Oregon

Department of Environmental Quality

John A. Kitzhaber, MD, Governor

Western Region Eugene Office
165 East 7th Avenue, Suite 100
Eugene, OR 97401
(541) 686-7838
FAX (541) 686-7551
TTY 711

February 17, 2011

David Lentz, PE
Regulatory Director
Science & Government Affairs
Infiltrator Systems Inc.
6 Business Park Rd.
P.O. Box 768
Old Saybrook, CT 06475

RE: Application(s) for IM-1060 septic tank and IM-1060 dosing septic tank
Final Review-Approved

Dear Mr. Lentz,

The Oregon Department of Environmental Quality (Department) has received plans, specifications and other associated materials you provided for septic tank configuration(s) manufactured by Infiltrator Systems, Inc. This letter is to inform you that the following tank(s) can be installed in the State of Oregon, based on your certification that the following tank(s) complies with all applicable Department rules and regulations:

- IM-1060 Septic Tank
- IM-1060 Dosing Septic Tank

The plans were stamped by John Reese Leavitt, from Leavitt & Associates Engineers, Inc. The approved plans, installation manual and riser connection guidance document are attached to this letter. Infiltrator Systems is authorized to manufacture and distribute the above-described tank(s) for use in onsite wastewater treatment systems in Oregon until further notice, provided the following conditions are met:

1. The tank must be manufactured in compliance with the Department's rules and the plans and design specifications provided. Any deviations to the approved plans and specifications dated February 16, 2011 are not permitted unless authorized in writing by the Department.

2. Prior to shipment from the manufacturing facility, the inlet and outlet tees in the septic tank and the inlet tee in the dosing septic tank, respectively shall be pre-drilled.

3. You are to deliver to each purchaser, a complete tank, including tees, gaskets, risers and lids. If the tank manufacturer does not fully assemble the tank, as with a two piece tank, the manufacturer must provide the bonding and sealing agents and an instruction manual for assembling the tank.

4. Each tank listed above must be manufactured to meet the structural specifications described in the plans and are only acceptable for use at locations where top loading will not exceed the engineering design parameters. Tanks proposed for use at other locations require an engineering analysis of the potential top loading, and may require preparation of site specific plans and specifications.

5. The minimum burial depth above the top of the tank is six (6) inches. The maximum burial depth above the top of the tank is thirty-six (36) inches.

6. The outlet tee in the septic tank was identified as compatible for specific effluent filters and includes the Polylock PL-68 and Zabel A1800 effluent filters. Other outlet tees and effluent filters are permissible,

provided they are compliant with applicable Oregon Administrative Rule (OAR), Chapter 340, division 73 requirements.

7. The riser connection guidance document identifies the following 24-inch (600mm) diameter riser products, from the following manufacturers as compatible with the IM-1060 tank:
    - Infiltrator TW Riser
    - EZ set by Infiltrator
    - Tuf-Tite® Corporation
    - PolyLok™ Inc.

    The following 24-inch (600mm) diameter pipe products are also compatible
    - IPEX Ultra-Rib™ PVC pipe
    - Corrugated high density polyethylene (HDPE) pipe

8. It is the responsibility of Infiltrator Systems, Inc. to ensure that each tank delivered to the construction site is watertight. Each tank must be water-tight tested in accordance with Oregon Administrative Rule (OAR) 340-073-0025(3) after complete installation at the job site.

9. An installation manual, on waterproof paper or equivalent, must be provided with each tank. The manual must describe how to properly install the tank, how to properly connect the risers, gaskets, lids, effluent sewer lines, water tight testing procedures, tank back fill, and any other special precautions and limitations.

10. Each tank must be marked with the liquid capacity, date of manufacture, burial depth limits, and either your full business name or the assigned number 580.

This approval should not be construed in any way as the Department's endorsement of this product or any advertising. Moreover, the Department is not responsible for any situation which may result in the improper use of your product.

