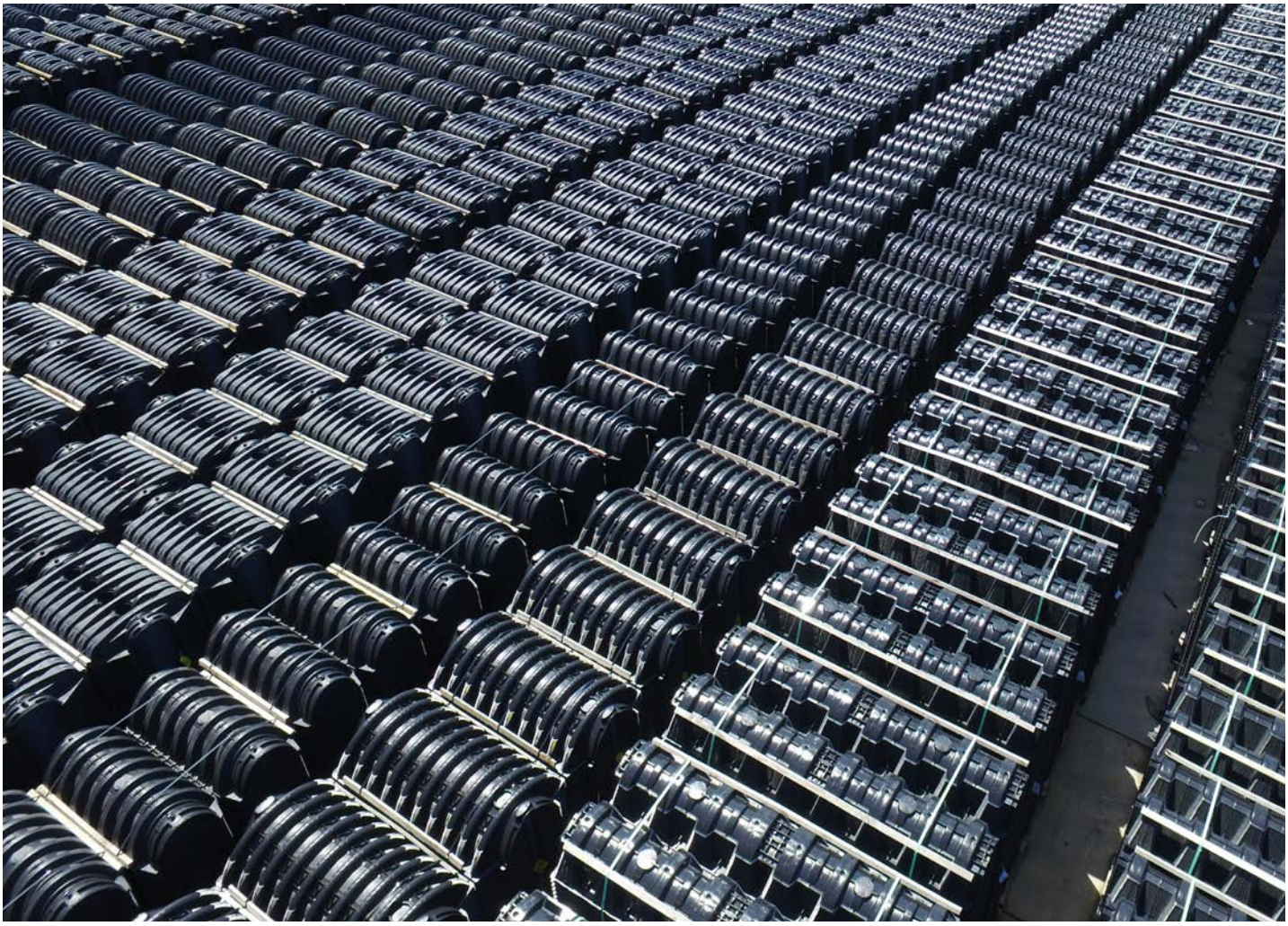
APRIL 2020

Design and Installation Manual for **Quick4 Plus Chambers**

Georgia



The purpose of this product manual is to provide specific design and installation information pertinent for the use of Infiltrator products. **For more detailed design information, please contact Infiltrator Water Technologies at (800) 221-4436.**

Table of Contents

Introduction 2

Products 4

System Sizing 6

Chamber Configurations..... 11

Installation Instructions 20

Appendices 23

Warranty 24

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QUICK4 PLUS CHAMBERS

The Quick4 Plus High Capacity, Quick4 Plus Standard, and the Quick4 Plus Standard Low Profile (LP) chambers fit into a 36-inch-wide trench. The Quick4 Plus EQ36 Low Profile (LP) chambers fit into a 24-inch-wide trench. The Quick4 Plus Standard LP and Quick4 Plus EQ36 LP chambers are 4 to 6 inches shorter than other chamber models, allowing for shallower installation. The Quick4 Plus All-in-One 12 Endcap is available with the Quick4 Plus High Capacity and Quick4 Plus Standard chambers.

The Quick4 Plus All-in-One 8 Endcap is available with the Quick4 Plus Standard LP chamber, providing increased flexibility in system configurations. Both the All-in-One 8 and All-in-One 12 endcaps are available with the Quick4 Plus All-in-One Periscope which allows for 180° top inletting.

Quick4 Plus High Capacity nominal chamber specifications

Size	34”W x 48”L x 14”H
Invert Elevation	8”
Chamber Rating	4.62 ft^2/lf

QUICK4 PLUS HIGH CAPACITY



Quick4 Plus Standard nominal chamber specifications

Size	34”W x 48”L x 12”H
Invert Elevation	8”
Chamber Rating	4.0 ft^2/lf

QUICK4 PLUS STANDARD



Quick4 Plus Standard LP nominal chamber specifications

Size	34”W x 48”L x 8”H
Invert Elevation	3.3” or 9”
Chamber Rating	3.0 ft^2/lf

QUICK4 PLUS STANDARD LP



Quick4 One Equalizer 36 nominal chamber specifications

Size	22”W x 48”L x 12”H
Invert Elevation	6”
Chamber Rating	3.0 ft^2/lf

QUICK4 ONE EQUALIZER 36



Quick4 Equalizer 36 nominal chamber specifications

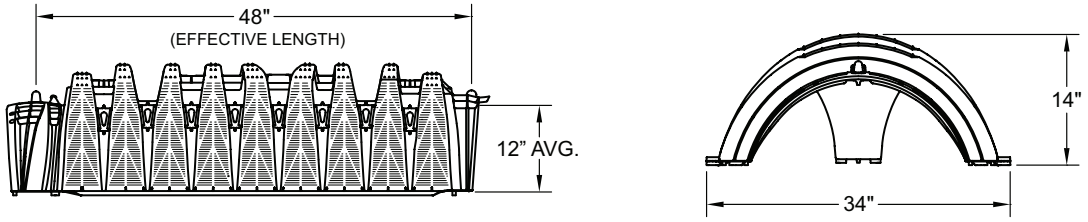
Size	22”W x 48”L x 12”H
Invert Elevation	6”
Chamber Rating	3.0 ft^2/lf

QUICK4 EQUALIZER 36



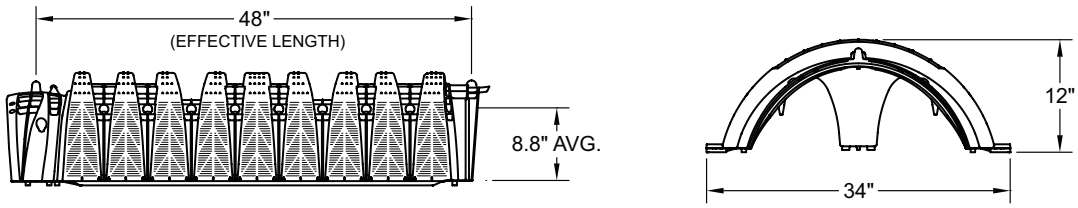
Quick4 Plus High Capacity Chamber

SIDE AND END VIEWS
(Not to scale)



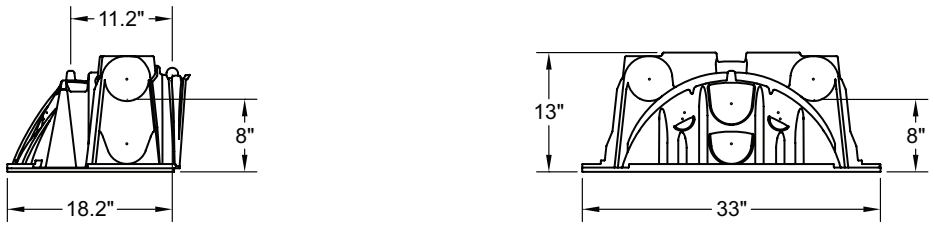
Quick4 Plus Standard Chamber

SIDE AND END VIEWS
(Not to scale)



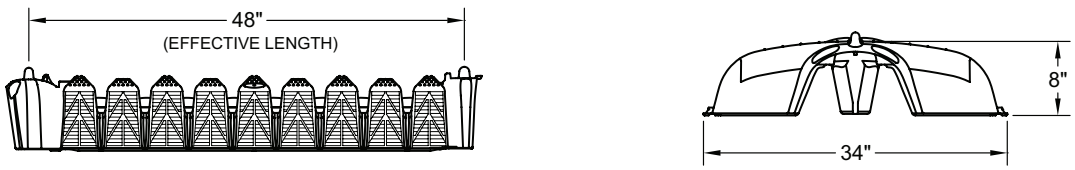
Quick4 Plus All-in-One 12 Endcap

SIDE AND END VIEWS
(Not to scale)



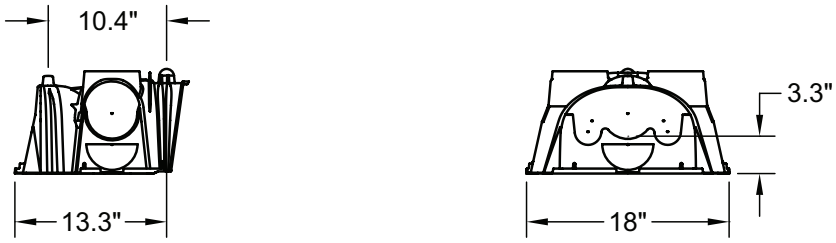
Quick4 Plus Standard Low Profile (LP) Chamber

SIDE AND END VIEWS
(Not to scale)

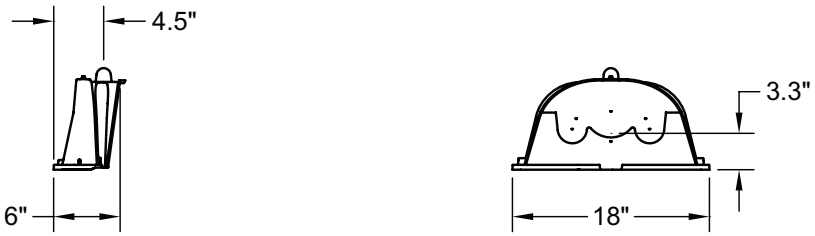


Quick4 Plus All-in-One 8 Endcap and Quick4 Plus 8 Endcap

QUICK4 PLUS ALL-IN-ONE 8 ENDCAP SIDE AND END VIEWS
(Not to scale)



