The Technical Advisory Committee on Weather Design Conditions has suggested that wet-bulb design temperature be taken as that wet-bulb temperature which has been equalled or exceeded in 5 percent of the hours during months of the period of record. While not available for the 1953 edition of THE GUIDE, due to the tremendous task of compiling these data, it is hoped that they will be available for some stations for future editions.

The wind velocity to be used in design should be that wind velocity which accompanies the design temperatures in each instance, but since these data are not available, the average summer wind velocities for the period of record were taken from U. S. Weather Bureau records revised to 1948. It is pointed out that this is not necessarily the velocity which coincides with the design temperatures, but it may serve as a guide to the designer.

Other weather data, such as *daily range of temperature*, are useful particularly when making cooling load calculations for an early morning peak on an east exposure. Daily range of temperature is the difference between the average of the daily maximum dry-bulb temperatures and the average of the daily minimum temperatures. This range is highest in semi-arid or desert regions and at high elevations, and lowest near the oceans or very large lakes. The daily range of temperature (Fahrenheit degrees) in July for the principal areas of the United States can be approximated from the following tabulation:

East Sea Shore	12 to 18	East of Mississippi River	19 to 24
Gulf Sea Shore	12 to 18	Mississippi River to Rocky Mountains	24 to 33
Great Lakes Shore	18 to 21	Rocky Mountain Area	33 to 42
West Sea Shore	15 to 20	West Coastal States	20 to 36

Ventilation Rate

The introduction of outside air is necessary for the ventilation of conditioned spaces. Chapter 6 suggests *minimum* outdoor-air requirements for representative applications; but it is to be emphasized that minimum requirements are not necessarily *adequate* requirements for all psychological attitudes and physiological responses. Where maximum economy in space and load are essential, as in submarines or other restricted spaces, as little as 1 cfm of outside air per person has been found to be sufficient provided that satisfactory ventilation is simultaneously obtained by an adequate decontamination of recirculated air.[2]

Local codes and ordinances frequently specify ventilation requirements for public places and for industrial installations. For operating rooms, minimum requirements for safe practice are given in *National Board of Fire Underwriters'* pamphlet.[3] This pamphlet does not require 100 percent outside air in operating rooms, although 100 percent outside air is normally used and recommended.

Recommended and minimum ventilation rates for the most common applications are summarized in Table 3. For further general applications, a basis of estimating the cfm per person may be taken as:

1. People not smoking	7½	*Recommended*	*5 Minimum*
2. People smoking	40	*Recommended*	*25 Minimum*

The cooling load due to the introduction of outside air for ventilation is determined once the indoor and outdoor design conditions are fixed. Calculations will be discussed subsequently.

TABLE 2. SUMMER CLIMATIC CONDITIONS[a]

