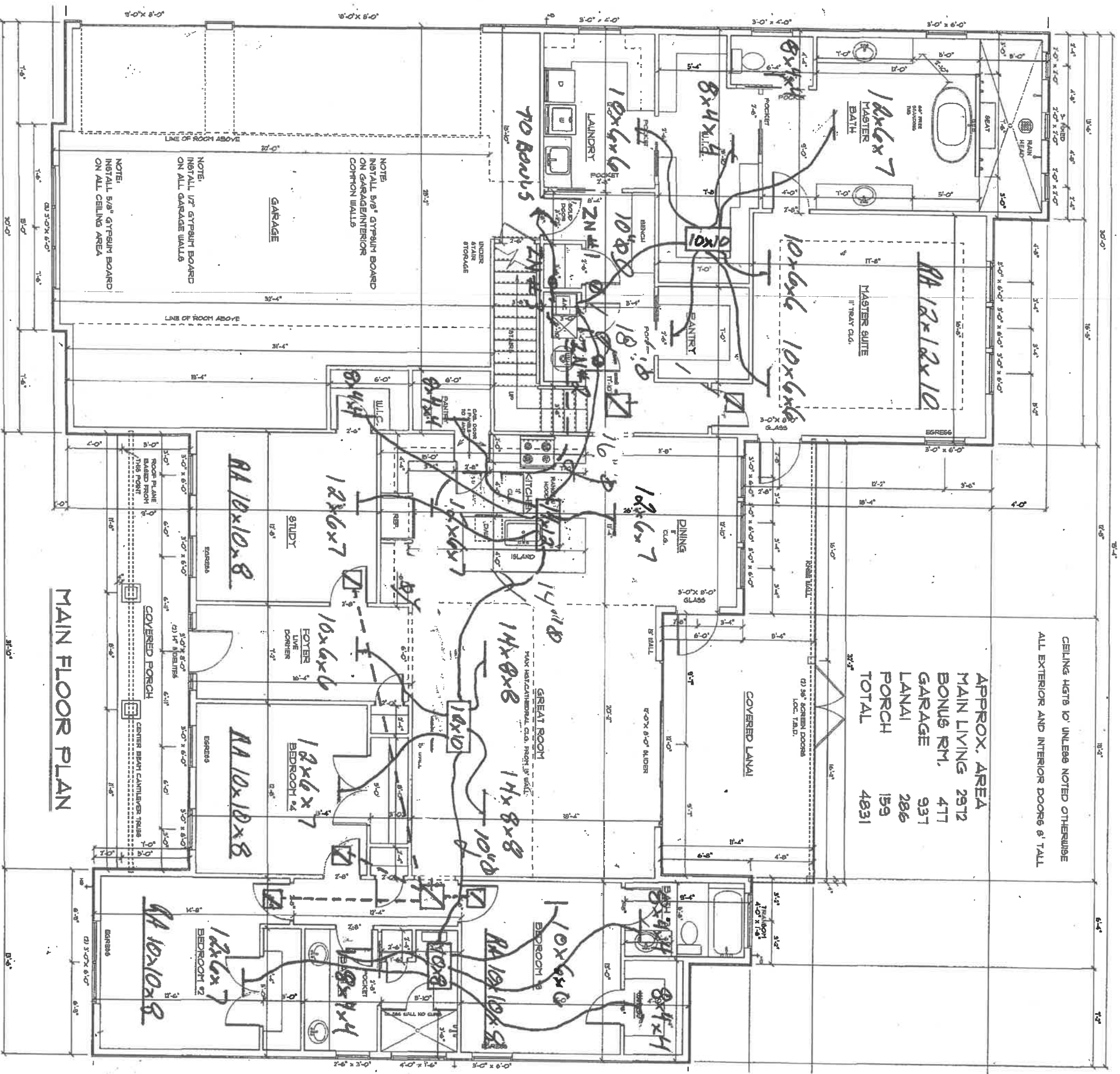


CP-AB-Short - Main Living



2/7/2022

*CP-AB-Short
HVAC Load Calculations*

for

Cory Amira
14901 N Main St
Alachua, FL 32615

Prepared By:

Ken Fonorow
Florida H.E.R.O., Inc.
15220 NW 5th Ave
Newberry, FL 32669
(352) 472-5661
Tuesday, February 8, 2022

