Table 6.... Heating Capacities and Cfm of Branch Ducts in Extended-Plenum Perimeter Systems (Continued)

Section C. Side Take-Off to 6-Inch Round Pipe for Baseboard Diffusers Only

Extended-Plenum Pressure 0.15 in. Static at 160 F — *Furnace-Plenum Pressure 0.15 in. Static at 170 F*

No. of Elbows		Actual Length from Extended-Plenum to Diffuser—Feet											
		5	10	15	20	25	30	35	40	45	50	55	60
0	Btuh	9800	9100	8430	7820	7230	6700	6200	5730	5320	4920	4550	4210
	Cfm	106.6	104.4	102.3	100.3	98.5	96.8	95.0	93.1	91.7	90.0	88.5	87.2
1	Btuh	9230	8550	7930	7360	6800	6300	5830	5400	5000	4620	4280	3960
	Cfm	100.4	98.7	97.0	95.3	93.7	92.0	90.4	88.9	87.6	86.2	84.9	83.8
2	Btuh	8740	8100	7500	6960	6420	5960	5510	5110	4730	4390	4050	3750
	Cfm	95.5	93.8	92.2	90.6	89.4	88.0	86.5	85.2	84.0	82.8	81.6	80.6
3	Btuh	8300	7690	7130	6600	6110	5680	5240	4850	4500	4170	3840	3560
	Cfm	91.0	89.5	88.0	86.7	85.5	84.2	83.0	82.0	80.9	79.8	78.8	77.9
4	Btuh	7930	7350	6800	6290	5830	5400	5000	4620	4270	3940	3630	3370
	Cfm	86.8	85.5	84.2	83.3	82.0	81.0	80.0	79.1	78.0	77.0	76.1	75.3
5	Btuh	7600	7020	6500	6020	5580	5160	4770	4410	4080	3770	3470	3190
	Cfm	83.6	82.5	81.3	80.2	79.1	78.1	77.1	76.4	75.3	74.4	73.5	72.8
6	Btuh	7300	6760	6260	5780	5350	4950	4560	4200	3900	3580	3300	3040
	Cfm	80.4	79.5	78.4	77.5	76.3	75.3	74.4	73.5	72.8	72.0	71.2	70.6

Note: Where any of the first three runs from the extended-plenum exceeds 20 ft and 3 elbows, count 3 extra elbows for that run.
The Equivalent Length Values used and included in calculating this table are: Diffuser and Boot = 100 ft; Each Elbow = 14 ft; Side Take-off = 20 ft.
Tapered Extended-Plenum Starting Collar.

Section D. Top Take-Off to 6-Inch Round Pipe for Baseboard Diffusers Only

Extended-Plenum Pressure 0.15 in. Static at 160 F — *Furnace-Plenum Pressure 0.15 in. Static at 170 F*

No. of Elbows		Actual Length from Extended-Plenum to Diffuser—Feet											
		5	10	15	20	25	30	35	40	45	50	55	60
0	Btuh	8700	8050	7450	6900	6400	5910	5470	5160	4670	4300	4000	3720
	Cfm	95.0	93.2	91.7	90.0	88.6	87.3	86.0	84.7	83.5	82.4	81.3	80.2
1	Btuh	8260	7640	7090	6560	6080	5630	5200	4820	4470	4140	3830	3530
	Cfm	90.2	88.8	87.5	86.2	85.0	83.7	82.6	81.7	80.4	79.4	78.4	77.5
2	Btuh	7880	7290	6750	6250	5800	5380	4980	4590	4260	3940	3620	3340
	Cfm	86.3	85.0	84.0	82.9	81.7	80.5	79.6	78.7	77.6	76.7	75.8	74.9
3	Btuh	7560	7000	6470	5980	5540	5130	4740	4380	4060	3730	3430	3170
	Cfm	83.0	82.0	81.0	79.8	79.0	78.0	76.9	76.0	75.1	74.2	73.3	72.5
4	Btuh	7260	6700	6200	5740	5290	4900	4510	4160	3850	3560	3290	3020
	Cfm	80.0	79.1	78.1	77.2	76.2	75.2	74.3	73.5	72.7	71.9	71.0	70.2
5	Btuh	7000	6470	5970	5490	5070	4700	4320	3990	3600	3400	3120	2870
	Cfm	77.3	76.3	75.4	74.5	73.6	72.8	71.9	71.2	70.2	69.3	68.7	68.1
6	Btuh	6770	6230	5740	5290	4890	4500	4140	3820	3520	3240	2980	2760
	Cfm	74.6	73.8	73.0	72.2	71.3	70.5	69.8	69.0	68.3	67.5	66.9	66.1

Note: Where any of the first three runs from the extended-plenum exceeds 20 ft and 3 elbows, count 3 extra elbows for that run.
The Equivalent Length Values used and included in calculating this table are: Diffuser and Boot = 100 ft; Each Elbow = 14 ft; Top Take-off = 50 ft.
Tapered Extended-Plenum Starting Collar.

taken from basements and crawl spaces, but should not be taken from confined spaces in which the furnace is located.

The following simplified procedure* may be used:

1. Lay out the return-air duct system. Measure the length and count the number of 90 deg turns in each return duct.
2. Total the heat loss of the area served by each return duct.
3. Determine the required duct free area from the length of duct, the number of 90 deg turns, and the heat loss using Table 8. Also determine the free area of the return grille from Table 8.

