

**OTTAWA CN**

Latitude = 45.32 N

Longitude = 75.67 W

Period of Record = 1973 to 1996

WMO No. 716280

Elevation = 374 feet

Average Pressure = 29.54 inches Hg

**Design Criteria Data**

|                                                  | <b>Design Value</b> | Mean Coincident (Average) Values |                         |                        |                             |
|--------------------------------------------------|---------------------|----------------------------------|-------------------------|------------------------|-----------------------------|
|                                                  |                     | Wet Bulb Temperature (°F)        | Humidity Ratio (gr/lb)  | Wind Speed (mph)       | Prevailing Direction (NSEW) |
| <b>Dry Bulb Temperature (T)</b>                  | <b>(°F)</b>         |                                  |                         |                        |                             |
| Median of Extreme Highs                          | 91                  | 73                               | 96                      | 10.1                   | WSW                         |
| 0.4% Occurrence                                  | 86                  | 70                               | 88                      | 9.3                    | SW                          |
| 1.0% Occurrence                                  | 84                  | 70                               | 86                      | 8.8                    | SW                          |
| 2.0% Occurrence                                  | 81                  | 68                               | 81                      | 8.1                    | SSW                         |
| Mean Daily Range                                 | 16                  | -                                | -                       | -                      | -                           |
| 97.5% Occurrence                                 | -2                  | -3                               | 3                       | 8.8                    | W                           |
| 99.0% Occurrence                                 | -8                  | -9                               | 2                       | 8.1                    | WNW                         |
| 99.6% Occurrence                                 | -13                 | -14                              | 2                       | 7.5                    | WNW                         |
| Median of Extreme Lows                           | -19                 | -20                              | 1                       | 9.9                    | W                           |
|                                                  | <b>Design Value</b> | Mean Coincident (Average) Values |                         |                        |                             |
|                                                  |                     | Dry Bulb Temperature (°F)        | Humidity Ratio (gr/lb)  | Wind Speed (mph)       | Prevailing Direction (NSEW) |
| <b>Wet Bulb Temperature (T<sub>wb</sub>)</b>     | <b>(°F)</b>         |                                  |                         |                        |                             |
| Median of Extreme Highs                          | 77                  | 88                               | 121                     | 9.2                    | SSW                         |
| 0.4% Occurrence                                  | 73                  | 82                               | 108                     | 7.9                    | SSW                         |
| 1.0% Occurrence                                  | 71                  | 79                               | 101                     | 7.2                    | SSW                         |
| 2.0% Occurrence                                  | 70                  | 78                               | 98                      | 6.9                    | SSW                         |
|                                                  | <b>Design Value</b> | Mean Coincident (Average) Values |                         |                        |                             |
|                                                  |                     | Dry Bulb Temperature (°F)        | Vapor Pressure (in. Hg) | Wind Speed (mph)       | Prevailing Direction (NSEW) |
| <b>Humidity Ratio (HR)</b>                       | <b>(gr/lb)</b>      |                                  |                         |                        |                             |
| Median of Extreme Highs                          | 127                 | 83                               | 0.83                    | 7.7                    | SSW                         |
| 0.4% Occurrence                                  | 112                 | 78                               | 0.74                    | 6.8                    | SSW                         |
| 1.0% Occurrence                                  | 105                 | 76                               | 0.69                    | 6.5                    | SSW                         |
| 2.0% Occurrence                                  | 99                  | 74                               | 0.65                    | 6.5                    | SSW                         |
| <b>Air Conditioning/<br/>Humid Area Criteria</b> | <b># of Hours</b>   | T ≥ 93°F                         | T ≥ 80°F                | T <sub>wb</sub> ≥ 73°F | T <sub>wb</sub> ≥ 67°F      |
|                                                  |                     | 2                                | 214                     | 51                     | 444                         |

**Other Site Data**

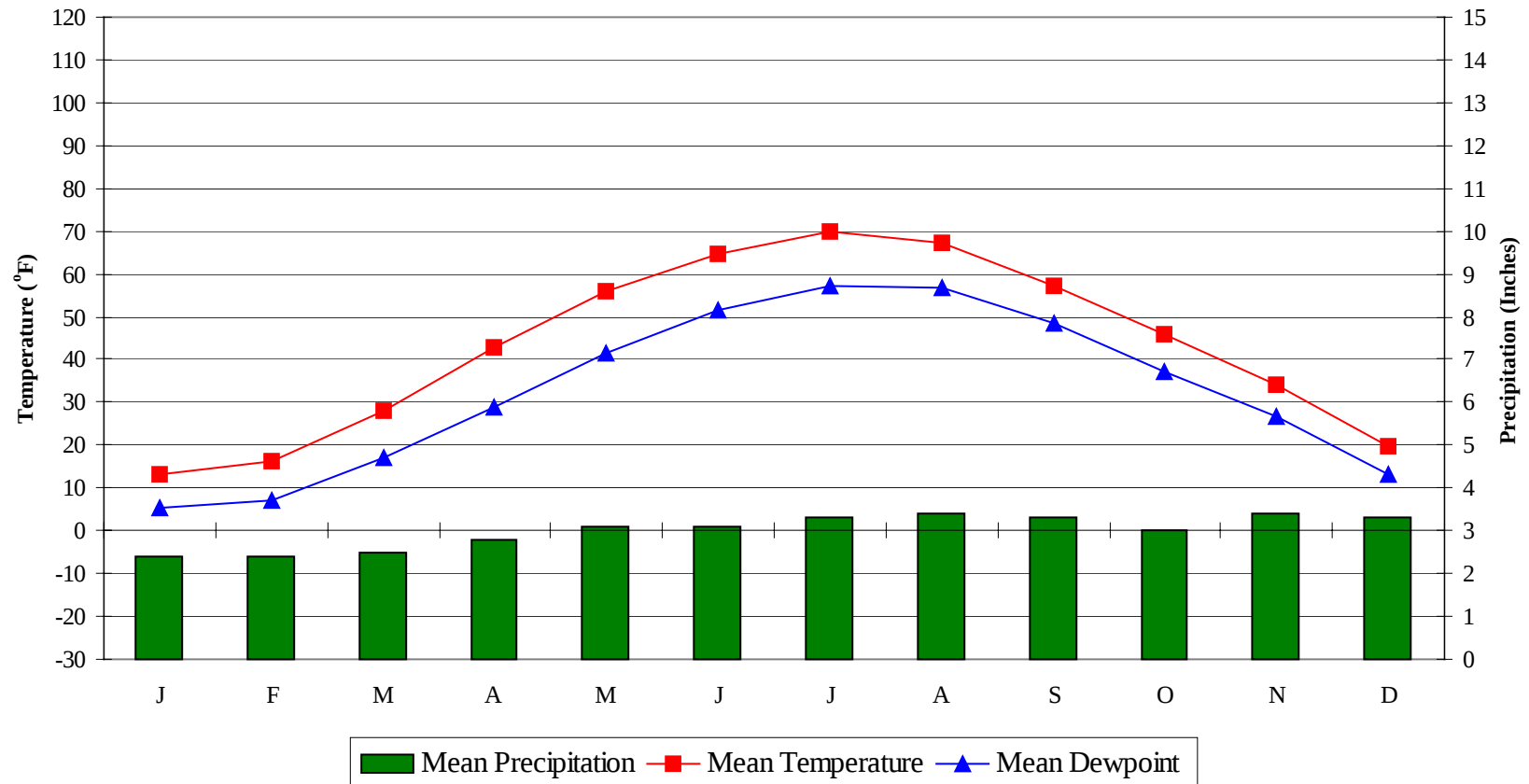
| Weather Region                                      | Rain Rate<br>100 Year Recurrence<br>(in./hr) | Basic Wind Speed<br>3 sec gust @ 33 ft<br>50 Year Recurrence (mph) | Ventilation Cooling Load Index<br>(Ton-hr/cfm/yr) Base 75°F-RH 60%<br>Latent + Sensible |
|-----------------------------------------------------|----------------------------------------------|--------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 5                                                   | N/A                                          | N/A                                                                | 0.5 + 0.2                                                                               |
| Ground Water<br>Temperature (°F)<br>50 Foot Depth * | Frost Depth<br>50 Year Recurrence<br>(in.)   | Ground Snow Load<br>50 Year Recurrence<br>(lb/ft <sup>2</sup> )    | Average Annual<br>Freeze-Thaw Cycles<br>(#)                                             |
| 45.4                                                | N/A                                          | N/A                                                                | 49                                                                                      |

\*Note: Temperatures at greater depths can be estimated by adding 1.5°F per 100 feet additional depth.

