

# Air System Sizing Summary for BARD

Project Name: 20001037 Cascade Christian Portable HVAC  
 Prepared by: Air Systems Engineering

08/30/2024  
09:38AM

PRMH20241661



## Air System Information

Air System Name ..... <b>BARD</b>	Number of Zones ..... <b>1</b>
Equipment Class ..... <b>PKG VERT</b>	Floor Area ..... <b>870.0</b> ft <sup>2</sup>
Air System Type ..... <b>SZCAV</b>	Location ..... <b>Tacoma, Washington</b>

## Sizing Calculation Information

Calculation Months ..... <b>May to Sep</b>	Zone CFM Sizing ..... <b>Sum of space airflow rates</b>
Sizing Data ..... <b>Calculated</b>	Space CFM Sizing ..... <b>Individual peak space loads</b>

## Central Cooling Coil Sizing Data

Total coil load ..... <b>1.6</b> Tons	Load occurs at ..... <b>Jul 1500</b>
Total coil load ..... <b>18.9</b> MBH	OA DB / WB ..... <b>86.0 / 65.0</b> °F
Sensible coil load ..... <b>18.9</b> MBH	Entering DB / WB ..... <b>80.9 / 64.6</b> °F
Coil CFM at Jul 1500 ..... <b>846</b> CFM	Leaving DB / WB ..... <b>59.9 / 57.2</b> °F
Max block CFM ..... <b>846</b> CFM	Coil ADP ..... <b>57.6</b> °F
Sum of peak zone CFM ..... <b>846</b> CFM	Bypass Factor ..... <b>0.100</b>
Sensible heat ratio ..... <b>1.000</b>	Resulting RH ..... <b>52</b> %
CFM/Ton ..... <b>536.2</b>	Design supply temp. .... <b>58.0</b> °F
ft <sup>2</sup> /Ton ..... <b>551.2</b>	Zone T-stat Check ..... <b>1 of 1</b> OK
BTU/(hr-ft <sup>2</sup> ) ..... <b>21.8</b>	Max zone temperature deviation ..... <b>0.0</b> °F
Water flow @ 10.0 °F rise ..... <b>N/A</b>	

## Central Heating Coil Sizing Data

Max coil load ..... <b>27.5</b> MBH	Load occurs at ..... <b>Des Htg</b>
Coil CFM at Des Htg ..... <b>846</b> CFM	BTU/(hr-ft <sup>2</sup> ) ..... <b>31.6</b>
Max coil CFM ..... <b>846</b> CFM	Ent. DB / Lvg DB ..... <b>45.3 / 75.7</b> °F
Water flow @ 20.0 °F drop ..... <b>N/A</b>	

## Supply Fan Sizing Data

Actual max CFM ..... <b>846</b> CFM	Fan motor BHP ..... <b>0.00</b> BHP
Standard CFM ..... <b>836</b> CFM	Fan motor kW ..... <b>0.00</b> kW
Actual max CFM/ft <sup>2</sup> ..... <b>0.97</b> CFM/ft <sup>2</sup>	Fan static ..... <b>0.00</b> in wg

## Outdoor Ventilation Air Data

Design airflow CFM ..... <b>400</b> CFM	CFM/person ..... <b>26.68</b> CFM/person
CFM/ft <sup>2</sup> ..... <b>0.46</b> CFM/ft <sup>2</sup>	



# Air System Design Load Summary for BARD

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	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1500			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 86.0 °F / 65.0 °F			HEATING OA DB / WB 18.0 °F / 14.8 °F		
ZONE LOADS	Details	Sensible (BTU/hr)	Latent (BTU/hr)	Details	Sensible (BTU/hr)	Latent (BTU/hr)
Window & Skylight Solar Loads	0 ft²	0	-	0 ft²	-	-
Wall Transmission	1180 ft²	1943	-	1180 ft²	2985	-
Roof Transmission	870 ft²	2406	-	870 ft²	1813	-
Window Transmission	0 ft²	0	-	0 ft²	0	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	0 ft²	0	-	0 ft²	0	-
Floor Transmission	870 ft²	0	-	870 ft²	0	-
Partitions	0 ft²	0	-	0 ft²	0	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	1088 W	3710	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	653 W	2226	-	0	0	-
People	15	3675	3075	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 5%	1396	154	10%	480	0
<b>&gt;&gt; Total Zone Loads</b>	-	<b>15357</b>	<b>3229</b>	-	<b>5278</b>	<b>0</b>
Zone Conditioning	-	14819	3229	-	5349	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Return Fan Load	846 CFM	0	-	846 CFM	0	-
Ventilation Load	400 CFM	4121	-3229	400 CFM	22131	0
Supply Fan Load	846 CFM	0	-	846 CFM	0	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
<b>&gt;&gt; Total System Loads</b>	-	<b>18940</b>	<b>0</b>	-	<b>27480</b>	<b>0</b>
Central Cooling Coil	-	18940	0	-	0	0
Central Heating Coil	-	0	-	-	27480	-
<b>&gt;&gt; Total Conditioning</b>	-	<b>18940</b>	<b>0</b>	-	<b>27480</b>	<b>0</b>
<b>Key:</b>	<b>Positive values are clg loads Negative values are htg loads</b>			<b>Positive values are htg loads Negative values are clg loads</b>		