Area	Heating HTM	Heating BTU	Sensible BTU	Latent BTU
20P-0c	1742.90	13.09	22814.56	10065.25	0.00

#### Infiltration

NCFM Heating	NCFM Cooling	Heating BTU	Sensible BTU	Latent BTU
88.31	46.48	3300.34	919.60	1452.78

#### Internal Loads

Heating BTU	Sensible BTU	Latent BTU
0.00	1158.00	1000.00
0.00	2400.00	0.00

#### Ventilation

(none)

#### Windows

Construction Nr.	Exposure	Area	Heating HTM	Heating BTU	Sensible BTU Avg.	Sensible BTU Peak	Latent BTU
1G	SW	6.00	11.55	69.36	80.41	156.74	0.00
1G	SW	36.00	11.55	416.16	494.40	940.42	0.00
1G	SW	36.00	11.55	416.16	506.35	940.42	0.00
1G	NW	6.00	11.55	69.36	70.94	136.78	0.00
1G	NW	24.00	11.55	277.44	283.76	547.13	0.00
1G	NE	12.00	11.55	138.72	124.34	207.42	0.00
1G	NE	48.00	11.55	554.88	497.38	829.68	0.00
1G	NE	36.00	11.55	416.16	373.03	622.26	0.00
1G	SE	6.00	11.55	69.36	71.04	135.86	0.00
1G	SE	12.00	11.55	138.72	148.58	271.71	0.00
1G	SW	12.00	11.55	138.72	164.80	313.47	0.00

#### Winter Humidification

(none)

Project Name: George  
Address: 428 Vermont Avenue, Green Cove Springs, FL  
Form Type: HVAC System  
HVAC System Name: entire house system



**ROOM LOADS**

Room Name	Heating	Sensible	Latent	Cooling	CFM
entire house	35743.66	21153.74	1452.78	22505.52	1068.00