OTTAWA CN

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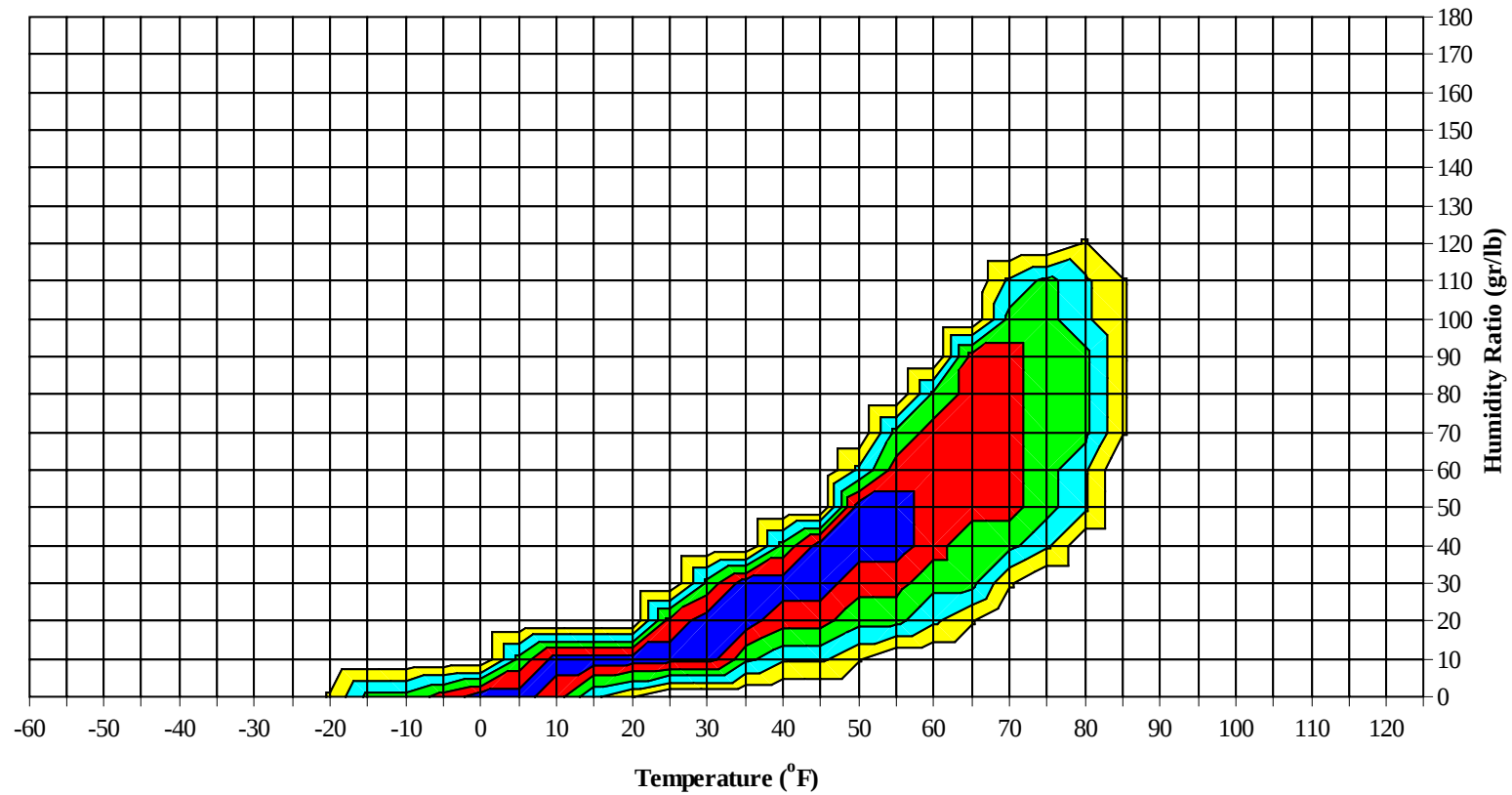
### Average Annual Climate



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### Long Term Psychrometric Summary

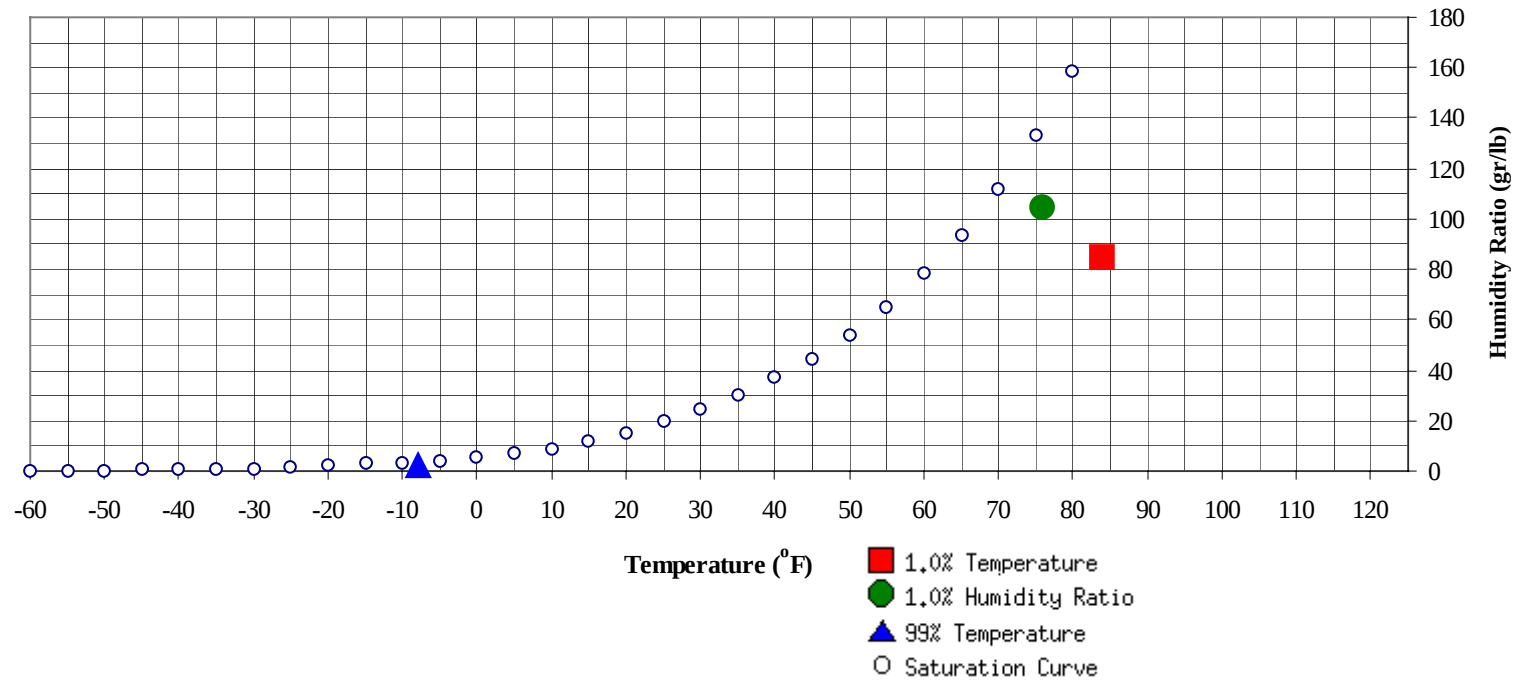


- 50% of all observations
- 80% of all observations
- 95% of all observations
- 97.5% of all observations
- 99% of all observations

OTTAWA CN

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## Psychrometric Summary of Peak Design Values



| 99% Dry Bulb | (°F) | MCHR<br>(gr/lb) | Enthalpy<br>(btu/lb) | 1.0% Humidity<br>Ratio | (gr/lb) | MCDB<br>(°F) | MCWB<br>(°F) | MC Dewpt<br>(°F) | Enthalpy<br>(btu/lb) |
|--------------|------|-----------------|----------------------|------------------------|---------|--------------|--------------|------------------|----------------------|
|              | -8   | 2.2             | -1.6                 |                        | 105     | 75.8         | 70.4         | 68               | 34.6                 |

| 1.0% Dry Bulb | (°F) | MCHR<br>(gr/lb) | MCWB<br>(°F) | Enthalpy<br>(btu/lb) |
|---------------|------|-----------------|--------------|----------------------|
|               | 84   | 85.2            | 69.5         | 33.5                 |

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**Dry-Bulb Temperature Hours For An Average Year (Sheet 1 of 5)**

Period of Record = 1973 to 1996

| Temperature<br>Range<br>(°F) | January             |                |                |              |                          | February            |                |                |              |                          | March               |                |                |              |                          |
|------------------------------|---------------------|----------------|----------------|--------------|--------------------------|---------------------|----------------|----------------|--------------|--------------------------|---------------------|----------------|----------------|--------------|--------------------------|
|                              | Hour<br>Group (LST) |                |                | Total<br>Obs | M<br>C<br>W<br>B<br>(°F) | Hour<br>Group (LST) |                |                | Total<br>Obs | M<br>C<br>W<br>B<br>(°F) | Hour<br>Group (LST) |                |                | Total<br>Obs | M<br>C<br>W<br>B<br>(°F) |
|                              | 01<br>To<br>08      | 09<br>To<br>16 | 17<br>To<br>00 |              |                          | 01<br>To<br>08      | 09<br>To<br>16 | 17<br>To<br>00 |              |                          | 01<br>To<br>08      | 09<br>To<br>16 | 17<br>To<br>00 |              |                          |
| 95 / 99                      |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| 90 / 94                      |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| 85 / 89                      |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| 80 / 84                      |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| 75 / 79                      |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| 70 / 74                      |                     |                |                |              |                          |                     |                |                |              |                          |                     | 0              | 0              | 0            | 56.8                     |
| 65 / 69                      |                     |                |                |              |                          |                     |                |                |              |                          |                     | 0              | 0              | 0            | 53.8                     |
| 60 / 64                      |                     |                |                |              |                          |                     |                |                |              |                          |                     | 1              | 0              | 1            | 51.5                     |
| 55 / 59                      |                     |                |                |              |                          |                     |                |                |              |                          | 0                   | 4              | 2              | 6            | 48.7                     |
| 50 / 54                      | 0                   | 0              | 0              | 0            | 50.3                     |                     | 0              | 0              | 0            | 45.7                     | 1                   | 8              | 6              | 15           | 45.0                     |
| 45 / 49                      | 0                   | 2              | 1              | 3            | 43.5                     | 0                   | 2              | 2              | 4            | 42.5                     | 5                   | 18             | 13             | 36           | 40.6                     |
| 40 / 44                      | 2                   | 2              | 2              | 6            | 39.1                     | 3                   | 5              | 4              | 12           | 39.0                     | 9                   | 20             | 17             | 46           | 37.3                     |
| 35 / 39                      | 11                  | 17             | 15             | 43           | 34.5                     | 12                  | 18             | 15             | 45           | 34.5                     | 28                  | 45             | 48             | 121          | 33.4                     |
| 30 / 34                      | 20                  | 24             | 22             | 66           | 30.5                     | 17                  | 23             | 24             | 64           | 29.8                     | 53                  | 46             | 50             | 149          | 29.2                     |
| 25 / 29                      | 23                  | 25             | 24             | 72           | 25.0                     | 20                  | 29             | 26             | 75           | 24.3                     | 36                  | 34             | 38             | 108          | 23.6                     |
| 20 / 24                      | 15                  | 20             | 18             | 53           | 20.4                     | 15                  | 24             | 23             | 62           | 19.7                     | 31                  | 22             | 24             | 77           | 19.4                     |
| 15 / 19                      | 28                  | 30             | 33             | 91           | 15.8                     | 33                  | 32             | 37             | 102          | 15.6                     | 29                  | 20             | 23             | 72           | 15.2                     |
| 10 / 14                      | 29                  | 32             | 34             | 95           | 10.7                     | 29                  | 30             | 35             | 94           | 10.3                     | 23                  | 16             | 16             | 55           | 10.1                     |
| 5 / 9                        | 32                  | 32             | 36             | 100          | 5.5                      | 31                  | 27             | 29             | 87           | 5.5                      | 17                  | 8              | 6              | 31           | 5.3                      |
| 0 / 4                        | 32                  | 27             | 29             | 88           | 0.4                      | 28                  | 19             | 18             | 65           | 0.2                      | 12                  | 4              | 3              | 19           | 0.4                      |
| -5 / -1                      | 17                  | 14             | 16             | 47           | -4.0                     | 16                  | 7              | 6              | 29           | -4.0                     | 3                   | 1              | 1              | 5            | -3.8                     |
| -10 / -6                     | 20                  | 12             | 13             | 45           | -8.1                     | 14                  | 5              | 4              | 23           | -8.0                     | 2                   | 0              | 0              | 2            | -7.8                     |
| -15 / -11                    | 10                  | 5              | 4              | 19           | -12.6                    | 5                   | 1              | 1              | 7            | -12.4                    | 0                   | 0              |                | 0            | -12.3                    |
| -20 / -16                    | 7                   | 3              | 2              | 12           | -16.9                    | 2                   | 1              | 0              | 3            | -16.8                    | 0                   | 0              |                | 0            | -16.4                    |
| -25 / -21                    | 2                   | 1              | 1              | 4            | -22.1                    | 0                   | 0              |                | 0            | -21.2                    |                     |                |                |              |                          |
| -30 / -26                    | 1                   | 0              | 0              | 1            | -27.5                    |                     |                |                |              |                          |                     |                |                |              |                          |
| -35 / -31                    | 0                   |                |                | 0            | -31.0                    |                     |                |                |              |                          |                     |                |                |              |                          |

