

Project Information

For: Dreambuilt Luxury Homes Inc., The Solid Rock Builders Construction, Inc
 102 SW Aurora Way, Lake City, FL 32025

Notes: Arium Model

Design Information

Weather: Gainesville, FL, US

Winter Design Conditions

Outside db 33 °F
 Inside db 70 °F
 Design TD 37 °F

Ventilation Method ASHRAE 62.2-2010

Summer Design Conditions

Outside db 94 °F
 Inside db 75 °F
 Design TD 19 °F
 Daily range M
 Relative humidity 50 %
 Moisture difference 42 gr/lb

Heating Summary

Structure 24100 Btuh
 Ducts 0 Btuh
 Central vent (78 cfm) 3115 Btuh
 Outside air Humidification 0 Btuh
 Piping 0 Btuh
 Equipment load 27215 Btuh

Infiltration

Method Blower door
 Shielding / stories 3 (partial) / 1
 Pressure /ACH /AVF 50 Pa / 5.0 / 1897 cfm

	Heating	Cooling
Area (ft ²)	1751	1751
Volume (ft ³)	22761	22761
Air changes/hour	0.39	0.22
Equiv. AVF (cfm)	110	20

Heating Equipment Summary

Make Goodman Mfg.
 Trade Heat Pump
 Model GLZS4BA3010A
 AHRI ref 215884103

Efficiency 7.8 HSPF2
 Heating input 28000 Btuh @ 47°F
 Heating output 0 °F
 Temperature rise 0 °F
 Actual air flow 0 cfm
 Air flow factor 0 cfm/Btuh
 Static pressure 0.70 in H2O
 Space thermostat
 Capacity balance point = 33 °F

Backup: Goodman Mfg.
 Input = 8 kW, Output = 27297 Btuh, 100 AFUE

Sensible Cooling Equipment Load Sizing

Structure 17908 Btuh
 Ducts 0 Btuh
 Central vent (78 cfm) 1613 Btuh
 Outside air Blower 0 Btuh

Use manufacturer's data y
 Rate/swing multiplier 1.00
 Equipment sensible load 19520 Btuh

Latent Cooling Equipment Load Sizing

Structure 2170 Btuh
 Ducts 0 Btuh
 Central vent (78 cfm) 2207 Btuh
 Outside air Equipment latent load 4377 Btuh

Equipment Total Load (Sen+Lat) 23898 Btuh
 Req. total capacity at 0.81 SHR 2.0 ton

Cooling Equipment Summary

Make Goodman Mfg.
 Trade Heat Pump
 Cond GLZS4BA3010A
 Coil AMVT30BP1300A
 AHRI ref 215884103

Efficiency 12.0 EER2, 15.2 SEER2
 Sensible cooling 22141 Btuh
 Latent cooling 5194 Btuh
 Total cooling 27335 Btuh
 Actual air flow 947 cfm
 Air flow factor 0.053 cfm/Btuh
 Static pressure 0.70 in H2O
 Load sensible heat ratio 0.82

Calculations approved by ACCA to meet all requirements of Manual J 8th Ed.

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Cooling Equipment

Design Conditions

Outdoor design DB:	94.0°F	Sensible gain:	19520 Btuh	Entering coil DB:	76.6°F
Outdoor design WB:	76.0°F	Latent gain:	4377 Btuh	Entering coil WB:	63.8°F
Indoor design DB:	75.0°F	Total gain:	23898 Btuh		
Indoor RH:	50%	Estimated airflow:	947 cfm		

Manufacturer's Performance Data at Actual Design Conditions

Equipment type:	Split ASHP				
Manufacturer:	Goodman Mfg.	Model:	GLZS4BA3010A+AMVT30BP1300A		
Actual airflow:	947 cfm				
Sensible capacity:	22152 Btuh		113% of load		
Latent capacity:	5183 Btuh		118% of load		
Total capacity:	27335 Btuh		114% of load	SHR:	81%

Heating Equipment

Design Conditions

Outdoor design DB:	33.3°F	Heat loss:	27215 Btuh	Entering coil DB:	70.0°F
Indoor design DB:	70.0°F				

Manufacturer's Performance Data at Actual Design Conditions

Equipment type:	Split ASHP				
Manufacturer:	Goodman Mfg.	Model:	GLZS4BA3010A+AMVT30BP1300A		
Actual airflow:	0 cfm				
Output capacity:	28000 Btuh		103% of load	Capacity balance:	33 °F
Supplemental heat required:	0 Btuh			Economic balance:	-99 °F

Backup equipment type:	Elec strip				
Manufacturer:	Goodman Mfg.	Model:			
Actual airflow:	0 cfm				
Output capacity:	8.0 kW	100% of load	Temp. rise:	21 °F	

Meets all requirements of ACCA Manual S.

