

Department of Health and Human Services  
Maine Center for Disease Control and Prevention  
286 Water Street  
# 11 State House Station  
Augusta, Maine 04333-0011  
Tel: (207) 287-5674  
Fax: (207) 287-5672; TTY: 1-800-606-0215

January 6, 2011

Infiltrator Systems, Inc.  
Attn.: David Lentz, P.E.  
6 Business Park Road  
P. O. Box 768  
Old Saybrook, CT 06475

Subject: Product Registration, Infiltrator Quick4 Plus High Capacity Chambers and Quick4 Plus 8 and 12 Endcaps

Dear Mr. Lentz:

The Division of Environmental Health has completed a review of a registration application for your company's product. This information was submitted pursuant to Section 1802 of the Maine State Plumbing Code, Subsurface Wastewater Disposal Rules (Rules), for use of the products in Maine.

The Quick4 Plus High Capacity chamber consists of a chamber which is superficially similar to a Quick4 Standard chamber, with various modifications which increase its strength and load bearing capacity. The design for the Quick4 Plus Endcaps results in a semi-circular footprint with a corresponding increase in usable bottom area and storage volume.

The Quick4 Plus High Capacity chamber is rated by the manufacturer at 8.0 square feet per linear foot and 5.8 square foot per linear foot, in trench and cluster configuration, respectively.

The manufacturer rates the Quick4 Plus 8 Endcaps as follow:

- Quick4 Plus 8 Endcap installed at end of chamber row: 1.0 square feet/end cap,
- Quick4 Plus All-in-One 8 Endcap installed at end of chamber row: 2.9 square feet/end cap,
- Quick4 Plus All-in-One 8 Endcap installed mid-line in chamber row: 2.2 square feet/end cap,
- Quick4 Plus All-in-One 12 Endcap installed at end of chamber row: 7.3 square feet/end cap, and
- Quick4 Plus All-in-One 12 Endcap installed mid-line in chamber row: 4.2 square feet/end cap.

On the basis of the information submitted, the Division has determined that the Quick4 Plus High Capacity chambers and end caps are acceptable for use in the State of Maine, provided that they are installed, operated, and maintained in conformance with the manufacturer's directions.

Page 2, Letter to David Lentz, P.E.  
Infiltrator Systems, Inc.

Because installation and owner maintenance has a significant effect on the working order of onsite sewage disposal systems, including their components, the Division makes no representation or guarantee as to the efficiency and/or operation of Quick4 Plus High Capacity chambers and end caps. Further, registration of this product for use in the State of Maine does not represent Division preference or recommendation for this product over similar or competing products.

If you have any questions please feel free to contact me at (207) 287-5695.

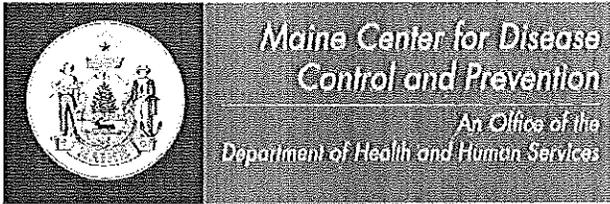
Sincerely,

A handwritten signature in cursive script that reads "James A. Jacobsen". The signature is written in black ink and is positioned below the word "Sincerely,".

James A. Jacobsen  
Project Manager, Webmaster  
Division of Environmental Health  
Drinking Water Program  
Subsurface Wastewater Unit  
e-mail: james.jacobsen@state.me.us

/jaj

xc: Product File



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6 Business Park Road  
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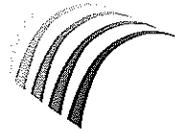
A handwritten signature in black ink that reads "James A. Jacobsen". The signature is written in a cursive style with a long horizontal flourish extending to the right.

