

TABLE 2. AVERAGE INSTALLED COSTS OF FORCED AIR HEATING AND AIR CONDITIONING APPARATUS

CFM SUPPLY AIR (THOUSANDS)	COST PER CFM—DOLLARS ^d			
	1	2	3	4
	AIR CONDITIONING EQUIPMENT ^a	HEATING AND VENTILATING EQUIPMENT ^b	DUCTS OFFICE BLDGS. ^c	DUCTS SPECIALTY STORES ^c
5	0.300	0.210		0.250
10	0.270	0.180		0.249
15	0.250	0.155		0.247
20	0.235	0.140		0.245
30	0.220	0.120		0.240
40	0.210	0.110	0.340	0.235
60	0.210	0.110	0.330	0.230
80	0.210	0.110	0.325	
100	0.210	0.110	0.320	
120	0.210	0.110	0.310	
140	0.210	0.110	0.305	
160	0.210	0.110	0.295	
180	0.210	0.110	0.290	
200	0.210	0.110	0.280	

^aAir conditioning equipment includes fans and drives, filters, heaters, spray dehumidifiers or cooling coils, automatic controls, apparatus casings and insulation, and recirculating pumps.

^bHeating and ventilating equipment includes fans and drives, filters, heaters, automatic controls and apparatus casings.

^cIncludes ducts, grilles, outlets, insulation where required and specialties.

^dThe approximate figure given above may vary as much as 35 per cent due to job conditions, labor rates and locality. Figures are based on conventional systems. Building alterations, piping, plumbing and wiring are not included. These figures represent the selling prices of the individual items indicated above based on costs encountered in the year 1940. It is suggested that correction be made according to the particular locality for increases in labor and material costs since that year.

TABLE 3. AVERAGE INSTALLED COSTS OF REFRIGERATION SYSTEMS AND WATER SAVING DEVICES

TONS/ REFRIG- ERATION	COST—DOLLARS PER TON ^a					
	1	2	3	4	5	6
	RECIPRO- CATING (WATER COOLING) ^a	CENTRIFUGAL (WATER COOLING) ^a	RECIPRO- CATING DIRECT EXPANSION ^b	EVAPO- RATIVE CONDENSER ^c	COOLING TOWER STEEL ^d	COOLING TOWER WOOD ^d
25	147		106	47		
50	132		86	40		
75	125		77	35		
100	120		72	32		
150	115	137			47	40
200	113	124			45	38
250	110	115			44	36
300		107			42	35
400		97			40	33
500		93			38	31
					36	29

^aColumns 1 and 2 include compressors, evaporators, and water-cooled condensers; auxiliaries; electric motor, starter and drive; refrigeration piping, refrigerant and insulation of cooler and suction lines. Turbine driven centrifugal equipment may cost about 4 to 6 per cent more than motor driven, if condensing turbine and steam condenser, with supplementary equipment, are used.

^bColumn 3 includes same items as Column 2 except evaporator and auxiliaries are omitted.

^cColumn 4—These values are additive to Columns 1 and 3.

^dColumns 5 and 6 include towers erected and a reasonable allowance for condenser water piping and pumps.

^eThe approximate figures given above may vary as much as 25 per cent due to job conditions, labor rates and locality. Building alterations, supply water and plumbing connections, wiring, chilled water piping and pumps are not included in these figures and may vary widely. Chilled water piping and pump costs may vary between \$10 and \$50 per ton of refrigeration effect. These figures represent the selling prices of the individual items indicated above based on costs encountered in the year 1940. It is suggested that correction be made according to the particular locality for increases in labor and material costs since that year.

TABLE 4. APPROXIMATE COSTS OF ALL-YEAR AIR CONDITIONING^{a,b}

APPLICATION	SELLING PRICE PER UNIT INDICATED											
	SQ FT NET AREA			PERSON			TON REFRIGERATION			CFM SUPPLY AIR		
	Low	Avg	High	Low	Avg	High	Low	Avg	High	Low	Avg	High
	\$1.25	\$2.00	\$3.50	\$80	\$140	\$320	\$350	\$480	\$700	\$0.95	\$1.40	\$2.75
Banks.....	0.60	1.00	1.15	25	40	100	250	325	400	0.60	0.80	1.00
Department Stores (Basement Main Floor Upper Floors).....	0.60	1.05	1.25	25	40	80	250	325	400	0.60	0.75	0.90
Hotels—Guest Rooms.....	0.60	0.90	1.10	30	45	100	300	350	400	0.60	0.80	1.00
Offices—Small Suites.....												
Restaurants.....												
Barber Shops and Beauty Parlors.....												
Specialty Dress Shops.....												
Shops (Five-and-Ten).....												
Shoe Stores.....												
Theaters.....												

^aModern Air Conditioning, Heating and Ventilating, by W. H. Carrier, R. E. Chrene and W. A. Grant (Pitman Publishing Corp., 1940, p. 64).

^bThere is a wide variation in unit prices such as shown above, due to differences in load concentration and in complexity of physical layout. Prices cover air-conditioning work only, for year-round use (except the low column, which in general includes summer cooling only). Net area (square feet) includes corridors, but excludes elevators and service spaces. ^cExcluded are the cost of plumbing and steam connections, electrical wiring, painting and redecorating, building construction and alterations, or boilers or burners. Low figures in general are simply direct expansion systems using city water for condensing. High figures are usually chilled water systems with cooling towers or evaporative condensers, and may be considered high quality systems as well.

^dPrice per room.

^ePrice per seat.