

**TRANE**

Load Short Form

Entire House

DL Williams Heating & Cooling LLC

Job: 1

Date: Aug 15, 2022

By: DL Williams Heating & C...

Plan: 1

(31)

PO Box 2156, Lake City, FL 32056 Phone: 386-754-1987 Email: williamscoolingllc@gmail.com Web: www.dlwilliamsheatingandcooling.com

Project Information

For: Scrivener, Mike Todd Construction
FL

Design Information

	Htg	Clg	Infiltration	Simplified Average
Outside db (°F)	33	92	Method	0
Inside db (°F)	68	75	Construction quality	
Design TD (°F)	35	17	Fireplaces	
Daily range	-	M		
Inside humidity (%)	30	50		
Moisture difference (gr/lb)	8	44		

HEATING EQUIPMENT

Make Trane
Trade TRANE
Model 4TWR6018H1
AHRI ref 8939413

Efficiency 8.55 HSPF
Heating input
Heating output 18100 Btuh @ 47°F
Temperature rise 28 °F
Actual air flow 600 cfm
Air flow factor 0.042 cfm/Btuh
Static pressure 0.50 in H2O
Space thermostat
Capacity balance point = 28 °F

Backup:

Input = 4 kW, Output = 13630 Btuh, 100 AFUE

COOLING EQUIPMENT

Make Trane
Trade TRANE
Cond 4TWR6018H1
Coil TEM4A0B24S21
AHRI ref 8939413

Efficiency 12.5 EER, 15 SEER
Sensible cooling 12600 Btuh
Latent cooling 5400 Btuh
Total cooling 18000 Btuh
Actual air flow 600 cfm
Air flow factor 0.048 cfm/Btuh
Static pressure 0.50 in H2O
Load sensible heat ratio 0.85

ROOM NAME	Area (ft²)	Htg load (Btuh)	Clg load (Btuh)	Htg AVF (cfm)	Clg AVF (cfm)
closet	88	1202	545	51	26
mbath	80	1971	1021	83	49
kitchen/dining	357	6871	7231	289	347
bedroom	273	4199	3715	177	178
Entire House	798	14242	12512	600	600
Other equip loads		0	0		
Equip. @ 0.97 RSM			12162		
Latent cooling			2244		
TOTALS	798	14242	14406	600	600

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



**TRANE**

Loads for Multiple Orientations

*Entire House***DL Williams Heating & Cooling LLC**

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Project Information

For: Scrivener, Mike Todd Construction
FL

Design Conditions

Location:

Gainesville Regional, FL, US

Elevation: 123 ft

Latitude: 30°N

Outdoor:

Drybulb (°F)

Dailyrange (°F)

Wet bulb (°F)

Wind speed (mph)

Heating**Cooling****Indoor:**

Indoor temperature (°F)

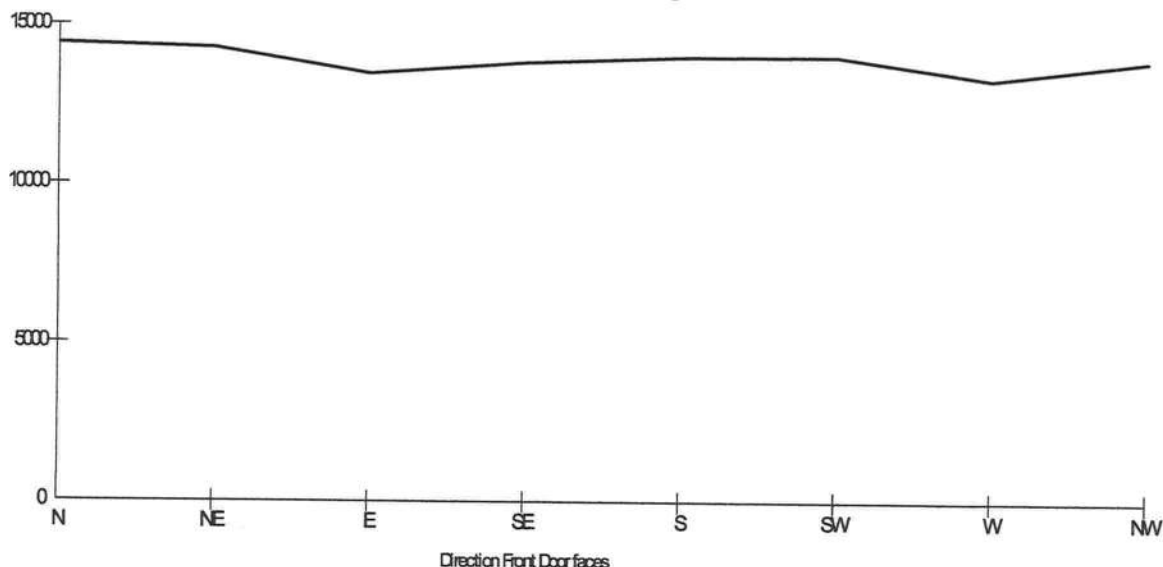
Design TD (°F)

Relative humidity (%)

Moisture difference (gr/lb)

Heating**Cooling****Infiltration:**

Front Door	North	Northeast	East	Southeast	South	Southwest	West	Northwest
Sensible Load (Btuh)	12162	12040	11238	11587	11775	11794	11090	11674
Latent Load (Btuh)	2244	2244	2244	2244	2244	2244	2244	2244
Total Load (Btuh)	14406	14283	13481	13831	14018	14038	13333	13918
Heating AVF (cfm)	600	600	600	600	600	600	600	600
Cooling AVF (cfm)	600	600	600	600	600	600	600	600

