

BANGKOK INTL, TH	Station ID = ICAO_VTBD
Latitude = 13.91 N	Elevation = 9 Feet
Longitude = 100.61 E	Average Pressure = 29.76 inches Hg
Period of Record = 1988 To 2017	

Design Criteria Data

	Mean Coincident (Average) Values				
Dry Bulb Temperature (T)	Design Value (°F)	Wet Bulb Temperature (°F)	Humidity Ratio (gr/lb)	Wind Speed (mph)	Prevailing Direction (NSEW)
Median of Extreme Highs	101	79	115	7.7	S
0.4% Occurrence	99	79	120	8.5	S
1.0% Occurrence	97	79	124	8.6	S
2.0% Occurrence	96	79	126	8.4	S
Mean Daily Range	14	-	-	-	N
97.5% Occurrence	73	68	94	4.6	N
99.0% Occurrence	70	64	82	4.6	N
99.6% Occurrence	67	62	73	5	N
Median of Extreme Lows	64	58	63	5.7	N

	Design Value (°F)	Dry Bulb Temperature (°F)	Humidity Ratio (gr/lb)	Wind Speed (mph)	Prevailing Direction (NSEW)
Wet Bulb Temperature (T _{wb})					
Median of Extreme Highs	84	91	163	7.8	S
0.4% Occurrence	85	92	168	7.8	S
1.0% Occurrence	84	91	163	7.8	S
2.0% Occurrence	83	90	158	7.6	S

	Design Value (gr/lb)	Dry Bulb Temperature (°F)	Vapor Pressure (in. Hg)	Wind Speed (mph)	Prevailing Direction (NSEW)
Humidity Ratio (HR)					
Median of Extreme Highs	173	89	1.13	7.4	S
0.4% Occurrence	173	89	1.13	7.4	S
1.0% Occurrence	169	89	1.11	7	S
2.0% Occurrence	162	87	1.07	7.1	S

Air Conditioning/ Humid Area Criteria	Threshold	T ≥ 93 °F	T ≥ 80 °F	Twb ≥ 73 °F	Twb ≥ 67 °F
	# of Hours	748	6708	7270	8071

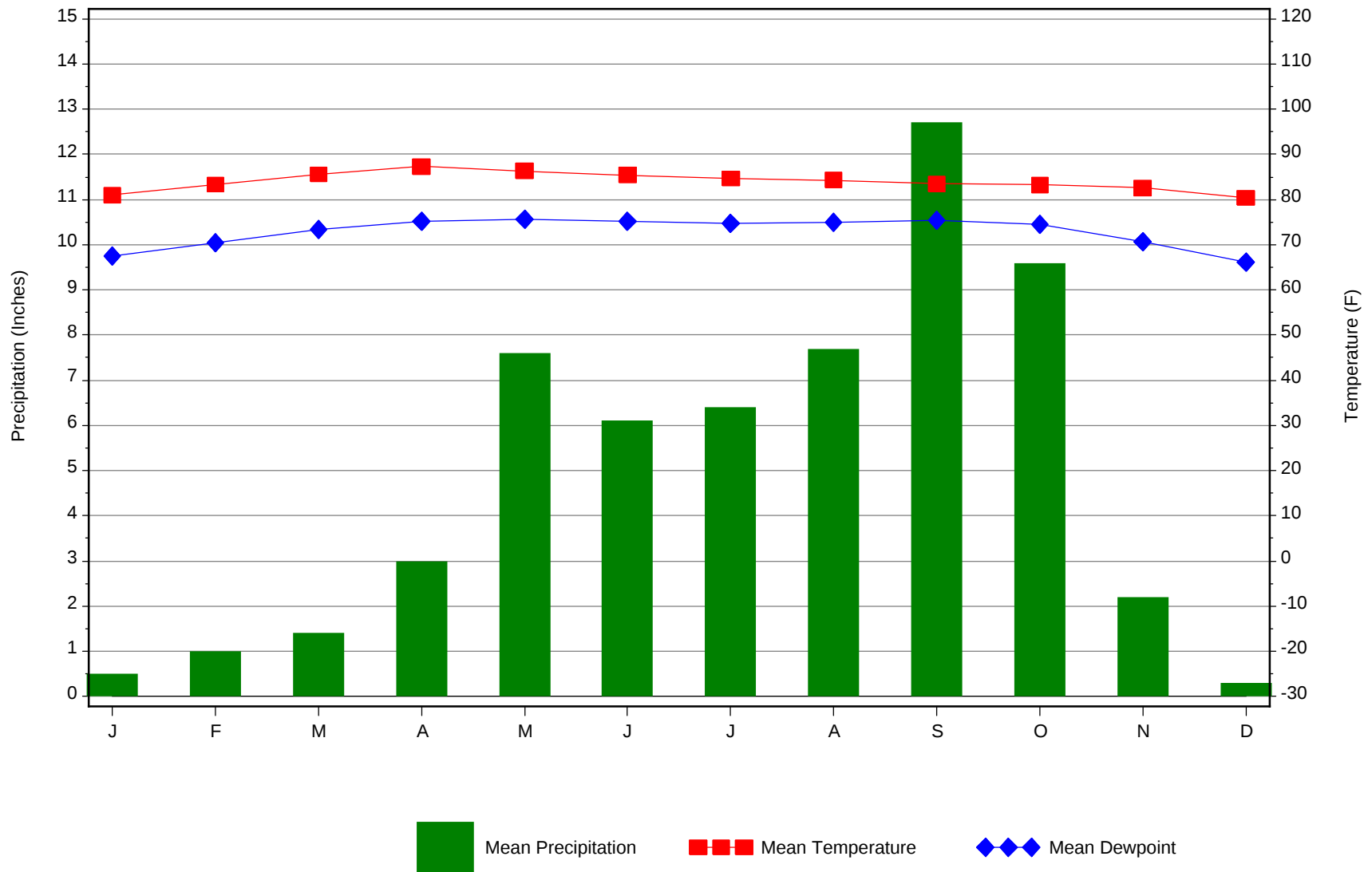
Other Site Data

Weather Region	Rain Rate 100 Year Recurrence (in./hr)	Basic Wind Speed 3 sec gust @ 33 ft 50 Year Recurrence (mph)	Ventilation Cooling Load Index (Ton-hr/cfm/yr) Base 75°F-RH 60% Latent + Sensible
10	N/A	80	22.7 + 7.2
Ground Water Temperature (°F) 50 Foot Depth*	Frost Depth 50 Year Recurrence (in)	Ground Snow Load 50 Year Recurrence (lb/ft ²)	Average Annual Freeze-Thaw Cycles (#)
86.5	0	0	0