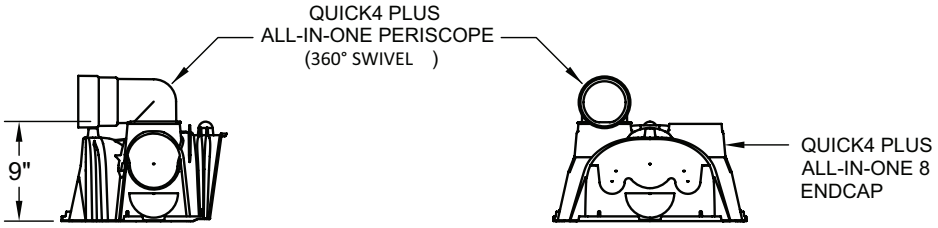
QUICK4 PLUS 8 ENDCAP SIDE AND END VIEWS
(Not to scale)



Quick4 Plus All-in-One 8 Endcap with Quick4 Plus All-in-One Periscope

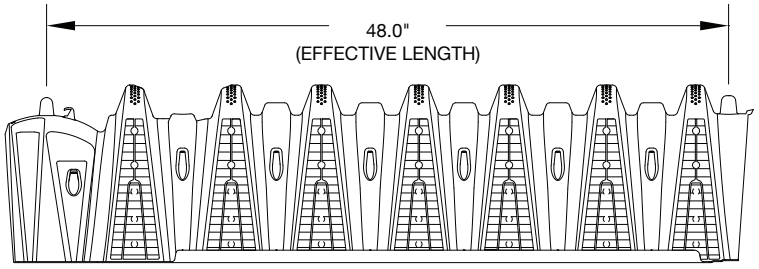
SIDE AND END VIEWS
(Not to scale)

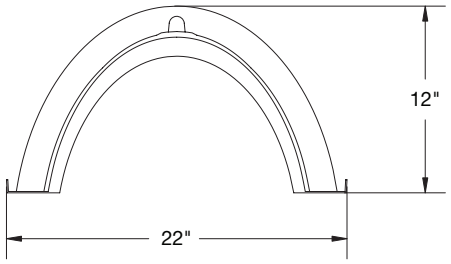
USE THE PERISCOPE WITH THE ALL-IN-ONE 8 ENDCAP FOR A 9-INCH INVERT WITH THE QUICK 4 PLUS STANDARD LOW PROFILE CHAMBER



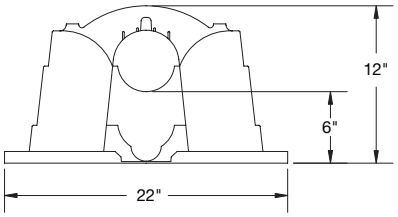
Quick4 One Equalizer 36 Chamber

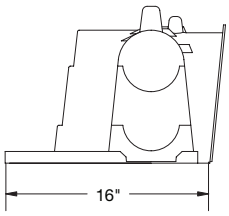
SIDE AND END VIEWS
(Not to scale)





MULTIPORT ENDCAP
(not to scale)

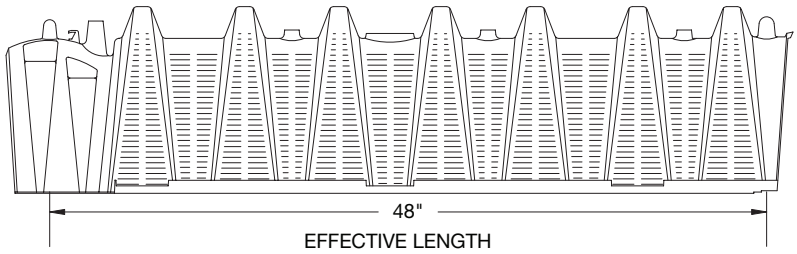


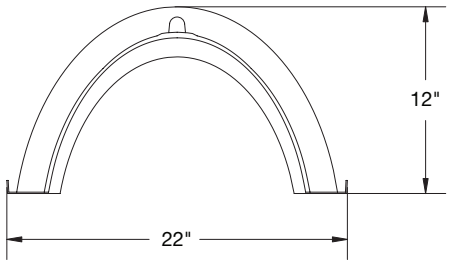


SIDE VIEW

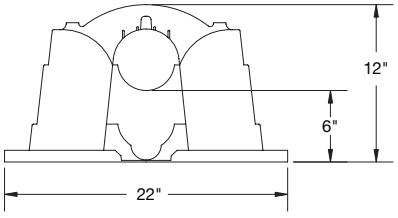
Quick4 Equalizer 36 Chamber

SIDE AND END VIEWS
(Not to scale)

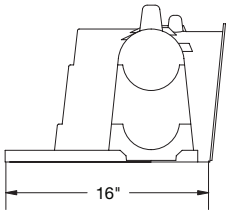




MULTIPORT ENDCAP
(not to scale)



FRONT VIEW



SIDE VIEW

SYSTEM SIZING

Soil Analysis

Georgia regulations require that a system's design be based on soil information. The following soil properties should be noted:

- Texture
- Color
- Rooting depth
- Seasonal high water tables
- Structure
- Mottling
- Restrictive layers

System Size Determination

Once the percolation rate and anticipated daily flow are determined, the health official or design engineer will design a system based on calculations from the Manual for Onsite Sewage Management Systems. The appropriate equivalency factor for Quick4 Plus High Capacity or Quick4 Plus Standard chambers is then applied. **TABLES 1 THROUGH 4** show the number of Quick4 chambers needed for residential applications. Commercial sizing must also consider waste strength into the sizing determination.

TABLE 1: NUMBER OF QUICK4 PLUS HIGH CAPACITY CHAMBERS REQUIRED AT 0.65 EQUIVALENCY FACTOR[1]

Perc Rate (min/in)	Absorption Area per Bedroom (sf)	Number of Bedrooms							
		3		4		5		Each Additional	
		Trench Length (ft)	Chambers Required	Trench Length (ft)	Chambers Required	Trench Length (ft)	Chambers Required	Trench Length (ft)	Chambers Required
10	165	107.25	27	143.00	36	178.75	45	35.75	9
15	190	123.50	31	164.67	42	205.83	52	41.17	11
20	210	136.50	35	182.00	46	227.50	57	45.50	12
25	230	149.50	38	199.33	50	249.17	63	49.83	13
30	250	162.50	41	216.67	55	270.83	68	54.17	14
35	265	172.25	44	229.67	58	287.08	72	57.42	15
40	280	182.00	46	242.67	61	303.33	76	60.67	16
45	300	195.00	49	260.00	65	325.00	82	65.00	17
50	310	201.50	51	268.67	68	335.83	84	67.17	17
55	325	211.25	53	281.67	71	352.08	89	70.42	18
60	335	217.75	55	290.33	73	362.92	91	72.58	19
65	345	224.25	57	299.00	75	373.75	94	74.75	19
70	355	230.75	58	307.67	77	384.58	97	76.92	20
75	365	237.25	60	316.33	80	395.42	99	79.08	20
80	370	240.50	61	320.67	81	400.83	101	80.17	21
85	375	243.75	61	325.00	82	406.25	102	81.25	21
90	380	247.00	62	329.33	83	411.67	103	82.33	21
95	385	250.25	63	333.67	84	417.08	105	83.42	21
100	390	253.50	64	338.00	85	422.50	106	84.50	22
105	395	256.75	65	342.33	86	427.92	107	85.58	22
110	400	260.00	65	346.67	87	433.33	109	86.67	22
115	405	263.25	66	351.00	88	438.75	110	87.75	22
120	410	266.50	67	355.33	89	444.17	112	88.83	23

Note:

1. A 0.65 equivalency factor provides a 35% trench length reduction compared to a conventional 36-inch-wide gravel trench.

SYSTEM SIZING

TABLE 2: NUMBER OF QUICK4 PLUS STANDARD CHAMBERS REQUIRED AT 0.75 EQUIVALENCY FACTOR[1]

Perc Rate (min/in)	Absorption Area per Bedroom (sf)	Number of Bedrooms							
		3		4		5		Each Additional	
		Trench Length (ft)	Chambers Required	Trench Length (ft)	Chambers Required	Trench Length (ft)	Chambers Required	Trench Length (ft)	Chambers Required
10	165	123.75	31	165.00	42	206.25	52	41.25	11
15	190	142.50	36	190.00	48	237.50	60	47.50	12
20	210	157.50	40	210.00	53	262.50	66	52.50	14
25	230	172.50	44	230.00	58	287.50	72	57.50	15
30	250	187.50	47	250.00	63	312.50	79	62.50	16
35	265	198.75	50	265.00	67	331.25	83	66.25	17
40	280	210.00	53	280.00	70	350.00	88	70.00	18
45	300	225.00	57	300.00	75	375.00	94	75.00	19
50	310	232.50	59	310.00	78	387.50	97	77.50	20
55	325	243.75	61	325.00	82	406.25	102	81.25	21
60	335	251.25	63	335.00	84	418.75	105	83.75	21
65	345	258.75	65	345.00	87	431.25	108	86.25	22
70	355	266.25	67	355.00	89	443.75	111	88.75	2
75	365	273.75	69	365.00	92	456.25	115	91.25	23
80	370	277.50	70	370.00	93	462.50	116	92.50	24
85	375	281.25	71	375.00	94	468.75	118	93.75	24
90	380	285.00	72	380.00	95	475.00	119	95.00	24
95	385	288.75	73	385.00	97	481.25	121	96.25	25
100	390	292.50	74	390.00	98	487.50	122	97.50	25
105	395	296.25	75	395.00	99	493.75	124	98.75	25
110	400	300.00	75	400.00	100	500.00	125	100.00	25
115	405	303.75	76	405.00	102	506.25	127	101.25	26
120	410	307.50	77	410.00	103	512.50	129	102.50	26

Note:

1. A 0.75 equivalency factor provides a 25% trench length reduction compared to a conventional 36-inch-wide gravel trench.