Building Orientation Cooling LoadCurrent Orientation: Front Door faces North
Highest Cooling Load: Front Door faces North

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

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A McQuay-Norris Building Company

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Building Analysis

Entire House

DL Williams Heating & Cooling LLC

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Plan: 1

PO Box 2156, Lake City, FL 32056 Phone: 386-754-1987 Email: williamscoolingllc@gmail.com Web: www.dlwilliamsheatingandcooling.com

Project Information

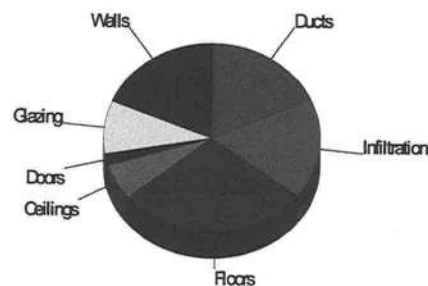
For: Scrivener, Mike Todd Construction
FL

Design Conditions

Location:		Indoor:		Heating	Cooling
Gainesville Regional, FL, US		Indoor temperature (°F)		68	75
Elevation: 123 ft		Design TD (°F)		35	17
Latitude: 30°N		Relative humidity (%)		30	50
		Moisture difference (gr/lb)		8.2	43.8
Outdoor:		Infiltration:			
Dry bulb (°F)	33	92	Method	Simplified	
Daily range (°F)	-	18 (M)	Construction quality	Average	
Wet bulb (°F)	-	76	Fireplaces	0	
Wind speed (mph)	15.0	7.5			

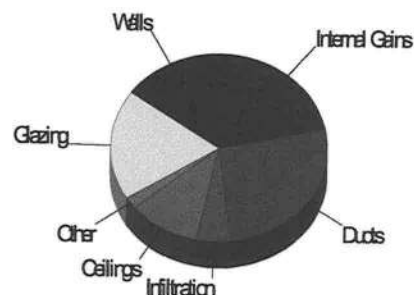
Heating

Component	Btuh/ft²	Btuh	% of load
Walls	3.2	2671	18.8
Glazing	16.4	1303	9.1
Doors	13.6	285	2.0
Ceilings	1.1	889	6.2
Floors	5.1	4061	28.5
Infiltration	2.6	2474	17.4
Ducts		2560	18.0
Piping		0	0
Humidification		0	0
Ventilation		0	0
Adjustments		0	0
Total		14242	100.0



Cooling

Component	Btuh/ft²	Btuh	% of load
Walls	2.2	1896	15.1
Glazing	29.7	2367	18.9
Doors	11.6	243	1.9
Ceilings	1.7	1359	10.9
Floors	0	0	0
Infiltration	0.7	641	5.1
Ducts		3317	26.5
Ventilation		0	0
Internal gains		2690	21.5
Blower		0	0
Adjustments		0	0
Total		12512	100.0



Latent Cooling Load = 2244 Btuh
Overall U-value = 0.104 Btuh/ft²·°F

Data entries checked.



J1 Form - Worksheet A

Entire House
DL Williams Heating & Cooling LLC

Job: 1
Date: Aug 15, 2022
By: DL Williams Heating & C...
Plan: 1

PO Box 2156, Lake City, FL 32056 Phone: 386-754-1987 Email: williamscoolingllc@gmail.com Web: www.dlwilliamsheatingandcooling.com

Supporting Detail

Project Name:	Mike Todd Scrivener addition	Date:	Aug 15, 2022
Address:	FL		
Phone:	Job ID:	1	

Worksheet A Location and Design Conditions

Weather Location:	Gainesville Regional, FL, US	Elevation =	123	Latitude =	30
Indoor Conditions, Heating:	DB = 68 °F	RH = 30 %	Indoor Conditions, Cooling:	DB = 75 °F	RH = 50 %
Table 1 Conditions	99% DB = 33 °F	1% DB = 92 °F	Grains Difference =	44 gr/lb	Daily Range = M
Design Temperature Differences	HTD =	35 °F	CTD =	17 °F	

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



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Component Constructions

Entire House

DL Williams Heating & Cooling LLC

Job: 1
Date: Aug 15, 2022
By: DL Williams Heating & C...
Plan: 1

PO Box 2156, Lake City, FL 32056 Phone: 386-754-1987 Email: williamscoolingllc@gmail.com Web: www.dlwilliamsheatingandcooling.com

Project Information

For: Scrivener, Mike Todd Construction
FL

Design Conditions

Location:		Indoor:		Heating	Cooling
Gainesville Regional, FL, US		Indoor temperature (°F)		68	75
Elevation:	123 ft	Design TD (°F)		35	17
Latitude:	30°N	Relative humidity (%)		30	50
		Moisture difference (gr/lb)		8.2	43.8
Outdoor:		Heating	Cooling		
Dry bulb (°F)		33	92		
Daily range (°F)		-	18 (M)		
Wet bulb (°F)		-	76		
Wind speed (mph)		15.0	7.5		
		Infiltration:			
		Method		Simplified	
		Construction quality		Average	
		Fireplaces		0	