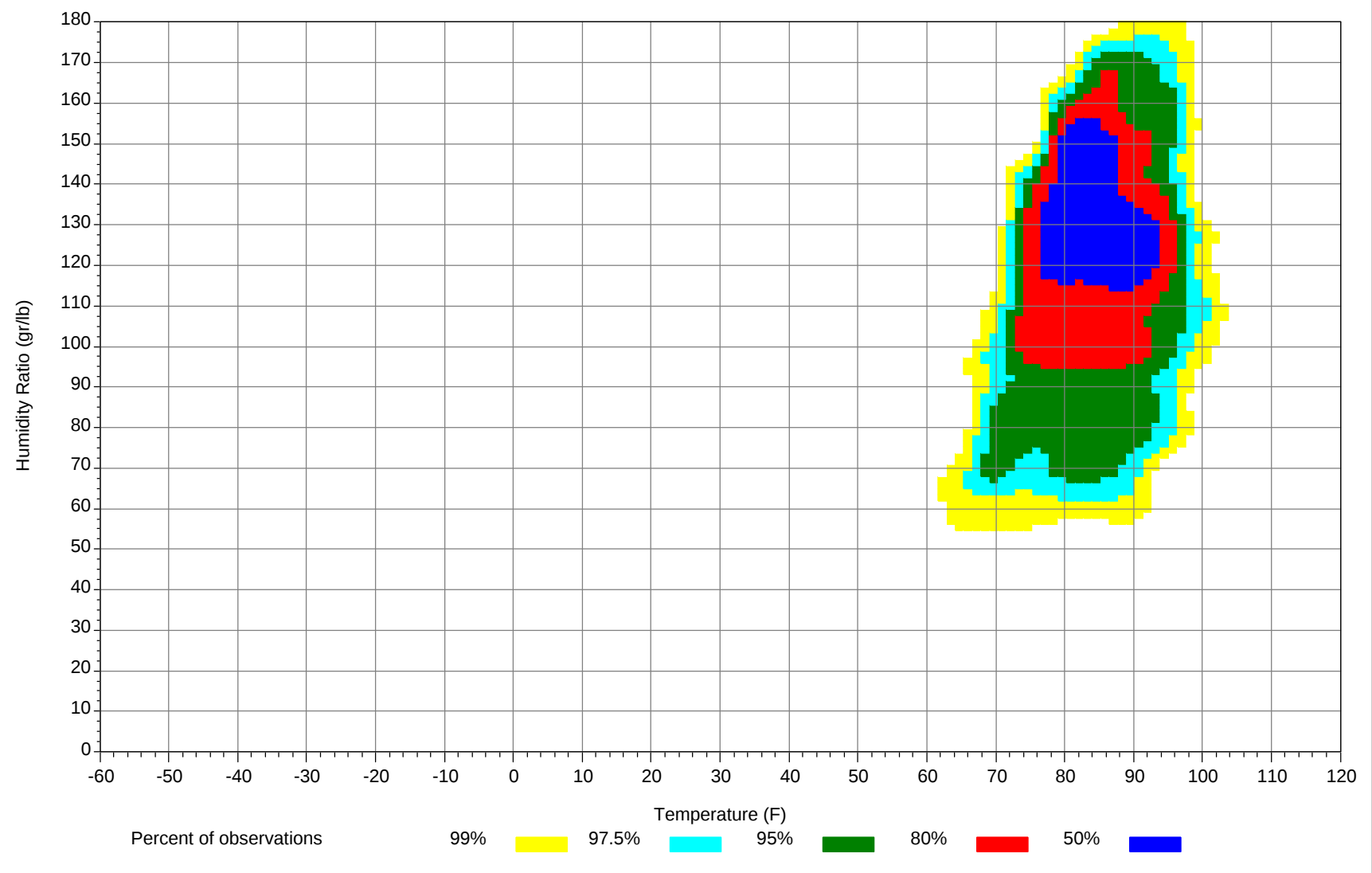
*Note: Temperatures at greater depths can be estimated by adding 1.5°F per 100 feet additional depth.



