Load Short Form

Job:
Date: Jan 19, 2021
By: Ryan Johnston

Bertie Heating and Air Conditioning

1730 NE 23rd Ave, Gainesville, FL 32609 Phone: 352-331-2005 Email: ryanj@bertieair.com Web: www.bertieair.com License: CAC058522

Project Information

For: Brewer Residence, Southtrust Construction
Gainesville, FL

Design Information

	Htg	Clg
Outside db (°F)	33	92
Inside db (°F)	70	75
Design TD (°F)	37	17
Daily range	-	M
Inside humidity (%)	50	50
Moisture difference (gr/lb)	32	47

Infiltration

Method	Simplified
Construction quality	Semi-tight
Fireplaces	0

HEATING EQUIPMENT

Make	Trane
Trade	TRANE
Model	4TWR5024H1
AHRI ref	9922058

Efficiency	9.5 HSPF	
Heating input		
Heating output	22000	Btuh @ 47°F
Temperature rise	29	°F
Actual air flow	700	cfm
Air flow factor	0.037	cfm/Btuh
Static pressure	0.50	in H2O
Space thermostat		

Capacity balance point = 33 °F

Backup:
Input = 6 kW, Output = 19877 Btuh, 100 AFUE

COOLING EQUIPMENT

Make	Trane
Trade	TRANE
Cond	4TWR5024H1
Coil	TEM6A0B24H21++TDR
AHRI ref	9922058

Efficiency	12.5 EER, 15 SEER	
Sensible cooling	16940	Btuh
Latent cooling	7260	Btuh
Total cooling	24200	Btuh
Actual air flow	700	cfm
Air flow factor	0.046	cfm/Btuh
Static pressure	0.50	in H2O
Load sensible heat ratio	0.78	

ROOM NAME	Area (ft²)	Htg load (Btuh)	Clg load (Btuh)	Htg AVF (cfm)	Clg AVF (cfm)
Living/Dining	343	9847	7720	367	352
Kitchen	144	1743	2481	65	113
Bath	54	81	121	3	6
Hall	32	0	0	0	0
W/D	18	0	0	0	0
HVAC	12	0	0	0	0
WIC	66	2050	692	76	32
Bed 1	217	3810	3740	142	171
Sitting	28	1250	591	47	27

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

Entire House	913	18781	15344	700	700
Other equip loads		2515	1161		
Equip. @ 0.97 RSM			15994		
Latent cooling			4750		
TOTALS	913	21295	20743	700	700

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Notes:

Design Information

Weather: Gainesville Rgnl, FL, US

Winter Design Conditions

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

Summer Design Conditions

Outside db	92	°F
Inside db	75	°F
Design TD	17	°F
Daily range	M	
Relative humidity	50	%
Moisture difference	47	gr/lb

Heating Summary

Structure	15279	Btuh
Ducts	3501	Btuh
Central vent (63 cfm)	2515	Btuh
Outside air		
Humidification	0	Btuh
Piping	0	Btuh
Equipment load	21295	Btuh

Sensible Cooling Equipment Load Sizing

Structure	11544	Btuh
Ducts	3801	Btuh
Central vent (63 cfm)	1161	Btuh
Outside air		
Blower	0	Btuh
Use manufacturer's data	n	
Rate/swing multiplier	0.97	
Equipment sensible load	15994	Btuh

Infiltration

Method	Simplified
Construction quality	Semi-tight
Fireplaces	0

	Heating	Cooling
Area (ft²)	913	913
Volume (ft³)	10188	10188
Air changes/hour	0.31	0.16
Equiv. AVF (cfm)	53	27

Latent Cooling Equipment Load Sizing

Structure	2062	Btuh
Ducts	695	Btuh
Central vent (63 cfm)	1993	Btuh
Outside air		
Equipment latent load	4750	Btuh
Equipment Total Load (Sen+Lat)	20743	Btuh
Req. total capacity at 0.70 SHR	1.9	ton

