

ARLANDA, SW	
Latitude = 59.65 N	Station ID = ICAO_ESSA
Longitude = 17.92 E	Elevation = 137 Feet
Period of Record = 1988 To 2017	Average Pressure = 29.68 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	84	64	59	10.3	WSW
0.4% Occurrence	81	64	62	10.3	S
1.0% Occurrence	77	62	61	10.5	S
2.0% Occurrence	73	60	59	10.6	WSW
Mean Daily Range	13	-	-	-	WSW
97.5% Occurrence	16	15	11	6.6	WSW
99.0% Occurrence	9	9	8	6.1	WSW
99.6% Occurrence	3	3	5	4.9	WSW
Median of Extreme Lows	-2	-3	4	3.6	WSW

	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	69	78	90	9.6	SE
0.4% Occurrence	67	75	84	9.1	SE
1.0% Occurrence	65	73	78	9.2	S
2.0% Occurrence	63	70	74	9.2	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	97	71	0.64	8.7	E
0.4% Occurrence	90	69	0.6	7.8	E
1.0% Occurrence	86	69	0.58	7.5	E
2.0% Occurrence	78	66	0.52	7.8	S

Air Conditioning/ Humid Area Criteria	Threshold	T ≥ 93 °F	T ≥ 80 °F	Twb ≥ 73 °F	Twb ≥ 67 °F
	# of Hours	0	50	3	45

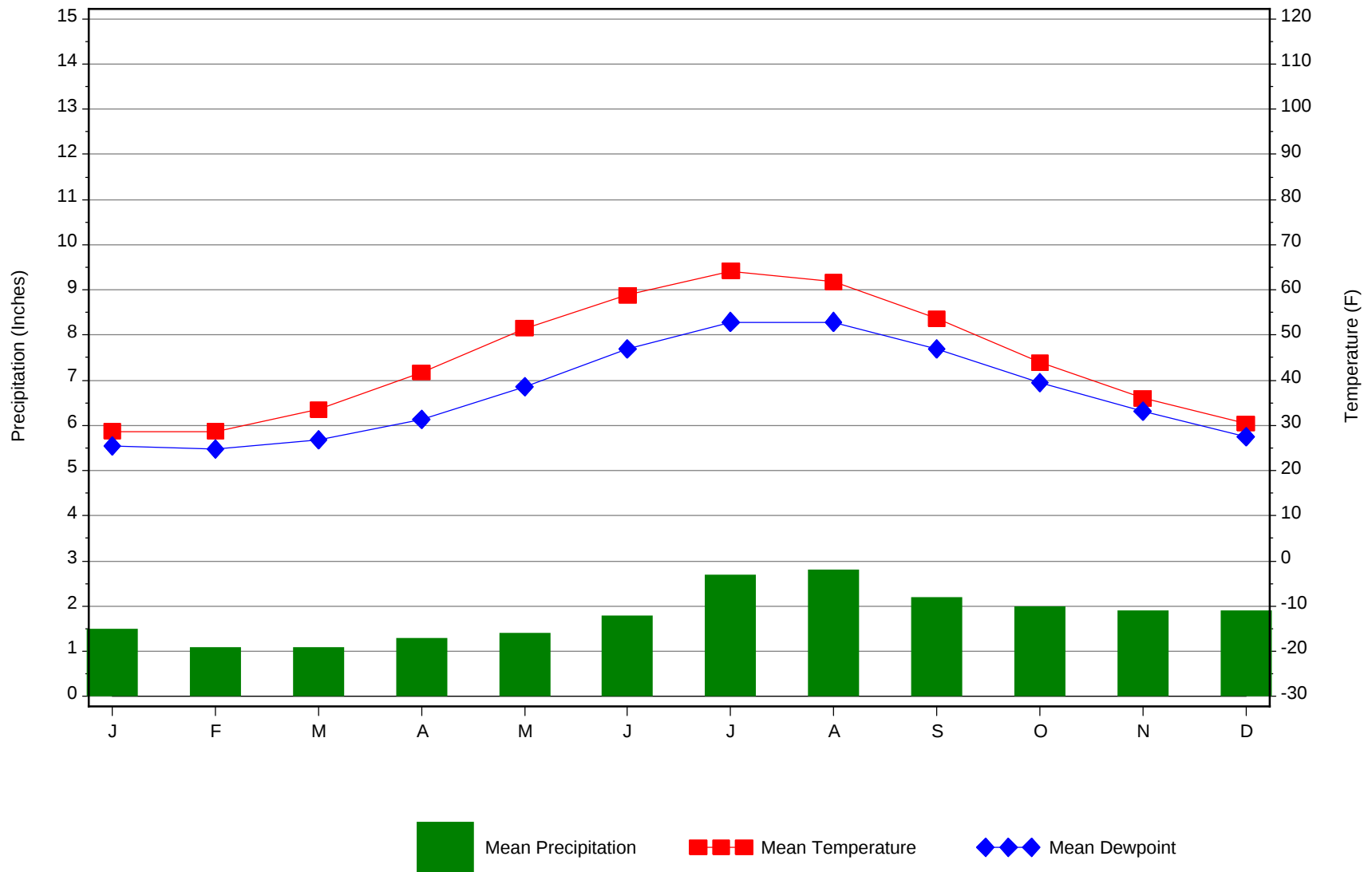
Other Site Data

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
5	N/A	N/A	0.1 + 0.0
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 (#)
47	N/A	N/A	55

