Residential System Sizing Calculation

Summary

Gootee Res
Project Title
1308061

, FL

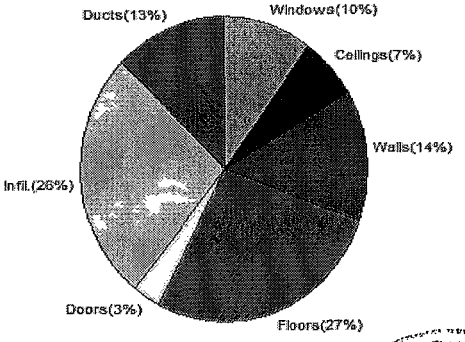
2013-08-23

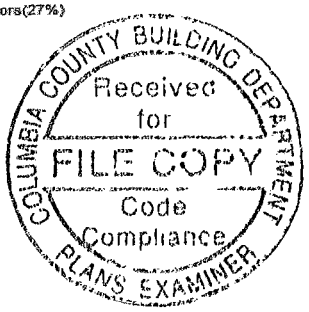
Location for weather data Gainesville, FL - Defaults Latitude(29.7) Altitude(152 ft) Temp Range(M)					
Humidity data Interior RH (50%) Outdoor wet bulb (77F) Humidity difference(54gr)					
Winter design temperature(MJ8 99%)	33	F	Summer design temperature(MJ8 99%)	92	F
Winter setpoint	70	F	Summer setpoint	75	F
Winter temperature difference	37	F	Summer temperature difference	17	F
Total heating load calculation	**26819**	**Btuh**	**Total cooling load calculation**	**29036**	**Btuh**
Submitted heating capacity	% of calc	Btuh	Submitted cooling capacity	% of calc	Btuh
Total (Electric Heat Pump)	126.8	34000	Sensible (SHR = 0 75)	115 1	25500
Heat Pump + Auxiliary(0 0kW)	126 8	34000	Latent	123.6	8500
			Total (Electric Heat Pump)	117 1	34000

WINTER CALCULATIONS

Winter Heating Load (for 1508 sqft)

Load component			Load	
Window total	144	sqft	2735	Btuh
Wall total	1146	sqft	3765	Btuh
Door total	53	sqft	789	Btuh
Ceiling total	1508	sqft	1777	Btuh
Floor total	1508	sqft	7335	Btuh
Infiltration	173	cfm	7024	Btuh
Duct loss			3395	Btuh
Subtotal			**26819**	**Btuh**
Ventilation	0	cfm	0	Btuh
TOTAL HEAT LOSS			**26819**	**Btuh**

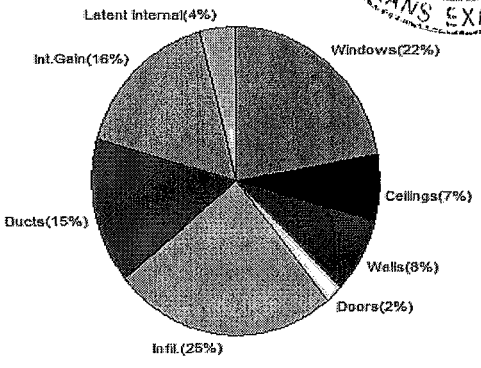




SUMMER CALCULATIONS

Summer Cooling Load (for 1508 sqft)

Load component			Load	
Window total	144	sqft	6487	Btuh
Wall total	1146	sqft	2301	Btuh
Door total	53	sqft	597	Btuh
Ceiling total	1508	sqft	2017	Btuh
Floor total			0	Btuh
Infiltration	130	cfm	2420	Btuh
Internal gain			4780	Btuh
Duct gain			3558	Btuh
Sens Ventilation	0	cfm	0	Btuh
Blower Load			0	Btuh
Total sensible gain			**22161**	**Btuh**
Latent gain(ducts)			923	Btuh
Latent gain(infiltration)			4753	Btuh
Latent gain(ventilation)			0	Btuh
Latent gain(internal/occupants/other)			1200	Btuh
Total latent gain			**6876**	**Btuh**
TOTAL HEAT GAIN			**29036**	**Btuh**