Project Report

General Project Information

Project Title: CP-AB-Short
 Designed By: Ken Fonorow
 Project Date: 1/30/2022
 Client Name: Cory Amira
 Client Address: 14901 N Main St
 Client City: Alachua, FL 32615
 Client Phone: 386 462-9071
 Client E-Mail Address: amirabuilders@aol.com
 Company Name: Florida H.E.R.O., Inc.
 Company Representative: Ken Fonorow
 Company Address: 15220 NW 5th Ave
 Company City: Newberry, FL 32669
 Company Phone: (352) 472-5661
 Company E-Mail Address: ken@floridahero.com
 Company Website: www.floridahero.com

Design Data

Reference City: Gainesville, Florida
 Building Orientation: Front door faces Southwest
 Daily Temperature Range: Medium
 Latitude: 29 Degrees
 Elevation: 152 ft.
 Altitude Factor: 0.995

	Outdoor Dry Bulb	Outdoor Wet Bulb	Outdoor Rel.Hum	Indoor Rel.Hum	Indoor Dry Bulb	Grains Difference
Winter:	33	30.8	n/a	n/a	72	n/a
Summer:	92	77	51%	50%	75	52

Check Figures

Total Building Supply CFM:	2,000	CFM Per Square ft.:	0.580
Square ft. of Room Area:	3,449	Square ft. Per Ton:	807
Volume (ft³):	35,334		

Building Loads

Total Heating Required Including Ventilation Air:	55,279 Btuh	55.279 MBH
Total Sensible Gain:	40,699 Btuh	79 %
Total Latent Gain:	10,574 Btuh	21 %
Total Cooling Required Including Ventilation Air:	51,273 Btuh	4.27 Tons (Based On Sensible + Latent)

Notes

Rhvac is an ACCA approved Manual J, D and S computer program.
 Calculations are performed per ACCA Manual J 8th Edition, Version 2.50, and ACCA Manual D.
 All computed results are estimates as building use and weather may vary.
 Be sure to select a unit that meets both sensible and latent loads according to the manufacturer's performance data at your design conditions.

Miscellaneous Report

System 1 Whole House Input Data	Outdoor Dry Bulb	Outdoor Wet Bulb	Outdoor Rel.Hum	Indoor Rel.Hum	Indoor Dry Bulb	Grains Difference
Winter:	33	30.8	80%	n/a	72	n/a
Summer:	92	77	51%	50%	75	51.69

Duct Sizing Inputs

	Main Trunk	Runouts
Calculate:	Yes	Yes
Use Schedule:	Yes	Yes
Roughness Factor:	0.15000	0.15000
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:	0.280 AC/hr 165 CFM	0.150 AC/hr 88 CFM
Infiltration Actual:	0.293 AC/hr	0.124 AC/hr
Above Grade Volume:	X 35,334 Cu.ft. 10,338 Cu.ft./hr X 0.0167	X 35,334 Cu.ft. 4,369 Cu.ft./hr X 0.0167
Total Building Infiltration:	172 CFM	73 CFM
Total Building Ventilation:	25 CFM	75 CFM

---System 1---

Infiltration & Ventilation Sensible Gain Multiplier:	18.60	= (1.10 X 0.995 X 17.00 Summer Temp. Difference)
Infiltration & Ventilation Latent Gain Multiplier:	34.96	= (0.68 X 0.995 X 51.69 Grains Difference)
Infiltration & Ventilation Sensible Loss Multiplier:	42.66	= (1.10 X 0.995 X 39.00 Winter Temp. Difference)
Winter Infiltration Specified:	0.280 AC/hr (165 CFM), Construction: Average	
Summer Infiltration Specified:	0.150 AC/hr (88 CFM), Construction: Average	

Duct Load Factor Scenarios for System 1

No.	Type	Description	Location	Attic Ceiling	Duct Leakage	Duct Insulation	Surface Area	From [T]MDD
1	Supply	Main	Attic	16C	0.09	6	931	No
1	Return	Main	Attic	16C	0.15	6	345	No