Construction descriptions

	Or	Area ft²	U-value Btuh/ft²-°F	Insul R ft²-°F/Btuh	Htg HTM Btuh/ft²	Loss Ctg HTM Btuh	Gain Btuh
Walls							
12C-0sw: Frm wall, stucco ext, 3/8" wood shth, r-13 cav ins, 1/2" gypsum board int fnsh, 2"x4" wood frm, 16" o.c. stud	n	168	0.091	13.0	3.17	532	378
	e	289	0.091	13.0	3.17	916	650
	s	148	0.091	13.0	3.17	469	333
	w	238	0.091	13.0	3.17	754	535
	all	843	0.091	13.0	3.17	2671	1896
Partitions (none)							
Windows							
4A5-2ov: 2 glazing, clr low-e outr, air gas, insulated vinyl frm mat, clr innr, 1/4" gap, 1/8" thk; NFRC rated (SHGC=0.31); 50% blinds 45°, light; 50% outdoor insect screen; 2 ft overhang (2 ft window ht, 2 ft sep.); 6.67 ft head ht	e	6	0.470	0	16.4	93	165
4A5-2ov: 2 glazing, clr low-e outr, air gas, insulated vinyl frm mat, clr innr, 1/4" gap, 1/8" thk; NFRC rated (SHGC=0.31); 50% blinds 45°, light; 50% outdoor insect screen; 2 ft overhang (3 ft window ht, 2 ft sep.); 6.67 ft head ht	e	9	0.470	0	16.4	147	263
4A5-2ov: 2 glazing, clr low-e outr, air gas, insulated vinyl frm mat, clr innr, 1/4" gap, 1/8" thk; NFRC rated (SHGC=0.31); 50% blinds 45°, light; 50% outdoor insect screen; 2 ft overhang (5 ft window ht, 2 ft sep.); 6.67 ft head ht	s	20	0.470	0	16.4	327	228
	w	15	0.470	0	16.4	245	438
	w	30	0.470	0	16.4	491	875
	all	65	0.470	0	16.4	1063	1541
Doors							
11D0: Door, wd sc type	w	21	0.390	0	13.6	285	243
Ceilings							
16B-30ad: Attic ceiling, asphalt shingles roof mat, r-31 roof ins, r-30 ceil ins, 1/2" gypsum board int fnsh		798	0.032	30.0	1.11	889	1359
Floors							
22A-vpl: Bg floor, light dry soil, on grade depth, vinyl flr fnsh		118	0.989	0	34.4	4061	0

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Component Constructions
closet
DL Williams Heating & Cooling LLC

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Project Information

For: Scrivener, Mike Todd Construction
FL

Design Conditions

Location:		Indoor:		Heating	Cooling
Gainesville Regional, FL, US		Indoor temperature (°F)		68	75
Elevation: 123 ft		Design TD (°F)		35	17
Latitude: 30°N		Relative humidity (%)		30	50
		Moisture difference (gr/lb)		8.2	43.8
Outdoor:		Heating	Cooling		
Drybulb (°F)	33	92			
Daily range (°F)	-	18 (M)			
Wet bulb (°F)	-	76			
Wind speed (mph)	15.0	7.5			
		Infiltration:			
		Method		Simplified	
		Construction quality		Average	
		Fireplaces		0	

Construction descriptions

	Or	Area ft²	U-value Btuh/ft²-°F	Insul R ft²-°F/Btuh	Htg HTM Btuh/ft²	Loss Btuh	Clg HTM Btuh/ft²	Gain Btuh
Walls 12C-0sw: Frm wall, stucco ext, 3/8" wood shth, r-13 cav ins, 1/2" gypsum board int fnsh, 2"x4" wood frm, 16" o.c. stud	e	88	0.091	13.0	3.17	279	2.25	198
Partitions (none)								
Windows (none)								
Doors (none)								
Ceilings 16B-30ad: Attic ceiling, asphalt shingles roof mat, r-31 roof ins, r-30 ceil ins, 1/2" gypsum board int fnsh		88	0.032	30.0	1.11	98	1.70	150
Floors 22A-vpl: Bg floor, light dry soil, on grade depth, vinyl flr fnsh		11	0.989	0	34.4	379	0	0



Component Constructions

mbath

DL Williams Heating & Cooling LLC

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Project Information

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FL

Design Conditions

Location:		Indoor:		Heating	Cooling
Gainesville Regional, FL, US		Indoor temperature (°F)		68	75
Elevation: 123 ft		Design TD (°F)		35	17
Latitude: 30°N		Relative humidity (%)		30	50
		Moisture difference (gr/lb)		8.2	43.8
Outdoor:	Heating	Cooling	Infiltration:		
Dry bulb (°F)	33	92	Method	Simplified	
Daily range (°F)	-	18 (M)	Construction quality	Average	
Wet bulb (°F)	-	76	Fireplaces	0	
Wind speed (mph)	15.0	7.5			

Construction descriptions

	Or	Area ft²	U-value Btuh/ft²-°F	Insul R ft²-°F/Btuh	Htg HTM Btuh/ft²	Loss Btuh	Clg HTM Btuh/ft²	Gain Btuh
Walls								
12C-0sw: Frm wall, stucco ext, 3/8" wood shth, r-13 cav ins, 1/2" gypsum board int fnsh, 2"x4" wood frm, 16" o.c. stud	n	64	0.091	13.0	3.17	203	2.25	144
	e	74	0.091	13.0	3.17	235	2.25	167
	all	138	0.091	13.0	3.17	438	2.25	311
Partitions								
(none)								
Windows								
4A5-2ov: 2 glazing, clr low-e outr, air gas, insulated vinyl frm mat, clr innr, 1/4" gap, 1/8" thk; NFRC rated (SHGC=0.31); 50% blinds 45°, light; 50% outdoor insect screen; 2 ft overhang (2 ft window ht, 2 ft sep.); 6.67 ft head ht	e	6	0.470	0	16.4	93	29.2	165
Doors								
(none)								
Ceilings								
16B-30ad: Attic ceiling, asphalt shingles roof mat, r-31 roof ins, r-30 ceil ins, 1/2" gypsum board int fnsh		80	0.032	30.0	1.11	89	1.70	136
Floors								
22A-vpl: Bg floor, light dry soil, on grade depth, vinyl flr fnsh		18	0.989	0	34.4	620	0	0