8th Edition

EnergyGauge® System Sizing
PREPARED BY Evan Bramlett
DATE 2013-08-23

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Gootee Res
, FL

Project Title.
1308061
Building Type User

2013-08-23

Reference City: Gainesville, FL (Defaults) Winter Temperature Difference: 37.0 F (MJ8 99%)

Component Loads for Whole House

Window	Panes/Type	Frame	U	Orientation	Area(sqft) X	HTM=	Load
1	2, NFRC 0.35	Metal	0 35	E	30 0	12.9	388 Btuh
2	2, NFRC 0 35	Metal	0.35	E	6.0	12 9	78 Btuh
3	2, NFRC 0 35	Metal	0 35	E	26 7	12 9	345 Btuh
4	2, NFRC 0 35	Metal	0 35	S	30.0	12 9	388 Btuh
5	2, NFRC 0.66	Metal	0 87	W	45 0	32 2	1449 Btuh
6	2, NFRC 0.35	Metal	0 35	W	6 7	12 9	86 Btuh
	Window Total				144 3(sqft)		2735 Btuh

Walls	Type	Ornt	Ueff	R-Value (Cav/Sh)	Area X	HTM=	Load
1	Frame - Wood	- Ext	(0 089)	13 0/0.0	216	3 28	710 Btuh
2	Frame - Wood	- Ext	(0.089)	13 0/0 0	178	3.28	585 Btuh
3	Frame - Wood	- Ext	(0 089)	13 0/0 0	388	3 28	1274 Btuh
4	Frame - Wood	- Ext	(0 089)	13 0/0 0	208	3 28	683 Btuh
5	Frame - Wood	- Adj	(0.089)	13 0/0.0	156	3.28	512 Btuh
	Wall Total				1146(sqft)		3765 Btuh

Doors	Type	Storm	Ueff.	Area X	HTM=	Load
1	Insulated - Exterior,	n	(0 400)	20	14 8	296 Btuh
2	Insulated - Exterior,	n	(0 400)	13	14 8	197 Btuh
3	Insulated - Garage,	n	(0 400)	20	14 8	296 Btuh
	Door Total			53(sqft)		789Btuh

Ceilings	Type/Color/Surface	Ueff	R-Value	Area X	HTM=	Load
1	Vented Attic/L/Shing	(0 032)	30 0/0 0	1508	1 2	1777 Btuh
	Ceiling Total			1508(sqft)		1777Btuh

Floors	Type	Ueff	R-Value	Size X	HTM=	Load
1	Slab On Grade	(1 180)	0 0	168 0 ft(perim)	43 7	7335 Btuh
	Floor Total			1508 sqft		7335 Btuh

	Envelope Subtotal	16401 Btuh

Infiltration	Type	Wholehouse ACH	Volume(cuft)	Wall Ratio	CFM=	
	Natural	0 86	12064	1 00	173 4	7024 Btuh

Duct load	Average sealed, R6 0, Supply(Att), Return(Att) (DLM of 0 145)	3395 Btuh
All Zones	**Sensible Subtotal All Zones**	**26819 Btuh**

Manual J Winter Calculations

Residential Load - Component Details (continued)

Gootee Res
, FL

Project Title:
1308061
Building Type User

2013-08-23

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss Ventilation Sensible Heat Loss Total Heat Loss	26819 Btuh 0 Btuh 26819 Btuh

EQUIPMENT

1 Electric Heat Pump	#	34000 Btuh

Key Window types - NFRC (Requires U-Factor and Shading coefficient(SHGC) of glass as numerical values)
or - Glass as 'Clear' or 'Tint' (Uses U-Factor and SHGC defaults)
U - (Window U-Factor)
HTM - (ManualJ Heat Transfer Multiplier)

Version 8

System Sizing Calculations - Summer

Residential Load - Whole House Component Details

Gootee Res

Project Title.
1308061

, FL

2013-08-23

Reference City Gainesville, FL Temperature Difference· 17 0F(MJ8 99%) Humidity difference. 54gr.