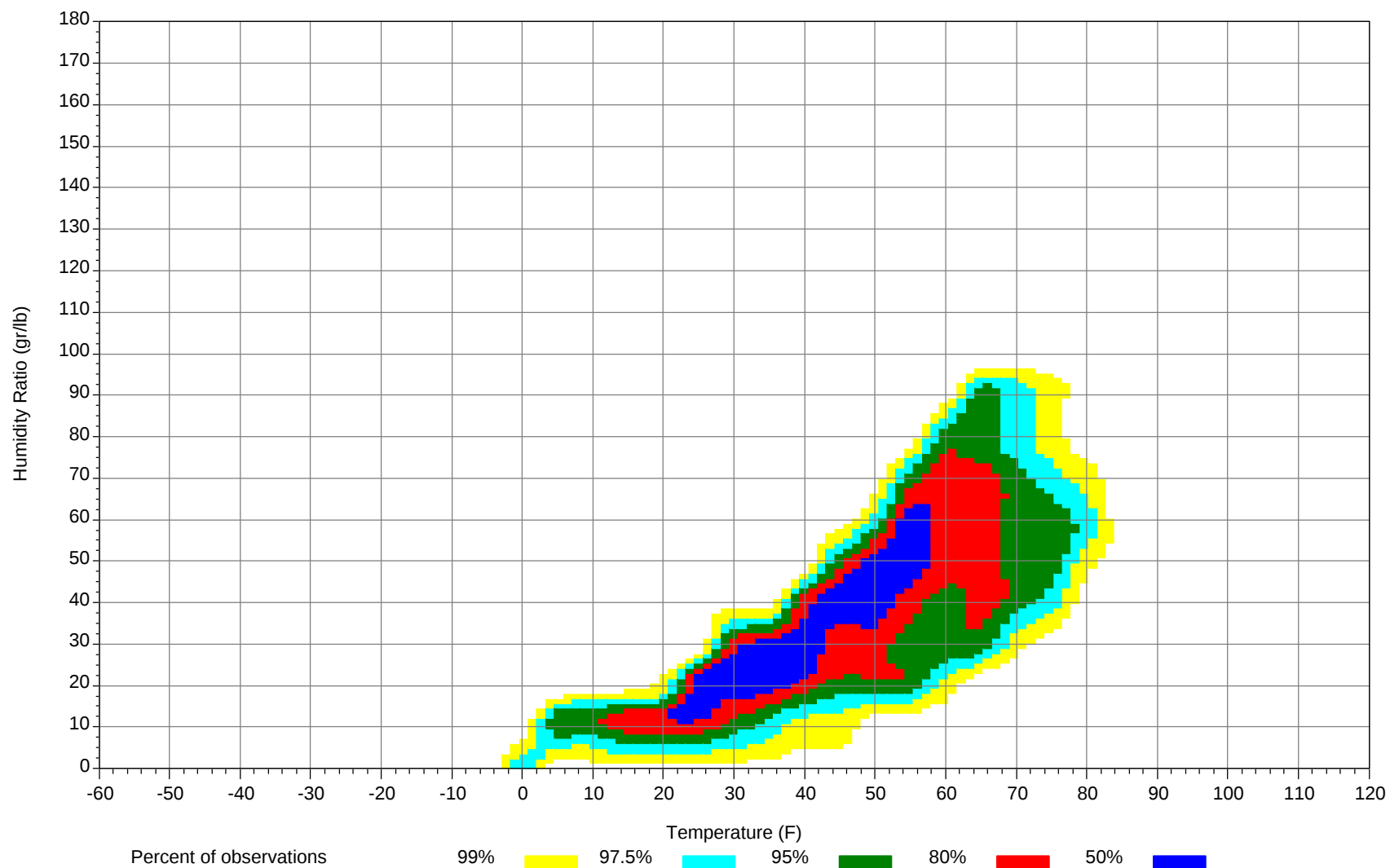
*Note: Temperatures at greater depths can be estimated by adding 1.5°F per 100 feet additional depth.