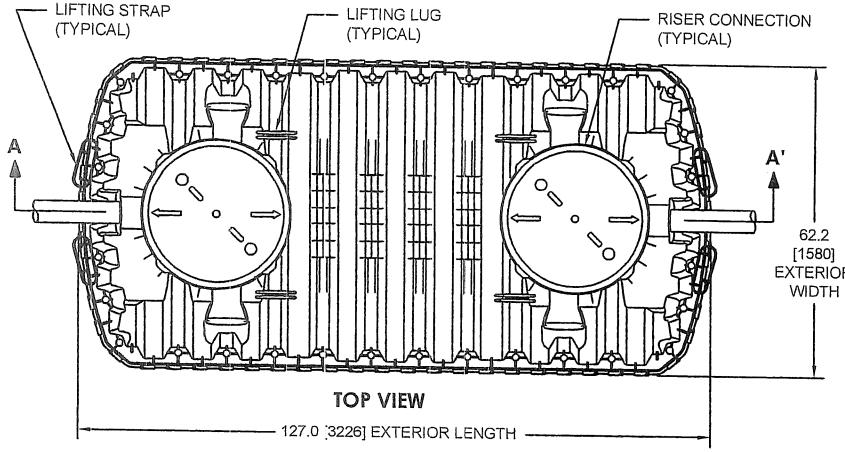
If you have any questions about this letter, please feel free to contact Dan Wiltse at (541) 687-7436.

Sincerely,

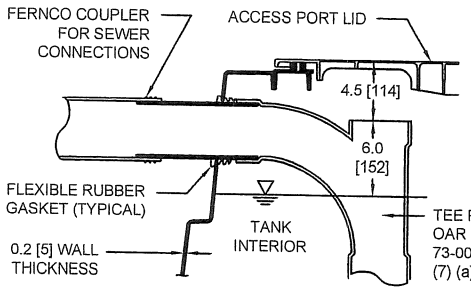
Randy Trox, Acting Manager
Water Quality/ Onsite

Enc. Approved Plans
Installation manual
Riser Connection Guidance

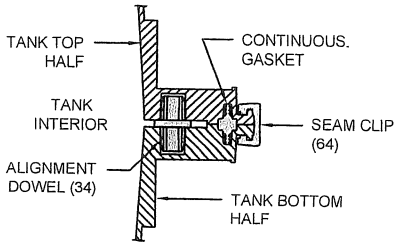
Ec: All Contract County Offices (W/ enclosures)
All DEQ Direct Services Offices (W/ enclosures)



TOP VIEW



Ⓟ PIPE PENETRATION SECTION DETAIL



Ⓢ MID-HEIGHT SEAM SECTION DETAIL

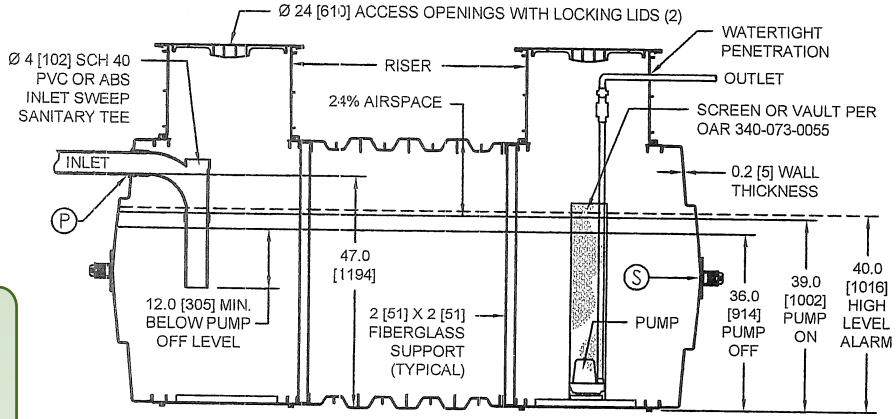
TANK EXTERIOR	
LENGTH	127.0 [3226]
WIDTH	62.2 [1580]
HEIGHT	54.7 [1389]