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**TRANE**

Component Constructions

kitchen/dining

DL Williams Heating & Cooling LLC

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Project Information

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 FL

Design Conditions

Location:		Indoor:		Heating	Cooling
Gainesville Regional, FL, US		Indoor temperature (°F)		68	75
Elevation: 123 ft		Design TD (°F)		35	17
Latitude: 30°N		Relative humidity (%)		30	50
		Moisture difference (gr/lb)		8.2	43.8
Outdoor:		Heating	Cooling		
Dry bulb (°F)		33	92		
Daily range (°F)		-	18 (M)		
Wet bulb (°F)		-	76		
Wind speed (mph)		15.0	7.5		
		Infiltration:		Heating	Cooling
		Method		Simplified	
		Construction quality		Average	
		Fireplaces		0	

Construction descriptions

Or	Area ft²	U-value Btuh/ft²-°F	Insul R ft²-°F/Btuh	Htg HTM Btuh/ft²	Loss Btuh	Clg HTM Btuh/ft²	Gain Btuh
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Walls							
12C-0sw: Frm wall, stucco ext, 3/8" wood shth, r-13 cav ins, 1/2" gypsum board int fnsh, 2"x4" wood frm, 16" o.c. stud	e	127	0.091	13.0	3.17	402	285
	s	148	0.091	13.0	3.17	469	333
	w	100	0.091	13.0	3.17	317	225
	all	375	0.091	13.0	3.17	1188	843

Partitions

(none)

Windows

4A5-2ov: 2 glazing, clr low-e outr, air gas, insulated vinyl frm mat, clr innr, 1/4" gap, 1/8" thk; NFRC rated (SHGC=0.31); 50% blinds 45°, light; 50% outdoor insect screen; 2 ft overhang (3 ft window ht, 2 ft sep.); 6.67 ft head ht	e	9	0.470	0	16.4	147	263
4A5-2ov: 2 glazing, clr low-e outr, air gas, insulated vinyl frm mat, clr innr, 1/4" gap, 1/8" thk; NFRC rated (SHGC=0.31); 50% blinds 45°, light; 50% outdoor insect screen; 2 ft overhang (5 ft window ht, 2 ft sep.); 6.67 ft head ht	s	20	0.470	0	16.4	327	228
	w	15	0.470	0	16.4	245	438
	all	35	0.470	0	16.4	572	666

Doors

11D0: Door, wd sc type	w	21	0.390	0	13.6	285	243
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Ceilings

16B-30ad: Attic ceiling, asphalt shingles roof mat, r-31 roof ins, r-30 ceil ins, 1/2" gypsum board int fnsh		357	0.032	30.0	1.11	398	608
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Floors

22A-vpl: Bg floor, light dry soil, on grade depth, vinyl flr fnsh		55	0.989	0	34.4	1893	0
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**TRANE****Component Constructions***bedroom***DL Williams Heating & Cooling LLC**

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 FL

Design Conditions

Location:			Indoor:	Heating	Cooling
Gainesville Regional, FL, US			Indoor temperature (°F)	68	75
Elevation:	123 ft		Design TD (°F)	35	17
Latitude:	30°N		Relative humidity (%)	30	50
Outdoor:			Moisture difference (gr/lb)	8.2	43.8
Heating	Cooling		Infiltration:		
Dry bulb (°F)	33	92	Method	Simplified	
Daily range (°F)	-	18 (M)	Construction quality	Average	
Wet bulb (°F)	-	76	Fireplaces	0	
Wind speed (mph)	15.0	7.5			

Construction descriptions

Or	Area ft²	U-value Btuh/ft²-°F	Insul R ft²-°F/Btuh	Htg HTM Btuh/ft²	Loss Btuh	Clg HTM Btuh/ft²	Gain Btuh
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Walls							
12C-0sw: Frm wall, stucco ext, 3/8" wood shth, r-13 cav ins, 1/2" gypsum board int fnsh, 2"x4" wood frm, 16" o.c. stud	n	104	0.091	13.0	3.17	329	234
	w	138	0.091	13.0	3.17	437	310
	all	242	0.091	13.0	3.17	766	544

Partitions
(none)**Windows**

4A5-2ov: 2 glazing, clr low-e outr, air gas, insulated vinyl frm mat, clr innr, 1/4" gap, 1/8" thk; NFRC rated (SHGC=0.31); 50% blinds 45°, light; 50% outdoor insect screen; 2 ft overhang (5 ft window ht, 2 ft sep.); 6.67 ft head ht	w	30	0.470	0	16.4	491	29.2	875
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Doors
(none)**Ceilings**

16B-30ad: Attic ceiling, asphalt shingles roof mat, r-31 roof ins, r-30 ceil ins, 1/2" gypsum board int fnsh		273	0.032	30.0	1.11	304	1.70	465
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Floors

22A-vpl: Bg floor, light dry soil, on grade depth, vinyl flr fnsh		34	0.989	0	34.4	1170	0	0
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Project Summary

Entire House
DL Williams Heating & Cooling LLC

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By: DL Williams Heating & C...
Plan: 1

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Project Information

For: Scrivener, Mike Todd Construction
FL

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 11682 Btuh
Ducts 2560 Btuh
Central vent (0 cfm)
(none) 0 Btuh
Humidification 0 Btuh
Piping 0 Btuh
Equipment load 14242 Btuh

Sensible Cooling Equipment Load Sizing

Structure 9196 Btuh
Ducts 3317 Btuh
Central vent (0 cfm)
(none) 0 Btuh
Blower 0 Btuh
Use manufacturer's data n
Rate/swing multiplier 0.97
Equipment sensible load 12162 Btuh