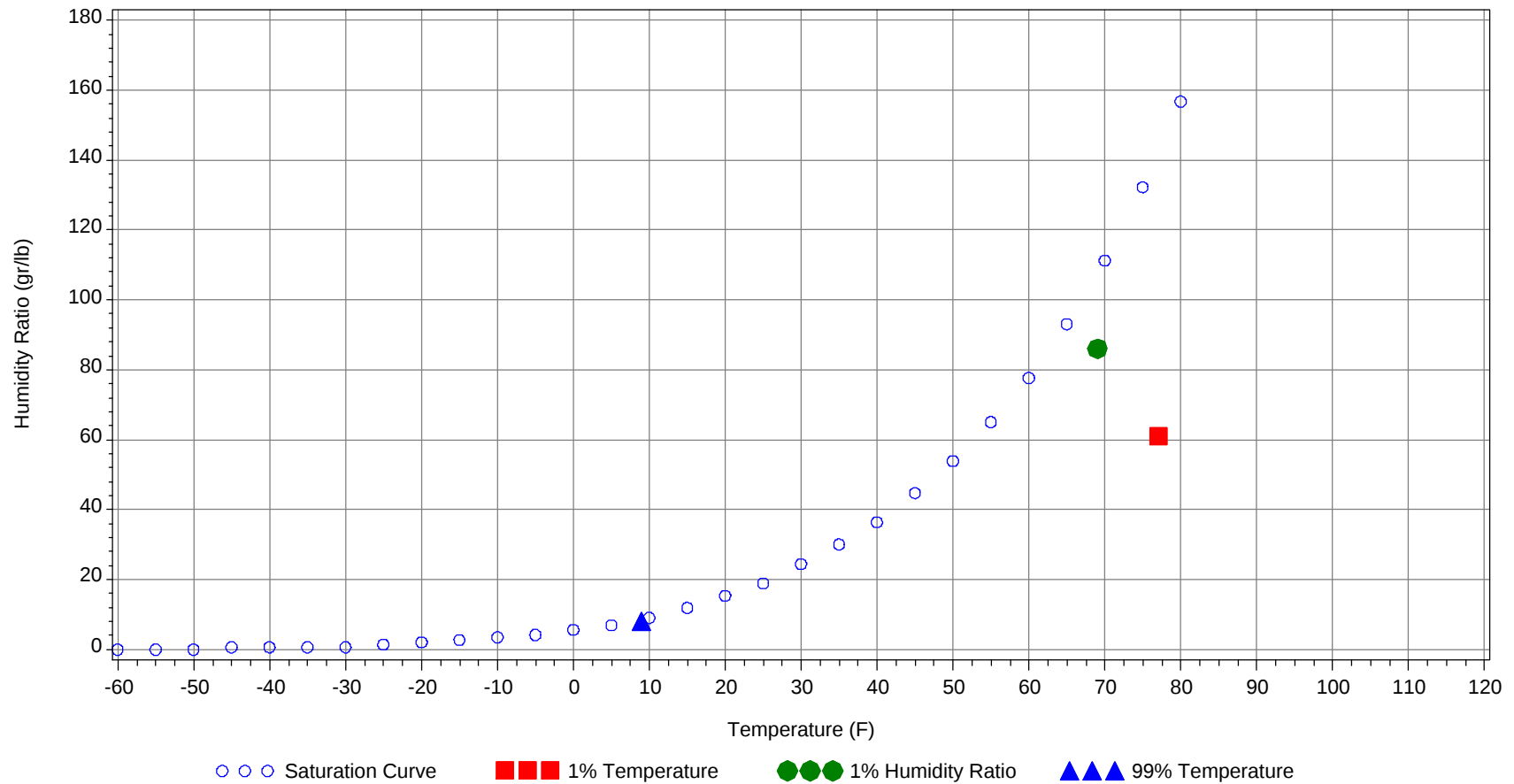
Average Annual Climate



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	77.0		62		61.0	27.9
99.0% Dry Bulb	9.0				8.0	3.2
1.0% Humidity Ratio	86.0	69.0	64.7	63.0		29.9

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)
90/ 94															
85/ 89															
80/ 84															
75/ 79															
70/ 74															
65/ 69												0		0	52
60/ 64												1	0	1	49.3
55/ 59												3	1	4	46.6
50/ 54	0	0	0	0	45.4		1	0	1	46.9	0	12	5	17	43.1
45/ 49	2	4	2	8	42.7	3	9	4	16	42.6	4	27	15	46	40.4
40/ 44	11	16	13	40	39.4	7	15	11	33	39.1	12	35	28	75	37.9
35/ 39	50	54	55	159	35.6	38	52	47	137	35.4	54	73	62	189	34.6
30/ 34	64	67	66	197	31	56	59	57	172	30.7	80	61	75	216	30.4
25/ 29	49	49	48	146	25.8	46	42	48	136	25.6	44	23	38	105	25.1
20/ 24	23	23	23	69	21.2	24	18	20	62	21.1	24	8	12	44	20.8
15/ 19	21	18	20	59	17	22	17	17	56	16.8	17	3	8	28	16.9
10/ 14	14	11	11	36	11.8	13	6	11	30	11.7	7	1	3	11	12
5/ 9	7	4	6	17	6.6	8	3	6	17	6.5	4	0	1	5	6.4
0/ 4	4	2	4	10	1.3	4	1	2	7	1.4	1		0	1	1.8
-5/ -1	2	1	1	4	-3.7	1	0	1	2	-3.6	0			0	-3.6
-10/ -6	0	0	0	0	-7.4	2	0	0	2	-7.7	0			0	-10
-15/-11	0	0		0	-12.6	0			0	-12					
-20/-16	0			0	-15										

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)
90/ 94															
85/ 89												0		0	60.6
80/ 84							1	0	1	62.9		5	1	6	62.9
75/ 79		0	0	0	58.5		8	2	10	59.4	0	19	6	25	60.7
70/ 74		2	1	3	54.6	0	18	7	25	56.6	3	36	19	58	58.1
65/ 69		3	1	4	52.6	1	18	9	28	54.1	6	39	23	68	56.4
60/ 64	0	13	5	18	49.8	6	46	23	75	51.4	28	64	55	147	54.6
55/ 59	1	27	11	39	46.9	20	58	45	123	48.8	66	51	66	183	52.2
50/ 54	7	46	28	81	43.7	50	53	59	162	46.1	83	22	49	154	49.3
45/ 49	26	58	47	131	41.1	74	32	57	163	42.9	42	4	17	63	44.8
40/ 44	38	37	43	118	38.1	42	9	24	75	39.4	10	0	2	12	40.7
35/ 39	71	39	56	166	34.8	38	4	17	59	35.7	3		1	4	36.9
30/ 34	61	15	37	113	30.3	15	0	4	19	31.3	0			0	32.8
25/ 29	29	1	12	42	25.7	2		1	3	26.1					
20/ 24	5		1	6	21.2	0			0	21.8					
15/ 19	1		0	1	17.9	0			0	18					
10/ 14															
5/ 9															
0/ 4															
-5/ -1															
-10/ -6															
-15/-11															
-20/-16															

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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)
90/ 94		1	0	1	68.7										
85/ 89		3	1	4	66		0	0	0	66.3					
80/ 84	0	18	6	24	64.4		9	2	11	64.4					
75/ 79	1	36	17	54	62.5	0	25	8	33	63.6		2	0	2	60.9
70/ 74	10	60	37	107	60.6	4	55	25	84	61		11	2	13	59.9
65/ 69	20	53	43	116	59.3	11	57	37	105	59.5	1	21	6	28	58.1
60/ 64	71	57	76	204	57.7	58	69	78	205	58	7	58	28	93	56
55/ 59	95	19	55	169	54.8	98	27	65	190	54.7	47	81	68	196	53.1
50/ 54	40	1	12	53	50.5	51	6	25	82	50.6	78	51	70	199	49.6
45/ 49	9	0	2	11	45.6	20	0	6	26	45.6	60	15	43	118	45
40/ 44	1			1	41.4	4		1	5	41.1	25	2	14	41	40.7
35/ 39						2		0	2	37.7	17	0	7	24	36.7
30/ 34						0			0	34	5		1	6	31.9
25/ 29											1		0	1	27.5
20/ 24															
15/ 19															
10/ 14															
5/ 9															
0/ 4															
-5/ -1															
-10/ -6															
-15/-11															
-20/-16															