**Caution:** This summary reflects the typical distribution of temperature in a typical year. It does not reflect the typical moisture distribution. Because wet bulb temperatures are averaged, this summary understates the annual moisture load. For accurate moisture load data, see the long-term humidity summary and the ventilation and infiltration load pages in this manual.

OTTAWA CN

WMO No. 716280

**Dry-Bulb Temperature Hours For An Average Year (Sheet 2 of 5)**

Period of Record = 1973 to 1996

| Temperature<br>Range<br>(°F) | April               |                |                |              |                          | May                 |                |                |              |                          | June                |                |                |              |                          |
|------------------------------|---------------------|----------------|----------------|--------------|--------------------------|---------------------|----------------|----------------|--------------|--------------------------|---------------------|----------------|----------------|--------------|--------------------------|
|                              | Hour<br>Group (LST) |                |                | Total<br>Obs | M<br>C<br>W<br>B<br>(°F) | Hour<br>Group (LST) |                |                | Total<br>Obs | M<br>C<br>W<br>B<br>(°F) | Hour<br>Group (LST) |                |                | Total<br>Obs | M<br>C<br>W<br>B<br>(°F) |
|                              | 01<br>To<br>08      | 09<br>To<br>16 | 17<br>To<br>00 |              |                          | 01<br>To<br>08      | 09<br>To<br>16 | 17<br>To<br>00 |              |                          | 01<br>To<br>08      | 09<br>To<br>16 | 17<br>To<br>00 |              |                          |
| 95 / 99                      |                     |                |                |              |                          |                     |                |                |              |                          |                     | 0              | 0              | 0            | 75.3                     |
| 90 / 94                      |                     |                |                |              |                          |                     | 0              |                | 0            | 67.7                     |                     | 3              | 1              | 4            | 71.1                     |
| 85 / 89                      |                     | 0              | 0              | 0            | 66.0                     |                     | 3              | 1              | 4            | 68.4                     |                     | 5              | 2              | 7            | 69.7                     |
| 80 / 84                      |                     | 1              | 0              | 1            | 64.1                     |                     | 6              | 3              | 9            | 66.0                     | 0                   | 22             | 10             | 32           | 67.4                     |
| 75 / 79                      |                     | 2              | 1              | 3            | 61.2                     | 0                   | 16             | 9              | 25           | 62.3                     | 2                   | 40             | 26             | 68           | 64.3                     |
| 70 / 74                      | 0                   | 5              | 3              | 8            | 57.9                     | 2                   | 27             | 19             | 48           | 59.2                     | 16                  | 56             | 46             | 119          | 61.5                     |
| 65 / 69                      | 0                   | 7              | 5              | 12           | 55.1                     | 8                   | 27             | 24             | 59           | 56.9                     | 27                  | 40             | 42             | 109          | 59.6                     |
| 60 / 64                      | 4                   | 16             | 12             | 32           | 52.1                     | 23                  | 48             | 42             | 113          | 53.7                     | 59                  | 40             | 57             | 156          | 56.7                     |
| 55 / 59                      | 6                   | 26             | 20             | 52           | 47.8                     | 39                  | 49             | 49             | 137          | 50.2                     | 73                  | 22             | 35             | 131          | 52.7                     |
| 50 / 54                      | 14                  | 35             | 31             | 80           | 44.2                     | 56                  | 37             | 51             | 144          | 46.4                     | 43                  | 8              | 14             | 65           | 48.1                     |
| 45 / 49                      | 30                  | 41             | 42             | 113          | 40.7                     | 60                  | 22             | 33             | 115          | 42.1                     | 16                  | 2              | 5              | 23           | 43.4                     |
| 40 / 44                      | 33                  | 34             | 35             | 102          | 37.2                     | 34                  | 7              | 11             | 52           | 38.3                     | 4                   | 0              | 1              | 5            | 39.2                     |
| 35 / 39                      | 56                  | 38             | 49             | 143          | 33.3                     | 22                  | 4              | 5              | 31           | 33.9                     | 1                   |                |                | 1            | 35.6                     |
| 30 / 34                      | 53                  | 21             | 30             | 104          | 28.8                     | 5                   | 1              | 1              | 7            | 29.1                     | 0                   |                |                | 0            | 30.0                     |
| 25 / 29                      | 28                  | 9              | 10             | 47           | 23.7                     | 1                   | 0              |                | 1            | 24.1                     |                     |                |                |              |                          |
| 20 / 24                      | 9                   | 3              | 2              | 14           | 19.0                     |                     |                |                |              |                          |                     |                |                |              |                          |
| 15 / 19                      | 5                   | 1              | 1              | 7            | 15.0                     |                     |                |                |              |                          |                     |                |                |              |                          |
| 10 / 14                      | 1                   | 0              | 1              | 2            | 10.5                     |                     |                |                |              |                          |                     |                |                |              |                          |
| 5 / 9                        | 1                   | 0              |                | 1            | 5.1                      |                     |                |                |              |                          |                     |                |                |              |                          |
| 0 / 4                        |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| -5 / -1                      |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| -10 / -6                     |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| -15 / -11                    |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| -20 / -16                    |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| -25 / -21                    |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| -30 / -26                    |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| -35 / -31                    |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |

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WMO No. 716280

**Dry-Bulb Temperature Hours For An Average Year (Sheet 3 of 5)**

Period of Record = 1973 to 1996

| Temperature<br>Range<br>(°F) | July                |                |                |              |                          | August              |                |                |              |                          | September           |                |                |              |                          |
|------------------------------|---------------------|----------------|----------------|--------------|--------------------------|---------------------|----------------|----------------|--------------|--------------------------|---------------------|----------------|----------------|--------------|--------------------------|
|                              | Hour<br>Group (LST) |                |                | Total<br>Obs | M<br>C<br>W<br>B<br>(°F) | Hour<br>Group (LST) |                |                | Total<br>Obs | M<br>C<br>W<br>B<br>(°F) | Hour<br>Group (LST) |                |                | Total<br>Obs | M<br>C<br>W<br>B<br>(°F) |
|                              | 01<br>To<br>08      | 09<br>To<br>16 | 17<br>To<br>00 |              |                          | 01<br>To<br>08      | 09<br>To<br>16 | 17<br>To<br>00 |              |                          | 01<br>To<br>08      | 09<br>To<br>16 | 17<br>To<br>00 |              |                          |
| 95 / 99                      |                     | 0              | 0              | 0            | 73.9                     |                     |                |                |              |                          |                     |                |                |              |                          |
| 90 / 94                      |                     | 4              | 2              | 6            | 74.2                     |                     | 2              | 0              | 2            | 73.9                     |                     | 0              | 0              | 0            | 73.1                     |
| 85 / 89                      |                     | 14             | 5              | 19           | 71.3                     |                     | 8              | 2              | 10           | 71.6                     |                     | 1              | 0              | 1            | 71.8                     |
| 80 / 84                      | 0                   | 45             | 22             | 66           | 68.2                     | 0                   | 32             | 13             | 45           | 69.0                     |                     | 6              | 2              | 8            | 69.4                     |
| 75 / 79                      | 6                   | 67             | 48             | 121          | 65.9                     | 3                   | 58             | 34             | 94           | 66.6                     | 1                   | 14             | 5              | 20           | 66.4                     |
| 70 / 74                      | 39                  | 70             | 75             | 183          | 63.7                     | 24                  | 66             | 65             | 155          | 64.1                     | 4                   | 30             | 18             | 52           | 63.5                     |
| 65 / 69                      | 58                  | 28             | 46             | 132          | 61.6                     | 48                  | 38             | 52             | 138          | 61.8                     | 11                  | 31             | 23             | 65           | 60.8                     |
| 60 / 64                      | 83                  | 17             | 39             | 139          | 58.3                     | 75                  | 31             | 52             | 158          | 58.4                     | 29                  | 54             | 49             | 132          | 57.1                     |
| 55 / 59                      | 48                  | 3              | 11             | 62           | 53.6                     | 63                  | 10             | 24             | 97           | 53.7                     | 44                  | 54             | 60             | 158          | 52.6                     |
| 50 / 54                      | 13                  | 0              | 1              | 14           | 49.2                     | 30                  | 2              | 6              | 38           | 49.4                     | 64                  | 33             | 50             | 147          | 48.5                     |
| 45 / 49                      | 2                   |                | 0              | 2            | 43.8                     | 5                   | 0              | 1              | 6            | 44.1                     | 51                  | 13             | 25             | 89           | 43.8                     |
| 40 / 44                      |                     |                |                |              |                          | 1                   |                | 0              | 1            | 39.3                     | 22                  | 2              | 6              | 30           | 39.4                     |
| 35 / 39                      |                     |                |                |              |                          | 0                   |                |                | 0            | 38.0                     | 12                  | 1              | 2              | 15           | 35.7                     |
| 30 / 34                      |                     |                |                |              |                          |                     |                |                |              |                          | 2                   |                | 0              | 2            | 31.0                     |
| 25 / 29                      |                     |                |                |              |                          |                     |                |                |              |                          | 0                   |                |                | 0            | 27.8                     |
| 20 / 24                      |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| 15 / 19                      |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| 10 / 14                      |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| 5 / 9                        |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| 0 / 4                        |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| -5 / -1                      |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| -10 / -6                     |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| -15 / -11                    |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| -20 / -16                    |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| -25 / -21                    |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| -30 / -26                    |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| -35 / -31                    |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |

**Caution:** This summary reflects the typical distribution of temperature in a typical year. It does not reflect the typical moisture distribution. Because wet bulb temperatures are averaged, this summary understates the annual moisture load. For accurate moisture load data, see the long-term humidity summary and the ventilation and infiltration load pages in this manual.

