Introduction

Community / Cluster Systems with Chambers

Cluster / community systems have become an important option for wastewater management where onsite systems are impractical or connecting to sewers is not financially or technically an option. These systems can consist of many combinations of wastewater treatment, collection and dispersal technologies and can serve small to large communities. Chambers have been used effectively in community / cluster systems for many years because of their design versatility and ability to accommodate large storage volumes during peak flows.

Product Applications

Infiltrator® chambers are an alternative to the traditional stone and pipe system and provide cost-effective, efficient methods for treatment and disposal of wastewater. Infiltrator Chamber Systems are approved in all 50 states and all 10 Canadian provinces with up to a 50% smaller footprint as compared to stone and pipe systems. The chambers can be used for commercial, municipal, industrial, residential, and repair applications.

One of the key advantages of the Infiltrator Chamber System is its design flexibility. Chambers may be configured into trenches, beds, and mounds of various sizes or shapes. Chamber length and articulation enhance the ability to design around utilities, natural or man made structures, and any other limiting boundaries easily and efficiently.

Infiltrator Chamber Systems can be installed in the following applications:

- Mounds
- Beds
- Trenches
- Sand Filters
- Pressure Dosed or Gravity Distribution
- Advanced Treatment Units (Discharge)
- Evapotranspiration Beds
- Constructed Wetlands
- Wastewater Treatment Plants
- Toxic Waste Remediation Sites
- Biofilters

Note: For stormwater applications, please visit www.stormtech.com.

Chamber Selection

The Quick4® family of chambers is the latest in the line of Infiltrator chamber products. These chambers have been designed to provide improved performance compared to a traditional gravel and pipe trench. Quick4 chambers come in four models. See the following pages for details and dimensions of each. The chambers each feature their own MultiPort™ end cap.

Primary considerations when selecting one of the Infiltrator Systems chambers are depth to restrictive layer, available area for subsurface treatment, and State/County regulatory requirements. Additional information can be found at www.infiltratorsystems.com.

MultiPort™ End Caps

Infiltrator Systems’ Quick4 MultiPort End Caps have features which provide many design options. Multiple inlets at different elevations give designers and installers several options when connecting chambers. Tools and fasteners are not required.

MultiPort End Caps are required at each end of a chamber row (two per row) and fit on either end of the Quick4 chambers. All MultiPort End Caps will accept inlet pipes up to 4 inches in diameter. For ease of installation, inlets are pre-marked with tear-out seals that allow for a tight fit for 3-inch and 4-inch SDR 35 and 4-inch SCH 40 pipe. (See details on pages 4 and 5.)
Quick4 Standard Chamber
Nominal Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size (W x L x H)</td>
<td>34&quot; x 48&quot; x 12&quot;</td>
</tr>
<tr>
<td>Invert Height</td>
<td>8&quot;</td>
</tr>
<tr>
<td>Storage Capacity</td>
<td>44 gal (5.8 ft³)</td>
</tr>
<tr>
<td>Additional Storage Capacity</td>
<td>With End Caps: 18.3 gal (2.4 ft³)</td>
</tr>
</tbody>
</table>

Quick4 High Capacity Chamber
Nominal Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size (W x L x H)</td>
<td>34&quot; x 48&quot; x 16&quot;</td>
</tr>
<tr>
<td>Invert Height</td>
<td>11.5&quot;</td>
</tr>
<tr>
<td>Storage Capacity</td>
<td>62 gal (8.3 ft³)</td>
</tr>
<tr>
<td>Additional Storage Capacity</td>
<td>With End Caps: 28.8 gal (3.9 ft³)</td>
</tr>
</tbody>
</table>

Quick4 Equalizer 36 Chamber
Nominal Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size (W x L x H)</td>
<td>22&quot; x 48&quot; x 12&quot;</td>
</tr>
<tr>
<td>Invert Height</td>
<td>6&quot;</td>
</tr>
<tr>
<td>Storage Capacity</td>
<td>32 gal (4.3 ft³)</td>
</tr>
<tr>
<td>Additional Storage Capacity</td>
<td>With End Caps: 11.1 gal (1.5 ft³)</td>
</tr>
</tbody>
</table>

Quick4 Equalizer 24 Chamber
Nominal Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size (W x L x H)</td>
<td>16&quot; x 48&quot; x 11&quot;</td>
</tr>
<tr>
<td>Invert Height</td>
<td>6&quot;</td>
</tr>
<tr>
<td>Storage Capacity</td>
<td>21 gal (2.8 ft³)</td>
</tr>
<tr>
<td>Additional Storage Capacity</td>
<td>With End Caps: 7.7 gal (1.0 ft³)</td>
</tr>
</tbody>
</table>
Product Information

QUICK4 STANDARD CHAMBERS
SIDE AND END VIEWS
(Not to scale)

MULTIPOWER END CAP
(Not to scale)

QUICK4 HIGH CAPACITY CHAMBERS
SIDE AND END VIEWS
(Not to scale)

MULTIPOWER END CAP
(Not to scale)
Product Information

QUICK4 EQUALIZER 36 CHAMBERS
SIDE AND END VIEWS
(Not to scale)

MULTIPORT END CAP
(Not to scale)

INVERT ADAPTER
(Not to scale)

QUICK4 EQUALIZER 24 CHAMBERS
SIDE AND END VIEWS
(Not to scale)