TABLE 3: NUMBER OF QUICK4 PLUS STANDARD LP CHAMBERS REQUIRED AT 1.0 EQUIVALENCY FACTOR[1]

Perc Rate (min/in)	Absorption Area per Bedroom (sf)	Number of Bedrooms							
		3		4		5		Each Additional	
		Trench Length (ft)	Chambers Required	Trench Length (ft)	Chambers Required	Trench Length (ft)	Chambers Required	Trench Length (ft)	Chambers Required
10	165	165.00	42	220.00	55	275.00	69	55.00	14
15	190	190.00	48	253.33	64	316.67	80	63.33	16
20	210	210.00	53	280.00	70	350.00	88	70.00	18
25	230	230.00	58	306.67	77	383.33	96	76.67	20
30	250	250.00	63	333.33	84	416.67	105	83.33	21
35	265	265.00	67	353.33	89	441.67	111	88.33	23
40	280	280.00	70	373.33	94	466.67	117	93.33	24
45	300	300.00	75	400.00	100	500.00	125	100.00	25
50	310	310.00	78	413.33	104	516.67	130	103.33	26
55	325	325.00	82	433.33	109	541.67	136	108.33	28
60	335	335.00	84	446.67	112	558.33	140	111.67	28
65	345	345.00	87	460.00	115	575.00	144	115.00	29
70	355	355.00	89	473.33	119	591.67	148	118.33	30
75	365	365.00	92	486.67	122	608.33	153	121.67	31
80	370	370.00	93	493.33	124	616.67	155	123.33	31
85	375	375.00	94	500.00	125	625.00	157	125.00	32
90	380	380.00	95	506.67	127	633.33	159	126.67	32
95	385	385.00	97	513.33	129	641.67	161	128.33	33
100	390	390.00	98	520.00	130	650.00	163	130.00	33
105	395	395.00	99	526.67	132	658.33	165	131.67	33
110	400	400.00	100	533.33	134	666.67	167	133.33	34
115	405	405.00	102	540.00	135	675.00	169	135.00	34
120	410	410.00	103	546.67	137	683.33	171	136.67	35

Note:

1. A 1.0 equivalency factor provides 1:1 sizing compared to a conventional 36-inch-wide gravel trench.

TABLE 4: NUMBER OF QUICK4 ONE EQUALIZER 36 OR QUICK4 EQUALIZER 36 CHAMBERS REQUIRED AT 1.0 EQUIVALENCY FACTOR

Perc Rate (min/in)	Absorption Area per Bedroom (sf)	Number of Bedrooms							
		3		4		5		Each Additional	
		Trench Length (ft)	Chambers Required	Trench Length (ft)	Chambers Required	Trench Length (ft)	Chambers Required	Trench Length (ft)	Chambers Required
10	165	165.00	42	220.00	55	275.00	69	55.00	14
15	190	190.00	48	253.33	64	316.67	80	63.33	16
20	210	210.00	53	280.00	70	350.00	88	70.00	18
25	230	230.00	58	306.67	77	383.33	96	76.67	20
30	250	250.00	63	333.33	84	416.67	105	83.33	21
35	265	265.00	67	353.33	89	441.67	111	88.33	23
40	280	280.00	70	373.33	94	466.67	117	93.33	24
45	300	300.00	75	400.00	100	500.00	125	100.00	25
50	310	310.00	78	413.33	104	516.67	130	103.33	26
55	325	325.00	82	433.33	109	541.67	136	108.33	28
60	335	335.00	84	446.67	112	558.33	140	111.67	28
65	345	345.00	87	460.00	115	575.00	144	115.00	29
70	355	355.00	89	473.33	119	591.67	148	118.33	30
75	365	365.00	92	486.67	122	608.33	153	121.67	31
80	370	370.00	93	493.33	124	616.67	155	123.33	31
85	375	375.00	94	500.00	125	625.00	157	125.00	32
90	380	380.00	95	506.67	127	633.33	159	126.67	32
95	385	385.00	97	513.33	129	641.67	161	128.33	33
100	390	390.00	98	520.00	130	650.00	163	130.00	33
105	395	395.00	99	526.67	132	658.33	165	131.67	33
110	400	400.00	100	533.33	134	666.67	167	133.33	34
115	405	405.00	102	540.00	135	675.00	169	135.00	34
120	410	410.00	103	546.67	137	683.33	171	136.67	35

Note:

1. A 1.0 equivalency factor provides 1:1 sizing compated to a conventional 36-inch-wide gravel trench.

SYSTEM LAYOUT

After the system is sized, then the system layout can be determined. This includes identifying the septic tank location, leachfield location, vertical alignment of all components, and the designation of a repair area.

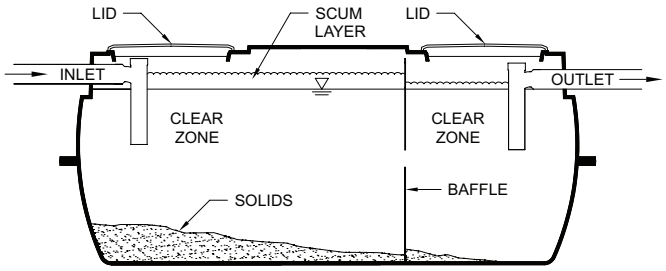
Location: System location is determined based upon the site evaluation. On undeveloped lots, the location of the system should take precedence over the location of the house, well, and driveway in order to ensure safe and effective siting.

Reserve Area: A reserve area location is also a necessary part of any complete system design. The State of Georgia requires that a minimum 100 percent reserve area be set aside in the event that the primary system requires replacement. Reserve areas are often located down slope of the main leachfield for easy connection to the existing septic tank. In many situations consideration should be given to installing a system in both the primary and the reserve area when the home is built. This advanced step would involve much less cost than later construction of a possible failed system replacement. Building the reserve area into the original plans would preserve and enhance the landscape and other property improvements would be kept intact. By alternating flow between the two leachfields and allowing one to rest, the system life should be extended considerably.

Septic Tank Design

Septic tanks must meet Georgia design criteria which includes compartmental tanks with inlet and outlet tees and an approved effluent filter **(see FIGURE 1)**.

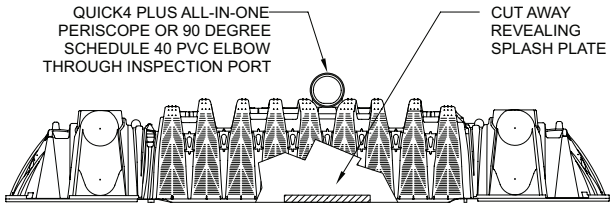
FIGURE 1: TYPICAL SEPTIC TANK CONFIGURATION



Pipe Connections

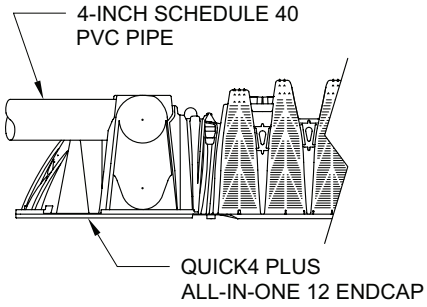
On sloping topography or in certain serial designs it is desirable to feed certain system configurations through the inspection port on top (see **FIGURE 2**).

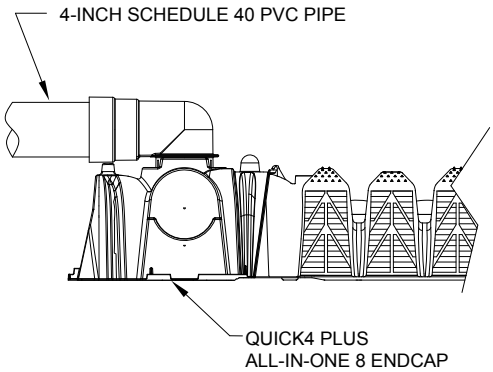
FIGURE 2: CONNECTION OF DISTRIBUTION PIPE INTO INSPECTION PORT THROUGH TOP OF CHAMBER



Connection of the distribution pipe to the chamber should be at the highest elevation possible on the Quick4 Plus endcap as shown below in **FIGURE 3**.

FIGURE 3: CONNECTION OF DISTRIBUTION PIPE TO CHAMBER





DISTRIBUTION METHODS

From the septic tank, the effluent is distributed throughout the leachfield. There are two ways of distributing the effluent which need to be considered when laying out the system; the distribution to the individual leachfield trenches or rows, and the distribution within each row. Equal, serial, pump up, siphon, and pressure distribution are the most prevalent means by which effluent is spread throughout the system.

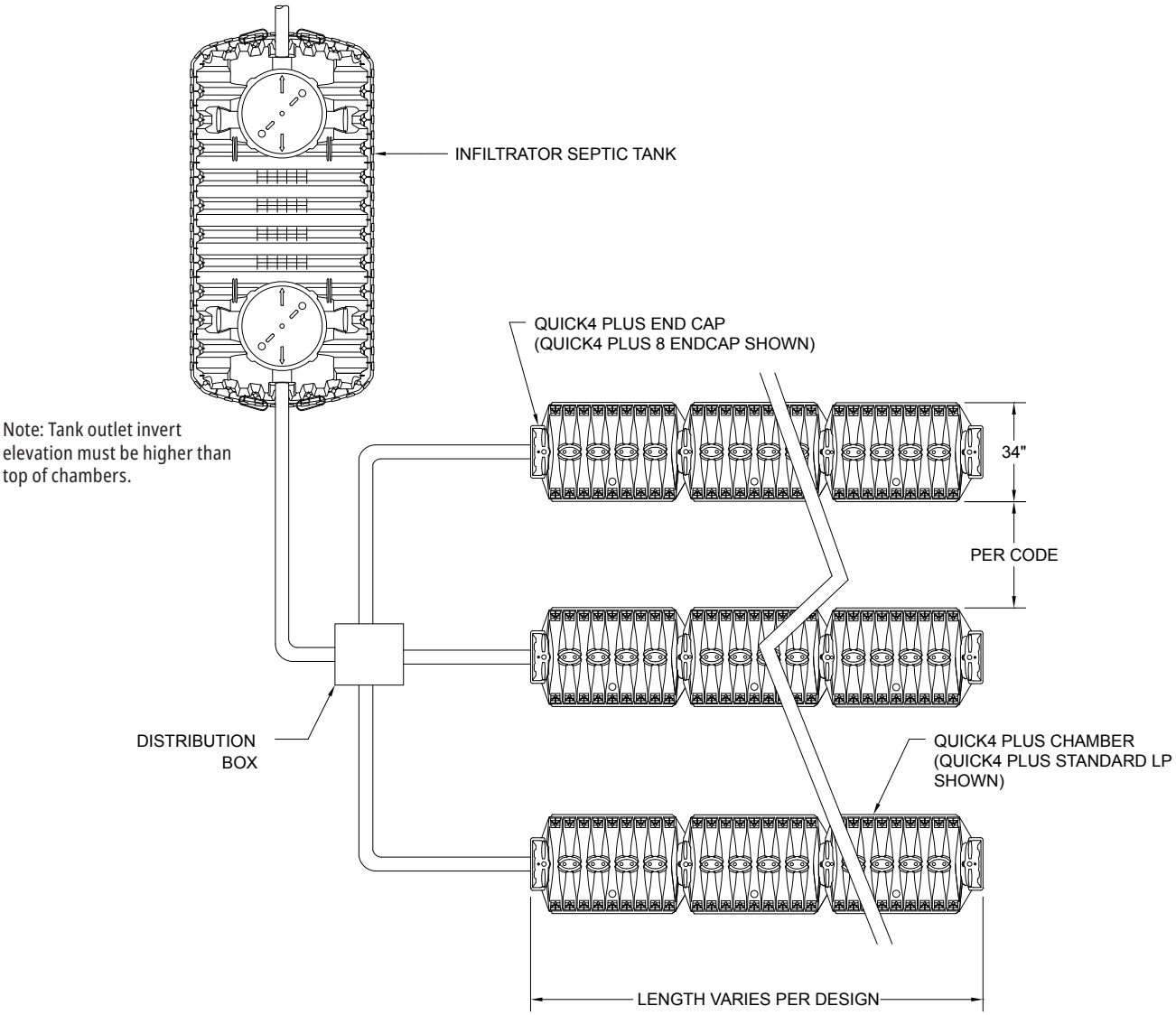
Equal Distribution

This method of distribution attempts to apply equal amounts of effluent to each trench in the system. It is best suited to flat or moderately sloping sites. By using either distribution boxes or header pipes, the wastewater is passed from the septic tank to the individual trenches, as shown below.