James A. Jacobsen  
Project Manager, Webmaster  
Division of Environmental Health  
Drinking Water Program  
Subsurface Wastewater Unit  
e-mail: james.jacobsen@state.me.us

/jaj

xc: Product File

hand delivered 12/01/10



**INFILTRATOR®**  
systems inc.

December 1, 2010

Mr. James Jacobsen  
Subsurface Wastewater Program  
Division of Environmental Health  
Maine Department of Health and Human Services  
286 Water Street, 3rd Floor  
Augusta, ME 04333-0011

Re: Request for Approval  
Quick4 Plus High Capacity Chamber  
Quick4 Plus-Series End Cap Clarifications

Dear Mr. Jacobsen,

Infiltrator Systems, Inc. (Infiltrator) has modified the design of the approved Quick4 High Capacity model chamber resulting in a new model, the Quick4 Plus High Capacity chamber. Infiltrator requests approval of the new chamber design when used in accordance with 10-144 CMR 241. Infiltrator also requests clarification of the Quick4 Plus-Series end cap nomenclature, chamber compatibility and ratings.

### Chamber Design Modifications

While the basic functions of the redesigned chamber remains the same as the approved Quick4 High Capacity chamber, certain features have been modified to provide improved performance. Illustrations and images of the Quick4 Plus High Capacity chamber and compatible end cap are included in Attachment 1. Table 1 includes a comparison of the new chamber design to the approved chamber.

Product	Width (In)	Height (In)	Lay Up Length (ft)	Invert Height (In)	Sidewall Height (In)
Quick4 High Capacity	34	16	4	8	12
Quick4 Plus High Capacity	34	14	4	8	12

**Table 1.** Product nominal dimension comparison

### Structural Design and Cover Requirements

The structural design of the new chamber has been augmented, where the load-resisting capacity is developed from a combination of: 1) bearing on the "feet" at the periphery of the chamber; and 2) the interior load-bearing integral support column system. The column system is situated along the centerline of the chamber, providing mid-span load-carrying support. The support system is a molded component of the chamber and cannot be removed without cutting the product.

The Quick4 Plus High Capacity chamber is capable of withstanding the American Association of State Highway Transportation Officials (AASHTO) H-10 (16,000 lb. axle load) load with 12 inches of

soil cover. In a shallow cover installation (6 inches of soil cover); the chambers are capable of supporting an axle load of 11,700 pounds, which is the equivalent of a backhoe axle load. Attachment 2 includes a structural report documenting the capacity of the new chamber under both loading conditions.

**Chamber Articulation**

Like the approved Quick4 High Capacity chamber, the Quick4 Plus High Capacity chamber model articulates 10 degrees in either direction from the chamber centerline, allowing for installation of the products around obstructions or in a manner that follows the contour of the land along a sloped surface.

**Quick4 Plus-Series End Caps**

Infiltrator submitted a request for review and approval of the Quick4 Plus-Series chambers to the Division of Environmental Health in December of 2009. Infiltrator subsequently submitted a letter dated March 31, 2010 regarding final design configuration of the Quick4 Plus standard chamber and associated end caps. In review of these submittals, Infiltrator would like to take this opportunity to clarify the Quick4 Plus-series end cap system model names, compatibility and measurements as detailed below in Table 2.

End Cap	Chamber Compatibility	Installation Option	Engaged Length (In)	End Cap Height (In)	End Cap Width (In)
Quick4 Plus 8 Endcap	Quick4 Plus Standard LP Quick4 Plus EQ 36 LP	Chamber row end	4.5	8	17.8
Quick4 Plus All-in-One 8 Endcap	Quick4 Plus Standard LP Quick4 Plus EQ 36 LP	Chamber row end	13.3	8	33
		In-line with chambers	10.4		
Quick4 Plus All-in-One 12 Endcap	Quick4 Plus Standard Quick4 Plus High Capacity	Chamber row end	18.2	12	33
		In-line with chambers	10.4		