MULTIPORT END CAP
(Not to scale)

INVERT ADAPTER
(Not to scale)
Advantages of Infiltrator Chamber Systems

Benefits to Contractors
- Easy to install and less site disruption
- Excellent for repairs
- Solution for difficult sites with limited access
- No waiting for gravel
- Save time and money with less labor
- Easily hand-carried into position
- More efficient construction

Infiltrator Chamber Advantages
- No stone or geotextile required
- Large storage volume accommodates peak flows of effluent
- Entire bottom of chamber is open for unobstructed infiltration into soil
- Optional inspection port
- Use of heavy equipment reduced
- Easy to handle and install
- In most cases less drainfield area needed
- Sidewall louvers eliminate fines intrusion and promote sidewall leaching
- History of superior performance
- Can be used in special applications

Benefits to Regulatory Officials
- Easy to inspect soil interface and complete system
- Reliable, long-term performance
- Proven infiltrative efficiency delivers an extra margin of safety
- Company offers training and technical support

Benefits to Engineers
- Manufacturing facility is ISO 9001-2000 certified
- Manufactured lengths and widths make designing systems easy
- Sales and Tech Support Teams available for consultation
- Standard 1 year structural warranty on all chamber products
- Proven history of performance
- Products are independently tested to meet strength and physical property requirements necessary for certification in accordance with IAPMO PS-63.

Benefits to Homeowners and the Community
- More efficient use of land
- Less damage to property during repairs and on difficult sites
- Environmentally-friendly solution
- Reduces negative environmental impacts
- Saves valuable natural resources
- Increased storage for peak flows and wet conditions

Stone and Pipe Disadvantages
- Stone compaction, embedment and fines reduce infiltration rate
- Geotextile required to prevent soil intrusion
- Solids build up between stones, limiting infiltration
- Lack of geotextile on trench sidewall may allow soil intrusion
Technical Support

Infiltrator Systems, Inc. (ISI) technical support staff is available for design assistance. This includes but is not limited to: providing details and product specifications, reviewing proposed plans and assisting with plan conversions from existing products to Infiltrator chambers. Not all plan sheets are necessary for ISI's review. Necessary sheets include plan view sheet(s) with final elevations, any detail sheets with cross sections of the onsite wastewater treatment disposal system, and design criteria for the proposed system.

It is recommended that ISI's chamber details and product specifications are included in the project plans. These items are available in various formats and may be downloaded from our website at www.infiltratorsystems.com.

ISI's design assistance is limited in nature to design support. It is the responsibility of the designer to ensure that the onsite wastewater system's design is in full compliance with all applicable rules and regulations. ISI's products must be designed and installed in accordance with State/County regulations and ISI's minimum requirements. Failure to do so will void the warranty.

Send Plans To:

Please contact ISI's Technical Services Department at 1-800-221-4436 to speak with a representative before sending plans.

Infiltrator Systems, Inc.
Attn: Technical Services/Plan Review
6 Business Park Road
Old Saybrook, CT 06475

Email: info@infiltratorsystems.com
File size should not exceed 2MB.
System Sizing

Sizing of Onsite Wastewater Treatment Systems (OWTS) will vary depending on location, soil characteristics, application rates and the characteristics of the wastewater. It is the responsibility of the designer to verify that systems are designed and sized appropriately according to state/county rules and regulations.

The following example is based on the United States Environmental Protection Agency’s suggested loading rates for sizing infiltration surfaces (see Table 1 on page 9).

System Design Example

Note: This example is for illustration purposes only. For specific design parameters please refer to your specific state, county and/or local environmental health codes.

Given the following information:

Facility size/type: 40 home subdivision
Number of people per home: 2.6 persons/household (per U.S. Census Bureau table HH-6 for 2003)
Number of gallons per person per day: 68.6 gal/person/day (per USEPA Onsite Wastewater Treatment Systems Manual, Table 3-1, pg. 3-3)
Design flow: 2.6 persons/household x 68.6 gal/person/day x 40 homes = 7134.4 gal/day
Soil Type = fine sandy loam , prismatic, blocky, granular, moderate, strong.
Hydraulic Loading capacity of soil (per EPA table) = 0.4 gal/ft²/day
Effluent Strength: septic tank effluent, no pre-treatment

Note: Many states/provinces allow increased soil application rates if a pretreatment device is installed. This would result in a reduced disposal field area.

Chamber Type: Infiltrator Quick4 Standard chambers at sizing of 4 sl/lf (USEPA Decentralized Systems Technology Fact Sheet, September 2000)

Note: The sizing of the chamber will vary per state/province approval.

System Calculations

Determine required square footage:
7134.4 gal/day ÷ 0.4 gal/ft²/day = 17,836 sf
Determine length of system:
17,836 sf ÷ 4 sl/lf (chamber rating) = 4,459 lf
Determine total number of chambers required:
4,459 lf ÷ 4 lf/chamber = 1,115 chambers

System Layout

Many designers prefer to break the treatment field into separate zones. This allows for the installation of a smaller pump, allows different zones to be dosed and rested and provides system flexibility for Operations and Maintenance. According to local regulations the treatment field is typically installed as a bed or trench, the previous design example is considered for each:

Bed Configuration Example:
Install the system in four separate zones; 4,459 lf / 4 zones = 1,115 lf/zone
Install 14 rows, each 80 feet long (total 1,120 lf)
The chambers can be installed edge to edge or there are benefits to installing with a 6-inch edge to edge separation. The separation will provide greater structural stability and allow better oxygen transfer to the system. If the chambers were spaced 6' then the total footprint for this zone would be 80 ft long x 48.5 ft wide.