TOTAL CAPACITY	1247 GAL [4720 L]
PRIMARY VOLUME*	1142 GAL [4323 L]

*BELOW 47-INCH INLET INVERT

STRUCTURAL DESIGN LOADS	
HYDRAULIC	62.4 pcf
HYDROSTATIC	62.4 pcf
EARTH	600 psf
WHEEL-LOAD	2500 lbs

WITH 4 FT OF COVER
TANK **IS NOT** TRAFFIC RATED



SECTION A - A'

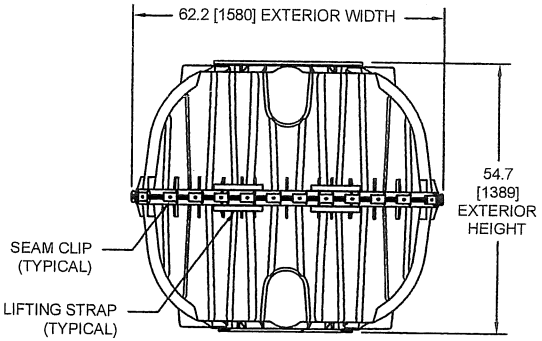
DOSING ASSEMBLIES PER OAR 340-073-0055:

PUMP ON, OFF AND HIGH LEVEL SWITCH HEIGHTS SHOWN FOR FOUR BEDROOM RESIDENCE WITH MAXIMUM DESIGN DAILY FLOW OF 450 GALLONS PER DAY.

HIGH LEVEL SWITCH CONNECTED TO AUDIBLE AND VISUAL ALARM.

MINIMUM 33% DESIGN FLOW STORAGE PROVIDED BETWEEN HIGH LEVEL ALARM SWITCH AND INLET INVERT (150 GAL. REQUIRED, 172 GAL. PROVIDED).

MAXIMUM 20% DESIGN FLOW PER PUMP DOSE (90 GAL. MAX. ALLOWABLE, 78 GAL. PROVIDED).

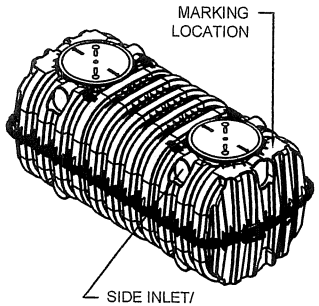


END VIEW

NOTES:

1. TANK NOT RATED FOR VEHICULAR TRAFFIC, A 2500-lb WHEEL LOAD IS THE MAXIMUM CAPACITY.
2. ALL RESIN USED IS COMPLIANT WITH IAPMO STANDARDS. THE TANK WILL BE IAPMO CERTIFIED.
3. TANK MARKINGS INCLUDE: MANUFACTURER NAME, MODEL NUMBER, DATE OF MANUFACTURE, LIQUID CAPACITY, MAXIMUM BURIAL DEPTH, INLET, AND OUTLET.
4. EXTERIOR OF ACCESS OPENING LID INCLUDES THE FOLLOWING WARNING WRITTEN IN ENGLISH, FRENCH & SPANISH: "DANGER DO NOT ENTER: POISON GASES."
5. MAXIMUM BURIAL DEPTH IS 36 in [914 mm] MINIMUM BURIAL DEPTH IS 6 in [152.4 mm].
6. ALL DRAWING DIMENSIONS IN INCHES [MILLIMETERS] UNLESS OTHERWISE NOTED.
7. SEE INSTALLATION INSTRUCTIONS PROVIDED AT: www.infiltratorsystems.com.
8. A WATERTIGHTNESS TEST IS REQUIRED PER OAR 340-0730023(3). TESTING SHALL BE CONDUCTED BY FILLING THE TANK TO A POINT AT LEAST 2 INCHES ABOVE THE POINT OF REFER CONNECTION TO THE TOP OF TANK. DURING THE TEST THERE MAY BE NO MORE THAN A ONE GALLON LEAKAGE OVER A 24-HOUR PERIOD.
9. INLET AND OUTLET FITTINGS MUST BE INSTALLED PER OAR 340-73-0025(7).
10. THE RISER COVER IS LESS THAN 50 POUNDS.
11. REFER TO INSTALLATION INSTRUCTIONS FOR EXCAVATION, BEDDING, AND BACKFILLING REQUIREMENTS.
12. ANTI-BUOYANCY CONTROL MEASURES MAY BE REQUIRED TO RESTRAIN THE TANK IN CONDITIONS WHERE GROUNDWATER IS HIGHER THAN 36 in [914 mm] ABOVE THE BOTTOM OF THE TANK AND BACKFILL OVER THE TANK WILL BE LESS THAN 16 in [406 mm] DEEP. REFER TO TANK INSTALLATION INSTRUCTIONS FOR CONTROL MEASURE OPTIONS AND DETAILS.