Infiltration

Method Simplified
Construction quality Average
Fireplaces 0

Latent Cooling Equipment Load Sizing

Structure 1610 Btuh
Ducts 634 Btuh
Central vent (0 cfm)
(none) 0 Btuh
Equipment latent load 2244 Btuh

	Heating	Cooling
Area (ft ²)	798	798
Volume (ft ³)	6384	6384
Air changes/hour	0.61	0.32
Equiv. AVF (cfm)	65	34

Equipment Total Load (Sen+Lat) 14406 Btuh
Req. total capacity at 0.70 SHR 1.4 ton

Heating Equipment Summary

Make Trane
Trade TRANE
Model 4TWR6018H1
AHRI ref 8939413
Efficiency 8.55 HSPF
Heating input 18100 Btuh @ 47°F
Heating output 28 °F
Temperature rise 600 cfm
Actual air flow 0.042 cfm/Btuh
Air flow factor 0.50 in H2O
Static pressure
Space thermostat
Capacity balance point = 28 °F

Cooling Equipment Summary

Make Trane
Trade TRANE
Cond 4TWR6018H1
Coil TEM4A0B24S21
AHRI ref 8939413
Efficiency 12.5 EER, 15 SEER
Sensible cooling 12600 Btuh
Latent cooling 5400 Btuh
Total cooling 18000 Btuh
Actual air flow 600 cfm
Air flow factor 0.048 cfm/Btuh
Static pressure 0.50 in H2O
Load sensible heat ratio 0.85

Backup:
Input = 4 kW, Output = 13630 Btuh, 100 AFUE

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



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...oft HVAC\Trane\Mike Todd Scrivener addition.rup Calc = MJ8 Front Door faces: N

**TRANE****AED Assessment***Entire House***DL Williams Heating & Cooling LLC**

Job: 1

Date: Aug 15, 2022

By: DL Williams Heating & C...

Plan: 1

PO Box 2156, Lake City, FL 32056 Phone: 386-754-1987 Email: williamscoolingllc@gmail.com Web: www.dlwilliamsheatingandcooling.com

Project InformationFor: Scrivener, Mike Todd Construction
FL**Design Conditions****Location:**

Gainesville Regional, FL, US

Elevation: 123 ft

Latitude: 30°N

Outdoor:

Dry bulb (°F)

Daily range (°F)

Wet bulb (°F)

Wind speed (mph)

Heating**Cooling****Indoor:**

Indoor temperature (°F)

Design TD (°F)

Relative humidity (%)

Moisture difference (gr/lb)

Infiltration:**Heating****Cooling**

68

75

35

17

30

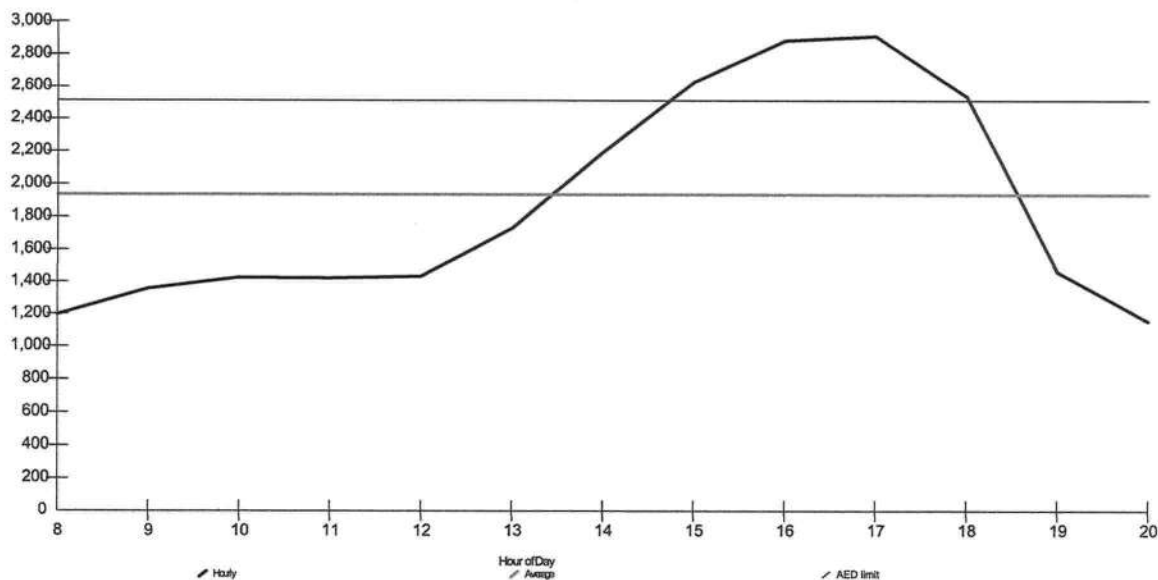
50

8.2

43.8

Test for Adequate Exposure Diversity

Hourly Glazing Load

**Maximum hourly glazing load exceeds average by 50.6%.****House does not have adequate exposure diversity (AED), based on AED limit of 30%.****AED excursion: 399 Btuh (PFG - 1.3*AFG)****wrightsoft®**
A McQuay-Norris Building Company

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Right-J® Worksheet

Entire House

DL Williams Heating & Cooling LLC

Job: 1
 Date: Aug 15, 2022
 By: DL Williams Heating & Cooling...
 Plan: 1

PO Box 2156, Lake City, FL 32056 Phone: 386-754-1987 Email: williamscoolingllc@gmail.com Web: www.dlwilliamsheatingandcooling.com