Trench Configuration Example:
Install the system in four separate zones; 4,459 lf / 4 zones = 1,115 lf/zone
Install 14 trenches, each 80 feet long (total 1,120 lf)
Install the chambers at the regulatory center-to-center spacing, in this case it is assumed to be 6 feet. Given the spacing of 6’ the total footprint for this zone would be 80 ft long x 81 ft wide.

Distribution

Pressurized System: Many codes require pressure distribution for large systems or if systems have advanced treatment. Infiltrator chambers are engineered to accept differing pressure distribution pipe sizes and locations. The piping can be attached to the top of the chamber, piping can be placed at the bottom of the trench or a pipe support mechanism can be installed (see detail plan on page 12). In each case, the orifices are oriented in the 12 o’clock position. The effluent will spray up and contact the chamber dome, then spread out and fall to the infiltrative surface. This method allows for maximum aeration and effluent dispersion. Infiltrator Chambers have an internal molded drip-lip that prevents the effluent from cascading down the sidewall.

Designing a pressurized distribution system is complex and involves many variables. The size, and length of the delivery line, manifold line and laterals, the orifice size and spacing, and change in elevation are all taken into consideration. Once these variables are understood then a pump size can be selected. Fortunately many pump manufacturers offer programs to design a pressurized system.

Gravity Distribution or Pump-Up systems (Pump to Gravity): Many codes allow gravity distribution, and it can be effective when designed properly. There are many methods to best distribute the effluent. The use of header pipes or distribution boxes help split the flow although for low flow, individual residential systems obtaining equal distribution is a concern. Typically with the higher flows of a commercial/community system better distribution is obtained. For example a distribution box may be out of level however when it is dosed at a high flow rate from a pump all of the discharge lines receive effluent. If flow equalization is a concern then one way to achieve this is to tie the ends of the chambers together (on level systems) at the base of trench elevation. This allows the whole system to be connected hydraulically and rise and fall, if any one trench receives too much flow it is simply dispersed to the other trenches.

The Quick4 High Flow Splash Plate designed for use with the Quick4 Standard chamber MultiPort End Cap, can be used in conjunction with any pump or pressure system. It prevents soil erosion below the invert when pump systems are cycled on.
### System Sizing

**TABLE 1: EPA SUGGESTED HYDRAULIC LOADING RATES FOR SIZING INFILTRATION SURFACES**

<table>
<thead>
<tr>
<th>TEXTURE</th>
<th>STRUCTURE</th>
<th>SHAPE</th>
<th>GRADE</th>
<th>BOD = 150 (gal/ft³ - day)</th>
<th>BOD = 30 (gal/ft³ - day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>COARSE SAND, SAND, LOAMY COARSE SAND, LOAMY SAND</td>
<td>SINGLE GRAIN</td>
<td>STRUCTURELESS</td>
<td>0.8</td>
<td>1.6</td>
<td></td>
</tr>
<tr>
<td>FINE SAND, VERY FINE SAND, LOAMY FINE SAND, LOAMY VERY FINE SAND</td>
<td>SINGLE GRAIN</td>
<td>STRUCTURELESS</td>
<td>0.4</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>COARSE SANDY LOAM, SANDY LOAM</td>
<td>MASSIVE</td>
<td>STRUCTURELESS</td>
<td>0.2</td>
<td>0.6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PLATY</td>
<td>WEAK</td>
<td>NA</td>
<td>0.5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PRISMATIC, BLOCKY, GRANULAR</td>
<td>WEAK</td>
<td>0.4</td>
<td>0.7</td>
<td></td>
</tr>
<tr>
<td>FINE SANDY LOAM, VERY FINE SANDY LOAM</td>
<td>MASSIVE</td>
<td>STRUCTURELESS</td>
<td>0.2</td>
<td>0.5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PLATY</td>
<td>WEAK, MOD., STRONG</td>
<td>NA</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PRISMATIC, BLOCKY, GRANULAR</td>
<td>WEAK</td>
<td>0.2</td>
<td>0.6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>MASSIVE</td>
<td>STRUCTURELESS</td>
<td>2</td>
<td>5</td>
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<tr>
<td></td>
<td>PLATY</td>
<td>WEAK, MOD., STRONG</td>
<td>NA</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PRISMATIC, BLOCKY, GRANULAR</td>
<td>WEAK</td>
<td>0.4</td>
<td>0.6</td>
<td></td>
</tr>
<tr>
<td>SILT LOAM</td>
<td>MASSIVE</td>
<td>STRUCTURELESS</td>
<td>NA</td>
<td>0.2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PLATY</td>
<td>WEAK, MOD., STRONG</td>
<td>NA</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PRISMATIC, BLOCKY, GRANULAR</td>
<td>WEAK</td>
<td>0.4</td>
<td>0.6</td>
<td></td>
</tr>
<tr>
<td>SANDY CLAY LOAM, CLAY LOAM, SILTY CLAY LOAM</td>
<td>MASSIVE</td>
<td>STRUCTURELESS</td>
<td>NA</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PLATY</td>
<td>WEAK, MOD., STRONG</td>
<td>NA</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PRISMATIC, BLOCKY, GRANULAR</td>
<td>WEAK</td>
<td>0.2</td>
<td>0.2</td>
<td></td>
</tr>
<tr>
<td>SANDY CLAY, CLAY, SILTY CLAY</td>
<td>MASSIVE</td>
<td>STRUCTURELESS</td>
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<td>NA</td>
<td></td>
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<tr>
<td></td>
<td>PLATY</td>
<td>WEAK, MOD., STRONG</td>
<td>NA</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PRISMATIC, BLOCKY, GRANULAR</td>
<td>WEAK</td>
<td>0.2</td>
<td>0.3</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** Table based on US EPA Table 4-3 Onsite Wastewater Treatment Systems manual February 2002. **Note:** This chart is for example only. System sizing must conform to state and/or local regulations.

