PAYA LEBAR, SN

Latitude = 1.36 N	Station ID = ICAO_WSAP
Longitude =103.91 E	Elevation = 65 Feet
Period of Record = 1999 To 2017	Average Pressure = 29.73 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	95	79	126	6.9	W
0.4% Occurrence	93	79	130	6.6	S
1.0% Occurrence	91	79	133	6.9	S
2.0% Occurrence	91	79	133	6.9	S
Mean Daily Range	11	-	-	-	N
97.5% Occurrence	75	74	124	2.4	N
99.0% Occurrence	75	74	124	2.4	N
99.6% Occurrence	73	72	117	2.7	W
Median of Extreme Lows	72	72	115	2.9	W

Wet Bulb Temperature (T_{wb})	**Design Value (°F)**	**Dry Bulb Temperature (°F)**	**Humidity Ratio (gr/lb)**	**Wind Speed (mph)**	**Prevailing Direction (NSEW)**
Median of Extreme Highs	85	90	169	6.7	NNE
0.4% Occurrence	82	88	152	5.1	S
1.0% Occurrence	82	88	152	5.1	S
2.0% Occurrence	82	88	152	5.1	S

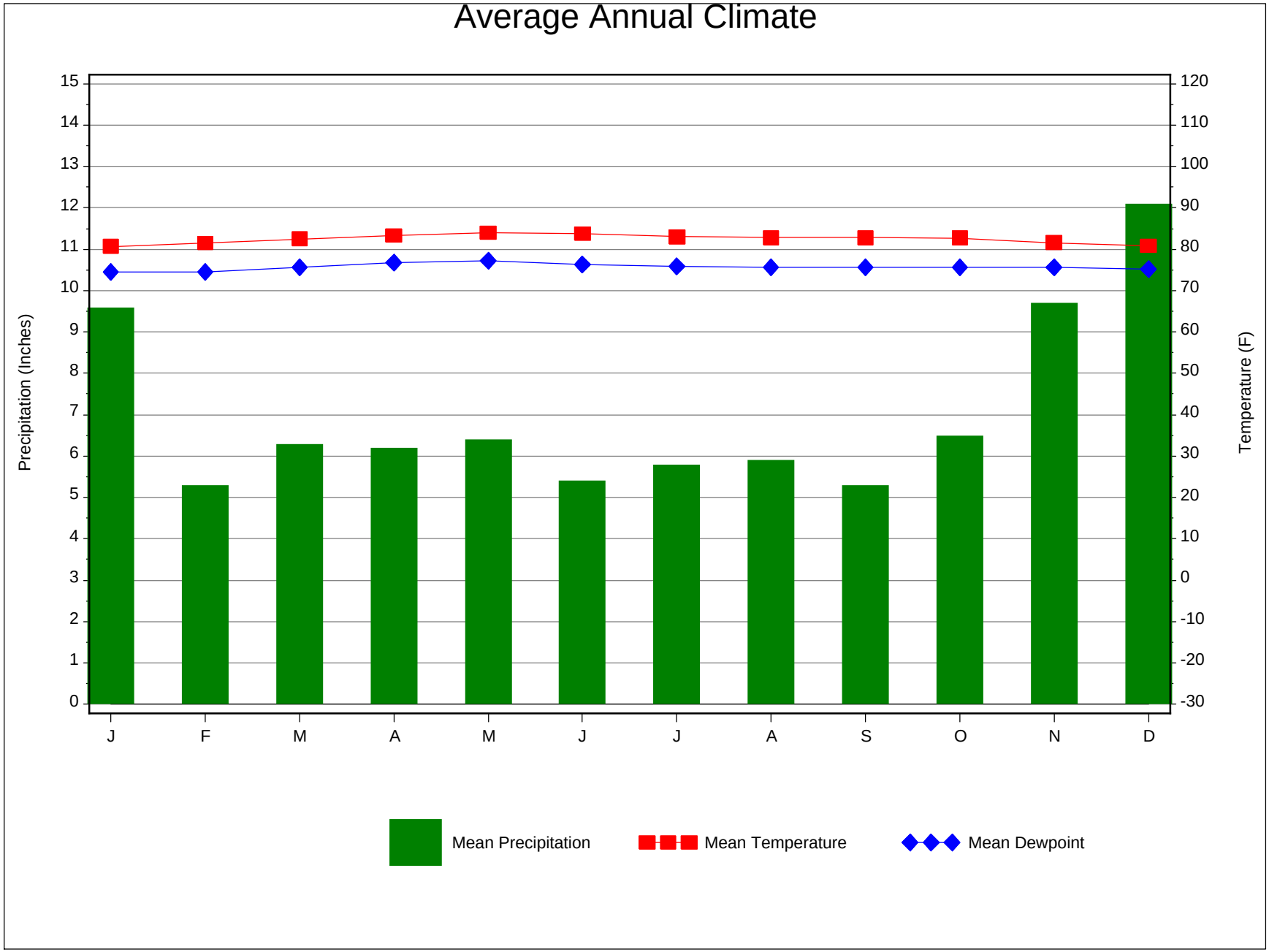
Humidity Ratio (HR)	**Design Value (gr/lb)**	**Dry Bulb Temperature (°F)**	**Vapor Pressure (in. Hg)**	**Wind Speed (mph)**	**Prevailing Direction (NSEW)**
Median of Extreme Highs	169	88	1.12	6.2	NNE
0.4% Occurrence	160	86	1.05	4.5	NNE
1.0% Occurrence	160	86	1.05	4.5	NNE
2.0% Occurrence	151	84	0.99	3.5	SE