1	Room name					Entire House				closet				
2	Exposed wall					118.0 ft				11.0 ft				
3	Room height					8.0 ft				8.0 ft				
4	Room dimensions					8.0 ft				8.0 x 11.0 ft				
5	Room area					798.0 ft²				88.0 ft²				
	Ty	Construction number	U-value (Btuh/ft²·°F)	Or	HTM (Btuh/ft²)		Area (ft²) or perimeter (ft)		Load (Btuh)		Area (ft²) or perimeter (ft)		Load (Btuh)	
					Heat	Cool	Gross	N/P/S	Heat	Cool	Gross	N/P/S	Heat	Cool
6	W	12C-0sw	0.091	n	3.17	2.25	168	168	532	378	0	0	0	0
.	W	12C-0sw	0.091	e	3.17	2.25	304	289	916	650	88	88	279	198
.	G	4A5-2ov	0.470	e	16.36	29.17	6	0	93	165	0	0	0	0
.	G	4A5-2ov	0.470	e	16.36	29.17	9	0	147	263	0	0	0	0
11	W	12C-0sw	0.091	s	3.17	2.25	168	148	469	333	0	0	0	0
	G	4A5-2ov	0.470	s	16.36	11.41	20	20	327	228	0	0	0	0
	W	12C-0sw	0.091	w	3.17	2.25	304	238	754	535	0	0	0	0
	G	4A5-2ov	0.470	w	16.36	29.17	15	0	245	438	0	0	0	0
	G	4A5-2ov	0.470	w	16.36	29.17	30	0	491	875	0	0	0	0
	D	11D0	0.390	w	13.57	11.58	21	21	285	243	0	0	0	0
	C	16B-30ad	0.032	-	1.11	1.70	798	798	889	1359	88	88	98	150
	F	22A-vol	0.989	-	34.42	0.00	798	118	4061	0	88	11	379	0

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



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Right-J® Worksheet
Entire House
DL Williams Heating & Cooling LLC

Job: 1
Date: Aug 15, 2022
By: DL Williams Heating & Cooling
Plan: 1

PO Box 2156, Lake City, FL 32056 Phone: 386-754-1987 Email: williamscoolingllc@gmail.com Web: www.dlwilliamsheatingandcooling.com

1	Room name					mbath				kitchen/dining				
2	Exposed wall					18.0 ft				55.0 ft				
3	Room height					8.0 ft heat/cool				8.0 ft heat/cool				
4	Room dimensions					8.0 8.0 x 10.0 ft				21.0 x 17.0 ft				
5	Room area					80.0 ft²				357.0 ft²				
	Ty	Construction number	U-value (Btuh/ft²·°F)	Or	HTM (Btuh/ft²)		Area (ft²) or perimeter (ft)		Load (Btuh)		Area (ft²) or perimeter (ft)		Load (Btuh)	
					Heat	Cool	Gross	N/P/S	Heat	Cool	Gross	N/P/S	Heat	Cool
6	W	12C-0sw	0.091	n	3.17	2.25	64	64	203	144	0	0	0	0
	W	12C-0sw	0.091	e	3.17	2.25	80	74	235	167	136	127	402	285
	G	4A5-2ov	0.470	e	16.36	29.17	6	0	93	165	0	0	0	0
	G	4A5-2ov	0.470	e	16.36	29.17	0	0	0	0	9	0	147	263
11	W	12C-0sw	0.091	s	3.17	2.25	0	0	0	0	168	148	469	333
	G	4A5-2ov	0.470	s	16.36	11.41	0	0	0	0	20	20	327	228
	W	12C-0sw	0.091	w	3.17	2.25	0	0	0	0	136	100	317	225
	G	4A5-2ov	0.470	w	16.36	29.17	0	0	0	0	15	0	245	438
	G	4A5-2ov	0.470	w	16.36	29.17	0	0	0	0	0	0	0	0
	D	11D0	0.390	w	13.57	11.58	0	0	0	0	21	21	285	243
	C	16B-30ad	0.032	-	1.11	1.70	80	80	89	136	357	357	398	608
	F	22A-vol	0.989	-	34.42	0.00	80	18	620	0	357	55	1893	0
6	c) AED excursion									40				-66
	Envelope loss/gain								1239	652			4483	2556
12	a) Infiltration								377	98			1153	299
	b) Room ventilation								0	0			0	0
13	Internal gains: Occupants @ 230						0			0	2			460
	Appliances/other									0				2000
	Subtotal (lines 6 to 13)								1617	750			5636	5315
	Less external load								0	0			0	0
	Less transfer								0	0			0	0
	Redistribution								0	0			0	0
14	Subtotal								1617	750			5636	5315
15	Duct loads						22%	36%	354	271	22%	36%	1235	1917
	Total room load								1971	1021			6871	7231
	Air required (cfm)								83	49			289	347

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



**TRANE****Duct system multi orientation report***Entire House***DL Williams Heating & Cooling LLC**

Job: 1
 Date: Aug 15, 2022
 By: DL Williams Heating & C...
 Plan: 1

PO Box 2156, Lake City, FL 32056 Phone: 386-754-1987 Email: williamscoolingllc@gmail.com Web: www.dlwilliamsheatingandcooling.com

Project Information

For: Scrivener, Mike Todd Construction
 FL

Group 1: (N, NE, E, SE, S, SW, W, NW)