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	Heating	Cooling
External static pressure	0.70 in H2O	0.70 in H2O
Pressure losses	0.31 in H2O	0.31 in H2O
Available static pressure	0.39 in H2O	0.39 in H2O
Supply / return available pressure	0.200 / 0.190 in H2O	0.200 / 0.190 in H2O
Lowest friction rate	0.085 in/100ft	0.085 in/100ft
Actual air flow	0 cfm	947 cfm
Total effective length (TEL)	459 ft	

Supply Branch Detail Table

Name	Design (Btuh)	Htg (cfm)	Clg (cfm)	Design FR	Diam (in)	H x W (in)	Duct Matl	Actual Ln (ft)	Ftg.Eqv Ln (ft)	Trunk
Attic	c 2062	0	109	0.089	7.0	0x0	VIFx	40.1	185.0	st3
Attic-A	c 2062	0	109	0.137	7.0	0x0	VIFx	11.1	135.0	st1
B4C	c 288	0	15	0.138	4.0	0x0	VIFx	10.1	135.0	st1
Bath2	c 122	0	6	0.127	4.0	0x0	VIFx	23.3	135.0	st2
Bath3	c 254	0	13	0.139	4.0	0x0	VIFx	9.5	135.0	st1
Bed 2	c 1319	0	70	0.131	6.0	0x0	VIFx	18.3	135.0	st2
Bed 3	c 2530	0	134	0.122	7.0	0x0	VIFx	29.1	135.0	st2
Bed 4	c 2421	0	128	0.142	7.0	0x0	VIFx	6.0	135.0	st1
Foyer	c 193	0	10	0.137	4.0	0x0	VIFx	16.5	130.0	st2
Great Room	c 1962	0	104	0.086	7.0	0x0	VIFx	46.7	185.0	st3
Kitchen	c 1549	0	82	0.089	6.0	0x0	VIFx	40.3	185.0	st3
Laundry	c 33	0	2	0.138	4.0	0x0	VIFx	10.1	135.0	st1
M Bath	c 420	0	22	0.088	4.0	0x0	VIFx	43.8	185.0	st3
MWIC	c 155	0	8	0.085	4.0	0x0	VIFx	45.7	190.0	st3
Master Bed	c 2537	0	134	0.086	7.0	0x0	VIFx	46.8	185.0	st3

Supply Trunk Detail Table

Name	Trunk Type	Htg (cfm)	Clg (cfm)	Design FR	Veloc (fpm)	Diam (in)	H x W (in)	Duct Material	Trunk
st1	Peak AVF	0	267	0.137	605	9.0	0 x 0	VinIFlx	st2
st3	Peak AVF	0	459	0.085	430	14.0	0 x 0	VinIFlx	
st2	Peak AVF	0	680	0.085	636	14.0	0 x 0	VinIFlx	

Return Branch Detail Table

Name	Grille Size (in)	Htg (cfm)	Clg (cfm)	TEL (ft)	Design FR	Veloc (fpm)	Diam (in)	H x W (in)	Stud/Joist Opening (in)	Duct Matl	Trunk
rb5	0x0	0	383	182.0	0.104	487	12.0	0x 0		VIFx	rt1
rb2	0x0	0	70	223.0	0.085	355	6.0	0x 0		VIFx	rt2
rb3	0x0	0	134	215.0	0.088	383	8.0	0x 0		VIFx	rt2
rb4	0x0	0	157	202.3	0.094	449	8.0	0x 0		VIFx	rt1
rb1	0x0	0	204	204.5	0.093	462	9.0	0x 0		VIFx	rt2

Return Trunk Detail Table

Name	Trunk Type	Htg (cfm)	Clg (cfm)	Design FR	Veloc (fpm)	Diam (in)	H x W (in)	Duct Material	Trunk
rt2	Peak AVF	0	408	0.085	519	12.0	0 x 0	VinIFlx	rt1
rt1	Peak AVF	0	947	0.085	472	15.1	17 x 17	RectFbg	



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Available Static Pressure

	Heating (in H2O)	Cooling (in H2O)
External static pressure	0.70	0.70
Pressure losses		
Coil	0	0
Heat exchanger	0	0
Supply diffusers	0.05	0.05
Return grilles	0.03	0.03
Filter	0.23	0.23
Humidifier	0	0
Balancing damper	0	0
Other device	0	0
Available static pressure	0.39	0.39

Total Effective Length

	Supply (ft)	Return (ft)
Measured length of run-out	10	10
Measured length of trunk	35	38
Equivalent length of fittings	190	175
Total length	236	223
Total effective length		459

Friction Rate

	Heating (in/100ft)		Cooling (in/100ft)	
Supply Ducts	0.085	OK	0.085	OK
Return Ducts	0.085	OK	0.085	OK

