

Air System Sizing Summary for AREA-1

Project Name: AN Delray Collision Center REV-2
Prepared by: P&G Engineering Design

07/24/2018
10:33AM

Air System Information

Air System Name **AREA-1**
Equipment Class **SPLT AHU**
Air System Type **SZCAV**

Number of zones **1**
Floor Area **3191.0** ft²
Location **West Palm Beach, Florida**

Sizing Calculation Information

Zone and Space Sizing Method:

Zone CFM **Sum of space airflow rates**
Space CFM **Individual peak space loads**

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Central Cooling Coil Sizing Data

Total coil load **7.9** Tons
Total coil load **95.3** MBH
Sensible coil load **70.7** MBH
Coil CFM at Jul 1500 **3091** CFM
Max block CFM **3091** CFM
Sum of peak zone CFM **3091** CFM
Sensible heat ratio **0.741**
ft²/Ton **401.7**
BTU/(hr-ft²) **29.9**
Water flow @ 10.0 °F rise **N/A**

Load occurs at **Jul 1500**
OA DB / WB **91.0 / 78.0** °F
Entering DB / WB **77.8 / 65.8** °F
Leaving DB / WB **56.7 / 55.6** °F
Coil ADP **54.3** °F
Bypass Factor **0.100**
Resulting RH **51** %
Design supply temp. **56.0** °F
Zone T-stat Check **1 of 1** OK
Max zone temperature deviation **0.0** °F

Central Heating Coil Sizing Data

Max coil load **29.3** MBH
Coil CFM at Des Htg **3091** CFM
Max coil CFM **3091** CFM
Water flow @ 20.0 °F drop **N/A**

Load occurs at **Des Htg**
BTU/(hr-ft²) **9.2**
Ent. DB / Lvg DB **66.3 / 75.1** °F

Supply Fan Sizing Data

Actual max CFM **3091** CFM
Standard CFM **3089** CFM
Actual max CFM/ft² **0.97** CFM/ft²

Fan motor BHP **0.36** BHP
Fan motor kW **0.27** kW
Fan static **0.40** in wg

Outdoor Ventilation Air Data

Design airflow CFM **415** CFM
CFM/ft² **0.13** CFM/ft²

CFM/person **17.29** CFM/person



Air System Design Load Summary for AREA-1

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	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1500 COOLING OA DB / WB 91.0 °F / 78.0 °F			HEATING DATA AT DES HTG HEATING OA DB / WB 43.0 °F / 36.1 °F		
ZONE LOADS	Details	Sensible (BTU/hr)	Latent (BTU/hr)	Details	Sensible (BTU/hr)	Latent (BTU/hr)
Window & Skylight Solar Loads	782 ft²	7526	-	782 ft²	-	-
Wall Transmission	1378 ft²	1180	-	1378 ft²	1724	-
Roof Transmission	3191 ft²	4924	-	3191 ft²	2558	-
Window Transmission	782 ft²	5338	-	782 ft²	10556	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	0 ft²	0	-	0 ft²	0	-
Floor Transmission	3191 ft²	0	-	3191 ft²	2582	-
Partitions	2583 ft²	1456	-	2583 ft²	0	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	4353 W	14851	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	4750 W	16207	-	0	0	-
People	24	4788	4920	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	4900	4100	-	0	0
Safety Factor	0% / 0%	0	0	0%	0	0
>> Total Zone Loads	-	61170	9020	-	17421	0
Zone Conditioning	-	59862	9020	-	17247	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	3091 CFM	0	-	3091 CFM	0	-
Ventilation Load	415 CFM	6813	15646	415 CFM	12065	0
Supply Fan Load	3091 CFM	917	-	3091 CFM	-917	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	5%	3059	-	5%	871	-
>> Total System Loads	-	70650	24666	-	29266	0
Central Cooling Coil	-	70650	24668	-	0	0
Central Heating Coil	-	0	-	-	29266	-
>> Total Conditioning	-	70650	24668	-	29266	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 AREA-2

Project Name: AN Delray Collision Center REV-2
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Air System Information

Air System Name **AREA-2**
Equipment Class **SPLT AHU**
Air System Type **SZCAV**

Number of zones **1**
Floor Area **14167.0** ft²
Location **West Palm Beach, Florida**

Sizing Calculation Information

Zone and Space Sizing Method:

Zone CFM **Sum of space airflow rates**
Space CFM **Individual peak space loads**

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Central Cooling Coil Sizing Data

Total coil load **32.8** Tons
Total coil load **393.8** MBH
Sensible coil load **320.7** MBH
Coil CFM at Aug 1600 **12330** CFM
Max block CFM **12330** CFM
Sum of peak zone CFM **12330** CFM
Sensible heat ratio **0.814**
ft²/Ton **431.7**
BTU/(hr-ft²) **27.8**
Water flow @ 10.0 °F rise **N/A**

