

RAFIC HARIRI INTL, LE

Latitude = 33.82 N

Longitude = 35.49 E

Period of Record = 1988 To 2017

Station ID = ICAO_OLBA

Elevation = 87 Feet

Average Pressure = 29.87 inches Hg

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	97	70	68	8.2	N
0.4% Occurrence	91	74	105	8.2	WSW
1.0% Occurrence	89	76	116	8.8	WSW
2.0% Occurrence	88	76	118	8.6	WSW
Mean Daily Range	11	-	-	-	E
97.5% Occurrence	52	47	39	6.6	E
99.0% Occurrence	48	43	33	7.4	E
99.6% Occurrence	46	41	30	7.4	E
Median of Extreme Lows	44	39	28	7.1	E

	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	82	88	152	8	WSW
0.4% Occurrence	81	87	147	7.9	WSW
1.0% Occurrence	79	85	137	8.1	SW
2.0% Occurrence	78	85	133	8	SW

	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	158	88	1.04	5.7	WSW
0.4% Occurrence	151	85	0.99	7.7	SW
1.0% Occurrence	141	85	0.93	7.8	SW
2.0% Occurrence	137	85	0.91	6.5	WSW

Air Conditioning/ Humid Area Criteria	Threshold	T ≥ 93 °F	T ≥ 80 °F	Twb ≥ 73 °F	Twb ≥ 67 °F
	# of Hours	17	1751	1448	2915

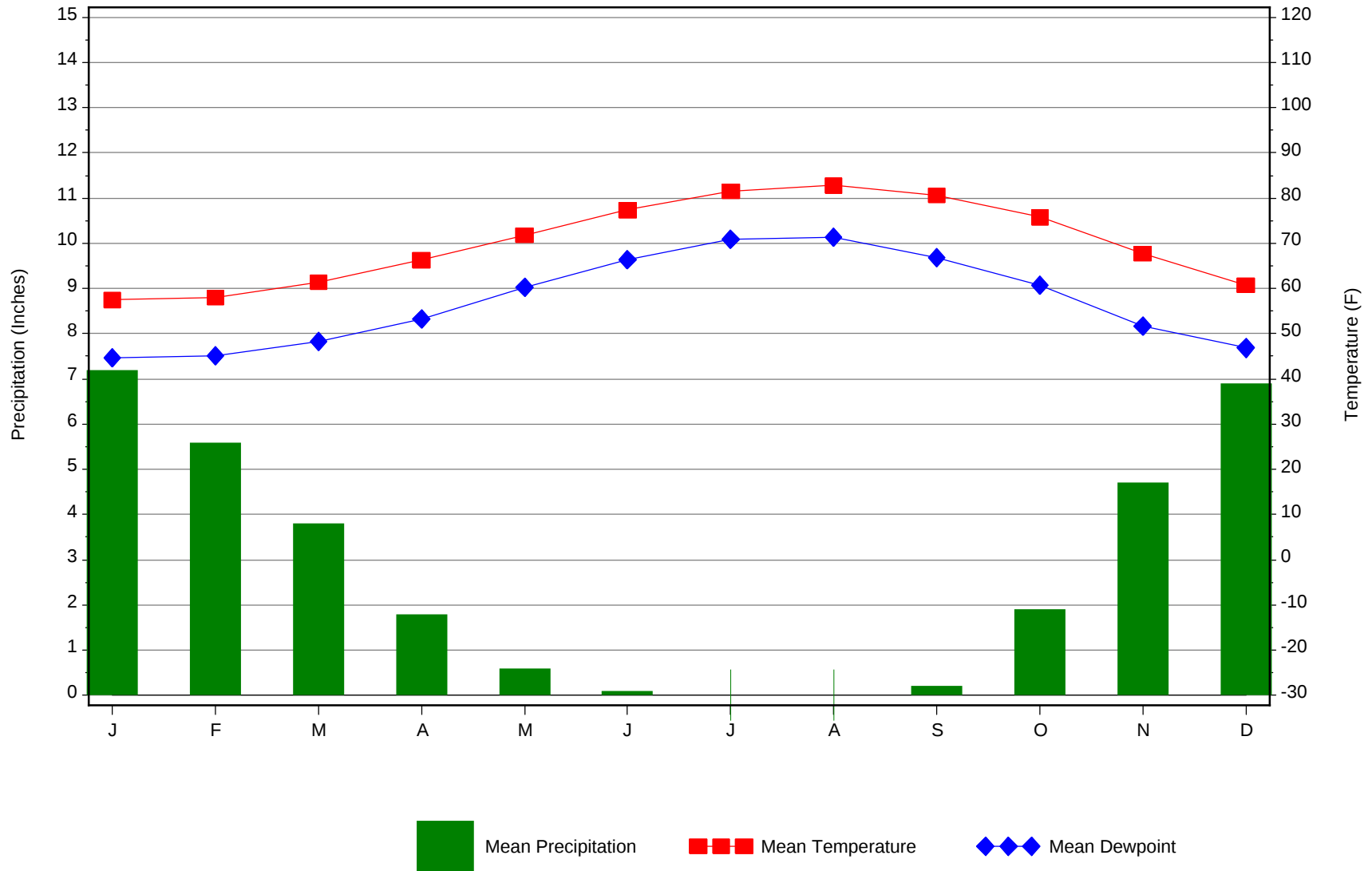
Other Site Data

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	N/A	5.3 + 1.8
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 (#)
72.7	N/A	N/A	0