It is important to design equal distribution systems so that there is equal apportionment among trenches, minimizing vulnerability to effluent breakout.

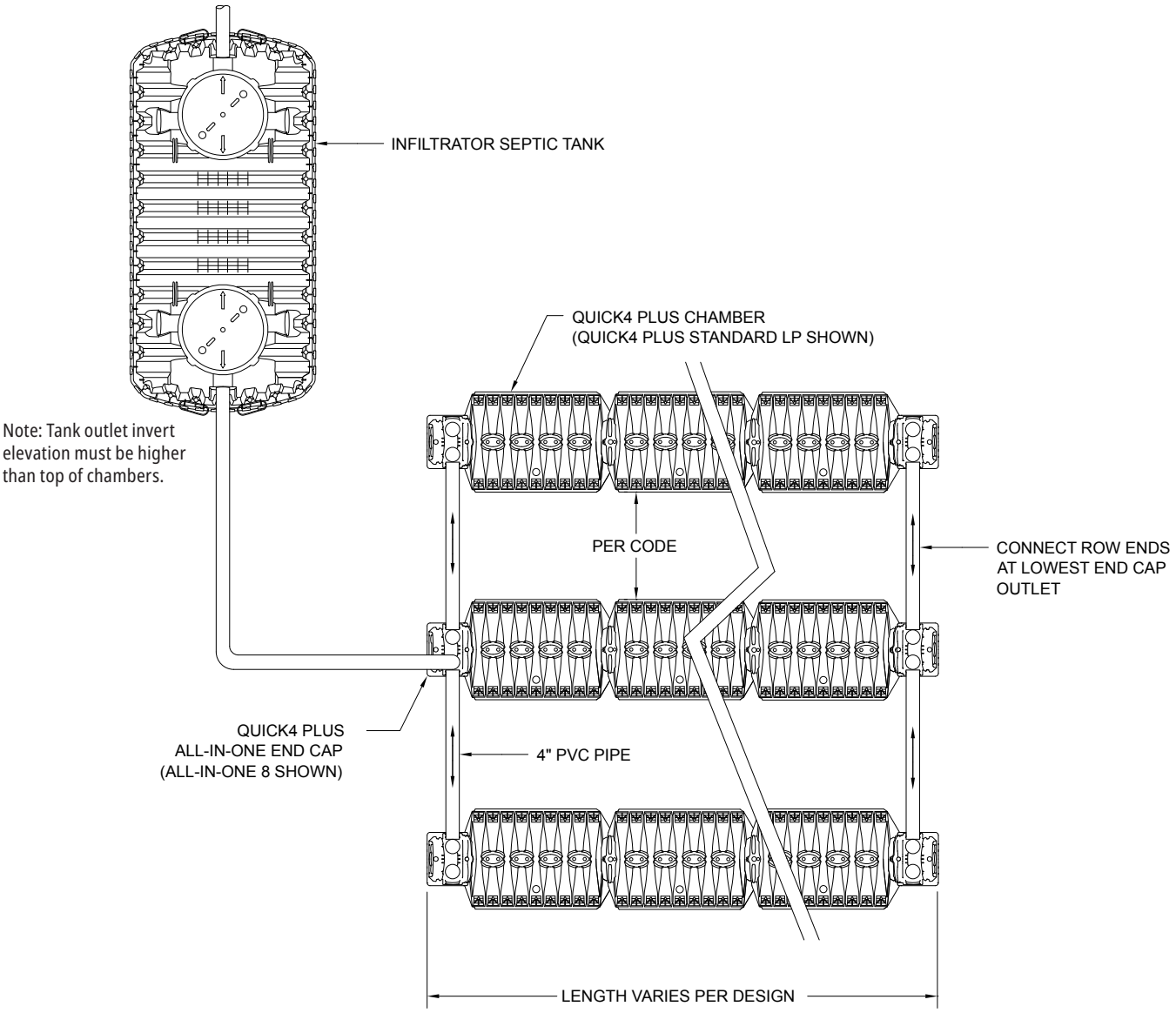
Also, when a distribution box is used, adjustable flow restrictors can be installed to compensate for movement of the box. This type of device is easy to install and must be properly adjusted and maintained.

DISTRIBUTION BOX SYSTEM
PLAN VIEW



DISTRIBUTION METHODS

LEVEL FIELD EQUAL DISTRIBUTION SYSTEM
PLAN VIEW



DISTRIBUTION METHODS

Serial Distribution

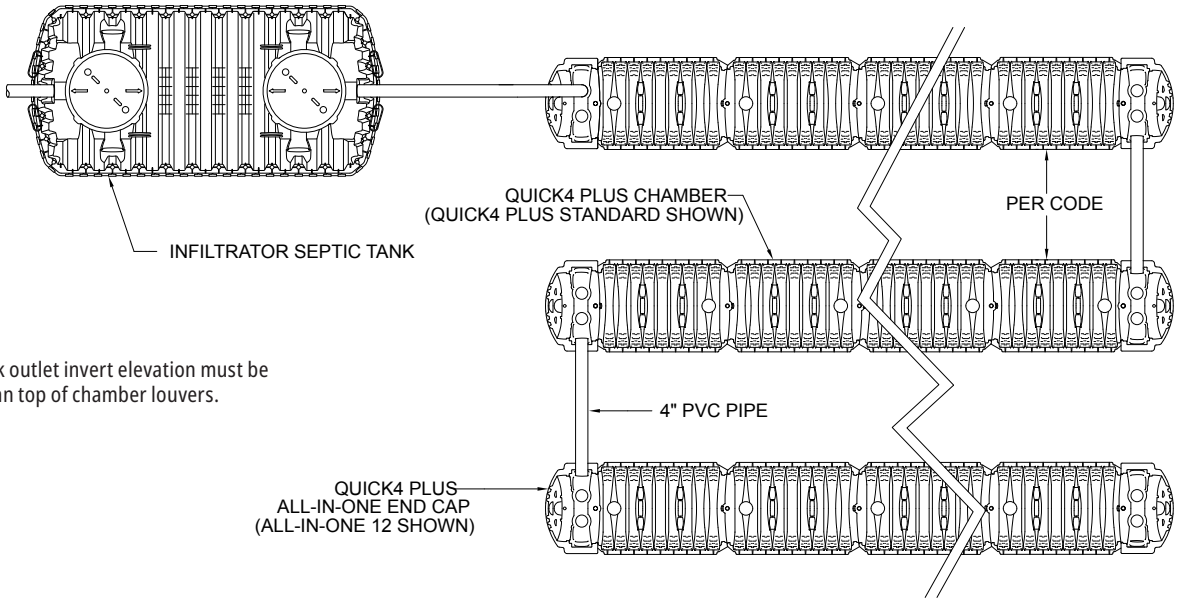
This distribution method feeds the trenches in series, rather than dividing the effluent flow equally among the rows. As the first trench develops a biomat sufficient to cause ponding, there is an overflow to the next trench. This continues from trench to trench. The effluent strength decreases in each successive trench and the Long-Term Acceptance Rate (LTAR) simultaneously increases. The further from the inlet point, the greater the soil's capacity to accept effluent. Serial distribution is adaptable to most sites, but is commonly used on sloping terrains where trenches are stepped down slope on contours.

There are three ways to design a serial distribution system: endcap , midline, or inspection port loading. In each of these, the effluent enters and fills the entire first trench before it spills over into the next one.

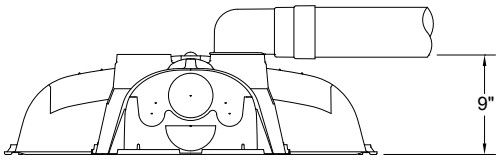
Endcap Serial Distribution

In the endcap design effluent may be fed into or out of the endcaps on each line to achieve distribution from the first line to the last. The effluent enters the first trench where it spreads and rises to the invert height before it flows into the second trench, and so on until the last chamber in the last trench.

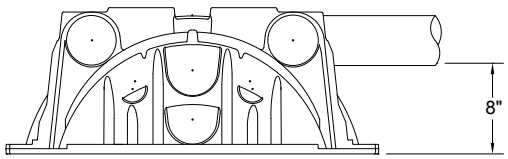
ENDCAP SERIAL DISTRIBUTION
PLAN VIEW



Note: Tank outlet invert elevation must be higher than top of chamber louvers.



QUICK4 PLUS ALL-IN-ONE 8 ENDCAP
WITH ALL-IN-ONE PERISCOPE
FOR QUICK4 PLUS STANDARD LP OR
QUICK4 PLUS EQUALIZER 36 LP CHAMBER



QUICK4 PLUS ALL-IN-ONE 12 ENDCAP
FOR QUICK4 PLUS STANDARD OR
QUICK4 PLUS HIGH CAPACITY CHAMBER

Notes:

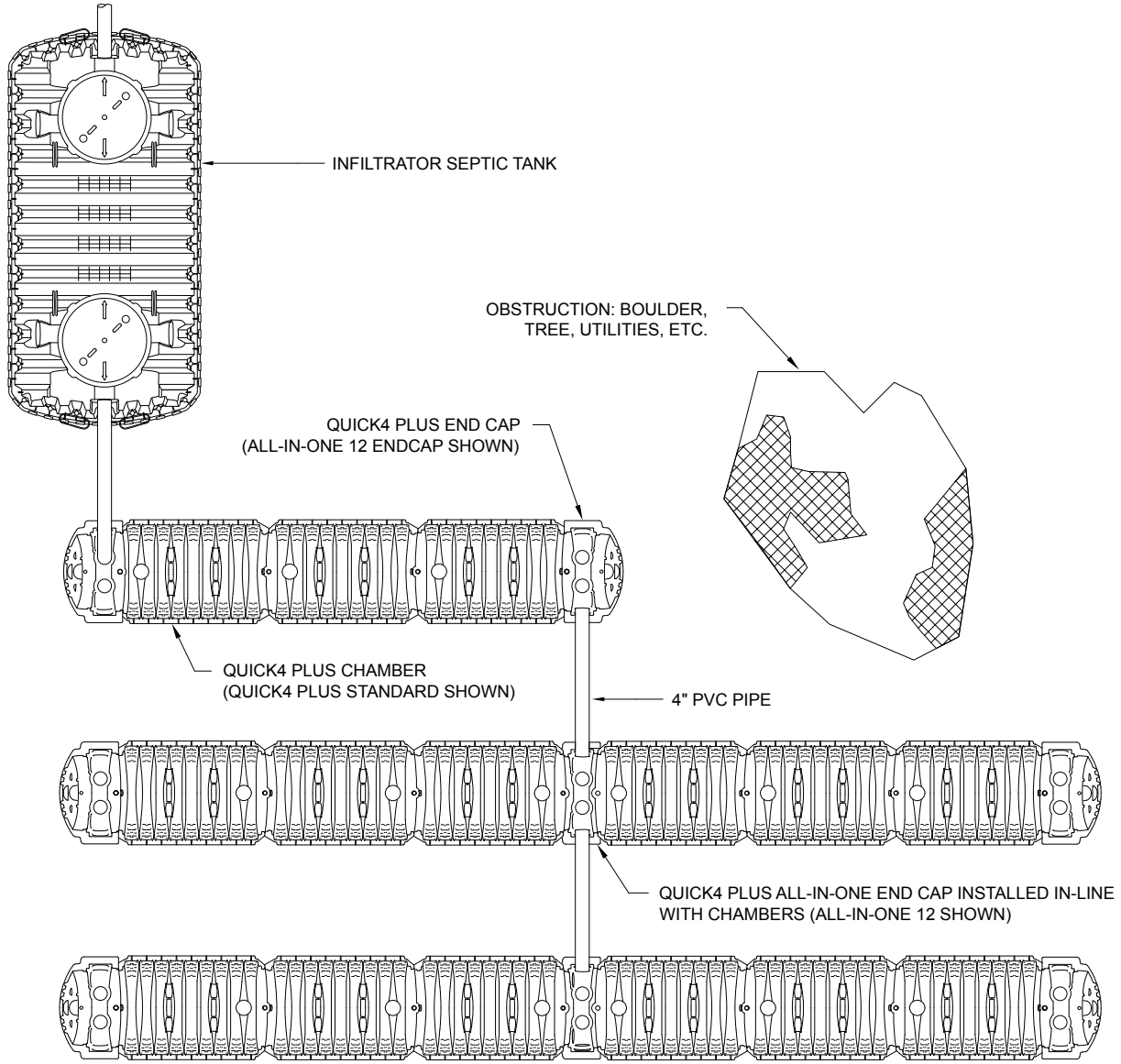
1. Quick4 Plus Standard LP and Quick4 Plus EQ36 LP chambers shall utilize the Quick4 Plus Periscope or a PVC 90-degree fitting with the Quick4 Plus All-in-One 8 Endcap to provide cross-overs with an elevation equal to the chamber height.
2. Quick4 Plus Standard and Quick4 Plus High Capacity chambers may utilize the highest side or end port on the Quick4 Plus All-in-One 12 Endcap to provide cross-overs with an elevation of at least 8 inches.

DISTRIBUTION METHODS

Midline Serial Distribution

In the midline design, effluent may be fed into the the Quick4 Plus All-in-One endcaps that are positioned midline within a chamber row to achieve distribution from the first trench row to the last. The Quick4 Plus All-in-One endcap must have a hole drilled on the end to allow for hydraulic connectivity within each chamber trench row as shown in the installation instructions. The effluent enters the first trench at the Quick4 Plus All-in-One endcap installed midline where it spreads and rises to the endcap outlet invert height before flowing to the second trench, and so on to the last chamber trench row. Using the Quick4 Plus All-in-One Periscope with the Quick4 Plus All-in-One 8 Endcap will achieve midline serial distribution for the Quick4 Plus standard LP chamber. Using the 8-inch side inverts of the Quick4 Plus All-in-One 12 Endcap will achieve midline serial distribution for the Quick4 Plus Standard and Quick4 Plus High Capacity chambers.

MIDLINE SERIAL DISTRIBUTION PLAN VIEW



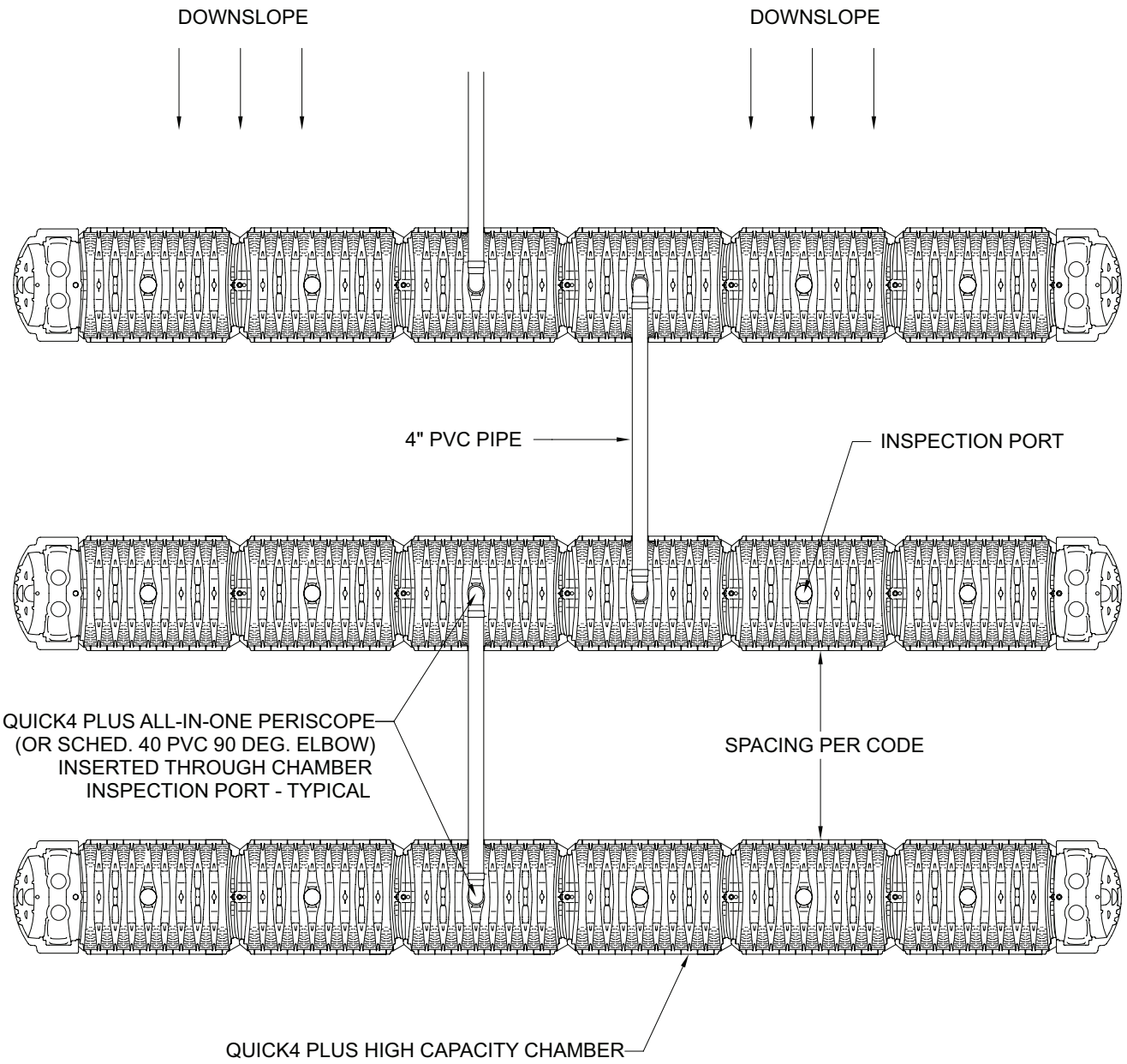
Note: Tank outlet invert elevation must be higher than top of chamber louvers.

DISTRIBUTION METHODS

Inspection Port Design

This ensures distribution to each trench by inletting the system through the inspection ports. The Infiltrator Quick4 Plus High Capacity chamber has a knockout hole or port located on the top of the unit. This knockout port may be removed and fit with the Quick4 Plus All-in-One Periscope or a PVC fitting so that a pipe can be connected between the rows for serial distribution. The effluent enters the first trench through the top of the chamber. A splash plate should be used under each inlet to protect the soil from erosion. The effluent has to completely fill this trench through the opening before it flows into the second trench. The designer should be careful to make sure that there is sufficient drop in elevation between trenches to allow for the gravity or head to properly drive the flow. In addition, special caution should be taken during the backfill process to make sure that the distribution pipe receives the proper bedding and cover. Chambers may also be used with other standard pipe connections commonly used for serial distribution.

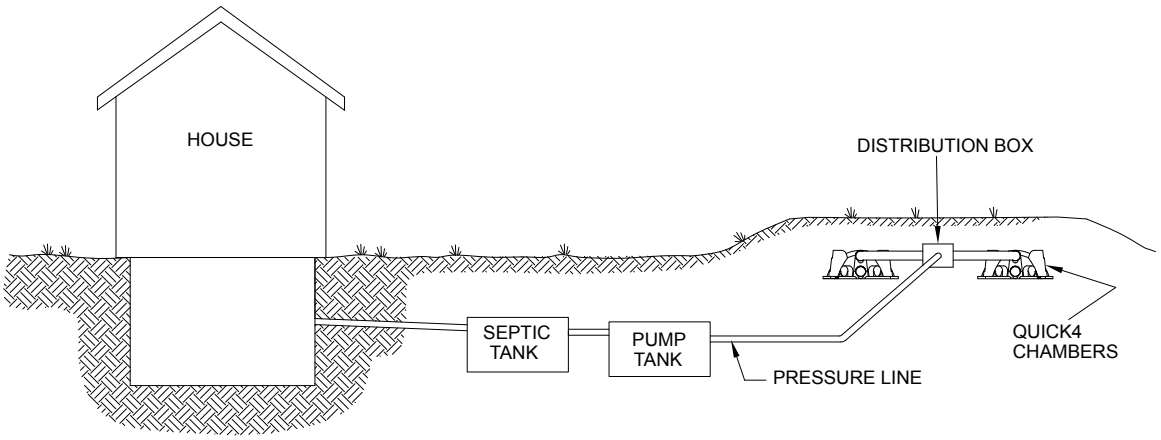
INSPECTION PORT SERIAL DISTRIBUTION PLAN VIEW

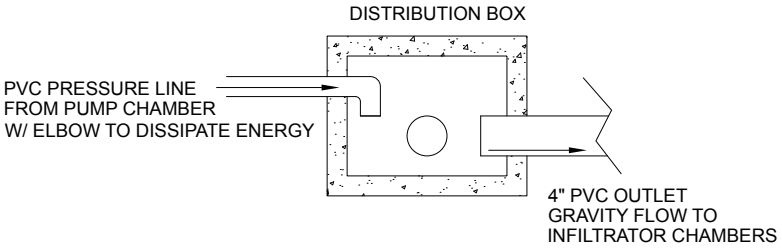


DISTRIBUTION METHODS

Pump Up Distribution

In a pump-up system, the effluent is pumped to a distribution box which receives a predetermined dosing volume of effluent. It is then gravity fed at a prescribed rate to the leaching area and is either equally or serially distributed to the rows or trenches within the leachfield. This design is commonly confused with a pressure-dosed system because the two share much of the same equipment. The main difference between the two lies in how the effluent is distributed within each trench. In a pressure-dosed system, the effluent is distributed throughout the trench with a pressurized pipe. In a pump-up system, the effluent is gravity fed as shown below. Infiltrator Water Technologies recommends dosing one gallon per linear foot of chambers.





