

OKECIE, PL	Station ID = ICAO_EPWA
Latitude = 52.17 N	Elevation = 110 Meters
Longitude = 20.97 E	Average Pressure = 1003 mb
Period of Record = 1988 To 2017	

Design Criteria Data

	Mean Coincident (Average) Values				
Dry Bulb Temperature (T)	Design Value (°C)	Wet Bulb Temperature (°C)	Humidity Ratio (g/kg)	Wind Speed (m/s)	Prevailing Direction (NSEW)
Median of Extreme Highs	33	21	11	3.6	S
0.4% Occurrence	30	20	11	3.7	S
1.0% Occurrence	28	19	11	3.7	SE
2.0% Occurrence	26	18	10	3.8	W
Mean Daily Range	8	-	-	-	E
97.5% Occurrence	-8	-9	2	3.5	E
99.0% Occurrence	-12	-13	1	3.3	E
99.6% Occurrence	-15	-15	1	3	E
Median of Extreme Lows	-17	-18	1	2.5	E

	Design Value (°C)	Dry Bulb Temperature (°C)	Humidity Ratio (g/kg)	Wind Speed (m/s)	Prevailing Direction (NSEW)
Wet Bulb Temperature (T _{wb})					
Median of Extreme Highs	26	31	17	3.2	SE
0.4% Occurrence	24	30	15	3.9	SE
1.0% Occurrence	22	27	13	3.5	VRB
2.0% Occurrence	21	26	13	3.4	VRB

	Design Value (g/kg)	Dry Bulb Temperature (°C)	Vapor Pressure (kPa)	Wind Speed (m/s)	Prevailing Direction (NSEW)
Humidity Ratio (HR)					
Median of Extreme Highs	16	26	83.72	3.5	SE
0.4% Occurrence	14	24	75.33	3.1	VRB
1.0% Occurrence	14	23	71.92	3.1	VRB
2.0% Occurrence	13	22	68.68	3.1	W

Air Conditioning/ Humid Area Criteria	Threshold	T ≥ 33.9 °C	T ≥ 26.7 °C	Twb ≥ 22.8 °C	Twb ≥ 19.4 °C
	# of Hours	5	169	8	234

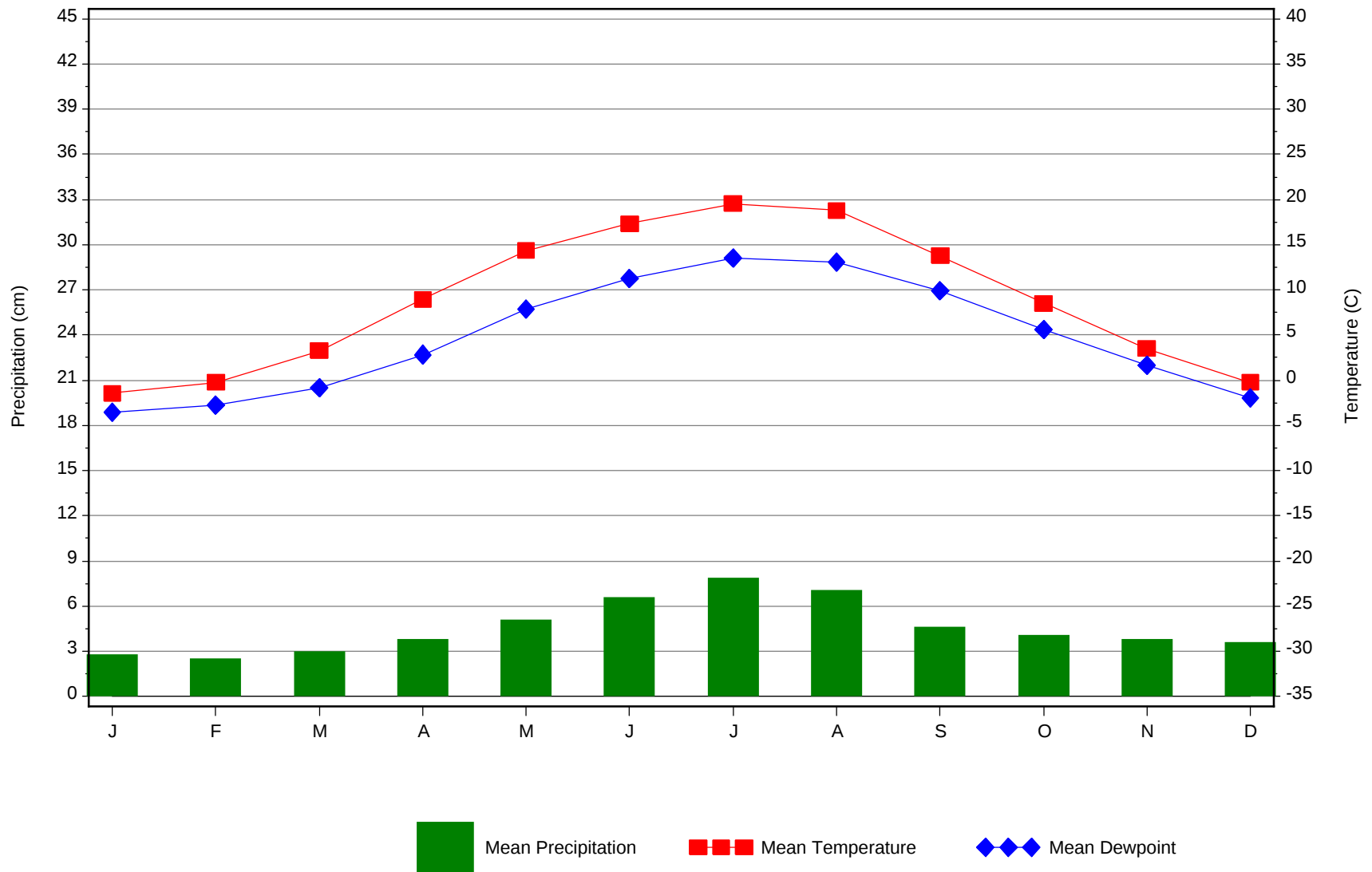
Other Site Data

Weather Region	Rain Rate 100 Year Recurrence (cm/hr)	Basic Wind Speed 3 sec gust @ 10 m 50 Year Recurrence (m/s)	Ventilation Cooling Load Index (kWh/l/s/yr) Base 24° C-RH 60% Latent + Sensible
6	N/A	N/A	0.2 + 0.1
Ground Water Temperature (°C) 15 Meter Depth*	Frost Depth 50 Year Recurrence (cm)	Ground Snow Load 50 Year Recurrence (kN/m ²)	Average Annual Freeze-Thaw Cycles (#)
10.3	N/A	N/A	45