Duct Name	(N)			(NE)			(E)			(SE)		
	Reg CFM	Reg Size	Duct Size	Reg CFM	Reg Size	Duct Size	Reg CFM	Reg Size	Duct Size	Reg CFM	Reg Size	Duct Size
Supply Branches												
bedroom	178 c	12x12	7	177 h	12x12	7	177 h	12x12	7	177 h	12x12	7
closet	51 h	12x12	5	51 h	12x12	5	51 h	12x12	5	51 h	12x12	5
kitchen/dining	173 c	12x12	7	183 c	12x12	7	197 c	12x12	7	181 c	12x12	7
kitchen/dining-A	173 c	12x12	7	183 c	12x12	7	197 c	12x12	7	181 c	12x12	7
mbath	83 h	12x12	6	83 h	12x12	6	83 h	12x12	6	83 h	12x12	6
Return Branches												
rb1	600 c	12x12	14	600 c	12x12	14	600 c	12x12	14	600 c	12x12	14
Friction Rates												
Heating FR	0.292			0.292			0.292			0.292		
Cooling FR	0.292			0.292			0.292			0.292		



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Project Information

For: Scrivener, Mike Todd Construction
FL

Duct Name	(S)			(SW)			(W)			(NW)		
	Reg CFM	Reg Size	Duct Size	Reg CFM	Reg Size	Duct Size	Reg CFM	Reg Size	Duct Size	Reg CFM	Reg Size	Duct Size
Supply Branches												
bedroom	177 h	12x12	7	177 h	12x12	7	177 h	12x12	7	177 h	12x12	7
closet	51 h	12x12	5	51 h	12x12	5	51 h	12x12	5	51 h	12x12	5
kitchen/dining	176 c	12x12	7	191 c	12x12	7	200 c	12x12	7	184 c	12x12	7
kitchen/dining-A	176 c	12x12	7	191 c	12x12	7	200 c	12x12	7	184 c	12x12	7
mbath	83 h	12x12	6	83 h	12x12	6	83 h	12x12	6	83 h	12x12	6
Return Branches												
rb1	600 c	12x12	14	600 c	12x12	14	600 c	12x12	14	600 c	12x12	14
Friction Rates												
Heating FR	0.292			0.292			0.292			0.292		
Cooling FR	0.292			0.292			0.292			0.292		



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Project Information

For: Scrivener, Mike Todd Construction
FL

Duct Name	Largest			Smallest		
	Reg CFM	Reg Size	Duct Size	Reg CFM	Reg Size	Duct Size
Supply Branches						
bedroom	178 c	12x12	7	177 h	12x12	7
closet	51 h	12x12	5	51 h	12x12	5
kitchen/dining	200 c	12x12	7	173 c	12x12	7
kitchen/dining-A	200 c	12x12	7	173 c	12x12	7
mbath	83 h	12x12	6	83 h	12x12	6
Return Branches						
rb1	600 c	12x12	14	600 c	12x12	14
Friction Rates						
Heating FR	0.292			0.292		
Cooling FR	0.292			0.292		

Background Color Legend

Yellow background

Duct Size - duct size is smaller than the largest duct size in the row

Reg Size - register size is smaller than the largest register size in the row

Reg CFM - register design cfm is larger than 150 CFM

Friction Rate - friction rate is outside ACCA Manual-D recommended range (0.06 - 0.18)

Pink background column header

Largest cooling load orientation



Static Pressure and Friction Rate

Entire House

DL Williams Heating & Cooling LLC

Job: 1
Date: Aug 15, 2022
By: DL Williams Heating & C...
Plan: 1

PO Box 2156, Lake City, FL 32056 Phone: 386-754-1987 Email: williamscoolingllc@gmail.com Web: www.dlwilliamsheatingandcooling.com

Project Information

For: Scrivener, Mike Todd Construction
FL

Available Static Pressure

	Heating (in H2O)	Cooling (in H2O)
External static pressure	0.50	0.50
Pressure losses		
Coil	0	0
Heat exchanger	0	0
Supply diffusers	0	0
Return grilles	0	0
Filter	0	0
Humidifier	0	0
Balancing damper	0	0
Other device	0	0
Available static pressure	0.50	0.50

Total Effective Length

	Supply (ft)	Return (ft)
Measured length of run-out	14	2
Measured length of trunk	0	0
Equivalent length of fittings	95	60
Total length	109	62
Total effective length		171

Friction Rate

	Heating (in/100ft)	Cooling (in/100ft)
Supply Ducts	0.292 > 0.18	0.292 > 0.18
Return Ducts	0.292 > 0.18	0.292 > 0.18

Fitting Equivalent Length Details

Supply 4AD=60, 1A=35: TotalEL=95
Return 5D=40, 6M=20: TotalEL=60

**TRANE**

Duct System Summary

*Entire House***DL Williams Heating & Cooling LLC**

Job: 1

Date: Aug 15, 2022

By: DL Williams Heating & C...

Plan: 1

PO Box 2156, Lake City, FL 32056 Phone: 386-754-1987 Email: williamscoolingllc@gmail.com Web: www.dlwilliamsheatingandcooling.com

Project Information

For: Scrivener, Mike Todd Construction
FL

	Heating	Cooling
External static pressure	0.50 in H2O	0.50 in H2O
Pressure losses	0 in H2O	0 in H2O
Available static pressure	0.50 in H2O	0.50 in H2O
Supply / return available pressure	0.319 / 0.181 in H2O	0.319 / 0.181 in H2O
Lowest friction rate	0.292 in/100ft	0.292 in/100ft
Actual air flow	600 cfm	600 cfm
Total effective length (TEL)		171 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
bedroom	c 3715	177	178	0.301	7.0	0x0	VIFx	10.8	95.0	
closet	h 1202	51	26	0.328	5.0	0x0	VIFx	2.2	95.0	
kitchen/dining	c 3616	145	173	0.302	7.0	0x0	VIFx	10.4	95.0	
kitchen/dining-A	c 3616	145	173	0.325	7.0	0x0	VIFx	3.2	95.0	
mbath	h 1971	83	49	0.292	6.0	0x0	VIFx	14.0	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
rb1	0x0	600	600	62.0	0.292	561	14.0	0x0		VIFx	