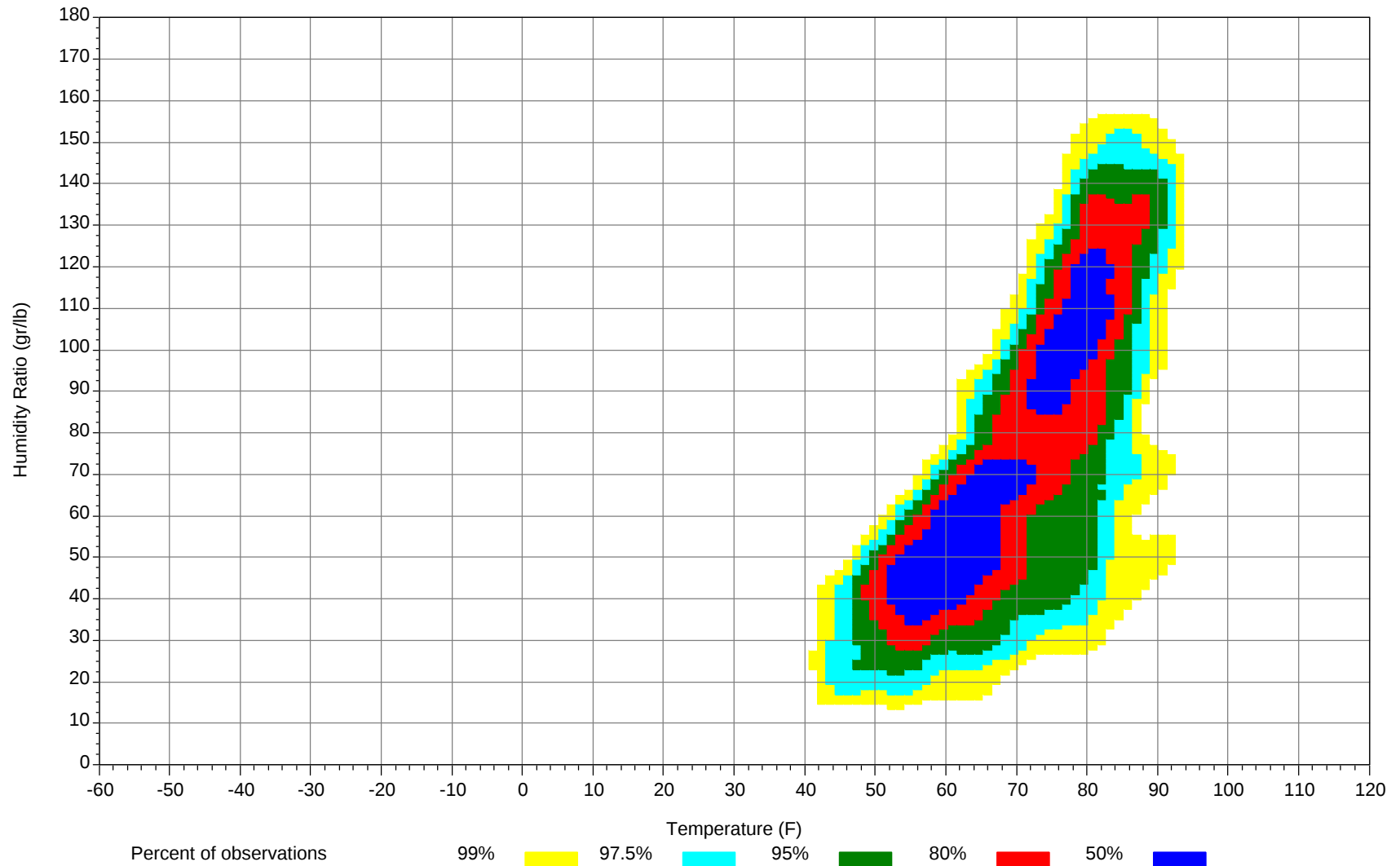
*Note: Temperatures at greater depths can be estimated by adding 1.5°F per 100 feet additional depth.



