

Project Information

For: Mitchell Brown, The Solid Rock Builders Construction Inc.
Old Bellamy Rd, High Springs, FL 32643

Notes:

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

Heating Summary

Structure 30000 Btuh
Ducts (R-6.0) 3149 Btuh
Central vent (0 cfm) 0 Btuh

Humidification 0 Btuh
Piping 0 Btuh
Equipment load 33149 Btuh

Infiltration

Method Blower door
Shielding / stories 3 (partial) / 1
Pressure / ACH / AVF 50 Pa / 7.0 / 2076 cfm

	Heating	Cooling
Area (ft²)	2307	2307
Volume (ft³)	23007	23007
Air changes/hour	0.47	0.27
Equiv. AVF (cfm)	179	102

Heating Equipment Summary

Make AMERISTAR
Trade AMERISTAR
Model A5HP5042A1
AHRI ref 215611101

Efficiency 8.1 HSPF2
Heating input 39000 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 = 29 °F

Backup: Goodman Mfg.
Input = 10 kW, Output = 34121 Btuh, 100 AFUE

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

Sensible Cooling Equipment Load Sizing

Structure 22581 Btuh
Ducts (R-6.0) 5715 Btuh
Central vent (0 cfm) 0 Btuh

Blower 0 Btuh

Use manufacturer's data y
Rate/swing multiplier 1.00
Equipment sensible load 28296 Btuh

Latent Cooling Equipment Load Sizing

Structure 4702 Btuh
Ducts 796 Btuh
Central vent (0 cfm) 0 Btuh

Equipment latent load 5498 Btuh

Equipment Total Load (Sen+Lat) 33793 Btuh
Req. total capacity at 0.80 SHR 2.9 ton

Cooling Equipment Summary

Make AMERISTAR
Trade AMERISTAR
Cond A5HP5042A1
Coil A5AHC005A1D3++TDR+TSTAT
AHRI ref 215611101

Efficiency 12.0 EER2, 15.2 SEER2
Sensible cooling 30400 Btuh
Latent cooling 7600 Btuh
Total cooling 38000 Btuh
Actual air flow 1267 cfm
Air flow factor 0.045 cfm/Btuh
Static pressure 0.70 in H2O
Load sensible heat ratio 0.84

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



Manual S Compliance Report

System 1

MechaniCalcs LLC

Job:
Date:
By: Jonathan Jacobs

122 Del Palma, Palm Coast, FL 32137 Phone: 386-503-0449 Email: MechaniCalcs@gmail.com Web: ineedHVACcalcs.com or MechaniCalcsLLC.com

Project Information

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Cooling Equipment

Design Conditions

Outdoor design DB:	94.0°F	Sensible gain:	28296	Btuh	Entering coil DB:	75.7°F
Outdoor design WB:	76.0°F	Latent gain:	5498	Btuh	Entering coil WB:	62.8°F
Indoor design DB:	75.0°F	Total gain:	33793	Btuh		
Indoor RH:	50%	Estimated airflow:	1267	cfm		

Manufacturer's Performance Data at Actual Design Conditions

Equipment type:	Split ASHP		
Manufacturer:	AMERISTAR	Model:	A5HP5042A1+A5AHC005A1D3++TDR+TSTAT
Actual airflow:	1267	cfm	
Sensible capacity:	30400	Btuh	107% of load
Latent capacity:	7600	Btuh	138% of load
Total capacity:	38000	Btuh	112% of load SHR: 80%

Heating Equipment

Design Conditions

Outdoor design DB:	33.3°F	Heat loss:	33149	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:	AMERISTAR	Model:	A5HP5042A1+A5AHC005A1D3++TDR+TSTAT
Actual airflow:	0	cfm	
Output capacity:	39000	Btuh	118% of load
Supplemental heat required:	0	Btuh	
			Capacity balance: 29 °F
			Economic balance: -99 °F

Backup equipment type:	Elec strip		
Manufacturer:	Goodman Mfg.	Model:	
Actual airflow:	0	cfm	
Output capacity:	10.0	kW	103% of load Temp. rise: 25 °F

Meets all requirements of ACCA Manual S.