ISOMETRIC VIEW



REGISTERED PROFESSIONAL ENGINEER
13076
OREGON
SEPT. 19, 1985
JOHN REESE LEAVITT

EXP. 12-31-2010
11-1-2010

APPROVED
By Dan Wiltse at 2:58 pm, Feb 16, 2011

...ISL_Products/Tanks/Injection-Molded Tank/1060 tank/OR 1060-single chamber septic dosing tank

LEAVITT & ASSOCIATES ENGINEERS, INC.
STRUCTURAL • CIVIL
SURVEYING
1324 FIRST STREET SOUTH, NAMPA, IDAHO 83651
PHONE (208)463-0333/463-7670 FAX (208)463-0040

INFILTRATOR® septic tanks

Infiltrator Systems Inc.
6 Business Park Rd. Old Saybrook, CT 06475
(800) 221-4436

Oregon 1060-Gallon Single Chamber Dosing Septic Tank

Drawn by: MS	Checked by: DL	Date: 10-26-10
Scale: Not to scale	Drawing: OR 2A	Sheet: 1 of 2

RISER AND LID CONNECTION

DETAILED PRODUCT SPECIFIC RISER AND LID CONNECTION GUIDANCE IS AVAILABLE FROM INFILTRATOR SYSTEMS AT:

www.infiltratorsystems.com

THE 1060-GALLON TANK RISER CONNECTION GUIDANCE DOCUMENT PROVIDES A FULL DESCRIPTION OF THE CONNECTION TYPE AND METHOD FOR EACH COMPATIBLE RISER.

COMPATIBLE RISER AND LID PRODUCTS

THE INFILTRATOR 1060-GALLON TANK IS COMPATIBLE WITH 24 in (600 mm) DIAMETER RISER AND LID PRODUCTS FROM THE FOLLOWING MANUFACTURERS:

- TW RISER SYSTEM BY INFILTRATOR
- TUF-TITE CORPORATION
- POLYLOK INC.

THE FOLLOWING 24 in [600 mm] DIAMETER PIPE PRODUCTS ARE ALSO COMPATIBLE WITH THE INFILTRATOR 1060-GALLON TANK WHEN USED WITH AN INFILTRATOR PIPE ADAPTER RING:

- IPEX ULTRA-RIB POLYVINYL CHLORIDE (PVC) PIPE - USE THE INFILTRATOR LID, POLYLOK 24 in [600 mm] HEAVY DUTY COVER, 24 in [600 mm] JACKEL SEPTIC TANK RISER COVER, OR EQUIVALENT PRODUCT AS A LID FOR THE IPEX PVC PIPE