Component Loads for Whole House

	Type*					Overhang		Window Area(sqft)			HTM		Load
Window	Panes	SHGC	U	InSh	IS	Ornt	Len	Hgt	Gross	Shaded	Unshaded	Shaded	Unshaded	
1	2 NFRC	0 35, 0 35		No	No	E	1 5ft	1 0ft	30 0	1 5	28 5	13	40	1152 Btuh
2	2 NFRC	0 35, 0 35		No	No	E	1 5ft	1 0ft	6 0	0 5	5 5	13	40	225 Btuh
3	2 NFRC	0 35, 0 35		No	No	E	1 5ft	1 0ft	26 7	1 0	25 7	13	40	1033 Btuh
4	2 NFRC	0 35, 0 35		No	No	S	1 5ft	1 0ft	30 0	30 0	0 0	13	16	399 Btuh
5	2 NFRC	0 66, 0 87		No	No	W	1 5ft	1 0ft	45 0	2 2	42 8	29	78	3419 Btuh
6	2 NFRC	0 35, 0 35		No	No	W	1 5ft	1 0ft	6 7	0 2	6 4	13	40	258 Btuh
	Window Total								144 (sqft)					6487 Btuh

Walls	Type	U-Value	R-Value Cav/Sheath	Area(sqft)	HTM	Load
1	Frame - Wood - Ext	0 09	13 0/0 0	216 3	2 1	451 Btuh
2	Frame - Wood - Ext	0 09	13 0/0 0	178 0	2 1	371 Btuh
3	Frame - Wood - Ext	0 09	13 0/0 0	388 0	2 1	809 Btuh
4	Frame - Wood - Ext	0 09	13 0/0 0	208 0	2 1	434 Btuh
5	Frame - Wood - Adj	0 09	13 0/0 0	156 0	1 5	235 Btuh
	Wall Total			1146 (sqft)		2301 Btuh

Doors	Type	Area (sqft)	HTM	Load
1	Insulated - Exterior	20 0	11 2	224 Btuh
2	Insulated - Exterior	13 3	11 2	149 Btuh
3	Insulated - Garage	20 0	11 2	224 Btuh
	Door Total	53 (sqft)		597 Btuh

Ceilings	Type/Color/Surface	U-Value	R-Value	Area(sqft)	HTM	Load
1	Vented Attic/Light/Shingle	0 032	30 0/0 0	1508 0	1 34	2017 Btuh
	Ceiling Total			1508 (sqft)		2017 Btuh

Floors	Type	R-Value	Size	HTM	Load
1	Slab On Grade	0 0	1508 (ft-perimeter)	0 0	0 Btuh
	Floor Total		1508 0 (sqft)		0 Btuh

	Envelope Subtotal	11402 Btuh

Infiltration	Type	Average ACH	Volume(cuft)	Wall Ratio	CFM=	Load
	Natural	0 65	12064	1	130.0	2420 Btuh

Internal gain	Occupants	Btuh/occupant		Appliance	Load
	6	X 230	+	3400	4780 Btuh

	Sensible Envelope Load	18602 Btuh
Duct load	Average sealed, Supply(R6 0-Attic), Return(R6 0-Attic) (DGM of 0.191)	3558 Btuh
	Sensible Load All Zones	**22161 Btuh**

Manual J Summer Calculations

Residential Load - Component Details (continued)

Gootee Res | Project Title 1308061 | Climate FL_GAINESVILLE_REGIONAL_A

, FL

2013-08-23

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	**Sensible Envelope Load All Zones**	**18602 Btuh**
	Sensible Duct Load	3558 Btuh
	Total Sensible Zone Loads	**22161 Btuh**
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	**22161 Btuh**
	Latent infiltration gain (for 54 gr. humidity difference)	4753 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	923 Btuh
	Latent occupant gain (6 0 people @ 200 Btuh per person)	1200 Btuh
	Latent other gain	0 Btuh
	Latent total gain	**6876 Btuh**
	TOTAL GAIN	**29036 Btuh**

EQUIPMENT

1 Central Unit	#	34000 Btuh

*Key Window types (Panes - Number and type of panes of glass)
(SHGC - Shading coefficient of glass as SHGC numerical value)
(U - Window U-Factor)
(InSh - Interior shading device none(No), Blinds(B), Draperies(D) or Roller Shades(R))
- For Blinds Assume medium color, half closed
For Draperies Assume medium weave, half closed
For Roller shades Assume translucent, half closed
(IS - Insect screen none(N), Full(F) or Half(½))
(Ornt - compass orientation)