OTTAWA CN

WMO No. 716280

**Dry-Bulb Temperature Hours For An Average Year (Sheet 4 of 5)**

Period of Record = 1973 to 1996

| Temperature<br>Range<br>(°F) | October             |                |                |              |                          | November            |                |                |              |                          | December            |                |                |              |                          |
|------------------------------|---------------------|----------------|----------------|--------------|--------------------------|---------------------|----------------|----------------|--------------|--------------------------|---------------------|----------------|----------------|--------------|--------------------------|
|                              | Hour<br>Group (LST) |                |                | Total<br>Obs | M<br>C<br>W<br>B<br>(°F) | Hour<br>Group (LST) |                |                | Total<br>Obs | M<br>C<br>W<br>B<br>(°F) | Hour<br>Group (LST) |                |                | Total<br>Obs | M<br>C<br>W<br>B<br>(°F) |
|                              | 01<br>To<br>08      | 09<br>To<br>16 | 17<br>To<br>00 |              |                          | 01<br>To<br>08      | 09<br>To<br>16 | 17<br>To<br>00 |              |                          | 01<br>To<br>08      | 09<br>To<br>16 | 17<br>To<br>00 |              |                          |
| 95 / 99                      |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| 90 / 94                      |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| 85 / 89                      |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| 80 / 84                      |                     | 0              |                | 0            | 67.0                     |                     |                |                |              |                          |                     |                |                |              |                          |
| 75 / 79                      |                     | 1              | 0              | 1            | 66.2                     |                     |                |                |              |                          |                     |                |                |              |                          |
| 70 / 74                      |                     | 5              | 2              | 7            | 61.7                     |                     |                |                |              |                          |                     |                |                |              |                          |
| 65 / 69                      | 0                   | 9              | 3              | 12           | 58.4                     | 0                   | 0              | 0              | 0            | 59.8                     |                     |                |                |              |                          |
| 60 / 64                      | 5                   | 22             | 13             | 40           | 55.9                     | 1                   | 3              | 1              | 5            | 57.1                     |                     | 0              | 0              | 0            | 57.5                     |
| 55 / 59                      | 15                  | 35             | 27             | 76           | 51.8                     | 2                   | 8              | 5              | 15           | 52.7                     | 0                   | 0              | 0              | 0            | 55.3                     |
| 50 / 54                      | 27                  | 51             | 45             | 122          | 47.2                     | 7                   | 12             | 9              | 28           | 48.2                     | 0                   | 0              | 1              | 1            | 49.5                     |
| 45 / 49                      | 52                  | 55             | 60             | 166          | 42.8                     | 15                  | 24             | 19             | 58           | 43.2                     | 2                   | 3              | 1              | 6            | 43.2                     |
| 40 / 44                      | 39                  | 34             | 38             | 110          | 38.4                     | 15                  | 30             | 24             | 69           | 39.0                     | 3                   | 6              | 5              | 14           | 39.6                     |
| 35 / 39                      | 56                  | 29             | 42             | 127          | 34.5                     | 50                  | 52             | 50             | 153          | 34.5                     | 15                  | 23             | 19             | 57           | 34.8                     |
| 30 / 34                      | 41                  | 7              | 18             | 66           | 29.9                     | 56                  | 51             | 59             | 167          | 29.8                     | 37                  | 45             | 44             | 126          | 30.5                     |
| 25 / 29                      | 13                  | 0              | 2              | 15           | 25.3                     | 40                  | 34             | 39             | 114          | 24.5                     | 37                  | 40             | 41             | 118          | 25.0                     |
| 20 / 24                      | 1                   |                | 0              | 1            | 20.8                     | 24                  | 12             | 16             | 52           | 20.3                     | 25                  | 25             | 26             | 76           | 20.6                     |
| 15 / 19                      |                     |                |                |              |                          | 19                  | 8              | 10             | 37           | 16.2                     | 33                  | 29             | 33             | 95           | 16.2                     |
| 10 / 14                      |                     |                |                |              |                          | 7                   | 3              | 5              | 15           | 11.0                     | 27                  | 22             | 24             | 73           | 10.9                     |
| 5 / 9                        |                     |                |                |              |                          | 3                   | 1              | 1              | 5            | 6.2                      | 24                  | 22             | 21             | 67           | 5.8                      |
| 0 / 4                        |                     |                |                |              |                          | 1                   | 0              |                | 1            | 0.9                      | 19                  | 17             | 17             | 53           | 0.5                      |
| -5 / -1                      |                     |                |                |              |                          |                     |                |                |              |                          | 11                  | 7              | 7              | 25           | -3.8                     |
| -10 / -6                     |                     |                |                |              |                          |                     |                |                |              |                          | 10                  | 5              | 6              | 21           | -8.0                     |
| -15 / -11                    |                     |                |                |              |                          |                     |                |                |              |                          | 4                   | 1              | 1              | 6            | -12.5                    |
| -20 / -16                    |                     |                |                |              |                          |                     |                |                |              |                          | 2                   | 1              | 1              | 4            | -16.6                    |
| -25 / -21                    |                     |                |                |              |                          |                     |                |                |              |                          | 1                   | 0              | 0              | 1            | -22.7                    |
| -30 / -26                    |                     |                |                |              |                          |                     |                |                |              |                          | 0                   |                |                | 0            | -26.0                    |
| -35 / -31                    |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |

**Caution:** This summary reflects the typical distribution of temperature in a typical year. It does not reflect the typical moisture distribution. Because wet bulb temperatures are averaged, this summary understates the annual moisture load. For accurate moisture load data, see the long-term humidity summary and the ventilation and infiltration load pages in this manual.

OTTAWA CN

WMO No. 716280

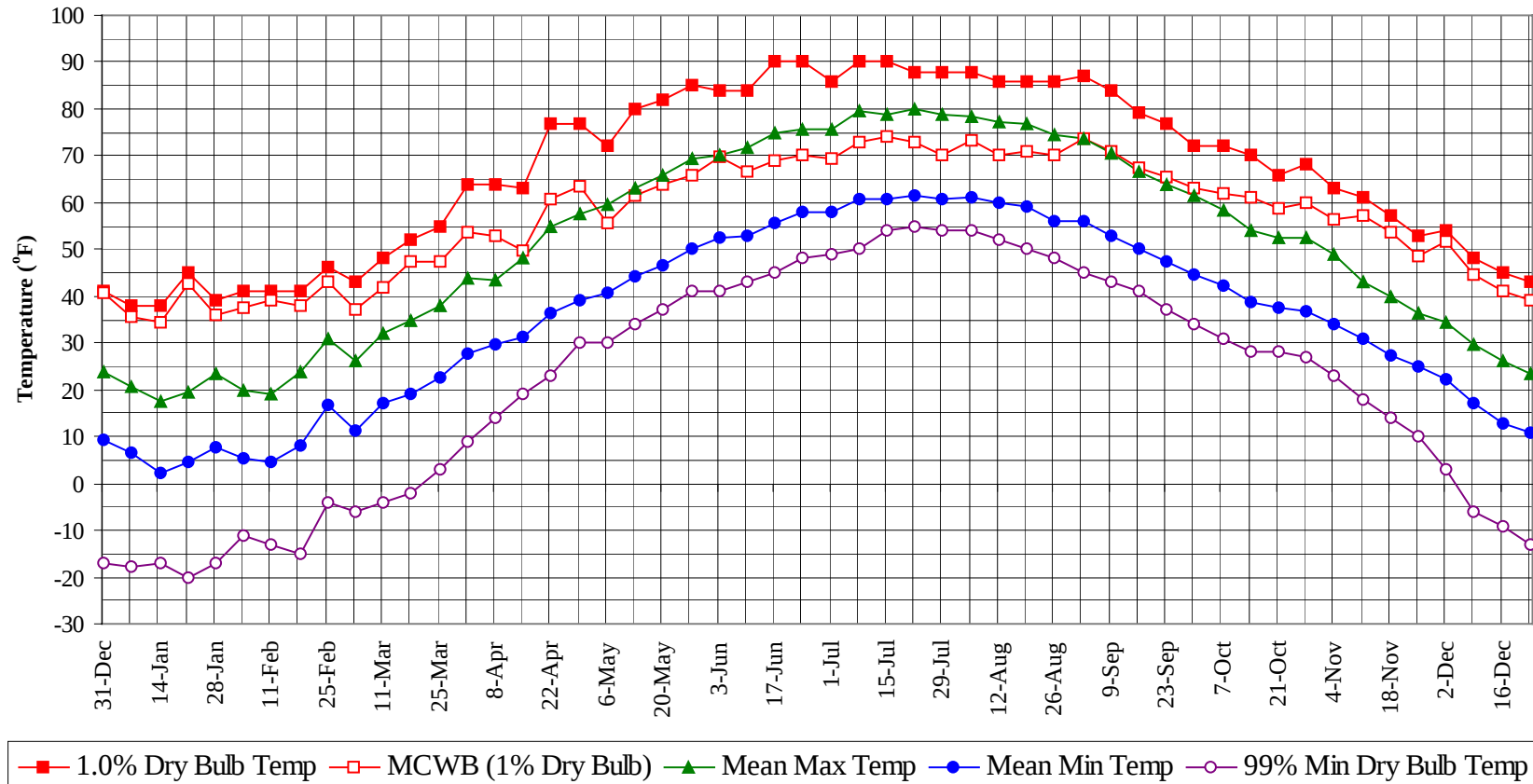
**Dry-Bulb Temperature Hours For An Average Year (Sheet 5 of 5)**