Air Conditioning/ Humid Area Criteria	**Threshold**	**T ≥ 93°F**	**T ≥ 80°F**	**Twb ≥ 73°F**	**Twb ≥ 67°F**
	# of Hours	79	5621	7616	7676

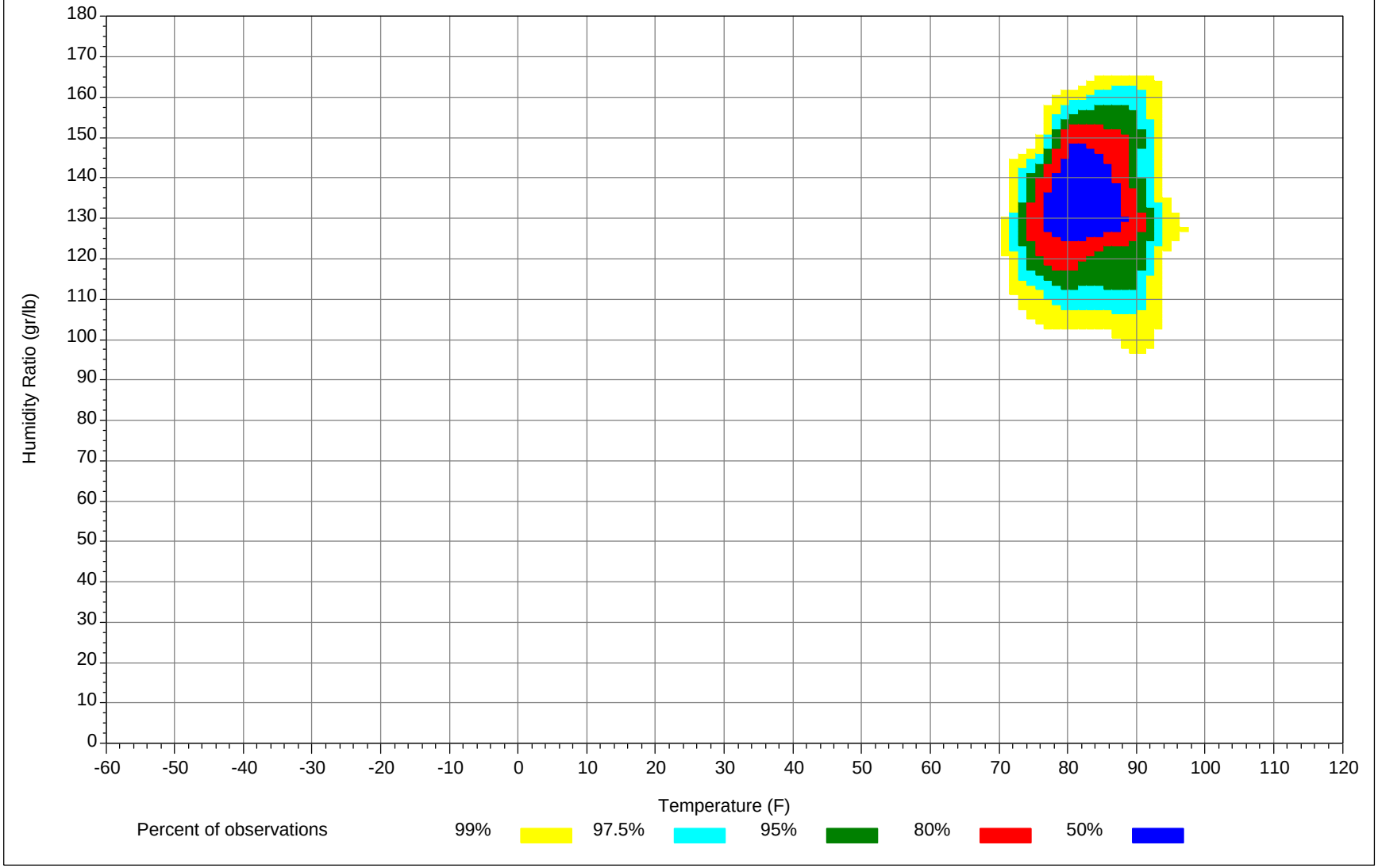
Other Site Data

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	27.5 + 6.0
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 (#)
84.9	N/A	N/A	0