Duct Size Preview

Room or Duct Name	Source	Minimum Velocity	Maximum Velocity	Rough Factor	Design L/100	SP Loss	Duct Velocity	Duct Length	Htg Flow	Clg Flow	Act. Flow	Duct Size	Reg Size
System 1													
Supply Runouts													
Zone 1													
1-Master Suite	Built-In	450	750	0.15	0.1		363.2		158	143	143	2--6	
2-Master Bath	Built-In	450	750	0.15	0.1		453.9		159	121	121	1--7	
3-MB WC	Built-In	450	750	0.15	0.1		404.2		37	35	35	1--4	
4-MBR WIC	Built-In	450	750	0.15	0.1		198.8		29	17	17	1--4	
5-Laundry	Built-In	450	750	0.15	0.1		412.9		106	81	81	1--6	
6-Pantry	Built-In	450	750	0.15	0.1		60.4		3	5	5	1--4	
7-Garage Entry	Built-In	450	750	0.15	0.1		0		103	55	55	0--0	
Zone 2													
8-Dining	Built-In	450	750	0.15	0.1		497.9		140	133	133	1--7	
9-Kitchen	Built-In	450	750	0.15	0.1		499.1		13	133	133	1--7	
10-Pantry 2	Built-In	450	750	0.15	0.1		150.2		30	13	13	1--4	
11-Study	Built-In	450	750	0.15	0.1		514.9		137	138	138	1--7	
12-Study WIC	Built-In	450	750	0.15	0.1		244.4		54	21	21	1--4	
13-Great Room	Built-In	450	750	0.15	0.1		549.1		232	383	383	2--8	
14-Foyer	Built-In	450	750	0.15	0.1		338.3		69	66	66	1--6	
15-Bedroom #4	Built-In	450	750	0.15	0.1		468.3		91	125	125	1--7	
16-Bedroom #2	Built-In	450	750	0.15	0.1		481.8		192	129	129	1--7	
17-Bath 2	Built-In	450	750	0.15	0.1		433.6		64	38	38	1--4	
18-Bedroom #3	Built-In	450	750	0.15	0.1		380.9		71	75	75	1--6	
19-BR #3 WIC	Built-In	450	750	0.15	0.1		206.1		57	18	18	1--4	
20-Bath #3	Built-In	450	750	0.15	0.1		368.8		83	32	32	1--4	
Zone 3													
21-Bonus Room	Built-In	450	750	0.15	0.1		344.7		148	203	203	3--6	
22-Bonus Bath	Built-In	450	750	0.15	0.1		128.1		9	11	11	1--4	
23-Bonus Stairs	Built-In	450	750	0.15	0.1		260.6		16	23	23	1--4	
Other Ducts in System 1													
Supply Main Trunk	Built-In	650	900	0.15	0.1		720		2,000	2,000	2,000	20x20	

