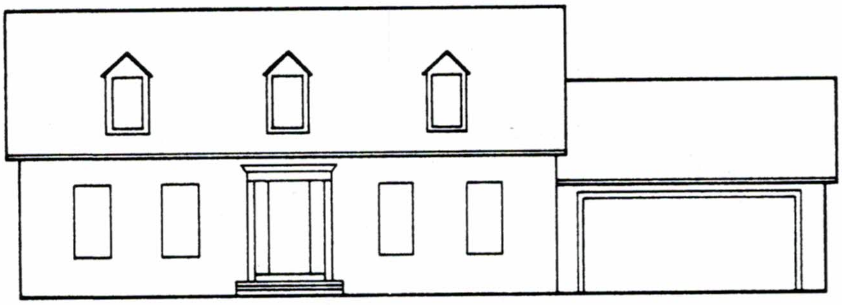
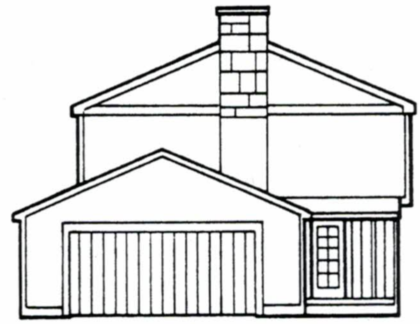
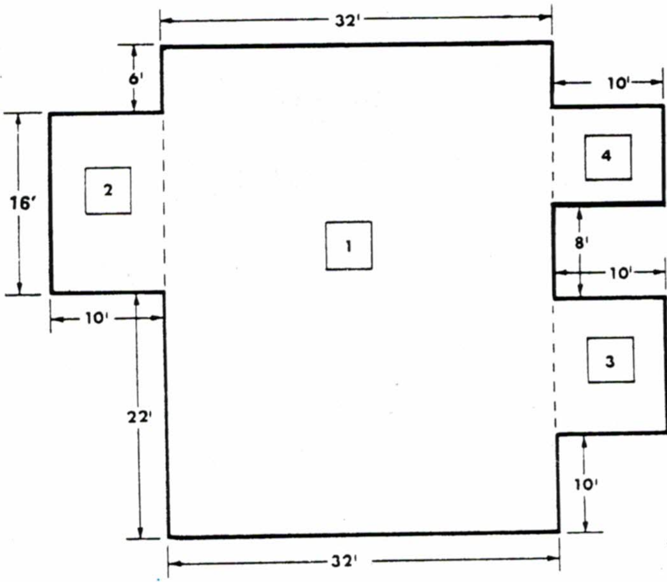
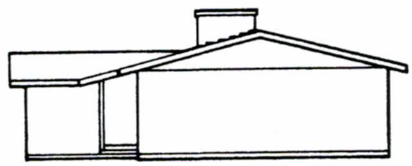
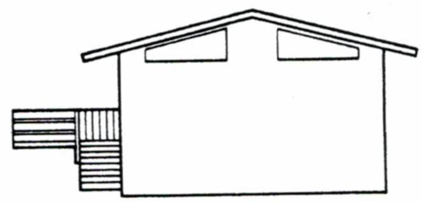
How To Measure A Building To Be Fumigated With Vikane® Gas Fumigant

