

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: Rogers Residence, South Trust Construction
Gainesville, FL

Design Information

	Htg	Clg	Infiltration	
Outside db (°F)	33	92	Method	Simplified
Inside db (°F)	70	75	Construction quality	Semi-tight
Design TD (°F)	37	17	Fireplaces	0
Daily range	-	M		
Inside humidity (%)	50	50		
Moisture difference (gr/lb)	32	47		

HEATING EQUIPMENT

Make Trane
Trade TRANE
Model 4TWR5030H1
AHRI ref 9033590
Efficiency 9.5 HSPF
Heating input
Heating output 27800 Btuh @ 47°F
Temperature rise 29 °F
Actual air flow 875 cfm
Air flow factor 0.036 cfm/Btuh
Static pressure 0.50 in H2O
Space thermostat
Capacity balance point = 34 °F

Backup:
Input = 8 kW, Output = 27247 Btuh, 100 AFUE

COOLING EQUIPMENT

Make Trane
Trade TRANE
Cond 4TWR5030H1
Coil TEM6A0B30H21++TDR
AHRI ref 9033590
Efficiency 12.5 EER, 15.25 SEER
Sensible cooling 20590 Btuh
Latent cooling 8410 Btuh
Total cooling 29000 Btuh
Actual air flow 875 cfm
Air flow factor 0.045 cfm/Btuh
Static pressure 0.50 in H2O
Load sensible heat ratio 0.76

ROOM NAME	Area (ft²)	Htg load (Btuh)	Clg load (Btuh)	Htg AVF (cfm)	Clg AVF (cfm)
WIC 1	76	1239	538	44	24
Toilet 1	21	804	566	29	26
Bath 1	102	2344	963	83	43
Laundry	59	1322	1270	47	57
Bed 1	188	1929	2174	69	98
Entry	47	947	416	34	19
Kitchen	137	2637	3082	94	139
Dining Room	117	2348	1982	83	89
Great Room	371	3747	4073	133	184
Toilet 2	25	1326	646	47	29
Bath 2	86	1373	614	49	28
WIC 2	46	861	323	31	15
Bed 2	221	3754	2759	133	124

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

Entire House	1494	24632	19405	875	875
Other equip loads		3002	1386		
Equip. @ 0.97 RSM			20147		
Latent cooling			6608		
TOTALS	1494	27633	26755	875	875

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



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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	19417 Btuh
Ducts	5215 Btuh
Central vent (75 cfm)	3002 Btuh
Outside air	
Humidification	0 Btuh
Piping	0 Btuh
Equipment load	27633 Btuh

Sensible Cooling Equipment Load Sizing

Structure	13790 Btuh
Ducts	5615 Btuh
Central vent (75 cfm)	1386 Btuh
Outside air	
Blower	0 Btuh
Use manufacturer's data	n
Rate/swing multiplier	0.97
Equipment sensible load	20147 Btuh

Infiltration

Method	Simplified
Construction quality	Semi-tight
Fireplaces	0

Latent Cooling Equipment Load Sizing

Structure	3190 Btuh
Ducts	1039 Btuh
Central vent (75 cfm)	2379 Btuh
Outside air	
Equipment latent load	6608 Btuh

	Heating	Cooling
Area (ft²)	1494	1494
Volume (ft³)	14072	14072
Air changes/hour	0.31	0.16
Equiv. AVF (cfm)	73	38

Equipment Total Load (Sen+Lat)	26755 Btuh
Req. total capacity at 0.71 SHR	2.4 ton

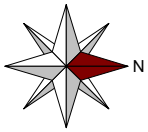
Heating Equipment Summary

Make	Trane
Trade	TRANE
Model	4TWR5030H1
AHRI ref	9033590
Efficiency	9.5 HSPF
Heating input	
Heating output	27800 Btuh @ 47°F
Temperature rise	29 °F
Actual air flow	875 cfm
Air flow factor	0.036 cfm/Btuh
Static pressure	0.50 in H2O
Space thermostat	
Capacity balance point = 34 °F	
Backup:	
Input = 8 kW, Output = 27247 Btuh, 100 AFUE	