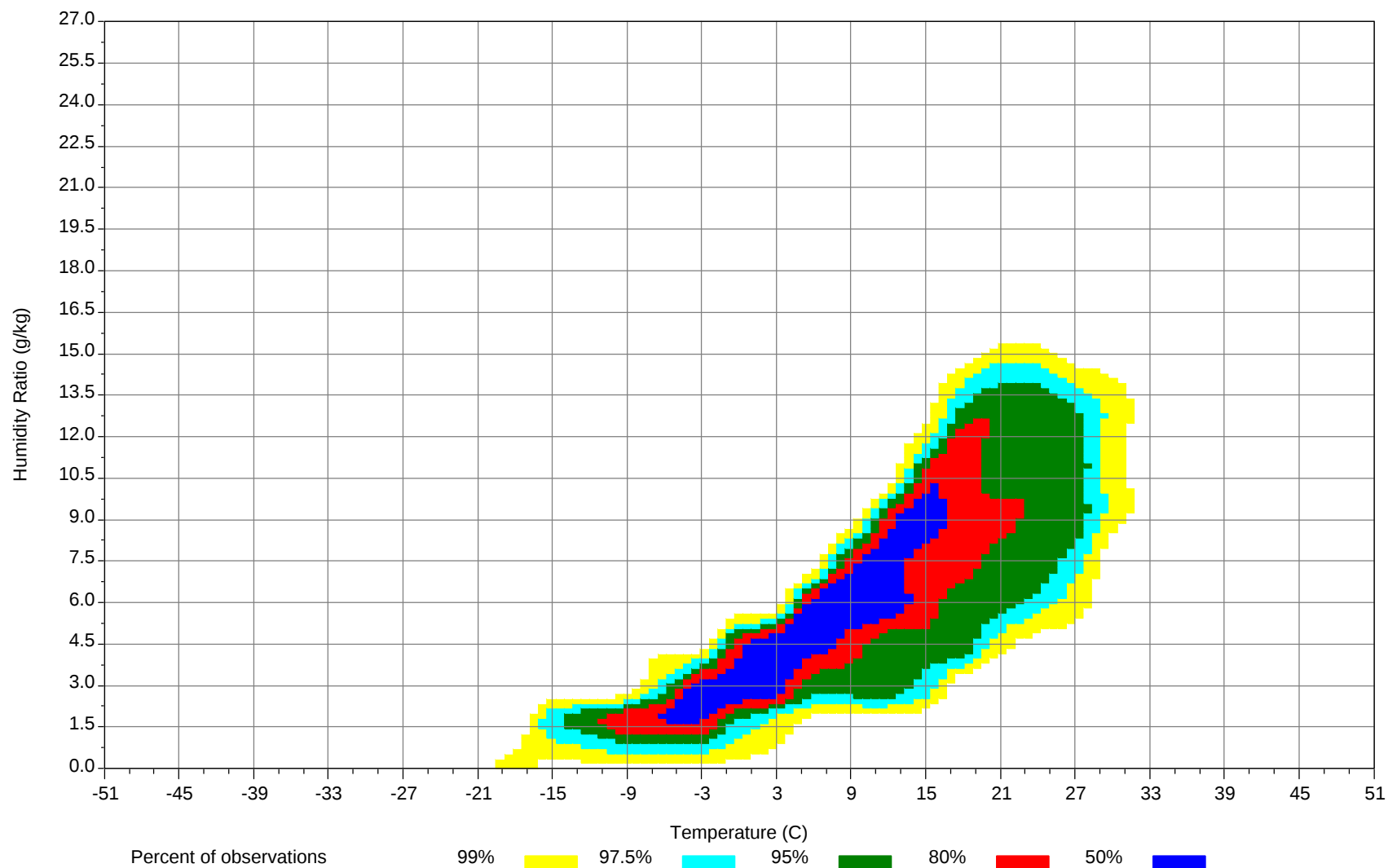
*Note: Temperatures at greater depths can be estimated by adding 0.83° C per 30 meters additional depth.



