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| --- | --- | --- | --- | --- | --- | --- | --- |
| **طرح نگهداشت و افزایش تولید 27 مخزن** | | | | | | | |
| **HVAC CALCULATION NOTE FOR EXTENSION OF EXISTING CONTROL BUILDING**  **نگهداشت و افزایش تولید میدان نفتی بینک** | | | | | | | |
|  | |  |  |  |  |  |  |
|  | |  |  |  |  |  |  |
|  | |  |  |  |  |  |  |
| D02 | | NOV. 2024 | AFD | K.Ahmadi | M.Fakharian | M.Sadeghian |  |
| D01 | | AUG. 2024 | IFA | K.Ahmadi | M.Fakharian | M.Sadeghian |  |
| D00 | | DEC. 2023 | IFC | K.Ahmadi | M.Fakharian | S.Faramarzpour |  |
| **Rev.** | | **Date** | **Purpose of Issue/Status** | **Prepared by:** | **Checked by:** | **Approved by:** | **CLIENT Approval** |
| **Class: 2** | | | **CLIENT Doc. Number:** **F0Z-709530** | | | | |
| **Status:** | | **IDC: Inter-Discipline Check**  **IFC: Issued For Comment**  **IFA: Issued For Approval**  **AFD: Approved For Design**  **AFC: Approved For Construction**  **AFP: Approved For Purchase**  **AFQ:** Approved For Quotation  **IFI: Issued For Information**  **AB-R: As-Built for CLIENT Review**  **AB-A: As-Built –Approved** | | | | | |

**REVISION RECORD SHEET**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **PAGE** | **D00** | **D01** | **D02** | **D03** | **D04** |  | **PAGE** | **D00** | **D01** | **D02** | **D03** | **D04** |
| 1 | X | X | X |  |  | 58 |  | X |  |  |  |
| 2 | X | X | X |  |  | 59 |  | X |  |  |  |
| 3 | X | X |  |  |  | 60 |  | X |  |  |  |
| 4 | X |  |  |  |  | 61 |  | X |  |  |  |
| 5 | X |  |  |  |  | 62 |  | X |  |  |  |
| 6 | X |  |  |  |  | 63 |  | X |  |  |  |
| 7 | X |  |  |  |  | 64 |  | X |  |  |  |
| 8 | X |  |  |  |  | 65 |  | X |  |  |  |
| 9 | X |  |  |  |  | 66 |  | X |  |  |  |
| 10 | X | X |  |  |  | 67 |  |  |  |  |  |
| 11 | X | X |  |  |  | 68 |  |  |  |  |  |
| 12 | X | X |  |  |  | 69 |  |  |  |  |  |
| 13 | X | X |  |  |  | 70 |  |  |  |  |  |
| 14 | X | X |  |  |  | 71 |  |  |  |  |  |
| 15 | X | X |  |  |  | 72 |  |  |  |  |  |
| 16 | X | X |  |  |  | 73 |  |  |  |  |  |
| 17 | X | X |  |  |  | 74 |  |  |  |  |  |
| 18 | X | X |  |  |  | 75 |  |  |  |  |  |
| 19 | X | X |  |  |  | 76 |  |  |  |  |  |
| 20 | X | X |  |  |  | 77 |  |  |  |  |  |
| 21 | X | X |  |  |  | 78 |  |  |  |  |  |
| 22 | X | X |  |  |  | 79 |  |  |  |  |  |
| 23 | X | X |  |  |  | 80 |  |  |  |  |  |
| 24 | X | X |  |  |  | 81 |  |  |  |  |  |
| 25 | X | X |  |  |  | 82 |  |  |  |  |  |
| 26 | X | X |  |  |  | 83 |  |  |  |  |  |
| 27 | X | X |  |  |  | 84 |  |  |  |  |  |
| 28 | X | X |  |  |  | 85 |  |  |  |  |  |
| 29 | X | X |  |  |  | 86 |  |  |  |  |  |
| 30 | X | X |  |  |  | 87 |  |  |  |  |  |
| 31 | X | X |  |  |  | 88 |  |  |  |  |  |
| 32 | X | X |  |  |  | 89 |  |  |  |  |  |
| 33 | X | X |  |  |  | 90 |  |  |  |  |  |
| 34 | X | X |  |  |  | 91 |  |  |  |  |  |
| 35 | X | X |  |  |  | 92 |  |  |  |  |  |
| 36 | X | X |  |  |  | 93 |  |  |  |  |  |
| 37 |  | X |  |  |  | 94 |  |  |  |  |  |
| 38 |  | X |  |  |  | 95 |  |  |  |  |  |
| 39 |  | X |  |  |  | 96 |  |  |  |  |  |
| 40 |  | X |  |  |  | 97 |  |  |  |  |  |
| 41 |  | X |  |  |  | 98 |  |  |  |  |  |
| 42 |  | X |  |  |  | 99 |  |  |  |  |  |
| 43 |  | X |  |  |  | 100 |  |  |  |  |  |
| 44 |  | X |  |  |  | 101 |  |  |  |  |  |
| 45 |  | X |  |  |  | 102 |  |  |  |  |  |
| 46 |  | X |  |  |  | 103 |  |  |  |  |  |
| 47 |  | X |  |  |  | 104 |  |  |  |  |  |
| 48 |  | X |  |  |  | 105 |  |  |  |  |  |
| 49 |  | X |  |  |  | 106 |  |  |  |  |  |
| 50 |  | X |  |  |  | 107 |  |  |  |  |  |
| 51 |  | X |  |  |  | 108 |  |  |  |  |  |
| 52 |  | X |  |  |  | 109 |  |  |  |  |  |
| 53 |  | X |  |  |  | 110 |  |  |  |  |  |
| 54 |  | X |  |  |  | 111 |  |  |  |  |  |
| 55 |  | X |  |  |  | 112 |  |  |  |  |  |
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1. **INTRODUCTION**

Binak oilfield in Bushehr province is a part of the southern oilfields of Iran, is located 20 km northwest of Genaveh city.

With the aim of increasing production of oil from Binak oilfield, an EPC/EPD Project has been defined by NIOC/NISOC and awarded to Petro Iran Development Company (PEDCO).Also PEDCO (as General Contractor) has assigned the EPC-packages of the Project to "Hirgan Energy - Design and Inspection" JV.

**GENERAL DEFINITION**

The following terms shall be used in this document.

|  |  |
| --- | --- |
| CLIENT: | National Iranian South Oilfields Company (NISOC) |
| PROJECT: | Binak Oilfield Development – General Facilities |
| GENERAL CONTRACTOR (GC): | Petro Iran Development Company (PEDCO) |
| EPC CONTRACTOR: | Joint Venture of :Hirgan Energy – Design & Inspection(D&I) Companies |
| VENDOR: | The firm or person who will fabricate the equipment or material. |
| EXECUTOR: | Executor is the party which carries out all or part of construction and/or commissioning for the project. |
| THIRD PARTY INSPECTOR (TPI): | The firm appointed by EPD/EPC CONTRACTOR (GC) and approved by CLIENT (in writing) for the inspection of goods. |
| SHALL: | Is used where a provision is mandatory. |
| SHOULD: | Is used where a provision is advisory only. |
| WILL: | Is normally used in connection with the action by CLIENT rather than by an EPC/EPD CONTRACTOR, supplier or VENDOR |
| MAY: | Is used where a provision is completely discretionary. |

1. **Scope**

The main purpose of this document is to define the HVAC system load calculation has been carried out by computer program (HAP software) as per ASHRAE method in order to evaluate cooling load (summer) and heating load (winter) and also to select HVAC equipment for the calculated cooling and heating load.

1. **NORMATIVE REFERENCES**

## Local Codes and Standards

* IPS Iranian petroleum standards
* INBC Iranian National Building Code

## International Codes and Standards

* ASTM American Society for Testing Materials Relevant Parts
* API 610 Centrifugal Pumps for General Refinery Service, 10th Edition
* ISO 15156 Petroleum and Natural Gas Industries. Materials for use in H2S Containing Environments in Oil and Gas

Production

* AMCA Air Movement and Control Association
* ANSI American National Standards Institute.
* ASHRAE American Society of Heating, Refrigeration and Air-conditioning Engineer
* ASTM American Society for Testing and Material
* BOCA Building Officials and Code Administrators international
* BS British Standards
* CIBSE Chartered Institute of Building Services Engineers.
* NFPA National fire protection association
* SBCCI Southern Building Code Congress International
* SMACNA Sheet Metal and Air Conditioning Contractors’ National Association
* AWWA [American Water Works Association](http://www.awwa.org/)
* ASME [The American Society of Mechanical Engineers](https://www.asme.org/)

Note: The latest issued or revised edition of all above mentioned codes and standards shall be considered as reference.

## ENVIRONMENTAL DATA

* Latitude 29° 73’ N
* Longitude 50° 35’ E
* Elevation 10 m
* Summer dry bulb temperature : 41° C
* Summer wet bulb temperature : 30.5° C
* Summer daily range temperature : 15.0° C
* Winter dry bulb temperature : 6° C
* Winter relative humidity : 78%

Refer to "Process Basis of Design; Doc. No BK-GNRAL-PEDCO-000-PR-DB-0001.

1. **HVAC CALCULATION**

## Design weather Parameters:

**Design Parameters:**

    City Name   **Binak**

    Location   **IRAN**

    Latitude   **29.7** Deg.

    Longitude   **-50.4** Deg.

    Elevation   **10.0** m

    Summer Design Dry-Bulb   **41.0** °C

    Summer Coincident Wet-Bulb   **30.5** °C

    Summer Daily Range   **15.0** °K

    Winter Design Dry-Bulb   **6.0** °C

    Winter Design Wet-Bulb   **4.4** °C

    Atmospheric Clearness Number   **1.00**

    Average Ground Reflectance   **0.20**

    Soil Conductivity   **1.385** W/(m-°K)

    Local Time Zone (GMT +/- N hours)   **-3.5** hours

    Consider Daylight Savings Time   **No**

    Simulation Weather Data   **noneN/A**

    Current Data is   **User Modified**

    Design Cooling Months   **January to December**

**Design Day Maximum Solar Heat Gains**

    (The MSHG values are expressed in W/m²)

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Month** | **N** | **NNE** | **NE** | **ENE** | **E** | **ESE** | **SE** | **SSE** | **S** |
| January | 77.5 | 77.5 | 95.1 | 360.4 | 561.2 | 730.9 | 794.1 | 786.3 | 762.3 |
| February | 89.1 | 89.1 | 206.7 | 484.1 | 668.9 | 760.8 | 782.0 | 718.9 | 671.9 |
| March | 101.4 | 120.5 | 367.4 | 576.2 | 723.5 | 759.6 | 702.5 | 590.8 | 520.1 |
| April | 113.0 | 252.7 | 487.2 | 636.6 | 705.1 | 688.3 | 568.6 | 408.7 | 322.0 |
| May | 124.3 | 351.1 | 551.9 | 666.3 | 679.9 | 619.4 | 469.6 | 279.8 | 199.5 |
| June | 161.0 | 389.1 | 570.0 | 664.8 | 662.8 | 586.8 | 421.4 | 228.9 | 165.7 |
| July | 128.9 | 355.9 | 541.6 | 644.7 | 671.3 | 606.9 | 452.1 | 270.2 | 196.1 |
| August | 118.3 | 256.1 | 470.7 | 606.2 | 686.0 | 663.8 | 546.8 | 395.4 | 311.9 |
| September | 104.3 | 109.2 | 354.3 | 538.8 | 681.8 | 728.9 | 670.0 | 569.4 | 503.5 |
| October | 91.2 | 91.2 | 226.5 | 441.2 | 642.7 | 746.9 | 748.8 | 692.4 | 650.8 |
| November | 78.1 | 78.1 | 103.7 | 341.8 | 572.3 | 707.9 | 785.7 | 774.1 | 747.8 |
| December | 71.9 | 71.9 | 71.9 | 306.4 | 524.4 | 699.0 | 788.1 | 799.2 | 780.7 |
| **Month** | **SSW** | **SW** | **WSW** | **W** | **WNW** | **NW** | **NNW** | **HOR** | **Mult** |
| January | 779.8 | 791.7 | 733.2 | 577.4 | 337.4 | 108.2 | 77.5 | 591.4 | 1.00 |
| February | 716.3 | 777.2 | 772.2 | 650.4 | 482.8 | 225.6 | 89.1 | 714.5 | 1.00 |
| March | 590.5 | 703.8 | 755.6 | 713.7 | 589.1 | 369.6 | 114.3 | 816.8 | 1.00 |
| April | 413.5 | 574.6 | 682.6 | 707.6 | 645.8 | 485.9 | 241.4 | 863.3 | 1.00 |
| May | 282.1 | 471.6 | 614.4 | 688.4 | 669.7 | 550.4 | 343.5 | 875.1 | 1.00 |
| June | 233.1 | 424.2 | 577.0 | 674.2 | 670.6 | 567.0 | 376.4 | 872.9 | 1.00 |
| July | 274.2 | 458.7 | 596.0 | 677.5 | 657.5 | 539.9 | 345.0 | 865.3 | 1.00 |
| August | 398.9 | 554.0 | 657.3 | 682.8 | 624.7 | 473.1 | 240.3 | 846.4 | 1.00 |
| September | 569.0 | 669.3 | 728.9 | 681.0 | 540.4 | 354.6 | 108.6 | 783.8 | 1.00 |
| October | 697.0 | 755.4 | 737.2 | 647.9 | 457.7 | 216.5 | 91.2 | 696.8 | 1.00 |
| November | 775.6 | 786.0 | 708.0 | 568.2 | 351.0 | 91.0 | 78.1 | 582.8 | 1.00 |
| December | 798.2 | 790.7 | 685.6 | 536.9 | 295.2 | 71.9 | 71.9 | 533.5 | 1.00 |

    Mult. = User-defined solar multiplier factor.

**Cooling Design Temperature Profile**

**Location: Binak, IRAN**

    (Dry and Wet Bulb temperatures are expressed in °C)

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Hr** | **January** | | **February** | | **March** | | **April** | | **May** | | **June** | |
|  | **DB** | **WB** | **DB** | **WB** | **DB** | **WB** | **DB** | **WB** | **DB** | **WB** | **DB** | **WB** |
| 0000 | 19.4 | 19.1 | 20.5 | 20.2 | 23.0 | 22.8 | 24.5 | 24.2 | 26.7 | 26.4 | 28.1 | 27.8 |
| 0100 | 18.6 | 18.3 | 19.7 | 19.5 | 22.3 | 22.0 | 23.7 | 23.5 | 26.0 | 25.7 | 27.4 | 27.1 |
| 0200 | 17.9 | 17.6 | 19.0 | 18.7 | 21.5 | 21.3 | 23.0 | 22.7 | 25.2 | 24.9 | 26.6 | 26.4 |
| 0300 | 17.3 | 17.0 | 18.4 | 18.1 | 20.9 | 20.7 | 22.4 | 22.1 | 24.6 | 24.3 | 26.0 | 25.8 |
| 0400 | 16.8 | 16.5 | 17.9 | 17.7 | 20.5 | 20.2 | 21.9 | 21.7 | 24.2 | 23.9 | 25.6 | 25.3 |
| 0500 | 16.7 | 16.4 | 17.8 | 17.5 | 20.3 | 20.1 | 21.8 | 21.5 | 24.0 | 23.7 | 25.4 | 25.2 |
| 0600 | 17.0 | 16.7 | 18.1 | 17.8 | 20.6 | 20.4 | 22.1 | 21.8 | 24.3 | 24.0 | 25.7 | 25.5 |
| 0700 | 17.7 | 17.4 | 18.8 | 18.6 | 21.4 | 21.1 | 22.8 | 22.6 | 25.1 | 24.8 | 26.5 | 26.2 |
| 0800 | 19.1 | 18.8 | 20.2 | 19.9 | 22.7 | 22.5 | 24.2 | 23.9 | 26.4 | 26.1 | 27.8 | 27.6 |
| 0900 | 21.0 | 20.7 | 22.1 | 21.9 | 24.7 | 24.4 | 26.1 | 25.9 | 28.4 | 27.0 | 29.8 | 28.2 |
| 1000 | 23.3 | 22.2 | 24.4 | 23.2 | 26.9 | 25.6 | 28.4 | 26.6 | 30.6 | 27.5 | 32.0 | 28.7 |
| 1100 | 25.8 | 22.9 | 26.9 | 23.9 | 29.5 | 26.2 | 30.9 | 27.2 | 33.2 | 28.1 | 34.6 | 29.3 |
| 1200 | 28.2 | 23.6 | 29.3 | 24.5 | 31.9 | 26.8 | 33.3 | 27.7 | 35.6 | 28.6 | 37.0 | 29.8 |
| 1300 | 30.0 | 24.1 | 31.1 | 25.0 | 33.7 | 27.2 | 35.1 | 28.1 | 37.4 | 29.0 | 38.8 | 30.2 |
| 1400 | 31.2 | 24.4 | 32.3 | 25.3 | 34.9 | 27.5 | 36.3 | 28.4 | 38.6 | 29.3 | 40.0 | 30.4 |
| 1500 | 31.7 | 24.5 | 32.8 | 25.4 | 35.3 | 27.6 | 36.8 | 28.5 | 39.0 | 29.4 | 40.4 | 30.5 |
| 1600 | 31.2 | 24.4 | 32.3 | 25.3 | 34.9 | 27.5 | 36.3 | 28.4 | 38.6 | 29.3 | 40.0 | 30.4 |
| 1700 | 30.2 | 24.1 | 31.3 | 25.0 | 33.8 | 27.3 | 35.3 | 28.2 | 37.5 | 29.1 | 38.9 | 30.2 |
| 1800 | 28.5 | 23.7 | 29.6 | 24.6 | 32.2 | 26.9 | 33.6 | 27.8 | 35.9 | 28.7 | 37.3 | 29.8 |
| 1900 | 26.6 | 23.1 | 27.7 | 24.1 | 30.2 | 26.4 | 31.7 | 27.3 | 33.9 | 28.3 | 35.3 | 29.4 |
| 2000 | 24.6 | 22.6 | 25.7 | 23.5 | 28.3 | 25.9 | 29.7 | 26.9 | 32.0 | 27.8 | 33.4 | 29.0 |
| 2100 | 23.0 | 22.1 | 24.1 | 23.1 | 26.6 | 25.5 | 28.1 | 26.5 | 30.3 | 27.4 | 31.7 | 28.6 |
| 2200 | 21.5 | 21.2 | 22.6 | 22.3 | 25.1 | 24.9 | 26.6 | 26.1 | 28.8 | 27.1 | 30.2 | 28.3 |
| 2300 | 20.3 | 20.0 | 21.4 | 21.1 | 23.9 | 23.7 | 25.4 | 25.1 | 27.6 | 26.8 | 29.0 | 28.0 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Hr** | **July** | | **August** | | **September** | | **October** | | **November** | | **December** | |
|  | **DB** | **WB** | **DB** | **WB** | **DB** | **WB** | **DB** | **WB** | **DB** | **WB** | **DB** | **WB** |
| 0000 | 28.7 | 27.8 | 28.7 | 27.8 | 27.6 | 27.2 | 25.6 | 25.3 | 22.5 | 22.2 | 19.9 | 19.6 |
| 0100 | 28.0 | 27.7 | 28.0 | 27.7 | 26.8 | 26.6 | 24.8 | 24.6 | 21.7 | 21.5 | 19.2 | 18.9 |
| 0200 | 27.2 | 26.9 | 27.2 | 26.9 | 26.1 | 25.8 | 24.1 | 23.8 | 21.0 | 20.7 | 18.4 | 18.1 |
| 0300 | 26.6 | 26.3 | 26.6 | 26.3 | 25.5 | 25.2 | 23.5 | 23.2 | 20.4 | 20.1 | 17.8 | 17.5 |
| 0400 | 26.2 | 25.9 | 26.2 | 25.9 | 25.0 | 24.8 | 23.0 | 22.8 | 19.9 | 19.7 | 17.4 | 17.1 |
| 0500 | 26.0 | 25.7 | 26.0 | 25.7 | 24.9 | 24.6 | 22.9 | 22.6 | 19.8 | 19.5 | 17.2 | 16.9 |
| 0600 | 26.3 | 26.0 | 26.3 | 26.0 | 25.2 | 24.9 | 23.2 | 22.9 | 20.1 | 19.8 | 17.5 | 17.2 |
| 0700 | 27.1 | 26.8 | 27.1 | 26.8 | 25.9 | 25.7 | 23.9 | 23.7 | 20.8 | 20.6 | 18.3 | 18.0 |
| 0800 | 28.4 | 27.8 | 28.4 | 27.8 | 27.3 | 27.0 | 25.3 | 25.0 | 22.2 | 21.9 | 19.6 | 19.3 |
| 0900 | 30.4 | 28.2 | 30.4 | 28.2 | 29.2 | 27.6 | 27.2 | 26.4 | 24.1 | 23.9 | 21.6 | 21.3 |
| 1000 | 32.6 | 28.7 | 32.6 | 28.7 | 31.5 | 28.1 | 29.5 | 26.9 | 26.4 | 25.4 | 23.8 | 23.4 |
| 1100 | 35.2 | 29.3 | 35.2 | 29.3 | 34.0 | 28.7 | 32.0 | 27.5 | 28.9 | 26.0 | 26.4 | 24.1 |
| 1200 | 37.6 | 29.8 | 37.6 | 29.8 | 36.4 | 29.2 | 34.4 | 28.1 | 31.3 | 26.6 | 28.8 | 24.7 |
| 1300 | 39.4 | 30.2 | 39.4 | 30.2 | 38.2 | 29.6 | 36.2 | 28.5 | 33.1 | 27.0 | 30.6 | 25.2 |
| 1400 | 40.6 | 30.4 | 40.6 | 30.4 | 39.4 | 29.8 | 37.4 | 28.7 | 34.3 | 27.3 | 31.8 | 25.5 |
| 1500 | 41.0 | 30.5 | 41.0 | 30.5 | 39.9 | 29.9 | 37.9 | 28.8 | 34.8 | 27.4 | 32.2 | 25.6 |
| 1600 | 40.6 | 30.4 | 40.6 | 30.4 | 39.4 | 29.8 | 37.4 | 28.7 | 34.3 | 27.3 | 31.8 | 25.5 |
| 1700 | 39.5 | 30.2 | 39.5 | 30.2 | 38.4 | 29.6 | 36.4 | 28.5 | 33.3 | 27.0 | 30.7 | 25.2 |
| 1800 | 37.9 | 29.9 | 37.9 | 29.9 | 36.7 | 29.3 | 34.7 | 28.1 | 31.6 | 26.6 | 29.1 | 24.8 |
| 1900 | 35.9 | 29.4 | 35.9 | 29.4 | 34.8 | 28.9 | 32.8 | 27.7 | 29.7 | 26.2 | 27.1 | 24.3 |
| 2000 | 34.0 | 29.0 | 34.0 | 29.0 | 32.8 | 28.4 | 30.8 | 27.2 | 27.7 | 25.7 | 25.2 | 23.8 |
| 2100 | 32.3 | 28.7 | 32.3 | 28.7 | 31.2 | 28.0 | 29.2 | 26.8 | 26.1 | 25.3 | 23.5 | 23.2 |
| 2200 | 30.8 | 28.3 | 30.8 | 28.3 | 29.7 | 27.7 | 27.7 | 26.5 | 24.6 | 24.3 | 22.0 | 21.7 |
| 2300 | 29.6 | 28.0 | 29.6 | 28.0 | 28.5 | 27.4 | 26.5 | 26.2 | 23.4 | 23.1 | 20.8 | 20.5 |