For the complete EPA Onsite Wastewater Treatment Systems Manual go to: http://www.epa.gov/ORD/NRMRL/Pubs/625R00008/625R00008totaldocument.pdf
MOUND FOR PROPER DRAINAGE
TOPSOIL
ESTABLISH VEGETATIVE COVER
96" MAXIMUM DEPTH
12" MIN., H-10 LOAD AREAS
6" MIN., NON-TRAFFIC AREAS
NATIVE BACKFILL
12"
34"
36"
34"
36"

Note: For more information on this specific application go to www.infiltratorsystems.com or call 1-800-221-4436.
Detail Drawings

QUICK4 EQUALIZER 36 CHAMBER
TRENCH DETAIL
(Not to scale)

- MOUND FOR PROPER DRAINAGE
- TOPSOIL
- NATIVE BACKFILL
- ESTABLISH VEGETATIVE COVER
- 96" MAXIMUM DEPTH
- 12" MIN., H-10 LOAD AREAS
- 6" MIN., NON-TRAFFIC AREAS

QUICK4 EQUALIZER 24 CHAMBER
TRENCH DETAIL
(Not to scale)

- MOUND FOR PROPER DRAINAGE
- TOPSOIL
- NATIVE BACKFILL
- ESTABLISH VEGETATIVE COVER
- 96" MAXIMUM DEPTH
- 12" MIN., H-10 LOAD AREAS
- 6" MIN., NON-TRAFFIC AREAS

Note: For more information on this specific application go to www.infiltratorsystems.com or call 1-800-221-4436.
Note: All Infiltrator Systems chambers can be installed in this type of application.

Note: For more information on this specific application go to www.infiltratorsystems.com or call 1-800-221-4436.
**Detail Drawings**

**QUICK4 CHAMBER**

**MOUND DETAIL (TYP.)**

(Not to scale)

- **6 INCHES OF TOPSOIL (TYP.)**
- **PRESSURE PIPE (TYP.) IF REQUIRED**
- **DEPTH PER DESIGN**
- **NATIVE SOIL**
- **REMOVE OR BREAK UP NATIVE SOIL PER DESIGN**

**Note:** All Infiltrator Systems chambers can be installed in this type of application.

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**QUICK4 CHAMBER**

**BED DETAIL (TYP.)**

(Not to scale)

- **6 INCHES MINIMUM COVER, 48 INCHES MAXIMUM COVER FOR BED APPLICATIONS (TYP.)**
- **BACKFILL MATERIAL - NATIVE, OR - FILL PER DESIGN SPECIFICATIONS**
- **ESTABLISH VEGETATIVE COVER**
- **QUICK4 STANDARD INFILTRATOR (TYP.)**
- **DEPTH PER DESIGN**
- **0.6" SPACING RECOMMENDED**

**Note:** All Infiltrator Systems chambers can be installed in this type of application.

**Note:** For more information on this specific application go to www.infiltratorsystems.com or call 1-800-221-4436.
TABLE 2: MAXIMUM ALLOWABLE CONSTRUCTION AXLE LOADS FOR WHEELED VEHICLES AT VARIOUS COVER DEPTHS

<table>
<thead>
<tr>
<th>Fill Depth (inches over chamber)</th>
<th>Maximum Axle Load (lbs)</th>
<th>Applicable Chambers</th>
</tr>
</thead>
<tbody>
<tr>
<td>24+ without pavement</td>
<td>32,000</td>
<td>High Capacity H-20 Chamber</td>
</tr>
<tr>
<td>12</td>
<td>16,000</td>
<td>All Chambers</td>
</tr>
<tr>
<td>6</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Note: For shallow cover applications (6" to less than 12" of cover) wheeled vehicles are not permitted over chambers during installation. Please see Table 3 for appropriate PSI rated tracked vehicle for shallow cover applications.

TABLE 3: MAXIMUM ALLOWABLE PSI FOR TRACKED VEHICLES AT VARIOUS COVER DEPTHS

<table>
<thead>
<tr>
<th>Fill Depth (inches over chamber)</th>
<th>Maximum Load (PSI)</th>
<th>Applicable Chambers</th>
</tr>
</thead>
<tbody>
<tr>
<td>12+</td>
<td>10</td>
<td>All Chambers</td>
</tr>
<tr>
<td>6</td>
<td>10</td>
<td>All Chambers</td>
</tr>
</tbody>
</table>

Note: Do not use wheeled vehicles, such as tri-axles or dump trucks to deliver or distribute fill over the system area.
Installation Instructions for Commercial/Cluster Systems

Before You Begin

Infiltrator Systems chambers can be installed in a number of different design configurations for onsite wastewater treatment systems (OWTS), including trenches, pressurized mounds and beds. The most common design configurations for large commercial/cluster systems are beds as well as current manufacturer’s instructions. There are many ways to construct a bed system, and typically the contractor determines the means and methods. Chambers may only be installed according to state and local regulations, as well as current manufacturer’s installation instructions. Please refer to the installation instructions below for information pertaining to manufacturers recommended OWTS bed installations.