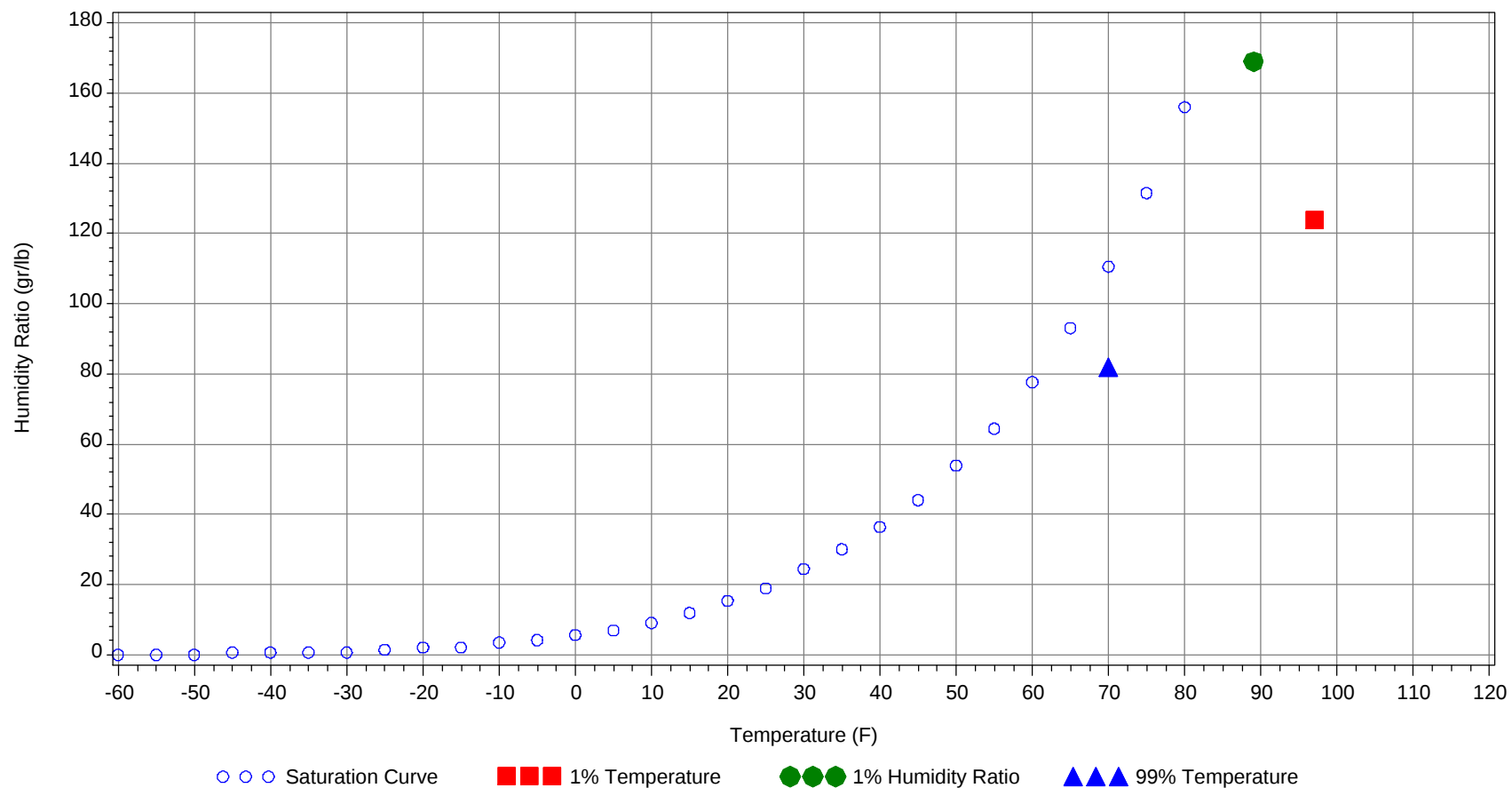
Average Annual Climate



Long Term Psychrometric Summary



Psychrometric Summary of Peak Design Values



	(° F) / (gr/lb)	MCDB (° F)	MCWB (° F)	MCDP (° F)	MCHR (gr/lb)	Enthalpy (btu/lb)
1.0% Dry Bulb	97.0		79		124.0	43.1
99.0% Dry Bulb	70.0				82.0	29.4
1.0% Humidity Ratio	169.0	89.0	83.8	82.4		47.9

Dry-Bulb Temperature Hours For An Average Year

	January					February					March				
Temperature Range (°F)	01 To 08 LST	09 To 16 LST	17 to 00 LST	Total Obs	M C W B (°F)	01 To 08 LST	09 To 16 LST	17 to 00 LST	Total Obs	M C W B (°F)	01 To 08 LST	09 To 16 LST	17 to 00 LST	Total Obs	M C W B (°F)
100/104							0		0	80.1		3	0	3	79.4
95/ 99		3	0	3	76		19	1	20	77.1		64	8	72	78.4
90/ 94		67	15	82	74.6	0	91	28	119	75.9		101	43	144	77.4
85/ 89	0	82	54	136	73.5	0	61	57	118	74.8	8	51	86	145	77.5
80/ 84	27	61	116	204	73.2	75	39	111	225	75.5	156	20	96	272	77.1
75/ 79	129	27	50	206	71.6	109	11	24	144	72.9	74	6	11	91	74.2
70/ 74	70	6	10	86	66.9	33	2	3	38	67.5	8	2	3	13	69
65/ 69	16	1	1	18	61.5	6	0	0	6	62.3	1	0	1	2	62.4
60/ 64	5	0	0	5	56.7	1	0	0	1	55	0	0	0	0	60.6
55/ 59	0			0	54	0			0	51					
50/ 54															

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 (° F)	01 To 08 LST	09 To 16 LST	17 to 00 LST	Total Obs	M C W B (° F)	01 To 08 LST	09 To 16 LST	17 to 00 LST	Total Obs	M C W B (° F)	01 To 08 LST	09 To 16 LST	17 to 00 LST	Total Obs	M C W B (° F)
100/104		9	1	10	78.4		5	0	5	79.2		1	0	1	78.6
95/ 99	0	91	17	108	79.6	0	59	10	69	79.8		26	3	29	79.8
90/ 94	1	80	50	131	79.2	2	99	43	144	79.6	0	115	29	144	79.2
85/ 89	52	41	107	200	79.3	50	58	93	201	79.2	27	76	88	191	78.5
80/ 84	142	15	52	209	77.8	141	22	79	242	77.9	157	20	94	271	77.5
75/ 79	43	3	13	59	75.1	55	4	21	80	75.9	55	2	24	81	75.9
70/ 74	2	0	1	3	71.7	1	0	0	1	72.9	1	0	1	2	72.5
65/ 69															
60/ 64															
55/ 59															
50/ 54															

