



Manual S Compliance Report

Entire House

Bounds Heating and Air



Job:
Date: Mar 31, 2022
By: Universal Engineering Science

Web: jlegler@boundshvac.com

Lawrence Powell
Examiner-License No.

PX2707

06/29/2022

Project Information

For: Ballard, Amira

Cooling Equipment

Design Conditions

Outdoor design DB:	92.2°F	Sensible gain:	40419 Btuh	Entering coil DB:	77.8°F
Outdoor design WB:	75.8°F	Latent gain:	6538 Btuh	Entering coil WB:	63.8°F
Indoor design DB:	75.0°F	Total gain:	46957 Btuh		
Indoor RH:	50%	Estimated airflow:	1883 cfm		

Manufacturer's Performance Data at Actual Design Conditions

Equipment type:	Split ASHP		
Manufacturer:	Carrier	Model:	CH17NA060P0G0B0+FV4CNB006L
Actual airflow:	1883 cfm		
Sensible capacity:	43454 Btuh	108% of load	
Latent capacity:	9190 Btuh	141% of load	
Total capacity:	52644 Btuh	112% of load	SHR: 83%

Heating Equipment

Design Conditions

Outdoor design DB:	33.2°F	Heat loss:	47276 Btuh	Entering coil DB:	66.8°F
Indoor design DB:	68.0°F				

Manufacturer's Performance Data at Actual Design Conditions

Equipment type:	Split ASHP		
Manufacturer:	Carrier	Model:	CH17NA060P0G0B0+FV4CNB006L
Actual airflow:	1883 cfm		
Output capacity:	57000 Btuh	121% of load	
Supplemental heat required:	0 Btuh		
		Capacity balance:	28 °F
		Economic balance:	-99 °F

Backup equipment type:	Elec strip		
Manufacturer:		Model:	
Actual airflow:	1883 cfm		
Output capacity:	13.0 kW	94% of load	Temp. rise: 50 °F

Meets all requirements of ACCA Manual S.



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Load Short Form

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Design Information

	Htg	Clg	Infiltration	
Outside db (°F)	33	92	Method	Simplified
Inside db (°F)	68	75	Construction quality	Semi-tight
Design TD (°F)	35	17	Fireplaces	0
Daily range	-	M		
Inside humidity (%)	50	50		
Moisture difference (gr/lb)	29	44		

HEATING EQUIPMENT

Make Carrier
Trade CARRIER
Model CH17NA060P0G0B0
AHRI ref 204862749

Efficiency 9 HSPF
Heating input
Heating output 57000 Btuh @ 47°F
Temperature rise 28 °F
Actual air flow 1883 cfm
Air flow factor 0.040 cfm/Btuh
Static pressure 0.50 in H2O
Space thermostat
Capacity balance point = 28 °F

Backup:

Input = 13 kW, Output = 44366 Btuh, 100 AFUE

COOLING EQUIPMENT

Make Carrier
Trade CARRIER
Cond CH17NA060P0G0B0
Coil FV4CNB006L
AHRI ref 204862749

Efficiency 12.5 EER, 16 SEER
Sensible cooling 39550 Btuh
Latent cooling 16950 Btuh
Total cooling 56500 Btuh
Actual air flow 1883 cfm
Air flow factor 0.047 cfm/Btuh
Static pressure 0.50 in H2O
Load sensible heat ratio 0.86

ROOM NAME	Area (ft²)	Htg load (Btuh)	Clg load (Btuh)	Htg AVF (cfm)	Clg AVF (cfm)
master bath	136	2737	1444	109	67
toilet	25	988	514	39	24
wic	95	1128	617	45	29
laundry	84	2196	1546	87	72
master suite	250	4622	4074	184	190
1/2	32	51	90	2	4
clutter	157	2556	1154	102	54
kitchen	287	3542	4000	141	186
safe	38	427	106	17	5
study	134	3034	3084	121	144
pantry	53	83	147	3	7
great room	538	6048	5649	241	263
foyer	115	1669	948	66	44
bedroom 2	230	2700	3396	108	158

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



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bath 2a	62	847	369	34	17
bath 2b	64	122	216	5	10
flex room	240	5389	3346	215	156
hall	89	0	0	0	0
wic 3	31	69	123	3	6
wic 2	27	53	93	2	4
bath	66	1508	756	60	35
bedroom 3	182	3589	4308	143	201
guest	197	3918	4438	156	207
Entire House	3132	47276	40419	1883	1883
Other equip loads		0	0		
Equip. @ 0.97 RSM			39287		
Latent cooling			6538		
TOTALS	3132	47276	45825	1883	1883



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Project Summary

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Project Information

For: Ballard, Amira

Notes:

Design Information

Weather: Gainesville Regional, FL, US

Winter Design Conditions

Outside db	33 °F
Inside db	68 °F
Design TD	35 °F

Summer Design Conditions

Outside db	92 °F
Inside db	75 °F
Design TD	17 °F
Daily range	M
Relative humidity	50 %
Moisture difference	44 gr/lb