Siphon Distribution

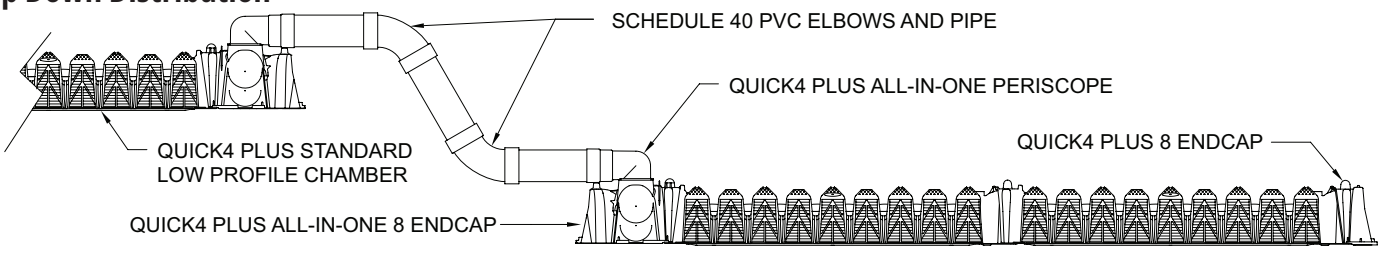
Siphon dosing can be a cost-effective alternative to pressure dosing. Prefabricated or modified distribution boxes are fit to a mechanical siphon that provides predetermined doses of effluent to each trench. This improves the chances of the effluent reaching the entire infiltrative area within the trench. The only possible drawback is the presence of another mechanical part in the system which may require maintenance at some time. Infiltrator Water Technologies recommends dosing one gallon per linear foot of chamber.

Note: Dosing frequencies for various soil types are addressed in Table 7-4 of the EPA Design Manual. See Appendix A for more information regarding dosing frequencies.

Step Down Distribution

On sloping terrain, it sometimes becomes necessary to construct a step down design as shown below. An overflow sewer is not necessary as with conventional technology since the endcap's construction causes the chambers to load to the top of the sidewall before spilling into the next trench. Note: Step down distribution is only recommended for serial systems.

STEP DOWN SYSTEM SIDE VIEW



DISTRIBUTION METHODS

Pressure Distribution

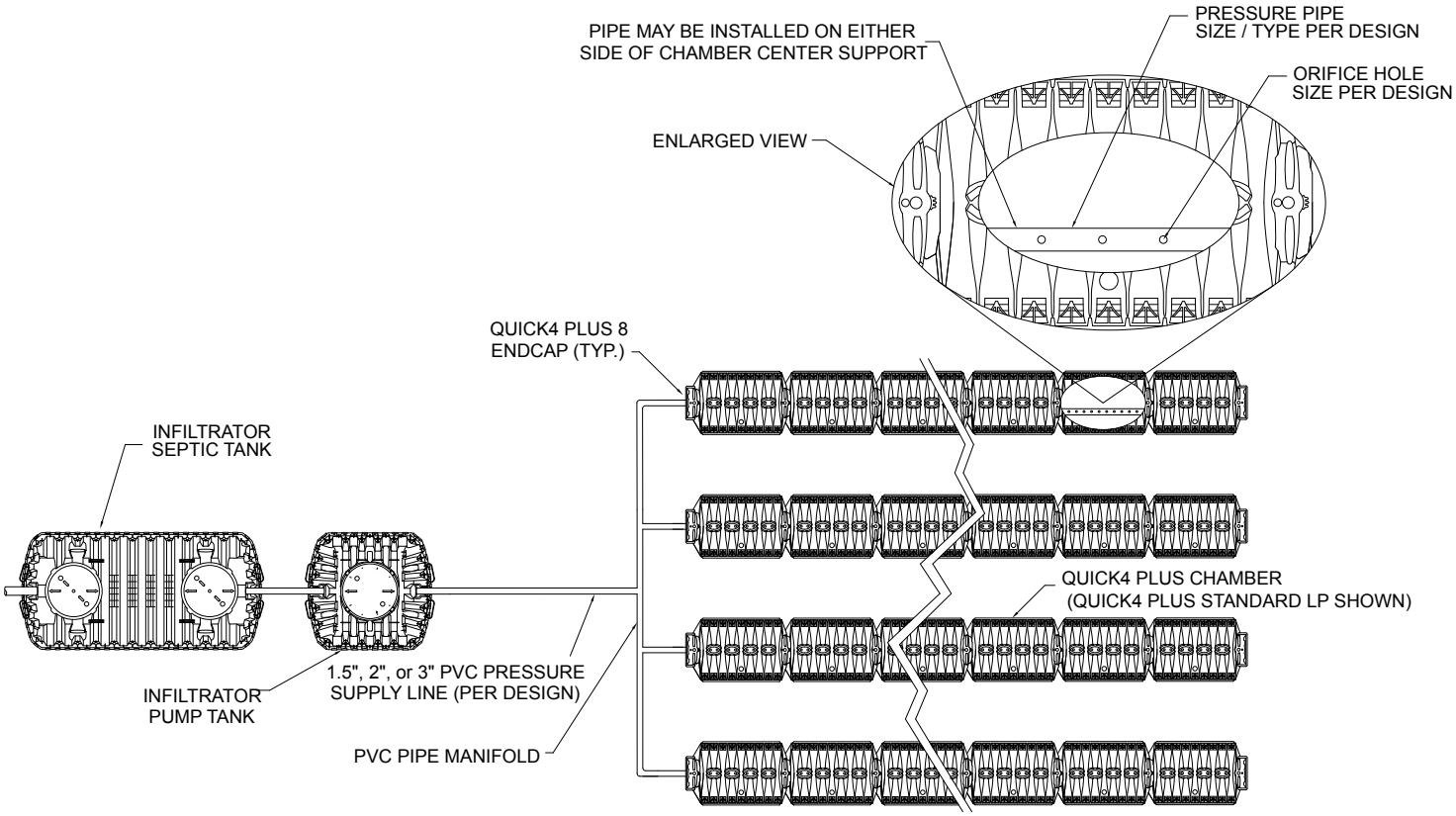
Pressure distribution is primarily used on large commercial applications. It requires that the entire leachfield be pressurized and dosed equally and should not be confused with a pump-up or elevated area-fill system which uses a gravity flow from the header or distribution box.

Pressure distribution uses a pump which transfers the wastewater to the leachfield and distributes it within the individual trenches. These systems are more complex and costly to design and install because they dose the entire leachfield at an equal rate. Pressure distribution is rarely used in residential applications. Nutrients are spread over a greater area than in gravity fed systems and the biomat develops slowly. This difference in the development of biomat has a temporary effect. A mature biomat will eventually form in both types of systems and cause ponding within the trench. Therefore, the long-term performance of gravity and pressure systems will be similar.

The system is designed by having properly-sized, small-diameter orifices in the pipe based on effluent volume and pipe hydraulics. The orifices are typically 1/ 8 inch to 3/ 8 inch in diameter and 3 to 6 feet apart. The pressure pipe is typically 1 inch to 21/2 inches in diameter. Advanced floats and control boxes are now available to accurately prescribe volumes and cycle times. Each Infiltrator chamber has molded holes in the top for securing the pressure pipe to the top of the chamber with the use of nylon pipe hangers. The orifices in the pipe must be pointed in the 12 o'clock position. The effluent sprays off the inside of the arc, allowing for unobstructed distribution to a larger soil surface.

The on-site septic community appears to be split on the advantages of pressure distribution. Proponents feel that pressure dosing gives the designer control over the function of the system by regulating dose volume, cycle times, and periods of rest. On the other hand, many experts believe that the best system is the simplest system, and the addition of mechanical equipment to any system increases the potential for mechanical failure.

PRESSURE DISTRIBUTION SYSTEM PLAN VIEW



Note (a): Ponding within a mature system is to be expected and should not be considered a failure unless the system can no longer accept and pass the design flow.

Note (b): Dosing frequencies for various soil types are addressed in Table 7-4 of the EPA Design Manual. See Appendix A for more information regarding dosing frequencies.

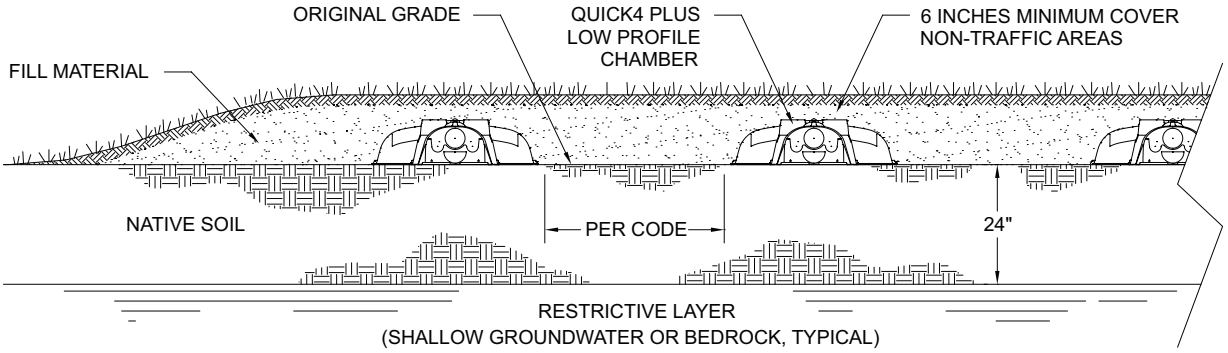
SPECIAL SYSTEM DESIGNS

At-Grade and Shallow In-Ground Systems

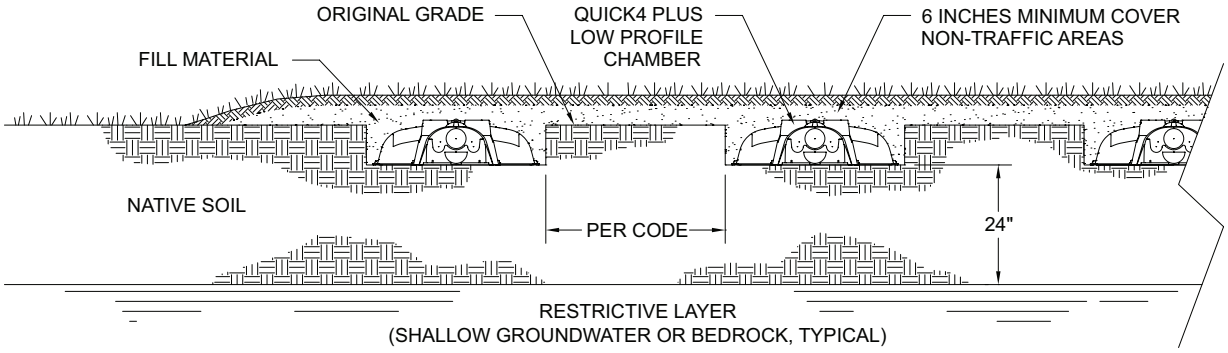
Both at-grade and shallow in-ground systems are mainly used by designers on sites with shallow groundwater. In at-grade systems, the bottom elevation of the trench is at or near the original ground's surface (grade). Native topsoil under the chambers should be scarified or ploughed to increase its permeability before adding fill material. A shallow in-ground system has a bottom elevation within the upper 2 feet of the original ground's surface. Both systems require fill material to be brought in as cover material.