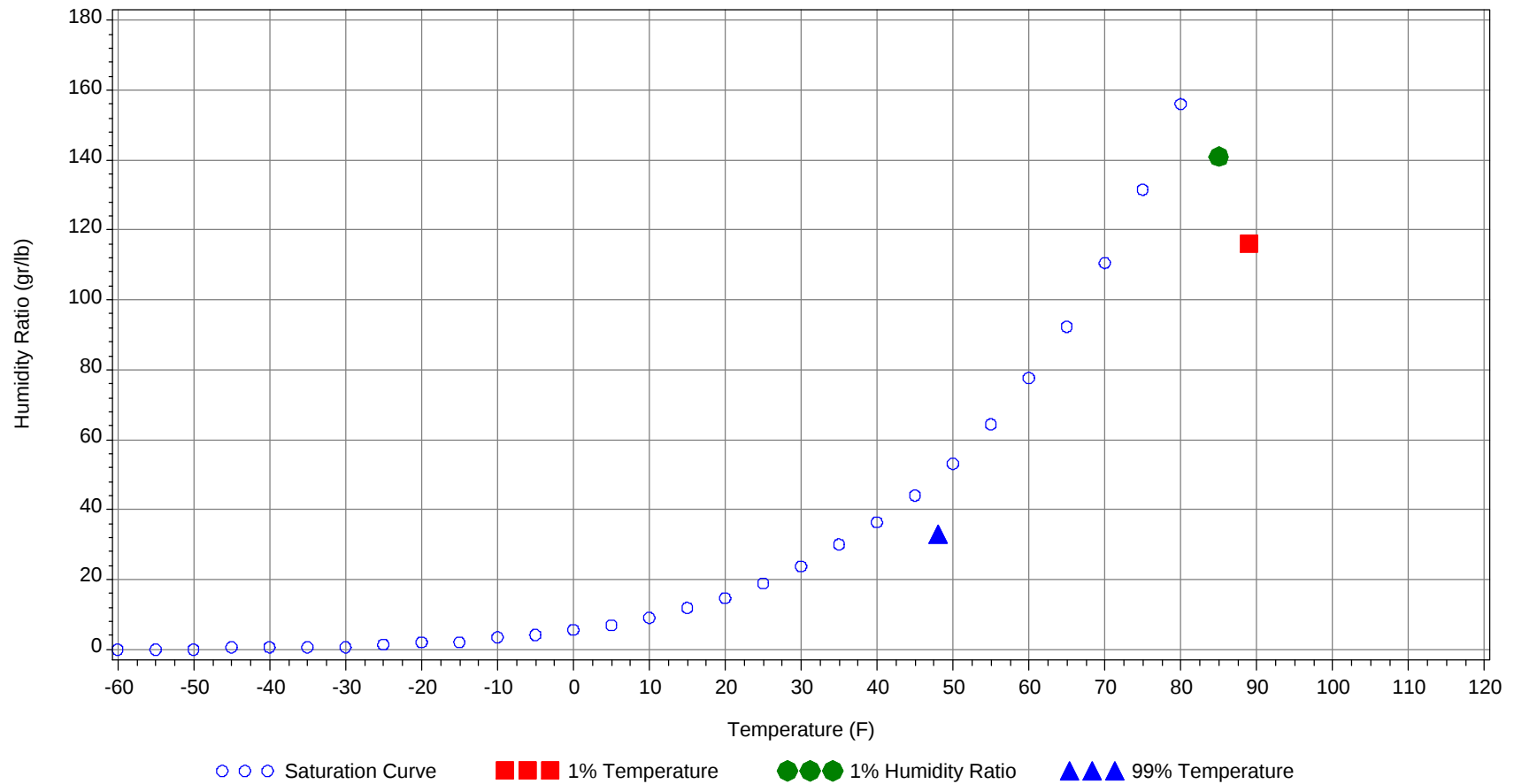
Average Annual Climate



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	89.0		76		116.0	40.5
99.0% Dry Bulb	48.0				33.0	16.5
1.0% Humidity Ratio	141.0	85.0	78.9	77.0		42.5

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															
95/ 99												0		0	63.8
90/ 94												1		1	62.9
85/ 89							0		0	60.5	1	1	0	2	60.7
80/ 84		0		0	57.4	0	0		0	59.9	2	4	2	8	59.5
75/ 79	0	1	0	1	57.8	0	3	1	4	58.2	3	10	4	17	59
70/ 74	1	7	1	9	57.8	1	12	2	15	57.6	7	24	11	42	59
65/ 69	3	40	5	48	56.9	4	35	8	47	57.1	13	65	24	102	58.6
60/ 64	26	100	56	182	54.1	26	96	61	183	54.6	59	104	105	268	55.6
55/ 59	107	68	117	292	50.8	94	48	97	239	51	115	28	80	223	51.5
50/ 54	92	26	58	176	47.1	75	22	42	139	47.1	42	10	19	71	47.6
45/ 49	17	4	10	31	42	20	6	11	37	42.4	6	1	3	10	43.2
40/ 44	3	1	1	5	38.9	3	1	2	6	38.8	0	0	0	0	39.6
35/ 39	0	0	0	0	34.7	0		0	0	36.3		0		0	
30/ 34	0			0	33										

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		0		0	63.2	0	0		0	66.3	0	0	0	0	70.5
95/ 99	0	1	0	1	63.4	0	1	0	1	66.2	0	0	0	0	67.2
90/ 94	0	3	1	4	62.7	0	3	1	4	66.1	0	3	1	4	69
85/ 89	1	5	2	8	62.6	1	7	3	11	66.5	1	16	5	22	74
80/ 84	3	10	6	19	62.3	4	22	11	37	67.6	17	124	39	180	73.1
75/ 79	7	22	12	41	62.7	21	99	37	157	67.8	104	91	137	332	70.1
70/ 74	19	67	27	113	62.1	84	97	110	291	65.2	105	4	56	165	66.4
65/ 69	39	89	66	194	60.3	88	17	69	174	61.9	12	0	2	14	62.7
60/ 64	110	37	103	250	57	47	2	16	65	58.2	0	0		0	58
55/ 59	55	6	20	81	52.8	2	0	0	2	54.4					
50/ 54	4	1	2	7	48.9										
45/ 49	1	0	0	1	41										
40/ 44															
35/ 39															
30/ 34															

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		0	70.7										
95/ 99	0	1	0	1	74.1		1	0	1	77		1		1	69.9
90/ 94	0	8	1	9	78.5	1	16	2	19	79.7	0	8	1	9	76.4
85/ 89	7	96	18	121	77.3	14	155	29	198	77.2	7	68	9	84	75.2
80/ 84	76	139	147	362	74.7	113	75	186	374	74.7	55	153	119	327	72.7
75/ 79	153	4	80	237	71.2	119	0	32	151	71.2	151	11	107	269	69
70/ 74	11	0	2	13	67.8	1	0	0	1	67.3	25	0	5	30	64.8
65/ 69						0			0	67	1	0	0	1	61.1
60/ 64															
55/ 59															
50/ 54															
45/ 49															
40/ 44															
35/ 39															
30/ 34															

