(Item 7) of the cold air entering by infiltration, or required to replace mechanical exhaust, represents the total heat loss equivalent for any building.

DESIGN OUTDOOR WEATHER CONDITIONS

There are no hard and fast rules for selecting the design outdoor weather conditions to be used for a given locality or type of building or heating system, and the selection is to some extent a matter of judgment and experience. The outside design temperature seldom is taken as the lowest temperature, or even the lowest daily mean temperature ever recorded in a given locality. Such temperatures rarely recur in successive years. Likewise the wind direction and velocity prevailing at the time of design outside conditions frequently are entirely different from those prevailing during the winter.

The A.S.H.V.E. Technical Advisory Committee on Weather Design Conditions has recommended the adoption for heating load calculations of an *outside design temperature which is equalled or exceeded during 97½ percent of the hours in December, January, February and March.*

Complete data of this nature are not available, but Column 8, Table 1, lists this recommended design temperature based on airport station readings for the period indicated, generally the five years, 1935–1939. In most cases these stations are outside of the city and these data apply primarily to rural areas. In general the use of the airport data for buildings within an adjacent city will not make an appreciable difference in design load.

Because of the limited data available, design temperatures in common use are listed in Column 10. Many of these values were furnished by A.S.H.V.E. members—the balance were taken from an *ACRMA* Bulletin,[1] manufacturers' publications and other sources,[2] and a few were estimated. The map, Fig. 1, shows isotherms approximated for these design temperatures. They may be used as a guide for localities not listed in the table. Interpolation between these lines is suggested, and due consideration must be given to elevations and other local conditions. Large differences in climate occur within relatively small distances of Weather Bureau stations in hilly and mountainous regions. Experience and judgment are necessary to deal properly with this factor.

Column 9 of Table 1 gives the maximum wind velocity which occurred with temperatures the same as, and lower than, those shown in Column 8. Winter average velocities for all temperatures are given in Column 11.

Column 6 lists the average annual minimum temperature which is the average of readings of the one lowest temperature occurring for each year the station has been in existence. It is of interest as a guide to the lowest temperature to be expected, except for an occasional extreme of short duration.

INSIDE TEMPERATURES

The inside air temperature which must be maintained within a building is understood to be the dry-bulb temperature at the breathing line, 5 ft above the floor, or at the seating level, 30 in. above the floor, and not less than 3 ft from the outside walls. Inside air temperatures usually specified, vary in accordance with the intended use of the building. Table 2 presents values which conform to good practice.

The proper dry-bulb temperature to be maintained depends upon the relative humidity and air motion, as explained in Chapter 6. In other

TABLE 1. WINTER CLIMATIC CONDITIONS[a]