Fitting Equivalent Length Details

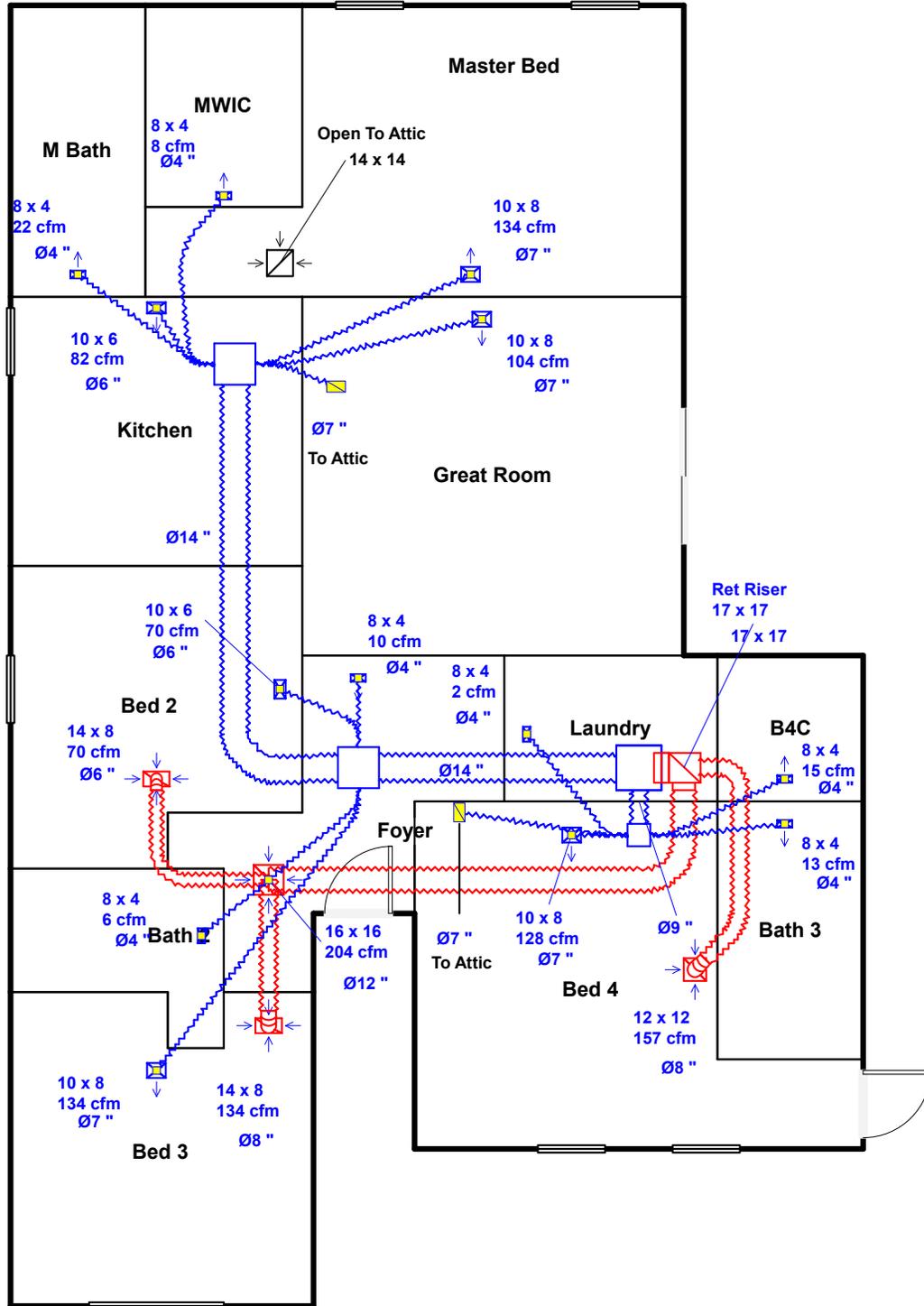
Supply 4AE=55, 11C=40, 11G=5, 11G=5, 11C=40, 11G=5, 11G=5, 1A=35: TotalEL=190