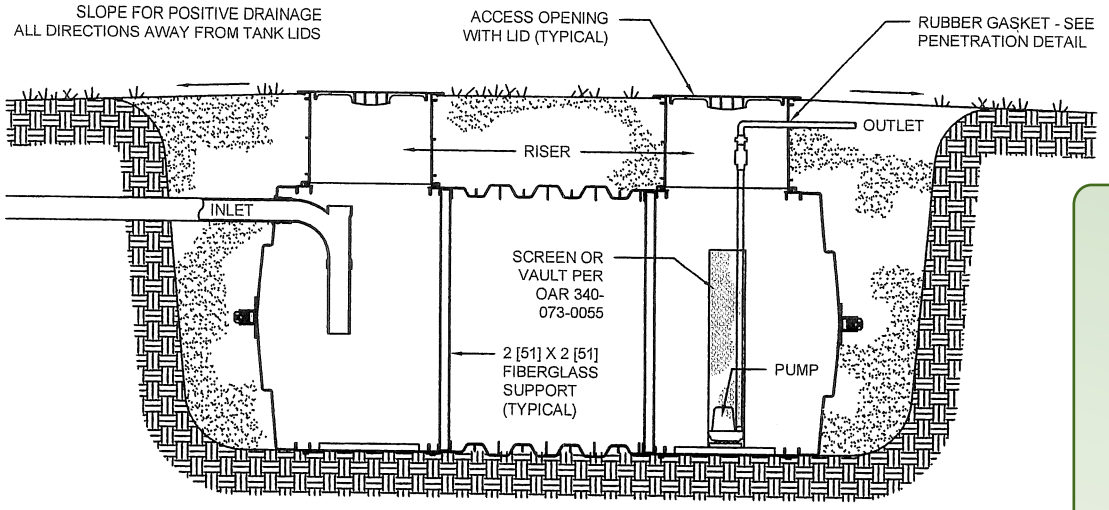
- CORRUGATED HIGH-DENSITY POLYETHYLENE (HDPE) PIPE - USE THE INFILTRATOR LID, EZSET LID BY INFILTRATOR, POLYLOK 24 in [600 mm X 9.5 mm] HEAVY DUTY COVER, ROTOSOLUTIONS 24 in [600 mm] SEPTIC LID, 24 in [600 mm] JACKEL SEPTIC TANK RISER OR EQUIVALENT PRODUCT AS A LID FOR THE HDPE PIPE.

RISER CONNECTION AT TANK - GENERAL PROCEDURES

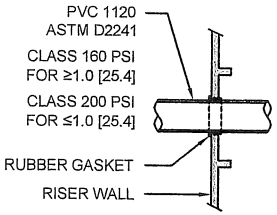
1. APPLY SEALANT BETWEEN RISER PARTS AND TANK AS SHOWN IN INFILTRATOR SYSTEM INC.'S 1060-GALLON TANK RISER CONNECTION GUIDANCE DOCUMENT.
2. ENSURE THAT ALL CONNECTION SURFACES ARE CLEAN AND DRY.
3. THE INSTALLER MUST USE DISCRETION IN DETERMINING THE BEAD SIZE AND AMOUNT OF SEALANT NEEDED TO CRAFT AND MAINTAIN A WATERTIGHT SEAL.
4. KEEP SEALANT AT A TEMPERATURE THAT MAINTAINS ITS WORKABILITY. KEEP IT FREE FROM DIRT AND DEBRIS THAT MAY COMPROMISE A WATERTIGHT SEAL.
5. WHEN APPLYING SEALANT TO A PART, ENSURE CONTINUOUS APPLICATION TO AVOID GAPS THAT MAY CAUSE LEAKS. APPLY AN ADEQUATE QUANTITY TO ENSURE A SEALED CONNECTION.
6. PHYSICALLY PRESS THE SEALANT ONTO THE PART TO ENSURE THAT IT STAYS PROPERLY POSITIONED DURING ASSEMBLY.
7. ENSURE THAT ALL SCREWS SUPPLIED WITH RISER PRODUCTS ARE INSTALLED FOR CONNECTION OF ADAPTER RINGS, RISERS AND LIDS.
8. DO NOT OVERTIGHTEN SCREWS. THIS MAY DAMAGE THE PLASTIC PARTS BEING CONNECTED, CAUSING THE SCREW CONNECTION TO FAIL. THIS MAY ALSO STRIP THE SCREW HEAD. USE TYPE 304 STAINLESS STEEL SCREWS.