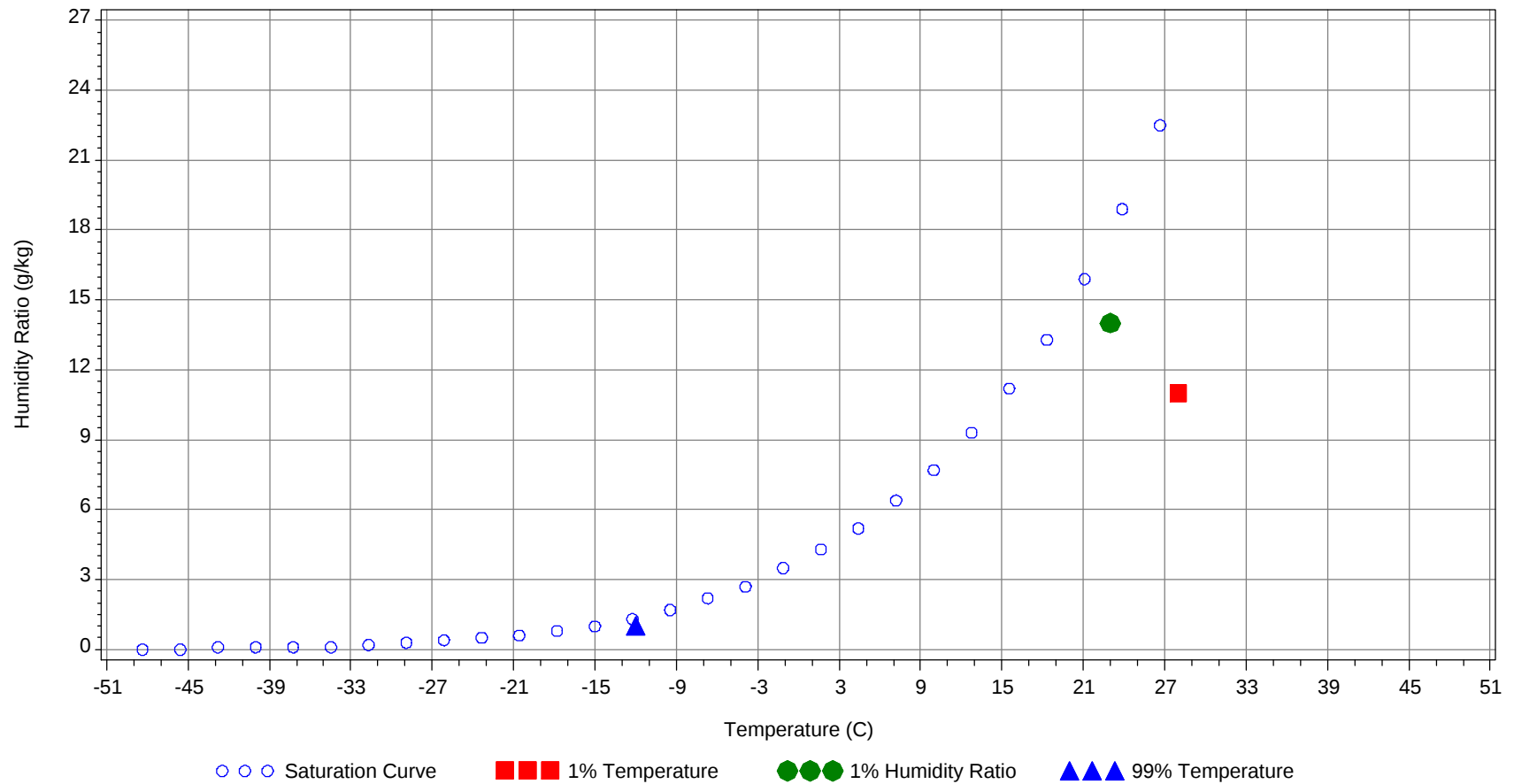
Average Annual Climate



Long Term Psychrometric Summary



Psychrometric Summary of Peak Design Values



	(°C) / (g/kg)	MCDB (°C)	MCWB (°C)	MCDP (°C)	MCHR (g/kg)	Enthalpy (kJ/kg)
1.0% Dry Bulb	28.0		19		11.0	55.0
99.0% Dry Bulb	-12.0				1.0	-9.7
1.0% Humidity Ratio	14.0	23.0	20.1	18.6		57.9

Dry-Bulb Temperature Hours For An Average Year

Temperature Range (°C)	January					February					March				
	01 To 08 LST	09 To 16 LST	17 to 00 LST	Total Obs	M C W B (°C)	01 To 08 LST	09 To 16 LST	17 to 00 LST	Total Obs	M C W B (°C)	01 To 08 LST	09 To 16 LST	17 to 00 LST	Total Obs	M C W B (°C)
36/ 38															
33/ 35															
30/ 32															
27/ 29															
24/ 26															
21/ 23												0		0	12.4
18/ 20												1	0	1	11.7
15/ 17							0		0	11.1	0	10	2	12	10
12/ 14	0	1	0	1	9.6	0	2	0	2	8.7	1	17	7	25	8.3
9/ 11	2	4	2	8	7.9	2	8	4	14	7.7	4	26	15	45	7.2
6/ 8	14	22	17	53	5.6	12	28	20	60	5.5	28	57	50	135	5.2
3/ 5	24	35	29	88	3.4	20	35	30	85	3.2	43	48	51	142	3
0/ 2	75	74	75	224	0.6	71	70	74	215	0.5	82	57	69	208	0.2
-3/ -1	42	41	43	126	-2.2	47	41	43	131	-2.4	50	23	37	110	-2.6
-6/ -4	30	26	28	84	-5	28	19	25	72	-5	24	6	13	43	-5.1
-9/ -7	28	28	29	85	-7.9	21	14	16	51	-8.1	11	1	4	16	-7.8
-12/-10	16	10	12	38	-10.8	10	4	6	20	-10.9	3	0	0	3	-10.8
-15/-13	8	5	7	20	-13.7	5	2	4	11	-13.7	1		0	1	-13.3
-18/-16	6	2	4	12	-16.6	4	1	2	7	-16.4	0			0	-15.6
-21/-19	2	1	1	4	-19.6	2	0	0	2	-19.4					
-24/-22	1	0	0	1	-22.1	0			0	-22.1					
-27/-25	0	0	0	0	-25.7										

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.

Dry-Bulb Temperature Hours For An Average Year

	April					May					June				
Temperature Range (°C)	01 To 08 LST	09 To 16 LST	17 to 00 LST	Total Obs	M C W B (°C)	01 To 08 LST	09 To 16 LST	17 to 00 LST	Total Obs	M C W B (°C)	01 To 08 LST	09 To 16 LST	17 to 00 LST	Total Obs	M C W B (°C)
36/ 38															
33/ 35												0		0	20.1
30/ 32		0		0	14.9		1	0	1	19		5	1	6	20.5
27/ 29		1	0	1	15.3	0	6	1	7	18.2	0	14	4	18	19
24/ 26		4	1	5	14.9	0	19	5	24	16.7	1	30	11	42	17.9
21/ 23	0	11	3	14	13.7	2	43	19	64	15.3	9	60	35	104	16.3
18/ 20	0	16	6	22	12.3	8	40	27	75	13.9	23	49	44	116	15.1
15/ 17	3	41	22	66	10.6	36	61	62	159	12.5	72	57	76	205	13.6
12/ 14	12	46	37	95	9.1	59	42	58	159	10.6	73	21	48	142	11.6
9/ 11	35	41	46	122	7.8	59	25	41	125	8.7	45	5	17	67	9.7
6/ 8	71	47	62	180	5.5	62	10	30	102	6.5	15	0	3	18	7.2
3/ 5	53	21	34	108	3	15	1	5	21	3.6	1			1	4.7
0/ 2	47	11	25	83	0.4	5		1	6	1.1					
-3/ -1	16	1	5	22	-2.2	1			1	-1.5					
-6/ -4	2	0	0	2	-4.4										
-9/ -7															
-12/-10															
-15/-13															
-18/-16															
-21/-19															
-24/-22															
-27/-25															

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Dry-Bulb Temperature Hours For An Average Year