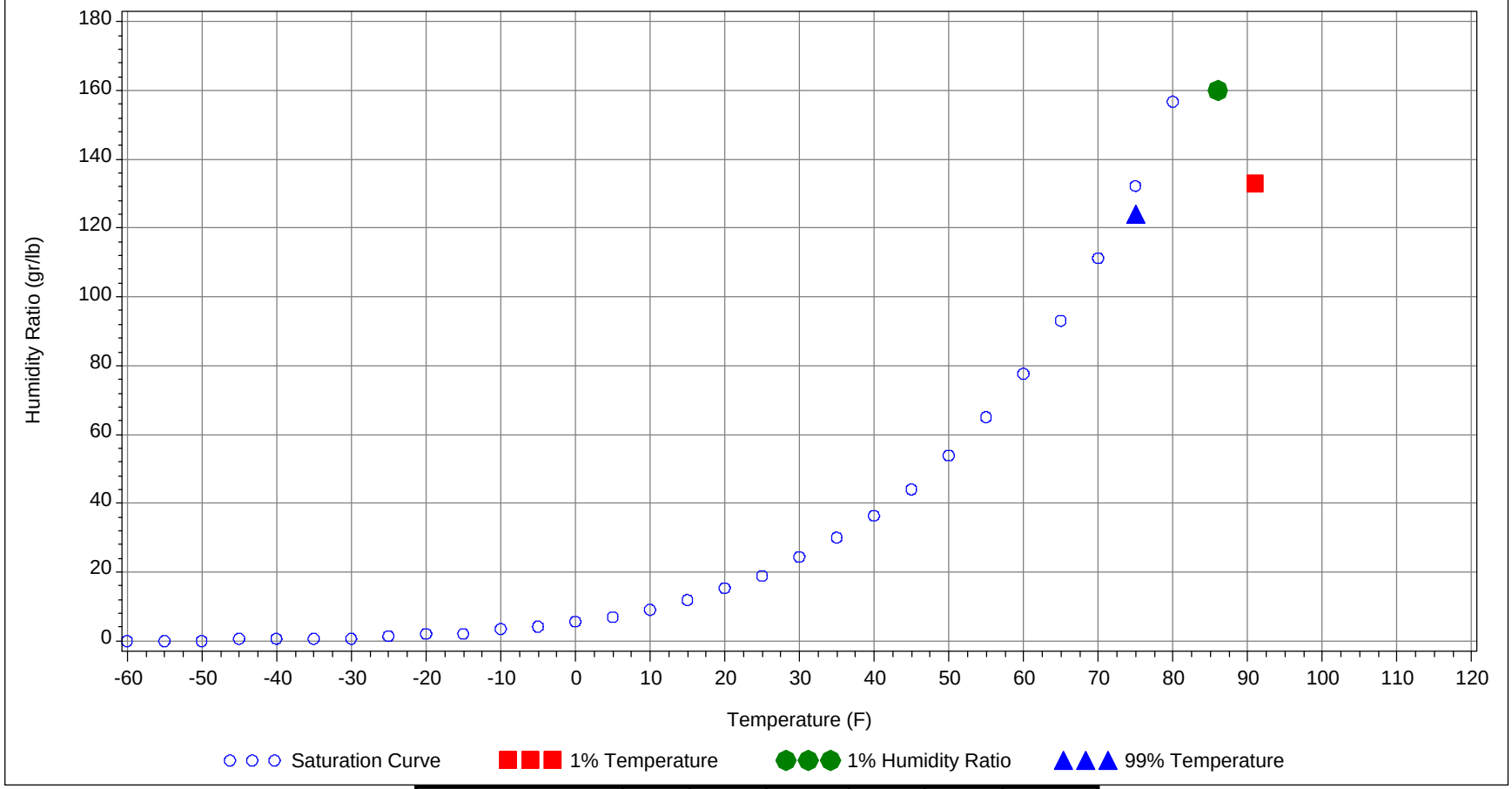
*Note: Temperatures at greater depths can be estimated by adding 1.5°F per 100 feet additional depth.


Average Annual Climate
Precipitation (Inches)
Temperature (F)
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
120
110
100
90
80
70
60
50
40
30
20
10
0
-10
-20
-30
J
F
M
A
M
J
J
A
S
O
N
D
Mean Precipitation
Mean Temperature
Mean Dewpoint

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	91.0		79		133.0	42.6
99.0% Dry Bulb	75.0				124.0	37.1
1.0% Humidity Ratio	160.0	86.0	82	80.6		45.7

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**	**MCWB (°F)**	**01 To 08 LST**	**09 To 16 LST**	**17 to 00 LST**	**Total Obs**	**MCWB (°F)**	**01 To 08 LST**	**09 To 16 LST**	**17 to 00 LST**	**Total Obs**	**MCWB (°F)**
95/ 99		0	0	0	77.2		0		0	79.7		1	0	1	79.7
90/ 94		23	3	26	78.9		39	5	44	78.8		73	12	85	79
85/ 89	0	81	23	104	77.7		83	30	113	77.7		81	40	121	78.5
80/ 84	20	102	112	234	76.8	29	79	114	222	76.9	89	73	140	302	77.7
75/ 79	223	40	109	372	75.2	192	22	74	288	75.4	157	19	56	232	76
70/ 74	5	1	1	7	72.5	3	0	1	4	72	2	1	1	4	72.5

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

	April					May					June				
Temperature Range (°F)	**01 To 08 LST**	**09 To 16 LST**	**17 to 00 LST**	**Total Obs**	**MCWB (°F)**	**01 To 08 LST**	**09 To 16 LST**	**17 to 00 LST**	**Total Obs**	**MCWB (°F)**	**01 To 08 LST**	**09 To 16 LST**	**17 to 00 LST**	**Total Obs**	**MCWB (°F)**
95/ 99		4	0	4	80.3		2	0	2	79.8		1	0	1	77.3
90/ 94		76	14	90	79.9		81	17	98	80		67	14	81	79.3
85/ 89	0	82	48	130	79.5	3	95	72	170	79.8	2	100	69	171	79.2
80/ 84	135	64	139	338	78.4	180	57	136	373	78.8	179	56	134	369	78.4
75/ 79	104	13	39	156	76.8	64	13	22	99	76.8	59	15	23	97	76.2
70/ 74	1	1	0	2	72.3	1	0	0	1	72.3	1	1	0	2	72.2

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

	July					August					September				
Temperature Range (°F)	**01 To 08 LST**	**09 To 16 LST**	**17 to 00 LST**	**Total Obs**	**MCWB (°F)**	**01 To 08 LST**	**09 To 16 LST**	**17 to 00 LST**	**Total Obs**	**MCWB (°F)**	**01 To 08 LST**	**09 To 16 LST**	**17 to 00 LST**	**Total Obs**	**MCWB (°F)**
95/ 99		0		0	77.5		0	0	0	77.3		0	0	0	78.1
90/ 94		42	8	50	78.9		39	6	45	78.8		45	8	53	78.5
85/ 89	0	106	56	162	78.7	0	98	50	148	78.5	0	98	49	147	78.5
80/ 84	164	76	149	389	78	164	87	155	406	77.8	143	75	148	366	77.7
75/ 79	82	23	35	140	76	81	22	36	139	75.9	95	20	35	150	75.9
70/ 74	2	1	1	4	71.7	2	1	0	3	72.3	2	1	0	3	72.4