Summary

System 1

Heating Flow: 2000

Cooling Flow: 2000

Total Building Summary Loads

Component Description	Area Quan	Sen Loss	Lat Gain	Sen Gain	Total Gain
VYN 34 23: Glazing-Dbl Pn Vyn Fr U .34 SHGC .23, ground reflectance = 0.23, outdoor insect screen with 50% coverage, medium color blinds at 45° with 25% coverage, U-value 0.34, SHGC 0.23	157.5	2,090	0	2,702	2,702
VYN 34 23: Glazing-Dbl Pn Vyn Fr U .34 SHGC .23, ground reflectance = 0.23, U-value 0.34, SHGC 0.23	18	239	0	422	422
VYN 34 23: Glazing-Dbl Pn Vyn Fr U .34 SHGC .23, ground reflectance = 0.32, outdoor insect screen with 50% coverage, medium color blinds at 45° with 25% coverage, U-value 0.34, SHGC 0.23	90	1,195	0	685	685
FrDr 34 23: Glazing-Dbl Pn FrDr U 34 SHGC 23, ground reflectance = 0.32, medium color blinds at 45° with 100% coverage, U-value 0.34, SHGC 0.23	24	318	0	208	208
SGD U 34 SHGC 23: Glazing-SGD DbPnVyFr U 34 SHGC 23, ground reflectance = 0.32, outdoor insect screen with 50% coverage, medium color blinds at 45° with 25% coverage, U-value 0.34, SHGC 0.23	96	1,272	0	2,457	2,457
VYN 34 23: Glazing-Dbl Pn Vyn Fr U .34 SHGC .23, ground reflectance = 0.23, outdoor insect screen with 50% coverage, medium color blinds at 45° with 50% coverage, U-value 0.34, SHGC 0.23	52	690	0	386	386
VYN 34 23: Glazing-Dbl Pn Vyn Fr U .34 SHGC .23, ground reflectance = 0.23, U-value 0.34, SHGC 0.23	6	80	0	63	63
11P: Door-Metal - Polyurethane Core, U-value 0.29	45.4	513	0	368	368
12E-Osw: Wall-Frame, R-19 insulation in 2 x 6 stud cavity, no board insulation, siding finish, wood studs, U-value 0.068	2133.5	5,659	0	2,813	2,813
12C-Osw: Wall-Frame, R-13 insulation in 2 x 4 stud cavity, no board insulation, siding finish, wood studs, U-value 0.091	558.6	1,982	0	1,194	1,194
16B-30: Roof/Ceiling-Under Attic with Insulation on Attic Floor (also use for Knee Walls and Partition Ceilings), Vented Attic, No Radiant Barrier, Dark Asphalt Shingles or Dark Metal, Tar and Gravel or Membrane, R-30 insulation, U-value 0.032	3449.1	4,304	0	5,741	5,741
16B-19: Roof/Ceiling-Under Attic with Insulation on Attic Floor (also use for Knee Walls and Partition Ceilings), Vented Attic, No Radiant Barrier, Dark Asphalt Shingles or Dark Metal, Tar and Gravel or Membrane, R-19 insulation, U-value 0.049	1524	2,911	0	3,884	3,884
22A-pl: Floor-Slab on grade, No edge insulation, no insulation below floor, any floor cover, passive, light dry soil, U-value 0.989	283	10,915	0	0	0
22A-pl-c: Floor-Slab on grade, No edge insulation, no insulation below floor, carpet covering, passive, light dry soil, U-value 0.989	21	810	0	0	0
20P-19-c: Floor-Over open crawl space or garage, Passive, R-19 blanket insulation, carpet covering, U-value 0.05	477	930	0	287	287
Subtotals for structure:		33,908	0	21,210	21,210
People:	6		1,200	1,380	2,580
Equipment:			1,950	3,700	5,650
Lighting:	0			0	0
Ductwork:		12,954	2,257	10,615	12,872
Infiltration: Winter CFM: 172, Summer CFM: 73		7,351	2,545	1,355	3,900
Ventilation: Winter CFM: 25, Summer CFM: 75		1,067	2,622	1,395	4,017

Total Building Summary Loads (cont'd)

Component Description	Area Quan	Sen Loss	Lat Gain	Sen Gain	Total Gain
Exhaust: Winter CFM: 75, Summer CFM: 25 AED Excursion:		0	0	1,044	1,044
Total Building Load Totals:		55,279	10,574	40,699	51,273

Check Figures

Total Building Supply CFM:	2,000	CFM Per Square ft.:	0.580
Square ft. of Room Area:	3,449	Square ft. Per Ton:	807
Volume (ft ³):	35,334		

Building Loads

Total Heating Required Including Ventilation Air:	55,279	Btuh	55.279	MBH
Total Sensible Gain:	40,699	Btuh	79	%
Total Latent Gain:	10,574	Btuh	21	%
Total Cooling Required Including Ventilation Air:	51,273	Btuh	4.27	Tons (Based On Sensible + Latent)

Notes

Rhvac is an ACCA approved Manual J, D and S computer program.
Calculations are performed per ACCA Manual J 8th Edition, Version 2.50, and ACCA Manual D.
All computed results are estimates as building use and weather may vary.
Be sure to select a unit that meets both sensible and latent loads according to the manufacturer's performance data at your design conditions.