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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)
90/ 94															
85/ 89															
80/ 84															
75/ 79															
70/ 74		0		0	60										
65/ 69		0		0	57.8										
60/ 64	0	4	0	4	55.9										
55/ 59	6	29	13	48	52.8		1	0	1	51.7		0		0	51
50/ 54	35	64	46	145	49	5	9	5	19	48.8	1	1	1	3	48.1
45/ 49	63	74	69	206	44.4	32	41	35	108	44.6	9	11	9	29	43.6
40/ 44	43	37	43	123	40	32	38	37	107	40.6	20	21	20	61	40
35/ 39	49	28	44	121	36	55	58	56	169	36	50	58	56	164	36
30/ 34	31	9	23	63	31	64	60	63	187	31.2	68	67	60	195	31.3
25/ 29	17	2	8	27	26.2	31	23	29	83	26.2	46	45	50	141	25.9
20/ 24	3	0	1	4	21.5	10	5	7	22	21.3	20	15	20	55	21.4
15/ 19	1		0	1	17.7	8	4	5	17	17.1	16	14	14	44	17
10/ 14	0		0	0	12.5	3	1	2	6	12.2	8	8	8	24	11.6
5/ 9						1	0	1	2	7.1	6	4	4	14	6.3
0/ 4											3	2	3	8	1.3
-5/ -1											1	1	1	3	-3.4
-10/ -6											0	0	1	1	-7.2
-15/-11											0	0	0	0	-12.4
-20/-16											0	0		0	-15

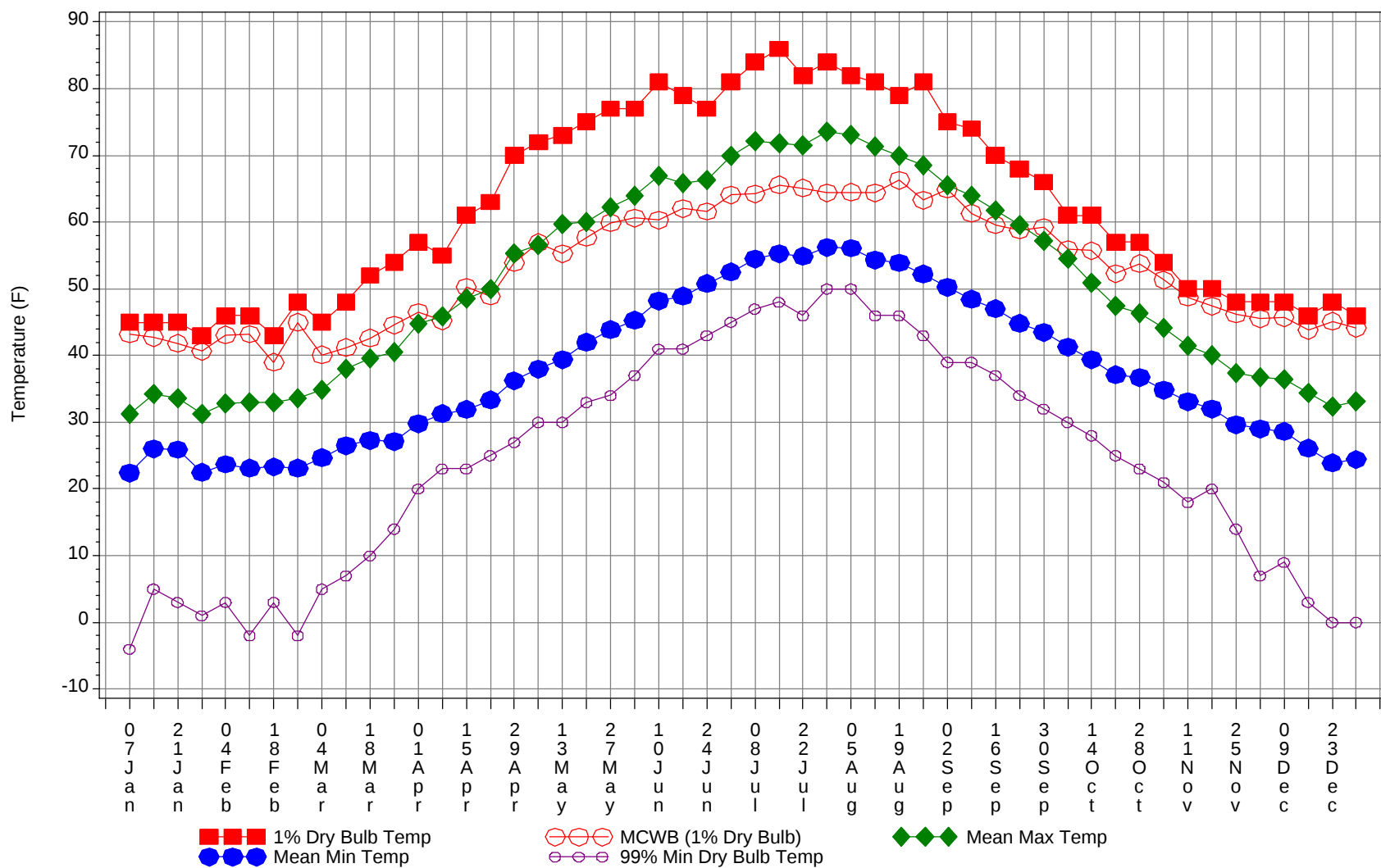
Caution: This summary reflects the typical distribution of temperature in a typical year. It does not reflect the typical moisture distribution. Because wet bulb temperatures are averaged, this summary understates the annual moisture load. For accurate moisture load data, see the long-term humidity summary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