	July					August					September				
Temperature Range (°C)	01 To 08 LST	09 To 16 LST	17 to 00 LST	Total Obs	M C W B (°C)	01 To 08 LST	09 To 16 LST	17 to 00 LST	Total Obs	M C W B (°C)	01 To 08 LST	09 To 16 LST	17 to 00 LST	Total Obs	M C W B (°C)
36/ 38							0	0	0	21.5					
33/ 35		2	1	3	21.2		2	0	2	21.1		0	0	0	19.3
30/ 32	0	14	4	18	20.6		9	2	11	21.1		0	0	0	19.7
27/ 29	1	29	11	41	19.6	0	24	7	31	19.8		3	0	3	19
24/ 26	4	42	20	66	18.4	1	40	15	56	18.3	0	8	1	9	17.5
21/ 23	21	69	57	147	17.4	14	75	48	137	17.2	1	33	8	42	16.4
18/ 20	47	49	57	153	16.3	36	50	57	143	16.1	4	40	18	62	15.1
15/ 17	98	34	71	203	14.7	96	39	76	211	14.5	30	74	59	163	13.5
12/ 14	55	8	23	86	12.2	67	8	34	109	12.1	65	53	70	188	11.6
9/ 11	19	0	4	23	10.2	27	1	8	36	10.1	68	22	52	142	9.6
6/ 8	3		0	3	8.2	6		1	7	7.9	55	6	27	88	7.1
3/ 5						0			0	5.1	15	0	3	18	4.4
0/ 2											2		0	2	1.7
-3/ -1															
-6/ -4															
-9/ -7															
-12/-10															
-15/-13															
-18/-16															
-21/-19															
-24/-22															
-27/-25															

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Dry-Bulb Temperature Hours For An Average Year

Temperature Range (°C)	October					November					December				
	01 To 08 LST	09 To 16 LST	17 to 00 LST	Total Obs	M C W B (°C)	01 To 08 LST	09 To 16 LST	17 to 00 LST	Total Obs	M C W B (°C)	01 To 08 LST	09 To 16 LST	17 to 00 LST	Total Obs	M C W B (°C)
36/ 38															
33/ 35															
30/ 32															
27/ 29															
24/ 26															
21/ 23		5	0	5	16.5										
18/ 20	0	11	2	13	15		0		0	12.3					
15/ 17	5	39	16	60	13.1	0	2	0	2	11.8					
12/ 14	18	43	37	98	11.1	3	9	4	16	10.8	0	1	0	1	10
9/ 11	45	54	53	152	9.1	10	26	16	52	8.9	2	5	4	11	8.7
6/ 8	78	58	69	205	6.5	46	61	55	162	6.5	17	25	20	62	6
3/ 5	43	23	39	105	3.7	54	50	53	157	3.9	30	39	35	104	3.6
0/ 2	39	12	25	76	0.9	68	57	64	189	0.8	84	83	83	250	0.7
-3/ -1	18	1	7	26	-1.9	37	23	31	91	-2	48	43	52	143	-2.1
-6/ -4	2	0	1	3	-4.4	13	7	11	31	-4.8	27	24	21	72	-4.9
-9/ -7	1		0	1	-7.1	6	4	4	14	-7.7	19	13	18	50	-7.8
-12/-10						3	1	2	6	-10.7	8	7	6	21	-10.7
-15/-13						1	0	1	2	-13	6	5	6	17	-13.5
-18/-16						1		0	1	-16	4	2	3	9	-16.4
-21/-19											2	0	0	2	-19.6
-24/-22											0			0	-21
-27/-25															

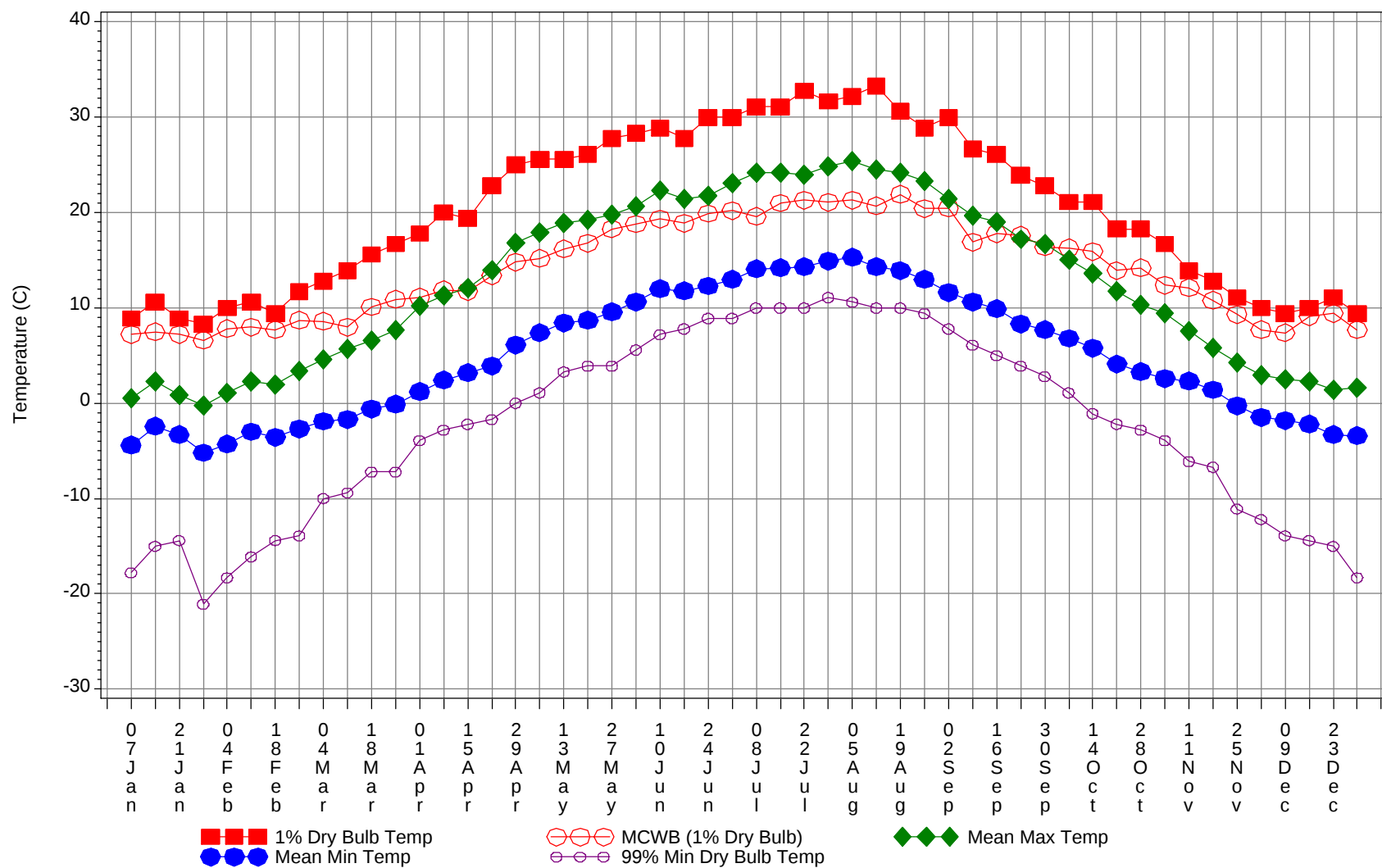
Caution: This summary reflects the typical distribution of temperature in a typical year. It does not reflect the typical moisture distribution. Because wet bulb temperatures are averaged, this summary understates the annual moisture load. For accurate moisture load data, see the long-term humidity summary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