System 1 Room Load Summary

Room No	Room Name	Area SF	Htg Sens Btuh	Min Htg CFM	Run Duct Size	Run Duct Vel	Clg Sens Btuh	Clg Lat Btuh	Min Clg CFM	Act Sys CFM
---Zone 1---										
1	Master Suite	323	4,105	75	2-6	363	2,815	624	129	143
2	Master Bath	209	4,148	76	1-7	454	2,394	594	109	121
3	MB WC	29	955	17	1-4	404	696	52	32	35
4	MBR WIC	107	744	14	1-4	199	342	43	16	17
5	Laundry	102	2,762	50	1-6	413	1,600	514	73	81
6	Pantry	49	77	1	1-4	60	104	0	5	5
7	Garage Entry	162	2,670	49	0-0	0	1,089	144	50	55
Zone 1 subtotal		981	15,459	283			9,041	1,971	413	458
---Zone 2---										
8	Dining	156	3,646	67	1-7	498	2,626	152	120	133
9	Kitchen	208	328	6	1-7	499	2,632	550	120	133
10	Pantry 2	30	782	14	1-4	150	259	48	12	13
11	Study	182	3,562	65	1-7	515	2,716	192	124	138
12	Study WIC	30	1,393	25	1-4	244	421	88	19	21
13	Great Room	450	6,047	111	2-8	549	7,566	760	346	383
14	Foyer	119	1,792	33	1-6	338	1,311	101	60	66
15	Bedroom #4	230	2,370	43	1-7	468	2,470	108	113	125
16	Bedroom #2	209	5,008	92	1-7	482	2,541	300	116	129
17	Bath 2	109	1,656	30	1-4	434	747	342	34	38
18	Bedroom #3	169	1,842	34	1-6	381	1,476	96	67	75
19	BR #3 WIC	38	1,474	27	1-4	206	355	100	16	18
20	Bath #3	62	2,158	39	1-4	369	635	391	29	32
Zone 2 subtotal		1,991	32,057	586			25,757	3,228	1,177	1,305
---Zone 3---										
21	Bonus Room	393	3,856	71	3-6	345	4,007	246	183	203
22	Bonus Bath	36	232	4	1-4	128	221	250	10	11
23	Bonus Stairs	48	425	8	1-4	261	449	0	21	23
Zone 3 subtotal		477	4,513	83			4,677	496	214	237
Ventilation			1,067				1,395	2,622		
Duct Latent								803		
Return Duct			2,183				3,314	1,454		
System 1 total		3,449	55,279	951			40,699	10,574	1,645	2,000

System 1 Main Trunk Size: 20x20 in.
 Velocity: 720 ft./min
 Loss per 100 ft.: 0.190 in.wg

Note: Since the system is multizone, the Peak Fenestration Gain Procedure was used to determine glass sensible gains at the room and zone levels, so the sums of the zone sensible gains and airflows for cooling shown above are not intended to equal the totals at the system level. Room and zone sensible gains and cooling CFM values are for the hour in which the glass sensible gain for the zone is at its peak. Sensible gains at the system level are based on the "Average Load Procedure + Excursion" method.

Cooling System Summary

	Cooling Tons	Sensible/Latent Split	Sensible Btuh	Latent Btuh	Total Btuh
Net Required:	4.27	79% / 21%	40,699	10,574	51,273
Actual:	3.33	77% / 23%	30,800	9,200	40,000

Equipment Data

	Heating System	Cooling System
Type:	Air Source Heat Pump	Air Source Heat Pump
Model:	CH14NB042*0**A*	CH14NB042*0**A*
Indoor Model:		FB4CNP042L
Brand:	14 SEER HP	14 SEER HP
Description:	Air Source Heat Pump	Air Source Heat Pump

System 1 Room Load Summary (cont'd)

Equipment Data

Efficiency:	8.2 HSPF	14 SEER
Sound:	0	0
Capacity:	41,000 Btuh	40,000 Btuh
Sensible Capacity:	n/a	30,800 Btuh
Latent Capacity:	n/a	9,200 Btuh
AHRI Reference No.:	n/a	9162578

This system's equipment was selected in accordance with ACCA Manual S.

Manual S equipment sizing data: SODB: 92F, SOWB: 77F, WODB: 33F, SIDB: 75F, SIRH: 50%, WIDB: 72F, Sen. gain: 40,699 Btuh, Lat. gain: 10,574 Btuh, Sen. loss: 55,279 Btuh, Entering clg. coil DB: 77.2F, Entering clg. coil WB: 63.6F, Entering htg. coil DB: 70.5F, Clg. coil TD: 20F, Htg. coil TD: 50F, Req. clg. airflow: 1645 CFM, Req. htg. airflow: 951 CFM