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

	July					August					September				
Temperature Range (° F)	01 To 08 LST	09 To 16 LST	17 to 00 LST	Total Obs	M C W B (° F)	01 To 08 LST	09 To 16 LST	17 to 00 LST	Total Obs	M C W B (° F)	01 To 08 LST	09 To 16 LST	17 to 00 LST	Total Obs	M C W B (° F)
100/104		0		0	84							0		0	90.5
95/ 99		15	2	17	79.9		12	1	13	80.7		6	1	7	81.6
90/ 94	0	109	26	135	78.8	0	105	22	127	79.1	0	89	17	106	79.4
85/ 89	15	88	82	185	78.1	8	94	74	176	78.2	3	93	58	154	78.5
80/ 84	160	31	109	300	77	155	34	112	301	77.1	120	46	110	276	77.4
75/ 79	71	5	29	105	75.5	84	4	38	126	75.5	115	6	53	174	75.8
70/ 74	1	0	1	2	72.6	1	0	0	1	72.7	2	0	1	3	72.8
65/ 69													0	0	58
60/ 64															
55/ 59															
50/ 54															

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

	October					November					December				
Temperature Range (°F)	01 To 08 LST	09 To 16 LST	17 to 00 LST	Total Obs	M C W B (°F)	01 To 08 LST	09 To 16 LST	17 to 00 LST	Total Obs	M C W B (°F)	01 To 08 LST	09 To 16 LST	17 to 00 LST	Total Obs	M C W B (°F)
100/104															
95/ 99		6	0	6	81		6	0	6	77.4		3	0	3	76.4
90/ 94	0	79	14	93	78.5		71	16	87	77.2		53	11	64	74.9
85/ 89	2	99	65	166	77.8	2	90	65	157	75.7	0	86	52	138	73.3
80/ 84	112	54	122	288	77.1	83	56	112	251	74.9	37	66	106	209	72.4
75/ 79	127	10	45	182	75.2	115	14	41	170	72.2	102	30	58	190	70.1
70/ 74	7	1	2	10	69.8	35	2	6	43	67.5	76	9	17	102	66
65/ 69	0		0	0	67	5	0		5	63.6	26	1	3	30	61.9
60/ 64						0			0	59.5	5	0	1	6	57.5
55/ 59											1		0	1	52.5
50/ 54											0			0	48.3

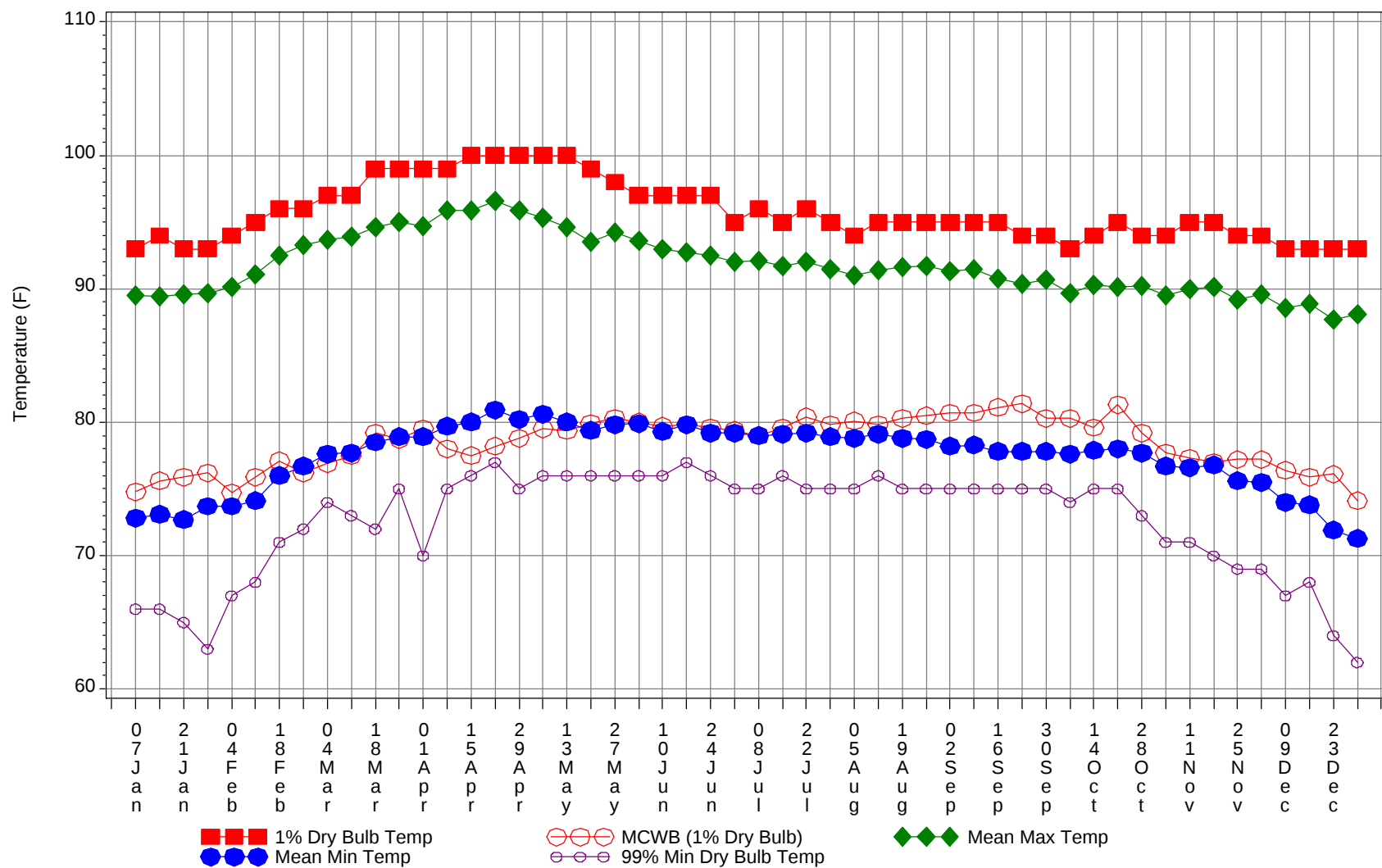
Caution: This summary reflects the typical distribution of temperature in a typical year. It does not reflect the typical moisture distribution. Because wet bulb temperatures are averaged, this summary understates the annual moisture load. For accurate moisture load data, see the long-term humidity summary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