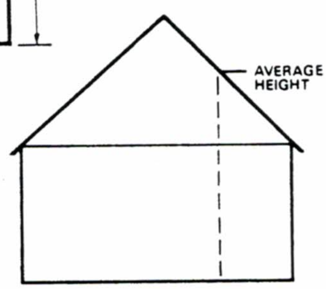


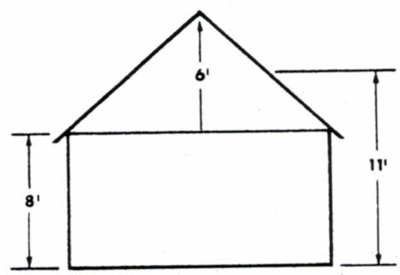


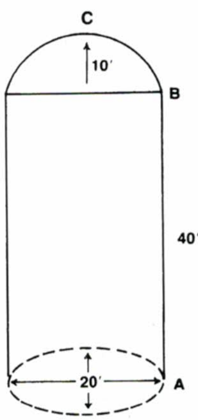


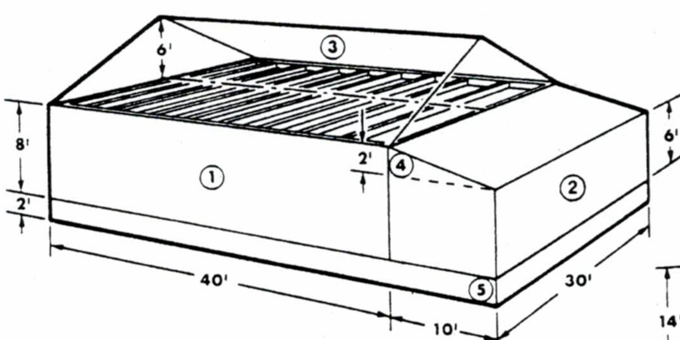


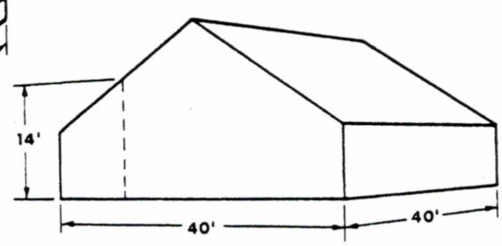












How to Measure A Building To Be Fumigated With Vikane® Gas Fumigant — An Aid To Estimating

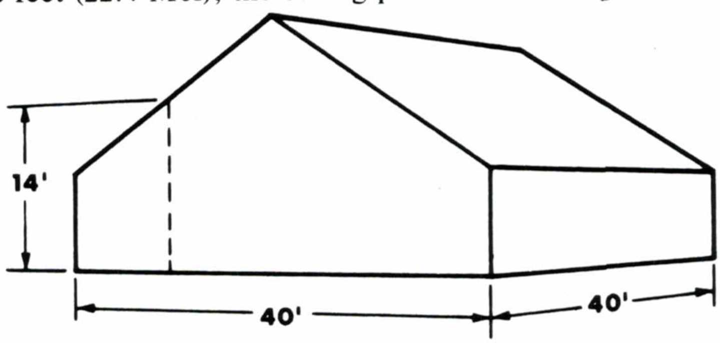
There are several very important factors to consider when estimating a fumigation. Probably the most important is accurate measurement. In simple terms, the cubic content of a structure is determined by multiplying the length by the width, and then multiplying the result by the height. In actual practice, the calculation is usually more involved, since most structures are irregular and have peaked or gable roofs. Therefore the first step in calculating the cubic content is to determine the area of the space to be fumigated, then multiply the area (square feet) by the average height (feet).

The building shown in figure 1 is 40 feet long and 40 feet wide, with an average height of 14 feet.

Length x width	= area
(40 feet x 40 feet	= 1,600 square feet)
Area x average height	= cubic content
(1,600 square feet x 14 feet	= 22,400 cubic feet)

Fumigations are usually priced in units of 1000 cubic feet (Mcf). Since the cubic content of this structure is 22,400 cubic feet (22.4 Mcf), the selling price of the fumigation will be the price per Mcf x 22.4.