Caution: This summary reflects the typical distribtion of temperature in a typical year. It does not reflect the typical mositure 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	0	1	0	1	65.3										
90/ 94	0	6	1	7	67.7		0		0	62.8					
85/ 89	3	16	4	23	69.8	1	2	0	3	63.6					
80/ 84	15	95	23	133	70.2	1	12	2	15	64.9		1	0	1	60.3
75/ 79	63	105	117	285	67.6	6	60	10	76	64.1	0	4	0	4	60.2
70/ 74	125	19	83	227	63.7	33	102	64	199	61.4	2	33	4	39	59.5
65/ 69	32	4	15	51	59.7	73	33	80	186	58.4	11	76	25	112	57.4
60/ 64	9	1	5	15	56.4	92	23	62	177	55.1	69	88	101	258	54.6
55/ 59	1	0	0	1	54.3	28	7	18	53	50.9	115	35	90	240	51.2
50/ 54						6	1	3	10	46.1	43	10	23	76	46.9
45/ 49						0	0	0	0	42.9	6	2	4	12	41.8
40/ 44											1	0	1	2	38.3
35/ 39															
30/ 34															

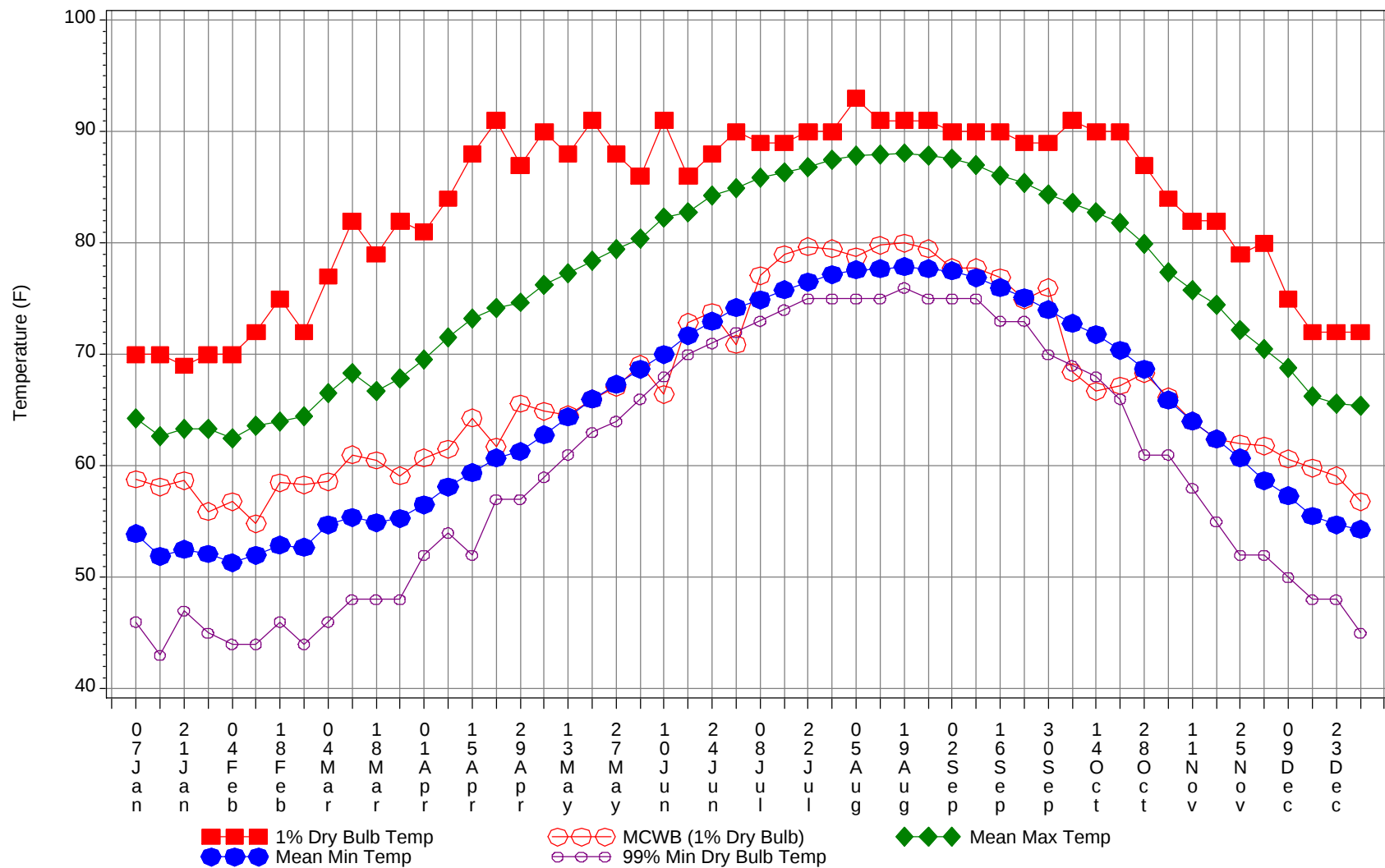
Caution: This summary reflects the typical distribution of temperature in a typical year. It does not reflect the typical moisture distribution. Because wet bulb temperatures are averaged, this summary understates the annual moisture load. For accurate moisture load data, see the long-term humidity summary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

