TABLE 1. WINTER CLIMATIC CONDITIONS[a]—(CONTINUED)

Col. 1 State	Col. 2 Station[b]	Col. 3 Elevation[c] ft	Col. 4 Period of Record[d]	Col. 5 Lowest Temp. on Record[d] °F	Col. 6 Average Annual Min. Temp.[e] °F	Col. 7 Design Dry-Bulb Temp. on TAC 97½% Basis[f] °F	Col. 8 Wind Vel. at Design Temp.[g] Mph	Col. 9 Design Dry-Bulb Temp. in Common Use[h] °F	Col. 10 Avg. Wind Vel.-Dec. Jan.-Feb.[i] Mph
Pa.	Philadelphia CO	200	1871-1947	−11	6			0	11.0
	Philadelphia AP	18	1940-1947	1					
	Pittsburgh CO	929	1875-1947	−20	−2			0	11.6
	Pittsburgh AP	1284	1935-1947	−16		6	12.1		
	Reading CO	311	1913-1947	−14		9[k]		0	9.0
	Scranton CO	877	1901-1947	−19				−5	7.6
	Sunbury AP	448	1935-1939[d]			7	7.1		
R. I.	Block Island CO	46	1881-1947	−10				0	20.6
	Providence CO	77	1904-1947	−17	1			0	12.1
S. C.	Charleston CO	59	1871-1947	7	22			15	10.5
	Charleston AP	51	1940-1947	14		26	6.9		
	Columbia CO	401	1887-1947	−2	19			10	8.0
	Columbia AP	227	1939-1947	9					
	Greenville CO	1006[c]	Up to 1946	−5				10	8.4
S. D.	Huron CO	1342	1881-1938	−43	−26			−20	10.7
	Huron AP	1287	1938-1947	−30					
	Rapid City CO	3209	1888-1947	−34	−21			−20	8.0
	Rapid City AP	3220	1939-1947	−27					
Tenn.	Chattanooga CO	952	1879-1947	−10	9			10	7.7
	Chattanooga AP	675	1940-1947	6		19	6.2		
	Knoxville CO	1024	1871-1942	−16	2			0	7.2
	Knoxville AP	1007	1942-1947	1					
	Memphis CO	348	1872-1941	−9	9			0	9.3
	Memphis AP	267	1941-1947	1		19	8.9		
	Nashville CO	714	1871-1947	−13	5			0	9.8
	Nashville AP	610	1939-1947	−15		14	7.3		
Texas	Abilene CO	1748	1885-1944	−6				15	10.1
	Abilene AP	1756	1940-1947	−9		20	10.4	−5	
	Amarillo CO	3686	1892-1941	−16	0			−10	12.1
	Amarillo AP	3595	1941-1947	−7		11	12.9		
	Austin CO	625	1897-1942	−1				20	8.3
	Austin AP	625	1942-1947	13					
	Brownsville CO	140	1922-1943	12	29			30	10.4
	Brownsville AP	25	1943-1947	30					
	Corpus Christi CO	21	1887-1942[d]	11				20	11.0
	Corpus Christi AP	45	1943-1946[d]	23					
	Dallas CO	732	1913-1940	−3	13			0	10.6
	Dallas AP	520	1940-1947	5		23	8.8		
	Del Rio CO	1020	1905-1947	12				15	8.0
	El Paso CO	3792	1880-1942	−5	16			10	9.0
	El Paso AP	3956	1939-1947	11		26	8.6		
	Fort Worth CO	708	1898-1939[d]	−8	12			10	10.5
	Fort Worth AP	728	1940 1947	4					
	Galveston CO	128	1871-1947	8				20	11.2
	Galveston AP	9	1939-1947	14					
	Houston CO	198	1888-1947	5	22			20	10.5
	Houston AP	73	1932-1947	5		33	9.2		
	Palestine CO	555	1881-1947	−6				15	8.0
	Port Arthur CO	64	1917-1947	11				20	10.7
	Port Arthur AP	21	1944-1947	24					
	San Antonio CO	770[c]	1885-1941	4	21			20	8.3
	San Antonio AP	800	1942-1947	17		32	7.6		
	Waco AP	513	1931-1947	7		26	11.6		
	Wink AP	2811	1935-1939[d]			23	8.5		
Utah	Milford AP	5095	1935-1939[d]	−17		−2	7.7		
	Modena CO	5472	1901-1947	−32	−15			−15	9.0
	Salt Lake City CO	4346	1874-1947	−20	−2			−10	7.8
	Salt Lake City AP	4254	1928-1947	−30		7	7.4		
Vt.	Burlington CO	409	1884-1943	−29	−17			−10	11.6
	Burlington AP	335	1943-1944	−23					
Va.	Cape Henry CO	24	1874-1947	5				10	14.0
	Lynchburg CO	644	1874-1944	−7	8			5	8.1
	Lynchburg AP	951	1944-1947	7					
	Norfolk CO	91	1871-1947	2	15			15	12.1
	Richmond CO	180	1897-1947	−3	10			15	8.1
	Richmond AP	172	1929-1947	−12		15	7.1		
	Roanoke AP	1194	1935-1939[d]			21	8.2		
Wash.	Ellensburg AP	1731	1935-1939[d]			1	3.8		
	North Head CO	199	1884-1947	11	24			20	16.1
	Seattle CO	104	1890-1947	3	20			15	9.8
	Seattle AP	47	1928-1947	3		24	6.3		
	Spokane CO	2030	1881-1941	−30	−5			−15	6.2
	Spokane AP	1974	1941-1947	−7		4	5.1		
	Tacoma CO	279	1897-1947	7				15	8.0
	Tatoosh Is CO	110	1883-1947	7				15	18.9
	Yakima CO	1160	1938-1946	−24				−5	4.1
	Yakima AP	1066	1944-1947	−4					
W. Va.	Elkins CO	1969[c]	1898-1944	−28	−8			−10	6.2
	Parkersburg CO	685	1888-1947	−27	−1			−10	7.2