**Design Temperature Profile**



## CONSTRUCTIONS U-VALUE:

**Wall (Anti acid ceramic tile)**

**Wall Details**

    Outside Surface Color   **Medium**

    Absorptivity   **0.675**

    Overall U-Value   **1.870** W/(m²-°K)

**Wall Layers Details (Inside to Outside)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Thickness** | **Density** | **Specific Ht.** | **R-Value** | **Weight** |
| **Layers** | **mm** | **kg/m³** | **kJ / (kg - °K)** | **(m²-°K)/W** | **kg/m²** |
| Inside surface resistance | 0.000 | 0.0 | 0.00 | 0.12064 | 0.0 |
| anti acid ceramic tile | 12.500 | 1800.0 | 0.34 | 0.01812 | 22.5 |
| cement plaster | 20.000 | 750.0 | 0.30 | 0.06667 | 15.0 |
| concrete wall | 400.000 | 2300.0 | 2.30 | 0.17391 | 920.0 |
| cement plaster | 20.000 | 750.0 | 0.30 | 0.06667 | 15.0 |
| face brick | 30.000 | 2000.0 | 1.00 | 0.03000 | 60.0 |
| Outside surface resistance | 0.000 | 0.0 | 0.00 | 0.05864 | 0.0 |
| **Totals** | **482.500** | **-** |  | **0.53465** | **1032.5** |

**Wall (Cement plaster)**

**Wall Details**

    Outside Surface Color   **Medium**

    Absorptivity   **0.675**

    Overall U-Value   **1.936** W/(m²-°K)

**Wall Layers Details (Inside to Outside)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Thickness** | **Density** | **Specific Ht.** | **R-Value** | **Weight** |
| **Layers** | **mm** | **kg/m³** | **kJ / (kg - °K)** | **(m²-°K)/W** | **kg/m²** |
| Inside surface resistance | 0.000 | 0.0 | 0.00 | 0.12064 | 0.0 |
| cement plaster | 1.667 | 750.0 | 0.30 | 0.06667 | 15.0 |
| concrete wall | 33.333 | 2300.0 | 2.30 | 0.17391 | 920.0 |
| cement plaster | 1.667 | 750.0 | 0.30 | 0.06670 | 15.0 |
| face brick | 2.500 | 2000.0 | 1.00 | 0.03000 | 60.0 |
| Outside surface resistance | 0.000 | 0.0 | 0.00 | 0.05864 | 0.0 |
| **Totals** | **39.167** | **-** |  | **0.51656** | **1010.0** |

**Wall (General)**

**Wall Details**

    Outside Surface Color   **Medium**

    Absorptivity   **0.675**

    Overall U-Value   **1.813** W/(m²-°K)

**Wall Layers Details (Inside to Outside)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Thickness** | **Density** | **Specific Ht.** | **R-Value** | **Weight** |
| **Layers** | **mm** | **kg/m³** | **kJ / (kg - °K)** | **(m²-°K)/W** | **kg/m²** |
| Inside surface resistance | 0.000 | 0.0 | 0.00 | 0.12064 | 0.0 |
| gypsum plaster | 20.000 | 1200.0 | 0.57 | 0.03509 | 24.0 |
| cement plaster | 20.000 | 750.0 | 0.30 | 0.06667 | 15.0 |
| concrete wall | 400.000 | 2300.0 | 2.30 | 0.17391 | 920.0 |
| cement plaster | 20.000 | 750.0 | 0.30 | 0.06667 | 15.0 |
| face brick | 30.000 | 2000.0 | 1.00 | 0.03000 | 60.0 |
| Outside surface resistance | 0.000 | 0.0 | 0.00 | 0.05864 | 0.0 |
| **Totals** | **490.000** | **-** |  | **0.55162** | **1034.0** |

**Roof**

**Roof Details**

    Outside Surface Color   **Medium**

    Absorptivity   **0.675**

    Overall U-Value   **0.484** W/(m²-°K)

**Roof Layers Details (Inside to Outside)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Thickness** | **Density** | **Specific Ht.** | **R-Value** | **Weight** |
| **Layers** | **mm** | **kg/m³** | **kJ / (kg - °K)** | **(m²-°K)/W** | **kg/m²** |
| Inside surface resistance | 0.000 | 0.0 | 0.00 | 0.12064 | 0.0 |
| Concrete roof-P210-19 INBR | 300.000 | 2300.0 | 0.84 | 0.13043 | 690.0 |
| HDPU-P218-19 INBR | 50.000 | 50.0 | 0.84 | 1.21951 | 2.5 |
| Cement plaster-P210-19 INBR | 100.000 | 750.0 | 0.84 | 0.33333 | 75.0 |
| Waterproofing layer-P219-19 INBR | 4.000 | 1100.0 | 1.67 | 0.01739 | 4.4 |
| Cement plaster-P210-19 INBR | 50.000 | 750.0 | 0.80 | 0.16667 | 37.5 |
| Terrazzo tile-P212-19 INBR | 25.000 | 2000.0 | 0.84 | 0.01852 | 50.0 |
| Outside surface resistance | 0.000 | 0.0 | 0.00 | 0.05864 | 0.0 |
| **Totals** | **529.000** | **-** |  | **2.06513** | **859.4** |

**B.P.D.-1**

**Door Details:**

    Gross Area   **2.6** m²

    Door U-Value   **3.000** W/(m²-°K)

**Glass Details:**

    Glass Area   **0.0** m²

    Glass U-Value   **3.293** W/(m²-°K)

    Glass Shade Coefficient   **0.880**

Glass Shaded All Day?   **No**

## SPACE INPUT DATA:

**00-Conference Room**

**1. General Details:**

    Floor Area   **38.4** m²

    Avg. Ceiling Height   **3.0** m

    Building Weight   **634.7** kg/m²

**1.1. OA Ventilation Requirements:**

    Space Usage   **User-Defined**

    OA Requirement 1   **10.0** L/s/person

    OA Requirement 2   **0.00** L/(s-m²)

    Space Usage Defaults   **ASHRAE Standard 62.1-2010**

**2. Internals:**

**2.1. Overhead Lighting:**

    Fixture Type   **Recessed (Unvented)**

    Wattage   **13.20** W/m²

    Ballast Multiplier   **1.00**

    Schedule   **Lighting**

**2.2. Task Lighting:**

    Wattage   **0.00** W/m²

    Schedule   **None**

**2.3. Electrical Equipment:**

    Wattage   **100.0** Watts

    Schedule   **Electrical Eq.**

**2.4. People:**

    Occupancy   **20.0** People

    Activity Level   **Office Work**

    Sensible   **71.8** W/person

    Latent   **60.1** W/person

    Schedule   **People**

**2.5. Miscellaneous Loads:**

    Sensible   **0** W

    Schedule   **None**

    Latent   **0** W

    Schedule   **None**

**3. Walls, Windows, Doors:**

| **Exp.** | **Wall Gross Area (m²)** | **Window 1 Qty.** | **Window 2 Qty.** | **Door 1 Qty.** |
| --- | --- | --- | --- | --- |
| WSW | 13.1 | 0 | 0 | 0 |
| SSE | 26.5 | 0 | 0 | 0 |

**3.1. Construction Types for Exposure WSW**

    Wall Type   **Wall (General)**

**3.2. Construction Types for Exposure SSE**

    Wall Type   **Wall (General)**

**4. Roofs, Skylights:**

| **Exp.** | **Roof Gross Area (m²)** | **Roof Slope (deg.)** | **Skylight Qty.** |
| --- | --- | --- | --- |
| H | 38.4 | 0 | 0 |

**4.1. Construction Types for Exposure H**

    Roof Type   **Roof**

**5. Infiltration:**

    Design Cooling   **0.00** L/s

    Design Heating   **0.00** L/s

    Energy Analysis   **0.00** L/s

    Infiltration occurs at all hours.

**6. Floors:**

    Type   **Slab Floor On Grade**

    Floor Area   **38.4** m²

    Total Floor U-Value   **0.568** W/(m²-°K)

    Exposed Perimeter   **13.2** m

    Edge Insulation R-Value   **0.00** (m²-°K)/W

**7. Partitions:**

**(No partition data).**

**01-Management Room**

**1. General Details:**

    Floor Area   **20.6** m²

    Avg. Ceiling Height   **3.0** m

    Building Weight   **634.7** kg/m²

**1.1. OA Ventilation Requirements:**

    Space Usage   **User-Defined**

    OA Requirement 1   **10.0** L/s/person

    OA Requirement 2   **0.00** L/(s-m²)

    Space Usage Defaults   **ASHRAE Standard 62.1-2010**

**2. Internals:**

**2.1. Overhead Lighting:**

    Fixture Type   **Recessed (Unvented)**

    Wattage   **11.90** W/m²

    Ballast Multiplier   **1.00**

    Schedule   **Lighting**

**2.2. Task Lighting:**

    Wattage   **0.00** W/m²

    Schedule   **None**

**2.3. Electrical Equipment:**

    Wattage   **150.0** Watts

    Schedule   **Electrical Eq.**

**2.4. People:**

    Occupancy   **5.0** People

    Activity Level   **Office Work**

    Sensible   **71.8** W/person

    Latent   **60.1** W/person

    Schedule   **People**

**2.5. Miscellaneous Loads:**

    Sensible   **0** W

    Schedule   **None**

    Latent   **0** W

    Schedule   **None**

**3. Walls, Windows, Doors:**

| **Exp.** | **Wall Gross Area (m²)** | **Window 1 Qty.** | **Window 2 Qty.** | **Door 1 Qty.** |
| --- | --- | --- | --- | --- |
| SSE | 14.2 | 0 | 0 | 0 |

**3.1. Construction Types for Exposure SSE**

    Wall Type   **Wall (General)**

**4. Roofs, Skylights:**

| **Exp.** | **Roof Gross Area (m²)** | **Roof Slope (deg.)** | **Skylight Qty.** |
| --- | --- | --- | --- |
| H | 20.6 | 0 | 0 |

**4.1. Construction Types for Exposure H**

    Roof Type   **Roof**

**5. Infiltration:**

    Design Cooling   **0.00** L/s

    Design Heating   **0.00** L/s

    Energy Analysis   **0.00** L/s

    Infiltration occurs at all hours.

**6. Floors:**

    Type   **Slab Floor On Grade**

    Floor Area   **20.6** m²

    Total Floor U-Value   **0.568** W/(m²-°K)

    Exposed Perimeter   **4.7** m

    Edge Insulation R-Value   **0.00** (m²-°K)/W

**7. Partitions:**

**7.1. 1st Partition Details:**

    Partition Type   **Wall Partition**

    Area   **5.7** m²

    U-Value   **1.260** W/(m²-°K)

    Uncondit. Space Max Temp   **35.0** °C

    Ambient at Space Max Temp   **41.0** °C

    Uncondit. Space Min Temp   **12.8** °C

    Ambient at Space Min Temp   **6.0** °C

**7.2. 2nd Partition Details:**

**(No partition data).**

**02-Entrance**

**1. General Details:**

    Floor Area   **15.8** m²

    Avg. Ceiling Height   **2.5** m

    Building Weight   **634.7** kg/m²

**1.1. OA Ventilation Requirements:**

    Space Usage   **User-Defined**

    OA Requirement 1   **10.0** L/s/person

    OA Requirement 2   **0.00** L/(s-m²)

    Space Usage Defaults   **ASHRAE Standard 62.1-2010**

**2. Internals:**

**2.1. Overhead Lighting:**

    Fixture Type   **Recessed (Unvented)**

    Wattage   **7.10** W/m²

    Ballast Multiplier   **1.00**

    Schedule   **Lighting**

**2.2. Task Lighting:**

    Wattage   **0.00** W/m²

    Schedule   **None**

**2.3. Electrical Equipment:**

    Wattage   **200.0** Watts

    Schedule   **Electrical Eq.**

**2.4. People:**

    Occupancy   **2.0** People

    Activity Level   **Office Work**

    Sensible   **71.8** W/person

    Latent   **60.1** W/person

    Schedule   **People**

**2.5. Miscellaneous Loads:**

    Sensible   **0** W

    Schedule   **None**

    Latent   **0** W

    Schedule   **None**

**3. Walls, Windows, Doors:**

**(No Wall, Window, Door data).**

**4. Roofs, Skylights:**

| **Exp.** | **Roof Gross Area (m²)** | **Roof Slope (deg.)** | **Skylight Qty.** |
| --- | --- | --- | --- |
| H | 15.8 | 0 | 0 |

**4.1. Construction Types for Exposure H**

    Roof Type   **Roof**

**5. Infiltration:**

    Design Cooling   **0.00** L/s

    Design Heating   **0.00** L/s

    Energy Analysis   **0.00** L/s

    Infiltration occurs at all hours.

**6. Floors:**

    Type   **Slab Floor On Grade**

    Floor Area   **15.8** m²

    Total Floor U-Value   **0.568** W/(m²-°K)

    Exposed Perimeter   **4.7** m

    Edge Insulation R-Value   **0.00** (m²-°K)/W

**7. Partitions:**

**7.1. 1st Partition Details:**

    Partition Type   **Wall Partition**

    Area   **8.9** m²

    U-Value   **1.260** W/(m²-°K)

    Uncondit. Space Max Temp   **35.0** °C

    Ambient at Space Max Temp   **41.0** °C

    Uncondit. Space Min Temp   **12.8** °C

    Ambient at Space Min Temp   **6.0** °C

**7.2. 2nd Partition Details:**

**(No partition data).**

**03-Archive**

**1. General Details:**

    Floor Area   **12.5** m²

    Avg. Ceiling Height   **3.0** m

    Building Weight   **634.7** kg/m²

**1.1. OA Ventilation Requirements:**

    Space Usage   **User-Defined**

    OA Requirement 1   **10.0** L/s/person

    OA Requirement 2   **0.00** L/(s-m²)

    Space Usage Defaults   **ASHRAE Standard 62.1-2010**

**2. Internals:**

**2.1. Overhead Lighting:**

    Fixture Type   **Recessed (Unvented)**

    Wattage   **11.90** W/m²

    Ballast Multiplier   **1.00**

    Schedule   **Lighting**

**2.2. Task Lighting:**

    Wattage   **0.00** W/m²

    Schedule   **None**

**2.3. Electrical Equipment:**

    Wattage   **100.0** Watts

    Schedule   **Electrical Eq.**

**2.4. People:**

    Occupancy   **3.0** People

    Activity Level   **Office Work**

    Sensible   **71.8** W/person

    Latent   **60.1** W/person

    Schedule   **People**

**2.5. Miscellaneous Loads:**

    Sensible   **0** W

    Schedule   **None**

    Latent   **0** W

    Schedule   **None**

**3. Walls, Windows, Doors:**

| **Exp.** | **Wall Gross Area (m²)** | **Window 1 Qty.** | **Window 2 Qty.** | **Door 1 Qty.** |
| --- | --- | --- | --- | --- |
| SSE | 8.8 | 0 | 0 | 0 |

**3.1. Construction Types for Exposure SSE**

    Wall Type   **Wall (General)**

**4. Roofs, Skylights:**

| **Exp.** | **Roof Gross Area (m²)** | **Roof Slope (deg.)** | **Skylight Qty.** |
| --- | --- | --- | --- |
| H | 12.5 | 0 | 0 |

**4.1. Construction Types for Exposure H**

    Roof Type   **Roof**

**5. Infiltration:**

    Design Cooling   **0.00** L/s

    Design Heating   **0.00** L/s

    Energy Analysis   **0.00** L/s

    Infiltration occurs at all hours.

**6. Floors:**

    Type   **Slab Floor On Grade**

    Floor Area   **12.5** m²

    Total Floor U-Value   **0.568** W/(m²-°K)

    Exposed Perimeter   **2.9** m

    Edge Insulation R-Value   **0.00** (m²-°K)/W

**7. Partitions:**

**7.1. 1st Partition Details:**

    Partition Type   **Wall Partition**

    Area   **5.7** m²

    U-Value   **1.260** W/(m²-°K)

    Uncondit. Space Max Temp   **35.0** °C

    Ambient at Space Max Temp   **41.0** °C

    Uncondit. Space Min Temp   **12.8** °C

    Ambient at Space Min Temp   **6.0** °C

**7.2. 2nd Partition Details:**

**(No partition data).**

**04-Locker**

**1. General Details:**

    Floor Area   **16.7** m²

    Avg. Ceiling Height   **3.0** m

    Building Weight   **634.7** kg/m²

**1.1. OA Ventilation Requirements:**

    Space Usage   **User-Defined**

    OA Requirement 1   **83.5** L/s

    OA Requirement 2   **0.00** L/(s-m²)

    Space Usage Defaults   **ASHRAE Standard 62.1-2010**

**2. Internals:**

**2.1. Overhead Lighting:**

    Fixture Type   **Recessed (Unvented)**

    Wattage   **11.50** W/m²

    Ballast Multiplier   **1.00**

    Schedule   **Lighting**

**2.2. Task Lighting:**

    Wattage   **0.00** W/m²

    Schedule   **None**

**2.3. Electrical Equipment:**

    Wattage   **50.0** Watts

    Schedule   **Electrical Eq.**

**2.4. People:**

    Occupancy   **5.0** People

    Activity Level   **Medium Work**

    Sensible   **86.5** W/person

    Latent   **133.3** W/person

    Schedule   **People**

**2.5. Miscellaneous Loads:**

    Sensible   **0** W

    Schedule   **None**

    Latent   **0** W

    Schedule   **None**

**3. Walls, Windows, Doors:**

| **Exp.** | **Wall Gross Area (m²)** | **Window 1 Qty.** | **Window 2 Qty.** | **Door 1 Qty.** |
| --- | --- | --- | --- | --- |
| SSE | 11.8 | 0 | 0 | 0 |

**3.1. Construction Types for Exposure SSE**

    Wall Type   **Wall (General)**

**4. Roofs, Skylights:**

| **Exp.** | **Roof Gross Area (m²)** | **Roof Slope (deg.)** | **Skylight Qty.** |
| --- | --- | --- | --- |
| H | 16.7 | 0 | 0 |

**4.1. Construction Types for Exposure H**

    Roof Type   **Roof**

**5. Infiltration:**

    Design Cooling   **0.00** L/s

    Design Heating   **0.00** L/s

    Energy Analysis   **0.00** L/s

    Infiltration occurs at all hours.

