

Air System Sizing Summary for System #1 Ground Floor

Project Name: 6th Street Auto Sales
 Prepared by: [REDACTED]

08/31/2016
 09:22AM

Air System Information

Air System Name: **System #1 Ground Floor**
 Air System Type: **Single Zone CAV**
 Number of zones: **1**
 Floor Area: **1760.0** sqft
 Location: **Topeka, Kansas**

Sizing Calculation Information

Calculation Months: **Jan to Dec**
 Calculation method: **Transfer Function Method**

Central Cooling Coil Sizing Data

Total coil load:	7.3 Tons	Load occurs at:	Aug 1600
Total coil load:	87.2 MBH	OA DB / WB:	95.4/74.8 F
Sensible coil load:	73.8 MBH	Entering DB / WB:	76.7/64.7 F
Coil airflow:	3810 CFM	Leaving DB / WB:	58.2/57.1 F
Sensible heat ratio:	0.846	Coil ADP:	56.1 F
Area per unit load:	242.2 sqft/Ton	Bypass Factor:	0.100
Load per unit area:	49.5 BTU/(hr-sqft)	Resulting RH:	55 %
		Design supply temp:	58.0 F

Central Heating Coil Sizing Data

Max coil load:	70.4 MBH	Load occurs at:	Des Htg
Coil airflow:	3810 CFM	Ent DB / Lvg DB:	64.0/81.7 F
Load per unit area:	40.0 BTU/(hr-sqft)		

Supply Fan Sizing Data

Actual max airflow:	3810 CFM	Fan motor BHP:	0.00 BHP
Standard airflow:	3690 CFM	Fan motor kW:	0.00 kW
Actual max airflow per unit area:	2.16 CFM/sqft	Fan static:	0.00 in wg

Outdoor Ventilation Air Data

Design airflow:	310 CFM	Airflow per person:	18.24 CFM/person
Airflow per unit floor area:	0.18 CFM/sqft		

Space Sizing Data

Space Name	Maximum Cooling Sensible MBH	Design Airflow CFM	Time of Peak Load	Maximum Heating Load MBH	Space Floor Area sqft	Space CFM/sqft
Break/Conference	9.3	523	Oct 1400	3.8	320.0	1.63
Customer Waiting	14.9	836	Jul 1700	14.1	634.0	1.32
Showroom/Sales	29.4	1654	Sep 1500	21.5	566.0	2.92
Executive Office	17.5	981	Sep 1500	7.4	240.0	4.09
Zone	67.7	3810	Sep 1500	46.8	1760.0	2.16

Note: Table contains data for all spaces controlled by a single thermostat:

Space sizing basis: **Peak space load**
 Zone sizing basis: **Peak zone load**

System Design Load Summary for System #1 Ground Floor

Project Name: 6th Street Auto Sales
 Prepared by: [REDACTED]

08/31/2016
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Zone Loads based on TFM	DESIGN COOLING			DESIGN HEATING		
	Aug 1600			Design Heating Day		
	OA DB / WB 95.4 F / 74.8 F			OA DB / WB -2 F / -3.4 F		
	Details	Sensible BTU/hr	Latent BTU/hr	Details	Sensible BTU/hr	Latent BTU/hr
Window and Skylight Solar Loads	718 sqft	40946	-	718 sqft	-	-
Wall Transmission	1745 sqft	3096	-	1745 sqft	5779	-
Roof Transmission	1860 sqft	2923	-	1860 sqft	3080	-
Window Transmission	718 sqft	4565	-	718 sqft	19123	-
Skylight Transmission	0 sqft	0	-	0 sqft	0	-
Door Loads	21 sqft	69	-	21 sqft	287	-
Floor Transmission	566 sqft	0	-	566 sqft	1311	-
Partitions/Ceilings	0 sqft	0	-	0 sqft	0	-
Overhead Lighting	1648 W	5623	-	0 W	0	-
Electric Equipment	0 W	0	-	0 W	0	-
People	17	4165	3485	0	0	0
Infiltration	-	4891	4225	-	17268	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	0% / 0%	0	0	0%	0	0
>>Total Zone Loads	-	66277	7710	-	46849	0
Thermostat and Pulldown Adjustment	-	893	0	-	233	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Ventilation Load	310 CFM	6591	5722	310 CFM	23293	0
Supply Fan Load	3810 CFM	0	-	3810 CFM	0	-
>> Total System Loads	-	73761	13432	-	70375	0
Central Cooling Coil	-	73761	13445	-	0	0
Central Heating Coil	-	0	-	-	70375	-
>> Total Coil Loads	-	73761	13445	-	70375	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