Period of Record = 1973 to 1996

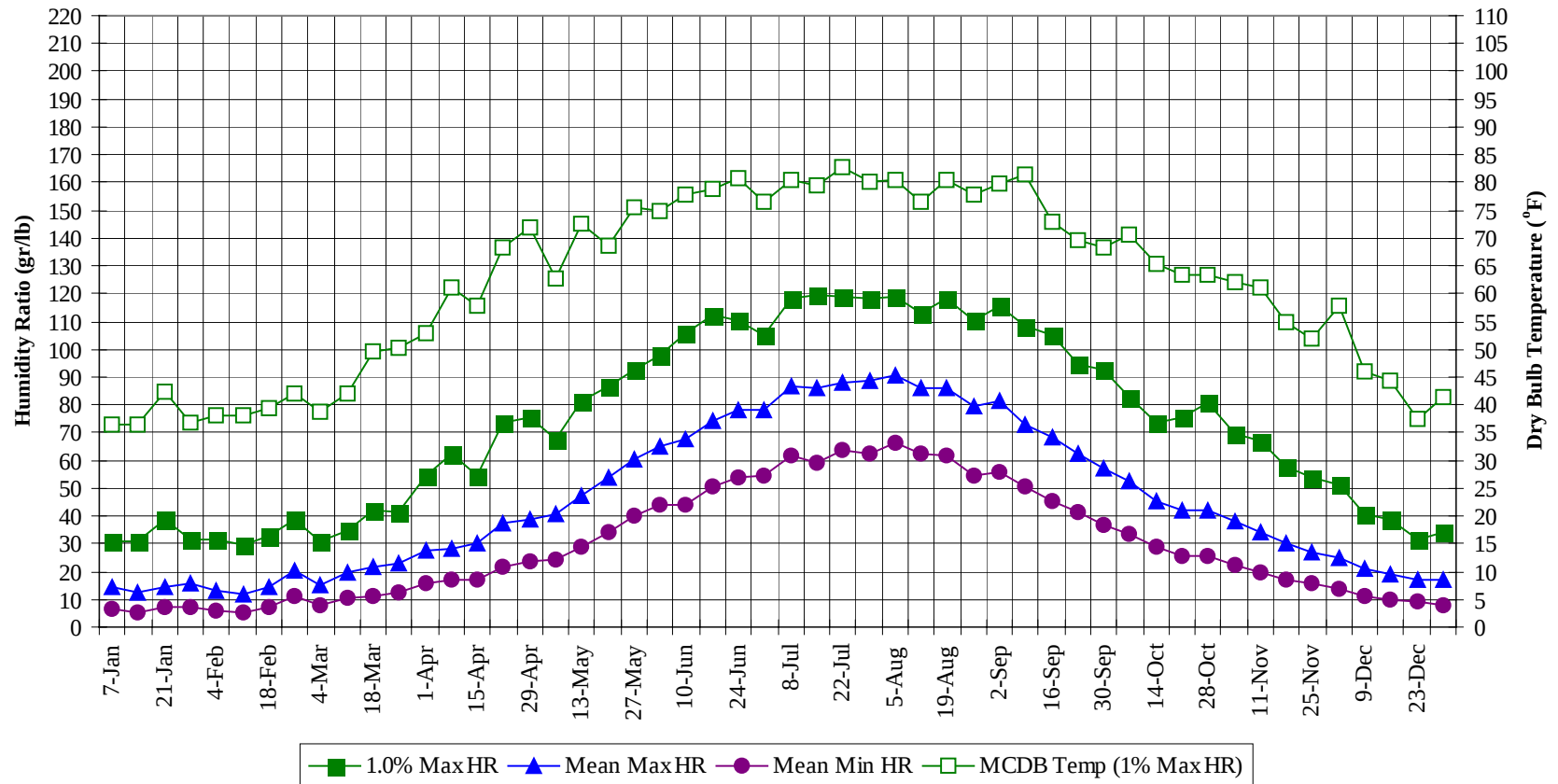
| Annual Totals                |                     |                |                |              |                          |
|------------------------------|---------------------|----------------|----------------|--------------|--------------------------|
| Temperature<br>Range<br>(°F) | Hour<br>Group (LST) |                |                | Total<br>Obs | M<br>C<br>W<br>B<br>(°F) |
|                              | 01<br>To<br>08      | 09<br>To<br>16 | 17<br>To<br>00 |              |                          |
| 95 / 99                      |                     | 0              | 0              | 0            | 74.3                     |
| 90 / 94                      |                     | 10             | 3              | 13           | 73.1                     |
| 85 / 89                      |                     | 31             | 10             | 41           | 70.8                     |
| 80 / 84                      | 0                   | 111            | 49             | 160          | 68.1                     |
| 75 / 79                      | 12                  | 196            | 123            | 330          | 65.5                     |
| 70 / 74                      | 84                  | 258            | 226            | 568          | 62.8                     |
| 65 / 69                      | 150                 | 181            | 194            | 524          | 60.4                     |
| 60 / 64                      | 275                 | 231            | 262            | 769          | 56.7                     |
| 55 / 59                      | 287                 | 209            | 232            | 728          | 51.9                     |
| 50 / 54                      | 251                 | 188            | 214            | 653          | 47.2                     |
| 45 / 49                      | 236                 | 183            | 203            | 622          | 42.4                     |
| 40 / 44                      | 164                 | 140            | 143            | 447          | 38.2                     |
| 35 / 39                      | 263                 | 227            | 245            | 736          | 34.1                     |
| 30 / 34                      | 286                 | 220            | 249            | 756          | 29.7                     |
| 25 / 29                      | 200                 | 174            | 181            | 554          | 24.4                     |
| 20 / 24                      | 119                 | 108            | 110            | 337          | 20.0                     |
| 15 / 19                      | 146                 | 121            | 139            | 406          | 15.8                     |
| 10 / 14                      | 116                 | 106            | 115            | 337          | 10.5                     |
| 5 / 9                        | 108                 | 91             | 94             | 293          | 5.5                      |
| 0 / 4                        | 92                  | 68             | 68             | 228          | 0.4                      |
| -5 / -1                      | 47                  | 29             | 30             | 106          | -4.0                     |
| -10 / -6                     | 46                  | 23             | 23             | 92           | -8.1                     |
| -15 / -11                    | 20                  | 8              | 6              | 34           | -12.5                    |
| -20 / -16                    | 11                  | 5              | 3              | 19           | -16.8                    |
| -25 / -21                    | 4                   | 2              | 1              | 7            | -22.1                    |
| -30 / -26                    | 1                   | 0              | 0              | 1            | -27.4                    |
| -35 / -31                    | 0                   |                |                | 0            | -31.0                    |

**Caution:** This summary reflects the typical distribution of temperature in a typical year. It does not reflect the typical moisture distribution. Because wet bulb temperatures are averaged, this summary understates the annual moisture load. For accurate moisture load data, see the long-term humidity summary and the ventilation and infiltration load pages in this manual.