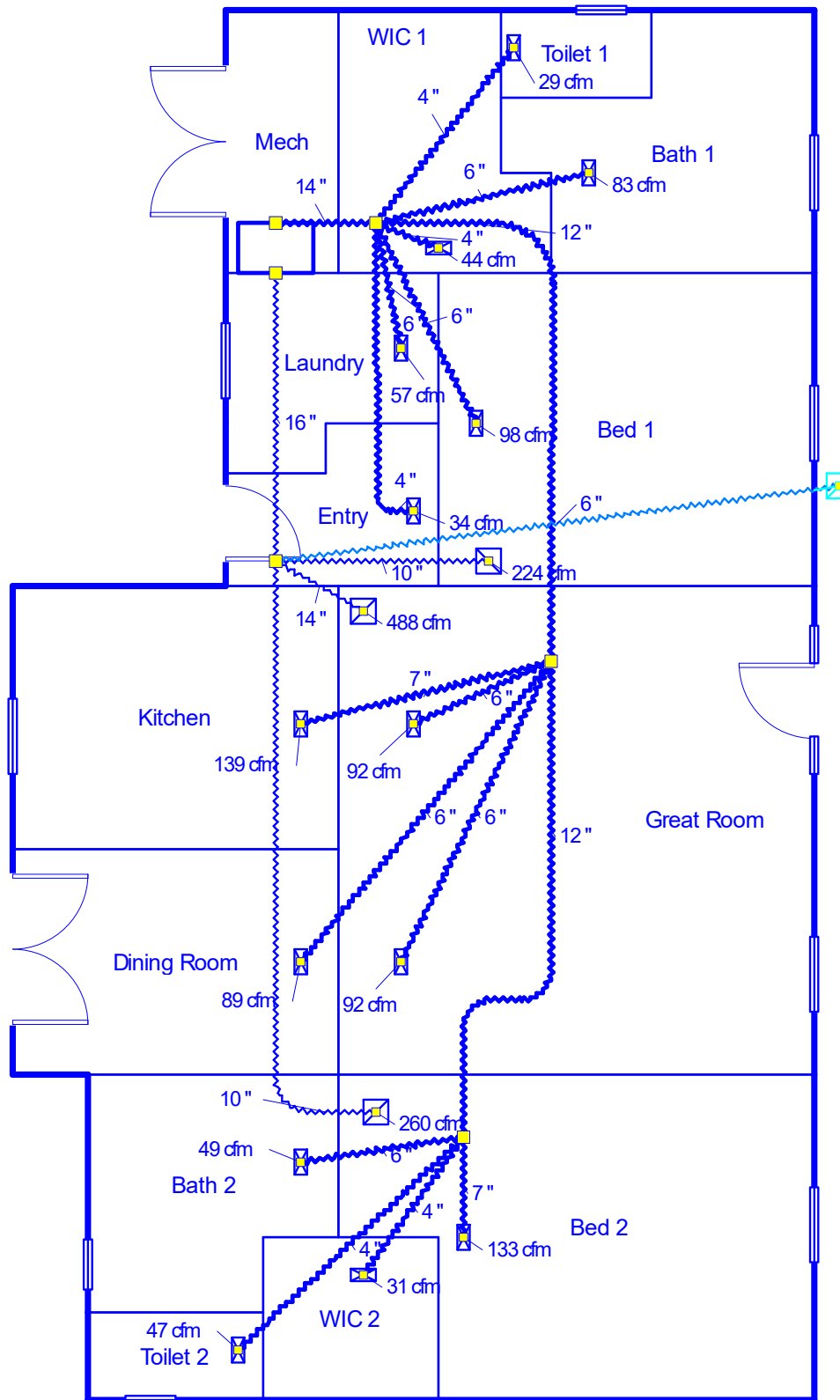
Cooling Equipment Summary

Make	Trane
Trade	TRANE
Cond	4TWR5030H1
Coil	TEM6A0B30H21++TDR
AHRI ref	9033590
Efficiency	12.5 EER, 15.25 SEER
Sensible cooling	20590 Btuh
Latent cooling	8410 Btuh
Total cooling	29000 Btuh
Actual air flow	875 cfm
Air flow factor	0.045 cfm/Btuh
Static pressure	0.50 in H2O
Load sensible heat ratio	0.76