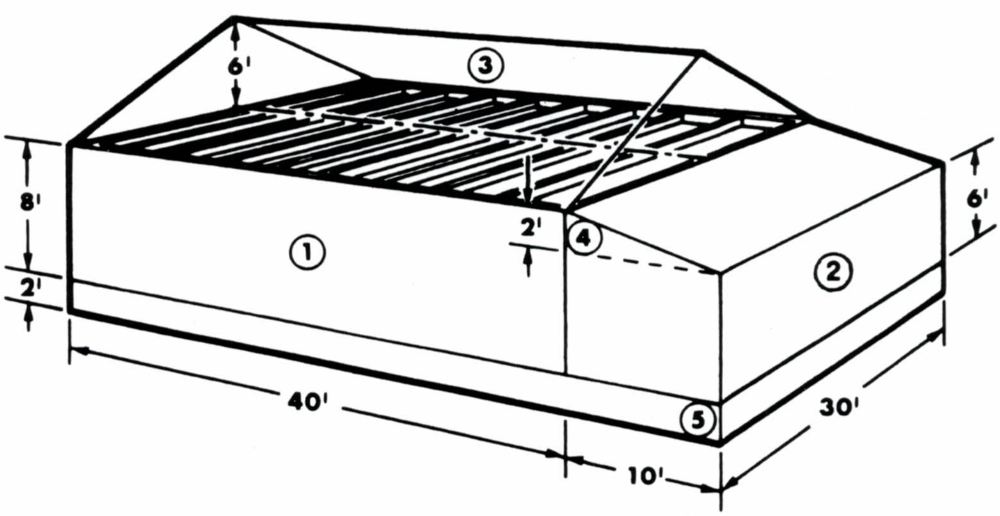
Figure 1



This is a very basic example. However, a fumigator must be able to calculate the cubic content of buildings much more complicated than this. He also must understand how to determine the average height. The building in Figure 2 is still simple, but a little more complicated than the one in Figure 1. It can be noted that a lean-to has been added to the main structure and that there is also a crawl space, or subarea.

The same procedure is used, but the cubic content of each section should be calculated separately. Section 1 is the main section, not including the attic and subarea. Section 2 is the lean-to, not including the attic and subarea of that section. Section 3 is the attic area of the main structure. Section 4 is the attic area of the lean-to, and Section 5 is the combined subareas below the main structure and the lean-to.

Figure 2



EXAMPLE:

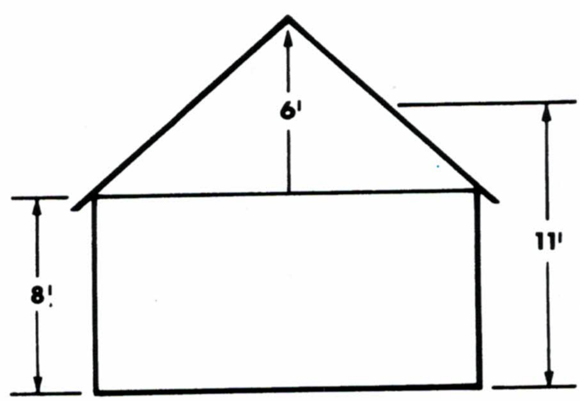
1) 40 ft. length X 30 ft. width equals 1,200 sq ft.
   1,200 sq. ft. X 8 ft. height equals 9,600 cu. ft.
2) 30 ft. X 10 ft. equals 300 sq. ft.
   300 sq. ft. X 6 ft. height equals 1,800 cu. ft.
3) 40 ft. X 30 ft. equals 1,200 sq. ft.
   1,200 X ½ of attic height, which would be 3 ft., equals 3,600 cu. ft.
4) 30 ft. X 10 ft. equals 300 sq. ft.
   300 X ½ of attic height (1 ft.) equals 300 cu. ft.
5) 40 ft. X 30 ft. equals 1,200 sq. ft. plus 30 ft. X 10 ft. (300 sq. ft.) equals 1,500 sq. ft.
   1,500 X subarea height of 2 ft. equals 3,000 cu. ft.

Total number of cubic feet would be:

9,600
1,800
3,600
300
3,000
18,300

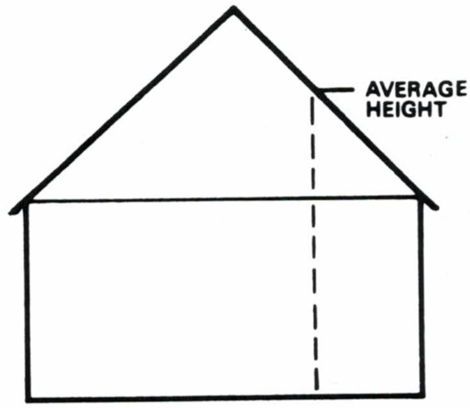
The average height of a building with a gable roof is usually calculated by multiplying one-half the distance from the ground-floor ceiling to the peak of the roof by the number of square feet in the attic. Another method is to multiply the maximum height at the peak by the number of square feet and dividing the result by two. If the building has a simple roof, without dormer or extra gables, as in figure 3, the average height of the total building can be calculated by adding the wall height and one-half of the attic height.