Heating Equipment Summary

Make	Trane
Trade	TRANE
Model	4TWR5024H1
AHRI ref	9922058

Efficiency	9.5 HSPF	
Heating input		
Heating output	22000	Btuh @ 47°F
Temperature rise	29	°F
Actual air flow	700	cfm
Air flow factor	0.037	cfm/Btuh
Static pressure	0.50	in H2O
Space thermostat		

Capacity balance point = 33 °F

Backup:
Input = 6 kW, Output = 19877 Btuh, 100 AFUE

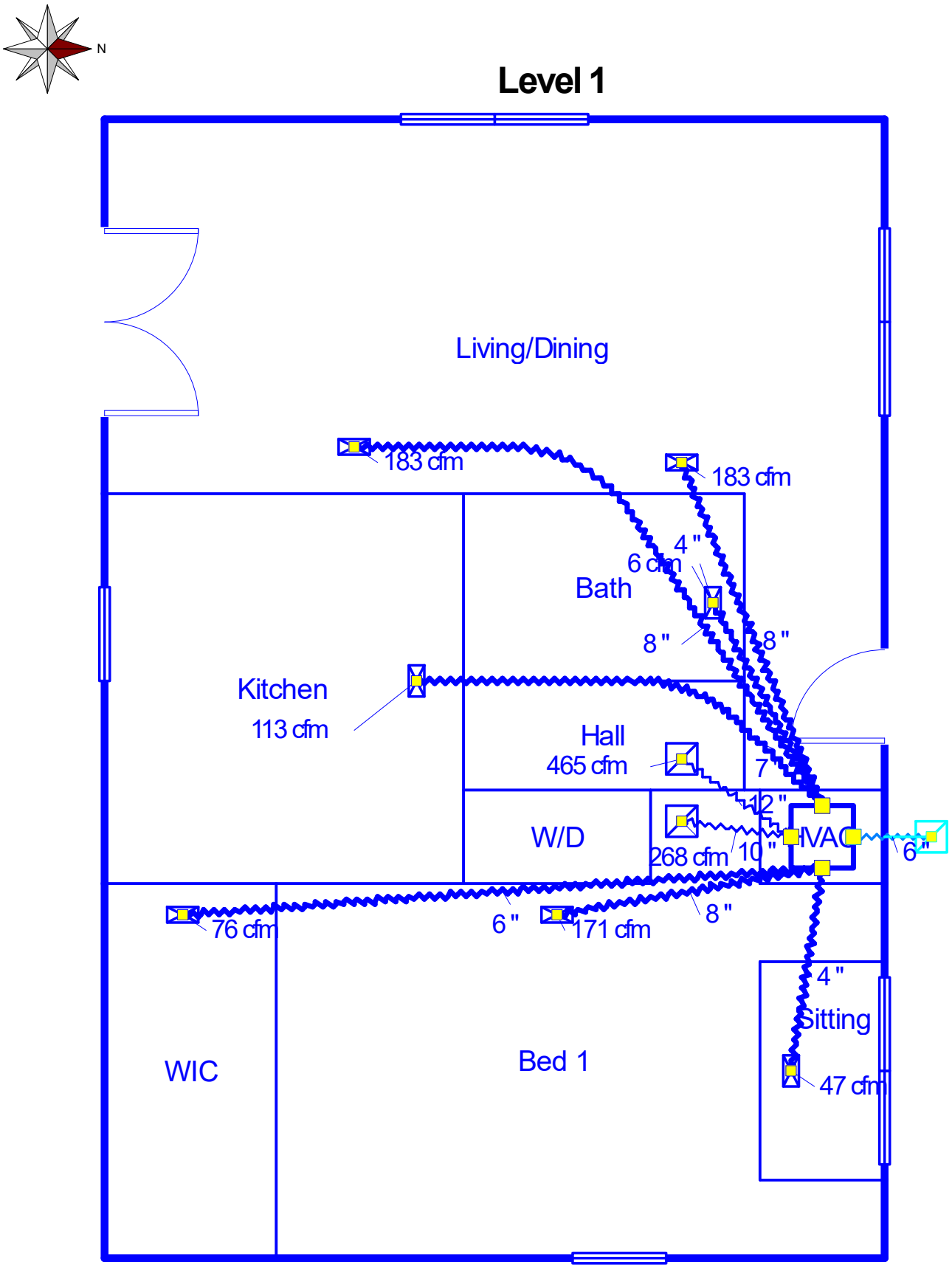
Cooling Equipment Summary

Make	Trane
Trade	TRANE
Cond	4TWR5024H1
Coil	TEM6A0B24H21++TDR
AHRI ref	9922058

Efficiency	12.5 EER, 15 SEER	
Sensible cooling	16940	Btuh
Latent cooling	7260	Btuh
Total cooling	24200	Btuh
Actual air flow	700	cfm
Air flow factor	0.046	cfm/Btuh
Static pressure	0.50	in H2O
Load sensible heat ratio	0.78	

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

Level 1



Job #:
Performed by Ryan Johnston for:
Brewer Residence

Gainesville, FL

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1730 NE 23rd Ave
Gainesville, FL 32609
Phone: 352-331-2005
www.bertieair.com ryanj@bertieair.com

Scale: 1 : 55

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Manual S Compliance Report

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Project Information

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Cooling Equipment

Design Conditions

Outdoor design DB:	91.9°F	Sensible gain:	16505	Btuh	Entering coil DB:	78.2°F
Outdoor design WB:	76.2°F	Latent gain:	4750	Btuh	Entering coil WB:	64.7°F
Indoor design DB:	75.0°F	Total gain:	21255	Btuh		
Indoor RH:	50%	Estimated airflow:	700	cfm		

Manufacturer's Performance Data at Actual Design Conditions

Equipment type:	Split ASHP				
Manufacturer:	Trane		Model:	4TWR5024H1+TEM6A0B24H21++TDR	
Actual airflow:	700	cfm			
Sensible capacity:	19258	Btuh	117% of load		
