## AIR SYSTEM SIZING SUMMARY FOR BLOCK LOAD

**Air System Information**

| | | | |
|---|---|---|---|
| Air System Name | BLOCK LOAD | Number of zones | 1 |
| Equipment Class | SPLT AHU | Floor Area | 3743.0 ft² |
| Air System Type | SZCAV | Location | Portland, Maine |

**Sizing Calculation Information**

Zone and Space Sizing Method:

| | | | |
|---|---|---|---|
| Zone CFM | Sum of space airflow rates | Calculation Months | Jan to Dec |
| Space CFM | Individual peak space loads | Sizing Data | Calculated |

**Central Cooling Coil Sizing Data**

| | | | | | |
|---|---|---|---|---|---|
| Total coil load | 11.9 | Tons | Load occurs at | Jul 1600 | |
| Total coil load | 142.9 | MBH | OA DB / WB | 85.4 / 70.8 | °F |
| Sensible coil load | 121.4 | MBH | Entering DB / WB | 76.5 / 64.1 | °F |
| Coil CFM at Jul 1600 | 5751 | CFM | Leaving DB / WB | 56.9 / 55.7 | °F |
| Max block CFM | 5751 | CFM | Coil ADP | 54.7 | °F |
| Sum of peak zone CFM | 5751 | CFM | Bypass Factor | 0.100 | |
| Sensible heat ratio | 0.850 | | Resulting RH | 51 | % |
| ft²/Ton | 314.2 | | Design supply temp. | 55.0 | °F |
| BTU/(hr-ft²) | 38.2 | | Zone T-stat Check | 1 of 1 | OK |
| Water flow @ 10.0 °F rise | N/A | | Max zone temperature deviation | 0.0 | °F |

**Central Heating Coil Sizing Data**

| | | | | | |
|---|---|---|---|---|---|
| Max coil load | 166.1 | MBH | Load occurs at | Des Htg | |
| Coil CFM at Des Htg | 5751 | CFM | BTU/(hr-ft²) | 44.4 | |
| Max coil CFM | 5751 | CFM | Ent. DB / Lvg DB | 56.7 / 83.5 | °F |
| Water flow @ 20.0 °F drop | N/A | | | | |

**Supply Fan Sizing Data**

| | | | | | |
|---|---|---|---|---|---|
| Actual max CFM | 5751 | CFM | Fan motor BHP | 0.00 | BHP |
| Standard CFM | 5738 | CFM | Fan motor kW | 0.00 | kW |
| Actual max CFM/ft² | 1.54 | CFM/ft² | Fan static | 0.00 | in wg |

**Outdoor Ventilation Air Data**

| | | | | | |
|---|---|---|---|---|---|
| Design airflow CFM | 895 | CFM | CFM/person | 25.29 | CFM/person |
| CFM/ft² | 0.24 | CFM/ft² | | | |

## ZONE SIZING SUMMARY FOR BLOCK LOAD

**Air System Information**

| | | | |
|---|---|---|---|
| Air System Name | BLOCK LOAD | Number of zones | 1 |
| Equipment Class | SPLT AHU | Floor Area | 3743.0 ft² |
| Air System Type | SZCAV | Location | Portland, Maine |

**Sizing Calculation Information**

Zone and Space Sizing Method:

| | | | |
|---|---|---|---|
| Zone CFM | Sum of space airflow rates | Calculation Months | Jan to Dec |
| Space CFM | Individual peak space loads | Sizing Data | Calculated |

**Zone Sizing Data**

| Zone Name | Maximum Cooling Sensible (MBH) | Design Air Flow (CFM) | Minimum Air Flow (CFM) | Time of Peak Load | Maximum Heating Load (MBH) | Zone Floor Area (ft²) | Zone CFM/ft² |
|---|---|---|---|---|---|---|---|
| Zone 1 | 116.5 | 5751 | 5751 | Jul 1600 | 97.9 | 3743.0 | 1.54 |

**Zone Terminal Sizing Data**

No Zone Terminal Sizing Data required for this system.

**Space Loads and Airflows**

| Zone Name / Space Name | Mult. | Cooling Sensible (MBH) | Time of Load | Air Flow (CFM) | Heating Load (MBH) | Floor Area (ft²) | Space CFM/ft² |
|---|---|---|---|---|---|---|---|
| *Zone 1* | | | | | | | |
| 1. SALES AREA | 1 | 71.8 | Jul 1600 | 3506 | 63.0 | 1519.0 | 2.31 |
| 10. MEZZANINE STORAGE#2 | 1 | 7.3 | Sep 1500 | 355 | 4.4 | 693.0 | 0.51 |
| 2. FITTING AREA | 1 | 6.9 | Aug 1700 | 363 | 10.5 | 472.0 | 0.77 |
| 3. STOCK AREA | 1 | 19.2 | Aug 1600 | 938 | 11.5 | 582.0 | 1.61 |
| 4. JANITORS | 1 | 0.1 | Jul 1500 | 5 | 0.1 | 6.0 | 0.83 |
| 5. TOILET #1 | 1 | 0.5 | Jul 1500 | 35 | 1.0 | 57.0 | 0.62 |
| 6. TOILET #2 | 1 | 0.5 | Jul 1500 | 33 | 1.0 | 54.0 | 0.62 |
| 7. CORRIDOR #1 | 1 | 0.6 | Jul 1500 | 30 | 0.9 | 48.0 | 0.62 |
| 8. CORRIDOR #2 | 1 | 1.2 | Jul 1600 | 58 | 0.7 | 41.0 | 1.42 |
| 9. MEZZANINE STORAGE#1 | 1 | 2.2 | Sep 1500 | 106 | 1.2 | 173.0 | 0.61 |
| 11. CASHWRAP | 1 | 6.8 | Aug 1700 | 321 | 3.5 | 118.0 | 2.72 |