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**	**MCWB (°F)**	**01 To 08 LST**	**09 To 16 LST**	**17 to 00 LST**	**Total Obs**	**MCWB (°F)**	**01 To 08 LST**	**09 To 16 LST**	**17 to 00 LST**	**Total Obs**	**MCWB (°F)**
95/ 99		1	0	1	77.7		0		0	82.5		0	0	0	78.2
90/ 94		59	11	70	78.5	0	42	6	48	79		28	4	32	79
85/ 89	0	92	48	140	78.5	0	82	26	108	78.7		75	20	95	78.4
80/ 84	116	77	142	335	77.8	60	91	128	279	77.7	33	102	114	249	77.3
75/ 79	131	18	47	196	76.1	178	24	79	281	76.2	210	41	108	359	75.7
70/ 74	1	0	0	1	72.6	3	1	1	5	72.9	5	1	3	9	72.9

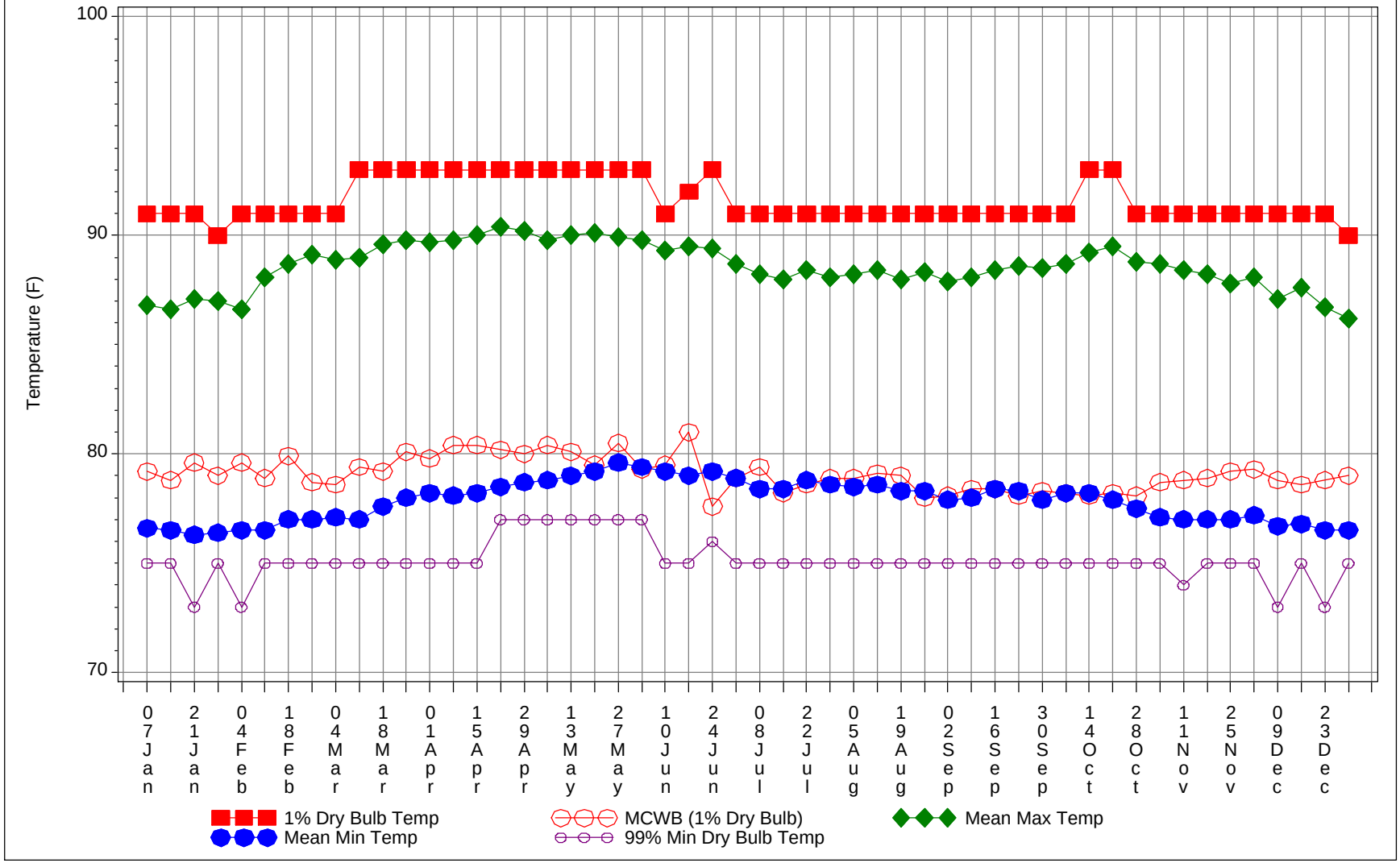
Caution: This summary reflects the typical distribtion of temperature in a typical year. It does not reflect the typical mositure distribution. Because wet bulb temperatures are averaged, this summary understates the annual moisture load. For accurate moisture load data, see the long-term humidity summary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