Dry-Bulb Temperature Hours For An Average Year

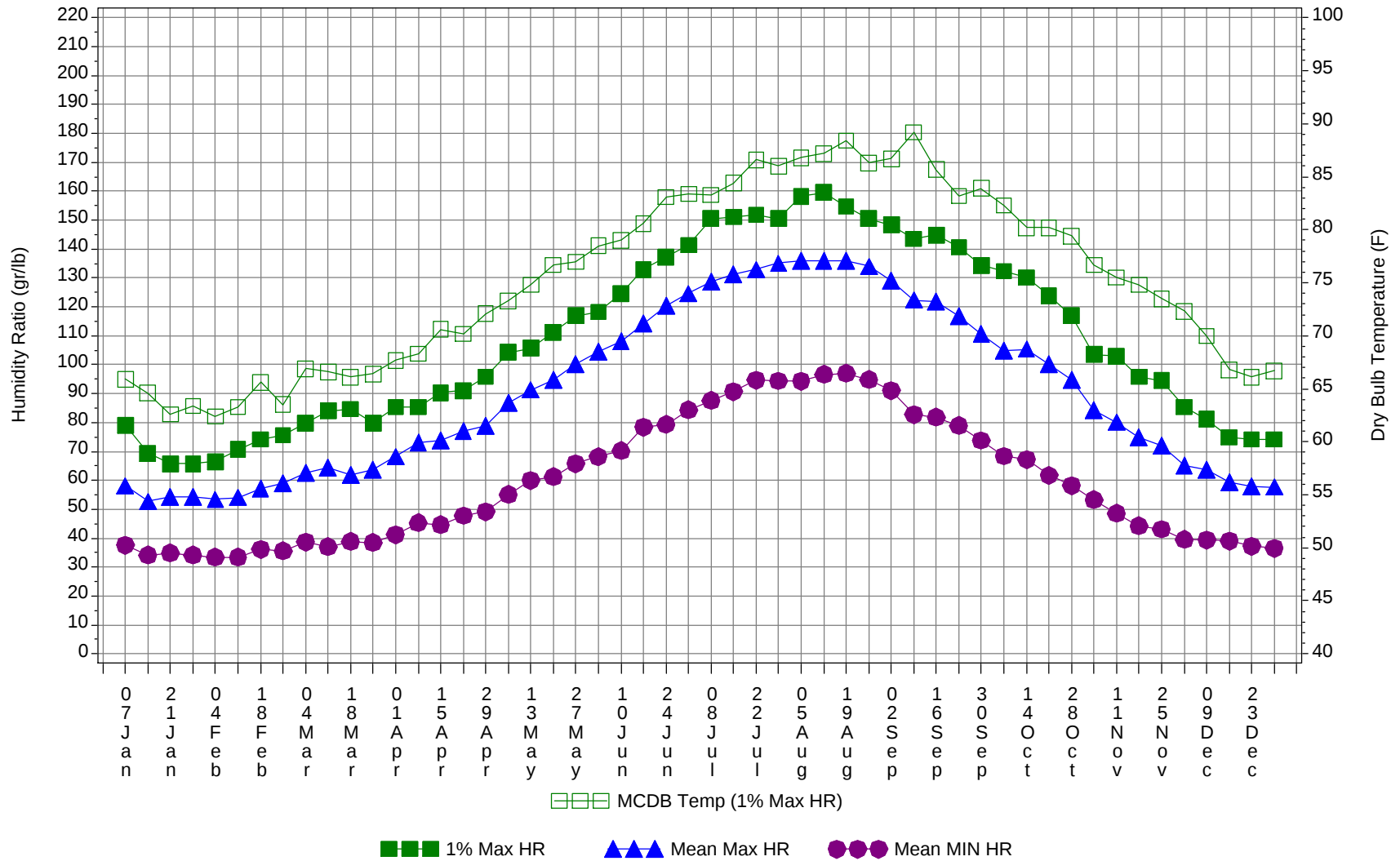
	Annual				
Temperature Range (°F)	01 To 08 LST	09 To 16 LST	17 to 00 LST	Total Obs	M C W B (°F)
100/104	0	1	0	1	67.3
95/ 99	0	6	1	7	68.8
90/ 94	3	49	7	59	74.1
85/ 89	36	366	71	473	75.7
80/ 84	289	636	535	1460	73.1
75/ 79	630	412	538	1580	68.8
70/ 74	416	367	366	1149	63.5
65/ 69	278	360	296	934	59.3
60/ 64	439	450	508	1397	55.4
55/ 59	513	190	420	1123	51.2
50/ 54	260	68	145	473	47.2
45/ 49	49	13	29	91	42.3
40/ 44	7	2	4	13	38.8
35/ 39	0	0	0	0	35.1
30/ 34	0			0	33