Dry-Bulb Temperature Hours For An Average Year

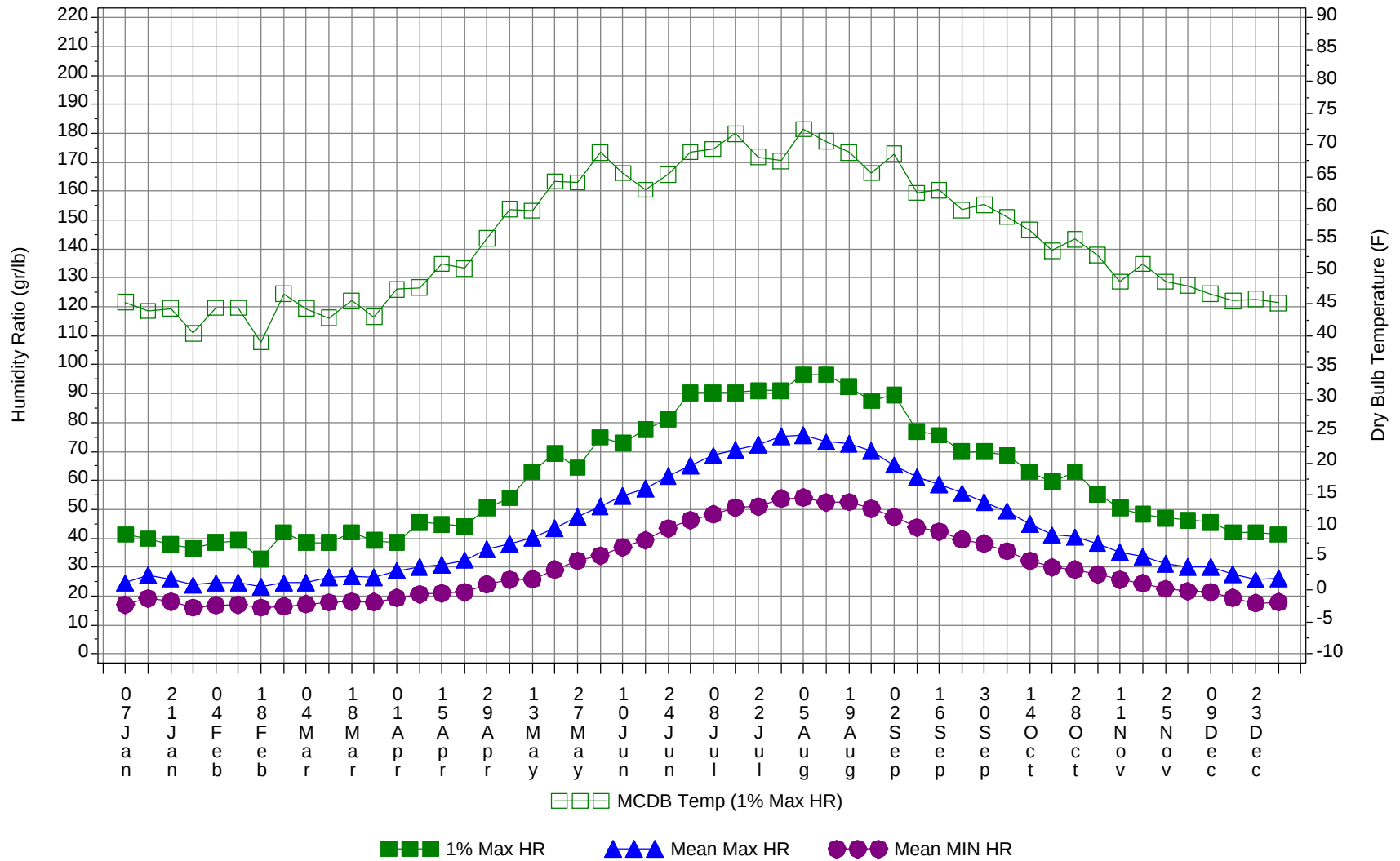
Temperature Range (° F)	Annual				
	01 To 08 LST	09 To 16 LST	17 to 00 LST	Total Obs	M C W B (° F)
90/ 94		1	0	1	68.7
85/ 89		4	1	5	65.8
80/ 84	0	32	9	41	64.2
75/ 79	2	90	34	126	62.2
70/ 74	17	182	90	289	59.8
65/ 69	39	190	120	349	58.2
60/ 64	170	311	265	746	56.1
55/ 59	332	294	324	950	52.7
50/ 54	349	265	299	913	48.3
45/ 49	343	275	305	923	43.6
40/ 44	244	211	236	691	39.5
35/ 39	427	367	403	1197	35.5
30/ 34	446	340	387	1173	30.9
25/ 29	266	186	234	686	25.7
20/ 24	110	70	84	264	21.2
15/ 19	86	56	64	206	16.9
10/ 14	44	26	35	105	11.8
5/ 9	25	11	17	53	6.5
0/ 4	12	5	9	26	1.4
-5/ -1	4	2	3	9	-3.6
-10/ -6	2	1	1	4	-7.6
-15/-11	1	0	0	1	-12.3
-20/-16	0	0		0	-15