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



Level 1



Job #:
Performed by Ryan Johnston for:
Rogers Residence
Gainesville, FL

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Project Information

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Cooling Equipment

Design Conditions

Outdoor design DB:	91.9°F	Sensible gain:	20791	Btuh	Entering coil DB:	78.4°F
Outdoor design WB:	76.2°F	Latent gain:	6608	Btuh	Entering coil WB:	64.8°F
Indoor design DB:	75.0°F	Total gain:	27400	Btuh		
Indoor RH:	50%	Estimated airflow:	875	cfm		

Manufacturer's Performance Data at Actual Design Conditions

Equipment type:	Split ASHP				
Manufacturer:	Trane	Model:	4TWR5030H1+TEM6A0B30H21++TDR		
Actual airflow:	875	cfm			
Sensible capacity:	20590	Btuh	99% of load		
Latent capacity:	8410	Btuh	127% of load		
Total capacity:	29000	Btuh	106% of load	SHR:	71%

Heating Equipment

Design Conditions

Outdoor design DB:	33.4°F	Heat loss:	27633	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:	4TWR5030H1+TEM6A0B30H21++TDR		
Actual airflow:	875	cfm			
Output capacity:	27800	Btuh	101% of load		Capacity balance: 34 °F
Supplemental heat required:	0	Btuh			Economic balance: -99 °F

Backup equipment type:	Elec strip				
Manufacturer:		Model:			
Actual airflow:	875	cfm			
Output capacity:	8.0	kW	99% of load	Temp. rise:	50 °F

Meets all requirements of ACCA Manual S.

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	Heating	Cooling
External static pressure	0.50 in H ₂ O	0.50 in H ₂ O
Pressure losses	0.22 in H ₂ O	0.22 in H ₂ O
Available static pressure	0.28 in H ₂ O	0.28 in H ₂ O
Supply / return available pressure	0.184 / 0.096 in H ₂ O	0.184 / 0.096 in H ₂ O
Lowest friction rate	0.079 in/100ft	0.079 in/100ft
Actual air flow	875 cfm	875 cfm
Total effective length (TEL)	356 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 1	h 2344	83	43	0.144	6.0	0x0	VIFx	12.7	115.0	st1
Bath 2	h 1373	49	28	0.081	6.0	0x0	VIFx	57.7	170.0	st3
Bed 1	c 2174	69	98	0.144	6.0	0x0	VIFx	12.9	115.0	st1
Bed 2	h 3754	133	124	0.082	7.0	0x0	VIFx	55.1	170.0	st3
Dining Room	c 1982	83	89	0.100	6.0	0x0	VIFx	44.2	140.0	st2
Entry	h 947	34	19	0.134	4.0	0x0	VIFx	16.9	120.0	st1
Great Room	c 2037	67	92	0.105	6.0	0x0	VIFx	34.6	140.0	st2
Great Room-A	c 2037	67	92	0.101	6.0	0x0	VIFx	42.0	140.0	st2
Kitchen	c 3082	94	139	0.103	7.0	0x0	VIFx	38.9	140.0	st2
Laundry	c 1270	47	57	0.148	6.0	0x0	VIFx	9.1	115.0	st1
Toilet 1	h 804	29	26	0.144	4.0	0x0	VIFx	12.9	115.0	st1
Toilet 2	h 1326	47	29	0.079	4.0	0x0	VIFx	63.5	170.0	st3
WIC 1	h 1239	44	24	0.151	4.0	0x0	VIFx	6.7	115.0	st1
WIC 2	h 861	31	15	0.081	4.0	0x0	VIFx	57.9	170.0	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
st3	Peak AVF	260	196	0.079	331	12.0	0 x 0	VinIFlx	st2
st2	Peak AVF	570	608	0.079	774	12.0	0 x 0	VinIFlx	st1
st1	Peak AVF	875	875	0.079	819	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
rb1	0x 0	391	488	95.5	0.101	457	14.0	0x 0		VIFx	rt1
rb2	0x 0	260	196	122.5	0.079	476	10.0	0x 0		VIFx	rt1
rb3	0x 0	224	191	100.0	0.096	411	10.0	0x 0		VIFx	rt1

Return Trunk Detail Table

Name	Trunk Type	Htg (cfm)	Clg (cfm)	Design FR	Veloc (fpm)	Diam (in)	H x W (in)	Duct Material	Trunk
rt1	Peak AVF	875	875	0.079	627	16.0	0 x 0	VinIFlx	