Dry-Bulb Temperature Hours For An Average Year

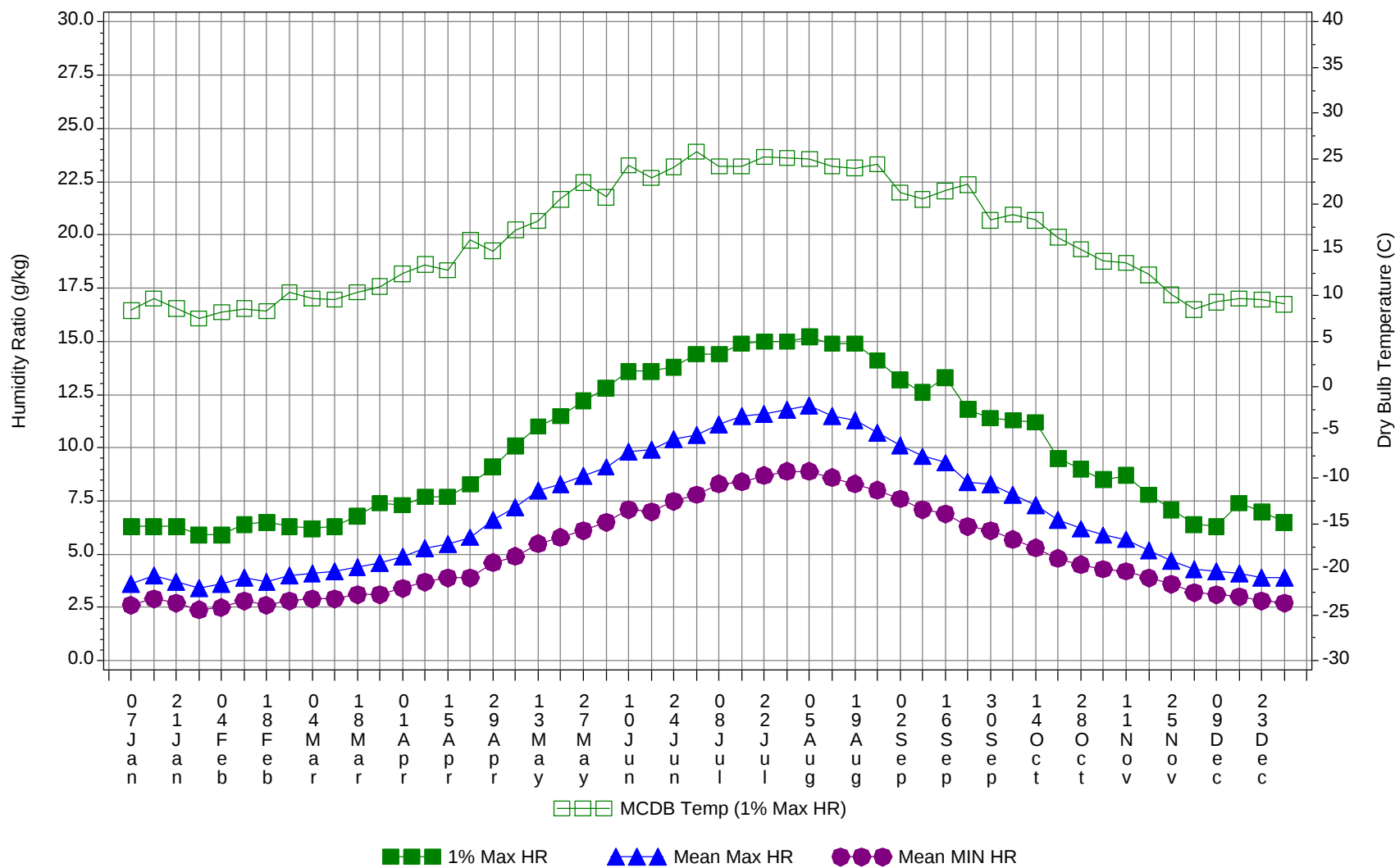
	Annual				
Temperature Range (° C)	01 To 08 LST	09 To 16 LST	17 to 00 LST	Total Obs	M C W B (° C)
36/ 38		0	0	0	21.5
33/ 35		5	1	6	21.1
30/ 32	0	29	7	36	20.7
27/ 29	1	76	25	102	19.4
24/ 26	6	142	52	200	18
21/ 23	47	297	170	514	16.7
18/ 20	119	257	212	588	15.4
15/ 17	340	358	384	1082	13.5
12/ 14	352	250	319	921	11.1
9/ 11	321	217	261	799	8.9
6/ 8	406	314	354	1074	6.1
3/ 5	298	252	279	829	3.4
0/ 2	473	365	415	1253	0.6
-3/ -1	259	173	217	649	-2.2
-6/ -4	127	82	98	307	-5
-9/ -7	87	60	72	219	-7.9
-12/-10	39	22	26	87	-10.8
-15/-13	21	12	17	50	-13.6
-18/-16	15	5	9	29	-16.5
-21/-19	6	1	2	9	-19.6
-24/-22	2	0	0	2	-22
-27/-25	0	0	0	0	-25.7