Dry-Bulb Temperature Hours For An Average Year

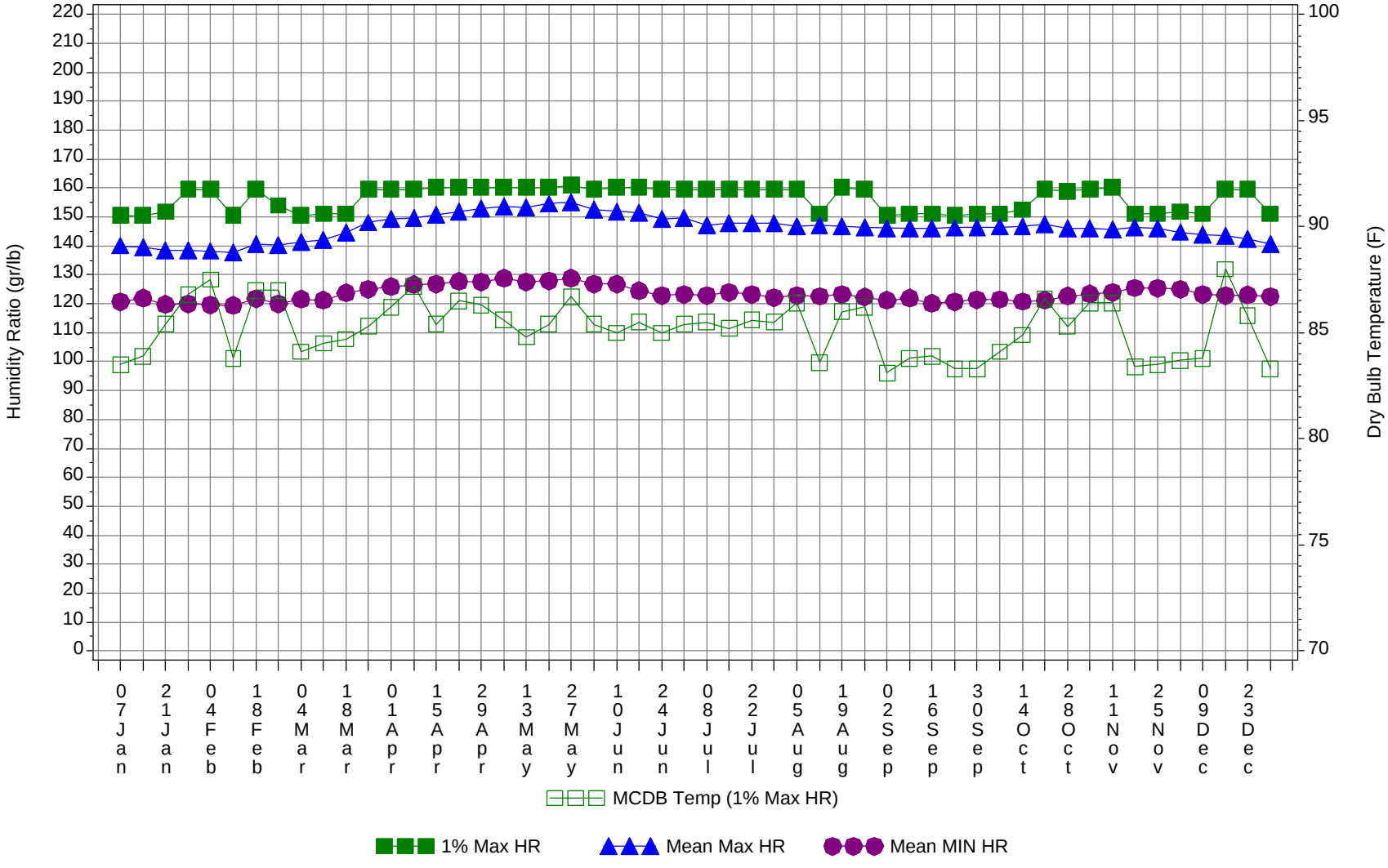
	Annual				
Temperature Range (°F)	**01 To 08 LST**	**09 To 16 LST**	**17 to 00 LST**	**Total Obs**	**MCWB (°F)**
95/ 99		12	1	13	79.3
90/ 94	0	616	109	725	79.2
85/ 89	6	1073	530	1609	78.7
80/ 84	1310	939	1610	3859	77.9
75/ 79	1577	271	662	2510	75.9
70/ 74	28	9	8	45	72.5

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.