WATERTIGHTNESS TESTING

1. CONDUCT WATER TIGHTNESS TESTING PER OAR 340-73-0025(3).
2. THE INSTALLER MUST TEST EACH TANK FOR WATERTIGHTNESS BY FILLING THE TANK TO A POINT AT LEAST 2 INCHES ABOVE THE POINT OF RISER CONNECTION TO THE TOP OF TANK.
3. DURING THE TEST, THERE MAY BE NO MORE THAN ONE GALLON OF LEAKAGE OVER A 24-HOUR PERIOD.



TANK AND RISER INSTALLATION



RISER PENETRATION GASKET DETAIL

REGISTERED PROFESSIONAL ENGINEER
13,076
OREGON
SEPT. 19, 1985
JOHN REESE LEAVITT

EXP. 12-31-2010
11-1-2010

APPROVED
By Dan Wiltse at 2:59 pm, Feb 16, 2011

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INFILTRATOR® septic tanks

Infiltrator Systems Inc.
6 Business Park Rd. Old Saybrook, CT 06475
(800) 221-4436

Oregon 1060-Gallon Single Chamber Dosing Septic Tank Riser Installation Configuration

Drawn by: MS	Checked by: DL	Date: 10-26-10
Scale: Not to scale	Drawing: OR 2B	Sheet: 2 of 2

Q:Technical Resources New/02--IS_Products/Tanks/Injection-Molded Tank/1060 Tank/OR 1060-single chamber septic dosing tank

Infiltrator 1060-Gallon Septic Tank Riser Connection Guidance Document

INFILTRATOR® septic tanks

APPROVED By Dan Wiltse at 3:20 pm, Feb 16, 2011

Before You Begin

This document provides recommended procedures for the connection of commercially available riser products to Infiltrator® Systems' (Infiltrator's) 1060-Gallon tank.

The intent of this document is to provide procedures for making the connection between the riser and tank. Once this connection has been made, the riser manufacturer's standard installation instructions should be used to complete the assembly.

Risers must be installed according to state and/or local regulations, which supersede the guidelines in this document. If unsure of the requirements for a particular site, contact the local health department or permitting authority.

Parts and Supplies

The parts and supplies necessary for installation of a riser system on an Infiltrator 1060-Gallon tank must be purchased separately from the tank. All parts and supplies are commercially available. Contact Infiltrator or the riser manufacturer for assistance obtaining parts and supplies.

General Guidelines

1. Complete riser assembly installation, including installation of adapter ring, riser(s), and lid prior to backfilling tank.

Note: Risers are to be connected to Infiltrator's access port connector ring (referred to herein as "Infiltrator connector ring"). The Infiltrator connector ring is a molded component of the tank body, and is the connection point for the riser component.

2. Ensure that all connection surfaces are clean and dry.

3. Sealant shall be ISI 1500 Adhesive Sealant or equivalent.

4. Sealants vary between manufacturers. Sealant identified herein represents a minimum recommendation. The installer must use discretion in determining the size and amount of sealant needed to craft and maintain a watertight seal.

5. Keep sealant at a temperature (at least 60° F/16° C) that maintains its workability. Keep it free from dirt and debris that may compromise a watertight seal.

6. When applying sealant to a part, ensure continuous application to avoid gaps that may cause leaks. Apply an adequate quantity to ensure a sealed connection.

7. Physically spread the sealant into the channel on the Infiltrator connector ring to ensure that it distributes properly during assembly.

8. Ensure that all screws supplied with riser products are installed for connection of adapter rings, risers, and lids. Insert screws only in prescribed locations.

9. Do not over tighten screws. This may damage the plastic parts being connected, causing the screw connection to fail. This may also strip the screw head. Be sure to insert screws in a "star" pattern, tightening opposite sides of the riser or pipe adapter.