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



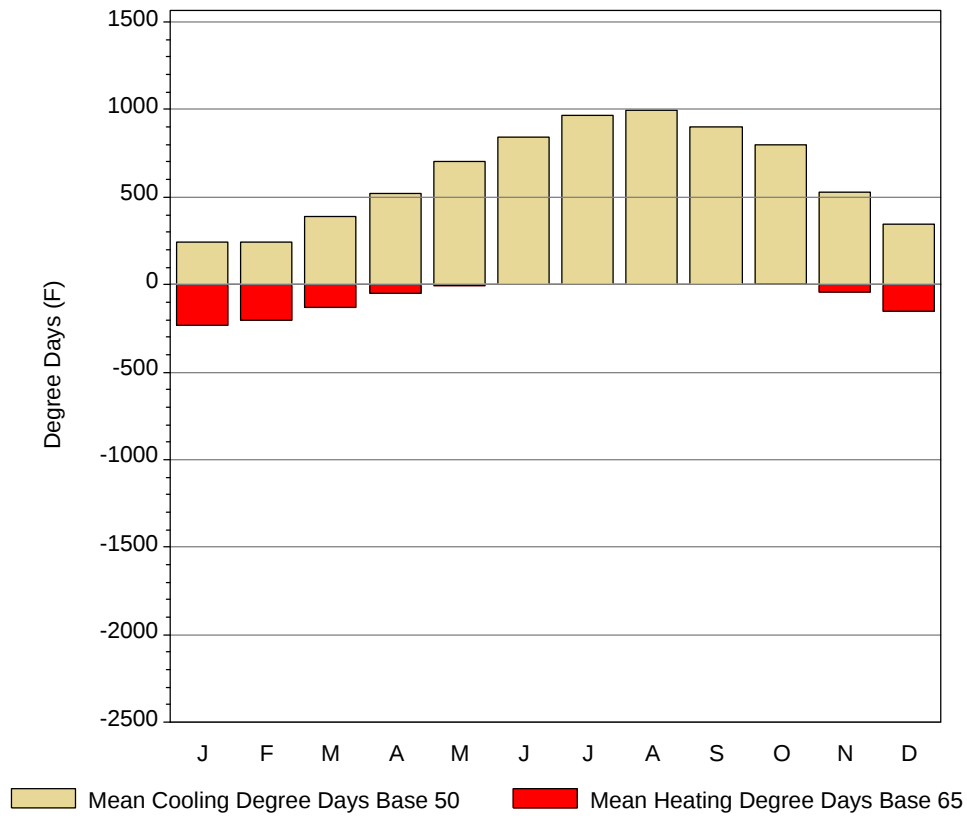
Long Term Humidity and Dry Bulb Temperature Summary