Suggested Design Wet-Bulb and Dry-Bulb Temperatures

Col. 1 State	Col. 2 Station[b]	Col. 3 Elevation[c] Ft	Col. 4 Period of Record[d]	Col. 5 Highest Temp. Ever Recorded[d] °F	Col. 6 Design Dry-Bulb Temp. on T.A.C. 2½% Basis[e] °F	Col. 7 Design Dry-Bulb Temp. in Common Use[f] °F	Col. 8 Design Wet-Bulb Temp. in Common Use[f] °F	Col. 9 Average Summer Wind Velocity[g] Mph
Ala.	Anniston CO	733	1893–1947	105	...	95	78	...
	Birmingham CO	711	1893–1945	107	...	95	78	5.4
	Birmingham AP	615	1939–1947	103	94	...	...	...
	Mobile CO	143	1872–1947	103	...	95	80	8.0
	Mobile AP	219	1940–1947	104	92	...	...	...
	Montgomery CO	293	1872–1947	107	...	95	78	...
	Montgomery AP	226	1938–1944[d]	103	...	...	...	...
Ariz.	Flagstaff CO	6957	1899–1947	93	...	90	65	...
	Kingman AP	3473	1935–1939	107	99	...	...	...
	Phoenix CO	1122	1895–1947	118	...	105	76	6.0
	Phoenix AP	1112	1933–1947	117	107	...	...	...
	Tucson AP	2561	1935–1939	112	102	105	72	...
	Winslow CO	4853	Up to 1946	107	...	100	70	...
	Winslow AP	4899	1937–1947	103	95	...	...	...
	Yuma CO	146	1876–1946	120	...	110	78	...
Ark.	Fort Smith CO	545	1882–1945	113	...	95	76	6.1
	Fort Smith AP	463	1945–1947	107	...	...	...	...
	Little Rock CO	451	1879–1942[d]	110	...	95	78	6.2
	Little Rock AP	282	1942–1947	107	97	...	...	...
Calif.	Bakersfield AP	499	1937–1946	113	104	105	70	...
	Burbank AP	740	1931–1947[d]	111	94	...	...	...
	Daggett AP	1925	1935–1939	113	104	...	...	...
	Eureka CO	132	1886–1947	85	...	90	65	...
	Fresno CO	387	1887–1939	115	...	105	74	7.9
	Fresno AP	281	1939–1947	111	103	...	...	...
	Los Angeles CO	534	1877–1947	109	...	90	70	5.8
	Oakland AP	21	1929–1947	102	80	85	65	...
	Red Bluff CO	305[c]	1877–1934	115	...	100	70	...
	Red Bluff AP	346	1944–1947	112	...	...	...	...
	Redding AP	579	1935–1939	112	101	...	...	...
	Sacramento CO	116	1877–1947	114	...	100	72	7.9
	Sacramento AP	22	1938–1947	108	...	...	...	...
	San Diego CO	90	1871–1940	110	...	85	68	...
	San Diego AP	34	1939–1947	106	79	...	...	...
	San Francisco CO	164	1875–1947	101	...	85	65	10.7
	San Jose CO	100	Up to 1946	106	...	91	70	...
	Williams AP	124	1935–1939	116	103	...	...	...
Colo.	Denver CO	5398	1871–1947	105	...	95	64	6.9
	Denver AP	5379	1934–1947	104	93	...	...	...
	Durango CO	6558	Up to 1946	99	...	95	65	...
	Grand Junction CO	4587[c]	Up to 1946	105	...	95	65	6.3
	Pueblo CO	4770	1889–1938	104	...	95	65	...
	Pueblo AP	4810	1939–1947	104	95	...	...	...
Conn.	Hartford CO	229	1905–1940[d]	101	...	93	75	...
	Hartford AP	20	1940–1947	98	88	...	...	...
	New Haven CO	180	1872–1947	101	...	95	75	7.4
	New Haven AP	17	1943–1947	94	84	...	...	...
D. C.	Washington CO	128	1871–1947	106	...	95	78	5.9
	Washington AP	20	1935–1939	106	92	...	...	...
Fla.	Apalachicola CO	23	1922–1947	102	...	95	80	...
	Jacksonville CO	104	1871–1947	104	...	95	78	8.4
	Jacksonville AP	29	1938–1947	105	94	...	...	...
	Key West CO	23	1871–1947	100	...	98	78	...
	Key West AP	48	1939–1947	95	...	...	...	...
	Miami CO	253	1896–1947	96	...	91	79	8.7
	Miami AP	13	1940–1947	100	89	...	...	...
	Pensacola CO	67	1879–1947	103	...	95	78	...
	Pensacola AP	113	1943–1947	105	...	...	...	...
	Tampa CO	111	1890–1940	98	...	95	78	7.4
	Tampa AP	12	1941–1946[d]	98	...	...	...	...
	Titusville AP	52	1935–1939	98	90	...	...	...
Ga.	Atlanta AP	1020	1935–1939	102	93	95	76	7.9
	Augusta CO	195	1871–1946	106	...	98	76	...
	Augusta AP	424	1939–1947	105	...	...	...	...
	Macon CO	408	1899–1947	105	...	95	78	...
	Macon AP	432	1939–1947	102	...	...	...	...
	Savannah CO	115	1871–1945[d]	105	...	95	78	8.0
	Savannah AP	56	1939–1947	105	93	...	...	...
Idaho	Boise CO	2818	1864–1939	112	...	95	65	5.8
	Boise AP	2849	1939–1947	109	95	...	...	...
	Burley AP	4150	1935–1939	104	94	...	...	...
	Idaho Falls AP	4744	1935–1939	100	88	...	...	...
	Lewiston CO	763	1900–1944[d]	117	...	95	65	...
	Pocatello CO	4522	1899–1947	105	...	95	65	...
	Pocatello AP	4467	1938–1947	103	92	...	...	...
Ill.	Cairo CO	319	1872–1947	106	...	98	78	...
	Chicago CO	601	Up to 1946	105	...	95	75	9.5
	Chicago AP	615	1935–1939	107	92	...	...	...
	Moline AP	594	1932–1947	106	94	96	76	...