**6. Floors:**

    Type   **Slab Floor On Grade**

    Floor Area   **16.7** m²

    Total Floor U-Value   **0.568** W/(m²-°K)

    Exposed Perimeter   **3.9** m

    Edge Insulation R-Value   **0.00** (m²-°K)/W

**7. Partitions:**

**(No partition data).**

**05-Prayer Room**

**1. General Details:**

    Floor Area   **16.7** m²

    Avg. Ceiling Height   **3.0** m

    Building Weight   **634.7** kg/m²

**1.1. OA Ventilation Requirements:**

    Space Usage   **User-Defined**

    OA Requirement 1   **83.5** L/s

    OA Requirement 2   **0.00** L/(s-m²)

    Space Usage Defaults   **ASHRAE Standard 62.1-2010**

**2. Internals:**

**2.1. Overhead Lighting:**

    Fixture Type   **Recessed (Unvented)**

    Wattage   **11.50** W/m²

    Ballast Multiplier   **1.00**

    Schedule   **Lighting**

**2.2. Task Lighting:**

    Wattage   **0.00** W/m²

    Schedule   **None**

**2.3. Electrical Equipment:**

    Wattage   **0.0** Watts

    Schedule   **None**

**2.4. People:**

    Occupancy   **15.0** People

    Activity Level   **Sedentary Work**

    Sensible   **82.1** W/person

    Latent   **79.1** W/person

    Schedule   **People**

**2.5. Miscellaneous Loads:**

    Sensible   **0** W

    Schedule   **None**

    Latent   **0** W

    Schedule   **None**

**3. Walls, Windows, Doors:**

| **Exp.** | **Wall Gross Area (m²)** | **Window 1 Qty.** | **Window 2 Qty.** | **Door 1 Qty.** |
| --- | --- | --- | --- | --- |
| SSE | 11.8 | 0 | 0 | 0 |

**3.1. Construction Types for Exposure SSE**

    Wall Type   **Wall (General)**

**4. Roofs, Skylights:**

| **Exp.** | **Roof Gross Area (m²)** | **Roof Slope (deg.)** | **Skylight Qty.** |
| --- | --- | --- | --- |
| H | 16.7 | 0 | 0 |

**4.1. Construction Types for Exposure H**

    Roof Type   **Roof**

**5. Infiltration:**

    Design Cooling   **0.00** L/s

    Design Heating   **0.00** L/s

    Energy Analysis   **0.00** L/s

    Infiltration occurs at all hours.

**6. Floors:**

    Type   **Slab Floor On Grade**

    Floor Area   **16.7** m²

    Total Floor U-Value   **0.568** W/(m²-°K)

    Exposed Perimeter   **3.9** m

    Edge Insulation R-Value   **0.00** (m²-°K)/W

**7. Partitions:**

**7.1. 1st Partition Details:**

    Partition Type   **Wall Partition**

    Area   **12.7** m²

    U-Value   **1.260** W/(m²-°K)

    Uncondit. Space Max Temp   **35.0** °C

    Ambient at Space Max Temp   **41.0** °C

    Uncondit. Space Min Temp   **12.8** °C

    Ambient at Space Min Temp   **6.0** °C

**7.2. 2nd Partition Details:**

**(No partition data).**

**06-Corridor**

**1. General Details:**

    Floor Area   **15.2** m²

    Avg. Ceiling Height   **2.5** m

    Building Weight   **634.7** kg/m²

**1.1. OA Ventilation Requirements:**

    Space Usage   **User-Defined**

    OA Requirement 1   **10.0** L/s/person

    OA Requirement 2   **0.00** L/(s-m²)

    Space Usage Defaults   **ASHRAE Standard 62.1-2010**

**2. Internals:**

**2.1. Overhead Lighting:**

    Fixture Type   **Recessed (Unvented)**

    Wattage   **7.10** W/m²

    Ballast Multiplier   **1.00**

    Schedule   **Lighting**

**2.2. Task Lighting:**

    Wattage   **0.00** W/m²

    Schedule   **None**

**2.3. Electrical Equipment:**

    Wattage   **0.0** Watts

    Schedule   **None**

**2.4. People:**

    Occupancy   **2.0** People

    Activity Level   **Office Work**

    Sensible   **71.8** W/person

    Latent   **60.1** W/person

    Schedule   **People**

**2.5. Miscellaneous Loads:**

    Sensible   **0** W

    Schedule   **None**

    Latent   **0** W

    Schedule   **None**

**3. Walls, Windows, Doors:**

**(No Wall, Window, Door data).**

**4. Roofs, Skylights:**

| **Exp.** | **Roof Gross Area (m²)** | **Roof Slope (deg.)** | **Skylight Qty.** |
| --- | --- | --- | --- |
| H | 15.2 | 0 | 0 |

**4.1. Construction Types for Exposure H**

    Roof Type   **Roof**

**5. Infiltration:**

    Design Cooling   **0.00** L/s

    Design Heating   **0.00** L/s

    Energy Analysis   **0.00** L/s

    Infiltration occurs at all hours.

**6. Floors:**

    Type   **Slab Floor On Grade**

    Floor Area   **15.2** m²

    Total Floor U-Value   **0.568** W/(m²-°K)

    Exposed Perimeter   **4.7** m

    Edge Insulation R-Value   **0.00** (m²-°K)/W

**7. Partitions:**

**7.1. 1st Partition Details:**

    Partition Type   **Wall Partition**

    Area   **3.4** m²

    U-Value   **1.260** W/(m²-°K)

    Uncondit. Space Max Temp   **35.0** °C

    Ambient at Space Max Temp   **41.0** °C

    Uncondit. Space Min Temp   **12.8** °C

    Ambient at Space Min Temp   **6.0** °C

**7.2. 2nd Partition Details:**

**(No partition data).**

**07-Battery Room**

**1. General Details:**

    Floor Area   **46.8** m²

    Avg. Ceiling Height   **4.0** m

    Building Weight   **634.7** kg/m²

**1.1. OA Ventilation Requirements:**

    Space Usage   **User-Defined**

    OA Requirement 1   **519.8** L/s

    OA Requirement 2   **0.00** L/(s-m²)

    Space Usage Defaults   **ASHRAE Standard 62.1-2010**

**2. Internals:**

**2.1. Overhead Lighting:**

    Fixture Type   **Recessed (Unvented)**

    Wattage   **20.00** W/m²

    Ballast Multiplier   **1.00**

    Schedule   **Lighting**

**2.2. Task Lighting:**

    Wattage   **0.00** W/m²

    Schedule   **None**

**2.3. Electrical Equipment:**

    Wattage   **1000.0** Watts

    Schedule   **Electrical Eq.**

**2.4. People:**

    Occupancy   **0.0** Person

    Activity Level   **Office Work**

    Sensible   **71.8** W/person

    Latent   **60.1** W/person

    Schedule   **None**

**2.5. Miscellaneous Loads:**

    Sensible   **0** W

    Schedule   **None**

    Latent   **0** W

    Schedule   **None**

**3. Walls, Windows, Doors:**

| **Exp.** | **Wall Gross Area (m²)** | **Window 1 Qty.** | **Window 2 Qty.** | **Door 1 Qty.** |
| --- | --- | --- | --- | --- |
| NNW | 19.4 | 0 | 0 | 0 |
| ENE | 39.0 | 0 | 0 | 0 |
| SSE | 19.4 | 0 | 0 | 1 |

**3.1. Construction Types for Exposure NNW**

    Wall Type   **Wall (Anti acid ceramic tile)**

**3.2. Construction Types for Exposure ENE**

    Wall Type   **Wall (Anti acid ceramic tile)**

**3.3. Construction Types for Exposure SSE**

    Wall Type   **Wall (Anti acid ceramic tile)**

    Door Type   **B.P.D.-1**

**4. Roofs, Skylights:**

| **Exp.** | **Roof Gross Area (m²)** | **Roof Slope (deg.)** | **Skylight Qty.** |
| --- | --- | --- | --- |
| H | 46.8 | 0 | 0 |

**4.1. Construction Types for Exposure H**

    Roof Type   **Roof**

**5. Infiltration:**

    Design Cooling   **0.00** ACH

    Design Heating   **0.00** ACH

    Energy Analysis   **0.00** ACH

    Infiltration occurs at all hours.

**6. Floors:**

    Type   **Slab Floor On Grade**

    Floor Area   **46.8** m²

    Total Floor U-Value   **0.568** W/(m²-°K)

    Exposed Perimeter   **19.4** m

    Edge Insulation R-Value   **0.00** (m²-°K)/W

**7. Partitions:**

**(No partition data).**

**08-UPS**

**1. General Details:**

    Floor Area   **33.5** m²

    Avg. Ceiling Height   **4.0** m

    Building Weight   **634.7** kg/m²

**1.1. OA Ventilation Requirements:**

    Space Usage   **User-Defined**

    OA Requirement 1   **37.2** L/s

    OA Requirement 2   **0.00** L/(s-m²)

    Space Usage Defaults   **ASHRAE Standard 62.1-2010**

**2. Internals:**

**2.1. Overhead Lighting:**

    Fixture Type   **Recessed (Unvented)**

    Wattage   **20.00** W/m²

    Ballast Multiplier   **1.00**

    Schedule   **Lighting**

**2.2. Task Lighting:**

    Wattage   **0.00** W/m²

    Schedule   **None**

**2.3. Electrical Equipment:**

    Wattage   **4000.0** Watts

    Schedule   **Electrical Eq.**

**2.4. People:**

    Occupancy   **0.0** Person

    Activity Level   **Office Work**

    Sensible   **71.8** W/person

    Latent   **60.1** W/person

    Schedule   **None**

**2.5. Miscellaneous Loads:**

    Sensible   **0** W

    Schedule   **None**

    Latent   **0** W

    Schedule   **None**

**3. Walls, Windows, Doors:**

| **Exp.** | **Wall Gross Area (m²)** | **Window 1 Qty.** | **Window 2 Qty.** | **Door 1 Qty.** |
| --- | --- | --- | --- | --- |
| NNW | 13.8 | 0 | 0 | 0 |
| WSW | 9.5 | 0 | 0 | 0 |
| SSE | 13.8 | 0 | 0 | 1 |

**3.1. Construction Types for Exposure NNW**

    Wall Type   **Wall (Cement plaster)**

**3.2. Construction Types for Exposure WSW**

    Wall Type   **Wall (Cement plaster)**

**3.3. Construction Types for Exposure SSE**

    Wall Type   **Wall (Cement plaster)**

    Door Type   **B.P.D.-1**

**4. Roofs, Skylights:**

| **Exp.** | **Roof Gross Area (m²)** | **Roof Slope (deg.)** | **Skylight Qty.** |
| --- | --- | --- | --- |
| H | 33.5 | 0 | 0 |

**4.1. Construction Types for Exposure H**

    Roof Type   **Roof**

**5. Infiltration:**

    Design Cooling   **0.00** ACH

    Design Heating   **0.00** ACH

    Energy Analysis   **0.00** ACH

    Infiltration occurs at all hours.

**6. Floors:**

    Type   **Slab Floor On Grade**

    Floor Area   **33.5** m²

    Total Floor U-Value   **0.568** W/(m²-°K)

    Exposed Perimeter   **9.3** m

    Edge Insulation R-Value   **0.00** (m²-°K)/W

**7. Partitions:**

**(No partition data).**

**09-E.X. C.R. (Rack R.1)**

**1. General Details:**

    Floor Area   **43.0** m²

    Avg. Ceiling Height   **3.0** m

    Building Weight   **634.7** kg/m²

**1.1. OA Ventilation Requirements:**

    Space Usage   **User-Defined**

    OA Requirement 1   **35.8** L/s

    OA Requirement 2   **0.00** L/(s-m²)

    Space Usage Defaults   **ASHRAE Standard 62.1-2010**

**2. Internals:**

**2.1. Overhead Lighting:**

    Fixture Type   **Recessed (Unvented)**

    Wattage   **20.00** W/m²

    Ballast Multiplier   **1.00**

    Schedule   **Lighting**

**2.2. Task Lighting:**

    Wattage   **0.00** W/m²

    Schedule   **None**

**2.3. Electrical Equipment:**

    Wattage   **1000.0** Watts

    Schedule   **Electrical Eq.**

**2.4. People:**

    Occupancy   **2.0** People

    Activity Level   **Sedentary Work**

    Sensible   **82.1** W/person

    Latent   **79.1** W/person

    Schedule   **People**

**2.5. Miscellaneous Loads:**

    Sensible   **0** W

    Schedule   **None**

    Latent   **0** W

    Schedule   **None**

**3. Walls, Windows, Doors:**

| **Exp.** | **Wall Gross Area (m²)** | **Window 1 Qty.** | **Window 2 Qty.** | **Door 1 Qty.** |
| --- | --- | --- | --- | --- |
| NNW | 13.2 | 0 | 0 | 0 |
| WSW | 7.6 | 0 | 0 | 0 |

**3.1. Construction Types for Exposure NNW**

    Wall Type   **Wall (General)**

**3.2. Construction Types for Exposure WSW**

    Wall Type   **Wall (General)**

**4. Roofs, Skylights:**

| **Exp.** | **Roof Gross Area (m²)** | **Roof Slope (deg.)** | **Skylight Qty.** |
| --- | --- | --- | --- |
| H | 43.0 | 0 | 0 |

**4.1. Construction Types for Exposure H**

    Roof Type   **Roof**

**5. Infiltration:**

    Design Cooling   **0.00** ACH

    Design Heating   **0.00** ACH

    Energy Analysis   **0.00** ACH

    Infiltration occurs at all hours.

**6. Floors:**

    Type   **Slab Floor On Grade**

    Floor Area   **43.0** m²

    Total Floor U-Value   **0.568** W/(m²-°K)

    Exposed Perimeter   **6.9** m

    Edge Insulation R-Value   **0.00** (m²-°K)/W

**7. Partitions:**

**(No partition data).**

**10-EXI. Control Room**

**1. General Details:**

    Floor Area   **114.6** m²

    Avg. Ceiling Height   **3.0** m

    Building Weight   **634.7** kg/m²

**1.1. OA Ventilation Requirements:**

    Space Usage   **User-Defined**

    OA Requirement 1   **10** % of supply air

    OA Requirement 2   **0.00** L/(s-m²)

    Space Usage Defaults   **ASHRAE Standard 62.1-2010**

**2. Internals:**

**2.1. Overhead Lighting:**

    Fixture Type   **Recessed (Unvented)**

    Wattage   **20.00** W/m²

    Ballast Multiplier   **1.00**

    Schedule   **Lighting**

**2.2. Task Lighting:**

    Wattage   **0.00** W/m²

    Schedule   **None**

**2.3. Electrical Equipment:**

    Wattage   **4000.0** Watts

    Schedule   **Electrical Eq.**

**2.4. People:**

    Occupancy   **15.0** People

    Activity Level   **Sedentary Work**

    Sensible   **82.1** W/person

    Latent   **79.1** W/person

    Schedule   **People**

**2.5. Miscellaneous Loads:**

    Sensible   **0** W

    Schedule   **None**

    Latent   **0** W

    Schedule   **None**

**3. Walls, Windows, Doors:**

| **Exp.** | **Wall Gross Area (m²)** | **Window 1 Qty.** | **Window 2 Qty.** | **Door 1 Qty.** |
| --- | --- | --- | --- | --- |
| NNW | 47.4 | 0 | 0 | 0 |

**3.1. Construction Types for Exposure NNW**

    Wall Type   **Wall (General)**

**4. Roofs, Skylights:**

| **Exp.** | **Roof Gross Area (m²)** | **Roof Slope (deg.)** | **Skylight Qty.** |
| --- | --- | --- | --- |
| H | 114.6 | 0 | 0 |

**4.1. Construction Types for Exposure H**

    Roof Type   **Roof**

**5. Infiltration:**

    Design Cooling   **0.00** ACH

    Design Heating   **0.00** ACH

    Energy Analysis   **0.00** ACH

    Infiltration occurs at all hours.

**6. Floors:**

    Type   **Slab Floor On Grade**

    Floor Area   **114.6** m²

    Total Floor U-Value   **0.568** W/(m²-°K)

    Exposed Perimeter   **15.8** m

    Edge Insulation R-Value   **0.00** (m²-°K)/W

**7. Partitions:**

**(No partition data).**

**11-EXI. UPS**

**1. General Details:**

    Floor Area   **13.2** m²

    Avg. Ceiling Height   **3.0** m

    Building Weight   **634.7** kg/m²

**1.1. OA Ventilation Requirements:**

    Space Usage   **User-Defined**

    OA Requirement 1   **11.0** L/s

    OA Requirement 2   **0.00** L/(s-m²)

    Space Usage Defaults   **ASHRAE Standard 62.1-2010**

**2. Internals:**

**2.1. Overhead Lighting:**

    Fixture Type   **Recessed (Unvented)**

    Wattage   **20.00** W/m²

    Ballast Multiplier   **1.00**

    Schedule   **Lighting**

**2.2. Task Lighting:**

    Wattage   **0.00** W/m²

    Schedule   **None**

**2.3. Electrical Equipment:**

    Wattage   **1000.0** Watts

    Schedule   **Electrical Eq.**

**2.4. People:**

    Occupancy   **0.0** Person

    Activity Level   **Sedentary Work**

    Sensible   **82.1** W/person

    Latent   **79.1** W/person

    Schedule   **None**

**2.5. Miscellaneous Loads:**

    Sensible   **0** W

    Schedule   **None**

    Latent   **0** W

    Schedule   **None**

**3. Walls, Windows, Doors:**

**(No Wall, Window, Door data).**

**4. Roofs, Skylights:**

| **Exp.** | **Roof Gross Area (m²)** | **Roof Slope (deg.)** | **Skylight Qty.** |
| --- | --- | --- | --- |
| H | 13.2 | 0 | 0 |

**4.1. Construction Types for Exposure H**

    Roof Type   **Roof**

**5. Infiltration:**

    Design Cooling   **0.00** ACH

    Design Heating   **0.00** ACH

    Energy Analysis   **0.00** ACH

    Infiltration occurs at all hours.

**6. Floors:**

    Type   **Slab Floor On Grade**

    Floor Area   **13.2** m²

    Total Floor U-Value   **0.568** W/(m²-°K)

    Exposed Perimeter   **0.0** m

    Edge Insulation R-Value   **0.00** (m²-°K)/W

**7. Partitions:**

**(No partition data).**

**12-EXI. Battery Room**

**1. General Details:**

    Floor Area   **10.7** m²

    Avg. Ceiling Height   **3.0** m

    Building Weight   **634.7** kg/m²

**1.1. OA Ventilation Requirements:**

    Space Usage   **User-Defined**

    OA Requirement 1   **89.2** L/s

    OA Requirement 2   **0.00** L/(s-m²)

    Space Usage Defaults   **ASHRAE Standard 62.1-2010**

**2. Internals:**

**2.1. Overhead Lighting:**

    Fixture Type   **Recessed (Unvented)**

    Wattage   **20.00** W/m²

    Ballast Multiplier   **1.00**

    Schedule   **Lighting**

**2.2. Task Lighting:**

    Wattage   **0.00** W/m²

    Schedule   **None**

**2.3. Electrical Equipment:**

    Wattage   **500.0** Watts

    Schedule   **Electrical Eq.**

**2.4. People:**

    Occupancy   **0.0** Person

    Activity Level   **Office Work**

    Sensible   **71.8** W/person

    Latent   **60.1** W/person

    Schedule   **None**

**2.5. Miscellaneous Loads:**

    Sensible   **0** W

    Schedule   **None**

    Latent   **0** W

    Schedule   **None**

**3. Walls, Windows, Doors:**

| **Exp.** | **Wall Gross Area (m²)** | **Window 1 Qty.** | **Window 2 Qty.** | **Door 1 Qty.** |
| --- | --- | --- | --- | --- |
| NNW | 7.8 | 0 | 0 | 1 |

**3.1. Construction Types for Exposure NNW**

    Wall Type   **Wall (Anti acid ceramic tile)**

    Door Type   **B.P.D.-1**

**4. Roofs, Skylights:**

| **Exp.** | **Roof Gross Area (m²)** | **Roof Slope (deg.)** | **Skylight Qty.** |
| --- | --- | --- | --- |
| H | 10.7 | 0 | 0 |

**4.1. Construction Types for Exposure H**

    Roof Type   **Roof**

**5. Infiltration:**

    Design Cooling   **0.00** ACH

    Design Heating   **0.00** ACH

    Energy Analysis   **0.00** ACH

    Infiltration occurs at all hours.