Latent capacity:	4017	Btuh	85% of load		
Total capacity:	23275	Btuh	110% of load	SHR:	83%

Heating Equipment

Design Conditions

Outdoor design DB:	33.4°F	Heat loss:	21295	Btuh	Entering coil DB:	65.6°F
Indoor design DB:	70.0°F					

Manufacturer's Performance Data at Actual Design Conditions

Equipment type:	Split ASHP						
Manufacturer:	Trane			Model:	4TWR5024H1+TEM6A0B24H21++TDR		
Actual airflow:	700	cfm					
Output capacity:	16817	Btuh	79% of load			Capacity balance:	33 °F
Supplemental heat required:	4478	Btuh				Economic balance:	-99 °F

Backup equipment type:	Elec strip				
Manufacturer:			Model:		
Actual airflow:	700	cfm			
Output capacity:	5.8	kW	93% of load	Temp. rise:	50 °F

Meets all requirements of ACCA Manual S.

Duct System Summary

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	Heating	Cooling
External static pressure	0.50 in H2O	0.50 in H2O
Pressure losses	0.22 in H2O	0.22 in H2O
Available static pressure	0.28 in H2O	0.28 in H2O
Supply / return available pressure	0.183 / 0.097 in H2O	0.183 / 0.097 in H2O
Lowest friction rate	0.151 in/100ft	0.151 in/100ft
Actual air flow	700 cfm	700 cfm
Total effective length (TEL)	186 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
Bath	c	121	3	6	0.179	4.0	0x 0	VlFx	7.4	95.0	
Bed 1	c	3740	142	171	0.177	8.0	0x 0	VlFx	8.6	95.0	
Kitchen	c	2481	65	113	0.160	7.0	0x 0	VlFx	14.7	100.0	
Living/Dining	h	4923	183	176	0.151	8.0	0x 0	VlFx	21.2	100.0	
Living/Dining-A	h	4923	183	176	0.171	8.0	0x 0	VlFx	11.9	95.0	
Sitting	h	1250	47	27	0.180	4.0	0x 0	VlFx	6.6	95.0	
WIC	h	2050	76	32	0.158	6.0	0x 0	VlFx	20.6	95.0	

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	268	235	63.5	0.153	491	10.0	0x 0		VlFx	
rb1	0x 0	432	465	64.3	0.151	592	12.0	0x 0		VlFx	