TABLE 1. WINTER CLIMATIC CONDITIONS[a]—(CONCLUDED)

Col. 1 State	Col. 2 Station[b]	Col. 3 Elevation[c] ft	Col. 4 Period of Record[d]	Col. 6 Lowest Temp. on Record[d] °F	Col. 6 Average Annual Min. Temp.[e] °F	Col. 7 Design Dry-Bulb Temp. on TAC 97½% Basis[f] °F	Col. 8 Wind Vel. at Design Temp.[g] Mph	Col. 9 Design Dry-Bulb Temp. in Common Use[h] °F	Col. 10 Avg. Wind Vel. Dec. Jan. Feb.[i] Mph
Wisc.	Green Bay CO	598	1886-1947	−36	−18			−20	10.5
	La Crosse CO	725	1872-1947	−43	−21			−25	9.3
	La Crosse AP	677	1943-1947	−28		−17	6.9		
	Madison CO	1008	1858-1947	−29				−15	10.1
	Madison AP	884	1935-1939[d]			−8	9.1		
	Milwaukee CO	744	1870-1947	−25	−12			−15	12.1
	Milwaukee AP	707	1927-1947	−29		−6	11.9		
Wyo.	Cheyenne CO	6144	1873-1935	−38	−18			−15	13.3
	Cheyenne AP	6161	1935-1947	−34		−3	11.1		
	Lander CO	5448	1891-1946	−40	−12			−18	3.9
	Lander AP	5568	1946-1947	−14					
	Rock Springs AP	6746	1932-1942	−33		−7	9.1		
Alta.	Edmonton	2219[c]	Up to 1943	−57	−41			−40	7.5
B. C.	Vancouver	22[c]	Up to 1943	2	13			10	4.5
	Victoria	228[c]	Up to 1943	−2	19			5	12.6
Man.	Winnipeg	786[c]	Up to 1943	−54	−38			−35	10.1
N. B.	Fredericton	164[c]	Up to 1943	−35	−25			−20	9.1
N. S.	Yarmouth	136[c]	Up to 1943	−12	0			−5	14.3
Ont.	London	912[c]	Up to 1943	−27	−14			−5	10.3
	Ottawa	294[c]	Up to 1943	−35	−24			−20	8.4
	Port Arthur	644[c]	Up to 1943	−40	−29			−30	8.0
	Toronto	379[c]	Up to 1943	−26	−11			−10	13.6
P. E. I.	Charlottetown	186[c]	Up to 1943	−27	−13			−10	9.8
Que.	Montreal	187[c]	Up to 1943	−29	−18			−15	11.3
	Quebec	296[c]	Up to 1943	−34	−23			−20	13.3
Sask.	Prince Albert	1414[c]	Up to 1943	−70	−47			−45	5.1
Y. T.	Dawson	1062[c]	Up to 1943	−68	−54			−45	3.7
Newf.	St. Johns	428[c]	Up to 1943	−21	−5			−10	12

[a] United States Data compiled from U. S. Weather Bureau Records for years indicated, and Canadian data from Meteorological Service of Canada corrected to 1946.

[b] Col. 2. The stations followed by letters AP are airport stations, all others are city office stations and are followed by letters CO.

[c] Col. 3. The elevations marked c are ground elevations of the station. All other elevations given are the actual elevations of the thermometer bulb above mean sea level.

[d] Col. 4. The periods of record indicated apply only to the lowest temperature ever recorded shown in Col. 5, and generally extend from a summer month of the first year indicated through the spring months of the last year indicated. The periods marked by d terminated in December of the year indicated.

[e] Average of readings of one lowest temperature obtained for each year.

[f] It should be noted that Col. 7 applies only to airports, as these data for city stations are not available at this time. The temperature shown is the minimum hourly out-door temperature which has been equalled or exceeded 97½ percent of the total hours in December, January and February for the period of record. It is pointed out that in most cases the airport stations are outside of the city and these data would apply primarily to rural areas.

[g] Col. 8 indicates the average wind velocity which occurred at temperatures the same as, and lower than, the temperatures shown in Col. 7.

[h] Col. 9 records design temperatures in use by A.S.H.V.E. Members as reported by Chapter Secretaries for the various stations. Where these were not available the design temperatures from an ACRMA publication and various other sources have been inserted.

[i] The wind velocities indicated in Col. 10 were furnished by the U. S. Weather Bureau and corrected through Feb. 1948.

[j] The bulletin published by A.S.H.V.E. for annual weather data of Detroit indicates 6 as design temperature.

[k] Computed for Reading by Karl Shelley and O. F. Smith.

words, a person may feel warm or cool at the same dry-bulb temperature, depending on the relative humidity and air motion. The optimum winter *effective temperature* for sedentary persons, as determined at the A.S.H.V.E. Research Laboratory, is 67–68 ET.

As explained in Chapter 6 for so-called still air conditions, a relative humidity of approximately 50 percent is required to produce an effective temperature of 68 ET when the dry-bulb temperature is 72.5 F. However, even where provision is made for artificial humidification, the relative humidity is seldom maintained higher than 40 percent during the ex-