Load occurs at **Aug 1600**
OA DB / WB **90.6 / 77.9** °F
Entering DB / WB **79.7 / 65.1** °F
Leaving DB / WB **55.6 / 54.3** °F
Coil ADP **52.9** °F
Bypass Factor **0.100**
Resulting RH **43** %
Design supply temp. **56.0** °F
Zone T-stat Check **1 of 1** OK
Max zone temperature deviation **0.0** °F

Central Heating Coil Sizing Data

Max coil load **42.9** MBH
Coil CFM at Des Htg **12330** CFM
Max coil CFM **12330** CFM
Water flow @ 20.0 °F drop **N/A**

Load occurs at **Des Htg**
BTU/(hr-ft²) **3.0**
Ent. DB / Lvg DB **67.8 / 71.0** °F

Supply Fan Sizing Data

Actual max CFM **12330** CFM
Standard CFM **12321** CFM
Actual max CFM/ft² **0.87** CFM/ft²

Fan motor BHP **1.44** BHP
Fan motor kW **1.07** kW
Fan static **0.40** in wg

Outdoor Ventilation Air Data

Design airflow CFM **1035** CFM
CFM/ft² **0.07** CFM/ft²

CFM/person **15.22** CFM/person

Air System Design Load Summary for AREA-2

Project Name: AN Delray Collision Center REV-2
Prepared by: P&G Engineering Design

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	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Aug 1600 COOLING OA DB / WB 90.6 °F / 77.9 °F			HEATING DATA AT DES HTG HEATING OA DB / WB 43.0 °F / 36.1 °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	3452 ft²	4312	-	3452 ft²	4320	-
Roof Transmission	2167 ft²	1916	-	2167 ft²	1846	-
Window Transmission	0 ft²	0	-	0 ft²	0	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	452 ft²	1429	-	452 ft²	3661	-
Floor Transmission	14167 ft²	0	-	14167 ft²	4160	-
Partitions	0 ft²	0	-	0 ft²	0	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	35074 W	119670	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	41814 W	142669	-	0	0	-
People	68	16580	30940	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	245	205	-	0	0
Safety Factor	0% / 0%	0	0	0%	0	0
>> Total Zone Loads	-	286822	31145	-	13987	0
Zone Conditioning	-	289396	31145	-	15671	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	12330 CFM	0	-	12330 CFM	0	-
Ventilation Load	1035 CFM	13329	41894	1035 CFM	30191	0
Supply Fan Load	12330 CFM	3656	-	12330 CFM	-3656	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	5%	14341	-	5%	699	-
>> Total System Loads	-	320723	73039	-	42905	0
Central Cooling Coil	-	320723	73050	-	0	0
Central Heating Coil	-	0	-	-	42905	-
>> Total Conditioning	-	320723	73050	-	42905	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 AREA-3

Project Name: AN Delray Collision Center REV-2
Prepared by: P&G Engineering Design

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Air System Information

Air System Name **AREA-3**
Equipment Class **SPLT AHU**
Air System Type **SZCAV**

Number of zones **1**
Floor Area **7068.0** ft²
Location **West Palm Beach, Florida**

Sizing Calculation Information

Zone and Space Sizing Method:

Zone CFM **Sum of space airflow rates**
Space CFM **Individual peak space loads**

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Central Cooling Coil Sizing Data

Total coil load **14.6** Tons
Total coil load **174.9** MBH
Sensible coil load **161.9** MBH
Coil CFM at Aug 1400 **6492** CFM
Max block CFM **6492** CFM
Sum of peak zone CFM **6492** CFM
Sensible heat ratio **0.926**
ft²/Ton **485.1**
BTU/(hr-ft²) **24.7**
Water flow @ 10.0 °F rise **N/A**

Load occurs at **Aug 1400**
OA DB / WB **90.6 / 77.9** °F
Entering DB / WB **79.1 / 63.8** °F
Leaving DB / WB **56.0 / 54.6** °F
Coil ADP **53.4** °F
Bypass Factor **0.100**
Resulting RH **42** %
Design supply temp. **56.0** °F
Zone T-stat Check **1 of 1** OK
Max zone temperature deviation **0.0** °F

Central Heating Coil Sizing Data

Max coil load **32.1** MBH
Coil CFM at Des Htg **6492** CFM
Max coil CFM **6492** CFM
Water flow @ 20.0 °F drop **N/A**

Load occurs at **Des Htg**
BTU/(hr-ft²) **4.5**
Ent. DB / Lvg DB **69.3 / 73.9** °F

Supply Fan Sizing Data

Actual max CFM **6492** CFM
Standard CFM **6487** CFM
Actual max CFM/ft² **0.92** CFM/ft²