Dry-Bulb Temperature Hours For An Average Year

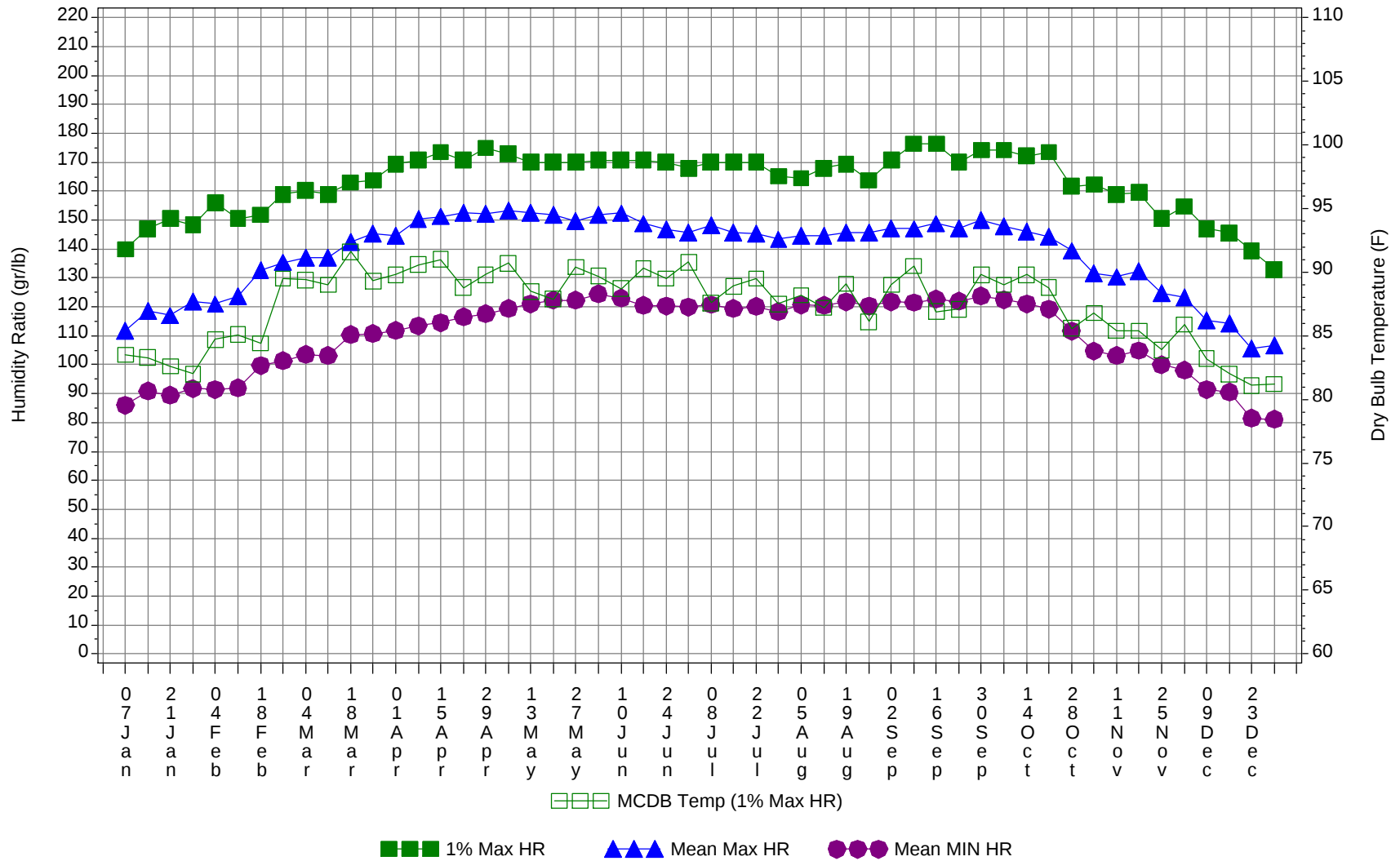
	Annual				
Temperature Range (°F)	01 To 08 LST	09 To 16 LST	17 to 00 LST	Total Obs	M C W B (°F)
100/104		19	1	20	78.9
95/ 99	0	311	46	357	79.3
90/ 94	3	1061	317	1381	78.1
85/ 89	169	919	884	1972	77.3
80/ 84	1374	462	1218	3054	76.4
75/ 79	1077	122	406	1605	73.8
70/ 74	233	22	43	298	67.2
65/ 69	52	3	5	60	61.9
60/ 64	11	1	1	13	57.1
55/ 59	1		0	1	52.8
50/ 54	0			0	48.3