## AIR SYSTEM DESIGN LOAD SUMMARY FOR BLOCK LOAD

| | DESIGN COOLING | | | DESIGN HEATING | | |
|---|---|---|---|---|---|---|
| | COOLING DATA AT Jul 1600 | | | HEATING DATA AT DES HTG | | |
| | COOLING OA DB / WB 85.4 °F / 70.8 °F | | | HEATING OA DB / WB -3.0 °F / -4.3 °F | | |
| ZONE LOADS | Details | Sensible (BTU/hr) | Latent (BTU/hr) | Details | Sensible (BTU/hr) | Latent (BTU/hr) |
| Window & Skylight Solar Loads | 845 ft² | 49559 | - | 845 ft² | - | - |
| Wall Transmission | 1578 ft² | 5375 | - | 1578 ft² | 11341 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 845 ft² | 4162 | - | 845 ft² | 34815 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 2877 ft² | 10058 | - | 2877 ft² | 51786 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 0 W | 0 | - | 0 | 0 | - |
| Task Lighting | 3919 W | 12274 | - | 0 | 0 | - |
| Electric Equipment | 5081 W | 17085 | - | 0 | 0 | - |
| People | 36 | 8628 | 7079 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 10% / 0% | 10504 | 0 | 0% | 0 | 0 |
| >> Total Zone Loads | - | 115547 | 7079 | - | 97942 | 0 |
| Zone Conditioning | - | 111198 | 7079 | - | 97992 | 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 | 5751 CFM | 0 | - | 5751 CFM | 0 | - |
| Ventilation Load | 895 CFM | 10251 | 14414 | 895 CFM | 68156 | 0 |
| Supply Fan Load | 5751 CFM | 0 | - | 5751 CFM | 0 | - |
| Space Fan Coil Fans | - | 0 | - | - | 0 | - |
| Duct Heat Gain / Loss | 0% | 0 | - | 0% | 0 | - |
| >> Total System Loads | - | 121448 | 21492 | - | 166147 | 0 |
| Central Cooling Coil | - | 121448 | 21498 | - | 0 | 0 |
| Central Heating Coil | - | 0 | - | - | 166148 | - |
| >> Total Conditioning | - | 121448 | 21499 | - | 166148 | 0 |
| Key: | Positive values are clg loads<br>Negative values are htg loads | | | Positive values are htg loads<br>Negative values are clg loads | | |

## AIR SYSTEM SIZING SUMMARY FOR AHU-1

**Air System Information**

| | | | |
|---|---|---|---|
| Air System Name | HP-1 | Number of zones | 1 |
| Equipment Class | SPLT AHU | Floor Area | 1637.0 ft² |
| Air System Type | SZCAV | Location | Portland, Maine |

**Sizing Calculation Information**

Zone and Space Sizing Method:

| | | | |
|---|---|---|---|
| Zone CFM | Sum of space airflow rates | Calculation Months | Jan to Dec |
| Space CFM | Individual peak space loads | Sizing Data | Calculated |

**Central Cooling Coil Sizing Data**

| | | | | | |
|---|---|---|---|---|---|
| Total coil load | 7.8 | Tons | Load occurs at | Jul 1700 | |
| Total coil load | 93.7 | MBH | OA DB / WB | 84.1 / 70.5 | °F |
| Sensible coil load | 80.6 | MBH | Entering DB / WB | 76.0 / 63.7 | °F |
| Coil CFM at Jul 1700 | 3827 | CFM | Leaving DB / WB | 56.5 / 55.4 | °F |
| Max block CFM | 3827 | CFM | Coil ADP | 54.3 | °F |
| Sum of peak zone CFM | 3827 | CFM | Bypass Factor | 0.100 | |
| Sensible heat ratio | 0.860 | | Resulting RH | 51 | % |
| ft²/Ton | 209.7 | | Design supply temp. | 55.0 | °F |
| BTU/(hr-ft²) | 57.2 | | Zone T-stat Check | 1 of 1 | OK |
| Water flow @ 10.0 °F rise | N/A | | Max zone temperature deviation | 0.0 | °F |