**Table 2.** Quick4 Plus-Series End Caps

All three end caps may be used with their respective compatible chambers at the end of a chamber row. However, both the Quick4 Plus All-in-One 8 Endcap and Quick4 Plus All-in-One 12 Endcap may also be used in-line with chambers. The in-line feature allows construction of chamber rows with a center feed, as an option to inletting at the ends of the chamber rows. Pipe connection options for the Quick4 Plus All-in-One 8 Endcap and Quick4 Plus All-in-One 12 Endcap include the end (drill points for gravity or pressure pipe), sides, or top. The Quick4 Plus 8 Endcap pipe connection options include drill points for gravity or pressure pipe at the end only. A comparison drawing of the Quick4 Plus-Series Endcaps is included in Attachment 3.

**Approval Request**

Infiltrator requests approval of the Quick4 Plus High Capacity chamber at the same rating as approved for the Quick4 High Capacity chamber. The July 26, 2005 approval letter for the Quick4 chambers is provided in Attachment 4 for reference. Table 3 below provides the requested sizing, which matches the approved Quick 4 sizing.

Product	Trench (sf/lf)	Cluster (sf/lf)
Quick4 High Capacity	8.0	5.8
Quick4 Plus High Capacity	8.0	5.8

**Table 3.** Proposed chamber sizing

Because the end cap system for the Quick4 Plus All-in-One chambers has a variety of uses, the proposed ratings are provided on a per end cap basis below.

- Quick4 Plus 8 Endcap installed at end of chamber row
  - 4.5" x 17.8" / (144 sq in/sf x 0.57 sizing multiplier) = 1.0 sf/end cap
- Quick4 Plus All-in-One 8 Endcap installed at end of chamber row
  - 13.3" x 17.8" / (144 sq in/sf x 0.57 sizing multiplier) = 2.9 sf/end cap
- Quick4 Plus All-in-One 8 Endcap installed mid-line in chamber row
  - 10.4" x 17.8" / (144 sq in/sf x 0.57 sizing multiplier) = 2.2 sf/end cap
- Quick4 Plus All-in-One 12 Endcap installed at end of chamber row
  - 18.2" x 33" / (144 sq in/sf x 0.57 sizing multiplier) = 7.3 sf/end cap
- Quick4 Plus All-in-One 12 Endcap installed mid-line in chamber row
  - 10.4" x 33" / (144 sq in/sf x 0.57 sizing multiplier) = 4.2 sf/end cap

A revised Quick4 Plus-Series chamber and end cap approval letter is included in Attachment 5 for your convenience. The letter has red-line revisions for the new Quick4 Plus High Capacity chamber and clarifications regarding end cap nomenclature and ratings.

Thank you very much for your review of this approval request. Please contact me at (860) 577-7198 if any further information is required.