## Annual Summary of Temperatures



## Long Term Humidity and Dry Bulb Temperature Summary

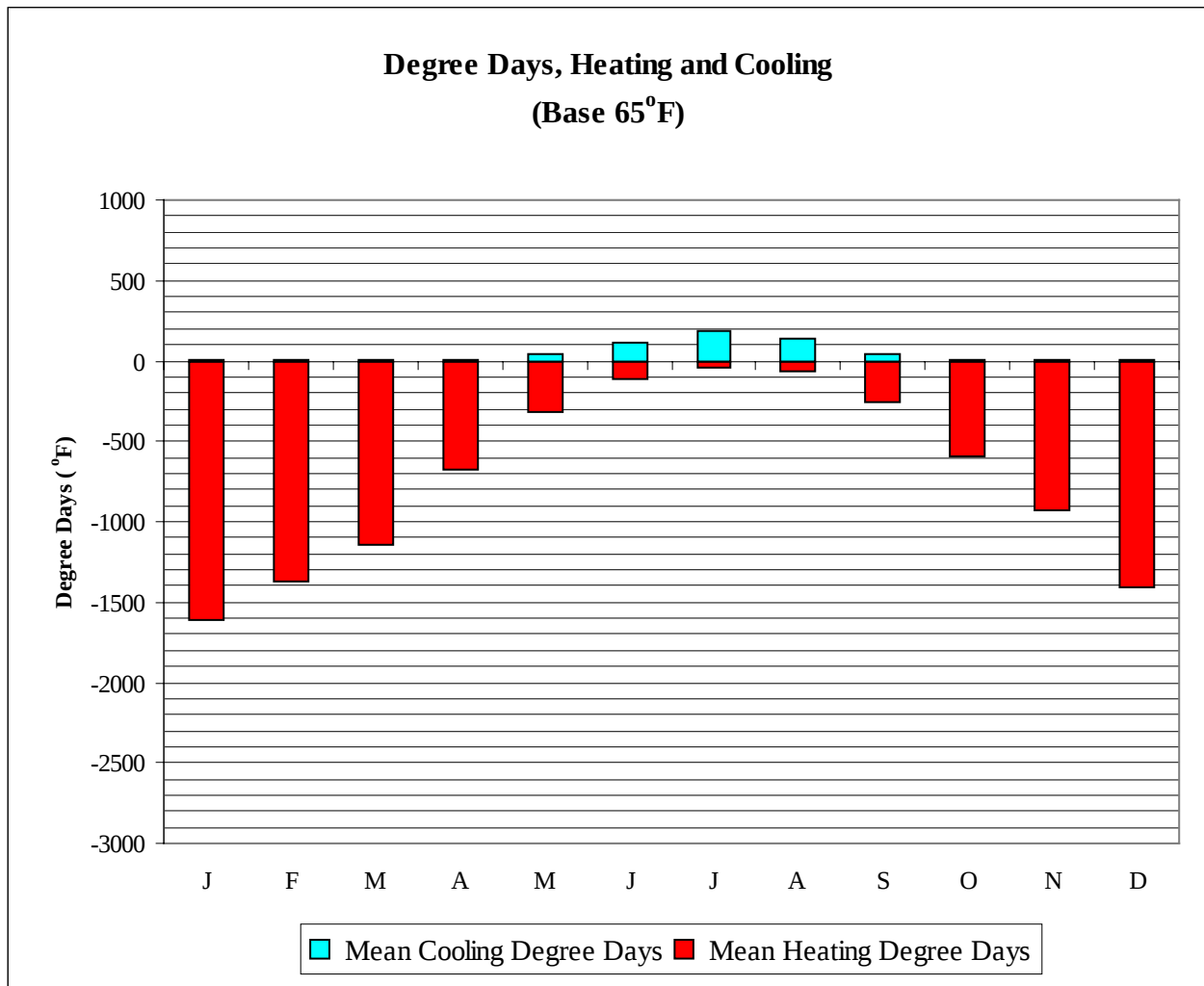


OTTAWA CN

WMO No. 716280

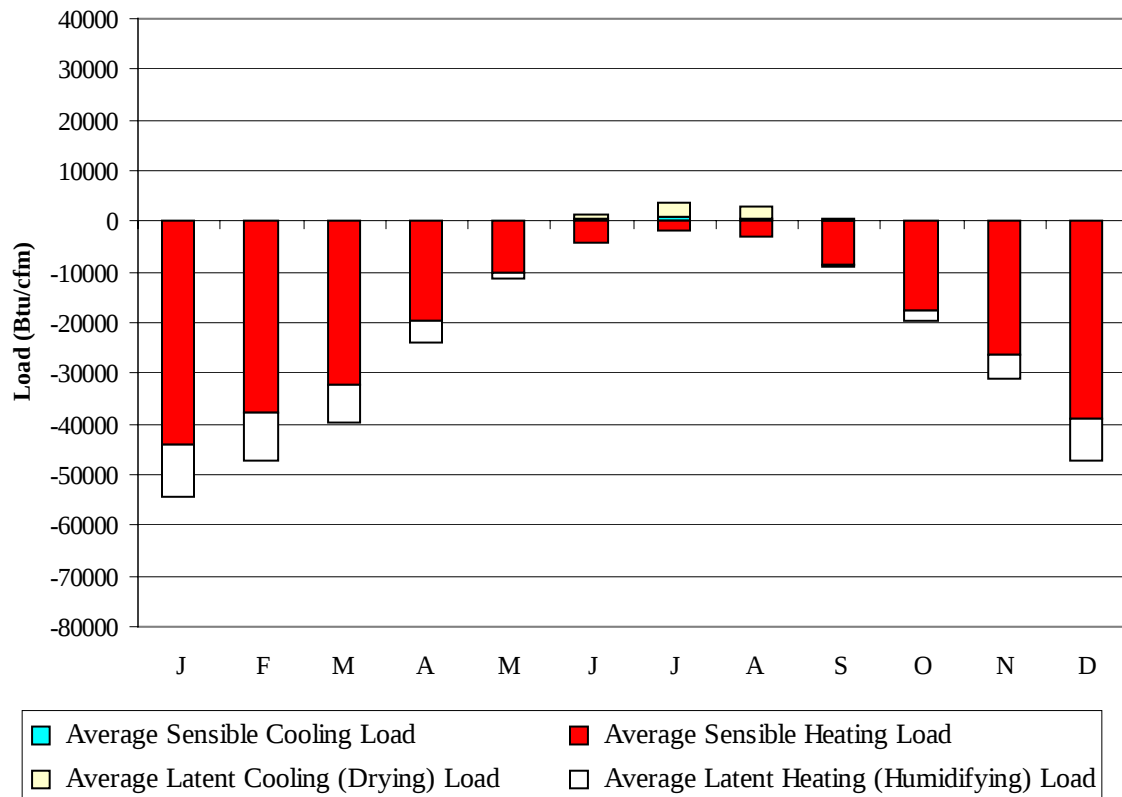
**Long Term Dry Bulb Temperature and Humidity Summary**

| Week Ending | 1.0% Temp (°F) | MCWB @ 1% Temp (°F) | Mean Max Temp (°F) | Mean Min Temp (°F) | 99% Temp (°F) | 1.0% HR (gr/lb) | MCDB @ 1% HR (°F) | Mean Max HR (gr/lb) | Mean Min HR (gr/lb) |
|-------------|----------------|---------------------|--------------------|--------------------|---------------|-----------------|-------------------|---------------------|---------------------|
| 7-Jan       | 38.0           | 35.8                | 20.8               | 6.5                | -18.0         | 30.8            | 36.3              | 14.5                | 6.6                 |
| 14-Jan      | 38.0           | 34.4                | 17.6               | 2.3                | -17.0         | 30.8            | 36.4              | 12.4                | 5.4                 |
| 21-Jan      | 45.0           | 42.6                | 19.5               | 4.6                | -20.0         | 38.5            | 42.4              | 14.3                | 6.9                 |
| 28-Jan      | 39.0           | 36.0                | 23.6               | 7.6                | -17.0         | 31.5            | 36.6              | 16.1                | 7.4                 |
| 4-Feb       | 41.0           | 37.5                | 20.0               | 5.4                | -11.0         | 31.5            | 38.0              | 13.0                | 6.0                 |
| 11-Feb      | 41.0           | 39.2                | 19.1               | 4.4                | -13.0         | 29.4            | 38.2              | 11.6                | 5.5                 |
| 18-Feb      | 41.0           | 37.8                | 23.8               | 8.0                | -15.0         | 32.9            | 39.5              | 14.4                | 7.2                 |
| 25-Feb      | 46.0           | 42.9                | 30.7               | 16.9               | -4.0          | 38.5            | 42.1              | 20.5                | 11.0                |
| 4-Mar       | 43.0           | 37.3                | 26.2               | 11.4               | -6.0          | 30.8            | 38.7              | 14.8                | 7.8                 |
| 11-Mar      | 48.0           | 41.7                | 32.2               | 17.0               | -4.0          | 35.0            | 42.1              | 19.5                | 10.2                |
| 18-Mar      | 52.0           | 47.6                | 34.9               | 19.2               | -2.0          | 42.0            | 49.5              | 21.5                | 11.2                |
| 25-Mar      | 55.0           | 47.6                | 38.1               | 22.6               | 3.0           | 41.3            | 50.2              | 23.1                | 12.6                |
| 1-Apr       | 64.0           | 53.8                | 43.7               | 27.8               | 9.0           | 54.6            | 52.8              | 27.5                | 15.7                |
| 8-Apr       | 64.0           | 52.8                | 43.5               | 29.6               | 14.0          | 62.3            | 61.0              | 28.0                | 16.8                |
| 15-Apr      | 63.0           | 49.7                | 48.1               | 31.4               | 19.0          | 54.6            | 57.7              | 29.9                | 17.1                |
| 22-Apr      | 77.0           | 60.9                | 54.8               | 36.4               | 23.0          | 73.5            | 68.2              | 37.3                | 21.5                |
| 29-Apr      | 77.0           | 63.6                | 57.8               | 39.3               | 30.0          | 75.6            | 71.8              | 38.6                | 23.9                |
| 6-May       | 72.0           | 55.6                | 59.4               | 40.8               | 30.0          | 67.9            | 62.8              | 40.5                | 24.0                |
| 13-May      | 80.0           | 61.5                | 63.1               | 44.4               | 34.0          | 81.2            | 72.7              | 47.5                | 29.0                |
| 20-May      | 82.0           | 63.9                | 65.9               | 46.7               | 37.0          | 86.8            | 68.5              | 54.1                | 33.9                |
| 27-May      | 85.0           | 65.8                | 69.2               | 50.3               | 41.0          | 92.4            | 75.6              | 60.6                | 39.9                |
| 3-Jun       | 84.0           | 69.8                | 70.3               | 52.3               | 41.0          | 98.0            | 74.9              | 65.2                | 43.9                |
| 10-Jun      | 84.0           | 66.5                | 71.6               | 53.0               | 43.0          | 105.7           | 77.7              | 67.8                | 44.0                |
| 17-Jun      | 90.0           | 68.8                | 75.0               | 55.7               | 45.0          | 112.0           | 78.7              | 73.9                | 50.3                |
| 24-Jun      | 90.0           | 70.2                | 75.6               | 57.9               | 48.0          | 110.6           | 80.7              | 78.0                | 54.1                |
| 1-Jul       | 86.0           | 69.6                | 75.6               | 57.9               | 49.0          | 105.0           | 76.6              | 78.0                | 54.4                |
| 8-Jul       | 90.0           | 72.8                | 79.5               | 60.6               | 50.0          | 118.3           | 80.4              | 86.5                | 61.6                |
| 15-Jul      | 90.0           | 74.0                | 78.8               | 60.6               | 54.0          | 119.7           | 79.5              | 85.8                | 59.3                |
| 22-Jul      | 88.0           | 72.7                | 80.0               | 61.6               | 55.0          | 119.0           | 82.8              | 88.3                | 63.7                |
| 29-Jul      | 88.0           | 70.2                | 78.7               | 60.8               | 54.0          | 118.3           | 80.1              | 88.7                | 62.5                |
| 5-Aug       | 88.0           | 73.5                | 78.3               | 61.2               | 54.0          | 119.0           | 80.5              | 90.5                | 66.1                |
| 12-Aug      | 86.0           | 70.1                | 77.1               | 59.9               | 52.0          | 112.7           | 76.4              | 86.2                | 62.4                |
| 19-Aug      | 86.0           | 70.9                | 76.9               | 59.1               | 50.0          | 118.3           | 80.6              | 85.8                | 61.7                |
| 26-Aug      | 86.0           | 70.2                | 74.6               | 56.1               | 48.0          | 110.6           | 77.9              | 79.2                | 54.6                |
| 2-Sep       | 87.0           | 73.8                | 73.6               | 56.1               | 45.0          | 115.5           | 79.7              | 81.4                | 55.9                |
| 9-Sep       | 84.0           | 71.0                | 70.6               | 52.7               | 43.0          | 108.5           | 81.4              | 72.7                | 50.3                |
| 16-Sep      | 79.0           | 67.3                | 66.8               | 50.0               | 41.0          | 105.0           | 72.8              | 68.2                | 45.4                |
| 23-Sep      | 77.0           | 65.6                | 63.7               | 47.4               | 37.0          | 94.5            | 69.7              | 62.6                | 41.1                |
| 30-Sep      | 72.0           | 63.2                | 61.4               | 44.7               | 34.0          | 92.4            | 68.4              | 57.1                | 37.0                |
| 7-Oct       | 72.0           | 62.1                | 58.5               | 42.3               | 31.0          | 82.6            | 70.8              | 52.8                | 33.7                |
| 14-Oct      | 70.0           | 61.1                | 54.2               | 38.8               | 28.0          | 73.5            | 65.3              | 45.4                | 29.2                |
| 21-Oct      | 66.0           | 58.8                | 52.6               | 37.5               | 28.0          | 75.6            | 63.5              | 41.9                | 25.9                |
| 28-Oct      | 68.0           | 59.8                | 52.3               | 36.8               | 27.0          | 80.5            | 63.4              | 42.2                | 25.9                |
| 4-Nov       | 63.0           | 56.4                | 49.0               | 34.0               | 23.0          | 69.3            | 62.2              | 38.1                | 22.3                |
| 11-Nov      | 61.0           | 57.3                | 43.2               | 30.8               | 18.0          | 67.2            | 61.1              | 34.2                | 19.9                |
| 18-Nov      | 57.0           | 53.8                | 40.1               | 27.4               | 14.0          | 58.1            | 55.0              | 30.0                | 17.0                |
| 25-Nov      | 53.0           | 48.5                | 36.4               | 25.1               | 10.0          | 53.9            | 51.9              | 27.1                | 15.9                |
| 2-Dec       | 54.0           | 51.7                | 34.2               | 22.3               | 3.0           | 51.1            | 57.8              | 25.0                | 14.1                |
| 9-Dec       | 48.0           | 44.6                | 29.6               | 17.1               | -6.0          | 40.6            | 45.8              | 21.3                | 11.3                |
| 16-Dec      | 45.0           | 41.1                | 26.2               | 13.0               | -9.0          | 38.5            | 44.3              | 18.8                | 10.1                |
| 23-Dec      | 43.0           | 39.1                | 23.5               | 10.7               | -13.0         | 31.5            | 37.3              | 16.8                | 9.0                 |
| 31-Dec      | 41.0           | 40.5                | 23.8               | 9.1                | -17.0         | 34.3            | 41.4              | 17.1                | 8.2                 |