Long Term Humidity and Dry Bulb Temperature Summary

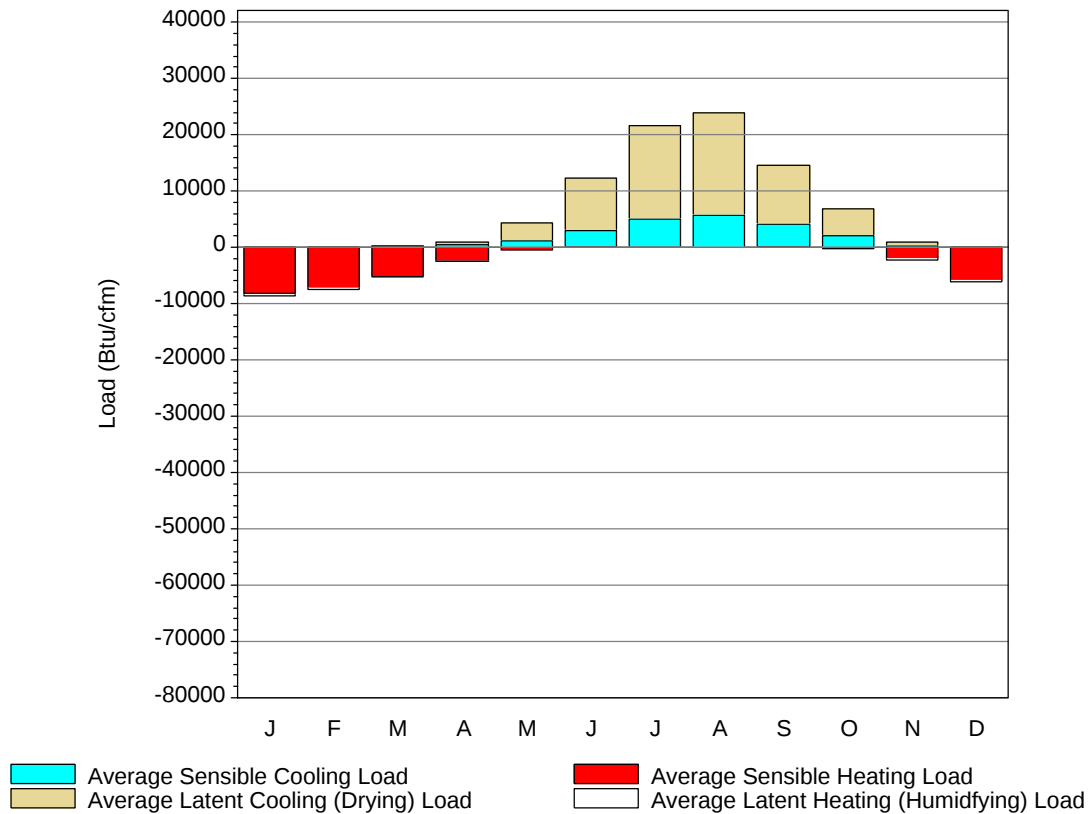
Week Ending	1.0% Temp (° F)	MCWB@ 1% Temp (° F)	Mean Max Temp (° F)	Mean Min Temp (° F)	99% Temp (° F)	1.0% HR (gr/lb)	MCDB@ 1% HR (° F)	Mean Max HR (gr/lb)	Mean Min HR (gr/lb)
7-Jan	70	58.8	64.3	53.9	46	79.1	65.9	58.1	37.6
14-Jan	70	58.1	62.7	51.9	43	69.3	64.6	52.7	34.1
21-Jan	69	58.7	63.3	52.5	47	65.8	62.6	54.4	34.9
28-Jan	70	55.9	63.3	52.1	45	65.8	63.4	54.3	34.1
4-Feb	70	56.8	62.5	51.3	44	66.5	62.4	53.4	33.5
11-Feb	72	54.8	63.6	52	44	70.7	63.3	54.1	33.4
18-Feb	75	58.5	64	52.9	46	74.2	65.6	57.3	36.1
25-Feb	72	58.3	64.5	52.7	44	75.6	63.5	59	35.6
4-Mar	77	58.6	66.5	54.7	46	79.8	66.9	62.5	38.7
11-Mar	82	61	68.3	55.4	48	84	66.6	64.3	37.1
18-Mar	79	60.5	66.7	54.9	48	84.7	66.1	61.9	38.9
25-Mar	82	59.1	67.9	55.3	48	79.8	66.4	63.6	38.5
1-Apr	81	60.7	69.6	56.5	52	85.4	67.7	68.2	41.2
8-Apr	84	61.5	71.5	58.1	54	85.4	68.3	73	45.3
15-Apr	88	64.3	73.2	59.4	52	90.3	70.6	73.7	44.7
22-Apr	91	61.7	74.2	60.7	57	91	70.2	77	47.8
29-Apr	87	65.6	74.7	61.3	57	95.9	72.1	79	49.1
6-May	90	64.9	76.3	62.8	59	104.3	73.3	86.8	55.1
13-May	88	64.6	77.3	64.4	61	105.7	74.8	91.3	60
20-May	91	66	78.4	66	63	111.3	76.7	94.9	61.2
27-May	88	67.1	79.5	67.3	64	116.9	77	100.3	65.7
4-Jun	86	69.1	80.4	68.7	66	118.3	78.5	104.5	68.2
10-Jun	91	66.4	82.3	70	68	124.6	79	108	70.3
17-Jun	86	72.9	82.8	71.7	70	133	80.6	114.2	78.4
24-Jun	88	73.8	84.3	73	71	137.2	83.1	120.4	79.4
1-Jul	90	70.9	84.9	74.2	72	141.4	83.4	124.6	84.4
8-Jul	89	77.1	85.9	74.9	73	150.5	83.3	128.7	87.6
15-Jul	89	79	86.4	75.8	74	151.2	84.4	131.4	90.7
22-Jul	90	79.7	86.8	76.5	75	151.9	86.6	132.9	94.6
29-Jul	90	79.5	87.5	77.2	75	150.5	86	135.1	94.4
5-Aug	93	78.8	87.9	77.6	75	158.2	86.8	135.9	94.3
12-Aug	91	79.8	88	77.7	75	159.6	87.2	136	96.7
19-Aug	91	80	88.1	77.9	76	154.7	88.4	136	97
26-Aug	91	79.5	87.9	77.7	75	150.5	86.3	134	94.8
2-Sep	90	77.8	87.6	77.5	75	148.4	86.7	129.1	91.1
9-Sep	90	77.8	87	76.9	75	143.5	89.2	122.4	82.8
16-Sep	90	76.9	86.1	76	73	144.9	85.7	121.8	81.9
23-Sep	89	74.9	85.4	75.1	73	140.7	83.2	116.7	79
30-Sep	89	76	84.4	74	70	134.4	83.9	110.7	73.8
7-Oct	91	68.4	83.6	72.8	69	132.3	82.3	104.9	68.4
14-Oct	90	66.7	82.8	71.8	68	130.2	80.2	105.4	67.2
21-Oct	90	67.2	81.8	70.4	66	123.9	80.2	100.1	61.7
28-Oct	87	68.3	79.9	68.7	61	116.9	79.4	94.7	58.2
4-Nov	84	66.2	77.4	65.9	61	103.6	76.7	84.2	53.3
11-Nov	82	64	75.8	64	58	102.9	75.5	80.1	48.6
18-Nov	82	62.4	74.5	62.4	55	95.9	74.8	75	44.2
25-Nov	79	62	72.2	60.7	52	94.5	73.5	72	43.1
2-Dec	80	61.8	70.5	58.7	52	85.4	72.3	65	39.5
9-Dec	75	60.6	68.8	57.3	50	81.2	70	63.8	39.4
16-Dec	72	59.8	66.3	55.5	48	74.9	66.8	59.5	39
23-Dec	72	59.1	65.6	54.7	48	74.2	66.1	57.9	37.2
31-Dec	72	56.8	65.4	54.3	45	74.2	66.7	57.7	36.5

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	244.7	11	234.3
FEB	242	15.3	205.6
MAR	390.4	52.5	128.3
APR	523.5	120.7	47.3
MAY	700.2	240.5	5.3
JUN	841.1	391.2	0
JUL	966.9	501.9	0
AUG	993.5	528.5	0
SEP	900.4	450.4	0
OCT	795.6	332.6	2
NOV	528.8	120.8	42
DEC	344.4	28.3	150.8
ANN	7471.5	2793.7	815.6

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	6	-8274	4	-239
FEB	11	-7302	5	-230
MAR	152	-5139	51	-159
APR	577	-2388	300	-67
MAY	1147	-476	3158	-6
JUN	2941	-10	9321	-2
JUL	5081	0	16480	-1
AUG	5767	0	18233	0
SEP	4098	-5	10583	0
OCT	1983	-171	4762	-5
NOV	293	-2097	525	-77
DEC	31	-5904	15	-167
ANN	22087	-31766	63437	-953