Annual Summary of Temperatures



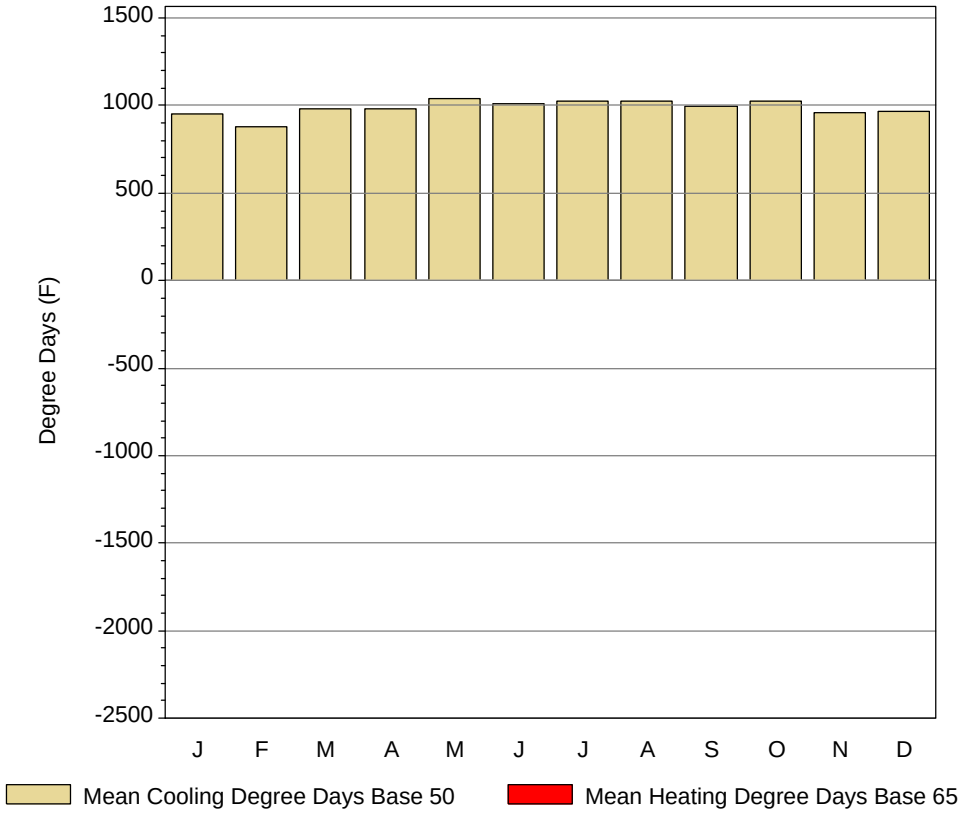
Long Term Humidity and Dry Bulb Temperature Summary



Long Term Humidity and Dry Bulb Temperature Summary

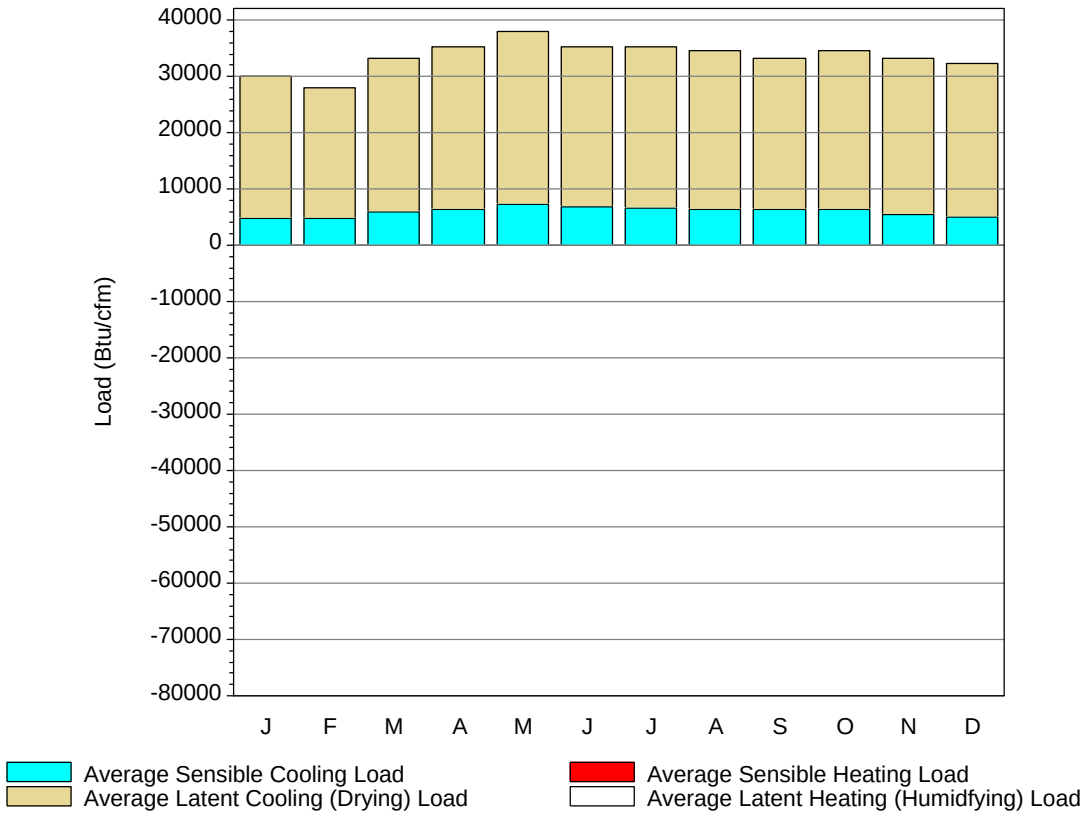
Week Ending	1.0% Temp (°F)	MCWB@ 1% Temp (°F)	Mean Max Temp (°F)	Mean Min Temp (°F)	99% Temp (°F)	1.0% HR (gr/lb)	MCDB@ 1% HR (°F)	Mean Max HR (gr/lb)	Mean Min HR (gr/lb)
7-Jan	91	79.2	86.8	76.6	75	150.5	83.5	140.1	120.7
14-Jan	91	78.8	86.6	76.5	75	150.5	83.9	139.6	122
21-Jan	91	79.6	87.1	76.3	73	151.9	85.4	138.6	119.8
28-Jan	90	79	87	76.4	75	159.6	86.8	138.4	120
4-Feb	91	79.6	86.6	76.5	73	159.6	87.5	138.3	119.6
11-Feb	91	78.9	88.1	76.5	75	150.5	83.8	137.7	119.5
18-Feb	91	79.9	88.7	77	75	159.6	87	140.7	121.7
25-Feb	91	78.7	89.1	77	75	154	87	140.3	119.9
4-Mar	91	78.6	88.9	77.1	75	150.5	84.1	141.4	121.6
11-Mar	93	79.4	89	77	75	151.2	84.5	142.1	121.2
18-Mar	93	79.2	89.6	77.6	75	151.2	84.7	144.5	123.8
25-Mar	93	80.1	89.8	78	75	159.6	85.3	148.1	125.1
1-Apr	93	79.8	89.7	78.2	75	159.6	86.2	149.3	125.9
8-Apr	93	80.4	89.8	78.1	75	159.6	87.2	149.7	126.6
15-Apr	93	80.4	90	78.2	75	160.3	85.4	150.8	126.9
22-Apr	93	80.2	90.4	78.5	77	160.3	86.5	151.8	127.7
29-Apr	93	80	90.2	78.7	77	160.3	86.3	152.9	127.6
6-May	93	80.4	89.8	78.8	77	160.3	85.6	153.6	128.9
13-May	93	80.1	90	79	77	160.3	84.8	153.4	127.6
20-May	93	79.5	90.1	79.2	77	160.3	85.4	154.6	127.9
27-May	93	80.5	89.9	79.6	77	161	86.7	155.1	128.9
4-Jun	93	79.3	89.8	79.4	77	159.6	85.4	152.6	126.8