|     | Mean Cooling<br>Degree Days (°F) | Mean Heating<br>Degree Days (°F) |
|-----|----------------------------------|----------------------------------|
| JAN | 0                                | 1610                             |
| FEB | 0                                | 1374                             |
| MAR | 0                                | 1147                             |
| APR | 6                                | 675                              |
| MAY | 40                               | 317                              |
| JUN | 108                              | 113                              |
| JUL | 190                              | 40                               |
| AUG | 143                              | 71                               |
| SEP | 36                               | 262                              |
| OCT | 3                                | 593                              |
| NOV | 0                                | 932                              |
| DEC | 0                                | 1404                             |
| ANN | 526                              | 8538                             |

**Average Ventilation and Infiltration Loads**  
**(Outside Air vs. 75°F, 60% RH summer; 68°F, 30% RH winter)**



|     | Average Sensible Cooling Load | Average Sensible Heating Load | Average Latent Cooling Load | Average Latent Heating Load |
|-----|-------------------------------|-------------------------------|-----------------------------|-----------------------------|
|     | (Btu/cfm)                     | (Btu/cfm)                     | (Btu/cfm)                   | (Btu/cfm)                   |
| JAN | 0                             | -44134                        | 0                           | -10363                      |
| FEB | 0                             | -37812                        | 0                           | -9238                       |
| MAR | 0                             | -32133                        | 0                           | -7605                       |
| APR | 21                            | -19766                        | 1                           | -3984                       |
| MAY | 165                           | -10243                        | 144                         | -1064                       |
| JUN | 522                           | -4293                         | 864                         | -69                         |
| JUL | 1052                          | -1868                         | 2436                        | -1                          |
| AUG | 666                           | -2954                         | 2241                        | -8                          |
| SEP | 111                           | -8723                         | 563                         | -171                        |
| OCT | 2                             | -17743                        | 23                          | -1701                       |
| NOV | 0                             | -26493                        | 0                           | -4574                       |
| DEC | 0                             | -38809                        | 0                           | -8521                       |
| ANN | 2539                          | -244971                       | 6272                        | -47299                      |

## Average Annual Solar Radiation – Nearest Available Site

(Source: National Renewable Energy Laboratory, Golden CO, 1995)

City: MASSENA  
 State: NY  
 WBAN No: 94725  
 Lat(N): 44.93  
 Long(W): 74.85  
 Elev(ft): 207

Stn Type: Secondary  
 SHADING GEOMETRY IN DIMENSIONLESS UNITS  
 Window: 1  
 Overhang: 0.676  
 Vert Gap: 0.331

| AVERAGE INCIDENT SOLAR RADIATION (Btu/sq.ft./day), Percentage Uncertainty = 9 |         | Jan  | Feb  | Mar  | Apr  | May  | Jun  | Jul  | Aug  | Sep  | Oct  | Nov  | Dec  | Year |
|-------------------------------------------------------------------------------|---------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| HORIZ                                                                         | Global  | 520  | 820  | 1170 | 1470 | 1750 | 1910 | 1920 | 1610 | 1230 | 820  | 490  | 410  | 1180 |
|                                                                               | Std Dev | 43   | 76   | 82   | 101  | 133  | 129  | 95   | 74   | 95   | 62   | 36   | 39   | 28   |
|                                                                               | Minimum | 400  | 660  | 1010 | 1190 | 1490 | 1630 | 1740 | 1480 | 1020 | 700  | 420  | 340  | 1130 |
|                                                                               | Maximum | 600  | 1000 | 1280 | 1620 | 1980 | 2120 | 2130 | 1760 | 1370 | 1020 | 560  | 500  | 1240 |
|                                                                               | Diffuse | 320  | 440  | 580  | 680  | 780  | 830  | 790  | 710  | 570  | 420  | 320  | 270  | 560  |
| Clear Day                                                                     | Global  | 730  | 1090 | 1610 | 2150 | 2520 | 2670 | 2580 | 2240 | 1740 | 1190 | 770  | 610  | 1660 |
| NORTH                                                                         | Global  | 180  | 260  | 350  | 430  | 550  | 630  | 590  | 470  | 350  | 260  | 180  | 150  | 370  |
|                                                                               | Diffuse | 180  | 260  | 350  | 420  | 490  | 530  | 510  | 450  | 350  | 260  | 180  | 150  | 340  |
| Clear Day                                                                     | Global  | 150  | 220  | 290  | 400  | 580  | 710  | 640  | 460  | 320  | 230  | 160  | 130  | 360  |
| EAST                                                                          | Global  | 370  | 560  | 750  | 910  | 1040 | 1110 | 1120 | 980  | 790  | 550  | 330  | 290  | 730  |
|                                                                               | Diffuse | 220  | 330  | 430  | 510  | 580  | 630  | 610  | 550  | 440  | 310  | 220  | 180  | 420  |
| Clear Day                                                                     | Global  | 620  | 860  | 1150 | 1410 | 1540 | 1580 | 1540 | 1420 | 1190 | 900  | 640  | 540  | 1120 |
| SOUTH                                                                         | Global  | 900  | 1130 | 1160 | 1010 | 910  | 870  | 920  | 990  | 1050 | 990  | 690  | 710  | 940  |
|                                                                               | Diffuse | 350  | 450  | 510  | 530  | 570  | 590  | 580  | 560  | 500  | 400  | 310  | 300  | 470  |
| Clear Day                                                                     | Global  | 1880 | 2040 | 1940 | 1580 | 1250 | 1090 | 1140 | 1400 | 1740 | 1920 | 1840 | 1770 | 1630 |
| WEST                                                                          | Global  | 370  | 560  | 760  | 900  | 1020 | 1110 | 1120 | 980  | 780  | 550  | 320  | 290  | 730  |
|                                                                               | Diffuse | 230  | 330  | 430  | 510  | 590  | 640  | 620  | 560  | 440  | 320  | 220  | 190  | 420  |
| Clear Day                                                                     | Global  | 620  | 860  | 1150 | 1410 | 1540 | 1580 | 1540 | 1420 | 1190 | 900  | 640  | 540  | 1120 |

## Average Annual Solar Heat and Illumination – Nearest Available Site

(Source: National Renewable Energy Laboratory, Golden CO, 1995)

| AVERAGE TRANSMITTED SOLAR RADIATION (Btu/sq.ft./day) FOR DOUBLE GLAZING, Percentage Uncertainty = 9 |          | Jan | Feb | Mar | Apr  | May  | Jun  | Jul  | Aug  | Sep | Oct | Nov | Dec | Year |
|-----------------------------------------------------------------------------------------------------|----------|-----|-----|-----|------|------|------|------|------|-----|-----|-----|-----|------|
| HORIZ                                                                                               | Unshaded | 330 | 540 | 810 | 1050 | 1260 | 1380 | 1390 | 1150 | 870 | 550 | 320 | 260 | 830  |
| NORTH                                                                                               | Unshaded | 120 | 180 | 240 | 290  | 360  | 410  | 390  | 320  | 250 | 180 | 120 | 100 | 250  |
|                                                                                                     | Shaded   | 100 | 150 | 200 | 250  | 310  | 350  | 330  | 270  | 210 | 150 | 100 | 84  | 210  |
| EAST                                                                                                | Unshaded | 250 | 390 | 530 | 650  | 740  | 790  | 800  | 700  | 560 | 390 | 230 | 190 | 520  |
|                                                                                                     | Shaded   | 220 | 340 | 440 | 530  | 600  | 630  | 640  | 570  | 470 | 330 | 190 | 170 | 430  |
| SOUTH                                                                                               | Unshaded | 680 | 840 | 820 | 680  | 580  | 540  | 580  | 650  | 730 | 720 | 520 | 540 | 650  |
|                                                                                                     | Shaded   | 650 | 760 | 610 | 400  | 330  | 340  | 340  | 360  | 480 | 610 | 490 | 510 | 490  |
| WEST                                                                                                | Unshaded | 250 | 400 | 540 | 640  | 730  | 790  | 800  | 700  | 560 | 390 | 220 | 200 | 520  |
|                                                                                                     | Shaded   | 220 | 340 | 450 | 520  | 590  | 640  | 640  | 570  | 460 | 330 | 190 | 170 | 430  |