Note: The onsite system area is not to be used as staging area for construction equipment or materials before or after construction of the system. Temporary fencing, warning tape, and appropriately located signs are commonly used to prevent unauthorized traffic from entering the construction areas.

Please note the following requirements to assure proper construction:

- Infiltrator Systems, Inc. (ISI) recommends contractors obtain ISI’s most current installation instructions and local onsite wastewater rules and regulations prior to system installation.
- All illustrations and photographs are examples of typical situations. Actual designs may vary. Be sure to follow the designer’s plans.
- It is the ultimate responsibility of the designer to assure that the Onsite Wastewater Treatment Systems’ design is in full compliance with all applicable rules and regulations. ISI’s products must be designed and installed in accordance with the State/County and ISI’s minimum requirements. Failure to do so will void the limited warranty.
- Contact local underground utility companies prior to construction.
- The State/County Health Agency and/or Project Designer must approve all ISI chamber designs.
- Per regulatory requirements, a soil evaluation is required to properly size and site the systems.
- Check chambers for shipping damage prior to installation. Units that are damaged must not be installed. Contact ISI immediately upon discovery of any damage.
- The contractor should refer to ISI’s installation instructions for Tables of Acceptable Vehicle Loads (Tables 2 and 3) at various depths of cover.
- Install erosion and sediment control measures to protect the onsite wastewater treatment and disposal system during all phases of site construction per local codes and designer’s specifications.

Excavating and Preparing the Site

Note: It is not recommended to install systems in wet conditions or in overly moist soils, as this causes machinery to smear the soil interface which can affect system performance.

1. Stake out the location of the bed and set the elevations of the tanks, pump chamber (if required), pre-treatment devices (if required), piping, and bed bottom. Install sedimentation and erosion control barriers as necessary.
2. Excavate and level the designated area. Be sure to excavate at least one extra foot around perimeter to allow for proper fit and ease installation.
3. If required, be sure to dig through any restrictive layer to the more suitable soils. Remove any debris from the bed walls.
4. Rake the bottom and sides if smearing has occurred while excavating. Verify the bottom of the bed is level using a transit, laser or level.
5. Prepare the chamber bed’s sub grade soil as outlined in the designer’s plans.

Specified Fill Material

1. If a specified fill material is required, the fill should be placed in lifts not exceeding 6” to 12”.
2. Lifts should be compacted using a vibratory plate/roller, construction equipment, or approved equivalent.
3. The fill material, as a minimum, should meet state and local specifications. However, sands with less than 5% passing the U.S. #200 sieve or meeting the ASTM C-33 concrete sand specifications are usually acceptable.
4. After the fill has been placed and compacted, verify the bottom of the bed is level using a transit, laser or level.
Installation Instructions

Preparing the End Cap

1. With a utility knife start the tear-out seal at the appropriate diameter for the inlet pipe. The seal allows for a tight fit for 3-inch, 4-inch SDR35 and 4-inch SCH40 pipe. A 2-inch line can be installed by using an appropriately sized hole saw to cut an opening in the end cap.

*Note: Pipe size may very according to state/county regulations or designer specifications.*

2. Pull the tab on the tear-out seal to create an opening on the end cap.

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

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

5. Construct a manifold to inlet each row of chambers. A d-box may be used if required by code or designer preference.

*Note: It is sometimes easier to install the chamber bed before constructing the manifold. If installing the chambers first in a gravity fed system, it is critical to ensure there is proper fall from the tank to accommodate a manifold.*

6. Once piping network is complete, insert pipe into the end cap at the beginning of each row of the bed.

7. Attach a closed end cap onto the outlet end of the chamber. Do not cut an opening on the closed or outlet end cap.

*Note: Looping the outlet end of the bed may be required by state/local code or specified by design. Infiltrator Systems recommends drilling a hole in the end cap at the specified invert height.*

8. Insert the loop manifold through the end cap and determine that the manifold is level before backfilling the system.

Installing the Quick4 Chambers

1. Construct the chamber bed by joining chambers. Place the inlet end of the first chamber over the back edge of the end cap.

2. Lift and place the end of the next chamber on to the previous chamber by holding it at a 90-degree angle. Line up the chamber end between the connector hook and locking pin at the top of the first chamber. Lower to the ground to connect the chambers.

*Note: When the chamber end is placed between the connector hook and locking pin at a 90-degree angle, the pin will be visible from the back side of the chamber.*

3. Continue connecting the chambers until the first row is completed.

4. Check the first row of chambers to be sure that it is level.

5. Continue connecting chambers until the bed is complete. As the chambers are installed, verify that they are level, straight and maintain the required separation distance between each row of chambers.