Version 8

Anthony Power Header®

GARAGE HEADER (84) $26F_b$ - 1.9E

ENGINEERED WOOD SECTION PROPERTIES AND LOAD CAPACITIES

ALLOWABLE DESIGN STRESSES (PSI):

FLEXURAL STRESS (F_b) =	2600
COMPRESSION PERP. TO GRAIN ($F_{c\perp}$) =	740
HORIZONTAL SHEAR (F_v) =	225
MODULUS OF ELASTICITY (MOE) =	1.9×10^6

	7.7	9.0	10.4	11.7	12.9	14.2	15.5
	326	514	789	1115	1521	2014	2604
	8865	12015	15996	20145	24772	29877	35460
	3908	4550	5250	5892	6533	7175	7817

NOTES:

1. Beam weights are based on 38 pcf.
2. Moment capacities are based on a span of 21 feet and must be modified for other spans.
3. Flexural Stress, F_b, shall be modified by the Volume Factor, C_v, as outlined in ATC 117 - Design 1993 and the NDS for Wood Construction 1997.
4. Allowable design properties and load capacities are based on a load duration of 100 percent and dry use conditions.
5. The ATC NER 466 was used in calculating the above allowable design stresses for Power Header®.

GARAGE HEADER COMPARISONS

	810 / 540	3-1/2" x 8-3/8"	3-1/2" x 9-5/8"	3-1/2" x 9"	3-1/2" x 9-1/4"	3-1/2" x 11-1/4"
	950 / 720	3-1/2" x 9-3/4"	3-1/2" x 9-5/8"	3-1/2" x 10-1/2"	3-1/2" x 9-1/4"	3-1/2" x 11-1/4"
	640 / 400	3-1/2" x 12-5/8"	3-1/2" x 13-1/4"	3-1/2" x 13-1/2"	3-1/2" x 14"	3-1/2" x 14"
	765 / 510	3-1/2" x 14"	3-1/2" x 13-1/8"	3-1/2" x 15"	3-1/2" x 14"	3-1/2" x 16"
	750 / 480	3-1/2" x 15-3/8"	3-1/2" x 16-1/2"	3-1/2" x 16-1/2"	3-1/2" x 16"	3-1/2" x 18"
	900 / 600	3-1/2" x 16-3/4"	3-1/2" x 17-7/8"	3-1/2" x 18"	3-1/2" x 16"	—

For more information on Power Header®, or other laminated structural products from Anthony Forest Products Company please call 1-800-221-2326 or FAX at 870-862-6502.

Distributed by

WOODFORD PLYWOOD INC
"Structural Wood Products"

11560 West Beaver Street
Jacksonville, Florida 32220

(904) 695-9080
(800) 447-6568
FAX (904) 695-9160

Anthony POWER HEADER® 26F_b - 1.9E

3-1/2" WIDTH GARAGE HEADER PLF CAPACITY

844	896		1216		1373								
161	207	254	330	390	510	552	668	752	824				
114	145	180	231	277	359	391	510	534	653	707	789		

844	973		1322										
161	207	254	330	390	510	552	724	732	897				
114	145	180	231	277	359	391	510	534	699	693			

562	778	888	1056	1363	1367		1582						
107	153	169	245	260	380	368	540	501	715	664	864	840	
76	107	120	171	185	267	261	380	356	521	471	684	609	813

NOTES:

1. Values shown are the maximum [illegible] loads [illegible] has been subtracted from the [illegible] load.
2. [illegible] are based on [illegible] design [illegible] equal to the [illegible] center [illegible]. Non-shaded [illegible] and [illegible] bearing at [illegible].
3. Headers are assumed to be loaded on the top edge with continuous lateral support along compression edge.
4. When no live load is listed, total load controls.
5. Deflection limits are listed within the PLF table heading.

GARAGE HEADER SIZING USING PLF TABLES:

To size a garage header supporting roof only, determine the total load & live load in pounds per lineal foot (PLF). Check the appropriate PLF table for a header supporting roof loads only (125% Non-Snow vs. 115% Snow) and select a member with a total load and live load capacity which meets or exceeds the design load for the rough opening size. For a garage header supporting roof, wall, and floor framing, determine the total load and live load in pounds per lineal foot (PLF). Select a header size from the roof, wall, and floor table (100% load duration) which has a total load and live load capacity equal to or greater than the design load for the appropriate rough opening.