Figure 3



There are several methods for determining the average height of a building. One is shown in Figure 4. From the midway point between roof peak and eave, measure to the ground. If the terrain is sloping or access to the outside is difficult, it is often useful to measure the roof from inside while making the inspection.

Figure 4



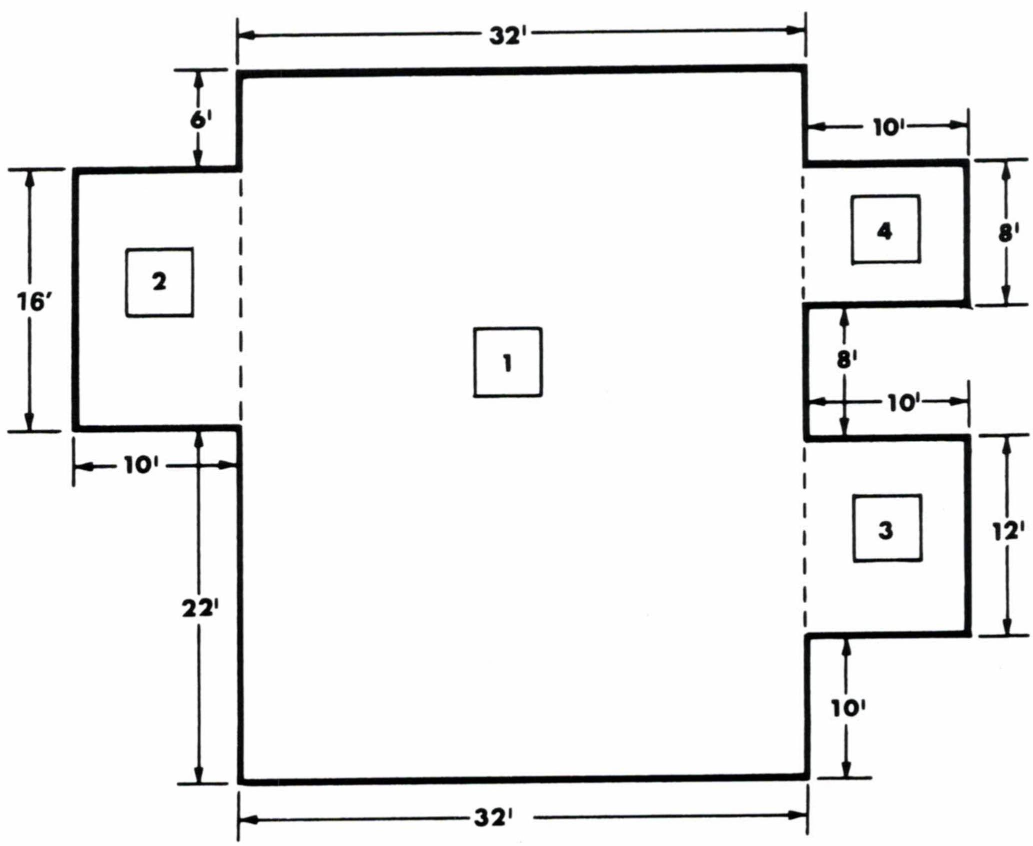
The structures illustrated to this point have all had square or rectangular foundations. In practice many buildings such as the one shown in Figure 5 have less regular foundation plans that may pose a greater problem. In such cases, it is helpful to remember that the first step in measuring a building should be to obtain the correct area in square feet. The central portion of the foundation plan in Figure 5 has several sections jutting off from it, marked off in the drawing by dotted lines. One of the easiest ways to determine the area of this building is to consider these small areas separately.