10-Jun	91	79.5	89.3	79.2	75	160.3	85	152	126.8
17-Jun	92	81	89.5	79	75	160.3	85.5	151.4	124.5
24-Jun	93	77.6	89.4	79.2	76	159.6	85	149.2	122.9
1-Jul	91	78.9	88.7	78.9	75	159.6	85.4	149.8	123.2
8-Jul	91	79.4	88.2	78.4	75	159.6	85.5	147.2	122.9
15-Jul	91	78.2	88	78.4	75	159.6	85.2	147.8	123.9
22-Jul	91	78.6	88.4	78.8	75	159.6	85.6	147.9	123.3
29-Jul	91	78.9	88.1	78.6	75	159.6	85.5	147.8	122.2
5-Aug	91	78.9	88.2	78.5	75	159.6	86.4	146.7	122.8
12-Aug	91	79.1	88.4	78.6	75	151.2	83.6	147.1	122.6
19-Aug	91	79	88	78.3	75	160.3	86	146.8	123.2
26-Aug	91	78	88.3	78.3	75	159.6	86.2	146.4	122.4
2-Sep	91	78.1	87.9	77.9	75	150.5	83.1	146.2	121.3
9-Sep	91	78.4	88.1	78	75	151.2	83.8	146	122
16-Sep	91	78.4	88.4	78.4	75	151.2	83.9	146.2	120.1
23-Sep	91	78.1	88.6	78.3	75	150.5	83.3	146.3	120.7
30-Sep	91	78.3	88.5	77.9	75	151.2	83.3	146.5	121.4
7-Oct	91	78.2	88.7	78.2	75	151.2	84.1	146.6	121.5
14-Oct	93	78.1	89.2	78.2	75	152.6	84.9	146.8	120.8
21-Oct	93	78.2	89.5	77.9	75	159.6	86.6	147.4	121.2
28-Oct	91	78.1	88.8	77.5	75	158.9	85.3	146.1	122.7
4-Nov	91	78.7	88.7	77.1	75	159.6	86.4	146	123.4
11-Nov	91	78.8	88.4	77	74	160.3	86.4	145.7	123.9
18-Nov	91	78.9	88.2	77	75	151.2	83.4	146.5	125.5
25-Nov	91	79.2	87.8	77	75	151.2	83.5	146	125.4
2-Dec	91	79.3	88.1	77.2	75	151.9	83.7	144.8	125
9-Dec	91	78.8	87.1	76.7	73	151.2	83.8	143.9	123.2
16-Dec	91	78.6	87.6	76.8	75	159.6	88	143.6	122.8
23-Dec	91	78.8	86.7	76.5	73	159.6	85.8	142.5	123.1
31-Dec	90	79	86.2	76.5	75	151.2	83.3	140.6	122.5