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													

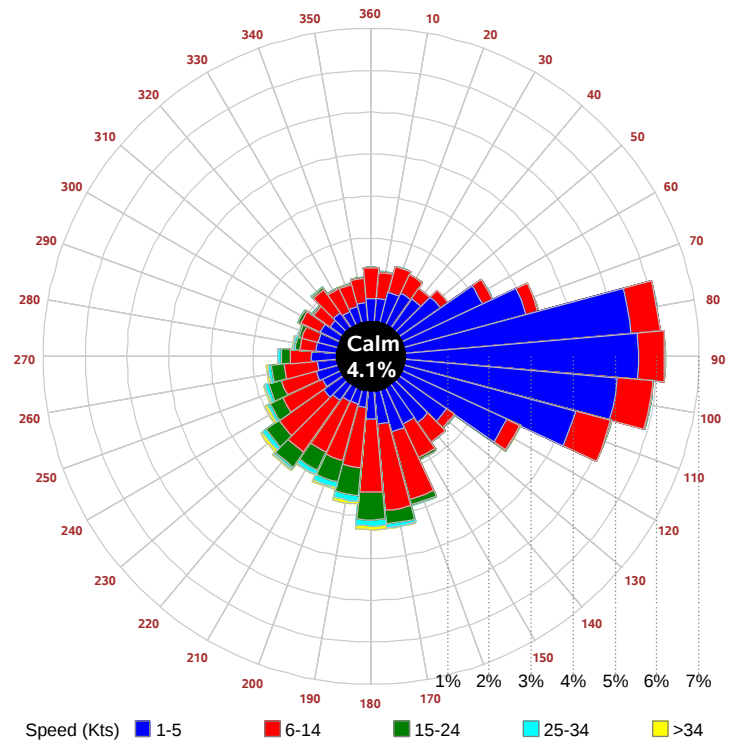
Average Annual Solar Radiation - Nearest Available Site Source: National Renewable Energy Laboratory, Golden CO, 1995

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													

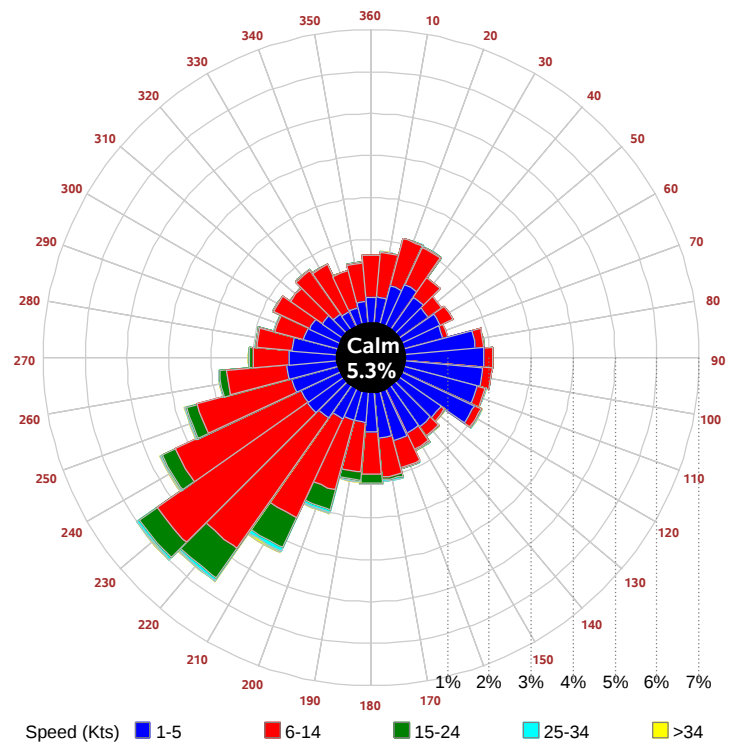
AVERAGE INCIDENT ILLUMINANCE (klux-hr) FOR MOSTLY CLEAR AND MOSTLY CLOUDY CONDITIONS, Percentage Uncertainty = 9												
				March						June		
		9am	11am	1pm	3pm	5pm	9am	11am	1pm	3pm	5pm	
HORIZ.	M.Clear											
	M.Cloudy											
NORTH	M.Clear											
	M.Cloudy											
EAST	M.Clear			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

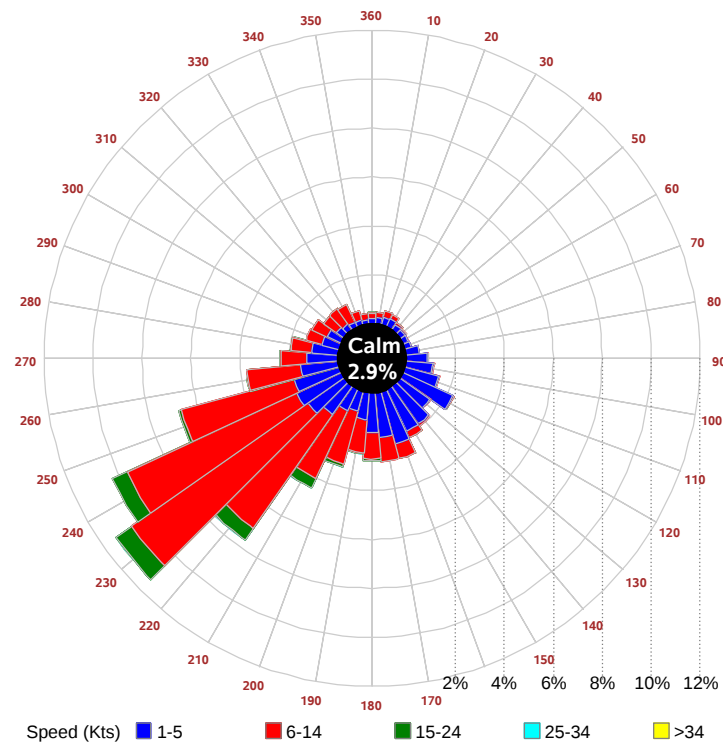
Wind Summary - December, January, and February



Wind Summary - March, April, and May



Wind Summary - June, July, and August



Wind Summary - September, October, and November