Air System Sizing Summary for System #2 Basement

Project Name: 6th Street Auto Sales
 Prepared by: [REDACTED]

08/31/2016
 09:04AM

Air System Information

Air System Name: **System #2 Basement**
 Air System Type: **Single Zone CAV**

Number of zones: **1**
 Floor Area: **1194.0** sqft
 Location: **Topeka, Kansas**

Sizing Calculation Information

Calculation Months: **Jan to Dec**

Calculation method: **Transfer Function Method**

Central Cooling Coil Sizing Data

Total coil load: **2.5** Tons
 Total coil load: **29.7** MBH
 Sensible coil load: **20.3** MBH
 Coil airflow: **560** CFM
 Sensible heat ratio: **0.684**
 Area per unit load: **483.1** sqft/Ton
 Load per unit area: **24.8** BTU/(hr-sqft)

Load occurs at: **Jul 1500**
 OA DB / WB: **96.0/75.0** F
 Entering DB / WB: **96.0/75.0** F
 Leaving DB / WB: **61.3/59.6** F
 Coil ADP: **57.5** F
 Bypass Factor: **0.100**
 Resulting RH: **.60** %
 Design supply temp: **58.0** F

Central Heating Coil Sizing Data

Max coil load: **53.6** MBH
 Coil airflow: **560** CFM
 Load per unit area: **44.9** BTU/(hr-sqft)

Load occurs at: **Des Htg**
 Ent DB / Lvg DB: **-2.0/89.5** F

Supply Fan Sizing Data

Actual max airflow: **560** CFM
 Standard airflow: **542** CFM
 Actual max airflow per unit area: **0.47** CFM/sqft

Fan motor BHP: **0.00** BHP
 Fan motor kW: **0.00** kW
 Fan static: **0.00** in wg

Outdoor Ventilation Air Data

Design airflow: **560** CFM
 Airflow per unit floor area: **0.47** CFM/sqft

Airflow per person: **140.00** CFM/person

Space Sizing Data

Space Name	Maximum Cooling Sensible Load MBH	Design Airflow CFM	Time of Peak Load	Maximum Heating Load MBH	Space Floor Area sqft	Space CFM/sqft
Wash Bay	2.0	135	Aug 1900	3.3	234.0	0.58
Detail Bay / Pick-up	6.1	425	Jul 1800	8.6	960.0	0.44
Zone	8.1	560	Aug 1900	11.9	1194.0	0.47

Note: Table contains data for all spaces controlled by a single thermostat:

Space sizing basis: **Peak space load**
 Zone sizing basis: **Peak zone load**

System Design Load Summary for System #2 Basement

Project Name: 6th Street Auto Sales
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Zone Loads based on TFM	DESIGN COOLING			DESIGN HEATING		
	Jul 1500			Design Heating Day		
	OA DB / WB 96 F / 75 F			OA DB / WB -2 F / -3.4 F		
	Details	Sensible BTU/hr	Latent BTU/hr	Details	Sensible BTU/hr	Latent BTU/hr
Window and Skylight Solar Loads	0 sqft	0	-	0 sqft	-	-
Wall Transmission	1465 sqft	1825	-	1465 sqft	6661	-
Roof Transmission	0 sqft	0	-	0 sqft	0	-
Window Transmission	0 sqft	0	-	0 sqft	0	-
Skylight Transmission	0 sqft	0	-	0 sqft	0	-
Door Loads	246 sqft	812	-	246 sqft	3365	-
Floor Transmission	1194 sqft	0	-	1194 sqft	1894	-
Partitions/Ceilings	0 sqft	0	-	0 sqft	0	-
Overhead Lighting	1200 W	4094	-	0 W	0	-
Electric Equipment	0 W	0	-	0 W	0	-
People	4	1180	1820	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	0% / 0%	0	0	0%	0	0
>>Total Zone Loads	-	7910	1820	-	11920	0
Thermostat and Pulldown Adjustment	-	242	0	-	-290	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Ventilation Load	560 CFM	12144	7540	560 CFM	41959	0
Supply Fan Load	560 CFM	0	-	560 CFM	0	-
>> Total System Loads	-	20297	9360	-	53588	0
Central Cooling Coil	-	20297	9360	-	0	0
Central Heating Coil	-	0	-	-	53588	-
>> Total Coil Loads	-	20297	9360	-	53588	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		