Heating Summary

Structure	33460 Btuh
Ducts	13816 Btuh
Central vent (0 cfm)	0 Btuh
(none)	
Humidification	0 Btuh
Piping	0 Btuh
Equipment load	47276 Btuh

Sensible Cooling Equipment Load Sizing

Structure	23264 Btuh
Ducts	17156 Btuh
Central vent (0 cfm)	0 Btuh
(none)	
Blower	0 Btuh
Use manufacturer's data	n
Rate/swing multiplier	0.97
Equipment sensible load	39287 Btuh

Infiltration

Method	Simplified
Construction quality	Semi-tight
Fireplaces	0

Latent Cooling Equipment Load Sizing

Structure	2948 Btuh
Ducts	3590 Btuh
Central vent (0 cfm)	0 Btuh
(none)	
Equipment latent load	6538 Btuh

	Heating	Cooling
Area (ft ²)	3132	3132
Volume (ft ³)	31320	31320
Air changes/hour	0.19	0.10
Equiv. AVF (cfm)	99	52

Equipment Total Load (Sen+Lat)	45825 Btuh
Req. total capacity at 0.70 SHR	4.7 ton

Heating Equipment Summary

Make	Carrier
Trade	CARRIER
Model	CH17NA060P0G0B0
AHRI ref	204862749
Efficiency	9 HSPF
Heating input	
Heating output	57000 Btuh @ 47°F
Temperature rise	28 °F
Actual air flow	1883 cfm
Air flow factor	0.040 cfm/Btuh
Static pressure	0.50 in H2O
Space thermostat	
Capacity balance point = 28 °F	
Backup:	
Input = 13 kW, Output = 44366 Btuh, 100 AFUE	

Cooling Equipment Summary

Make	Carrier
Trade	CARRIER
Cond	CH17NA060P0G0B0
Coil	FV4CNB006L
AHRI ref	204862749
Efficiency	12.5 EER, 16 SEER
Sensible cooling	39550 Btuh
Latent cooling	16950 Btuh
Total cooling	56500 Btuh
Actual air flow	1883 cfm
Air flow factor	0.047 cfm/Btuh
Static pressure	0.50 in H2O
Load sensible heat ratio	0.86

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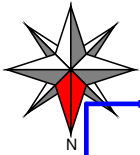


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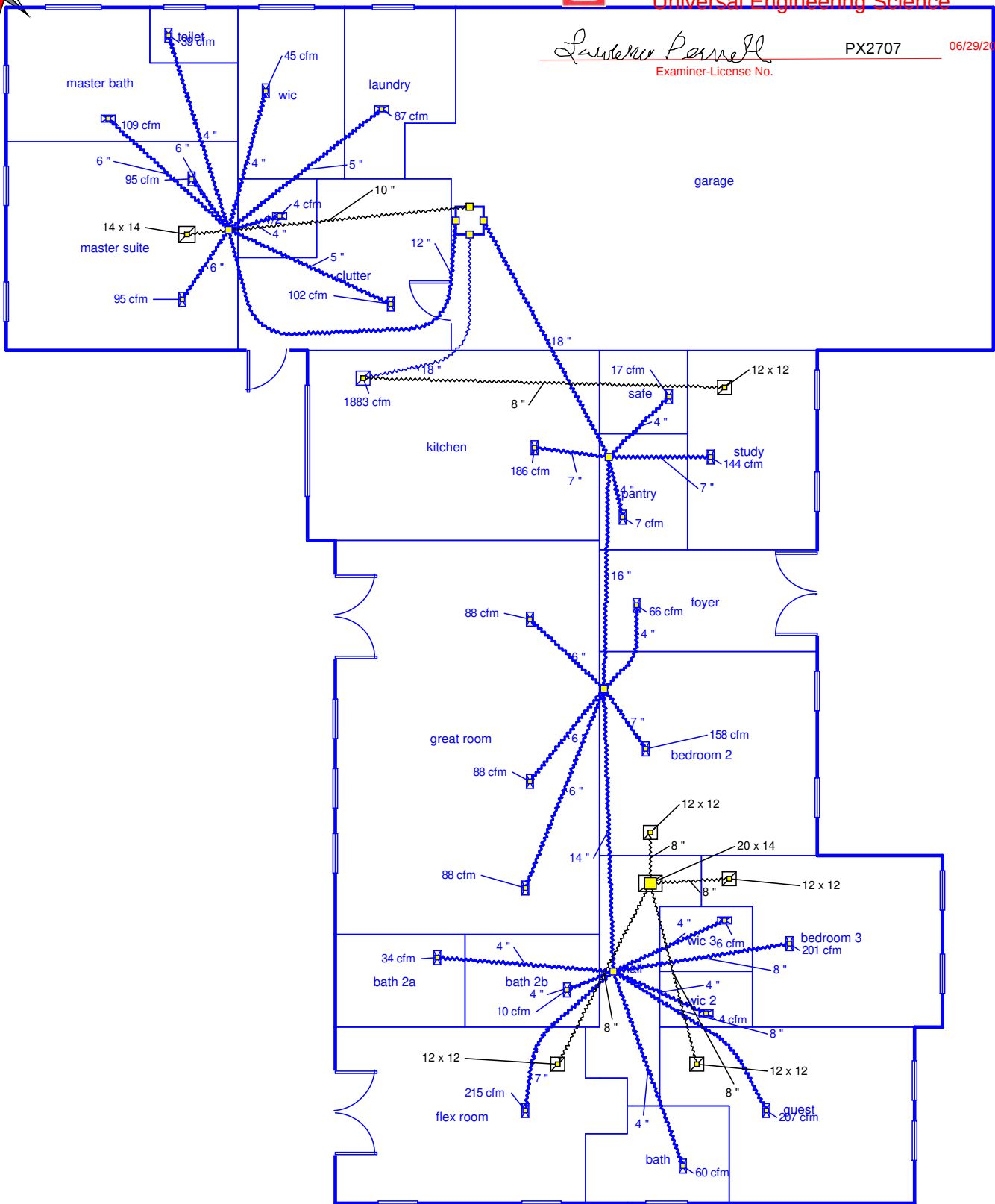