**6. Floors:**

    Type   **Slab Floor On Grade**

    Floor Area   **10.7** m²

    Total Floor U-Value   **0.568** W/(m²-°K)

    Exposed Perimeter   **2.6** m

    Edge Insulation R-Value   **0.00** (m²-°K)/W

**7. Partitions:**

**(No partition data).**

**13-EXI. Lavatory & Shower**

**1. General Details:**

    Floor Area   **21.3** m²

    Avg. Ceiling Height   **3.0** m

    Building Weight   **634.7** kg/m²

**1.1. OA Ventilation Requirements:**

    Space Usage   **User-Defined**

    OA Requirement 1   **266.3** L/s

    OA Requirement 2   **0.00** L/(s-m²)

    Space Usage Defaults   **ASHRAE Standard 62.1-2010**

**2. Internals:**

**2.1. Overhead Lighting:**

    Fixture Type   **Recessed (Unvented)**

    Wattage   **7.10** W/m²

    Ballast Multiplier   **1.00**

    Schedule   **Lighting**

**2.2. Task Lighting:**

    Wattage   **0.00** W/m²

    Schedule   **None**

**2.3. Electrical Equipment:**

    Wattage   **0.0** Watts

    Schedule   **None**

**2.4. People:**

    Occupancy   **4.0** People

    Activity Level   **Sedentary Work**

    Sensible   **82.1** W/person

    Latent   **79.1** W/person

    Schedule   **People**

**2.5. Miscellaneous Loads:**

    Sensible   **0** W

    Schedule   **None**

    Latent   **0** W

    Schedule   **None**

**3. Walls, Windows, Doors:**

| **Exp.** | **Wall Gross Area (m²)** | **Window 1 Qty.** | **Window 2 Qty.** | **Door 1 Qty.** |
| --- | --- | --- | --- | --- |
| NNW | 15.3 | 0 | 0 | 0 |
| WSW | 15.0 | 0 | 0 | 0 |

**3.1. Construction Types for Exposure NNW**

    Wall Type   **Wall (Anti acid ceramic tile)**

**3.2. Construction Types for Exposure WSW**

    Wall Type   **Wall (Anti acid ceramic tile)**

**4. Roofs, Skylights:**

| **Exp.** | **Roof Gross Area (m²)** | **Roof Slope (deg.)** | **Skylight Qty.** |
| --- | --- | --- | --- |
| H | 21.3 | 0 | 0 |

**4.1. Construction Types for Exposure H**

    Roof Type   **Roof**

**5. Infiltration:**

    Design Cooling   **0.00** ACH

    Design Heating   **0.00** ACH

    Energy Analysis   **0.00** ACH

    Infiltration occurs at all hours.

**6. Floors:**

    Type   **Slab Floor On Grade**

    Floor Area   **21.3** m²

    Total Floor U-Value   **0.568** W/(m²-°K)

    Exposed Perimeter   **10.1** m

    Edge Insulation R-Value   **0.00** (m²-°K)/W

**7. Partitions:**

**(No partition data).**

**14-EXI. Locker Room**

**1. General Details:**

    Floor Area   **6.7** m²

    Avg. Ceiling Height   **3.0** m

    Building Weight   **634.7** kg/m²

**1.1. OA Ventilation Requirements:**

    Space Usage   **User-Defined**

    OA Requirement 1   **33.5** L/s

    OA Requirement 2   **0.00** L/(s-m²)

    Space Usage Defaults   **ASHRAE Standard 62.1-2010**

**2. Internals:**

**2.1. Overhead Lighting:**

    Fixture Type   **Recessed (Unvented)**

    Wattage   **11.50** W/m²

    Ballast Multiplier   **1.00**

    Schedule   **Lighting**

**2.2. Task Lighting:**

    Wattage   **0.00** W/m²

    Schedule   **None**

**2.3. Electrical Equipment:**

    Wattage   **0.0** Watts

    Schedule   **None**

**2.4. People:**

    Occupancy   **1.0** Person

    Activity Level   **Medium Work**

    Sensible   **86.5** W/person

    Latent   **133.3** W/person

    Schedule   **People**

**2.5. Miscellaneous Loads:**

    Sensible   **0** W

    Schedule   **None**

    Latent   **0** W

    Schedule   **None**

**3. Walls, Windows, Doors:**

| **Exp.** | **Wall Gross Area (m²)** | **Window 1 Qty.** | **Window 2 Qty.** | **Door 1 Qty.** |
| --- | --- | --- | --- | --- |
| WSW | 10.1 | 0 | 0 | 0 |

**3.1. Construction Types for Exposure WSW**

    Wall Type   **Wall (General)**

**4. Roofs, Skylights:**

| **Exp.** | **Roof Gross Area (m²)** | **Roof Slope (deg.)** | **Skylight Qty.** |
| --- | --- | --- | --- |
| H | 6.7 | 0 | 0 |

**4.1. Construction Types for Exposure H**

    Roof Type   **Roof**

**5. Infiltration:**

    Design Cooling   **0.00** L/s

    Design Heating   **0.00** L/s

    Energy Analysis   **0.00** L/s

    Infiltration occurs at all hours.

**6. Floors:**

    Type   **Slab Floor On Grade**

    Floor Area   **6.7** m²

    Total Floor U-Value   **0.568** W/(m²-°K)

    Exposed Perimeter   **3.4** m

    Edge Insulation R-Value   **0.00** (m²-°K)/W

**7. Partitions:**

**(No partition data).**

**15-EXI. HVAC Room**

**1. General Details:**

    Floor Area   **22.1** m²

    Avg. Ceiling Height   **3.0** m

    Building Weight   **634.7** kg/m²

**1.1. OA Ventilation Requirements:**

    Space Usage   **User-Defined**

    OA Requirement 1   **6.2** L/s

    OA Requirement 2   **0.00** L/(s-m²)

    Space Usage Defaults   **ASHRAE Standard 62.1-2010**

**2. Internals:**

**2.1. Overhead Lighting:**

    Fixture Type   **Recessed (Unvented)**

    Wattage   **7.10** W/m²

    Ballast Multiplier   **1.00**

    Schedule   **Lighting**

**2.2. Task Lighting:**

    Wattage   **0.00** W/m²

    Schedule   **None**

**2.3. Electrical Equipment:**

    Wattage   **500.0** Watts

    Schedule   **Electrical Eq.**

**2.4. People:**

    Occupancy   **1.0** Person

    Activity Level   **Heavy Work**

    Sensible   **153.9** W/person

    Latent   **271.1** W/person

    Schedule   **People**

**2.5. Miscellaneous Loads:**

    Sensible   **0** W

    Schedule   **None**

    Latent   **0** W

    Schedule   **None**

**3. Walls, Windows, Doors:**

| **Exp.** | **Wall Gross Area (m²)** | **Window 1 Qty.** | **Window 2 Qty.** | **Door 1 Qty.** |
| --- | --- | --- | --- | --- |
| WSW | 18.5 | 0 | 0 | 2 |

**3.1. Construction Types for Exposure WSW**

    Wall Type   **Wall (Cement plaster)**

    Door Type   **B.P.D.-1**

**4. Roofs, Skylights:**

| **Exp.** | **Roof Gross Area (m²)** | **Roof Slope (deg.)** | **Skylight Qty.** |
| --- | --- | --- | --- |
| H | 22.1 | 0 | 0 |

**4.1. Construction Types for Exposure H**

    Roof Type   **Roof**

**5. Infiltration:**

    Design Cooling   **0.00** L/s

    Design Heating   **0.00** L/s

    Energy Analysis   **0.00** L/s

    Infiltration occurs at all hours.

**6. Floors:**

    Type   **Slab Floor On Grade**

    Floor Area   **22.1** m²

    Total Floor U-Value   **0.568** W/(m²-°K)

    Exposed Perimeter   **6.2** m

    Edge Insulation R-Value   **0.00** (m²-°K)/W

**7. Partitions:**

**(No partition data).**

**16-Pantry & Dining Room**

**1. General Details:**

    Floor Area   **57.3** m²

    Avg. Ceiling Height   **3.0** m

    Building Weight   **634.7** kg/m²

**1.1. OA Ventilation Requirements:**

    Space Usage   **User-Defined**

    OA Requirement 1   **286.5** L/s

    OA Requirement 2   **0.00** L/(s-m²)

    Space Usage Defaults   **ASHRAE Standard 62.1-2010**

**2. Internals:**

**2.1. Overhead Lighting:**

    Fixture Type   **Recessed (Unvented)**

    Wattage   **13.20** W/m²

    Ballast Multiplier   **1.00**

    Schedule   **Lighting**

**2.2. Task Lighting:**

    Wattage   **0.00** W/m²

    Schedule   **None**

**2.3. Electrical Equipment:**

    Wattage   **500.0** Watts

    Schedule   **Electrical Eq.**

**2.4. People:**

    Occupancy   **20.0** People

    Activity Level   **Sedentary Work**

    Sensible   **82.1** W/person

    Latent   **79.1** W/person

    Schedule   **People**

**2.5. Miscellaneous Loads:**

    Sensible   **400** W

    Schedule   **People**

    Latent   **800** W

    Schedule   **People**

**3. Walls, Windows, Doors:**

**(No Wall, Window, Door data).**

**4. Roofs, Skylights:**

| **Exp.** | **Roof Gross Area (m²)** | **Roof Slope (deg.)** | **Skylight Qty.** |
| --- | --- | --- | --- |
| H | 57.3 | 0 | 0 |

**4.1. Construction Types for Exposure H**

    Roof Type   **Roof**

**5. Infiltration:**

    Design Cooling   **0.00** L/s

    Design Heating   **0.00** L/s

    Energy Analysis   **0.00** L/s

    Infiltration occurs at all hours.

**6. Floors:**

    Type   **Slab Floor On Grade**

    Floor Area   **57.3** m²

    Total Floor U-Value   **0.568** W/(m²-°K)

    Exposed Perimeter   **0.0** m

    Edge Insulation R-Value   **0.00** (m²-°K)/W

**7. Partitions:**

**(No partition data).**

**17-E.X. C.R. (Rack R.2)**

**1. General Details:**

    Floor Area   **40.3** m²

    Avg. Ceiling Height   **3.0** m

    Building Weight   **634.7** kg/m²

**1.1. OA Ventilation Requirements:**

    Space Usage   **User-Defined**

    OA Requirement 1   **33.7** L/s

    OA Requirement 2   **0.00** L/(s-m²)

    Space Usage Defaults   **ASHRAE Standard 62.1-2010**

**2. Internals:**

**2.1. Overhead Lighting:**

    Fixture Type   **Recessed (Unvented)**

    Wattage   **20.00** W/m²

    Ballast Multiplier   **1.00**

    Schedule   **Lighting**

**2.2. Task Lighting:**

    Wattage   **0.00** W/m²

    Schedule   **None**

**2.3. Electrical Equipment:**

    Wattage   **1000.0** Watts

    Schedule   **Electrical Eq.**

**2.4. People:**

    Occupancy   **2.0** People

    Activity Level   **Sedentary Work**

    Sensible   **82.1** W/person

    Latent   **79.1** W/person

    Schedule   **People**

**2.5. Miscellaneous Loads:**

    Sensible   **0** W

    Schedule   **None**

    Latent   **0** W

    Schedule   **None**

**3. Walls, Windows, Doors:**

| **Exp.** | **Wall Gross Area (m²)** | **Window 1 Qty.** | **Window 2 Qty.** | **Door 1 Qty.** |
| --- | --- | --- | --- | --- |
| ENE | 8.0 | 0 | 0 | 0 |

**3.1. Construction Types for Exposure ENE**

    Wall Type   **Wall (General)**

**4. Roofs, Skylights:**

| **Exp.** | **Roof Gross Area (m²)** | **Roof Slope (deg.)** | **Skylight Qty.** |
| --- | --- | --- | --- |
| H | 40.3 | 0 | 0 |

**4.1. Construction Types for Exposure H**

    Roof Type   **Roof**

**5. Infiltration:**

    Design Cooling   **0.00** ACH

    Design Heating   **0.00** ACH

    Energy Analysis   **0.00** ACH

    Infiltration occurs at all hours.

**6. Floors:**

    Type   **Slab Floor On Grade**

    Floor Area   **40.3** m²

    Total Floor U-Value   **0.568** W/(m²-°K)

    Exposed Perimeter   **2.7** m

    Edge Insulation R-Value   **0.00** (m²-°K)/W

**7. Partitions:**

**7.1. 1st Partition Details:**

    Partition Type   **Wall Partition**

    Area   **3.3** m²

    U-Value   **1.260** W/(m²-°K)

    Uncondit. Space Max Temp   **35.0** °C

    Ambient at Space Max Temp   **41.0** °C

    Uncondit. Space Min Temp   **12.8** °C

    Ambient at Space Min Temp   **6.0** °C

**7.2. 2nd Partition Details:**

**(No partition data).**

**18-EX. Corridor**

**1. General Details:**

    Floor Area   **63.7** m²

    Avg. Ceiling Height   **2.5** m

    Building Weight   **634.7** kg/m²

**1.1. OA Ventilation Requirements:**

    Space Usage   **User-Defined**

    OA Requirement 1   **10.0** L/s/person

    OA Requirement 2   **0.00** L/(s-m²)

    Space Usage Defaults   **ASHRAE Standard 62.1-2010**

**2. Internals:**

**2.1. Overhead Lighting:**

    Fixture Type   **Recessed (Unvented)**

    Wattage   **7.10** W/m²

    Ballast Multiplier   **1.00**

    Schedule   **Lighting**

**2.2. Task Lighting:**

    Wattage   **0.00** W/m²

    Schedule   **None**

**2.3. Electrical Equipment:**

    Wattage   **0.0** Watts

    Schedule   **None**

**2.4. People:**

    Occupancy   **5.0** People

    Activity Level   **Office Work**

    Sensible   **71.8** W/person

    Latent   **60.1** W/person

    Schedule   **People**

**2.5. Miscellaneous Loads:**

    Sensible   **0** W

    Schedule   **None**

    Latent   **0** W

    Schedule   **None**

**3. Walls, Windows, Doors:**

**(No Wall, Window, Door data).**

**4. Roofs, Skylights:**

| **Exp.** | **Roof Gross Area (m²)** | **Roof Slope (deg.)** | **Skylight Qty.** |
| --- | --- | --- | --- |
| H | 63.7 | 0 | 0 |

**4.1. Construction Types for Exposure H**

    Roof Type   **Roof**

**5. Infiltration:**

    Design Cooling   **0.00** L/s

    Design Heating   **0.00** L/s

    Energy Analysis   **0.00** L/s

    Infiltration occurs at all hours.

**6. Floors:**

    Type   **Slab Floor On Grade**

    Floor Area   **63.7** m²

    Total Floor U-Value   **0.568** W/(m²-°K)

    Exposed Perimeter   **0.0** m

    Edge Insulation R-Value   **0.00** (m²-°K)/W

**7. Partitions:**

**7.1. 1st Partition Details:**

    Partition Type   **Wall Partition**

    Area   **6.0** m²

    U-Value   **1.260** W/(m²-°K)

    Uncondit. Space Max Temp   **35.0** °C

    Ambient at Space Max Temp   **41.0** °C

    Uncondit. Space Min Temp   **12.8** °C

    Ambient at Space Min Temp   **6.0** °C

**7.2. 2nd Partition Details:**

**(No partition data).**

## SYSTEM INPUT DATA

**1. General Details:**

    Air System Name   **Package Unit**

    Equipment Type   **Packaged Rooftop Units**

    Air System Type   **2-Deck Multi zone**

    Number of zones   **3**

**2. Ventilation System Components:**

**Ventilation Air Data:**

    Airflow Control   **Constant Ventilation Airflow**

    Ventilation Sizing Method   **Sum of Space OA Airflows**

    Unocc. Damper Position   **Closed**

    Damper Leak Rate   **0** %

    Outdoor Air CO2 Level   **400** ppm

**Central Cooling Data:**

    Supply Air Temperature   **14.4** °C

    Coil Bypass Factor   **0.100**

    Cooling Source   **Air-Cooled DX**

    Schedule   **JFMAMJJASOND**

    Capacity Control   **Constant Temperature - Fan On**

**Central Heating Data:**

    Supply Temperature   **35.0** °C

    Heating Source   **Electric Resistance**

    Schedule   **JFMAMJJASOND**

    Capacity Control   **Constant Temperature - Fan On**

**Supply Fan Data:**

    Fan Type   **Forward Curved**

    Configuration   **Blow-thru**

    Fan Performance   **0** Pa

    Overall Efficiency   **54** %

**Duct System Data:**

**Supply Duct Data:**

    Duct Heat Gain   **0** %

    Duct Leakage   **0** %

**Return Duct or Plenum Data:**

    Return Air Via   **Ducted Return**

**3. Zone Components:**

**Space Assignments:**

|  |  |
| --- | --- |
| **Zone 1: Zone 1** |  |
| 00-Conference Room | x1 |
| 01-Management Room | x1 |
| 02-Entrance | x1 |
| 03-Archive | x1 |
| 04-Locker | x1 |
| 05-Prayer Room | x1 |
| 06-Corridor | x1 |
| 08-UPS | x1 |
| 09-E.X. C.R. (Rack R.1) | x1 |
| 10-EXI. Control Room | x1 |
| 11-EXI. UPS | x1 |
| 13-EXI. Lavatory & Shower | x1 |
| 14-EXI. Locker Room | x1 |
| 16-Pantry & Dining Room | x1 |
| 17-E.X. C.R. (Rack R.2) | x1 |
| 18-EX. Corridor | x1 |
| **Zone 2: Zone 2** |  |
| 07-Battery Room | x1 |
| 12-EXI. Battery Room | x1 |
| **Zone 3: Zone 3** |  |
| 15-EXI. HVAC Room | x1 |

**Thermostats and Zone Data:**

| **Zone** | **Cooling T-Stat Occ.** | **Cooling T-Stat Unocc.** | **Heating T-Stat Occ.** | **Heating T-Stat Unocc.** | **T-Stat Throttling Range** | **Diversity Factor** | **Direct Exhaust Airflow** | **Direct Exhaust Fan** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **(°C)** | **(°C)** | **(°C)** | **(°C)** | **(°C)** | **(%)** | **(L/s)** | **(kW)** |
| **1** | 24.0 | 28.0 | 22.0 | 18.0 | 0.83 | 100 | 0.0 | 0.0 |
| **2** | 27.0 | 32.0 | 21.0 | 14.0 | 0.83 | 100 | 0.0 | 0.0 |
| **3** | 30.0 | 34.0 | 10.0 | 6.0 | 0.83 | 100 | 0.0 | 0.0 |

   Thermostat Schedule   **Fan**

    Unoccupied Cooling is   **Available**

**Supply Terminals Data:**

    Zone   **All**

    Terminal Type   **Diffuser**

    Minimum Airflow   **0.00** L/s/person

**Zone Heating Units:**

    Zone   **All**

    Zone Heating Unit Type   **None**

    Zone Unit Heat Source   **Electric Resistance**

    Zone Heating Unit Schedule   **JFMAMJJASOND**

**4. Sizing Data (Computer-Generated):**

**System Sizing Data:**

**Sizing Data:**

**Safety Factors:**

    Cooling Sensible   **10** %

    Cooling Latent   **10** %

    Heating   **10** %

**Zone Sizing Data:**

    Zone Airflow Sizing Method   **Sum of space airflow rates**

    Space Airflow Sizing Method   **Individual peak space loads**

## AIR SYSTEM SIZING SUMMARAIR

**Air System Information**

Air System Name   **Package Unit**

Equipment Class   **PKG ROOF**

Air System Type   **2DMZ**

Number of zones   **3**

Floor Area   **609.1** m²

Location   **Binak, IRAN**

**Sizing Calculation Information**

Calculation Months   **Jan to Dec**

Sizing Data   **Calculated**

Zone L/s Sizing   **Sum of space airflow rates**

Space L/s Sizing   **Individual peak space loads**

**Central Cooling Coil Sizing Data**

Total coil load   **159.7** kW

Sensible coil load   **81.6** kW

Coil L/s at Jul 1500   **3840** L/s

Max block L/s   **4488** L/s

Sum of peak zone L/s   **4488** L/s

Sensible heat ratio   **0.511**

m²/kW   **3.8**

W/m²   **262.3**

Water flow @ 5.6 °K rise   **N/A**

Load occurs at   **Jul 1500**

OA DB / WB   **41.0 / 30.5** °C

Entering DB / WB   **32.0 / 24.7** °C

Leaving DB / WB   **14.4 / 14.0** °C

Coil ADP   **12.4** °C

Bypass Factor   **0.100**

Resulting RH   **57** %

Design supply temp.   **14.4** °C

Zone T-stat Check   **3 of 3** OK

Max zone temperature deviation   **0.0** °K

**Central Heating Coil Sizing Data**

    Max coil load   **52.6** kW

Coil L/s at Des Htg   **2231** L/s

Max coil L/s   **2231** L/s

Water flow @ 11.1 °K drop   **N/A**

Load occurs at   **Des Htg**

W/m²   **86.0**

Ent. DB / Lvg DB   **14.7 / 35.0** °C

**Supply Fan Sizing Data**

Actual max L/s   **4488** L/s

Standard L/s   **4482** L/s

Actual max L/(s-m²)   **7.37** L/(s-m²)

Fan motor BHP   **0.00** BHP

Fan motor kW   **0.00** kW

Fan static   **0** Pa

**Outdoor Ventilation Air Data**

Design airflow L/s   **1938** L/s

L/(s-m²)   **3.18** L/(s-m²)

L/s/person   **19.00** L/s/person

## ventilation sizing summary

**Air System Information**

Air System Name   **Package Unit**

Equipment Class   **PKG ROOF**

Air System Type   **2DMZ**

Number of zones   **3**

Floor Area   **609.1** m²

Location   **Binak, IRAN**

**Sizing Calculation Information**

Calculation Months   **Jan to Dec**

Sizing Data   **Calculated**

Zone L/s Sizing   **Sum of space airflow rates**

Space L/s Sizing   **Individual peak space loads**

**Zone Sizing Data**

|  | **Maximum** |  |  |  | **Maximum** | **Zone** |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Cooling** | **Design** | **Minimum** |  | **Heating** | **Floor** |  |
|  | **Sensible** | **Airflow** | **Airflow** | **Time of** | **Load** | **Area** | **Zone** |
| **Zone Name** | **(kW)** | **(L/s)** | **(L/s)** | **Peak Load** | **(kW)** | **(m²)** | **L/(s-m²)** |
| Zone 1 | 39.6 | 3746 | 3746 | Jul 0800 | 14.1 | 529.5 | 7.07 |
| Zone 2 | 4.7 | 609 | 609 | Jul 0800 | 3.4 | 57.5 | 10.59 |
| Zone 3 | 2.5 | 133 | 133 | Aug 1700 | 0.2 | 22.1 | 6.00 |

**Zone Terminal Sizing Data**

No Zone Terminal Sizing Data required for this system.