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



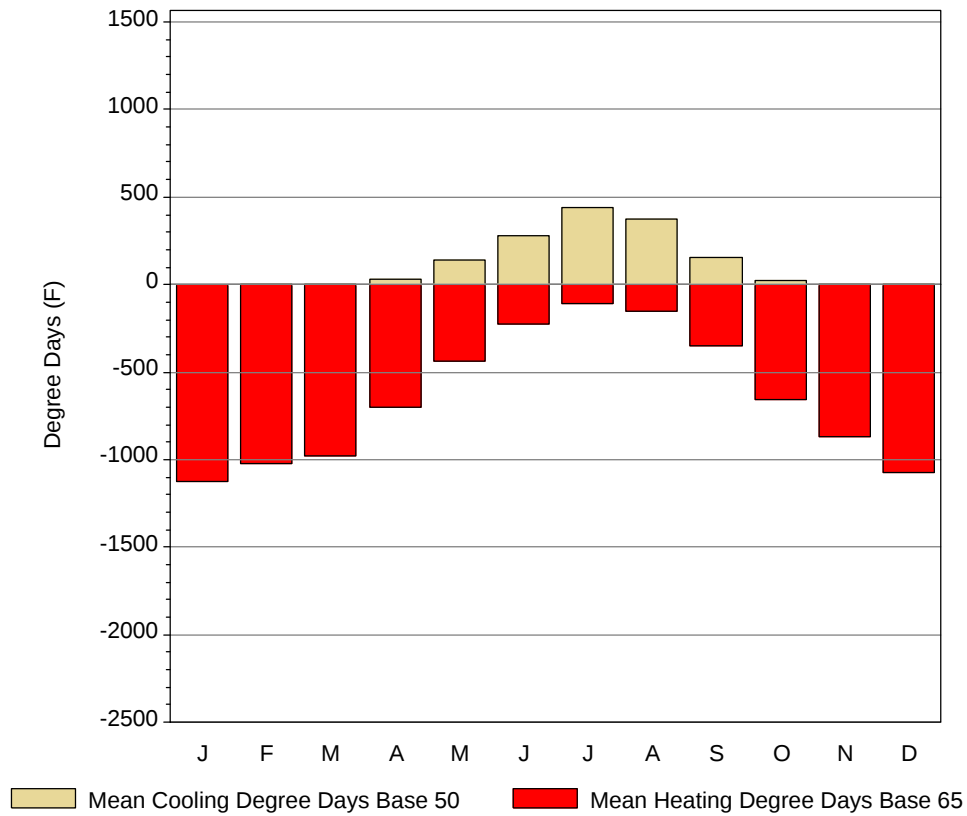
Long Term Humidity and Dry Bulb Temperature Summary