Sincerely,

*David Lentz*

David Lentz, P.E.  
Regulatory Director  
Science & Government Affairs

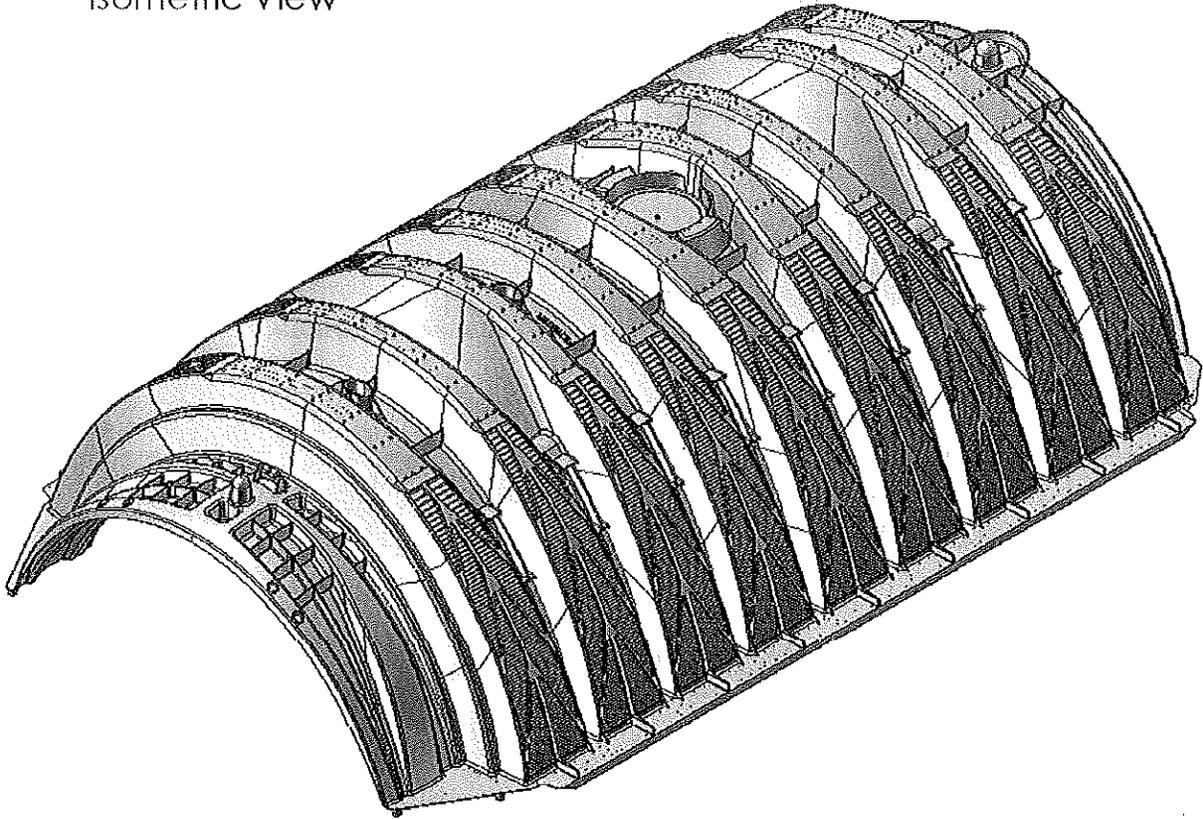
cc: Blake Johnston, Infiltrator Systems Inc.

Attachment 1

Product Illustrations and Images

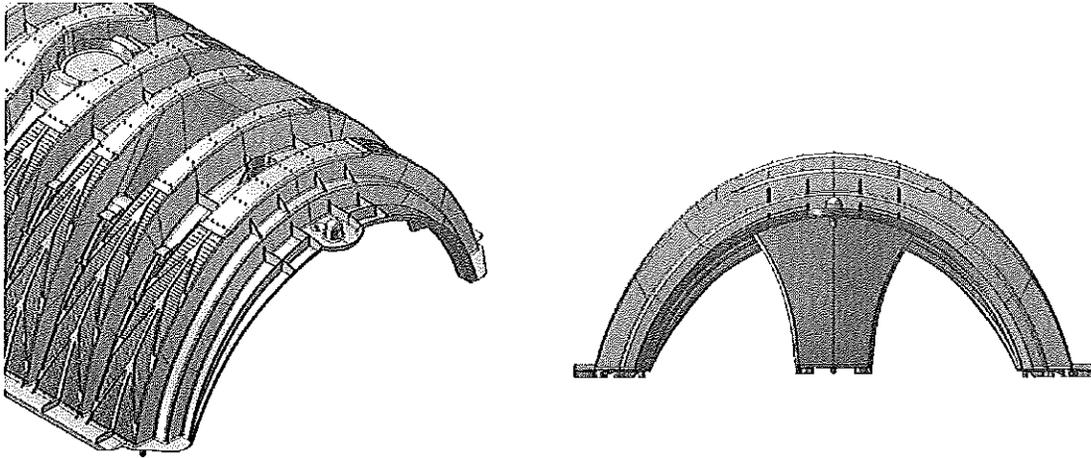
# Infiltrator Quick4 Plus High Capacity Chamber