**Space Loads and Airflows**

|  |  | **Cooling** | **Time** | **Air** | **Heating** | **Floor** |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Zone Name /** |  | **Sensible** | **of** | **Flow** | **Load** | **Area** | **Space** |
| **Space Name** | **Mult.** | **(kW)** | **Load** | **(L/s)** | **(kW)** | **(m²)** | **L/(s-m²)** |
| ***Zone 1*** |  |  |  |  |  |  |  |
| 00-Conference Room | 1 | 3.5 | Aug 0800 | 303 | 1.7 | 38.4 | 7.89 |
| 01-Management Room | 1 | 1.3 | Aug 0800 | 115 | 0.8 | 20.6 | 5.58 |
| 02-Entrance | 1 | 0.7 | Jul 0800 | 56 | 0.3 | 15.8 | 3.55 |
| 03-Archive | 1 | 0.8 | Aug 0800 | 72 | 0.5 | 12.5 | 5.75 |
| 04-Locker | 1 | 1.1 | Aug 0800 | 98 | 0.6 | 16.7 | 5.88 |
| 05-Prayer Room | 1 | 2.0 | Aug 0800 | 175 | 0.7 | 16.7 | 10.48 |
| 06-Corridor | 1 | 0.4 | Jul 0800 | 34 | 0.2 | 15.2 | 2.24 |
| 08-UPS | 1 | 8.6 | Jul 1700 | 739 | 1.7 | 33.5 | 22.06 |
| 09-E.X. C.R. (Rack R.1) | 1 | 2.8 | Jul 0800 | 243 | 1.1 | 43.0 | 5.64 |
| 10-EXI. Control Room | 1 | 9.5 | Jul 0800 | 822 | 2.8 | 114.6 | 7.17 |
| 11-EXI. UPS | 1 | 1.4 | Jul 0800 | 120 | 0.1 | 13.2 | 9.13 |
| 13-EXI. Lavatory & Shower | 1 | 1.5 | Jul 0800 | 266 | 1.3 | 21.3 | 12.50 |
| 14-EXI. Locker Room | 1 | 0.5 | Jul 0800 | 45 | 0.4 | 6.7 | 6.66 |
| 16-Pantry & Dining Room | 1 | 3.8 | Jul 0800 | 331 | 0.5 | 57.3 | 5.78 |
| 17-E.X. C.R. (Rack R.2) | 1 | 2.4 | Jul 0800 | 211 | 0.7 | 40.3 | 5.23 |
| 18-EX. Corridor | 1 | 1.3 | Jul 0800 | 116 | 0.6 | 63.7 | 1.82 |
| ***Zone 2*** |  |  |  |  |  |  |  |
| 07-Battery Room | 1 | 3.8 | Jul 0800 | 520 | 3.0 | 46.8 | 11.11 |
| 12-EXI. Battery Room | 1 | 0.9 | Jul 0800 | 89 | 0.4 | 10.7 | 8.34 |
| ***Zone 3*** |  |  |  |  |  |  |  |
| 15-EXI. HVAC Room | 1 | 2.5 | Aug 1700 | 133 | 0.2 | 22.1 | 6.00 |

## VENTILATION SIZING SUMMARY:

**1. Summary**

    Ventilation Sizing Method   **Sum of Space OA Airflows**

    Design Ventilation Airflow Rate   **1938** L/s

**2. Space Ventilation Analysis Table**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **Floor** |  | **Maximum** | **Required** | **Required** | **Required** | **Required** | **Uncorrected** |
|  |  | **Area** | **Maximum** | **Supply Air** | **Outdoor Air** | **Outdoor Air** | **Outdoor Air** | **Outdoor Air** | **Outdoor Air** |
| **Zone Name / Space Name** | **Mult.** | **(m²)** | **Occupants** | **(L/s)** | **(L/s/person)** | **(L/(s-m²))** | **(L/s)** | **(% of supply)** | **(L/s)** |
| **Zone 1** |  |  |  |  |  |  |  |  |  |
| 00-Conference Room | 1 | 38.4 | 20.0 | 302.9 | 10.00 | 0.00 | 0.0 | 0.0 | 200.0 |
| 01-Management Room | 1 | 20.6 | 5.0 | 115.0 | 10.00 | 0.00 | 0.0 | 0.0 | 50.0 |
| 02-Entrance | 1 | 15.8 | 2.0 | 56.2 | 10.00 | 0.00 | 0.0 | 0.0 | 20.0 |
| 03-Archive | 1 | 12.5 | 3.0 | 71.9 | 10.00 | 0.00 | 0.0 | 0.0 | 30.0 |
| 04-Locker | 1 | 16.7 | 5.0 | 98.2 | 0.00 | 0.00 | 83.5 | 0.0 | 83.5 |
| 05-Prayer Room | 1 | 16.7 | 15.0 | 174.9 | 0.00 | 0.00 | 83.5 | 0.0 | 83.5 |
| 06-Corridor | 1 | 15.2 | 2.0 | 34.0 | 10.00 | 0.00 | 0.0 | 0.0 | 20.0 |
| 08-UPS | 1 | 33.5 | 0.0 | 739.1 | 0.00 | 0.00 | 37.2 | 0.0 | 37.2 |
| 09-E.X. C.R. (Rack R.1) | 1 | 43.0 | 2.0 | 242.5 | 0.00 | 0.00 | 35.8 | 0.0 | 35.8 |
| 10-EXI. Control Room | 1 | 114.6 | 15.0 | 822.2 | 0.00 | 0.00 | 0.0 | 10.0 | 82.2 |
| 11-EXI. UPS | 1 | 13.2 | 0.0 | 120.5 | 0.00 | 0.00 | 11.0 | 0.0 | 11.0 |
| 13-EXI. Lavatory & Shower | 1 | 21.3 | 4.0 | 266.3 | 0.00 | 0.00 | 266.3 | 0.0 | 266.3 |
| 14-EXI. Locker Room | 1 | 6.7 | 1.0 | 44.6 | 0.00 | 0.00 | 33.5 | 0.0 | 33.5 |
| 16-Pantry & Dining Room | 1 | 57.3 | 20.0 | 331.3 | 0.00 | 0.00 | 286.5 | 0.0 | 286.5 |
| 17-E.X. C.R. (Rack R.2) | 1 | 40.3 | 2.0 | 210.6 | 0.00 | 0.00 | 33.7 | 0.0 | 33.7 |
| 18-EX. Corridor | 1 | 63.7 | 5.0 | 115.8 | 10.00 | 0.00 | 0.0 | 0.0 | 50.0 |
| **Zone 2** |  |  |  |  |  |  |  |  |  |
| 07-Battery Room | 1 | 46.8 | 0.0 | 519.8 | 0.00 | 0.00 | 519.8 | 0.0 | 519.8 |
| 12-EXI. Battery Room | 1 | 10.7 | 0.0 | 89.2 | 0.00 | 0.00 | 89.2 | 0.0 | 89.2 |
| **Zone 3** |  |  |  |  |  |  |  |  |  |
| 15-EXI. HVAC Room | 1 | 22.1 | 1.0 | 132.6 | 0.00 | 0.00 | 6.2 | 0.0 | 6.2 |
| **Totals (incl. Space Multipliers)** |  |  |  | **4487.5** |  |  |  |  | **1938.4** |

## air system design load summary:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **DESIGN COOLING** | | | **DESIGN HEATING** | | |
|  | **COOLING DATA AT Jul 1500** | | | **HEATING DATA AT DES HTG** | | |
|  | **COOLING OA DB / WB 41.0 °C / 30.5 °C** | | | **HEATING OA DB / WB 6.0 °C / 4.4 °C** | | |
|  |  | **Sensible** | **Latent** |  | **Sensible** | **Latent** |
| **ZONE LOADS** | **Details** | **(W)** | **(W)** | **Details** | **(W)** | **(W)** |
| Window & Skylight Solar Loads | 0 m² | 0 | - | 0 m² | - | - |
| Wall Transmission | 331 m² | 10460 | - | 331 m² | 9337 | - |
| Roof Transmission | 609 m² | 4864 | - | 609 m² | 4563 | - |
| Window Transmission | 0 m² | 0 | - | 0 m² | 0 | - |
| Skylight Transmission | 0 m² | 0 | - | 0 m² | 0 | - |
| Door Loads | 13 m² | 415 | - | 13 m² | 421 | - |
| Floor Transmission | 609 m² | 0 | - | 609 m² | 1251 | - |
| Partitions | 46 m² | 532 | - | 46 m² | 530 | - |
| Ceiling | 0 m² | 0 | - | 0 m² | 0 | - |
| Overhead Lighting | 0 W | 204 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 14100 W | 14098 | - | 0 | 0 | - |
| People | 102 | 8089 | 7882 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 400 | 800 | - | 0 | 0 |
| Safety Factor | 10% / 10% | 3906 | 868 | 10% | 1610 | 0 |
| **>> Total Zone Loads** | **-** | **42969** | **9550** | **-** | **17712** | **0** |
| Zone Conditioning | - | 42262 | 9550 | - | 17510 | 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 | 4488 L/s | 0 | - | 4488 L/s | 0 | - |
| Ventilation Load | 1938 L/s | 36966 | 68629 | 1938 L/s | 35804 | 0 |
| Supply Fan Load | 4488 L/s | 0 | - | 4488 L/s | 0 | - |
| Space Fan Coil Fans | - | 0 | - | - | 0 | - |
| Duct Heat Gain / Loss | 0% | 0 | - | 0% | 0 | - |
| **>> Total System Loads** | **-** | **79229** | **78178** | **-** | **53314** | **0** |
| Central Cooling Coil | - | 81559 | 78188 | - | -821 | 0 |
| Central Heating Coil | - | -2331 | - | - | 54601 | - |
| **>> Total Conditioning** | **-** | **79229** | **78188** | **-** | **53780** | **0** |
| **Key:** | **Positive values are clg loads** | | | **Positive values are htg loads** | | |
|  | **Negative values are htg loads** | | | **Negative values are clg loads** | | |

## ZONE DESIGN LOAD SUMMARY:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Zone 1** | **DESIGN COOLING** | | | **DESIGN HEATING** | | |
|  | **COOLING DATA AT Jul 0800** | | | **HEATING DATA AT DES HTG** | | |
|  | **COOLING OA DB / WB 28.4 °C / 27.8 °C** | | | **HEATING OA DB / WB 6.0 °C / 4.4 °C** | | |
|  | **OCCUPIED T-STAT 24.0 °C** | | | **OCCUPIED T-STAT 22.0 °C** | | |
|  |  | **Sensible** | **Latent** |  | **Sensible** | **Latent** |
| **ZONE LOADS** | **Details** | **(W)** | **(W)** | **Details** | **(W)** | **(W)** |
| Window & Skylight Solar Loads | 0 m² | 0 | - | 0 m² | - | - |
| Wall Transmission | 237 m² | 6140 | - | 237 m² | 6979 | - |
| Roof Transmission | 530 m² | 4802 | - | 530 m² | 4102 | - |
| Window Transmission | 0 m² | 0 | - | 0 m² | 0 | - |
| Skylight Transmission | 0 m² | 0 | - | 0 m² | 0 | - |
| Door Loads | 3 m² | 42 | - | 3 m² | 125 | - |
| Floor Transmission | 530 m² | 0 | - | 530 m² | 1039 | - |
| Partitions | 46 m² | 211 | - | 46 m² | 530 | - |
| Ceiling | 0 m² | 0 | - | 0 m² | 0 | - |
| Overhead Lighting | 7834 W | 4400 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 12100 W | 12098 | - | 0 | 0 | - |
| People | 101 | 7935 | 7611 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 400 | 800 | - | 0 | 0 |
| Safety Factor | 10% / 10% | 3603 | 841 | 10% | 1277 | 0 |
| **>> Total Zone Loads** | **-** | **39631** | **9252** | **-** | **14052** | **0** |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Zone 2** | **DESIGN COOLING** | | | **DESIGN HEATING** | | |
|  | **COOLING DATA AT Jul 0800** | | | **HEATING DATA AT DES HTG** | | |
|  | **COOLING OA DB / WB 28.4 °C / 27.8 °C** | | | **HEATING OA DB / WB 6.0 °C / 4.4 °C** | | |
|  | **OCCUPIED T-STAT 27.0 °C** | | | **OCCUPIED T-STAT 21.0 °C** | | |
|  |  | **Sensible** | **Latent** |  | **Sensible** | **Latent** |
| **ZONE LOADS** | **Details** | **(W)** | **(W)** | **Details** | **(W)** | **(W)** |
| Window & Skylight Solar Loads | 0 m² | 0 | - | 0 m² | - | - |
| Wall Transmission | 80 m² | 1637 | - | 80 m² | 2256 | - |
| Roof Transmission | 58 m² | 438 | - | 58 m² | 418 | - |
| Window Transmission | 0 m² | 0 | - | 0 m² | 0 | - |
| Skylight Transmission | 0 m² | 0 | - | 0 m² | 0 | - |
| Door Loads | 5 m² | 38 | - | 5 m² | 234 | - |
| Floor Transmission | 58 m² | 0 | - | 58 m² | 195 | - |
| Partitions | 0 m² | 0 | - | 0 m² | 0 | - |
| Ceiling | 0 m² | 0 | - | 0 m² | 0 | - |
| Overhead Lighting | 1150 W | 646 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 1500 W | 1500 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 10% / 10% | 426 | 0 | 10% | 310 | 0 |
| **>> Total Zone Loads** | **-** | **4685** | **0** | **-** | **3412** | **0** |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Zone 3** | **DESIGN COOLING** | | | **DESIGN HEATING** | | |
|  | **COOLING DATA AT Aug 1700** | | | **HEATING DATA AT DES HTG** | | |
|  | **COOLING OA DB / WB 39.5 °C / 30.2 °C** | | | **HEATING OA DB / WB 6.0 °C / 4.4 °C** | | |
|  | **OCCUPIED T-STAT 30.0 °C** | | | **OCCUPIED T-STAT 10.0 °C** | | |
|  |  | **Sensible** | **Latent** |  | **Sensible** | **Latent** |
| **ZONE LOADS** | **Details** | **(W)** | **(W)** | **Details** | **(W)** | **(W)** |
| Window & Skylight Solar Loads | 0 m² | 0 | - | 0 m² | - | - |
| Wall Transmission | 13 m² | 1385 | - | 13 m² | 103 | - |
| Roof Transmission | 22 m² | 109 | - | 22 m² | 43 | - |
| Window Transmission | 0 m² | 0 | - | 0 m² | 0 | - |
| Skylight Transmission | 0 m² | 0 | - | 0 m² | 0 | - |
| Door Loads | 5 m² | 116 | - | 5 m² | 62 | - |
| Floor Transmission | 22 m² | 0 | - | 22 m² | 17 | - |
| Partitions | 0 m² | 0 | - | 0 m² | 0 | - |
| Ceiling | 0 m² | 0 | - | 0 m² | 0 | - |
| Overhead Lighting | 0 W | 3 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 500 W | 500 | - | 0 | 0 | - |
| People | 1 | 154 | 271 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 10% / 10% | 227 | 27 | 10% | 23 | 0 |
| **>> Total Zone Loads** | **-** | **2494** | **298** | **-** | **248** | **0** |

