



DEPT. OF ENVIRONMENT AND ENERGY

This guidance document is advisory in nature but is binding on an agency until amended by such agency. A guidance document does not include internal procedural documents that only affect the internal operations of the agency and does not impose additional requirements or penalties on regulated parties or include confidential information or rules and regulations made in accordance with the Administrative Procedure Act. If you believe that this guidance document imposes additional requirements or penalties on regulated parties, you may request a review of the document.

17-023

9/13/2023

Gravelless Chambers:
Determination of Inside Bottom Width, Calculation of Effective Width,
and Calculation of Soil Absorption Area

This guidance is to clarify the NDEE’s accepted method for determining the “inside bottom width” of gravelless chambers, calculating the “effective width” of various makes and models of chambers, and calculating the soil absorption area based on the effective width.

1. The determination of inside bottom width and effective width for gravelless chambers is used when filter material (crushed rock, gravel, tire chips, etc.) **IS NOT USED** for backfill around the chambers, and the chambers are backfilled with the native soil material from the trench area. See Title 124, Chapter 14, Section 018.02B.
2. When filter material **IS NOT USED** in the trench, the “effective width” of the chambers is equal to the actual “inside bottom width” of the chambers multiplied by 1.5.
3. Calculation of the soil absorption area is then determined by multiplying the “effective width” of the trench by the total length of all trenches. For example:

Inside Bottom Width of Chamber	Multiply By 1.5	Effective Width of Chamber	Number Of Trenches	Length Of Each Trench	Total Trench Length	Soil Absorption Area
29 inches or (2.416 feet)	X 1.5 =	43.5 inches or (3.625 feet)	3	60 feet	(3 x 60) 180 feet	3.625 x 180 = <u>652.5 square feet</u>

4. The soil absorption area calculated above must be at least as large as the required soil absorption area, as determined in General Permit GTS220000 Septic Septic Tank and Subsurface Leach Field, Section K.19. The required soil absorption area is based on the design flow (gallons per day) and the soil percolation rate (minutes per inch).
5. When filter material is used in the trench backfill, the actual trench width is used to calculate the soil absorption area. See General Permit GTS220000 Septic Septic Tank and Subsurface Leach Field, Section K.17.

In order to standardize gravelless chamber measurements and avoid confusion on field measurements, the NDEE Onsite Wastewater Unit has conferred with the manufacturer’s representatives on a list of standard gravelless chamber width dimensions. **These dimensions are to be used for the Inside Bottom Width of each make and model of chamber listed below.** For any chambers not listed, please contact the NDEE Onsite Wastewater Unit.

Gravelless Chamber Make / Model		Inside Bottom Width		Effective Width	
		<i>Inches</i>	<i>(Feet)</i>	<i>Inches</i>	<i>(Feet)</i>
Infiltrator	Quick4 Standard	27"	(2.25')	40.5"	(3.375')
	Quick4 High Capacity	29"	(2.42')	43.5"	(3.625')
	Quick4 Equalizer 36	19"	(1.58')	28.5"	(2.375')
	Quick4 Equalizer 24 HD	13"	(1.08')	19.5"	(1.625')
	Quick4 Equalizer 24 Low Profile	12"	(1.00')	18"	(1.50')
Infiltrator	Quick4 Plus (Std., HC, & LP)	29"	(2.42')	43.5"	(3.625')
	Quick4 Plus Equalizer 36 LP	19"	(1.58')	28.5"	(2.375')
Infiltrator	High Capacity H-20	29"	(2.42')	43.5"	(3.625')
ADS	Arc 18	13"	(1.08')	19.5"	(1.625')
	Arc 24	19"	(1.58')	28.5"	(2.375')
	Arc 36 (Std., HC & LP)	29"	(2.42')	43.5"	(3.625')
	BioDiffuser 11" Standard	27"	(2.25')	40.5"	(3.375')
	BioDiffuser 14" HC & 16" HC	29"	(2.42')	43.5"	(3.625')
	Bio 2	12"	(1.00')	18"	(1.50')
	Bio 3	19"	(1.58')	28.5"	(2.375')
Infiltrator	Bundled Expanded Polystyrene EZ Flow	36"	(3')	54'	(4.5)
Prinsco	Pro4/36	30"	(2.5')	45"	(3.75')

If the inside bottom width of the chambers is 29 inches X 1.5 (credit for using chambers without filter material) = 43.5 inches, divide by 12 to get feet = 3.625 feet. 100 (total trench length installed) X 3.625 = 362.5 total effective trench bottom area.