Isometric View

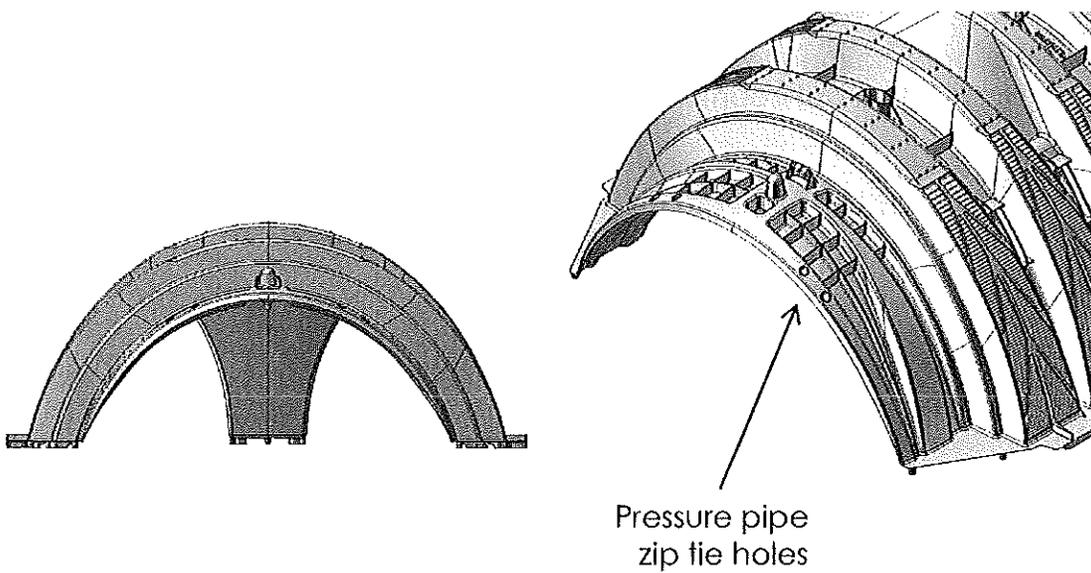


# Infiltrator Quick4 Plus High Capacity Chamber

Inlet Isometric and End Views



Outlet End and Isometric Views



Attachment 2

Structural Testing Results



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**Structural Ground Testing**  
**Quick4™ Plus High Capacity Prototype Chamber**  
**Using Infiltrator Systems Inc. Raised Bed Test Protocol**

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<b>Test Date:</b>	March 2, 2010	<b>Test Site:</b>	Rhodes Construction Old Saybrook, CT
<b>Test Conditions:</b>	Dry, 45° F		
<b>Personnel:</b>	Mark Youngclaus and Doug Paul of Infiltrator Systems Inc., John McClain of Rhodes Construction		

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**Objective:**

Test the structural capacity of the Quick4™ Plus High Capacity prototype chambers using the Infiltrator Systems Inc. (ISI) protocol for raised bed applications without collapsing, fracturing, or breaking.

Protocol: Cover chambers with 12 inches of ASTM C33 sand, cross chambers with test vehicles. Scrape to 6 inches of sand cover and repeat test vehicle crossing.

Step 1: Cross chambers with heavy-duty work truck (9,040 lbs gross vehicle weight).

Step 2: Cross chambers with backhoe (15,740 lbs gross vehicle weight).