Long Term Humidity and Dry Bulb Temperature Summary

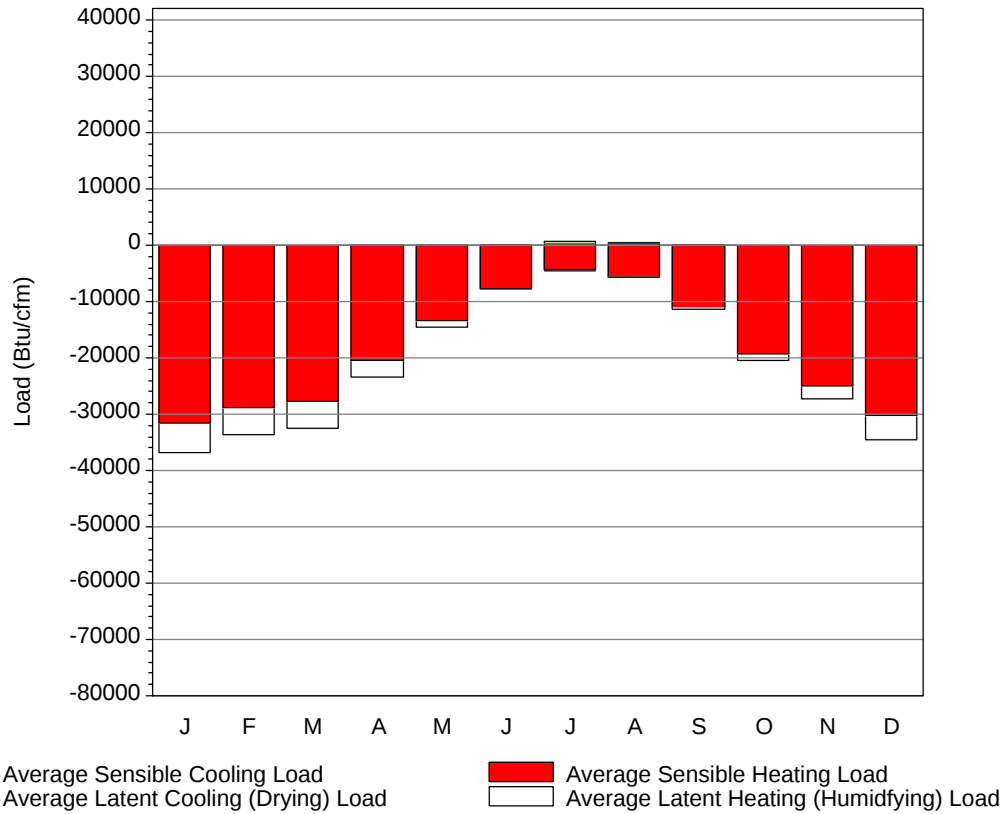
Week Ending	1.0% Temp (° F)	MCWB@ 1% Temp (° F)	Mean Max Temp (° F)	Mean Min Temp (° F)	99% Temp (° F)	1.0% HR (gr/lb)	MCDB@ 1% HR (° F)	Mean Max HR (gr/lb)	Mean Min HR (gr/lb)
7-Jan	45	43.2	31.2	22.4	-4	41.3	45.3	24.5	16.9
14-Jan	45	42.7	34.3	26	5	39.9	43.9	27.3	19.1
21-Jan	45	41.8	33.6	25.9	3	37.8	44.3	25.9	18.1
28-Jan	43	40.6	31.3	22.5	1	36.4	40.4	23.8	16
4-Feb	46	43.1	32.8	23.7	3	38.5	44.4	24.5	16.8
11-Feb	46	43.2	32.9	23.1	-2	39.2	44.4	24.7	17
18-Feb	43	39	32.9	23.3	3	32.9	39	23.3	16
25-Feb	48	45	33.6	23.1	-2	42	46.6	24.5	16.5
4-Mar	45	40.1	34.8	24.7	5	38.5	44.3	24.8	17.1
11-Mar	48	41.2	38	26.5	7	38.5	42.8	26.4	17.8
18-Mar	52	42.6	39.6	27.3	10	42	45.5	26.7	18
25-Mar	54	44.6	40.5	27.1	14	39.2	43	26.5	17.9
1-Apr	57	46.5	44.7	29.8	20	38.5	47.3	28.8	19.4
8-Apr	55	45.2	45.9	31.3	23	45.5	47.6	30	20.6
15-Apr	61	50.2	48.6	31.9	23	44.8	51.3	30.9	21
22-Apr	63	48.9	50	33.3	25	44.1	50.6	32.4	21.3
29-Apr	70	53.9	55.3	36.2	27	50.4	55.3	36.2	24.1
6-May	72	56.9	56.5	38	30	53.9	59.9	37.9	25.6
13-May	73	55.3	59.7	39.4	30	63	59.7	40.2	25.9
20-May	75	57.7	60.1	42	33	69.3	64.3	43.4	29.1
27-May	77	59.9	62.2	43.9	34	64.4	64.1	47.3	32.1
4-Jun	77	60.6	63.9	45.3	37	74.9	68.8	51	34
10-Jun	81	60.3	66.9	48.2	41	72.8	65.6	54.8	36.8
17-Jun	79	62	65.9	48.9	41	77.7	63	57.3	39.3
24-Jun	77	61.6	66.3	50.8	43	81.2	65.4	61.4	43.3
1-Jul	81	64.1	69.9	52.5	45	90.3	68.9	65.1	46.2
8-Jul	84	64.2	72.2	54.5	47	90.3	69.4	68.6	48.3
15-Jul	86	65.6	71.8	55.3	48	90.3	71.8	70.7	50.6
22-Jul	82	65.1	71.5	54.9	46	91	68.1	72.4	51
29-Jul	84	64.4	73.6	56.2	50	91	67.5	75.3	53.6
5-Aug	82	64.5	73.1	56.1	50	96.6	72.5	75.7	54.1
12-Aug	81	64.4	71.4	54.3	46	96.6	70.6	73.3	52.4
19-Aug	79	66.3	69.9	53.9	46	92.4	68.8	72.8	52.5
26-Aug	81	63.3	68.5	52.2	43	87.5	65.6	70.1	50.3
2-Sep	75	64.9	65.5	50.2	39	89.6	68.6	65.3	47.3
9-Sep	74	61.3	63.9	48.4	39	77	62.5	61.1	43.8
16-Sep	70	59.6	61.7	47	37	75.6	62.9	58.5	42.2
23-Sep	68	58.8	59.5	44.8	34	70	59.8	55.6	39.5
30-Sep	66	59.2	57.2	43.5	32	70	60.6	52.4	38.1
7-Oct	61	55.9	54.5	41.3	30	68.6	58.7	49.4	35.5
14-Oct	61	55.7	50.9	39.4	28	63	56.6	44.9	32.2
21-Oct	57	52.3	47.5	37.1	25	59.5	53.4	41.1	29.9
28-Oct	57	53.8	46.4	36.7	23	63	55.2	40.4	29.1
4-Nov	54	51.3	44.2	34.8	21	55.3	52.7	38.2	27.5
11-Nov	50	48.7	41.4	33.1	18	50.4	48.5	35.2	25.7
18-Nov	50	47.4	40.1	32	20	48.3	51.3	33.7	24.4
25-Nov	48	46.2	37.3	29.6	14	46.9	48.5	31.3	22.5
2-Dec	48	45.5	36.7	29	7	46.2	47.9	30	21.6
9-Dec	48	45.7	36.5	28.6	9	45.5	46.6	30.2	21.4
16-Dec	46	43.8	34.4	26.1	3	42	45.5	27.6	19.4
23-Dec	48	45.1	32.4	23.9	0	42	45.8	25.6	17.6
31-Dec	46	44.1	33.2	24.4	0	41.3	45.2	26.2	17.9

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	0	0	1126.4
FEB	0.1	0	1025.1
MAR	2.6	0	976.1
APR	30.3	1.1	700
MAY	140.8	14.3	433.7
JUN	279.4	37.5	222.6
JUL	442.3	86.4	110.6
AUG	373.4	54.5	152.2
SEP	155.5	6.7	346.9
OCT	24.4	0	654.3
NOV	0.9	0	869.6
DEC	0.2	0	1071.7
ANN	1449.9	200.5	7689.2

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	0	-31606	0	-5161
FEB	0	-28768	0	-4918
MAR	0	-27711	0	-4665
APR	1	-20460	0	-2849
MAY	21	-13474	0	-1060
JUN	88	-7669	30	-94
JUL	346	-4409	312	-4
AUG	141	-5716	350	-3
SEP	2	-11213	10	-108
OCT	0	-19370	0	-1022
NOV	0	-24872	0	-2457
DEC	0	-30189	0	-4347
ANN	599	-225457	702	-26688