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	950.4	488.3	0
FEB	882.3	464	0
MAR	983.7	529.9	0
APR	980.7	541.5	0
MAY	1037.5	583.3	0
JUN	1010.7	564.8	0
JUL	1027.2	562.2	0
AUG	1023.9	558.9	0
SEP	992.7	542.7	0
OCT	1023.9	558.9	0
NOV	959.2	509.2	0
DEC	968.3	503.3	0
ANN	11840.5	6407	0

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	4681	0	25415	0
FEB	4803	0	23069	0
MAR	5900	0	27389	0
APR	6450	0	28751	0
MAY	7274	0	30620	0
JUN	6938	0	28253	0
JUL	6543	0	28651	0
AUG	6455	0	28060	0
SEP	6295	0	26808	0
OCT	6455	0	28068	0
NOV	5423	0	27684	0
DEC	5017	0	27205	0
ANN	72234	0	329973	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

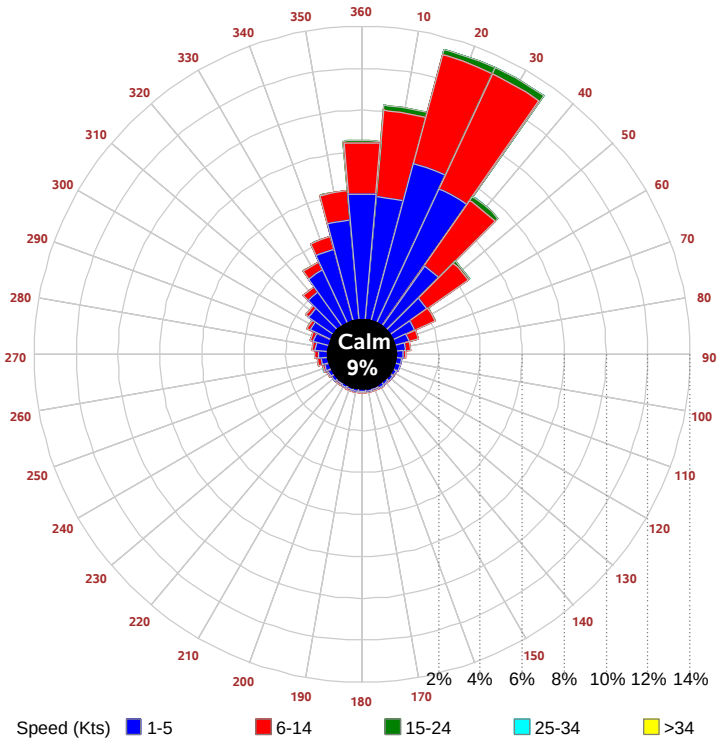
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
HORIZ.	Global													
	Std.Dev.													
	Minimum													
	Maximum													
	Diffuse													
Clear Day	Global													
NORTH	Global													
	Diffuse													
Clear Day	Global													
EAST	Global													
	Diffuse													
Clear Day	Global													
SOUTH	Global													
	Diffuse													
Clear Day	Global													
WEST	Global													
	Diffuse													
Clear Day	Global													

AVERAGE 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													

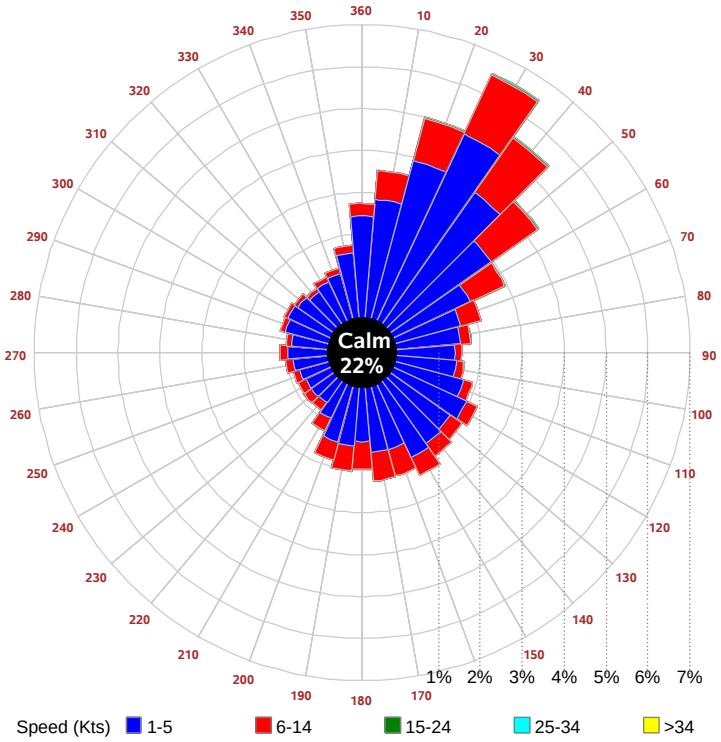
AVERAGE INCIDENT ILLUMINENCE (klux-hr) FOR MOSTLY CLEAR AND MOSTLY CLOUDY CONDITIONS, Percentage Uncertainty = 9											
				March					June		
		9am	11am	1pm	3pm	5pm	9am	11am	1pm	3pm	5pm
HORIZ.	M.Clear										
	M.Cloudy										
NORTH	M.Clear										
	M.Cloudy										
EAST	M.Clear										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

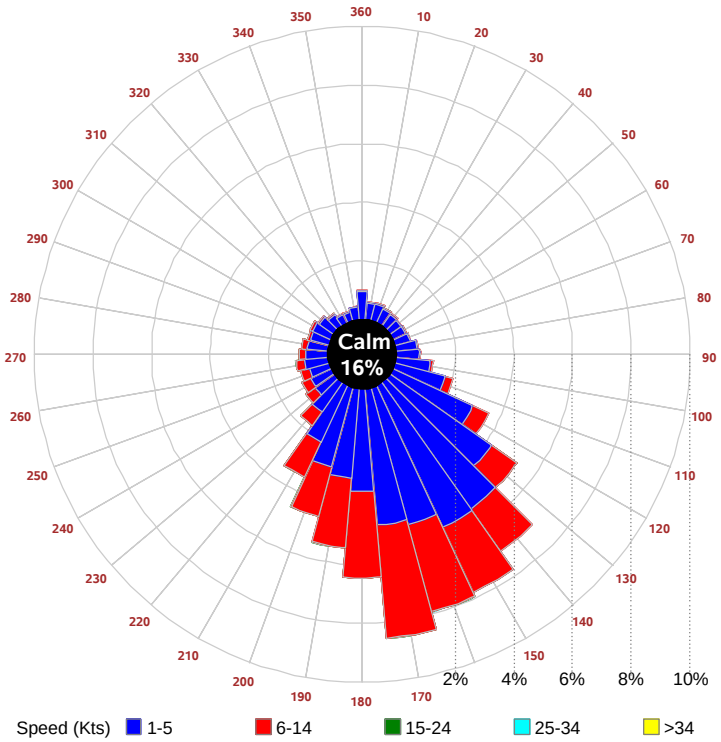
Wind Summary - December, January, and February



Wind Summary - March, April, and May



Wind Summary - June, July, and August



Wind Summary - September, October, and November