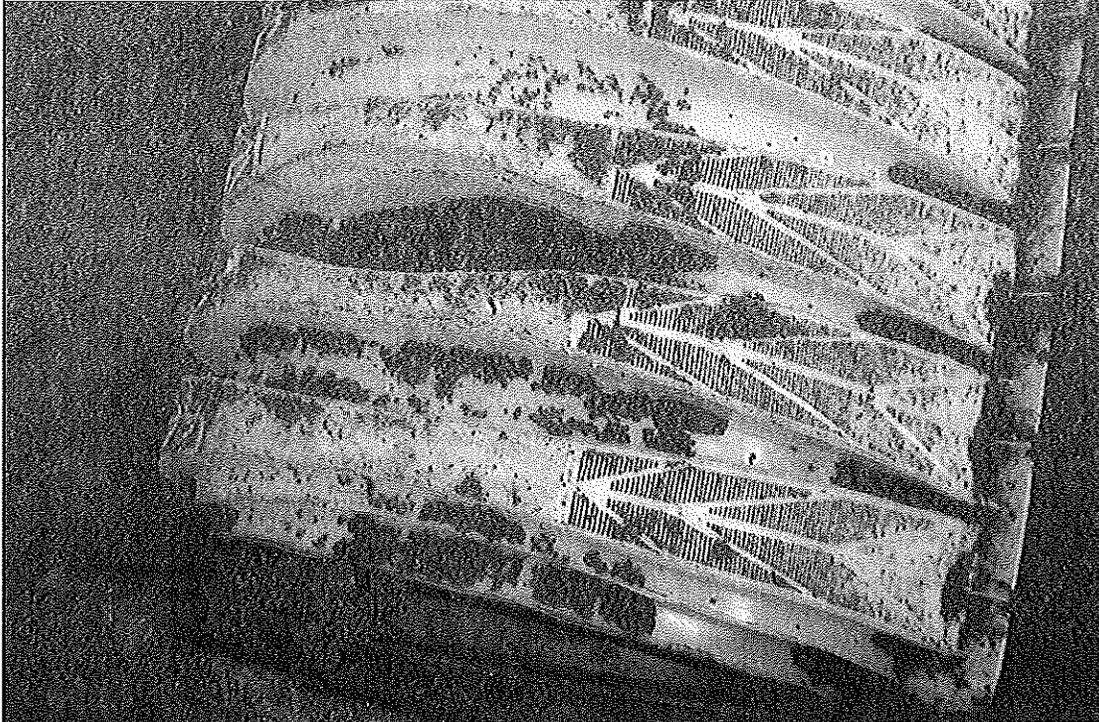
**Conclusions:**

Step 1: All chambers successfully passed the heavy-duty work truck ISI shallow cover load capacity protocol at the corrugation without collapse, fracturing or breaking.

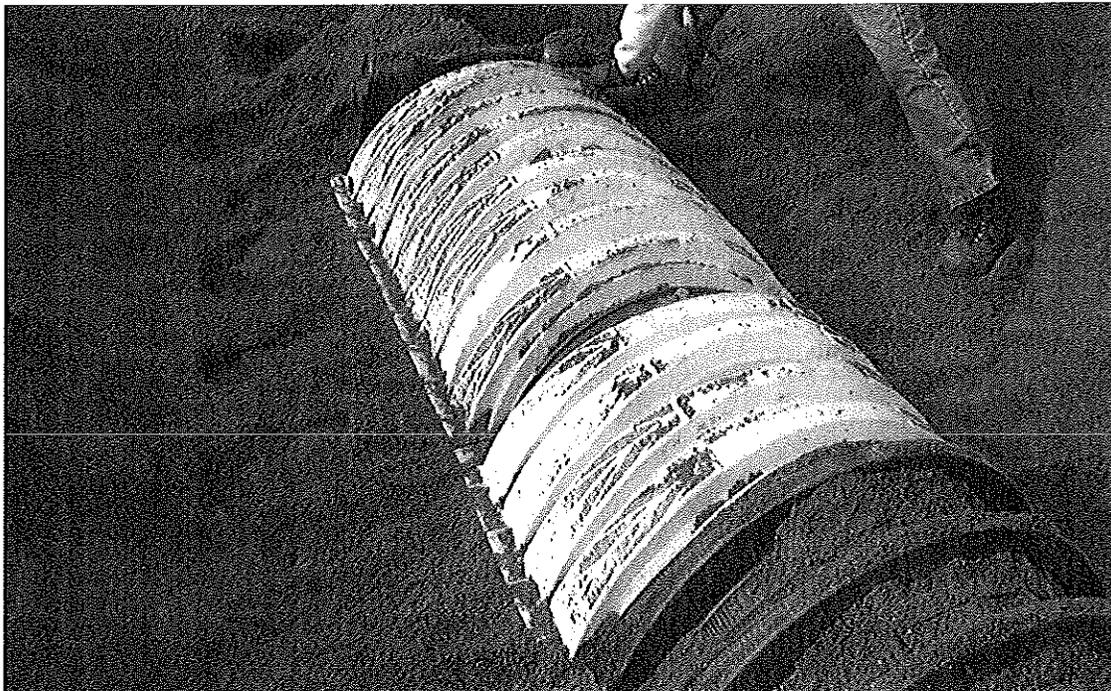
Step 2: All chambers successfully passed the backhoe ISI shallow cover load capacity protocol at the corrugation without collapse, fracturing or breaking.