*Note: Separation distance between chamber rows varies per code. Infiltrator Systems recommends 6 inches of separation, but it is not required.*

6. The last chamber in the row requires an end cap. Lift the end cap at a 45-degree angle and insert the connector hook through the opening on the top of the end cap. Applying firm pressure, lower the end cap to the ground to snap it into place. Do not remove the tear out seal if ends are not to be connected. Repeat this step for each row in the bed.

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Call Infiltrator Systems, Inc. at 1-800-221-4436 or visit our website at www.infiltratorsystems.com for technical and product information.
Installation Instructions

7. To ensure structural stability, fill the sidewall area by pulling soil in from the sides of the bed with a shovel or by placing fill material with a backhoe or excavator bucket.

8. Continue to carefully anchor chambers by ladling fill material between the chamber rows making sure not to dislodge the units. Be sure the fill extends above the louvers a minimum of two inches.

Note: Only drive over the system with a tracked vehicle.

Note: Do not drive over the chambers until a minimum of 12" of fill is placed above the chambers. See Table 2 for Acceptable Vehicles Loads. For rows not accessible from the edge of the bed, wait until a majority of the chambers are covered with 6" of fill before stabilizing middle rows (for tracked vehicles only).

9. Pack down the fill by walking along the sidewalls of the chambers as this helps to give better structural support. In wet conditions, silty or clay soils, do not walk in the sidewalls.

Installing Optional Inspection Ports

1. With a hole saw, drill the pre-marked area in the top of the chamber to create a 4-inch opening.

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

Note: The sleeve will accommodate a 4-inch SCH 40 pipe.

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. For better protections, a valve box may be installed to place the inspection port below grade.

Covering the System

Before backfilling, the system must be inspected by a health official or as state and local codes require.

1. Backfill the chamber system by pushing or ladling the fill material onto the units with a tracked vehicle being careful not to shift the chambers. Large rocks and organic matter such as roots, stumps, etc. must not be part of the backfill material.

Note: For large bed systems that can not be filled from the sides, use a light tracked vehicle making sure to maintain a minimum cover of 6" between the chambers and tracks at all times. For examples of acceptable vehicles, maximum wheel loads and maximum ground pressure limits, please see the Table 2 and Table 3 on page 14 or contact Infiltrator Systems.

Note: Do not use wheeled vehicles, such as tri-axles or dump trucks to deliver or distribute fill over the system area.

Note: If allowed by code, chambers can be installed with a minimum of 6" of cover using light tracked vehicles. A maximum of 4 feet of cover is allowed for bed systems.

2. Leave several inches of soil above the required amount for settling and to divert runoff water from the system.

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

Note: The leachfield area should not be used as a construction staging area or materials storage area before or after completion of the system.
High Capacity H-20 Chamber Systems for Under Parking Applications

Infiltrator Systems does not recommend installing onsite systems beneath pavement or where vehicle parking is anticipated. Research collected on this issue has been inconclusive, however performance problems may arise due to the decreased oxygen transfer through the soil and increased soil compaction during construction. Alternative areas that are not subjected to traffic should be considered for installing septic leachfields. Even in non-paved areas, the compaction of the overburden from vehicle traffic restricts the ability of the soil to diffuse oxygen as well as changing the soil structure.

Balancing available oxygen and organic loading facilitates aerobic conditions. Utilizing practices such as pretreatment units and venting may help to promote aerobic conditions.

If a portion of the septic system must be installed beneath a parking surface due to site constraints, the instructions and policies in this document must be followed. Failure to follow this policy releases Infiltrator of all liability or structural warranties.

Note: The structural integrity of the High Capacity H-20 chamber is not compromised in these applications when constructed in accordance with manufacturer’s design and installation guidelines.

If you have any questions regarding the installation of Infiltrator chamber systems in under parking applications, please call Infiltrator Systems at 1-800-221-4436.

Chamber Selection
The High Capacity H-20 chamber is the only Infiltrator chamber warranted to be installed in traffic applications. High Capacity H-20 chambers used in under parking applications have passed an H-20 loading of 32,000 pounds per axle with a minimum of 18 inches of properly compacted cover (excluding the pavement) as specified in the installation requirements.
HIGH CAPACITY H-20 CHAMBERS
SIDE AND END VIEWS
(Not to scale)

END PLATE
(Not to scale)

Detail Drawing

HIGH CAPACITY H-20 CHAMBER
CROSS SECTION (TYP)
(Not to scale)

Note: Only Infiltrator Systems High Capacity H-20 Chambers can be installed in this type of application.
Note: For more information on this specific application go to www.infiltratorsystems.com or call 1-800-221-4436.
Installation Instructions for Traffic Applications

Before You Begin

It is important to note that the High Capacity H-20 chamber is the only Infiltrator chamber warranted to be installed in traffic applications. When installed using the following installation instructions, the chambers can sustain vehicle loads of up to 32,000 lbs (H-20) per axle.

Like non-traffic bed systems, the soil and site conditions must be approved prior to installation. Be sure that a thorough site evaluation is conducted to determine the proper size and location of the system before proceeding with the installation.

Note: The onsite system area is not to be used as staging area for construction equipment or materials before or after construction of the system. Temporary fencing, warning tape, and appropriately located signs are commonly used to prevent unauthorized traffic from damaging sensitive soils.

Note: Due to the installation of stone on the bottom of the bed, system sizing in parking applications must not include any reduction in the absorption area.