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Manual S Compliance Report

Entire House

DL Williams Heating & Cooling LLC

Job: 1
Date: Aug 15, 2022
By: DL Williams Heating & C...
Plan: 1

PO Box 2156, Lake City, FL 32056 Phone: 386-754-1987 Email: williamscoolingllc@gmail.com Web: www.dlwilliamsheatingandcooling.com

Project Information

For: Scrivener, Mike Todd Construction
FL

Cooling Equipment

Design Conditions

Outdoor design DB:	92.2°F	Sensible gain:	12512 Btuh	Entering coil DB:	77.0°F
Outdoor design WB:	75.8°F	Latent gain:	2244 Btuh	Entering coil WB:	63.4°F
Indoor design DB:	75.0°F	Total gain:	14756 Btuh		
Indoor RH:	50%	Estimated airflow:	600 cfm		

Manufacturer's Performance Data at Actual Design Conditions

Equipment type: Split ASHP
Manufacturer: Trane Model: 4TWR6018H1+TEM4A0B24S21
Actual airflow: 600 cfm
Sensible capacity: 14065 Btuh 112% of load
Latent capacity: 2869 Btuh 128% of load
Total capacity: 16934 Btuh 115% of load SHR: 83%

Heating Equipment

Design Conditions

Outdoor design DB:	33.2°F	Heat loss:	14242 Btuh	Entering coil DB:	67.1°F
Indoor design DB:	68.0°F				

Manufacturer's Performance Data at Actual Design Conditions

Equipment type: Split ASHP
Manufacturer: Trane Model: 4TWR6018H1+TEM4A0B24S21
Actual airflow: 600 cfm
Output capacity: 13616 Btuh 96% of load
Supplemental heat required: 626 Btuh
Capacity balance: 28 °F
Economic balance: -99 °F

Backup equipment type: Elec strip
Manufacturer: Model:
Actual airflow: 600 cfm
Output capacity: 4.0 kW 96% of load Temp. rise: 50 °F

Meets all requirements of ACCA Manual S.



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Residential Plans Examiner Review Form for HVAC System Design (Loads, Equipment, Ducts)

Form
RPER 1
15 Mar 09

Header Information

Contractor: DL Williams Heating & Cooling LLC
Derrick Williams

Mechanical license:

Building plan #: 1

Home address (Street or Lot#, Block, Subdivision): , Entire House

REQUIRED ATTACHMENTS

Manual J1 Form (and supporting worksheets):
or MJ1AE Form* (and supporting worksheets):
OEM performance data (heating, cooling, blower):
Manual D Friction Rate Worksheet:
Duct distribution sketch:

ATTACHED

Yes ☐ No ☐
Yes ☐ No ☐
Yes ☐ No ☐
Yes ☐ No ☐
Yes ☐ No ☐

HVAC LOAD CALCULATION (IRC M1401.3)

Design Conditions

Winter Design Conditions

Outdoor temperature: 33 °F
Indoor temperature: 68 °F
Total heat loss: 14242 Btuh

Summer Design Conditions

Outdoor temperature: 92 °F
Indoor temperature: 75 °F
Grains difference: 44 gr/lb @50% RH
Sensible heat gain: 12873 Btuh
Latent heat gain: 2308 Btuh
Total heat gain: 15181 Btuh

Building Construction Information

Building

Orientation: Front Door faces North
North, East, West, South, Northeast, Northwest, Southeast, Southwest

Number of bedrooms: 0
Conditioned floor area: 798 ft²
Number of occupants: 3

Windows

Eave overhang depth: 2.0 ft
Internal shade: blinds
Blinds, drapes, etc.
Number of skylights: 0



HVAC EQUIPMENT SELECTION (IRC M1401.3)

Heating Equipment Data

Equipment type: Split ASHP
Furnace, Heat pump, Boiler, etc.
Model: Trane
4TWR6018H1+TEM4A0B24S21
Heating output capacity: 13616 Btuh
Heat pumps - capacity at winter design outdoor conditions
Aux. heating output capacity: 13630 Btuh

Cooling Equipment Data

Equipment type: Split ASHP
Air Conditioner, Heat pump, etc.
Model: Trane
4TWR6018H1+TEM4A0B24S21
Total cooling capacity: 16934 Btuh
Sensible cooling capacity: 14065 Btuh
Latent cooling capacity: 2869 Btuh

Blower Data

Heating cfm: 600
Cooling cfm: 600
Static pressure: 0.50 in H₂O
Fan's rated external static pressure for design airflow

HVAC DUCT DISTRIBUTION SYSTEM DESIGN (IRC M1601.1)

Design airflow: 600 cfm
Equipment design ESP: 0.50 in H₂O
Total device pressure losses: 0 in H₂O
Available static pressure (ASP): 0.50 in H₂O
Longest supply duct: 109 ft
Longest return duct: 62 ft
Total effective length (TEL): 171 ft
Friction rate: 0.292 in/100ft
Duct Materials Used
Trunk duct:
Branch duct: Round flex vinyl
Friction Rate = ASP ÷ (TEL × 100)

I declare the load calculation, equipment, equipment selection and duct design were rigorously performed based on the building plan listed above. I understand the claims made on these forms will be subject to review and verification.

Contractor's printed name: _____

Contractor's signature: _____

Date: _____

Reserved for County, Town Municipality or Authority having jurisdiction use.

*Home qualifies for MJ1AE Form based on Abridged Edition Checklist