Duct System Summary

System 1

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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	0.223 / 0.167 in H2O	0.223 / 0.167 in H2O
Lowest friction rate	0.147 in/100ft	0.147 in/100ft
Actual air flow	0 cfm	1267 cfm
Total effective length (TEL)	265 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
B2C	c 224	0	10	0.234	4.0	0x0	VIFx	49.0	46.2	st4
B3C	c 435	0	19	0.467	4.0	0x0	VIFx	30.2	17.6	st2
B4C	c 284	0	13	0.526	4.0	0x0	VIFx	25.5	16.9	st2
Bath 2	c 120	0	5	0.261	4.0	0x0	VIFx	39.7	45.8	st4
Bath 3	c 355	0	16	0.636	4.0	0x0	VIFx	18.1	17.0	st2
Bed 2	c 2831	0	127	0.219	7.0	0x0	VIFx	44.8	56.8	st4
Bed 3	c 2722	0	122	0.524	6.0	0x0	VIFx	18.5	24.1	st2
Bed 4	c 2256	0	101	0.633	6.0	0x0	VIFx	14.6	20.6	st2
Dining	c 1725	0	77	0.536	5.0	0x0	VIFx	14.6	26.9	st1
Foyer	c 796	0	36	0.336	4.0	0x0	VIFx	27.4	39.0	st3
Kitchen_Living	c 3810	0	171	0.294	7.0	0x0	VIFx	27.6	48.2	st3
Kitchen_Living-A	c 3810	0	171	0.439	7.0	0x0	VIFx	16.0	34.8	st1
Laundry	c 874	0	39	0.233	4.0	0x0	VIFx	41.6	54.2	st4
M Bath	c 1463	0	65	0.153	5.0	0x0	VIFx	73.0	72.6	st5
M Tit	c 224	0	10	0.175	4.0	0x0	VIFx	70.1	57.7	st5
MWIC	c 1144	0	51	0.147	4.0	0x0	VIFx	69.8	81.6	st5
Master Bed	c 2264	0	101	0.178	6.0	0x0	VIFx	53.1	72.0	st5
Master Bed-A	c 2264	0	101	0.176	6.0	0x0	VIFx	54.5	72.2	st5
Pantry	c 694	0	31	0.345	4.0	0x0	VIFx	26.9	37.7	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
st5	Peak AVF	0	330	0.147	604	10.0	0 x 0	VinIFlx	st4
st4	Peak AVF	0	511	0.147	650	12.0	0 x 0	VinIFlx	st3
st3	Peak AVF	0	748	0.147	700	14.0	0 x 0	VinIFlx	st1
st1	Peak AVF	0	996	0.147	932	14.0	0 x 0	VinIFlx	
st2	Peak AVF	0	271	0.467	776	8.0	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
rb2	0x 0	0	141	98.9	0.169	529	7.0	0x 0		VIFx	rt2
rb3	0x 0	0	114	91.7	0.182	426	7.0	0x 0		VIFx	rt2
rb1	0x 0	0	1012	113.4	0.147	725	16.0	0x 0		VIFx	rrs1

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	255	0.169	577	9.0	0 x 0	VinIFlx	rrs1
rrs1	Peak AVF	0	1267	0.147	563	9.4	18 x 18	RectFbg	rt1
rt1	Peak AVF	0	1267	0.147	563	9.4	18 x 18	RectFbg	





Static Pressure and Friction Rate System 1 MechaniCalcs LLC

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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

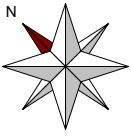
	Supply (ft)	Return (ft)
Measured length of run-out	20	11
Measured length of trunk	50	14
Equivalent length of fittings	82	88
Total length	151	113
Total effective length		265