Fan motor BHP **0.76** BHP
Fan motor kW **0.56** kW
Fan static **0.40** in wg

Outdoor Ventilation Air Data

Design airflow CFM **180** CFM
CFM/ft² **0.03** CFM/ft²

CFM/person **15.00** CFM/person

Air System Design Load Summary for AREA-3

Project Name: AN Delray Collision Center REV-2
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	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Aug 1400 COOLING OA DB / WB 90.6 °F / 77.9 °F			HEATING DATA AT DES HTG HEATING OA DB / WB 43.0 °F / 36.1 °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	3909 ft²	4184	-	3909 ft²	4891	-
Roof Transmission	7068 ft²	7706	-	7068 ft²	6065	-
Window Transmission	0 ft²	0	-	0 ft²	0	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	1200 ft²	3683	-	1200 ft²	9720	-
Floor Transmission	7068 ft²	0	-	7068 ft²	3902	-
Partitions	0 ft²	0	-	0 ft²	0	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	17670 W	60289	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	21204 W	72348	-	0	0	-
People	12	2837	5460	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	-	151046	5460	-	24578	0
Zone Conditioning	-	150082	5460	-	27535	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	6492 CFM	0	-	6492 CFM	0	-
Ventilation Load	180 CFM	2301	7524	180 CFM	5262	2
Supply Fan Load	6492 CFM	1925	-	6492 CFM	-1925	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	5%	7552	-	5%	1229	-
>> Total System Loads	-	161860	12984	-	32101	2
Central Cooling Coil	-	161860	12994	-	0	0
Central Heating Coil	-	0	-	-	32101	-
>> Total Conditioning	-	161860	12994	-	32101	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 AREA-4

Project Name: AN Delray Collision Center REV-2
Prepared by: P&G Engineering Design

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Air System Information

Air System Name **AREA-4**
Equipment Class **SPLT AHU**
Air System Type **SZCAV**

Number of zones **1**
Floor Area **2352.0** ft²
Location **West Palm Beach, Florida**

Sizing Calculation Information

Zone and Space Sizing Method:

Zone CFM **Sum of space airflow rates**
Space CFM **Individual peak space loads**

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Central Cooling Coil Sizing Data

Total coil load **4.1** Tons
Total coil load **49.3** MBH
Sensible coil load **40.0** MBH
Coil CFM at Aug 1500 **1554** CFM
Max block CFM **1554** CFM
Sum of peak zone CFM **1554** CFM
Sensible heat ratio **0.811**
ft²/Ton **571.9**
BTU/(hr-ft²) **21.0**
Water flow @ 10.0 °F rise **N/A**

Load occurs at **Aug 1500**
OA DB / WB **91.0 / 78.0** °F
Entering DB / WB **80.1 / 65.6** °F
Leaving DB / WB **56.3 / 55.0** °F
Coil ADP **53.6** °F
Bypass Factor **0.100**
Resulting RH **43** %
Design supply temp. **56.0** °F
Zone T-stat Check **1 of 1** OK
Max zone temperature deviation **0.0** °F

Central Heating Coil Sizing Data

Max coil load **15.8** MBH
Coil CFM at Des Htg **1554** CFM
Max coil CFM **1554** CFM
Water flow @ 20.0 °F drop **N/A**

Load occurs at **Des Htg**
BTU/(hr-ft²) **6.7**
Ent. DB / Lvg DB **66.8 / 76.2** °F

Supply Fan Sizing Data

Actual max CFM **1554** CFM
Standard CFM **1553** CFM
Actual max CFM/ft² **0.66** CFM/ft²

Fan motor BHP **0.18** BHP
Fan motor kW **0.14** kW
Fan static **0.40** in wg

Outdoor Ventilation Air Data

Design airflow CFM **180** CFM
CFM/ft² **0.08** CFM/ft²

CFM/person **45.00** CFM/person

Air System Design Load Summary for AREA-4

Project Name: AN Delray Collision Center REV-2
Prepared by: P&G Engineering Design

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	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Aug 1500 COOLING OA DB / WB 91.0 °F / 78.0 °F			HEATING DATA AT DES HTG HEATING OA DB / WB 43.0 °F / 36.1 °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	1796 ft²	1775	-	1796 ft²	2248	-
Roof Transmission	2352 ft²	3551	-	2352 ft²	3136	-
Window Transmission	0 ft²	0	-	0 ft²	0	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	380 ft²	1214	-	380 ft²	3078	-
Floor Transmission	2352 ft²	0	-	2352 ft²	1507	-
Partitions	0 ft²	0	-	0 ft²	0	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	5880 W	20062	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	2356 W	8039	-	0	0	-
People	4	961	1820	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	250	200	-	0	0
Safety Factor	0% / 0%	0	0	0%	0	0
>> Total Zone Loads	-	35852	2020	-	9969	0
Zone Conditioning	-	35374	2020	-	10513	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	1554 CFM	0	-	1554 CFM	0	-
Ventilation Load	180 CFM	2390	7309	180 CFM	5226	0
Supply Fan Load	1554 CFM	461	-	1554 CFM	-461	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	5%	1793	-	5%	498	-
>> Total System Loads	-	40018	9329	-	15776	0
Central Cooling Coil	-	40018	9331	-	0	0
Central Heating Coil	-	0	-	-	15776	-
>> Total Conditioning	-	40018	9331	-	15776	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		