**Central Heating Coil Sizing Data**

| | | | | | |
|---|---|---|---|---|---|
| Max coil load | 103.9 | MBH | Load occurs at | Des Htg | |
| Coil CFM at Des Htg | 3827 | CFM | BTU/(hr-ft²) | 63.5 | |
| Max coil CFM | 3827 | CFM | Ent. DB / Lvg DB | 58.2 / 83.4 | °F |
| Water flow @ 20.0 °F drop | N/A | | | | |

**Supply Fan Sizing Data**

| | | | | | |
|---|---|---|---|---|---|
| Actual max CFM | 3827 | CFM | Fan motor BHP | 0.00 | BHP |
| Standard CFM | 3819 | CFM | Fan motor kW | 0.00 | kW |
| Actual max CFM/ft² | 2.34 | CFM/ft² | Fan static | 0.00 | in wg |

**Outdoor Ventilation Air Data**

| | | | | | |
|---|---|---|---|---|---|
| Design airflow CFM | 585 | CFM | CFM/person | 21.72 | CFM/person |
| CFM/ft² | 0.31 | CFM/ft² | | | |

## AIR SYSTEM SIZING SUMMARY FOR AHU-2

**Air System Information**

| | | | |
|---|---|---|---|
| Air System Name | HP-2 | Number of zones | 1 |
| Equipment Class | SPLT AHU | Floor Area | 2106.0 ft² |
| Air System Type | SZCAV | Location | Portland, Maine |

**Sizing Calculation Information**

Zone and Space Sizing Method:

| | | | |
|---|---|---|---|
| Zone CFM | Sum of space airflow rates | Calculation Months | Jan to Dec |
| Space CFM | Individual peak space loads | Sizing Data | Calculated |

**Central Cooling Coil Sizing Data**

| | | | | | |
|---|---|---|---|---|---|
| Total coil load | 4.1 | Tons | Load occurs at | Aug 1500 | |
| Total coil load | 49.2 | MBH | OA DB / WB | 86.0 / 71.0 | °F |
| Sensible coil load | 40.8 | MBH | Entering DB / WB | 77.1 / 64.8 | °F |
| Coil CFM at Aug 1500 | 1924 | CFM | Leaving DB / WB | 57.4 / 56.2 | °F |
| Max block CFM | 1924 | CFM | Coil ADP | 55.2 | °F |
| Sum of peak zone CFM | 1924 | CFM | Bypass Factor | 0.100 | |
| Sensible heat ratio | 0.830 | | Resulting RH | 52 | % |
| ft²/Ton | 514.0 | | Design supply temp. | 55.0 | °F |
| BTU/(hr-ft²) | 23.3 | | Zone T-stat Check | 1 of 1 | OK |
| Water flow @ 10.0 °F rise | N/A | | Max zone temperature deviation | 0.0 | °F |

**Central Heating Coil Sizing Data**

| | | | | | |
|---|---|---|---|---|---|
| Max coil load | 60.2 | MBH | Load occurs at | Des Htg | |
| Coil CFM at Des Htg | 1924 | CFM | BTU/(hr-ft²) | 28.6 | |
| Max coil CFM | 1924 | CFM | Ent. DB / Lvg DB | 53.2 / 82.2 | °F |
| Water flow @ 20.0 °F drop | N/A | | | | |

**Supply Fan Sizing Data**

| | | | | | |
|---|---|---|---|---|---|
| Actual max CFM | 1924 | CFM | Fan motor BHP | 0.00 | BHP |
| Standard CFM | 1919 | CFM | Fan motor kW | 0.00 | kW |
| Actual max CFM/ft² | 0.91 | CFM/ft² | Fan static | 0.00 | in wg |

**Outdoor Ventilation Air Data**

| | | | | | |
|---|---|---|---|---|---|
| Design airflow CFM | 390 | CFM | CFM/person | 32.13 | CFM/person |
| CFM/ft² | 0.19 | CFM/ft² | | | |

## DESIGN WEATHER PARAMETERS

| | | |
|---|---|---|
| City Name | Portland | |
| Location | Maine | |
| Latitude | 43.7 | Deg. |
| Longitude | 70.3 | Deg. |
| Elevation | 62.0 | ft |
| Summer Design Dry-Bulb | 86.0 | °F |
| Summer Coincident Wet-Bulb | 71.0 | °F |
| Summer Daily Range | 18.7 | °F |
| Winter Design Dry-Bulb | -3.0 | °F |
| Winter Design Wet-Bulb | -4.3 | °F |
| Atmospheric Clearness Number | 1.05 | |
| Average Ground Reflectance | 0.20 | |
| Soil Conductivity | 0.800 | BTU/(hr-ft-°F) |
| Local Time Zone (GMT +/- N hours) | 5.0 | hours |
| Consider Daylight Savings Time | No | |
| Simulation Weather Data | noneN/A | |
| Current Data Is | 2001 ASHRAE Handbook | |
| Design Cooling Months | January to December | |

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WCW Engineers, Inc.
760 Crest Drive
Wood Dale, Illinois 60191
Tel. 630/595-8800
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PROFESSIONAL STAMP:

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2700 S. River Road, Suite 600
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