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 Avg. Winter Temp.[f] °F	Col. 8 Design Dry-Bulb Temp. on TAC 97½% Basis[g] °F	Col. 9 Wind Vel. at Design Temp.[h] Mph	Col. 10 Design Dry-Bulb Temp. in Common Use[i] °F	Col. 11 Avg. Wind Vel. Dec. Jan. Feb.[j] Mph
Ala.	Anniston	C	733	1893–1947	−10		52.3			5	
	Birmingham	C	711	1893–1945	−10	12	53.8			10	8.0
	Birmingham	A	615	1939–1947	−10		51.8	21	7.4		
	Mobile	C	143	1872–1947	−1	22	58.9			15	9.9
	Mobile	A	219	1940–1947	13			30	8.5		
	Montgomery	C	293	1872–1947	−5	18	56.4			10	7.5
	Montgomery	A	226	1938–1944	9	19					
Ariz.	Flagstaff	C	6957	1899–1947	−25	−15	35.9			−10	7.7
	Kingman	A	3473	1935–1939*	8			22	8.6		
	Phoenix	C	1122	1895–1947	16	26	59.5			25	5.4
	Phoenix	A	1112	1937–1947	21		57.7	31	5.6		
	Tucson	C		Up to 1946	6		57.2			25	5.2
	Tucson	A	2561	1935–1939[d]	19		57.2	30	6.3		
	Winslow	C	4853	Up to 1946	−19	−1	43.6			−10	
	Winslow	A	4899	1932–1947	−18		43.5	6	7.5		
	Yuma	C	146	1876–1946*	22	27	62.5			30	6.7
Ark.	Fort Smith	C	545	1882–1945	−15	6	50.4			10	8.3
	Fort Smith	A	463	1945–1947	7						
	Little Rock	C	451	1879–1942	−12	10	51.6			5	8.3
	Little Rock	A	282	1942–1947	7			21	6.6		
Cal.	Bakersfield	A	499	1937–1946*	19	25	55.5	33	5.6	25	
	Burbank	A	740	1931–1947	21		57.5	35	4.9		
	Daggett	A	1925	1935–1939*				27	8.5		
	Eureka	C	115	1886–1947	20	29	49.3			30	7.3
	Fresno	C	387	1887–1939	17	26	53.8			25	5.4
	Fresno	A	281	1939–1947	23			32	4.5		
	Los Angeles	C	534	1877–1947	28	37	59.3			35	6.4
	Oakland	A	21	1929–1947	23		51.9	36	7.5	30	
	Red Bluff	C	341[c]	1877–1934	17		53.9				6.1
	Red Bluff	A	346	1944–1947	25		52.9				
	Redding	A	579	1935–1939*	17			32	7.1		
	Sacramento	C	116	1877–1947	17	28	53.0			30	7.2
	Sacramento	A	22	1938–1947	22						
	San Diego	C	90	1871–1940	25	37	58.2			35	6.3
	San Diego	A	34	1939–1947	34			43	5.8		
	San Francisco	C	164	1875–1947	27	37	54.2			35	7.5
	San Jose	C	100[c]	Up to 1946	22		53.5			25	
	Williams	A	124	1935–1939*				29	8.3		
Col.	Denver	C	5398	1871–1947	−29	−11	39.0			−10	7.5
	Denver	A	5379	1934–1947	−30		37.0	0	8.8		
	Grand Junction	C	4587[c]	1889–1945*	−21	−2	39.9			−15	4.4
	Pueblo	C	4770	1889–1938*	−27		41.1			−20	7.9
	Pueblo	A	4810	1939–1947	−26			2	6.4		
Conn.	Hartford	C	229	1905–1940	−18		36.4			0	8.7
	Hartford	A	20	1940–1947	−24			4	8.3		
	New Haven	C	180	1872–1946*	−15	−1	38.4			0	9.4
	New Haven	A	17	1943–1947	−4			11	8.1		
D.C.	Washington	C	128	1871–1947	−15	−1	43.4			0	7.8
	Washington	A	20	1935–1939*				14	7.4		
Fla.	Apalachicola	C	23	1922–1947	18		60.9			25	8.4
	Jacksonville	C	104	1871–1947	10	29	62.0			25	9.0
	Jacksonville	A	29	1938–1947	16		60.6	31	7.0		
	Key West	C	23	1871–1947	41		73.1			45	10.6
	Key West	A	48	1939–1947	42		72.5				
	Miami	C	253	1896–1947	27	38	71.4			35	10.1
	Miami	A	13	1940–1947	28	35		45	7.3		
	Pensacola	C	67	1879–1947	7	23	59.7			20	10.9
	Pensacola	A	113	1943–1947	20						
	Tampa	C	111	1890–1940*	19	32	66.0			30	8.6
	Tampa	A	12	1941–1946	31						
	Titusville	A	52	1935–1939*				38	6.5		
Ga.	Atlanta	A	1020	1878–1945*	−8	12	51.3	22	10.2	10	11.7
	Augusta	C	195	1871–1946*	3		54.2			10	6.5
	Augusta	A	424	1939–1947	10						
	Macon	C	408	1899–1947	7		54.7			15	6.7
	Macon	A	432	1939–1947	8						
	Savannah	C	115	1871–1945	8	22	58.5			20	9.5
	Savannah	A	56	1939–1947	16		56.7	29	7.7		
Idaho	Boise	C	2818	1864–1939*	−28		40.3			−10	9.1
	Boise	A	2849	1939–1947	−13	−1	39.8	5	4.5		
	Burley	A	4150	1935–1939*	−35		36.9	2	8.8		
	Idaho Falls	A	4744	1935–1939*	−18			−7	7.6		
	Lewiston	C	763	1900–1944	−23	1	42.7			5	4.1
	Pocatello	C	4522	1899–1947	−28	−12	37.1			−5	8.9
	Pocatello	A	4467	1938–1947	−23		35.0	6	7.2		
Ill.	Cairo	C	319	1872–1947	−16		46.4			0	9.8
	Chicago	C	601[c]	Up to 1946	−23	−8	37.6			−10	12.0

Blank spaces indicate data not yet completed.