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



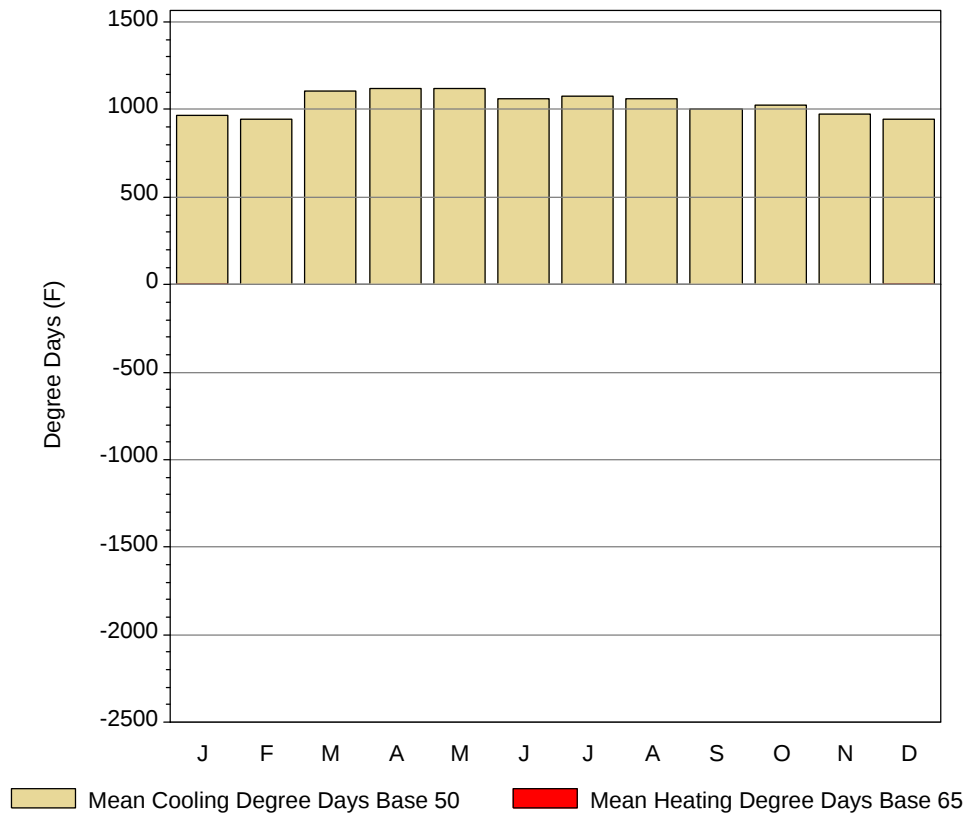
Long Term Humidity and Dry Bulb Temperature Summary