EXAMPLE:

1)	32 ft. X 44 ft.	=	1408
2)	16 ft. X 10 ft.	=	160
3)	12 ft. X 10 ft.	=	120
4)	10 ft. X 8 ft.	=	80
Total square feet			1768

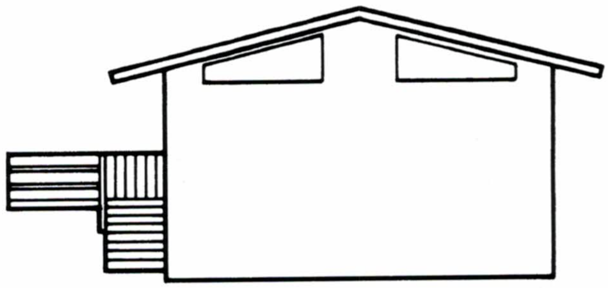
It is usually a simple matter to find the area by this method, regardless of the number or size of the sections.

Figure 5



To this point we have covered only the basic method for estimating the cubic content of the structure itself, but there is more to consider before the final price can be determined. Buildings have overhanging eaves, high chimneys, porches, stairs and other appurtenances that will have to be enclosed with the tarp, and these will increase the cubic content to be fumigated. Figure 6 shows a dwelling with wide overhanging eaves and a porch and stairway that must be covered. The tarp will angle from edge of roof eaves to the base of the foundation; so a safe rule to follow is to include one eave for each wall length or width to be measured. In this instance, the porch presents a further problem. The extra cubic content is calculated for the space beginning at the roof eave and extending out over the outer edge of porch to the ground level. It is not difficult to measure this additional space if a fumigation tarp is visualized enclosing this area.

Figure 6



The building shown in Figure 7 has three additional spaces to fumigate besides the main structure: the area around the chimney, the offset between the eave of the house and the eave of the garage, and the offset area near the front door where the garage joins the house. Some consideration should also be given to the two different roof levels.
There will be some space enclosed underneath the tarps where they extend over the garage, the volume depending on how closely the fumigation crew contours the tarps to the building.

Figure 7

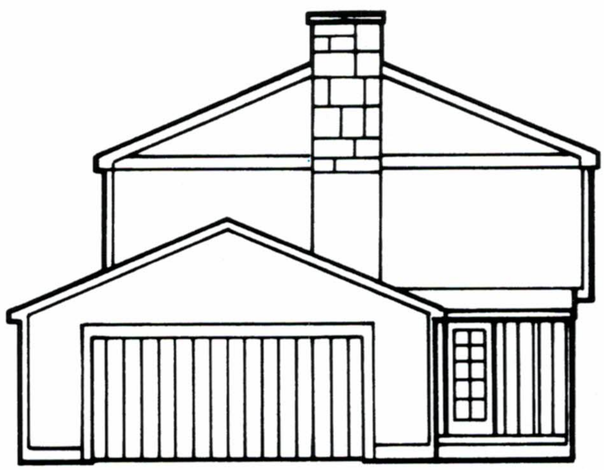


Figure 8 shows a building with a chimney and overhanging eaves to cover, together with some additional space near the front door that could possibly add 3,000 to 5,000 cubic feet to a structure that in itself, might measure as little as 12,000 to 15,000 cubic feet. If this additional space is overlooked the measurements could be off by as much as 25% to 35%.