Please note the following requirements to assure proper construction:

- Contact local underground utility companies to locate all utilities prior to construction.
- Check all chambers for shipping damage before installation. Units that have been damaged should not be installed. Contact Infiltrator Systems immediately upon discovery of any damage.
- For a large bed that cannot be filled from the sides, Infiltrator Systems recommends using a light-weight tracked vehicle (ground pressure of tracks must not exceed 10 psi for 6’ to 12’ of cover. For examples of acceptable vehicles, maximum wheel loads and maximum ground pressure limits, please see the Tables 2 and 3 on page 14.
- ISI’s requirements for systems with a pavement design (asphalt, concrete pavers, etc.): minimum cover is 18” excluding pavement; maximum cover is 96” including pavement. Note: Only the High Capacity H-20 chamber is permitted for use in traffic applications.
- A minimum of 6 inches of gravel must be maintained beneath the tracks at all times.
- Washed, crushed stone must be between 1⅜” to 2” in size. Rounded or recycled stone is not acceptable.
- A well-graded granular soil must be used for backfill to maximize load carrying capacity.
- Sandy soils have special installation requirements. Refer to Appendix A on page 22 for those requirements.
- For gravity distribution, a distribution pipe is not required to run the length of the chambers.

Excavating and Preparing the Site

Note: Do not install system in wet conditions or in overly moist soils, as this causes machinery to smear the soil

1. Locate all underground utilities.
2. Stake out the location of the bed and set the elevations of the tank, pump chamber (if required), pre-treatment devices (if required), piping, and bed bottom. Install sedimentation and erosion control barriers as necessary.
3. Excavate and level the designated area.
4. Rake the bottom and sides if smearing has occurred while excavating. Verify the bottom of the bed is level using a transit, laser or level.
5. Prepare the chamber bed’s sub grade soil as outlined in the designer’s plans.
6. Place a minimum 3-inch layer of 1½ to 2 inch washed, crushed stone over the entire bottom surface of the bed. (Refer to the typical cross section of a High Capacity H-20 Infiltrator Chamber System detail on page 19.)
7. Compact the stone using at least two perpendicular passes of the vibratory roller with full dynamic force applied to achieve a flat surface. (Maximum gross vehicle weight of 12,000 lbs and a maximum dynamic force of 20,000 lbs.)

Specified Fill Material

Note: If installing the system in loose sandy soils, refer to Appendix A on page 22.

1. If a specified fill material is required, the fill should be placed in lifts not exceeding 6 to 12 inches. The compaction of the fill should meet a minimum density equivalent to 95 percent of the soils Maximum Standard Proctor Density Value (ASTM-D698).
2. The fill material, as a minimum, should meet state and local criteria. However sands with less than 5% passing the U.S. #200 sieve are usually acceptable provided their saturated hydraulic conductivity (after compaction) is greater than 5 feet per day.
3. Compact the fill using a large piece of machinery (i.e. backhoe or bulldozer) or a vibratory roller with its full dynamic force applied to achieve a flat surface. (Maximum gross vehicle weight of 12,000 lbs and a maximum dynamic force of 20,000 lbs.)
4. After the fill has been placed and compacted, verify the bottom of the bed is level using a transit, laser or level.

Preparing the PosiLock End Plates

1. With a hole saw, cut an opening for the inlet pipe using one of the pre-marked circles on the end plate as a guide. Pre-marked circles allow for 4-inch corrugated, 4-inch SDR 35, 4-inch SCH 40, and 3-inch and 2-inch pressure dosing pipe.

Note: Pipe size may very according to state/county regulations or designer specifications.
Installation Instructions for Traffic Applications

2. Attach end plate to the inlet end of the chamber by lining up the locking hubs with the corresponding chamber end. Apply firm pressure to lock the hubs in place on one side of the chamber and then the other.

   Note: The end plate is clearly marked “Inlet Side Toward Chamber” to ensure proper installation.

3. At the inlet end of the end plate, insert the appropriate diameter pipe into the previously drilled hole. Fasten the pipe in place with a 2-inch screw to secure it to the end plate. (End plates are required only at the beginning and end of each row of chambers. They are reversible to fit either end of the chamber.)

   Note: The end plate is designed so effluent will flow in through the pipe and corresponding inlet hole and spill out of the opening on the other side. When inserting the inlet pipe, it will only extend into the end plate one inch before reaching a stop.

Installing the System

1. Install piping per plan. A d-box or manifold may be installed if allowed/required by code.

   Note: For pressurized systems, it may be easier to install the piping before constructing the chamber bed.

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

3. Set the invert elevation at the appropriate height by measuring from the bottom of the bed to the bottom of the inlet. Invert height will vary depending on which chamber model is used. Precisely measure the invert height on the end plate prior to setting the invert elevation.

   Note: Scour controls, such as splash pads, may be required by state/county regulations or by the designer if inlet flows exceed specified volumes. Locate and install scour control measures if required per site plan.

4. Construct the chamber bed by joining chambers length wise in rows (if possible, be sure chamber placement does not exceed the reach of the construction equipment used to place fill).

5. To connect the chambers, lift and place the end of the next chamber onto the previous one at a 45-degree angle. Line up the notches on the center end of the chamber and lower it to the ground to engage the interlocks.