Long Term Humidity and Dry Bulb Temperature Summary

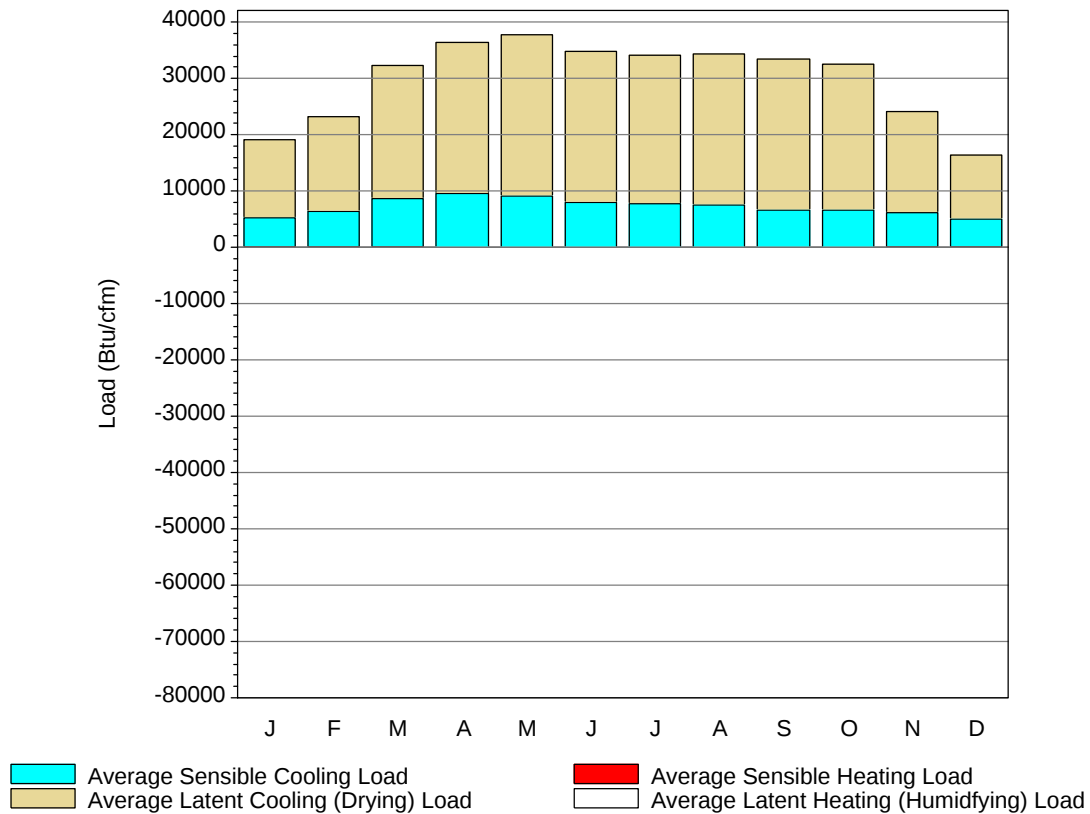
Week Ending	1.0% Temp (° F)	MCWB@ 1% Temp (° F)	Mean Max Temp (° F)	Mean Min Temp (° F)	99% Temp (° F)	1.0% HR (gr/lb)	MCDB@ 1% HR (° F)	Mean Max HR (gr/lb)	Mean Min HR (gr/lb)
7-Jan	93	74.8	89.5	72.8	66	140	83.5	111.7	86
14-Jan	94	75.6	89.4	73.1	66	147	83.3	118.7	90.9
21-Jan	93	75.9	89.6	72.7	65	150.5	82.6	117	89.5
28-Jan	93	76.2	89.7	73.7	63	148.4	82	122	91.7
4-Feb	94	74.7	90.1	73.7	67	156.1	84.7	121	91.5
11-Feb	95	75.9	91.1	74.1	68	150.5	85.1	123.6	92
18-Feb	96	77.1	92.5	76	71	151.9	84.4	132.8	99.7
25-Feb	96	76.2	93.3	76.7	72	158.9	89.5	135.4	101.4
4-Mar	97	76.9	93.7	77.6	74	160.3	89.4	137.1	103.6
11-Mar	97	77.5	93.9	77.7	73	158.9	89	137	103.2
18-Mar	99	79.2	94.6	78.5	72	163.1	91.6	142.6	110.4
25-Mar	99	78.7	95	78.9	75	163.8	89.3	145.5	110.7
1-Apr	99	79.5	94.7	78.9	70	169.4	89.8	144.7	111.8
8-Apr	99	78	95.9	79.7	75	170.8	90.6	150.5	113.5
15-Apr	100	77.5	95.9	80	76	173.6	91	151.3	114.5
22-Apr	100	78.2	96.6	80.9	77	170.8	88.8	152.7	116.5
29-Apr	100	78.8	95.9	80.2	75	175	89.8	152.1	117.7
6-May	100	79.5	95.3	80.6	76	172.9	90.7	153.4	119.5
13-May	100	79.4	94.6	80	76	170.1	88.5	152.5	121
20-May	99	79.9	93.5	79.4	76	170.1	87.9	151.9	122.4
27-May	98	80.3	94.2	79.8	76	170.1	90.4	149.7	122.3
4-Jun	97	80	93.6	79.9	76	170.8	89.7	151.9	124.5
10-Jun	97	79.7	93	79.3	76	170.8	88.7	152.4	123.1
17-Jun	97	79.8	92.7	79.8	77	170.8	90.3	148.8	120.5
24-Jun	97	79.6	92.5	79.2	76	170.1	89.5	146.7	120.3
1-Jul	95	79.4	92	79.2	75	168	90.8	145.8	119.9
8-Jul	96	79	92.1	79	75	170.1	87.6	148.2	120.8
15-Jul	95	79.6	91.7	79.1	76	170.1	88.9	145.7	119.5
22-Jul	96	80.4	92	79.2	75	170.1	89.5	145.3	120.1
29-Jul	95	79.8	91.5	78.9	75	165.2	87.5	143.4	118.3
5-Aug	94	80.1	91	78.8	75	164.5	88.2	144.6	120.7
12-Aug	95	79.8	91.4	79.1	76	168	87.2	144.6	120.5
19-Aug	95	80.3	91.6	78.8	75	169.4	89.1	145.8	121.7
26-Aug	95	80.5	91.7	78.7	75	163.8	86.1	145.8	120.4
2-Sep	95	80.7	91.3	78.2	75	170.8	89	147.3	121.8
9-Sep	95	80.7	91.5	78.3	75	176.4	90.5	147	121.5
16-Sep	95	81.1	90.8	77.8	75	176.4	86.9	148.8	122.7
23-Sep	94	81.4	90.4	77.8	75	170.1	87.1	147.2	121.9
30-Sep	94	80.3	90.7	77.8	75	174.3	89.8	150	123.7
7-Oct	93	80.3	89.7	77.6	74	174.3	89	147.8	122.5
14-Oct	94	79.6	90.3	77.9	75	172.2	89.8	146.2	121
21-Oct	95	81.3	90.1	78	75	173.6	88.8	144.2	119.3
28-Oct	94	79.2	90.2	77.7	73	161.7	85.6	139.4	111.7
4-Nov	94	77.7	89.5	76.7	71	162.4	86.8	131.7	104.7
11-Nov	95	77.3	90	76.6	71	158.9	85.4	130.4	103.2
18-Nov	95	77	90.1	76.8	70	159.6	85.4	132.4	104.9
25-Nov	94	77.2	89.2	75.6	69	150.5	83.9	124.8	100
2-Dec	94	77.2	89.6	75.5	69	154.7	85.9	123.3	98.1
9-Dec	93	76.4	88.6	74	67	147	83.2	115.4	91.5
16-Dec	93	75.9	88.9	73.8	68	145.6	82	114.4	90.5
23-Dec	93	76.1	87.7	71.9	64	139.3	81.1	105.6	81.5
31-Dec	93	74.1	88.1	71.3	62	133	81.2	106.8	81.1

Degree Days, Heating and Cooling (Base 65 F) & Cooling (Base 50F)



Month	Mean Cooling Degree Days (°F) Base 50	Mean Cooling Degree Days (°F) Base 65	Mean Heating Degree Days (°F) Base 65
JAN	963.4	499.1	0.6
FEB	943.5	519.5	0
MAR	1104.3	639.3	0
APR	1117	667	0
MAY	1124	659	0
JUN	1061.3	611.3	0
JUL	1074.2	609.2	0
AUG	1063.3	598.3	0
SEP	1003.6	553.6	0
OCT	1027.6	562.6	0
NOV	977.8	527.8	0
DEC	946	481.8	0.8
ANN	12406	6928.5	1.4

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



Month	Average Sensible Cooling Load (Btu/cfm)	Average Sensible Heating Load (Btu/cfm)	Average Latent Cooling Load (Btu/cfm)	Average Latent Heating Load (Btu/cfm)
JAN	5352	-49	13825	0
FEB	6302	-7	16988	0
MAR	8592	-4	23792	0
APR	9517	0	26879	0
MAY	9047	0	28737	0
JUN	8069	0	26749	0
JUL	7760	0	26417	0
AUG	7476	0	26793	0
SEP	6577	0	26936	0
OCT	6567	0	25915	0
NOV	6050	-2	17956	0
DEC	5065	-66	11386	0
ANN	86374	-128	272373	0