Figure 8

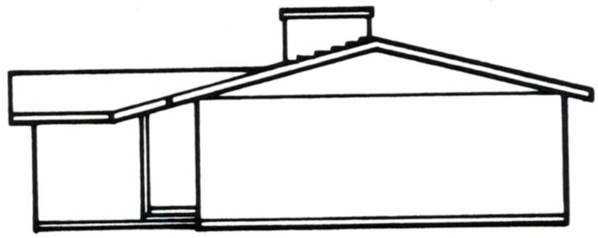
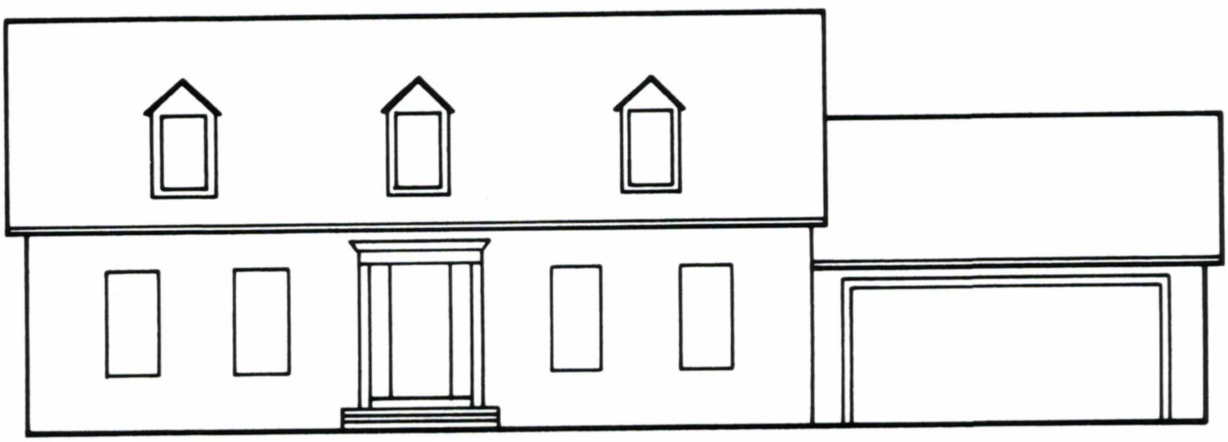


Figure 9 presents still another problem. The dormer windows on the roof will alter the roof height. These dormers reach above the midway point between the eave and the roof peak. Therefore it will become necessary to figure the average height using the point where they join the roof. In most cases dormers extend out as much as three or four feet.
This particular building also has two different roof heights. Buildings as large as this require great accuracy in measuring.

Figure 9



Every possible contingency cannot be covered in written instructions. For example, there will also be buildings with full basements and others having an interior ground level considerably lower than the exterior grade, which increases the average height, thereby increasing the amount of space to be fumigated.

Both overestimating and underestimating are economically dangerous. One results in a waste of Vikane® gas fumigant and the other creates the risk of fumigation failure. If the fumigator takes the estimators measurements and undershoots a job, his readings on the Fumiscope will be misleading, and considerable time can be lost trying to determine what is wrong. Since dosages of **Vikane® gas fumigant** are determined using the **Fumiguide®** "**B**", by the "Half Loss Time" system, wrong measurements can yield erroneous "Half Loss Times" resulting in an ineffectual (sublethal) dosage. Although at first glance the difference in "Half Loss Time" appears slight when comparing two measurements of only a few thousand cubic feet difference, when you are working with high "Half Loss Times" and low dosages, the reduced dosage caused by this difference can result in a failure. The same holds true with other fumigants as well.

Much time and money has gone into establishing correct dosages of all pesticides. This information is placed on the label for the benefit of the user, and it is important that the instructions be adhered to strictly. Experience has shown that if all the factors that influence a fumigation are plugged into the instrumentation system as accurately as possible, the fumigation will be successful. Since precision in measurement is a factor that can be controlled, it is very important to make thorough and accurate measurements in estimating a fumigation.

Appendix

MEASURING A CIRCULAR BUILDING

Measuring a circular building is really only slightly more complicated than measuring a rectangular or square one. First you will need to determine whether you're dealing with a dome or a cylinder, since the ways of measuring them are different.

Figure 10, for instance, contains both a dome and a cylinder. (From point A to point B, the building is a cylinder. From point B to point C, the building is a dome.) These two parts of the building will have to be measured separately and the results added together.