Additional testing at 12 inches and 6 inches of cover: In an effort to cause failure we drove the backhoe across the chambers with a full bucket of soil, front axle weight of 9,560 lbs exerting 44 PSI (exerting a higher stress than H-10 loading, gross vehicle weight of 18,660). All chambers successfully passed this step of the ISI shallow cover load capacity protocol at the corrugation without collapse, fracturing or breaking.

**FIGURE 2: Post-Loading Chamber Inspection**



**FIGURE 3: Post-Loading Chamber Inspection**



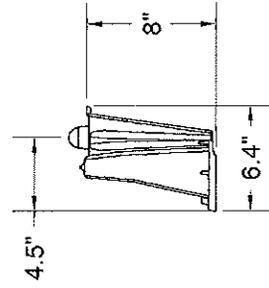
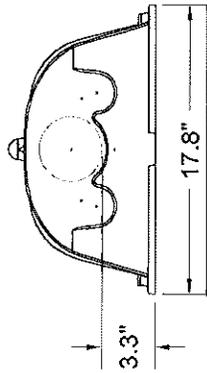
Infiltrator Systems Inc.  
Quick4 Plus 8 Endcap

Dimensions and Invert Heights

For Use with:

Quick4 Plus Equalizer 36 Low Profile Chamber

Quick4 Plus Standard Low Profile Chamber



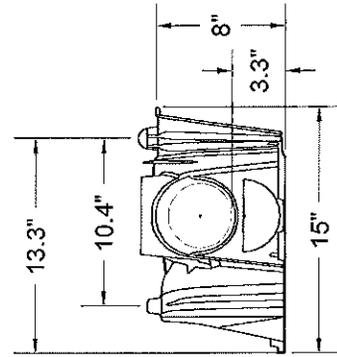
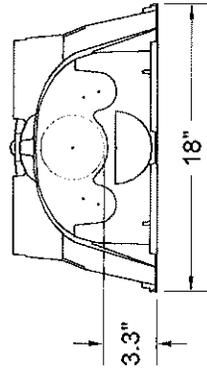
Infiltrator Systems Inc.  
Quick4 Plus All-in-One 8 Endcap

Dimensions and Invert Heights

For Use with:

Quick4 Plus Equalizer 36 Low Profile Chamber

Quick4 Plus Standard Low Profile Chamber



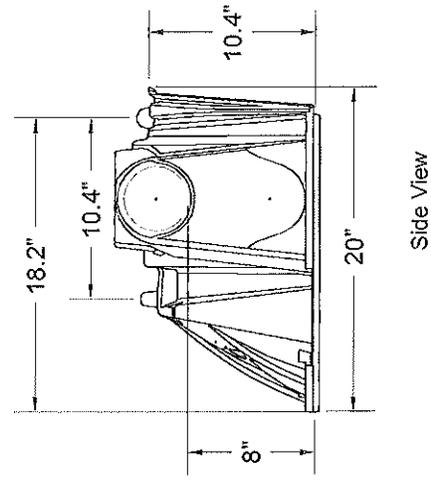
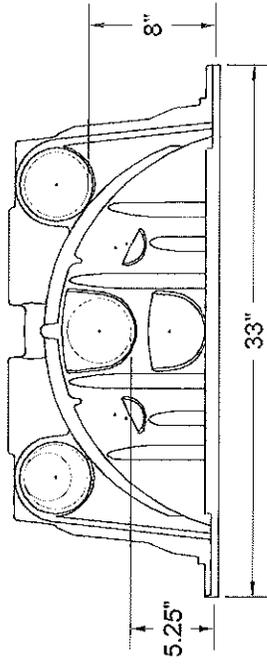
Infiltrator Systems Inc.  
Quick4 Plus All-in-One 12 Endcap

Dimensions and Invert Heights

For Use with:

Quick4 Plus Standard Chamber

Quick4 Plus High Capacity Chamber



Attachment 4

Quick4 Chamber Approval Letter



STATE OF MAINE  
 DEPARTMENT OF HEALTH AND HUMAN SERVICES  
 DIVISION OF HEALTH ENGINEERING  
 286 WATER STREET  
 AUGUSTA, MAINE  
 04333-0011

John Elias Baldacci  
 Governor

July 26, 2005

John R. Nicholas  
 Commissioner

Infiltrator Systems, Inc.  
 Attn.: Brian Parker, Environmental Scientist  
 6 Business Park Road  
 P. O. Box 768  
 Old Saybrook, CT 06475

Subject: Product Registration, Infiltrator Quick 4 High Capacity and Standard, Quick 4 Equalizer 24, and Quick 4 Equalizer 36 Chambers

Dear Mr. Parker:

The Division of Health Engineering has completed a review of a registration application for your company's products. This information was submitted pursuant to Section 1802 of the Maine State Plumbing Code, Subsurface Wastewater Disposal Rules (Rules), for code registration, for use in Maine.

**Product Description**

The Infiltrator Quick 4 chambers consist of conventional Infiltrator plastic chambers, except that all Quick 4 chambers are four feet long, rather than 6.3 or 8.3 feet long, depending upon original model. A new design for the end caps results in a semi-circular footprint with a corresponding increase in usable bottom and sidewall areas and storage volume.

**Claim**

According to the information you provided, the Infiltrator Quick 4 chambers have the following effective infiltrative surface areas:

Product	Without End Cap, Trench	Without End Cap, Cluster	With End Cap (per pair)
Quick 4 Standard Chamber	7.0 square feet/linear foot	5.8 square feet/linear foot	9.2 square feet
Quick 4 High Capacity Chamber	8.0 square feet/linear foot	5.8 square feet/linear foot	12.0 square feet
Quick 4 Equalizer 24	4.0 square feet/linear foot	4.0 square feet/linear foot	4.6 square feet
Quick 4 Equalizer 36	5.2 square feet/linear foot	3.7 square feet/linear foot	6.4 square feet

**Determination**

On the basis of the information, the Division has determined that the Infiltrator Quick 4 chambers are acceptable for use in the State of Maine, provided that they are installed, operated, and maintained in conformance with the manufacturer's directions and the sizing table above.

In the event that the products fail to perform as claimed by the applicant, use of the new or experimental technology in Maine, including all installations approved pursuant to Section 1801.7 of the Rules, shall cease. Use of the new or experimental technology shall not resume until the applicant and the Division have reached a mutually acceptable agreement for resolving the failure to perform as claimed.

Because installation and owner maintenance has a significant effect on the working order of onsite sewage disposal systems, including their components, the Division makes no representation or guarantee as to the efficiency and/or operation of Infiltrator Quick 4 chambers. Further, registration of this product for use in the State of Maine does not represent Division preference or recommendation for this product over similar products.

Attachment 5  
Draft Approval Letter