Designers are typically forced to look at these types of designs to overcome limiting conditions within the soil profile such as shallow groundwater, bedrock, or an impermeable clay layer. The choice between an at-grade and a shallow in-ground system should be determined by the separation required by Georgia's health codes.

AT-GRADE SYSTEM CROSS SECTION



SHALLOW IN-GROUND SYSTEM CROSS SECTION



Elevated Sand Mound Systems

Unlike at-grade and shallow in-ground designs, mound systems are constructed completely above the original grade with fill material.

One of the main advantages of using chambers in mounds is their ability to provide superior pressure distribution. Experience shows that it is critical to distribute the effluent evenly across the entire mound in order to control potential hydraulic failure at the toe of the sand fill. As discussed earlier in this manual, chambers provide superior, even pressure distribution with their arch or shield that is used to equally disperse the effluent.

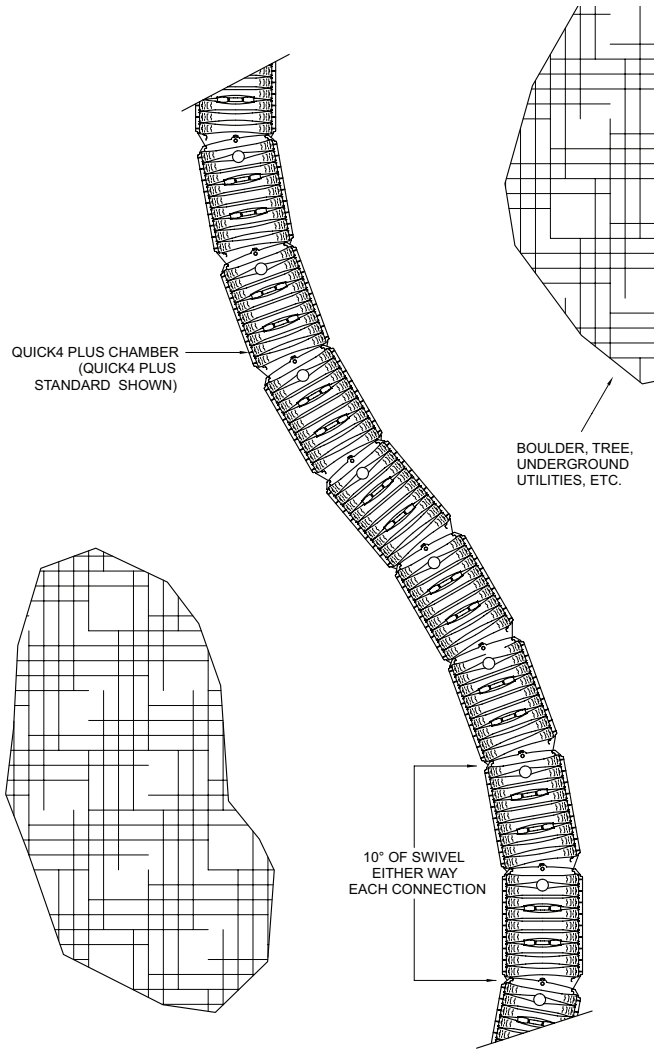
Chambers have been successfully used in mounds throughout the country as a replacement for stone beds. As with any chamber design, by removing the negative effects of stone, the designer may use equivalency sizing of the absorption bed as per local code requirements. However, the use of chambers may not allow the designer to reduce the required basal area because this calculation is dictated by soil hydraulics and not stone masking.

The mound design was first founded through research done by the University of Wisconsin's soil department and is often referred to as the "Wisconsin Mound." Mound design is covered in Section F of the DCH's Manual for Onsite Sewage Management Systems.

TURN DESIGN CONFIGURATIONS

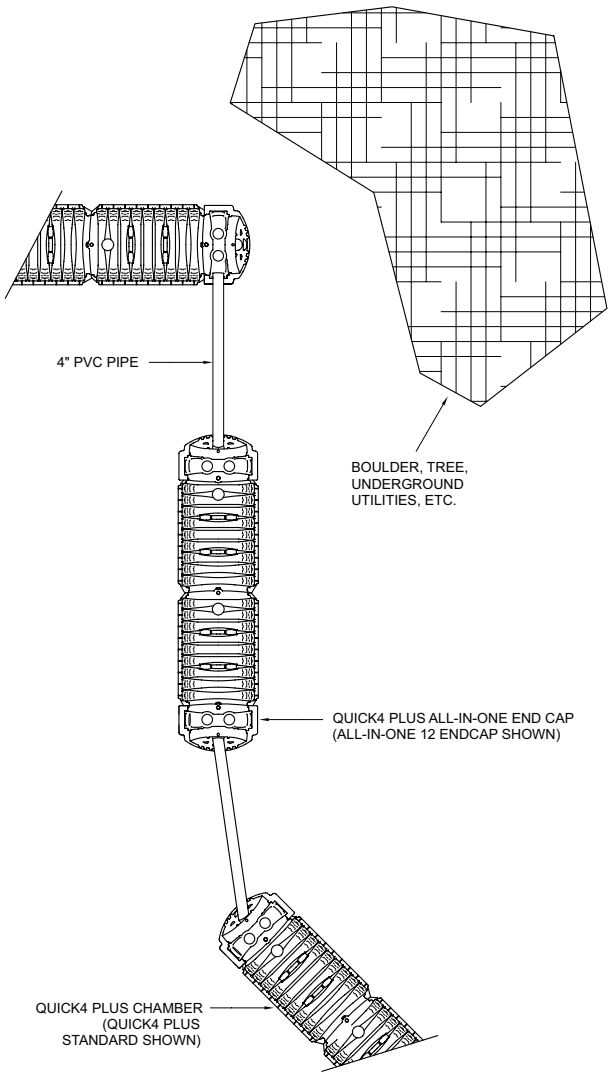
Contour Swivel Connection™

The Quick4 Plus Chamber's Contour Swivel Connection allows systems to be constructed on sloped sites and avoid obstructions without additional parts or accessories. The chamber easily follows contours or an "S" curve and avoids obstacles without additional parts or accessories. Each chamber connection swivels 10-degrees right or left.



PVC Pipe with All-in-One Endcaps

The Quick4 Plus All-in-One endcap's design offers unlimited piping and design options. The molded-in inlets/outlets allow you to pipe from multiple directions and eliminate pipe fittings.



Note: Connections may be made at either the top or bottom ports of the All-in-One endcaps to achieve either equal or serial distribution.

SPECIAL SYSTEM DESIGNS

Deep System Design

Often soil conditions dictate a deep placement of the leachfield. A maximum cover depth of 8 feet is recommended for structural purposes.

Note: Any additional aggregate (stone, styrofoam, tire-chips, etc.) placed in or above the impervious layer provides no additional effective sidewall area and should not be counted as infiltration area.

Before You Begin

Quick4 Plus High Capacity Chambers and Quick4 Plus Standard Chambers may only be installed according to State and/or local regulations. If unsure of the installation requirements for a particular site, contact the local health department.

Like conventional systems, the soil and site conditions must be approved prior to installation. Conduct a thorough site evaluation to determine the proper sizing and siting of the system before installation.

Materials and Equipment Needed

- ☐ Quick4 Plus Chambers
- ☐ Endcaps
- ☐ PVC Pipe and Couplings
- ☐ Backhoe
- ☐ Laser, Transit, or Level
- ☐ Shovel and Rake
- ☐ Tape Measure
- ☐ Utility Knife
- ☐ Hole Saw*
- ☐ 2-inch Drywall Screws*
- ☐ Screw Gun*
- ☐ Small Valve-Cover Box*
- ☐ 4-inch Cap for Inspection Port*

* Optional

These guidelines for construction machinery must be followed during installation:

- ☐ Avoid direct contact with chambers when using construction equipment. Chambers require a 12-inch minimum of compacted cover to support a wheel load rating of 16,000 lbs/axle or equivalent to an
- ☐ AASHTO H-10 load rating.
- ☐ Only drive across the trenches when necessary. Never drive down the length of the trenches.
- ☐ To avoid additional soil compaction, never drive heavy vehicles over the completed system.

Excavating and Preparing the Site

Note: As is the case with conventional systems, do not install the systems in wet conditions or in overly moist soils, as this causes machinery to smear the soil.

1. Stake out the location of all trenches and lines. Set the elevations of the tank, pipe, and trench bottom.

2. Install sedimentation and erosion control measures. Temporary drainage swales/berms may be installed to protect the site during rainfall events.

3. Excavate and level 3-foot wide trenches with proper center-to-center separation. Verify that the trenches are level or have the prescribed slope.

Note: Over excavate the trench width in areas where you are planning to contour.

4. Rake the bottom and sides if smearing has occurred while excavating. Remove any large stones and other debris. Do not use the bucket teeth to rake the trench bottom.

Note: Raking to eliminate smearing is not necessary in sandy soils. In fine textured soils (silts and clays), avoid walking in the trench to prevent compaction and loss of soil structure.

5. Verify that each trench is level using a level, transit, or laser.

Preparing the Quick4 Plus All-in-One 8 and Quick4 Plus All-in-One 12 Endcaps

Note: Quick4 Plus endcap systems are available for use with the Quick4 Plus chambers on either end of the trench, depending upon the installer's preference and configuration requirements.

1. The Quick4 Plus All-in-One 12 Endcap is compatible with the Quick4 Plus Standard and Quick4 Plus High Capacity chambers. The Quick4 Plus All-in-One 8 Endcap and Quick4 Plus 8 Endcap are compatible with the Quick4 Plus Standard LP chamber.

Note: Endcap photos shown throughout this document are for demonstrative purposes only. The endcap being used may differ and is dependent upon the chamber being used and system design.



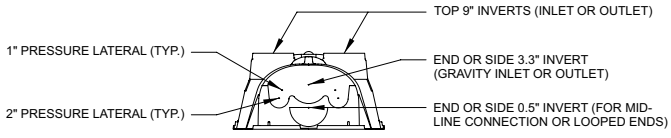
Drill top of Quick4 Plus All-in-One 8 Endcap.

2. For the Quick4 Plus All-in-One 12 Endcap, with a hole saw, drill a 4.5-inch opening on front or side of endcap using center point marking (see illustration) as a guide. For the Quick4 Plus All-in-One 8 Endcap, with a hole saw, drill a 4.5-inch opening in the top of endcap using center point marking (see illustration) as a guide.