6. Continue connecting the chambers until the first row is completed.

7. Check the first row of chambers to be sure that it is level.

8. Continue connecting chambers until the bed is complete. As the chambers are installed, verify that they are level.

9. Determine that the chamber rows are parallel following the steps above. Keep the required distance between each row of chambers.

   Note: Separation distance between chamber rows varies per code. If possible, Infiltrator Systems recommends 6 inches of separation.

10. The last chamber in the row requires an end plate. Attach a closed end plate onto the outlet end of the chamber. Do not cut an opening in the closed or outlet end plate. The existing opening on the end plate must face outward when installed on the closed or outlet end of the chamber. Repeat this step for each row in the bed.

   Note: Looping the outlet end of the bed may be required by state/local code or specified by design. Infiltrator recommends drilling a hole in the end plate at the specified invert height.

11. Insert the loop manifold through the end plate and determine that the manifold is level before backfilling the system.

Covering the System

1. To ensure structural stability, carefully anchor chambers by ladling approved gravel between the chamber rows making sure not to dislodge the units. Be sure the gravel extends above the louvers a minimum of two inches.

2. Place 6 inches of stone over the top of the chamber system, filling the space between the chambers.

   Note: For a large bed that cannot be filled from the sides, a light-tracked vehicle must be used. The ground pressure of the tracks must not exceed 10 psi for 6” to 12” of cover. Be sure to maintain a 6-inch minimum of compacted cover beneath the tracks at all times. Please see the Tables 2 and 3 on page 14.

3. Compact the stone with a walk-behind plate compactor or vibratory roller, not to exceed the dynamic force of 10,000 lb.

4. Cover the entire installation area with filter fabric by taking it from the perimeter and laying it over the top of the stone. Make sure that it overlaps onto itself by at least 2 feet.

5. Backfill in a 6-inch lift of well-graded, granular soil over the top of the filter fabric. Large rocks and organic matter such as roots, stumps, etc. must not be part of the backfill material.

   Note: A well-graded soil is a soil that contains an even distribution of particle sizes, ranging from silt through sand to gravel, with a maximum of 10% fines (soil passing the #200 sieve).

6. Compact the backfill after this and each additional lift to a minimum of 95% of the modified Proctor density. Use a vibratory roller with maximum gross vehicle weight of 12,000 lb and a maximum dynamic force of 20,000 lb.

7. Lay ISI 14,000 or Tensar BX1100 geogrid over the 6 inches of compacted backfill. If two rolls are to be placed side-by-side, or end-to-end, overlap them a minimum of 2 feet.

   Note: Geogrid must extend at least 5 feet beyond the footprint of the chambers. Refer to manufacture’s specifications for other installation guidelines.

8. Continue to backfill in 12-inch lifts until the specified height of the system is achieved.

   Note: Place the backfill in 6-inch lifts in sandy soil, compacting after each lift. Refer to special installation requirements for sandy soil.


   Note: The bed must be protected from traffic until it is paved.
Appendix A

Technical Guidance Note

_Exfiltration Trenches Over Very Loose to Loose Sands._
Prepared for Infiltrator Systems Inc. by Dr. Devo Seereeram, Hydro-Geotechnology Consultant

General Information

Loose cohesion less (sandy) soils may undergo consolidation due to the hydraulic stresses created by the rapid collection and concentration of stormwater runoff in exfiltration trenches. If this type of settlement occurs, it is usually immediate (not time-dependent) and is evident after the trench receives its first significant slug of water. After this initial settlement, the soil particles become arranged in a stronger configuration and there is usually little or no additional settlement. This mechanism of settlement is by no means an unusual phenomenon in very loose sandy soils, such as is sometimes encountered on the well-drained ridges of Florida. Indeed, it is a common practice of contractors to address this condition by flooding foundation sub grades to achieve compaction where the water table is deep and the soils are loose and sandy.

Engineers can assess the susceptibility of a site to this type of settlement by considering the following combination of risk factors:

1. Hydrologic Soil Group "A".
2. Natural soil profile of uncemented sands (with less than 5% by weight passing the U.S. No. 200 Sieve) to depths of over six feet below land surface. The same also applies for uncompacted sand backfill.
3. Deep water table (over six feet below land surface).
4. Very loose to loose soil conditions as manifested by Standard Penetration Test (SPT) below counts in the range of one to six.
5. Runoff from a large impervious contributing drainage area concentrated in a relatively narrow trench.

If preliminary review of the site data indicates that there is a potential for settlement due to hydraulic forces, Cone Penetration Tests (CPT) or Standard Penetration Tests (SPT) should be used to characterize the density of the soil profile. As a minimum, continuous testing should be performed in the uppermost ten feet of the soil profile.

Suggested Solution

If the above factors reveal that there is a risk of hydraulic-related settlement, the trench should be flooded continuously for a minimum period of eight to ten hours, prior to final grading of the cover. This flooding should simulate worst-case rainfall runoff conditions and eliminate generalized or localized subsidence of the overlying pavement. Settlement of the rigid elements in the trench should be monitored during the flooding and for about a week thereafter, before final grades are established over the trench. This memorandum does not address the possibility of sinkhole formation due to localized recharge. This information is presented for general guidance only and a professional geotechnical engineer should be consulted for project-specific recommendations.
Infiltrator Systems, Inc. Limited Warranty

(a) The structural integrity of each chamber, end cap, end plate and 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.

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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.