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													

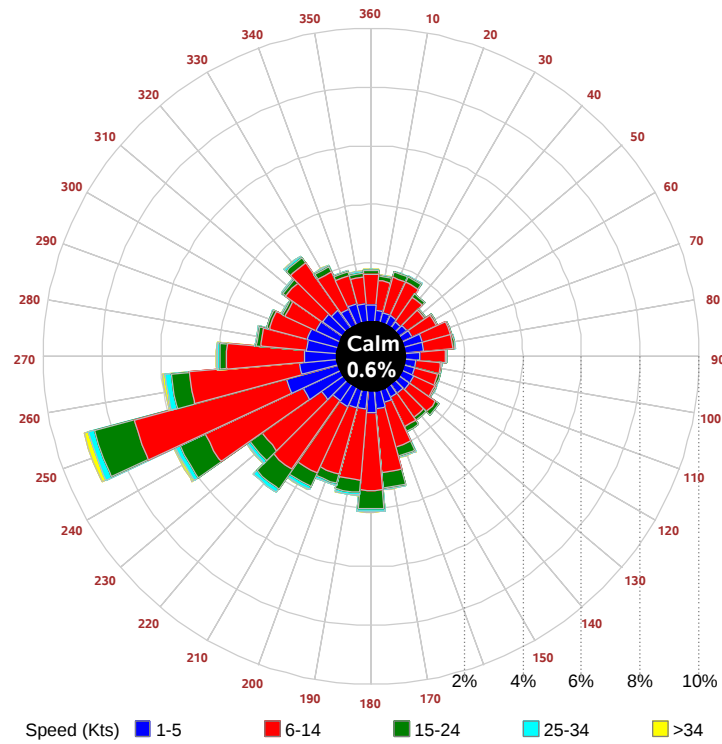
Average Annual Solar Radiation - Nearest Available Site Source: National Renewable Energy Laboratory, Golden CO, 1995

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													

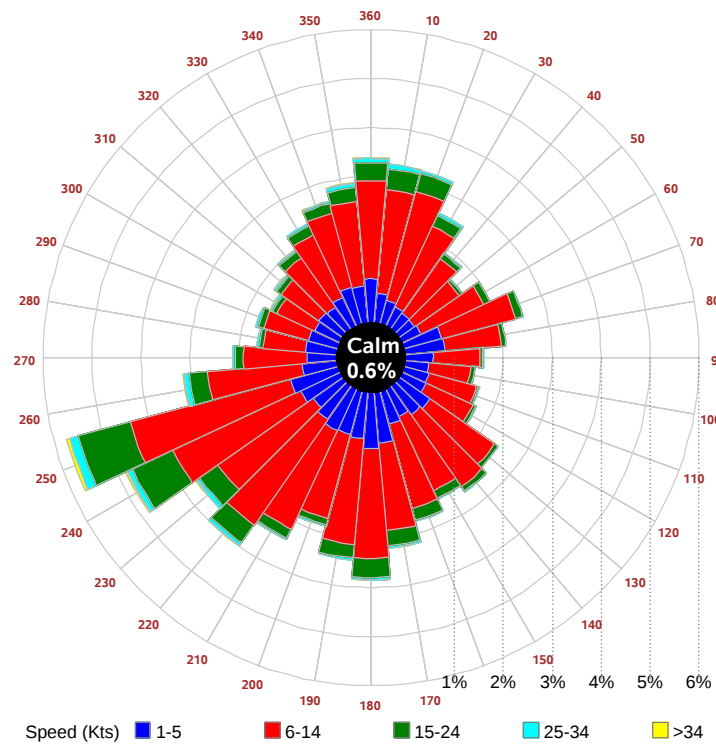
AVERAGE INCIDENT ILLUMINANCE (klux-hr) FOR MOSTLY CLEAR AND MOSTLY CLOUDY CONDITIONS, Percentage Uncertainty = 9												
		March						June				
		9am	11am	1pm	3pm	5pm		9am	11am	1pm	3pm	5pm
HORIZ.	M.Clear											
	M.Cloudy											
NORTH	M.Clear											
	M.Cloudy											
EAST	M.Clear			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

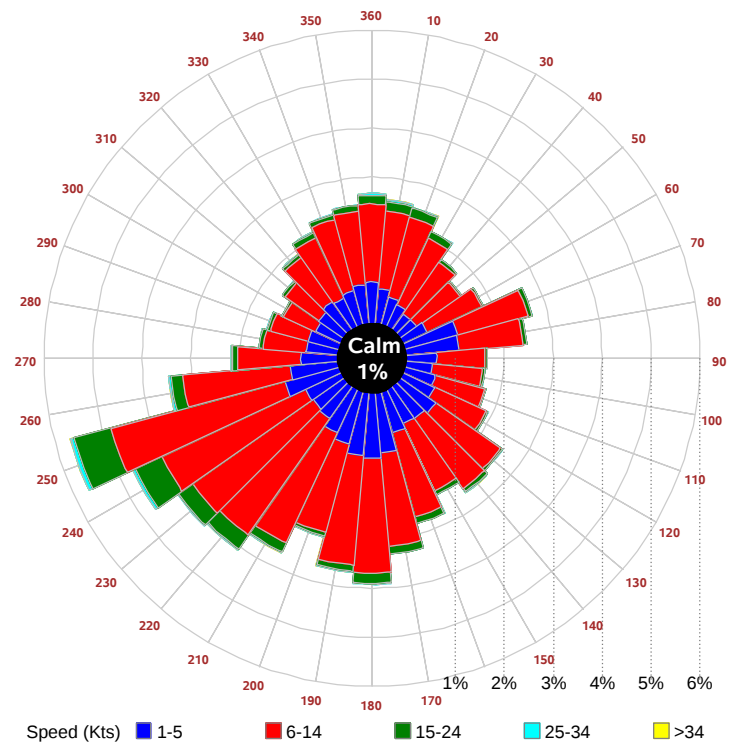
Wind Summary - December, January, and February



Wind Summary - March, April, and May



Wind Summary - June, July, and August



Wind Summary - September, October, and November