## SPACE DESIGN LOAD SUMMARY:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **TABLE 1.1.A. COMPONENT LOADS FOR SPACE '' 00-Conference Room '' IN ZONE '' Zone 1 ''** | | | | | | |
|  | **DESIGN COOLING** | | | **DESIGN HEATING** | | |
|  | **COOLING DATA AT Aug 0800** | | | **HEATING DATA AT DES HTG** | | |
|  | **COOLING OA DB / WB 28.4 °C / 27.8 °C** | | | **HEATING OA DB / WB 6.0 °C / 4.4 °C** | | |
|  | **OCCUPIED T-STAT 24.0 °C** | | | **OCCUPIED T-STAT 22.0 °C** | | |
|  |  | **Sensible** | **Latent** |  | **Sensible** | **Latent** |
| **SPACE LOADS** | **Details** | **(W)** | **(W)** | **Details** | **(W)** | **(W)** |
| Window & Skylight Solar Loads | 0 m² | 0 | - | 0 m² | - | - |
| Wall Transmission | 40 m² | 1036 | - | 40 m² | 1149 | - |
| Roof Transmission | 38 m² | 331 | - | 38 m² | 298 | - |
| Window Transmission | 0 m² | 0 | - | 0 m² | 0 | - |
| Skylight Transmission | 0 m² | 0 | - | 0 m² | 0 | - |
| Door Loads | 0 m² | 0 | - | 0 m² | 0 | - |
| Floor Transmission | 38 m² | 0 | - | 38 m² | 133 | - |
| Partitions | 0 m² | 0 | - | 0 m² | 0 | - |
| Ceiling | 0 m² | 0 | - | 0 m² | 0 | - |
| Overhead Lighting | 507 W | 285 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 100 W | 100 | - | 0 | 0 | - |
| People | 20 | 1436 | 1202 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 10% / 10% | 319 | 120 | 10% | 158 | 0 |
| **>> Total Zone Loads** | **-** | **3506** | **1322** | **-** | **1737** | **0** |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **TABLE 1.1.B. ENVELOPE LOADS FOR SPACE '' 00-Conference Room '' IN ZONE '' Zone 1 ''** | | | | | | |
|  |  |  |  | **COOLING** | **COOLING** | **HEATING** |
|  | **Area** | **U-Value** | **Shade** | **TRANS** | **SOLAR** | **TRANS** |
|  | **(m²)** | **(W/(m²-°K))** | **Coeff.** | **(W)** | **(W)** | **(W)** |
| **WSW EXPOSURE** |  |  |  |  |  |  |
| WALL | 13 | 1.813 | - | 364 | - | 380 |
| **SSE EXPOSURE** |  |  |  |  |  |  |
| WALL | 27 | 1.813 | - | 672 | - | 769 |
| **H EXPOSURE** |  |  |  |  |  |  |
| ROOF | 38 | 0.484 | - | 331 | - | 298 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **TABLE 1.2.A. COMPONENT LOADS FOR SPACE '' 01-Management Room '' IN ZONE '' Zone 1 ''** | | | | | | |
|  | **DESIGN COOLING** | | | **DESIGN HEATING** | | |
|  | **COOLING DATA AT Aug 0800** | | | **HEATING DATA AT DES HTG** | | |
|  | **COOLING OA DB / WB 28.4 °C / 27.8 °C** | | | **HEATING OA DB / WB 6.0 °C / 4.4 °C** | | |
|  | **OCCUPIED T-STAT 24.0 °C** | | | **OCCUPIED T-STAT 22.0 °C** | | |
|  |  | **Sensible** | **Latent** |  | **Sensible** | **Latent** |
| **SPACE LOADS** | **Details** | **(W)** | **(W)** | **Details** | **(W)** | **(W)** |
| Window & Skylight Solar Loads | 0 m² | 0 | - | 0 m² | - | - |
| Wall Transmission | 14 m² | 360 | - | 14 m² | 412 | - |
| Roof Transmission | 21 m² | 178 | - | 21 m² | 160 | - |
| Window Transmission | 0 m² | 0 | - | 0 m² | 0 | - |
| Skylight Transmission | 0 m² | 0 | - | 0 m² | 0 | - |
| Door Loads | 0 m² | 0 | - | 0 m² | 0 | - |
| Floor Transmission | 21 m² | 0 | - | 21 m² | 58 | - |
| Partitions | 6 m² | 26 | - | 6 m² | 66 | - |
| Ceiling | 0 m² | 0 | - | 0 m² | 0 | - |
| Overhead Lighting | 245 W | 138 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 150 W | 150 | - | 0 | 0 | - |
| People | 5 | 359 | 300 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 10% / 10% | 121 | 30 | 10% | 70 | 0 |
| **>> Total Zone Loads** | **-** | **1332** | **330** | **-** | **765** | **0** |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **TABLE 1.2.B. ENVELOPE LOADS FOR SPACE '' 01-Management Room '' IN ZONE '' Zone 1 ''** | | | | | | |
|  |  |  |  | **COOLING** | **COOLING** | **HEATING** |
|  | **Area** | **U-Value** | **Shade** | **TRANS** | **SOLAR** | **TRANS** |
|  | **(m²)** | **(W/(m²-°K))** | **Coeff.** | **(W)** | **(W)** | **(W)** |
| **SSE EXPOSURE** |  |  |  |  |  |  |
| WALL | 14 | 1.813 | - | 360 | - | 412 |
| **H EXPOSURE** |  |  |  |  |  |  |
| ROOF | 21 | 0.484 | - | 178 | - | 160 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **TABLE 1.3.A. COMPONENT LOADS FOR SPACE '' 02-Entrance '' IN ZONE '' Zone 1 ''** | | | | | | |
|  | **DESIGN COOLING** | | | **DESIGN HEATING** | | |
|  | **COOLING DATA AT Jul 0800** | | | **HEATING DATA AT DES HTG** | | |
|  | **COOLING OA DB / WB 28.4 °C / 27.8 °C** | | | **HEATING OA DB / WB 6.0 °C / 4.4 °C** | | |
|  | **OCCUPIED T-STAT 24.0 °C** | | | **OCCUPIED T-STAT 22.0 °C** | | |
|  |  | **Sensible** | **Latent** |  | **Sensible** | **Latent** |
| **SPACE LOADS** | **Details** | **(W)** | **(W)** | **Details** | **(W)** | **(W)** |
| Window & Skylight Solar Loads | 0 m² | 0 | - | 0 m² | - | - |
| Wall Transmission | 0 m² | 0 | - | 0 m² | 0 | - |
| Roof Transmission | 16 m² | 143 | - | 16 m² | 122 | - |
| Window Transmission | 0 m² | 0 | - | 0 m² | 0 | - |
| Skylight Transmission | 0 m² | 0 | - | 0 m² | 0 | - |
| Door Loads | 0 m² | 0 | - | 0 m² | 0 | - |
| Floor Transmission | 16 m² | 0 | - | 16 m² | 51 | - |
| Partitions | 9 m² | 41 | - | 9 m² | 103 | - |
| Ceiling | 0 m² | 0 | - | 0 m² | 0 | - |
| Overhead Lighting | 112 W | 63 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 200 W | 200 | - | 0 | 0 | - |
| People | 2 | 144 | 120 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 10% / 10% | 59 | 12 | 10% | 28 | 0 |
| **>> Total Zone Loads** | **-** | **650** | **132** | **-** | **304** | **0** |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **TABLE 1.3.B. ENVELOPE LOADS FOR SPACE '' 02-Entrance '' IN ZONE '' Zone 1 ''** | | | | | | |
|  |  |  |  | **COOLING** | **COOLING** | **HEATING** |
|  | **Area** | **U-Value** | **Shade** | **TRANS** | **SOLAR** | **TRANS** |
|  | **(m²)** | **(W/(m²-°K))** | **Coeff.** | **(W)** | **(W)** | **(W)** |
| **H EXPOSURE** |  |  |  |  |  |  |
| ROOF | 16 | 0.484 | - | 143 | - | 122 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **TABLE 1.4.A. COMPONENT LOADS FOR SPACE '' 03-Archive '' IN ZONE '' Zone 1 ''** | | | | | | |
|  | **DESIGN COOLING** | | | **DESIGN HEATING** | | |
|  | **COOLING DATA AT Aug 0800** | | | **HEATING DATA AT DES HTG** | | |
|  | **COOLING OA DB / WB 28.4 °C / 27.8 °C** | | | **HEATING OA DB / WB 6.0 °C / 4.4 °C** | | |
|  | **OCCUPIED T-STAT 24.0 °C** | | | **OCCUPIED T-STAT 22.0 °C** | | |
|  |  | **Sensible** | **Latent** |  | **Sensible** | **Latent** |
| **SPACE LOADS** | **Details** | **(W)** | **(W)** | **Details** | **(W)** | **(W)** |
| Window & Skylight Solar Loads | 0 m² | 0 | - | 0 m² | - | - |
| Wall Transmission | 9 m² | 223 | - | 9 m² | 255 | - |
| Roof Transmission | 13 m² | 108 | - | 13 m² | 97 | - |
| Window Transmission | 0 m² | 0 | - | 0 m² | 0 | - |
| Skylight Transmission | 0 m² | 0 | - | 0 m² | 0 | - |
| Door Loads | 0 m² | 0 | - | 0 m² | 0 | - |
| Floor Transmission | 13 m² | 0 | - | 13 m² | 36 | - |
| Partitions | 6 m² | 26 | - | 6 m² | 66 | - |
| Ceiling | 0 m² | 0 | - | 0 m² | 0 | - |
| Overhead Lighting | 149 W | 84 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 100 W | 100 | - | 0 | 0 | - |
| People | 3 | 215 | 180 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 10% / 10% | 76 | 18 | 10% | 45 | 0 |
| **>> Total Zone Loads** | **-** | **832** | **198** | **-** | **499** | **0** |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **TABLE 1.4.B. ENVELOPE LOADS FOR SPACE '' 03-Archive '' IN ZONE '' Zone 1 ''** | | | | | | |
|  |  |  |  | **COOLING** | **COOLING** | **HEATING** |
|  | **Area** | **U-Value** | **Shade** | **TRANS** | **SOLAR** | **TRANS** |
|  | **(m²)** | **(W/(m²-°K))** | **Coeff.** | **(W)** | **(W)** | **(W)** |
| **SSE EXPOSURE** |  |  |  |  |  |  |
| WALL | 9 | 1.813 | - | 223 | - | 255 |
| **H EXPOSURE** |  |  |  |  |  |  |
| ROOF | 13 | 0.484 | - | 108 | - | 97 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **TABLE 1.5.A. COMPONENT LOADS FOR SPACE '' 04-Locker '' IN ZONE '' Zone 1 ''** | | | | | | |
|  | **DESIGN COOLING** | | | **DESIGN HEATING** | | |
|  | **COOLING DATA AT Aug 0800** | | | **HEATING DATA AT DES HTG** | | |
|  | **COOLING OA DB / WB 28.4 °C / 27.8 °C** | | | **HEATING OA DB / WB 6.0 °C / 4.4 °C** | | |
|  | **OCCUPIED T-STAT 24.0 °C** | | | **OCCUPIED T-STAT 22.0 °C** | | |
|  |  | **Sensible** | **Latent** |  | **Sensible** | **Latent** |
| **SPACE LOADS** | **Details** | **(W)** | **(W)** | **Details** | **(W)** | **(W)** |
| Window & Skylight Solar Loads | 0 m² | 0 | - | 0 m² | - | - |
| Wall Transmission | 12 m² | 299 | - | 12 m² | 342 | - |
| Roof Transmission | 17 m² | 144 | - | 17 m² | 129 | - |
| Window Transmission | 0 m² | 0 | - | 0 m² | 0 | - |
| Skylight Transmission | 0 m² | 0 | - | 0 m² | 0 | - |
| Door Loads | 0 m² | 0 | - | 0 m² | 0 | - |
| Floor Transmission | 17 m² | 0 | - | 17 m² | 48 | - |
| Partitions | 0 m² | 0 | - | 0 m² | 0 | - |
| Ceiling | 0 m² | 0 | - | 0 m² | 0 | - |
| Overhead Lighting | 192 W | 108 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 50 W | 50 | - | 0 | 0 | - |
| People | 5 | 432 | 667 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 10% / 10% | 103 | 67 | 10% | 52 | 0 |
| **>> Total Zone Loads** | **-** | **1137** | **733** | **-** | **571** | **0** |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **TABLE 1.5.B. ENVELOPE LOADS FOR SPACE '' 04-Locker '' IN ZONE '' Zone 1 ''** | | | | | | |
|  |  |  |  | **COOLING** | **COOLING** | **HEATING** |
|  | **Area** | **U-Value** | **Shade** | **TRANS** | **SOLAR** | **TRANS** |
|  | **(m²)** | **(W/(m²-°K))** | **Coeff.** | **(W)** | **(W)** | **(W)** |
| **SSE EXPOSURE** |  |  |  |  |  |  |
| WALL | 12 | 1.813 | - | 299 | - | 342 |
| **H EXPOSURE** |  |  |  |  |  |  |
| ROOF | 17 | 0.484 | - | 144 | - | 129 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **TABLE 1.6.A. COMPONENT LOADS FOR SPACE '' 05-Prayer Room '' IN ZONE '' Zone 1 ''** | | | | | | |
|  | **DESIGN COOLING** | | | **DESIGN HEATING** | | |
|  | **COOLING DATA AT Aug 0800** | | | **HEATING DATA AT DES HTG** | | |
|  | **COOLING OA DB / WB 28.4 °C / 27.8 °C** | | | **HEATING OA DB / WB 6.0 °C / 4.4 °C** | | |
|  | **OCCUPIED T-STAT 24.0 °C** | | | **OCCUPIED T-STAT 22.0 °C** | | |
|  |  | **Sensible** | **Latent** |  | **Sensible** | **Latent** |
| **SPACE LOADS** | **Details** | **(W)** | **(W)** | **Details** | **(W)** | **(W)** |
| Window & Skylight Solar Loads | 0 m² | 0 | - | 0 m² | - | - |
| Wall Transmission | 12 m² | 299 | - | 12 m² | 342 | - |
| Roof Transmission | 17 m² | 144 | - | 17 m² | 129 | - |
| Window Transmission | 0 m² | 0 | - | 0 m² | 0 | - |
| Skylight Transmission | 0 m² | 0 | - | 0 m² | 0 | - |
| Door Loads | 0 m² | 0 | - | 0 m² | 0 | - |
| Floor Transmission | 17 m² | 0 | - | 17 m² | 48 | - |
| Partitions | 13 m² | 59 | - | 13 m² | 147 | - |
| Ceiling | 0 m² | 0 | - | 0 m² | 0 | - |
| Overhead Lighting | 192 W | 108 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 15 | 1231 | 1187 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 10% / 10% | 184 | 119 | 10% | 67 | 0 |
| **>> Total Zone Loads** | **-** | **2025** | **1305** | **-** | **733** | **0** |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **TABLE 1.6.B. ENVELOPE LOADS FOR SPACE '' 05-Prayer Room '' IN ZONE '' Zone 1 ''** | | | | | | |
|  |  |  |  | **COOLING** | **COOLING** | **HEATING** |
|  | **Area** | **U-Value** | **Shade** | **TRANS** | **SOLAR** | **TRANS** |
|  | **(m²)** | **(W/(m²-°K))** | **Coeff.** | **(W)** | **(W)** | **(W)** |
| **SSE EXPOSURE** |  |  |  |  |  |  |
| WALL | 12 | 1.813 | - | 299 | - | 342 |
| **H EXPOSURE** |  |  |  |  |  |  |
| ROOF | 17 | 0.484 | - | 144 | - | 129 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **TABLE 1.7.A. COMPONENT LOADS FOR SPACE '' 06-Corridor '' IN ZONE '' Zone 1 ''** | | | | | | |
|  | **DESIGN COOLING** | | | **DESIGN HEATING** | | |
|  | **COOLING DATA AT Jul 0800** | | | **HEATING DATA AT DES HTG** | | |
|  | **COOLING OA DB / WB 28.4 °C / 27.8 °C** | | | **HEATING OA DB / WB 6.0 °C / 4.4 °C** | | |
|  | **OCCUPIED T-STAT 24.0 °C** | | | **OCCUPIED T-STAT 22.0 °C** | | |
|  |  | **Sensible** | **Latent** |  | **Sensible** | **Latent** |
| **SPACE LOADS** | **Details** | **(W)** | **(W)** | **Details** | **(W)** | **(W)** |
| Window & Skylight Solar Loads | 0 m² | 0 | - | 0 m² | - | - |
| Wall Transmission | 0 m² | 0 | - | 0 m² | 0 | - |
| Roof Transmission | 15 m² | 138 | - | 15 m² | 118 | - |
| Window Transmission | 0 m² | 0 | - | 0 m² | 0 | - |
| Skylight Transmission | 0 m² | 0 | - | 0 m² | 0 | - |
| Door Loads | 0 m² | 0 | - | 0 m² | 0 | - |
| Floor Transmission | 15 m² | 0 | - | 15 m² | 50 | - |
| Partitions | 3 m² | 16 | - | 3 m² | 39 | - |
| Ceiling | 0 m² | 0 | - | 0 m² | 0 | - |
| Overhead Lighting | 108 W | 61 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 2 | 144 | 120 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 10% / 10% | 36 | 12 | 10% | 21 | 0 |
| **>> Total Zone Loads** | **-** | **393** | **132** | **-** | **228** | **0** |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **TABLE 1.7.B. ENVELOPE LOADS FOR SPACE '' 06-Corridor '' IN ZONE '' Zone 1 ''** | | | | | | |
|  |  |  |  | **COOLING** | **COOLING** | **HEATING** |
|  | **Area** | **U-Value** | **Shade** | **TRANS** | **SOLAR** | **TRANS** |
|  | **(m²)** | **(W/(m²-°K))** | **Coeff.** | **(W)** | **(W)** | **(W)** |
| **H EXPOSURE** |  |  |  |  |  |  |
| ROOF | 15 | 0.484 | - | 138 | - | 118 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **TABLE 1.8.A. COMPONENT LOADS FOR SPACE '' 08-UPS '' IN ZONE '' Zone 1 ''** | | | | | | |
|  | **DESIGN COOLING** | | | **DESIGN HEATING** | | |
|  | **COOLING DATA AT Jul 1700** | | | **HEATING DATA AT DES HTG** | | |
|  | **COOLING OA DB / WB 39.5 °C / 30.2 °C** | | | **HEATING OA DB / WB 6.0 °C / 4.4 °C** | | |
|  | **OCCUPIED T-STAT 24.0 °C** | | | **OCCUPIED T-STAT 22.0 °C** | | |
|  |  | **Sensible** | **Latent** |  | **Sensible** | **Latent** |
| **SPACE LOADS** | **Details** | **(W)** | **(W)** | **Details** | **(W)** | **(W)** |
| Window & Skylight Solar Loads | 0 m² | 0 | - | 0 m² | - | - |
| Wall Transmission | 35 m² | 3383 | - | 35 m² | 1069 | - |
| Roof Transmission | 34 m² | 277 | - | 34 m² | 260 | - |
| Window Transmission | 0 m² | 0 | - | 0 m² | 0 | - |
| Skylight Transmission | 0 m² | 0 | - | 0 m² | 0 | - |
| Door Loads | 3 m² | 105 | - | 3 m² | 125 | - |
| Floor Transmission | 34 m² | 0 | - | 34 m² | 105 | - |
| Partitions | 0 m² | 0 | - | 0 m² | 0 | - |
| Ceiling | 0 m² | 0 | - | 0 m² | 0 | - |
| Overhead Lighting | 0 W | 14 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 4000 W | 4000 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 10% / 10% | 778 | 0 | 10% | 156 | 0 |
| **>> Total Zone Loads** | **-** | **8555** | **0** | **-** | **1713** | **0** |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **TABLE 1.8.B. ENVELOPE LOADS FOR SPACE '' 08-UPS '' IN ZONE '' Zone 1 ''** | | | | | | |
|  |  |  |  | **COOLING** | **COOLING** | **HEATING** |
|  | **Area** | **U-Value** | **Shade** | **TRANS** | **SOLAR** | **TRANS** |
|  | **(m²)** | **(W/(m²-°K))** | **Coeff.** | **(W)** | **(W)** | **(W)** |
| **NNW EXPOSURE** |  |  |  |  |  |  |
| WALL | 14 | 1.936 | - | 1315 | - | 427 |
| **WSW EXPOSURE** |  |  |  |  |  |  |
| WALL | 10 | 1.936 | - | 1190 | - | 294 |
| **SSE EXPOSURE** |  |  |  |  |  |  |
| WALL | 11 | 1.936 | - | 878 | - | 347 |
| DOOR | 3 | 3.000 | - | 105 | - | 125 |
| **H EXPOSURE** |  |  |  |  |  |  |
| ROOF | 34 | 0.484 | - | 277 | - | 260 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **TABLE 1.9.A. COMPONENT LOADS FOR SPACE '' 09-E.X. C.R. (Rack R.1) '' IN ZONE '' Zone 1 ''** | | | | | | |
|  | **DESIGN COOLING** | | | **DESIGN HEATING** | | |
|  | **COOLING DATA AT Jul 0800** | | | **HEATING DATA AT DES HTG** | | |
|  | **COOLING OA DB / WB 28.4 °C / 27.8 °C** | | | **HEATING OA DB / WB 6.0 °C / 4.4 °C** | | |
|  | **OCCUPIED T-STAT 24.0 °C** | | | **OCCUPIED T-STAT 22.0 °C** | | |
|  |  | **Sensible** | **Latent** |  | **Sensible** | **Latent** |
| **SPACE LOADS** | **Details** | **(W)** | **(W)** | **Details** | **(W)** | **(W)** |
| Window & Skylight Solar Loads | 0 m² | 0 | - | 0 m² | - | - |
| Wall Transmission | 21 m² | 515 | - | 21 m² | 603 | - |
| Roof Transmission | 43 m² | 390 | - | 43 m² | 333 | - |
| Window Transmission | 0 m² | 0 | - | 0 m² | 0 | - |
| Skylight Transmission | 0 m² | 0 | - | 0 m² | 0 | - |
| Door Loads | 0 m² | 0 | - | 0 m² | 0 | - |
| Floor Transmission | 43 m² | 0 | - | 43 m² | 100 | - |
| Partitions | 0 m² | 0 | - | 0 m² | 0 | - |
| Ceiling | 0 m² | 0 | - | 0 m² | 0 | - |
| Overhead Lighting | 860 W | 483 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 1000 W | 1000 | - | 0 | 0 | - |
| People | 2 | 164 | 158 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 10% / 10% | 255 | 16 | 10% | 104 | 0 |
| **>> Total Zone Loads** | **-** | **2807** | **174** | **-** | **1140** | **0** |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **TABLE 1.9.B. ENVELOPE LOADS FOR SPACE '' 09-E.X. C.R. (Rack R.1) '' IN ZONE '' Zone 1 ''** | | | | | | |
|  |  |  |  | **COOLING** | **COOLING** | **HEATING** |
|  | **Area** | **U-Value** | **Shade** | **TRANS** | **SOLAR** | **TRANS** |
|  | **(m²)** | **(W/(m²-°K))** | **Coeff.** | **(W)** | **(W)** | **(W)** |
| **NNW EXPOSURE** |  |  |  |  |  |  |
| WALL | 13 | 1.813 | - | 305 | - | 383 |
| **WSW EXPOSURE** |  |  |  |  |  |  |
| WALL | 8 | 1.813 | - | 210 | - | 220 |
| **H EXPOSURE** |  |  |  |  |  |  |
| ROOF | 43 | 0.484 | - | 390 | - | 333 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **TABLE 1.10.A. COMPONENT LOADS FOR SPACE '' 10-EXI. Control Room '' IN ZONE '' Zone 1 ''** | | | | | | |
|  | **DESIGN COOLING** | | | **DESIGN HEATING** | | |
|  | **COOLING DATA AT Jul 0800** | | | **HEATING DATA AT DES HTG** | | |
|  | **COOLING OA DB / WB 28.4 °C / 27.8 °C** | | | **HEATING OA DB / WB 6.0 °C / 4.4 °C** | | |
|  | **OCCUPIED T-STAT 24.0 °C** | | | **OCCUPIED T-STAT 22.0 °C** | | |
|  |  | **Sensible** | **Latent** |  | **Sensible** | **Latent** |
| **SPACE LOADS** | **Details** | **(W)** | **(W)** | **Details** | **(W)** | **(W)** |
| Window & Skylight Solar Loads | 0 m² | 0 | - | 0 m² | - | - |
| Wall Transmission | 47 m² | 1095 | - | 47 m² | 1375 | - |
| Roof Transmission | 115 m² | 1039 | - | 115 m² | 888 | - |
| Window Transmission | 0 m² | 0 | - | 0 m² | 0 | - |
| Skylight Transmission | 0 m² | 0 | - | 0 m² | 0 | - |