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



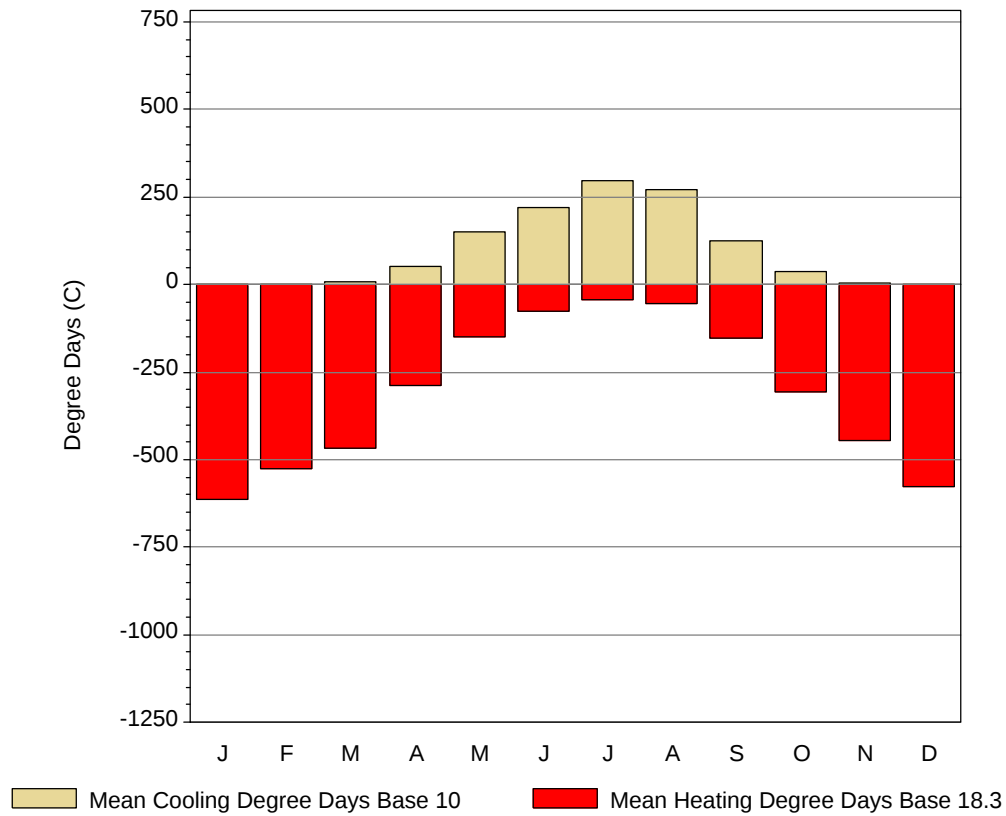
Long Term Humidity and Dry Bulb Temperature Summary



Long Term Humidity and Dry Bulb Temperature Summary

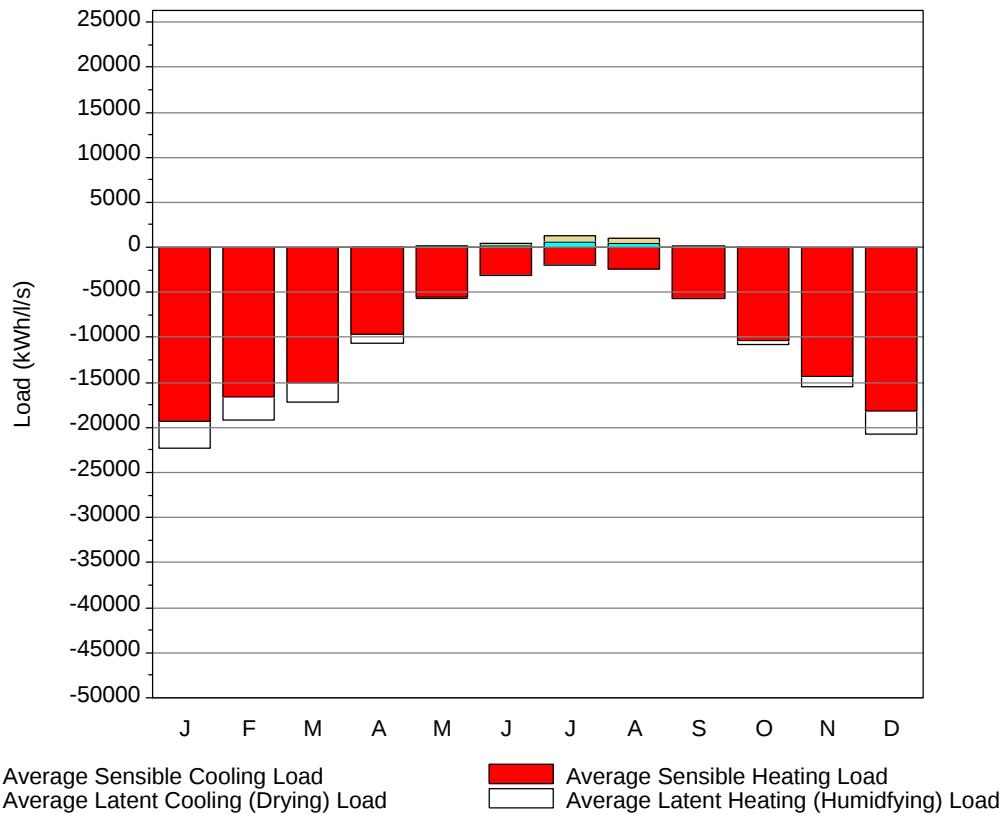
Week Ending	1.0% Temp (°C)	MCWB@ 1% Temp (°C)	Mean Max Temp (°C)	Mean Min Temp (°C)	99% Temp (°C)	1.0% HR (g/kg)	MCDB@ 1% HR (°C)	Mean Max HR (g/kg)	Mean Min HR (g/kg)
7-Jan	8.9	7.2	0.5	-4.4	-17.8	6.3	8.4	3.6	2.6
14-Jan	10.6	7.5	2.3	-2.4	-15	6.3	9.7	4	2.9
21-Jan	8.9	7.2	0.9	-3.3	-14.4	6.3	8.6	3.7	2.7
28-Jan	8.3	6.6	-0.2	-5.2	-21.1	5.9	7.5	3.4	2.4
4-Feb	10	7.8	1.1	-4.3	-18.3	5.9	8.2	3.6	2.5
11-Feb	10.6	8	2.3	-3	-16.1	6.4	8.6	3.9	2.8
18-Feb	9.4	7.7	1.9	-3.6	-14.4	6.5	8.3	3.7	2.6
25-Feb	11.7	8.7	3.4	-2.7	-13.9	6.3	10.4	4	2.8
4-Mar	12.8	8.6	4.6	-1.9	-10	6.2	9.7	4.1	2.9
11-Mar	13.9	8	5.7	-1.7	-9.4	6.3	9.6	4.2	2.9
18-Mar	15.6	10.1	6.6	-0.6	-7.2	6.8	10.4	4.4	3.1
25-Mar	16.7	10.9	7.7	-0.1	-7.2	7.4	11	4.6	3.1
1-Apr	17.8	11.1	10.2	1.2	-3.9	7.3	12.4	4.9	3.4
8-Apr	20	11.9	11.3	2.4	-2.8	7.7	13.4	5.3	3.7
15-Apr	19.4	11.7	12.1	3.2	-2.2	7.7	12.8	5.5	3.9
22-Apr	22.8	13.4	13.9	3.9	-1.7	8.3	16.1	5.8	3.9
29-Apr	25	14.8	16.8	6.1	0	9.1	14.9	6.6	4.6
6-May	25.6	15.2	17.9	7.4	1.1	10.1	17.2	7.2	4.9
13-May	25.6	16.2	18.9	8.4	3.3	11	18.2	8	5.5
20-May	26.1	16.8	19.2	8.7	3.9	11.5	20.6	8.3	5.8
27-May	27.8	18.3	19.8	9.6	3.9	12.2	22.4	8.7	6.1
4-Jun	28.3	18.8	20.7	10.6	5.6	12.8	20.8	9.1	6.5
10-Jun	28.9	19.3	22.3	12	7.2	13.6	24.3	9.8	7.1
17-Jun	27.8	18.9	21.4	11.8	7.8	13.6	22.9	9.9	7
24-Jun	30	19.9	21.8	12.3	8.9	13.8	24.1	10.4	7.5
1-Jul	30	20.2	23.1	13	8.9	14.4	25.8	10.6	7.8
8-Jul	31.1	19.6	24.2	14.1	10	14.4	24.2	11.1	8.3
15-Jul	31.1	21	24.2	14.2	10	14.9	24.2	11.5	8.4
22-Jul	32.8	21.3	24	14.3	10	15	25.2	11.6	8.7
29-Jul	31.7	21.1	24.9	14.9	11.1	15	25.1	11.8	8.9
5-Aug	32.2	21.3	25.4	15.3	10.6	15.2	25	12	8.9
12-Aug	33.3	20.7	24.5	14.3	10	14.9	24.2	11.5	8.6
19-Aug	30.6	21.9	24.2	13.9	10	14.9	24	11.3	8.3
26-Aug	28.9	20.4	23.3	13	9.4	14.1	24.4	10.7	8
2-Sep	30	20.5	21.4	11.6	7.8	13.2	21.3	10.1	7.6
9-Sep	26.7	16.9	19.7	10.6	6.1	12.6	20.6	9.6	7.1
16-Sep	26.1	17.8	19	9.9	5	13.3	21.5	9.3	6.9
23-Sep	23.9	17.6	17.2	8.3	3.9	11.8	22.2	8.4	6.3
30-Sep	22.8	16.4	16.7	7.7	2.8	11.4	18.3	8.3	6.1
7-Oct	21.1	16.3	15.1	6.8	1.1	11.3	18.9	7.8	5.7
14-Oct	21.1	15.9	13.6	5.8	-1.1	11.2	18.3	7.3	5.3
21-Oct	18.3	13.9	11.7	4.1	-2.2	9.5	16.4	6.6	4.8
28-Oct	18.3	14.2	10.3	3.3	-2.8	9	15.1	6.2	4.5
4-Nov	16.7	12.4	9.4	2.6	-3.9	8.5	13.8	5.9	4.3
11-Nov	13.9	12.1	7.6	2.3	-6.1	8.7	13.6	5.7	4.2
18-Nov	12.8	10.8	5.8	1.4	-6.7	7.8	12.3	5.2	3.9
25-Nov	11.1	9.3	4.3	-0.3	-11.1	7.1	10.1	4.7	3.6
2-Dec	10	7.7	2.9	-1.5	-12.2	6.4	8.5	4.3	3.2
9-Dec	9.4	7.4	2.5	-1.8	-13.9	6.3	9.3	4.2	3.1
16-Dec	10	9.1	2.3	-2.2	-14.4	7.4	9.7	4.1	3
23-Dec	11.1	9.4	1.4	-3.3	-15	7	9.6	3.9	2.8
31-Dec	9.4	7.7	1.6	-3.4	-18.3	6.5	9.1	3.9	2.7