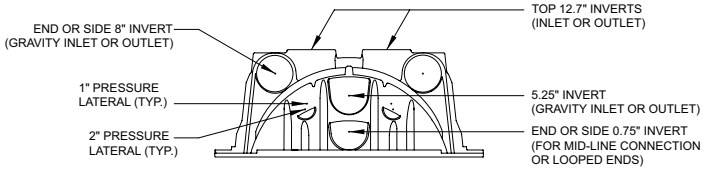
3. Snap off the molded splash plate located on the bottom front of the endcap.

4. Install splash plate into the appropriate slots below inlet to prevent trench bottom erosion.

QUICK4 PLUS ALL-IN-ONE 8 ENDCAP DRILL LOCATIONS:



QUICK4 PLUS ALL-IN-ONE 12 ENDCAP DRILL LOCATIONS:



Installing the System

1. Check the header pipe to be sure it is level or has the prescribed slope.

2. Set the invert height as specified in the design from the bottom of the inlet.

3. Place the first chamber in the trench.

4. Place the back edge of the endcap over the inlet end of the first chamber. Be sure to line up the locking pins on the top of both the chamber and endcap.

5. Insert the inlet pipe 2.5 inches into the opening on the endcap.

6. Lift and place the end of the next chamber onto the previous chamber by holding it at a 45° angle. Line up the chamber end between the connector hook and locking pin at the top of the first chamber. Lower the chamber to the ground to connect the chambers.

7. Swivel the chamber on the pin to achieve the proper direction for trench layout.

Note: The chamber allows up to 10° swivel in either direction at each joint.

8. Continue connecting chambers until the trench is completed.

9. The last chamber in the trench requires an endcap. Lift the endcap at a 45° angle and align the connector hook on the top of the chamber with the raised slot on the top of the endcap. Lower the endcap to the ground and into place.

10. To ensure structural stability, fill the sidewall area by pulling soil from the sides of the trench with a shovel. Start at the joints where the chambers connect. Continue backfilling the entire sidewall area, making sure the fill covers the louvers.

11. Pack down fill by walking along the edges of trench and chambers.

12. Proceed to the next trench and begin with Step 1.



Place endcap inlet end.



Insert inlet pipe.



Connect chambers.



Place endcap outlet end.

Installing Quick4 Plus All-in-One 8 and Quick4 Plus All-in-One 12 Endcaps as a Mid-line Connection

1. With a hole saw drill an opening appropriate for the pipe diameter being used on the side (3.3" invert) or on top (9.0" invert) of endcap.

2. With a hole saw, drill a 4½-inch opening on the end of the Quick4 Plus All-in-One 8 Endcap to create an invert at 0.5 inches. This will allow effluent to fill both sides of the chamber line.



Drill bottom of endcap.

3. Snap off the molded splash plate located on the bottom front of the endcap.

4. Install splash plate into the appropriate slots below the inlet to prevent trench bottom erosion.

5. Place the back edge of the endcap over the inlet end of the first chamber. Be sure to line up the locking pins on the top of both chamber and endcap.

6. Insert connection pipe 2.5 inches into opening on endcap.

Installing Inspection Ports

Inspection ports may be installed on the chamber, the Quick4 Plus All-in-One 8 Endcap or the Quick4 Plus All-in-One 12 Endcap. The Quick4 Plus 8 Endcap does not allow inspection port construction.

Endcap Inspection Port

1. With a hole saw drill the pre-marked area in the top of endcap to create a 4.5-inch opening based on pipe type.

2. Set a cut piece of pipe of the appropriate length into the corresponding endcap's inspection port sleeve.

3. Use two screws to fasten the pipe to the sleeve around the inspection port.

4. Attach a threaded cap or cleanout assembly onto the protruding pipe at the appropriate height.

5. A small valve cover box may be used if the inspection port is below the desired grade.



Drill top of endcap.

Covering the System

Before backfilling, the system must be inspected by a health officer or other official as required by State and local codes. Create an as-built drawing at this time for future records.

1. Backfill the trench by pushing fill material over the chambers with a backhoe. Keep a minimum of 12 inches of compacted cover over the chambers before driving over the system.

2. It is best to mound several inches of soil over the finish grade to allow for settling. This also ensures that runoff water is diverted away from the system.

3. After the system is covered, the site should be seeded or sodded to prevent erosion.

APPENDICES

APPENDIX A

TABLE 7-4 EPA DESIGN MANUAL: ONSITE WASTEWATER TREATMENT AND DISPOSAL SYSTEMS, OCTOBER 1980

Dosing Frequencies For Various Soil Textures	
Soil Texture	**Dosing Frequency**
Sand	4 Doses/Day
Sandy Loam	1 Dose/Day
Loam	Frequency Not Critical
Silt Loam Silty Clay Loam	1 Dose/Day
Clay	Frequency Not Critical

APPENDIX B

TABLE B-1: EQUIVALENT SIZING FOR QUICK4 CHAMBERS COMPARED TO STONE AND PIPE

Gravel	Quick4 Plus High Capacity and Quick4 High Capacity (0.65 Equivalency Factor)[1]		Quick4 Plus Standard and Quick4 Standard (0.75 Equivalency Factor) [1]		Quick4 Plus Standard LP (1.0 Equivalency Factor)[1]		Quick4 One Equalizer 36 and Quick4 Equalizer 36 (1.0 Equivalency Factor)[1]	
Trench Length (ft) S&P	Trench Length (ft)	Chambers Required	Trench Length (ft)	Chambers Required	Trench Length (ft)	Chambers Required	Trench Length (ft)	Chambers Required
100	65.0	17	75.0	19	100	25	100	25
110	71.5	18	82.5	21	110	28	110	28
120	78.0	20	90.0	23	120	30	120	30
130	84.5	22	97.5	25	130	33	130	33
140	91.0	23	105.0	27	140	35	140	35
150	97.5	25	112.5	29	150	38	150	38
160	104.0	26	120.0	30	160	40	160	40
170	110.5	28	127.5	32	170	43	170	43
180	117.0	30	135.0	34	180	45	180	45
190	123.5	31	142.5	36	190	48	190	48
200	130.0	33	150.0	38	200	50	200	50
210	136.5	35	157.5	40	210	53	210	53
220	143.0	36	165.0	42	220	55	220	55
230	149.5	38	172.5	44	230	58	230	58
240	156.0	39	180.0	45	240	60	240	60
250	162.5	41	187.5	47	250	63	250	63
260	169.0	43	195.0	47	260	65	260	65
270	175.5	44	202.5	51	270	68	270	68
280	182.0	46	210.0	53	280	70	280	70
290	188.5	48	217.5	55	290	73	290	73
300	195.0	49	225.0	57	300	75	300	75
310	201.5	51	232.5	59	310	78	310	78
320	208.0	52	240.0	60	320	80	320	80
330	214.5	54	247.5	62	330	83	330	83
340	221.0	56	255.0	64	340	85	340	85
350	227.5	57	262.5	66	350	88	350	88
360	234.0	59	270.0	68	360	90	360	90
370	240.5	61	277.5	70	370	93	370	93
380	247.0	62	285.0	72	380	95	380	95
390	253.5	64	292.5	74	390	98	390	98
400	260.0	65	300.0	75	400	100	400	100

Note:

1. Equivalency factors and trench length reductions are as follows: 0.65 = 35% length reduction, 0.75 = 25% length reduction, and 1.0 = 1:1 sizing compared to a conventional 36-inch-wide gravel trench.

INFILTRATOR WATER TECHNOLOGIES, LLC ("INFILTRATOR")
Infiltrator Water Technologies, LLC STANDARD LIMITED Drainfield WARRANTY

(a) The structural integrity of each chamber, endcap, EZflow expanded polystyrene and/or other accessory manufactured by Infiltrator ("Units"), when installed and operated in a leachfield of an onsite septic system in accordance with Infiltrator's instructions, is warranted to the original purchaser ("Holder") against defective materials and workmanship for one year from the date that the septic permit is issued for the septic system containing the Units; provided, however, that if a septic permit is not required by applicable law, the warranty period will begin upon the date that installation of the septic system commences. To exercise its warranty rights, Holder must notify Infiltrator in writing at its Corporate Headquarters in Old Saybrook, Connecticut within fifteen (15) days of the alleged defect. Infiltrator will supply replacement Units for Units determined by Infiltrator to be covered by this Limited Warranty. Infiltrator's liability specifically excludes the cost of removal and/or installation of the Units.

(b) THE LIMITED WARRANTY AND REMEDIES IN SUBPARAGRAPH (a) ARE EXCLUSIVE. THERE ARE NO OTHER WARRANTIES WITH RESPECT TO THE UNITS, INCLUDING NO IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE

(c) This Limited Warranty shall be void if any part of the chamber system is manufactured by anyone other than Infiltrator. The Limited Warranty does not extend to incidental, consequential, special or indirect damages. Infiltrator shall not be liable for penalties or liquidated damages, including loss of production and profits, labor and materials, overhead costs, or other losses or expenses incurred by the Holder or any third party. Specifically excluded from Limited Warranty coverage are damage to the Units due to ordinary wear and tear, alteration, accident, misuse, abuse or neglect of the Units; the Units being subjected to vehicle traffic or other conditions which are not permitted by the installation instructions; failure to maintain the minimum ground covers set forth in the installation instructions; the placement of improper materials into the system containing the Units; failure of the Units or the septic system due to improper siting or improper sizing, excessive water usage, improper grease disposal, or improper operation; or any other event not caused by Infiltrator. This Limited Warranty shall be void if the Holder fails to comply with all of the terms set forth in this Limited Warranty. Further, in no event shall Infiltrator be responsible for any loss or damage to the Holder, the Units, or any third party resulting from installation or shipment, or from any product liability claims of Holder or any third party. For this Limited Warranty to apply, the Units must be installed in accordance with all site conditions required by state and local codes; all other applicable laws; and Infiltrator's installation instructions.

(d) No representative of Infiltrator has the authority to change or extend this Limited Warranty. No warranty applies to any party other than the original Holder.

The above represents the Standard Limited Warranty offered by Infiltrator. A limited number of states and counties have different warranty requirements. Any purchaser of Units should contact Infiltrator's Corporate Headquarters in Old Saybrook, Connecticut, prior to such purchase, to obtain a copy of the applicable warranty, and should carefully read that warranty prior to the purchase of Units.

Contact Infiltrator's Technical Services Department for assistance at 1-800-221-4436 or info@infiltratorwater.com

U.S. Patents: 4,759,661; 5,017,041; 5,156,488; 5,336,017; 5,401,116; 5,401,459; 5,511,903; 5,716,163; 5,588,778; 5,839,844 Canadian Patents: 1,329,959; 2,004,564 Other patents pending. Infiltrator, Equalizer and Quick4 are registered trademarks of Infiltrator Water Technologies. Infiltrator is a registered trademark in France. Infiltrator Water Technologies is a registered trademark in Mexico. Contour, MicroLeaching, PolyTuff, MultiPort, QuickPlay, SnapLock and StraightLock are trademarks of Infiltrator Water Technologies. PolyLok is a trademark of PolyLok, Inc. TUF-TITE is a registered trademark of TUF-TITE, INC. Ultra-Rib is a trademark of IPEX Inc.

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