CYLINDRICAL STRUCTURES

To measure the cylindrical portion of the building (point A to point B), use the following steps:

1. Determine the diameter of the circle formed by the cylinder. In figure 10, this diameter is 20 feet.
2. Multiply the diameter by itself. For figure 10, this would be 20 feet x 20 feet = 400 square feet.
3. Determine the height of the cylinder. For figure 10, the height is 40 feet.
4. Multiply the height by the figure you got in step 2. For figure 10, this would be 40 feet x 400 square feet = 16,000 cubic feet.
5. Multiply the number you got in step four by .785. For figure 10, this would be 16,000 cubic feet x .785 = 12,560 cubic feet. This is the volume of the cylindrical portion of the building.

DOMES

Next you will need to determine the area of the dome (point B to point C). This may be done as shown in the following steps.

1. Determine the diameter of the dome at its base. In figure 10, since we already determined the diameter of the cylinder (and we can see that the dome has the same diameter), we know that the diameter is 20 feet.
2. Multiply the diameter by itself. For figure 10, this would be 20 feet x 20 feet = 400 square feet.
3. Multiply the number you got in step 2 by the diameter again. For figure 10, this would be 20 feet x 400 square feet = 8000 cubic feet.
4. Multiply the number you got in step three by 3.14. For figure 10, this would be 8,000 cubic feet x 3.14 = 25,120 cubic feet.
5. Divide the number you got in step four by 12. For figure 10, this would be 25,120 cubic feet divided by 12 = 2,093 cubic feet.

The number you got in step 5 should be the volume of the dome you measured. This simple method should work for all domes of half a sphere or less. (Domes of more than half a sphere are unlikely to be encountered.)

So, to determine the volume of the building represented in figure 10, add the volume of the cylindrical portion (12,560 cubic feet) to the volume of the dome (2,093 cubic feet). For figure 10, the total volume of the building would be 14,653 cubic feet.