Degree Days, Heating and Cooling (Base 18.3 C) & Cooling (Base 10 C)



Month	Mean Cooling Degree Days (°C) Base 10	Mean Cooling Degree Days (°C) Base 18.3	Mean Heating Degree Days (°C) Base 18.3
JAN	0	0	613
FEB	1	0	526
MAR	8	0	468
APR	52	5	287
MAY	151	25	149
JUN	221	45	76
JUL	296	79	42
AUG	272	67	53
SEP	126	14	151
OCT	39	1	307
NOV	4	0	446
DEC	0	0	576
ANN	1169	236	3694

Average Ventilation and Infiltration Loads (Outside Air vs 24C, 60% RH summer; 20C, 30% RH winter)



	Average Sensible Cooling Load	Average Sensible Heating Load	Average Latent Cooling Load	Average Latent Heating Load
Month	(kWh/l/s)	(kWh/l/s)	(kWh/l/s)	(kWh/l/s)
JAN	0	-19260	0	-3046
FEB	0	-16585	0	-2566
MAR	0	-15043	0	-2073
APR	12	-9699	0	-882
MAY	88	-5524	24	-124
JUN	213	-3175	272	-5
JUL	520	-1979	814	-1
AUG	398	-2383	659	0
SEP	38	-5649	62	-8
OCT	0	-10352	5	-390
NOV	0	-14363	0	-1152
DEC	0	-18180	0	-2487
ANN	1268	-122191	1836	-12734

Station Information		Shading Geometry in Dimensionless Units	
City, State, WBAN	N/A	N/A	N/A
Lat, Lon, Elev	N/A	N/A	N/A
Press Stn Type	N/A	N/A	N/A

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													
	Std.Dev.													
	Minimum													
	Maximum													
	Diffuse													
Clear Day	Global													
NORTH	Global													
	Diffuse													
	Clear Day	Global												
EAST	Global													
	Diffuse													
	Clear Day	Global												
SOUTH	Global													
	Diffuse													
	Clear Day	Global												
WEST	Global													
	Diffuse													
	Clear Day	Global												