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Duct System Summary

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	Heating	Cooling
External static pressure	0.50 in H ₂ O	0.50 in H ₂ O
Pressure losses	0 in H ₂ O	0 in H ₂ O
Available static pressure	0.50 in H ₂ O	0.50 in H ₂ O
Supply / return available pressure	0.385 / 0.115 in H ₂ O	0.385 / 0.115 in H ₂ O
Lowest friction rate	0.186 in/100ft	0.186 in/100ft
Actual air flow	1883 cfm	1883 cfm
Total effective length (TEL)	268 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
1/2	c 90	2	4	0.289	4.0	0x0	VIFx	33.1	100.0	st2
bath	h 1508	60	35	0.192	4.0	0x0	VIFx	71.1	130.0	st4
bath 2a	h 847	34	17	0.194	4.0	0x0	VIFx	69.0	130.0	st4
bath 2b	c 216	5	10	0.203	4.0	0x0	VIFx	59.8	130.0	st4
bedroom 2	c 3396	108	158	0.255	7.0	0x0	VIFx	41.2	110.0	st3
bedroom 3	c 4308	143	201	0.194	8.0	0x0	VIFx	69.1	130.0	st4
clutter	h 2556	102	54	0.271	5.0	0x0	VIFx	42.1	100.0	st2
flex room	h 5389	215	156	0.189	7.0	0x0	VIFx	68.9	135.0	st4
foyer	h 1669	66	44	0.244	4.0	0x0	VIFx	42.9	115.0	st3
great room	c 1883	80	88	0.249	6.0	0x0	VIFx	44.4	110.0	st3
great room-A	c 1883	80	88	0.251	6.0	0x0	VIFx	43.2	110.0	st3
great room-B	c 1883	80	88	0.239	6.0	0x0	VIFx	51.3	110.0	st3
guest	c 4438	156	207	0.186	8.0	0x0	VIFx	71.6	135.0	st4
kitchen	c 4000	141	186	0.336	7.0	0x0	VIFx	24.6	90.0	st1
laundry	h 2196	87	72	0.269	5.0	0x0	VIFx	43.3	100.0	st2
master bath	h 2737	109	67	0.273	6.0	0x0	VIFx	41.1	100.0	st2
master suite	c 2037	92	95	0.285	6.0	0x0	VIFx	35.3	100.0	st2
master suite-A	c 2037	92	95	0.288	6.0	0x0	VIFx	33.8	100.0	st2
pantry	c 147	3	7	0.339	4.0	0x0	VIFx	23.7	90.0	st1
safe	h 427	17	5	0.334	4.0	0x0	VIFx	25.4	90.0	st1
study	c 3084	121	144	0.331	7.0	0x0	VIFx	26.6	90.0	st1
toilet	h 988	39	24	0.268	4.0	0x0	VIFx	44.0	100.0	st2
wic	h 1128	45	29	0.276	4.0	0x0	VIFx	39.7	100.0	st2
wic 2	c 93	2	4	0.199	4.0	0x0	VIFx	63.6	130.0	st4
wic 3	c 123	3	6	0.198	4.0	0x0	VIFx	65.0	130.0	st4

Bold/italic values have been manually overridden

Supply Trunk Detail Table



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Name	Trunk Type	Htg (cfm)	Clg (cfm)	Design FR	Veloc (fpm)	Diam (in)	H x W (in)	Duct Material	Trunk
st4	Peak AVF	617	636	0.186	595	14.0	0 x 0	VinIFlx	st3
st3	Peak AVF	1032	1101	0.186	789	16.0	0 x 0	VinIFlx	st1
st1	Peak AVF	1314	1443	0.186	817	18.0	0 x 0	VinIFlx	
st2	Peak AVF	569	440	0.268	724	12.0	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	1883	1883	61.5	0.186	599	24.0	0x 0		VIFx	rst8

Return Trunk Detail Table

Name	Trunk Type	Htg (cfm)	Clg (cfm)	Design FR	Veloc (fpm)	Diam (in)	H x W (in)	Duct Material	Trunk
rst8	Peak AVF	1883	1883	0.186	1066	18.0	0 x 0	VinIFlx	

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