Other Perimeter Systems

Each of the foregoing procedures can be used with approved furnaces that are capable of delivering their rated cfm air volume against a total pressure of 0.20 in. water external to the furnace. This available pressure is usually distributed on the basis of three-fourths (0.15 in. water) on the supply side and one-fourth (0.05 in. water) on the return side. Other systems, such as perimeter crawl-space plenum systems, may be designed by procedures outlined in Manual 4. In addition, procedures for designing 4-in. diameter duct systems are contained* in Manual 10 of the National Warm Air Heating and Air Conditioning Association.

Other systems of a proprietary nature but utilizing the perimeter concept of diffuser placement are in common use. These systems should be designed and installed in strict accordance with the manufacturer's recommendations. Such systems usually utilize smaller ducts (4 in. or less) and higher pressures (above 0.20 in. water). They also may require special streamlined, low resistance fittings and special diffusers. Some systems also employ higher bonnet tempera-

Table 6.... Heating Capacities and Cfm of Branch Ducts in Extended-Plenum Perimeter Systems (Concluded)

Section E. Side Take-Off to 6-Inch Round Pipe for Side-wall and Floor Diffusers

Extended-Plenum Pressure 0.15 in. Static at 160 F — *Furnace-Plenum Pressure 0.15 in. Static at 170 F*

No. of Elbows		Actual Length from Extended-Plenum to Diffuser—Feet											
		5	10	15	20	25	30	35	40	45	50	55	60
0	Btuh							8600	7930	7310	6740	6230	5800
	Cfm							123.2	120.0	116.8	114.0	111.4	109.1
1	Btuh						8560	7900	7290	6720	6200	5740	5340
	Cfm						117.4	114.5	112.1	109.2	107.0	104.8	102.8
2	Btuh					8510	7890	7300	6740	6230	5750	5310	4960
	Cfm					112.7	110.0	107.6	105.3	103.1	101.0	99.0	97.4
3	Btuh				8540	7900	7300	6780	6270	5800	5360	4960	4610
	Cfm				108.2	105.8	103.6	101.5	99.6	97.8	95.9	94.0	92.5
4	Btuh			8580	7970	7370	6820	6330	5850	5410	5000	4620	4300
	Cfm			104.0	101.9	99.8	97.8	96.0	94.5	92.8	91.1	89.7	88.3
5	Btuh		8720	8080	7490	6940	6440	5960	5490	5080	4690	4320	4020
	Cfm		100.2	98.3	96.7	94.8	93.0	91.4	90.0	88.7	87.2	85.0	84.7
6	Btuh	8900	8240	7630	7060	6550	6070	5600	5190	4800	4430	4100	3810
	Cfm	97.0	95.1	93.4	91.9	90.2	88.8	87.3	86.2	85.0	83.8	82.6	81.5

Note: Where any of the first three runs from the extended-plenum exceeds 20 ft and 3 elbows, count 3 extra elbows for that run.
The Equivalent Length Values used and included in calculating this table are: Diffuser and Boot = 40 ft; Each Elbow = 14 ft; Side Take-off = 20 ft.
Tapered Extended-Plenum Starting Collar.

Section F. Top Take-Off to 6-Inch Round Pipe for Side-wall and Floor Diffusers

Extended-Plenum Pressure 0.15 in. Static at 160 F — *Furnace-Plenum Pressure 0.15 in. Static at 170 F*

No. of Elbows		Actual Length from Extended-Plenum to Diffuser—Feet											
		5	10	15	20	25	30	35	40	45	50	55	60
0	Btuh					8430	7800	7210	6660	6170	5700	5270	4910
	Cfm					111.2	108.8	106.3	104.4	102.2	100.2	98.4	96.7
1	Btuh				8450	7840	7250	6700	6210	5730	5300	4900	4560
	Cfm				107.2	105.0	102.8	100.7	98.9	97.0	95.1	93.4	91.9
2	Btuh			8530	7900	7320	6800	6280	5790	5350	4960	4590	4250
	Cfm			103.2	101.1	99.0	97.2	95.4	93.8	92.1	90.6	89.0	87.8
3	Btuh		8660	8020	7430	6900	6370	5900	5450	5030	4650	4300	3990
	Cfm		99.7	97.8	96.0	94.2	92.4	90.8	89.4	88.0	86.7	85.3	84.2
4	Btuh	8810	8180	7580	7010	6500	6000	5550	5150	4750	4400	4070	3780
	Cfm	96.0	94.4	92.8	91.2	89.7	88.0	86.8	85.7	84.3	83.1	82.0	81.1
5	Btuh	8390	7770	7200	6650	6160	5700	5280	4890	4500	4170	3840	3580
	Cfm	91.4	90.0	88.5	87.2	85.8	84.5	83.2	82.4	81.0	80.0	79.0	78.3
6	Btuh	7980	7380	6840	6340	5880	5430	5020	4650	4290	3970	3660	3400
	Cfm	87.5	86.2	85.0	83.8	82.5	81.4	80.2	79.4	78.3	77.3	76.3	75.6

Note: Where any of the first three runs from the extended-plenum exceeds 20 ft and 3 elbows count 3 extra elbows for that run.
The Equivalent Length Values used and included in calculating this table are: Diffuser and Boot = 40 ft; Each Elbow = 14 ft; Top Take-off = 50 ft.
Tapered Extended-Plenum Starting Collar.