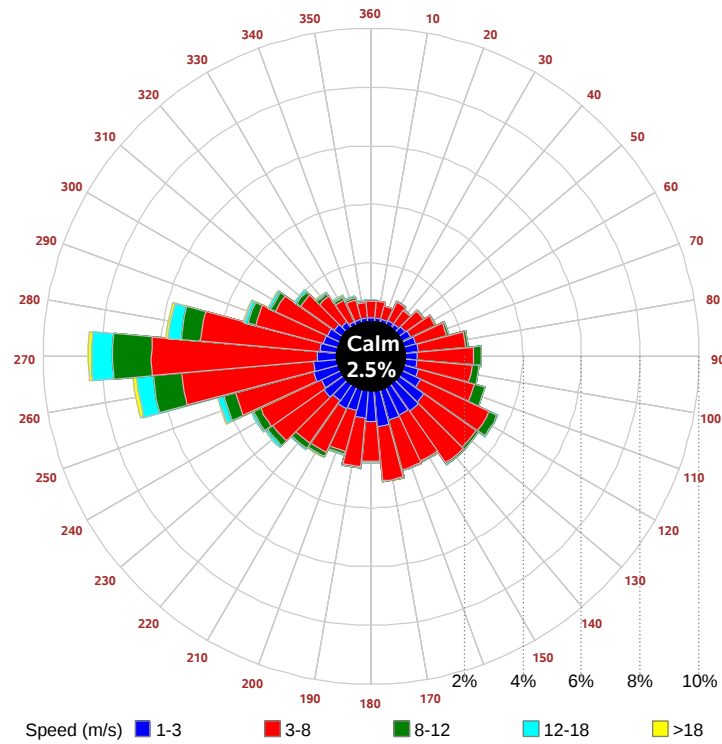
Average Annual Solar Radiation - Nearest Available Site
Source: National Renewable Energy Laboratory, Golden CO, 1995

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													
NORTH	Unshaded													
	Shaded													
EAST	Unshaded													
	Shaded													
SOUTH	Unshaded													
	Shaded													
WEST	Unshaded													
	Shaded													

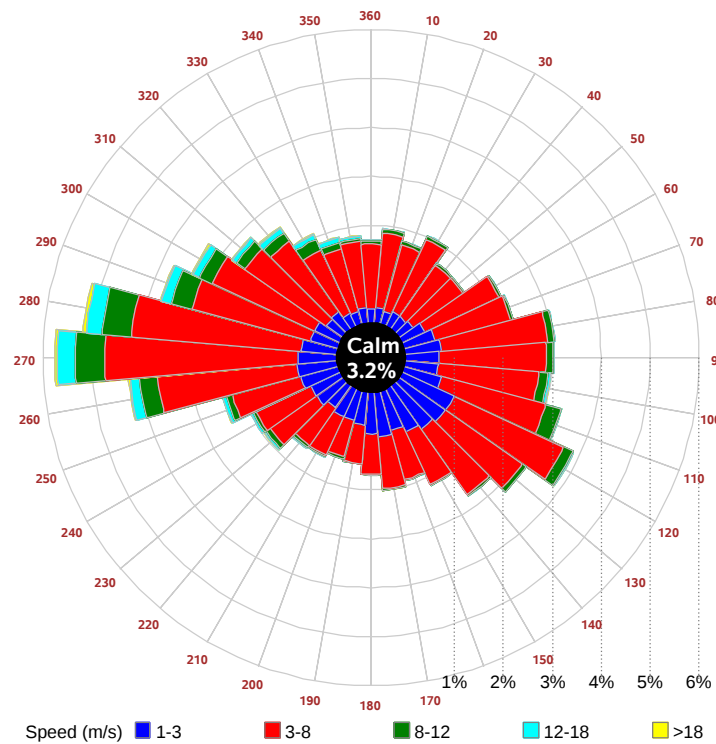
AVERAGE INCIDENT ILLUMINENCE (klux-hr) FOR MOSTLY CLEAR AND MOSTLY CLOUDY CONDITIONS, Percentage Uncertainty = 9											
		March					June				
		9am	11am	1pm	3pm	5pm	9am	11am	1pm	3pm	5pm
HORIZ.	M.Clear										
	M.Cloudy										
NORTH	M.Clear										
	M.Cloudy										
EAST	M.Clear										
	M.Cloudy										
SOUTH	M.Clear										
	M.Cloudy										
WEST	M.Clear										
	M.Cloudy										
M.Clear	(% hrs)										

		Sept					Dec				
		9am	11am	1pm	3pm	5pm	9am	11am	1pm	3pm	5pm
HORIZ.	M.Clear										
	M.Cloudy										
NORTH	M.Clear										
	M.Cloudy										
EAST	M.Clear										
	M.Cloudy										
SOUTH	M.Clear										
	M.Cloudy										
WEST	M.Clear										
	M.Cloudy										
M.Clear	(% hrs)										

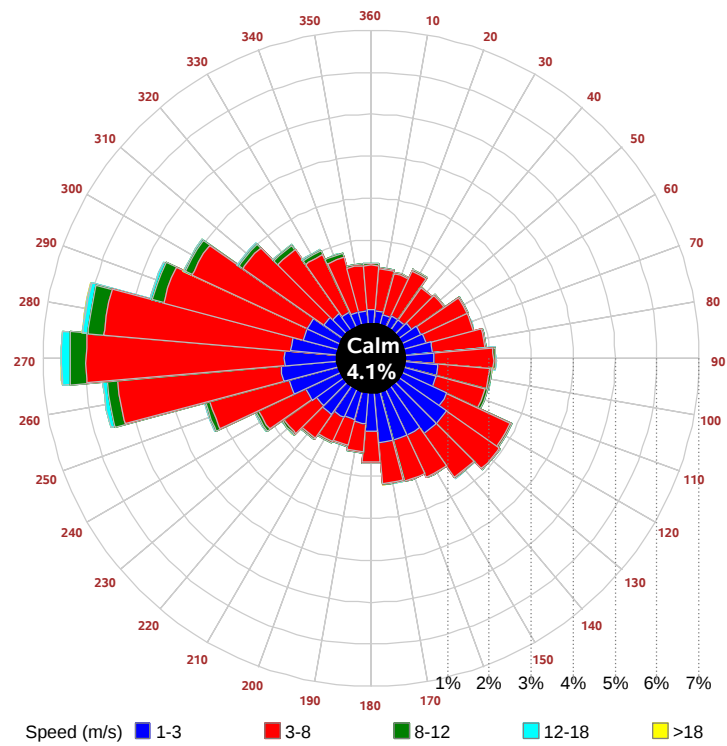
Wind Summary - December, January, and February



Wind Summary - March, April, and May



Wind Summary - June, July, and August



Wind Summary - September, October, and November