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													

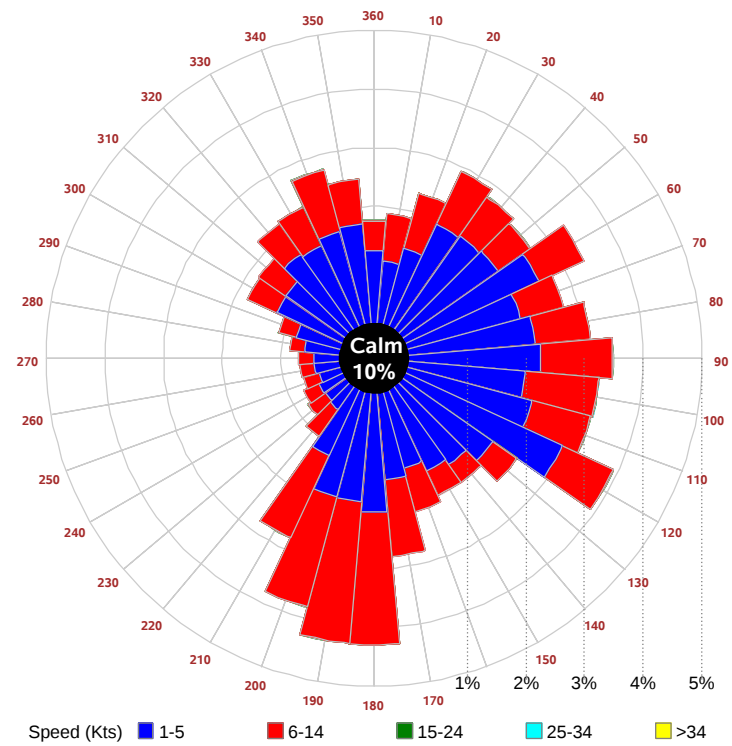
Average Annual Solar Radiation - Nearest Available Site Source: National Renewable Energy Laboratory, Golden CO, 1995

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													

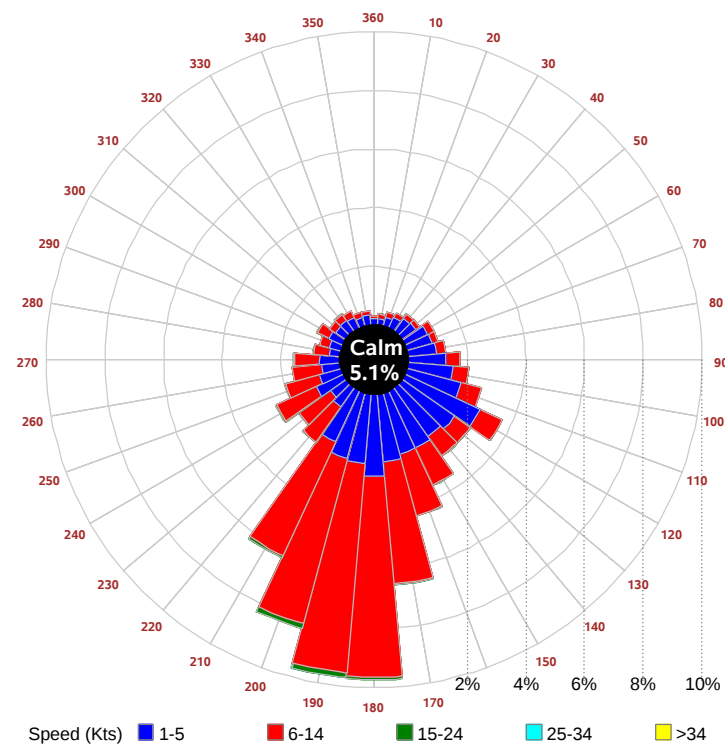
AVERAGE INCIDENT ILLUMINENCE (klux-hr) FOR MOSTLY CLEAR AND MOSTLY CLOUDY CONDITIONS, Percentage Uncertainty = 9											
				March					June		
		9am	11am	1pm	3pm	5pm	9am	11am	1pm	3pm	5pm
HORIZ.	M.Clear										
	M.Cloudy										
NORTH	M.Clear										
	M.Cloudy										
EAST	M.Clear										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

		9am		11am		Sept 1pm		3pm		5pm		Dec 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)																				

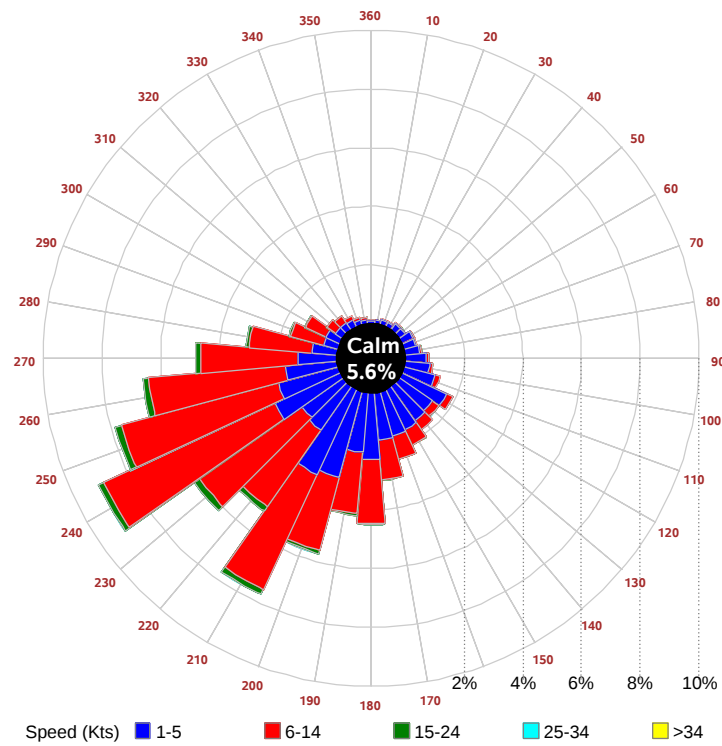
Wind Summary - December, January, and February



Wind Summary - March, April, and May



Wind Summary - June, July, and August



Wind Summary - September, October, and November