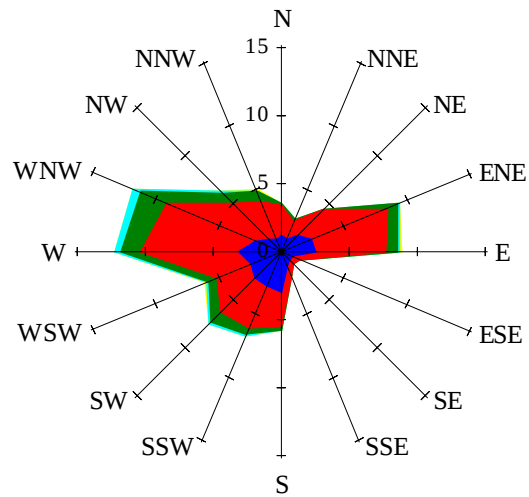
| AVERAGE INCIDENT ILLUMINANCE (klux-hr) FOR MOSTLY CLEAR AND MOSTLY CLOUDY CONDITIONS, Percentage Uncertainty = 9 |          | March |      |     |     |     | June |      |     |     |     |
|------------------------------------------------------------------------------------------------------------------|----------|-------|------|-----|-----|-----|------|------|-----|-----|-----|
|                                                                                                                  |          | 9am   | 11am | 1pm | 3pm | 5pm | 9am  | 11am | 1pm | 3pm | 5pm |
| HORIZ.                                                                                                           | M.Clear  | 37    | 66   | 74  | 58  | 23  | 50   | 82   | 97  | 90  | 66  |
|                                                                                                                  | M.Cloudy | 23    | 43   | 47  | 37  | 15  | 31   | 52   | 66  | 63  | 45  |
| NORTH                                                                                                            | M.Clear  | 9     | 13   | 14  | 12  | 7   | 14   | 15   | 16  | 16  | 14  |
|                                                                                                                  | M.Cloudy | 9     | 15   | 17  | 14  | 7   | 12   | 17   | 19  | 18  | 15  |
| EAST                                                                                                             | M.Clear  | 73    | 54   | 14  | 12  | 7   | 80   | 70   | 28  | 16  | 14  |
|                                                                                                                  | M.Cloudy | 26    | 30   | 17  | 14  | 7   | 36   | 40   | 25  | 18  | 15  |
| SOUTH                                                                                                            | M.Clear  | 43    | 78   | 87  | 68  | 27  | 12   | 39   | 54  | 48  | 24  |
|                                                                                                                  | M.Cloudy | 18    | 38   | 43  | 32  | 12  | 12   | 27   | 38  | 35  | 20  |
| WEST                                                                                                             | M.Clear  | 9     | 13   | 23  | 66  | 64  | 12   | 15   | 16  | 51  | 78  |
|                                                                                                                  | M.Cloudy | 9     | 15   | 20  | 32  | 22  | 12   | 17   | 19  | 37  | 45  |
| M.Clear                                                                                                          | (% hrs)  | 32    | 31   | 31  | 31  | 31  | 37   | 34   | 29  | 28  | 31  |

|         |          | Sept |      |     |     |     | Dec |      |     |     |     |
|---------|----------|------|------|-----|-----|-----|-----|------|-----|-----|-----|
|         |          | 9am  | 11am | 1pm | 3pm | 5pm | 9am | 11am | 1pm | 3pm | 5pm |
| HORIZ.  | M.Clear  | 27   | 61   | 77  | 70  | 42  | 10  | 31   | 36  | 20  | 0   |
|         | M.Cloudy | 17   | 37   | 50  | 45  | 26  | 7   | 20   | 22  | 13  | 0   |
| NORTH   | M.Clear  | 8    | 13   | 15  | 14  | 11  | 4   | 8    | 9   | 6   | 0   |
|         | M.Cloudy | 7    | 13   | 16  | 15  | 10  | 3   | 9    | 9   | 6   | 0   |
| EAST    | M.Clear  | 66   | 66   | 25  | 14  | 11  | 31  | 33   | 9   | 6   | 0   |
|         | M.Cloudy | 23   | 31   | 21  | 15  | 10  | 8   | 15   | 9   | 6   | 0   |
| SOUTH   | M.Clear  | 23   | 60   | 79  | 70  | 39  | 30  | 73   | 83  | 54  | 0   |
|         | M.Cloudy | 11   | 29   | 44  | 38  | 20  | 8   | 24   | 27  | 17  | 0   |
| WEST    | M.Clear  | 8    | 13   | 15  | 52  | 71  | 4   | 8    | 20  | 41  | 0   |
|         | M.Cloudy | 7    | 13   | 16  | 31  | 30  | 3   | 9    | 12  | 14  | 0   |
| M.Clear | (% hrs)  | 37   | 34   | 28  | 29  | 34  | 22  | 21   | 19  | 20  | 23  |

### Wind Summary - December, January, and February

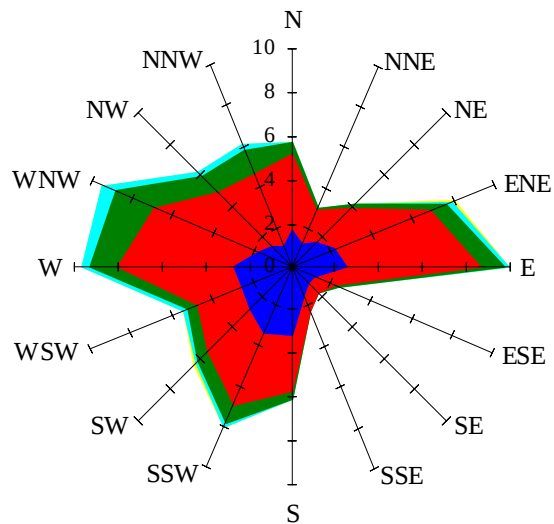
Labels of Percent Frequency on North Axis



Percent Calm = 6.54

### Wind Summary - March, April, and May

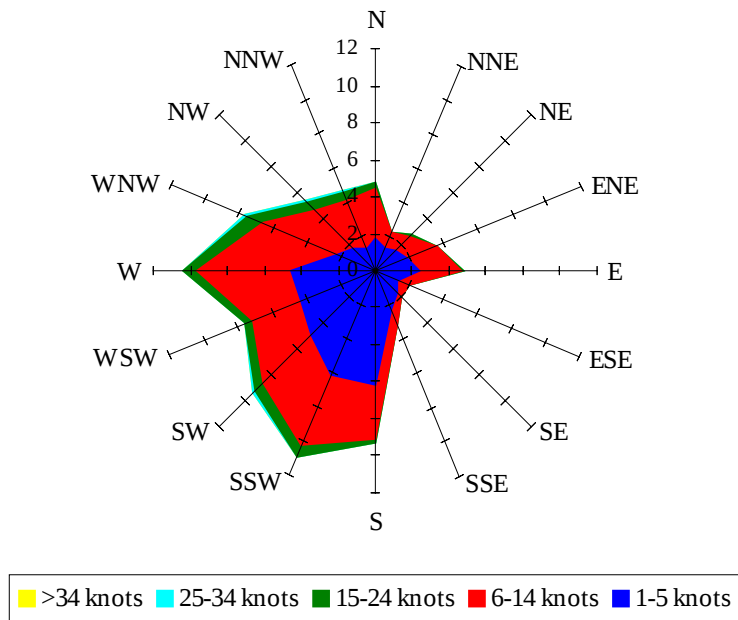
Labels of Percent Frequency on North Axis



Percent Calm = 6.19

### Wind Summary - June, July, and August

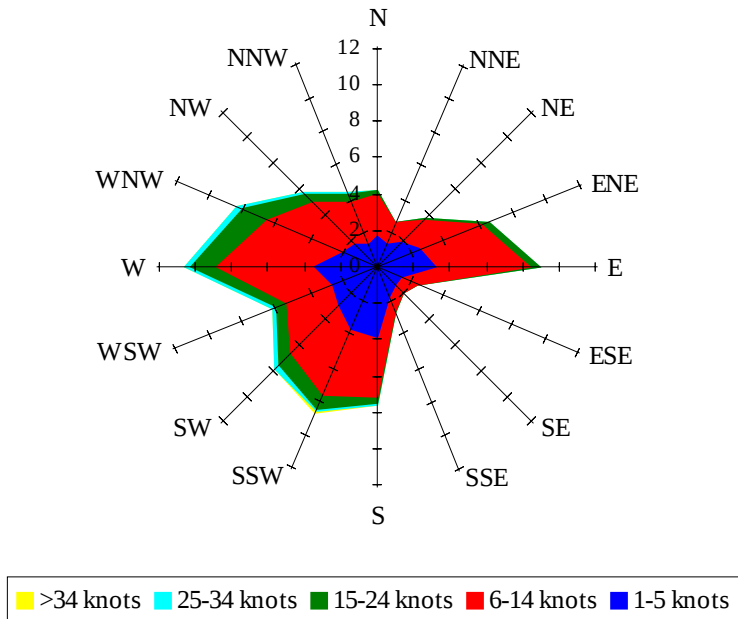
Labels of Percent Frequency on North Axis



Percent Calm = 9.67

### Wind Summary - September, October, and November

Labels of Percent Frequency on North Axis



Percent Calm = 7.89