| Door Loads | 0 m² | 0 | - | 0 m² | 0 | - |
| Floor Transmission | 115 m² | 0 | - | 115 m² | 244 | - |
| Partitions | 0 m² | 0 | - | 0 m² | 0 | - |
| Ceiling | 0 m² | 0 | - | 0 m² | 0 | - |
| Overhead Lighting | 2292 W | 1287 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 4000 W | 3999 | - | 0 | 0 | - |
| People | 15 | 1231 | 1187 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 10% / 10% | 865 | 119 | 10% | 251 | 0 |
| **>> Total Zone Loads** | **-** | **9517** | **1305** | **-** | **2757** | **0** |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **TABLE 1.10.B. ENVELOPE LOADS FOR SPACE '' 10-EXI. Control Room '' IN ZONE '' Zone 1 ''** | | | | | | |
|  |  |  |  | **COOLING** | **COOLING** | **HEATING** |
|  | **Area** | **U-Value** | **Shade** | **TRANS** | **SOLAR** | **TRANS** |
|  | **(m²)** | **(W/(m²-°K))** | **Coeff.** | **(W)** | **(W)** | **(W)** |
| **NNW EXPOSURE** |  |  |  |  |  |  |
| WALL | 47 | 1.813 | - | 1095 | - | 1375 |
| **H EXPOSURE** |  |  |  |  |  |  |
| ROOF | 115 | 0.484 | - | 1039 | - | 888 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **TABLE 1.11.A. COMPONENT LOADS FOR SPACE '' 11-EXI. UPS '' IN ZONE '' Zone 1 ''** | | | | | | |
|  | **DESIGN COOLING** | | | **DESIGN HEATING** | | |
|  | **COOLING DATA AT Jul 0800** | | | **HEATING DATA AT DES HTG** | | |
|  | **COOLING OA DB / WB 28.4 °C / 27.8 °C** | | | **HEATING OA DB / WB 6.0 °C / 4.4 °C** | | |
|  | **OCCUPIED T-STAT 24.0 °C** | | | **OCCUPIED T-STAT 22.0 °C** | | |
|  |  | **Sensible** | **Latent** |  | **Sensible** | **Latent** |
| **SPACE LOADS** | **Details** | **(W)** | **(W)** | **Details** | **(W)** | **(W)** |
| Window & Skylight Solar Loads | 0 m² | 0 | - | 0 m² | - | - |
| Wall Transmission | 0 m² | 0 | - | 0 m² | 0 | - |
| Roof Transmission | 13 m² | 120 | - | 13 m² | 102 | - |
| Window Transmission | 0 m² | 0 | - | 0 m² | 0 | - |
| Skylight Transmission | 0 m² | 0 | - | 0 m² | 0 | - |
| Door Loads | 0 m² | 0 | - | 0 m² | 0 | - |
| Floor Transmission | 13 m² | 0 | - | 13 m² | 0 | - |
| Partitions | 0 m² | 0 | - | 0 m² | 0 | - |
| Ceiling | 0 m² | 0 | - | 0 m² | 0 | - |
| Overhead Lighting | 264 W | 148 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 1000 W | 1000 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 10% / 10% | 127 | 0 | 10% | 10 | 0 |
| **>> Total Zone Loads** | **-** | **1395** | **0** | **-** | **112** | **0** |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **TABLE 1.11.B. ENVELOPE LOADS FOR SPACE '' 11-EXI. UPS '' IN ZONE '' Zone 1 ''** | | | | | | |
|  |  |  |  | **COOLING** | **COOLING** | **HEATING** |
|  | **Area** | **U-Value** | **Shade** | **TRANS** | **SOLAR** | **TRANS** |
|  | **(m²)** | **(W/(m²-°K))** | **Coeff.** | **(W)** | **(W)** | **(W)** |
| **H EXPOSURE** |  |  |  |  |  |  |
| ROOF | 13 | 0.484 | - | 120 | - | 102 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **TABLE 1.12.A. COMPONENT LOADS FOR SPACE '' 13-EXI. Lavatory & Showe '' IN ZONE '' Zone 1 ''** | | | | | | |
|  | **DESIGN COOLING** | | | **DESIGN HEATING** | | |
|  | **COOLING DATA AT Jul 0800** | | | **HEATING DATA AT DES HTG** | | |
|  | **COOLING OA DB / WB 28.4 °C / 27.8 °C** | | | **HEATING OA DB / WB 6.0 °C / 4.4 °C** | | |
|  | **OCCUPIED T-STAT 24.0 °C** | | | **OCCUPIED T-STAT 22.0 °C** | | |
|  |  | **Sensible** | **Latent** |  | **Sensible** | **Latent** |
| **SPACE LOADS** | **Details** | **(W)** | **(W)** | **Details** | **(W)** | **(W)** |
| Window & Skylight Solar Loads | 0 m² | 0 | - | 0 m² | - | - |
| Wall Transmission | 30 m² | 787 | - | 30 m² | 907 | - |
| Roof Transmission | 21 m² | 193 | - | 21 m² | 165 | - |
| Window Transmission | 0 m² | 0 | - | 0 m² | 0 | - |
| Skylight Transmission | 0 m² | 0 | - | 0 m² | 0 | - |
| Door Loads | 0 m² | 0 | - | 0 m² | 0 | - |
| Floor Transmission | 21 m² | 0 | - | 21 m² | 85 | - |
| Partitions | 0 m² | 0 | - | 0 m² | 0 | - |
| Ceiling | 0 m² | 0 | - | 0 m² | 0 | - |
| Overhead Lighting | 151 W | 85 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 4 | 328 | 316 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 10% / 10% | 139 | 32 | 10% | 116 | 0 |
| **>> Total Zone Loads** | **-** | **1533** | **348** | **-** | **1272** | **0** |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **TABLE 1.12.B. ENVELOPE LOADS FOR SPACE '' 13-EXI. Lavatory & Showe '' IN ZONE '' Zone 1 ''** | | | | | | |
|  |  |  |  | **COOLING** | **COOLING** | **HEATING** |
|  | **Area** | **U-Value** | **Shade** | **TRANS** | **SOLAR** | **TRANS** |
|  | **(m²)** | **(W/(m²-°K))** | **Coeff.** | **(W)** | **(W)** | **(W)** |
| **NNW EXPOSURE** |  |  |  |  |  |  |
| WALL | 15 | 1.870 | - | 362 | - | 458 |
| **WSW EXPOSURE** |  |  |  |  |  |  |
| WALL | 15 | 1.870 | - | 425 | - | 449 |
| **H EXPOSURE** |  |  |  |  |  |  |
| ROOF | 21 | 0.484 | - | 193 | - | 165 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **TABLE 1.13.A. COMPONENT LOADS FOR SPACE '' 14-EXI. Locker Room '' IN ZONE '' Zone 1 ''** | | | | | | |
|  | **DESIGN COOLING** | | | **DESIGN HEATING** | | |
|  | **COOLING DATA AT Jul 0800** | | | **HEATING DATA AT DES HTG** | | |
|  | **COOLING OA DB / WB 28.4 °C / 27.8 °C** | | | **HEATING OA DB / WB 6.0 °C / 4.4 °C** | | |
|  | **OCCUPIED T-STAT 24.0 °C** | | | **OCCUPIED T-STAT 22.0 °C** | | |
|  |  | **Sensible** | **Latent** |  | **Sensible** | **Latent** |
| **SPACE LOADS** | **Details** | **(W)** | **(W)** | **Details** | **(W)** | **(W)** |
| Window & Skylight Solar Loads | 0 m² | 0 | - | 0 m² | - | - |
| Wall Transmission | 10 m² | 279 | - | 10 m² | 293 | - |
| Roof Transmission | 7 m² | 61 | - | 7 m² | 52 | - |
| Window Transmission | 0 m² | 0 | - | 0 m² | 0 | - |
| Skylight Transmission | 0 m² | 0 | - | 0 m² | 0 | - |
| Door Loads | 0 m² | 0 | - | 0 m² | 0 | - |
| Floor Transmission | 7 m² | 0 | - | 7 m² | 28 | - |
| Partitions | 0 m² | 0 | - | 0 m² | 0 | - |
| Ceiling | 0 m² | 0 | - | 0 m² | 0 | - |
| Overhead Lighting | 77 W | 43 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 1 | 86 | 133 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 10% / 10% | 47 | 13 | 10% | 37 | 0 |
| **>> Total Zone Loads** | **-** | **517** | **147** | **-** | **410** | **0** |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **TABLE 1.13.B. ENVELOPE LOADS FOR SPACE '' 14-EXI. Locker Room '' IN ZONE '' Zone 1 ''** | | | | | | |
|  |  |  |  | **COOLING** | **COOLING** | **HEATING** |
|  | **Area** | **U-Value** | **Shade** | **TRANS** | **SOLAR** | **TRANS** |
|  | **(m²)** | **(W/(m²-°K))** | **Coeff.** | **(W)** | **(W)** | **(W)** |
| **WSW EXPOSURE** |  |  |  |  |  |  |
| WALL | 10 | 1.813 | - | 279 | - | 293 |
| **H EXPOSURE** |  |  |  |  |  |  |
| ROOF | 7 | 0.484 | - | 61 | - | 52 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **TABLE 1.14.A. COMPONENT LOADS FOR SPACE '' 16-Pantry & Dining Room '' IN ZONE '' Zone 1 ''** | | | | | | |
|  | **DESIGN COOLING** | | | **DESIGN HEATING** | | |
|  | **COOLING DATA AT Jul 0800** | | | **HEATING DATA AT DES HTG** | | |
|  | **COOLING OA DB / WB 28.4 °C / 27.8 °C** | | | **HEATING OA DB / WB 6.0 °C / 4.4 °C** | | |
|  | **OCCUPIED T-STAT 24.0 °C** | | | **OCCUPIED T-STAT 22.0 °C** | | |
|  |  | **Sensible** | **Latent** |  | **Sensible** | **Latent** |
| **SPACE LOADS** | **Details** | **(W)** | **(W)** | **Details** | **(W)** | **(W)** |
| Window & Skylight Solar Loads | 0 m² | 0 | - | 0 m² | - | - |
| Wall Transmission | 0 m² | 0 | - | 0 m² | 0 | - |
| Roof Transmission | 57 m² | 520 | - | 57 m² | 444 | - |
| Window Transmission | 0 m² | 0 | - | 0 m² | 0 | - |
| Skylight Transmission | 0 m² | 0 | - | 0 m² | 0 | - |
| Door Loads | 0 m² | 0 | - | 0 m² | 0 | - |
| Floor Transmission | 57 m² | 0 | - | 57 m² | 0 | - |
| Partitions | 0 m² | 0 | - | 0 m² | 0 | - |
| Ceiling | 0 m² | 0 | - | 0 m² | 0 | - |
| Overhead Lighting | 756 W | 425 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 500 W | 500 | - | 0 | 0 | - |
| People | 20 | 1641 | 1582 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 400 | 800 | - | 0 | 0 |
| Safety Factor | 10% / 10% | 349 | 238 | 10% | 44 | 0 |
| **>> Total Zone Loads** | **-** | **3834** | **2620** | **-** | **488** | **0** |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **TABLE 1.14.B. ENVELOPE LOADS FOR SPACE '' 16-Pantry & Dining Room '' IN ZONE '' Zone 1 ''** | | | | | | |
|  |  |  |  | **COOLING** | **COOLING** | **HEATING** |
|  | **Area** | **U-Value** | **Shade** | **TRANS** | **SOLAR** | **TRANS** |
|  | **(m²)** | **(W/(m²-°K))** | **Coeff.** | **(W)** | **(W)** | **(W)** |
| **H EXPOSURE** |  |  |  |  |  |  |
| ROOF | 57 | 0.484 | - | 520 | - | 444 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **TABLE 1.15.A. COMPONENT LOADS FOR SPACE '' 17-E.X. C.R. (Rack R.2) '' IN ZONE '' Zone 1 ''** | | | | | | |
|  | **DESIGN COOLING** | | | **DESIGN HEATING** | | |
|  | **COOLING DATA AT Jul 0800** | | | **HEATING DATA AT DES HTG** | | |
|  | **COOLING OA DB / WB 28.4 °C / 27.8 °C** | | | **HEATING OA DB / WB 6.0 °C / 4.4 °C** | | |
|  | **OCCUPIED T-STAT 24.0 °C** | | | **OCCUPIED T-STAT 22.0 °C** | | |
|  |  | **Sensible** | **Latent** |  | **Sensible** | **Latent** |
| **SPACE LOADS** | **Details** | **(W)** | **(W)** | **Details** | **(W)** | **(W)** |
| Window & Skylight Solar Loads | 0 m² | 0 | - | 0 m² | - | - |
| Wall Transmission | 8 m² | 219 | - | 8 m² | 232 | - |
| Roof Transmission | 40 m² | 365 | - | 40 m² | 312 | - |
| Window Transmission | 0 m² | 0 | - | 0 m² | 0 | - |
| Skylight Transmission | 0 m² | 0 | - | 0 m² | 0 | - |
| Door Loads | 0 m² | 0 | - | 0 m² | 0 | - |
| Floor Transmission | 40 m² | 0 | - | 40 m² | 54 | - |
| Partitions | 3 m² | 15 | - | 3 m² | 38 | - |
| Ceiling | 0 m² | 0 | - | 0 m² | 0 | - |
| Overhead Lighting | 806 W | 453 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 1000 W | 1000 | - | 0 | 0 | - |
| People | 2 | 164 | 158 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 10% / 10% | 222 | 16 | 10% | 64 | 0 |
| **>> Total Zone Loads** | **-** | **2438** | **174** | **-** | **700** | **0** |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **TABLE 1.15.B. ENVELOPE LOADS FOR SPACE '' 17-E.X. C.R. (Rack R.2) '' IN ZONE '' Zone 1 ''** | | | | | | |
|  |  |  |  | **COOLING** | **COOLING** | **HEATING** |
|  | **Area** | **U-Value** | **Shade** | **TRANS** | **SOLAR** | **TRANS** |
|  | **(m²)** | **(W/(m²-°K))** | **Coeff.** | **(W)** | **(W)** | **(W)** |
| **ENE EXPOSURE** |  |  |  |  |  |  |
| WALL | 8 | 1.813 | - | 219 | - | 232 |
| **H EXPOSURE** |  |  |  |  |  |  |
| ROOF | 40 | 0.484 | - | 365 | - | 312 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **TABLE 1.16.A. COMPONENT LOADS FOR SPACE '' 18-EX. Corridor '' IN ZONE '' Zone 1 ''** | | | | | | |
|  | **DESIGN COOLING** | | | **DESIGN HEATING** | | |
|  | **COOLING DATA AT Jul 0800** | | | **HEATING DATA AT DES HTG** | | |
|  | **COOLING OA DB / WB 28.4 °C / 27.8 °C** | | | **HEATING OA DB / WB 6.0 °C / 4.4 °C** | | |
|  | **OCCUPIED T-STAT 24.0 °C** | | | **OCCUPIED T-STAT 22.0 °C** | | |
|  |  | **Sensible** | **Latent** |  | **Sensible** | **Latent** |
| **SPACE LOADS** | **Details** | **(W)** | **(W)** | **Details** | **(W)** | **(W)** |
| Window & Skylight Solar Loads | 0 m² | 0 | - | 0 m² | - | - |
| Wall Transmission | 0 m² | 0 | - | 0 m² | 0 | - |
| Roof Transmission | 64 m² | 578 | - | 64 m² | 494 | - |
| Window Transmission | 0 m² | 0 | - | 0 m² | 0 | - |
| Skylight Transmission | 0 m² | 0 | - | 0 m² | 0 | - |
| Door Loads | 0 m² | 0 | - | 0 m² | 0 | - |
| Floor Transmission | 64 m² | 0 | - | 64 m² | 0 | - |
| Partitions | 6 m² | 28 | - | 6 m² | 70 | - |
| Ceiling | 0 m² | 0 | - | 0 m² | 0 | - |
| Overhead Lighting | 452 W | 254 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 5 | 359 | 300 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 10% / 10% | 122 | 30 | 10% | 56 | 0 |
| **>> Total Zone Loads** | **-** | **1340** | **330** | **-** | **619** | **0** |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **TABLE 1.16.B. ENVELOPE LOADS FOR SPACE '' 18-EX. Corridor '' IN ZONE '' Zone 1 ''** | | | | | | |
|  |  |  |  | **COOLING** | **COOLING** | **HEATING** |
|  | **Area** | **U-Value** | **Shade** | **TRANS** | **SOLAR** | **TRANS** |
|  | **(m²)** | **(W/(m²-°K))** | **Coeff.** | **(W)** | **(W)** | **(W)** |
| **H EXPOSURE** |  |  |  |  |  |  |
| ROOF | 64 | 0.484 | - | 578 | - | 494 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **TABLE 2.1.A. COMPONENT LOADS FOR SPACE '' 07-Battery Room '' IN ZONE '' Zone 2 ''** | | | | | | |
|  | **DESIGN COOLING** | | | **DESIGN HEATING** | | |
|  | **COOLING DATA AT Jul 0800** | | | **HEATING DATA AT DES HTG** | | |
|  | **COOLING OA DB / WB 28.4 °C / 27.8 °C** | | | **HEATING OA DB / WB 6.0 °C / 4.4 °C** | | |
|  | **OCCUPIED T-STAT 27.0 °C** | | | **OCCUPIED T-STAT 21.0 °C** | | |
|  |  | **Sensible** | **Latent** |  | **Sensible** | **Latent** |
| **SPACE LOADS** | **Details** | **(W)** | **(W)** | **Details** | **(W)** | **(W)** |
| Window & Skylight Solar Loads | 0 m² | 0 | - | 0 m² | - | - |
| Wall Transmission | 75 m² | 1542 | - | 75 m² | 2110 | - |
| Roof Transmission | 47 m² | 357 | - | 47 m² | 340 | - |
| Window Transmission | 0 m² | 0 | - | 0 m² | 0 | - |
| Skylight Transmission | 0 m² | 0 | - | 0 m² | 0 | - |
| Door Loads | 3 m² | 19 | - | 3 m² | 117 | - |
| Floor Transmission | 47 m² | 0 | - | 47 m² | 165 | - |
| Partitions | 0 m² | 0 | - | 0 m² | 0 | - |
| Ceiling | 0 m² | 0 | - | 0 m² | 0 | - |
| Overhead Lighting | 936 W | 526 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 1000 W | 1000 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 10% / 10% | 344 | 0 | 10% | 273 | 0 |
| **>> Total Zone Loads** | **-** | **3788** | **0** | **-** | **3005** | **0** |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **TABLE 2.1.B. ENVELOPE LOADS FOR SPACE '' 07-Battery Room '' IN ZONE '' Zone 2 ''** | | | | | | |
|  |  |  |  | **COOLING** | **COOLING** | **HEATING** |
|  | **Area** | **U-Value** | **Shade** | **TRANS** | **SOLAR** | **TRANS** |
|  | **(m²)** | **(W/(m²-°K))** | **Coeff.** | **(W)** | **(W)** | **(W)** |
| **NNW EXPOSURE** |  |  |  |  |  |  |
| WALL | 19 | 1.870 | - | 353 | - | 544 |
| **ENE EXPOSURE** |  |  |  |  |  |  |
| WALL | 39 | 1.870 | - | 881 | - | 1094 |
| **SSE EXPOSURE** |  |  |  |  |  |  |
| WALL | 17 | 1.870 | - | 308 | - | 471 |
| DOOR | 3 | 3.000 | - | 19 | - | 117 |
| **H EXPOSURE** |  |  |  |  |  |  |
| ROOF | 47 | 0.484 | - | 357 | - | 340 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **TABLE 2.2.A. COMPONENT LOADS FOR SPACE '' 12-EXI. Battery Room '' IN ZONE '' Zone 2 ''** | | | | | | |
|  | **DESIGN COOLING** | | | **DESIGN HEATING** | | |
|  | **COOLING DATA AT Jul 0800** | | | **HEATING DATA AT DES HTG** | | |
|  | **COOLING OA DB / WB 28.4 °C / 27.8 °C** | | | **HEATING OA DB / WB 6.0 °C / 4.4 °C** | | |
|  | **OCCUPIED T-STAT 27.0 °C** | | | **OCCUPIED T-STAT 21.0 °C** | | |
|  |  | **Sensible** | **Latent** |  | **Sensible** | **Latent** |
| **SPACE LOADS** | **Details** | **(W)** | **(W)** | **Details** | **(W)** | **(W)** |
| Window & Skylight Solar Loads | 0 m² | 0 | - | 0 m² | - | - |
| Wall Transmission | 5 m² | 95 | - | 5 m² | 146 | - |
| Roof Transmission | 11 m² | 82 | - | 11 m² | 78 | - |
| Window Transmission | 0 m² | 0 | - | 0 m² | 0 | - |
| Skylight Transmission | 0 m² | 0 | - | 0 m² | 0 | - |
| Door Loads | 3 m² | 19 | - | 3 m² | 117 | - |
| Floor Transmission | 11 m² | 0 | - | 11 m² | 29 | - |
| Partitions | 0 m² | 0 | - | 0 m² | 0 | - |
| Ceiling | 0 m² | 0 | - | 0 m² | 0 | - |
| Overhead Lighting | 214 W | 120 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 500 W | 500 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 10% / 10% | 82 | 0 | 10% | 37 | 0 |
| **>> Total Zone Loads** | **-** | **897** | **0** | **-** | **407** | **0** |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **TABLE 2.2.B. ENVELOPE LOADS FOR SPACE '' 12-EXI. Battery Room '' IN ZONE '' Zone 2 ''** | | | | | | |
|  |  |  |  | **COOLING** | **COOLING** | **HEATING** |
|  | **Area** | **U-Value** | **Shade** | **TRANS** | **SOLAR** | **TRANS** |
|  | **(m²)** | **(W/(m²-°K))** | **Coeff.** | **(W)** | **(W)** | **(W)** |
| **NNW EXPOSURE** |  |  |  |  |  |  |
| WALL | 5 | 1.870 | - | 95 | - | 146 |
| DOOR | 3 | 3.000 | - | 19 | - | 117 |
| **H EXPOSURE** |  |  |  |  |  |  |
| ROOF | 11 | 0.484 | - | 82 | - | 78 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **TABLE 3.1.A. COMPONENT LOADS FOR SPACE '' 15-EXI. HVAC Room '' IN ZONE '' Zone 3 ''** | | | | | | |
|  | **DESIGN COOLING** | | | **DESIGN HEATING** | | |
|  | **COOLING DATA AT Aug 1700** | | | **HEATING DATA AT DES HTG** | | |
|  | **COOLING OA DB / WB 39.5 °C / 30.2 °C** | | | **HEATING OA DB / WB 6.0 °C / 4.4 °C** | | |
|  | **OCCUPIED T-STAT 30.0 °C** | | | **OCCUPIED T-STAT 10.0 °C** | | |
|  |  | **Sensible** | **Latent** |  | **Sensible** | **Latent** |
| **SPACE LOADS** | **Details** | **(W)** | **(W)** | **Details** | **(W)** | **(W)** |
| Window & Skylight Solar Loads | 0 m² | 0 | - | 0 m² | - | - |
| Wall Transmission | 13 m² | 1385 | - | 13 m² | 103 | - |
| Roof Transmission | 22 m² | 109 | - | 22 m² | 43 | - |
| Window Transmission | 0 m² | 0 | - | 0 m² | 0 | - |
| Skylight Transmission | 0 m² | 0 | - | 0 m² | 0 | - |
| Door Loads | 5 m² | 116 | - | 5 m² | 62 | - |
| Floor Transmission | 22 m² | 0 | - | 22 m² | 17 | - |
| Partitions | 0 m² | 0 | - | 0 m² | 0 | - |
| Ceiling | 0 m² | 0 | - | 0 m² | 0 | - |
| Overhead Lighting | 0 W | 3 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 500 W | 500 | - | 0 | 0 | - |
| People | 1 | 154 | 271 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 10% / 10% | 227 | 27 | 10% | 23 | 0 |
| **>> Total Zone Loads** | **-** | **2494** | **298** | **-** | **248** | **0** |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **TABLE 3.1.B. ENVELOPE LOADS FOR SPACE '' 15-EXI. HVAC Room '' IN ZONE '' Zone 3 ''** | | | | | | |
|  |  |  |  | **COOLING** | **COOLING** | **HEATING** |
|  | **Area** | **U-Value** | **Shade** | **TRANS** | **SOLAR** | **TRANS** |
|  | **(m²)** | **(W/(m²-°K))** | **Coeff.** | **(W)** | **(W)** | **(W)** |
| **WSW EXPOSURE** |  |  |  |  |  |  |
| WALL | 13 | 1.936 | - | 1385 | - | 103 |
| DOOR | 5 | 3.000 | - | 116 | - | 62 |
| **H EXPOSURE** |  |  |  |  |  |  |
| ROOF | 22 | 0.484 | - | 109 | - | 43 |