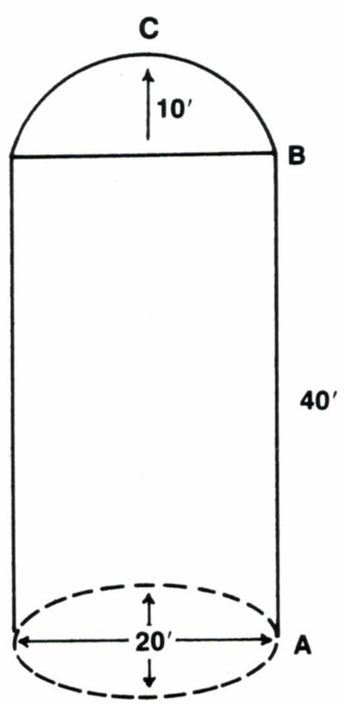


Figure 10

Quick Reference Charts
For Estimating Circular Building Volume

Diameter \ Height	5	8	10	12	14	16	18	20	22	24	26	28	30	35	40	45
5	98.1	157.0	196.2	235.5	274.7	314.0	353.2	392.5	431.7	471.0	510.2	549.5	588.7	686.8	785.0	88
8	251.2	401.9	502.4	602.8	703.3	803.8	904.3	1004.8	1105.2	1205.7	1306.2	1406.7	1507.2	1758.4	2009.6	226
10	392.5	628.0	785.0	942.0	1099.0	1256.0	1413.0	1570.0	1727.0	1884.0	2041.0	2198.0	2355.0	2747.5	3140.0	35
12	565.2	904.3	1130.4	1356.4	1582.5	1808.6	2034.7	2260.8	2486.8	2712.9	2939.0	3165.1	3391.2	3956.4	4521.6	50
14	769.3	1230.8	1538.6	1846.3	2154.0	2461.7	2769.4	3077.2	3384.9	3692.6	4000.3	4308.0	4615.8	5385.1	6154.4	69
16	1004.8	1607.6	2009.6	2411.5	2813.4	3215.3	3617.2	4019.2	4421.1	4823.0	5224.9	5626.8	6028.8	7033.6	8038.4	90
18	1271.7	2034.7	2543.4	3052.0	3560.7	4069.4	4578.1	5086.8	5595.4	6104.1	6612.8	7121.5	7630.2	8901.9	10173.6	114
20	1570.0	2512.0	3140.0	3768.0	4396.0	5024.0	5652.0	6280.0	6908.0	7536.0	8164.0	8792.0	9420.0	10990.0	12560.0	141
22	1899.7	3039.5	3799.4	4559.2	5319.1	6079.0	6838.9	7598.8	8358.6	9118.5	9878.4	10638.3	11398.2	13297.9	15197.6	170
24	2260.8	3617.2	4521.6	5425.9	6330.2	7234.5	8138.8	9043.2	9947.5	10851.8	11756.1	12660.4	13564.8	15825.6	18086.4	203
26	2653.3	4245.2	5306.6	6367.9	7429.2	8490.5	9551.8	10613.2	11674.5	12735.8	13797.1	14858.4	15919.8	18573.1	21226.4	238
28	3077.2	4923.5	6154.4	7385.2	8616.1	9847.0	11077.9	12308.8	13539.6	14770.5	16001.4	17232.3	18463.2	21540.4	24617.6	276
30	3532.5	5652.0	7065.0	8478.0	9891.0	11304.0	12717.0	14130.0	15543.0	16956.0	18369.0	19782.0	21195.0	24727.5	28260.0	317
35	4808.1	7693.0	9616.2	11539.5	13462.7	15386.0	17309.2	19232.5	21155.7	23079.0	25002.2	26925.5	28848.7	33656.8	38465.0	432
40	6280.0	10048.0	12560.0	15072.0	17584.0	20096.0	22608.0	25120.0	27632.0	30144.0	32656.0	35168.0	37680.0	43960.0	50240.0	565
45	7948.1	12717.0	15896.2	19075.5	22254.7	25434.0	28613.2	31792.5	34971.7	38151.0	41330.2	44509.5	47688.7	55636.8	62585.0	715
50	9812.5	15700.0	19625.0	23550.0	27475.0	31400.0	35325.0	39250.0	43175.0	47100.0	51025.0	54950.0	58875.0	68687.5	78500.0	883
55	11873.1	18997.0	23746.2	28495.5	33244.7	37994.0	42743.2	47492.5	52241.7	56991.0	61740.2	66489.5	71238.7	83111.8	94985.0	1068
60	14130.0	22608.0	28260.0	33912.0	39564.0	45216.0	50868.0	56520.0	62172.0	67824.0	73476.0	79128.0	84780.0	98910.0	113040.0	1271

50	55	60	65
981.2	1079.3	1177.5	1275.6
512.0	2763.2	3014.4	3265.6
925.0	4317.5	4710.0	5102.5
652.0	6217.2	6782.4	7347.6
693.0	8462.3	9231.6	10000.9
048.0	11052.8	12057.6	13062.4
717.0	13988.7	15260.4	16532.1
700.0	17270.0	18840.0	20410.0
997.0	20896.7	22796.4	24696.1
608.0	24868.8	27129.6	29390.4
533.0	29186.3	31839.6	34492.9
772.0	33849.2	36926.4	40003.6
525.0	38857.5	42390.0	45922.5
081.2	52889.3	57697.5	62505.6
800.0	69080.0	75360.0	81640.0
481.2	87429.3	95377.5	103325.6
125.0	107937.5	117750.0	127562.5
731.2	130604.3	142477.5	154350.6
300.0	155430.0	169560.0	183690.0

DIAMETER	VOLUME OF DOME
5.	32.7
8.	133.9
10.	261.6
12.	452.1
14.	718.0
16.	1071.7
18.	1526.0
20.	2093.3
22.	2786.2
24.	3617.2
26.	4599.0
28.	5744.1
30.	7064.9
35.	11218.9
40.	16746.6
45.	23844.3
50.	32708.3
55.	43534.7
60.	56519.9

Vikane is a federally Restricted Use Pesticide.
Always read and follow label directions.
These materials have been created specifically for Vikane® gas fumigant and no other structural fumigant. The information contained in these materials is based upon the product label and use instructions for Vikane and are not intended for use with other structural fumigants, which will have different product label requirements.

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U01-069-076
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010-70088
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