Friction Rate

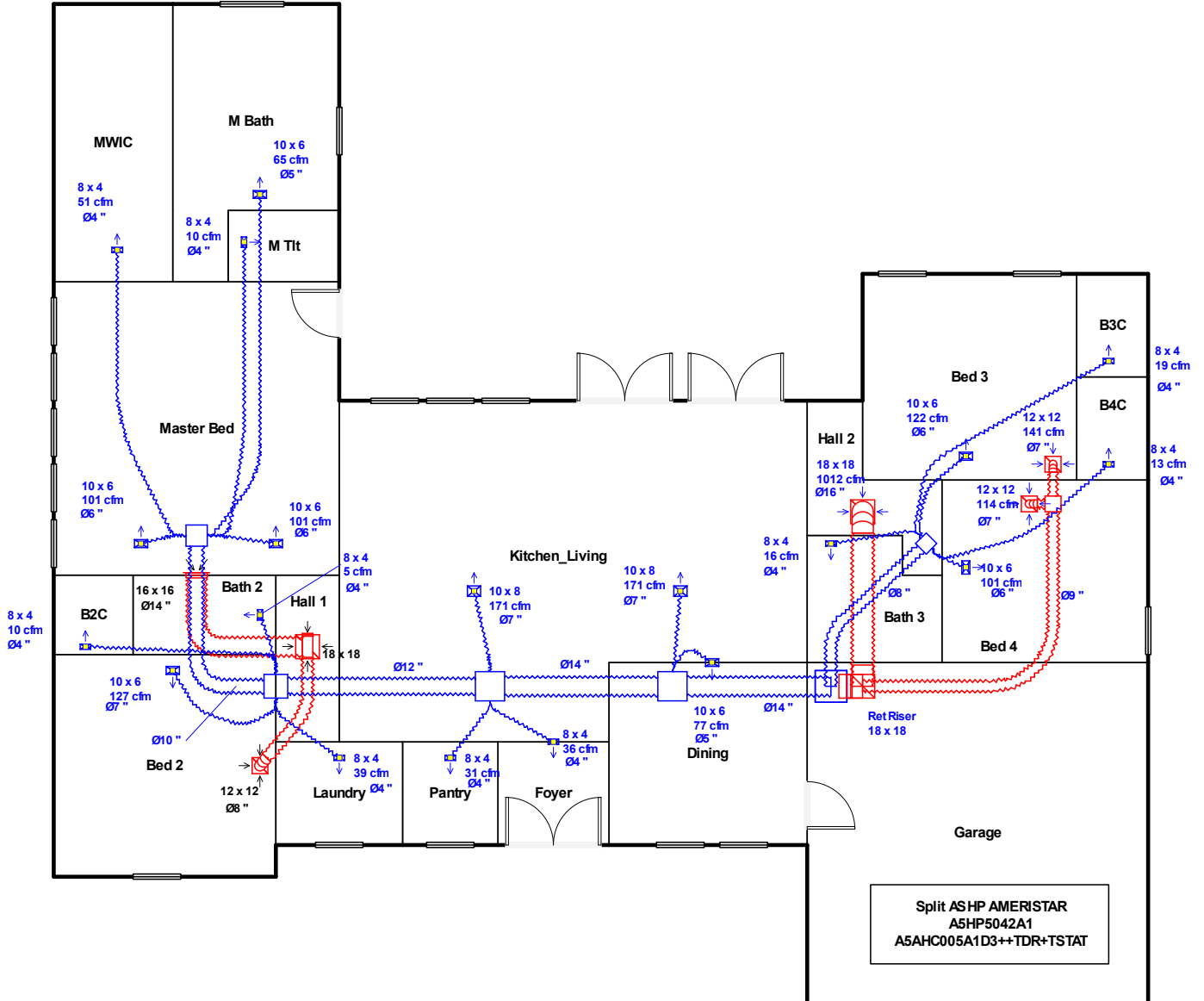
	Heating (in/100ft)		Cooling (in/100ft)	
Supply Ducts	0.147	OK	0.147	OK
Return Ducts	0.147	OK	0.147	OK

Fitting Equivalent Length Details

Supply	4AE=55, 11C=40, 11G=5, 11G=5, 11C=40, 11G=5, 11C=40, 11C=40, 1A=35, VelAdj=-183: TotalEL=82
Return	6L=20, 11C=40, 8D3=65, 5B=40, VelAdj=-77: TotalEL=88



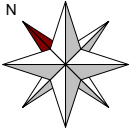
First Floor



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Performed by Jonathan Jacobs for:
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High Springs, FL 32643

MechaniCalcs LLC
122 Del Palma
Palm Coast, FL 32137
Phone: 386-503-0449
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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 by MechaniCalcs design team.

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 its 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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MechaniCalcs LLC
122 Del Palma
Palm Coast, FL 32137
Phone: 386-503-0449
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