## system psychrometric:

**July DESIGN COOLING DAY, 1500**

**TABLE 1: SYSTEM DATA**

|  |  | **Dry-Bulb** | **Specific** |  |  | **Sensible** | **Latent** |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **Temp** | **Humidity** | **Airflow** | **CO2 Level** | **Heat** | **Heat** |
| **Component** | **Location** | **(°C)** | **(kg/kg)** | **(L/s)** | **(ppm)** | **(W)** | **(W)** |
| Ventilation Air | Inlet | 41.0 | 0.02351 | 1938 | 400 | 36966 | 68629 |
| Vent - Return Mixing | Outlet | 32.0 | 0.01668 | 4488 | 613 | - | - |
| Supply Fan | Outlet | 32.0 | 0.01668 | 4488 | 613 | 0 | - |
| Central Cooling Coil | Outlet | 14.4 | 0.00977 | 3840 | 613 | 81559 | 78188 |
| Central Heating Coil | Outlet | 35.0 | 0.01668 | 648 | 613 | 2331 | - |
| Cold Supply Duct | Outlet | 14.4 | 0.00977 | 3840 | 613 | - | - |
| Hot Supply Duct | Outlet | 35.0 | 0.00977 | 648 | 613 | 0 | - |
| Zone Air | - | 25.2 | 0.01149 | 4488 | 775 | 42262 | 9550 |
| Return Plenum | Outlet | 25.2 | 0.01149 | 4488 | 775 | 0 | - |

*Air Density x Heat Capacity x Conversion Factor: At sea level = 1.207; At site altitude = 1.206 W/(L/s-K)*

*Air Density x Heat of Vaporization x Conversion Factor: At sea level = 2947.6; At site altitude = 2944.1 W/(L/s)*

*Site Altitude = 10.0 m*

**TABLE 2: ZONE DATA**

|  | **Zone** |  |  |  |  |  | **Terminal** | **Zone** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Sensible** |  | **Zone** | **Zone** | **Zone** | **CO2** | **Heating** | **Heating** |
|  | **Load** | **T-stat** | **Cond** | **Temp** | **Airflow** | **Level** | **Coil** | **Unit** |
| **Zone Name** | **(W)** | **Mode** | **(W)** | **(°C)** | **(L/s)** | **(ppm)** | **(W)** | **(W)** |
| Zone 1 | 36771 | Cooling | 36213 | 24.6 | 3746 | 800 | 0 | 0 |
| Zone 2 | 4062 | Cooling | 3996 | 27.3 | 609 | 622 | 0 | 0 |
| Zone 3 | 2135 | Cooling | 2053 | 30.7 | 133 | 759 | 0 | 0 |

**WINTER DESIGN HEATING**

**TABLE 1: SYSTEM DATA**

|  |  | **Dry-Bulb** | **Specific** |  |  | **Sensible** | **Latent** |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **Temp** | **Humidity** | **Airflow** | **CO2 Level** | **Heat** | **Heat** |
| **Component** | **Location** | **(°C)** | **(kg/kg)** | **(L/s)** | **(ppm)** | **(W)** | **(W)** |
| Ventilation Air | Inlet | 6.0 | 0.00453 | 1938 | 400 | -35804 | 0 |
| Vent - Return Mixing | Outlet | 14.7 | 0.00453 | 4488 | 408 | - | - |
| Supply Fan | Outlet | 14.7 | 0.00453 | 4488 | 408 | 0 | - |
| Central Cooling Coil | Outlet | 14.4 | 0.00453 | 2257 | 408 | 821 | 0 |
| Central Heating Coil | Outlet | 35.0 | 0.00453 | 2231 | 408 | 54601 | - |
| Cold Supply Duct | Outlet | 14.4 | 0.00453 | 2257 | 408 | - | - |
| Hot Supply Duct | Outlet | 35.0 | 0.00453 | 2231 | 408 | 0 | - |
| Zone Air | - | 21.3 | 0.00453 | 4488 | 413 | -17510 | 0 |
| Return Plenum | Outlet | 21.3 | 0.00453 | 4488 | 413 | 0 | - |

*Air Density x Heat Capacity x Conversion Factor: At sea level = 1.207; At site altitude = 1.206 W/(L/s-K)*

*Air Density x Heat of Vaporization x Conversion Factor: At sea level = 2947.6; At site altitude = 2944.1 W/(L/s)*

*Site Altitude = 10.0 m*

**TABLE 2: ZONE DATA**

|  | **Zone** |  |  |  |  |  | **Terminal** | **Zone** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Sensible** |  | **Zone** | **Zone** | **Zone** | **CO2** | **Heating** | **Heating** |
|  | **Load** | **T-stat** | **Cond** | **Temp** | **Airflow** | **Level** | **Coil** | **Unit** |
| **Zone Name** | **(W)** | **Mode** | **(W)** | **(°C)** | **(L/s)** | **(ppm)** | **(W)** | **(W)** |
| Zone 1 | -14052 | Heating | -13904 | 21.8 | 3746 | 413 | 0 | 0 |
| Zone 2 | -3412 | Heating | -3361 | 20.7 | 609 | 413 | 0 | 0 |
| Zone 3 | -248 | Heating | -245 | 10.0 | 133 | 413 | 0 | 0 |



1. **Equipment Selection**

## PACKAGE UNIT

**1202-PU-GCSCB-01 Control Building (Existing & Extension)**

|  |  |  |  |
| --- | --- | --- | --- |
| **UNIT IDENTITY** | | | **BLDG. NAME** |
| Control Building (Existing & Extension) |
| **DESCRIPTIONS** | | | **TECHNICAL REQUIREMENT** |
| Location | Condensing Unit | | Control Building Roof |
| Air Handling Unit | | Control Building HVAC Room |
| Quantity | | | 1+1 (Duty + Standby) |
| Ambient Design Condition | | Summer DB. Temp (°C) | 41.0 |
| Summer WB. Temp (°C) | 30.5 |
| Winter DB. Temp (°C) | 6.0 |
| Elevation (M) | 10 |
| Total Actual Cooling Load Capacity (Kw) | | | 159.7 \* 1.1 (+ 10% Over Capacity)= 175.67 |
| Sensible Cooling Load Capacity (Kw) | | | 81.6 |
| Entering Air DB / WB (°C) | | | 32.0 / 24.7 |
| Leaving Air DB / WB (°C) | | | 14.4 / 14.0 |
| Outdoor Air DB / WB (°C) | | | 41.0 / 30.5 |
| Cooling Coil Type | | | DX |
| Heating Load Capacity (Kw) | | | 54.6 \* 1.1 (+ 10% Over Capacity)= 60.06 |
| Entering Air DB (Heating Coil) (°C) | | | 14.7°C |
| Leaving Air DB (Heating Coil) (°C) | | | 35.0°C |
| Heating Coil Type | | | Electrical |
| AHU Section Supply Air Flow (L/S) | | | 4520 |
| AHU Section Return Air Flow (L/S) | | | 2555 |
| AHU Section Fresh Air Flow (L/S) | | | 1965 |
| Unit Type | | | Split Type |
| External Static Pressure (Pa) | | | 579.2 |
| Total Static Pressure (Pa) | | | By Vendor |
| Total Power Consumption (Kw) | | | By Vendor |
| Electric Power | | | 400-420v/3 PH/50HZ |

**External Static Pressure Drop:**

|  |  |
| --- | --- |
| Duct static pressure Pa (in.wg) | 97.86 (0.39) |
| Motorized Smoke Fire Damper Pa (in.wg) | 25 (0.10) |
| Supply Air Volume Damper Pa (in.wg) | 30 (0.12) |
| Return Air Volume Damper Pa (in.wg) | 35 (0.14) |
| Blast Valve Pa (in.wg) | 140 (0.56) |
| Return Grill Pa (in.wg) | 16.2 (0.065) |
| Supply Diffuser Pa (in.wg) | 23.89 (0.096) |
| Sand Trap Louver Pa (in.wg) | 149 (0.60) |
| Door Louver Pa (in.wg) | 9.60 (0.040) |
| Total External static pressure + 10% Over S.F. Pa (in.wg) | 579.2 (2.33) |

Supply Air Duct static pressure: 1.5 \* 55 m \* 0.735 pa/m =60.64 pa

Return Air Duct static pressure: 1.5 \* 38 m \* 0.653 pa/m =37.22 pa

## Exhaust fan selection

**1202-EF-GCSCB-01 (Locker + Prayer Room + Store)**

**Locker**

Air Flow = 16.7 (area, m²) × 3 (height, m) × 6 ACH ÷ 60 min = 5.01 m³/min = 176.9 cfm = 83.5 L/S ~ 115 L/S

(100 L/s Supply Air & 15 L/s Transfer Air)

**Prayer Room**

Air Flow = 16.7 (area, m²) × 3 (height, m) × 6 ACH ÷ 60 min = 5.01 m³/min = 176.9 cfm = 83.5 L/S ~ 190 L/S

(175 L/s Supply Air & 15 L/s Transfer Air)

**Store**

Air Flow = 23 (area, m²) × 3 (height, m) × 6 ACH ÷ 60 min = 6.9 m³/min = 243.7 cfm = 115 L/S

(115 L/s Transfer Air)

115+190+115 = 420 L/S

|  |  |  |
| --- | --- | --- |
| Item | | **1202-EF-GCSCB-01** |
| Service Area | | Locker + Prayer Room + Store |
| Equipment QTY. | | 1 |
| Air Flow(L/S) | | 420 |
| Air Flow(CFM) | | 889.9 |
| Component Pressure Drop  (External)  Pa (in.wg) | Blast Proof Valve | 130 (0.52) |
| Fuse Fire Damper | 20 (0.08) |
| Volume Damper | 35 (0.14) |
| Duct static pressure | 13.7 (0.055) |
| Exhaust Grill | 6.47 (0.026) |
| Door Louver | 11.2 (0.045) |
| Total Pressure Drop \*  + 10% Over S.F. | (In.WG.) | 0.956 |
| (Pa) | 238 |
| Exhaust Fan type | | Utility Ex. Fan |
| Power Supply (V/PH/Hz) | | 400/3/50 |
| Power Consumption (w) Each Eq. | | By Vendor |
| REMARKE | | Equipped With Bird Mesh and Motorized Smoke Fire Damper |

\*Total Pressure Drop Should Be Specified By Vendor.

Duct static pressure: 1.5 \* 16 m \* 0.571 pa/m =13.7 pa

**1202-EF-GCSCB-02 (Pantry +Dining Room)**

**Pantry + Dining Room**

Air Flow = 57.3 (area, m²) × 3 (height, m) × 6 ACH ÷ 60 min = 17.19 m³/min =607.05 cfm = 286.5 L/S ~ 420 L/S

(330 L/s Supply Air & 90 L/s Transfer Air)

|  |  |  |
| --- | --- | --- |
| Item | | **1202-EF-GCSCB-02** |
| Service Area | | Pantry + Dining Room |
| Equipment QTY. | | 1 |
| Air Flow(L/S) | | 420 |
| Air Flow(CFM) | | 889.9 |
| Component Pressure Drop  (External)  Pa (in.wg) | Blast Proof Valve | 130 (0.52) |
| Fuse Fire Damper | 20 (0.08) |
| Volume Damper | 35 (0.14) |
| Duct static pressure | 12.85 (0.052) |
| Exhaust Grill | 17.17 (0.069) |
| Door Louver | 11.5 (0.046) |
| Total Pressure Drop \*  + 10% Over S.F. | (In.WG.) | 1.001 |
| (Pa) | 249.172 |
| Exhaust Fan type | | Utility Ex. Fan |
| Power Supply (V/PH/Hz) | | 400/3/50 |
| Power Consumption (w) Each Eq. | | By Vendor |
| REMARKE | | Equipped With Bird Mesh and Motorized Smoke Fire Damper |

\*Total Pressure Drop Should Be Specified By Vendor.

Duct static pressure: 1.5 \* 15 m \* 0.571 pa/m =12.85 pa

**1202-EF-GCSCB-03 (Battery Room)**

**Battery Room (Extension)**

Air Flow = 46.79 (area, m²) × 4 (height, m) × 10 ACH ÷ 60 min = 31.19 m³/min = 1101.5 cfm = 519.8 L/S ~ 520 L/S

(520 L/s Supply Air)

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| Item | | | **1202-EF-GCSCB-03** |
| Service Area | | | Battery Room (Extension) |
| Equipment QTY. | | | 2 (1 Duty + 1 Standby) |
| Air Flow(L/S) | | | 520 |
| Air Flow(CFM) | | | 1101.5 |
| Component Pressure Drop  (External)  Pa (in.wg) | | Blast Proof Valve | 140 (0.56) |
| Fuse Fire Damper | 35 (0.14) |
| Duct static pressure | 7.28 (0.029) |
| Exhaust Grill | 16.17 (0.065) |
| Total Pressure Drop \*  + 10% Over S.F. | | (In.WG.) | 0.877 |
| (Pa) | 218.30 |
| Exhaust Fan type |  | | Utility Ex. Fan |
| Power Supply (V/PH/Hz) | | | 400/3/50 |
| Power Consumption (w) Each Eq. | | | By Vendor |
| REMARKE | | | Equipped With Bird Mesh and Motorized Smoke Fire Damper |

\*Total Pressure Drop Should Be Specified By Vendor.

Duct static pressure: 1.5 \* 8.5 m \* 0.571 pa/m =7.28 pa

**1202-EF-GCSCB-04 (Battery Room)**

**Battery Room (Existing)**

Air Flow = 10.7 (area, m²) × 3 (height, m) × 10 ACH ÷ 60 min = 5.35 m³/min = 188.9 cfm = 89.2 L/S ~ 90 L/S

(90 L/s Supply Air)

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| Item | | | **1202-EF-GCSCB-04** |
| Service Area | | | Battery Room (Existing) |
| Equipment QTY. | | | 2 (1 Duty + 1 Standby) |
| Air Flow(L/S) | | | 90 |
| Air Flow(CFM) | | | 190.7 |
| Component Pressure Drop  (External)  Pa (in.wg) | | Blast Proof Valve | 140 (0.56) |
| Fuse Fire Damper | 35 (0.14) |
| Duct static pressure | 4.28 (0.017) |
| Exhaust Grill | 14.9 (0.060) |
| Total Pressure Drop \*  + 10% Over S.F. | | (In.WG.) | 0.858 |
| (Pa) | 213.60 |
| Exhaust Fan type |  | | Utility Ex. Fan |
| Power Supply (V/PH/Hz) | | | 400/3/50 |
| Power Consumption (w) Each Eq. | | | By Vendor |
| REMARKE | | | Equipped With Bird Mesh and Motorized Smoke Fire Damper |

\*Total Pressure Drop Should Be Specified By Vendor.

Duct static pressure: 1.5 \* 5 m \* 0.571 pa/m =4.28 pa

**1202-EF-GCSCB-05 (Lavatory + Shower + Locker)**

**Lavatory + Shower (Existing)**

Air Flow = 21.3 (area, m²) × 3 (height, m) × 15 ACH ÷ 60 min = 15.98 m³/min = 564.33 cfm = 266.3 L/S ~ 270 L/S

(170+100 L/s Transfer Air)

**Locker (Existing)**

Air Flow = 6.7 (area, m²) × 3 (height, m) × 6 ACH ÷ 60 min = 2.01 m³/min = 70.98 cfm = 33.5 L/S ~ 65 L/S

(45 L/s Supply Air & 20 L/s Transfer Air)

270+65 = 335 L/S

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| Item | | | **1202-EF-GCSCB-05** |
| Service Area | | | Lavatory + Shower + Locker (Existing) |
| Equipment QTY. | | | 1 |
| Air Flow(L/S) | | | 335 |
| Air Flow(CFM) | | | 709.8 |
| Component Pressure Drop  (External)  Pa (in.wg) | | Blast Proof Valve | 160 (0.64) |
| Motorized Smoke Fire Damper | 25 (0.10) |
| Duct static pressure | 6.85 (0.028) |
| Door Louver | 11.5 (0.046) |
| Exhaust Grill | 14.18 (0.057) |
| Total Pressure Drop \*  + 10% Over S.F. | | (In.WG.) | 0.874 |
| (Pa) | 217.53 |
| Exhaust Fan type |  | | Inline Axial Exhaust Fan. |
| Power Supply (V/PH/Hz) | | | 400/3/50 |
| Power Consumption (w) Each Eq. | | | By Vendor |
| REMARKE | | | - |

\*Total Pressure Drop Should Be Specified By Vendor.

Duct static pressure: 1.5 \* 8 m \* 0.571 pa/m = 6.85 pa