Return 6L=20, 11G=5, 11C=40, 8D3=65, 11G=5, 5B=40: TotalEL=175



First Floor

Split ASHP Goodman Mfg. Heat Pump
GLZS4BA3010A AMVT30BP1300A



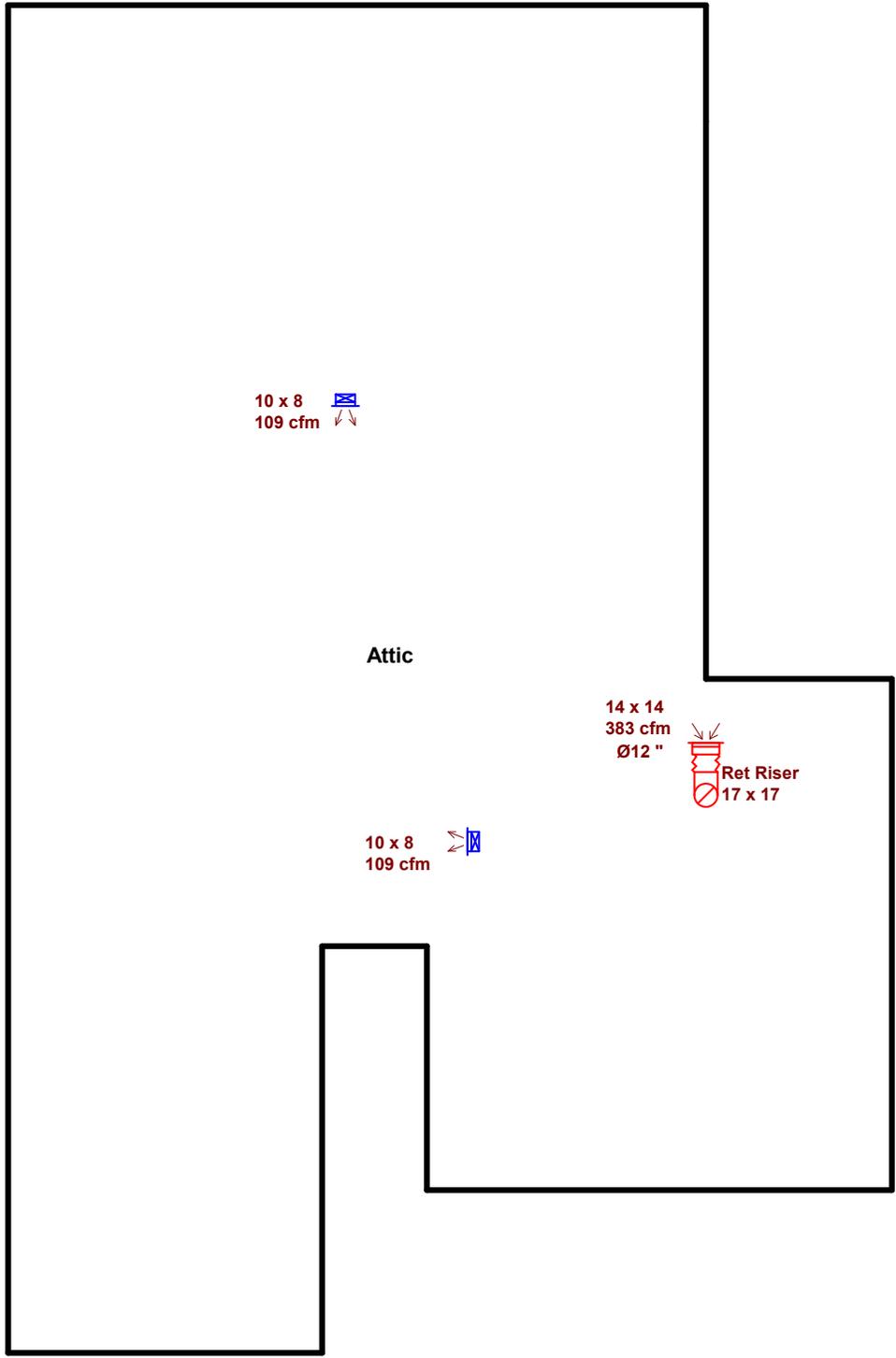
Job #:
Performed by Jonathan Jacobs for:
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Page 1
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Second Floor



10 x 8
109 cfm

Attic

14 x 14
383 cfm
Ø12 "



Ret Riser
17 x 17

10 x 8
109 cfm



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Page 2
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Notes

MechaniCalcs DESIGN DETAIL SUMMARY

MechaniCalcs responsibility is solely for design of the HVAC system based upon the design information and conditions specified in the drawing and accompanying ACCA Manual J, S, D and T reports. The HVAC design is based only upon the design information and conditions shown, which have not been verified. Before use, the building designer must verify the applicability of the design information and conditions, and properly incorporate this HVAC design into the overall building design. The HVAC design shown is only valid for the building layout, elevations, orientation, interior floor plan, construction materials, equipment, and weather bin data specified in the drawing.

Any change to the design information and conditions, or deviation from this design will require an updated HVAC design. MechaniCalcs no responsibility for deviations from it's HVAC design, use of its designs for purpose other than as intended by MechaniCalcs, or for the improper construction or installation of HVAC systems based on its designs

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Page 3
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