Note: Use #14 x1¼-inch stainless steel screws

10. In addition to the measures shown in this document, additional sealant may also be applied to the exterior joint connection to help establish and maintain watertight connections.

Compatible Products

The Infiltrator 1060-Gallon tanks is compatible with 24-inch (600-mm) diameter riser products from the following manufacturers:

- Infiltrator TW Riser
- EZset by Infiltrator
- Tuf-Tite® Corporation
- PolyLok™ Inc.

The following 24-inch (600-mm) diameter pipe products are also compatible with the Infiltrator 1060-Gallon tank:

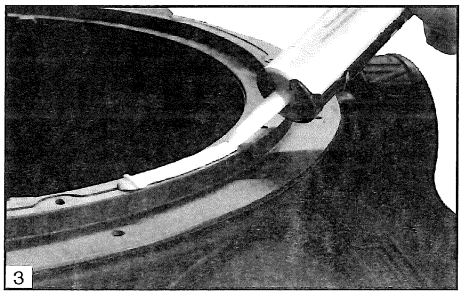
- IPEX Ultra-Rib™ PVC pipe
- Corrugated high density polyethylene (HDPE) pipe

Infiltrator TW Riser

1. Install riser assembly prior to backfilling tank.

2. Place the TW Riser over the Infiltrator connector ring and rotate the TW Riser to the proper alignment. Proper alignment is ensured when the indexing tabs on the bottom of the riser drop into the receiving slots of the Infiltrator connector ring and alignment arrows on the riser and tank are aligned. Note the proper alignment position and remove the TW Riser.

3. Apply ISI 1500 Adhesive Sealant in alignment with the factory-drilled screw holes in the channel on the top surface of the Infiltrator connector ring. The sealant thickness must be adequate to fill the gap beneath the TW Riser.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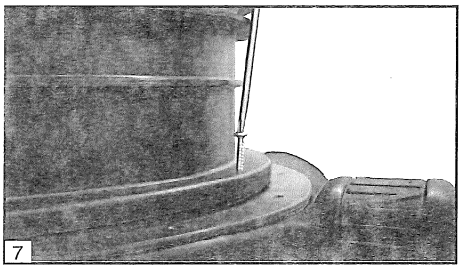
4. Invert the TW Riser and center over the Infiltrator connector ring in the proper alignment position determined in step 2.

5. Verify that the sealant remains properly aligned on EZset riser.

6. The 10 pre-drilled pilot holes on the riser should be aligned with the 10 receiving holes on the Infiltrator connector ring.

7. Fasten the TW Riser to the Infiltrator connector ring with 10 factory-supplied screws. If the factory-supplied screws are not available, use ten #14 x 1¼-inch (4.9 mm x 37 mm) stainless steel screws.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8. Tighten screws in a "star" pattern, tightening screws on opposite sides of the TW Riser. Repeat the star pattern at least

twice, without over tightening screws. This will compress the sealant to the tank evenly during fastening.

9. Connect additional TW Riser sections or the included Infiltrator lid as needed.

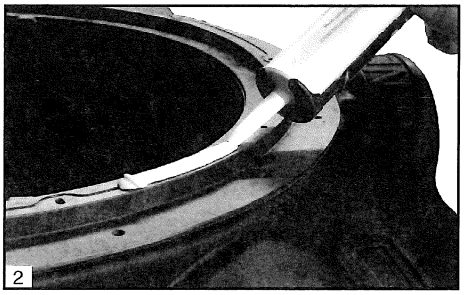
10. Backfill tank in accordance with Infiltrator's 1060-Gallon septic tank installation instructions.

11. Following tank backfilling, visually examine the riser to Infiltrator connector ring joint for damage resulting from backfill placement. Repair or replace if damaged.

EZset by Infiltrator Riser

1. Install riser assembly prior to backfilling tank.

2. Apply ISI 1500 Adhesive Sealant in alignment with the factory-drilled screw holes in the channel on the top surface of the Infiltrator connector ring. The sealant thickness must be adequate to fill the gap beneath the EZset riser.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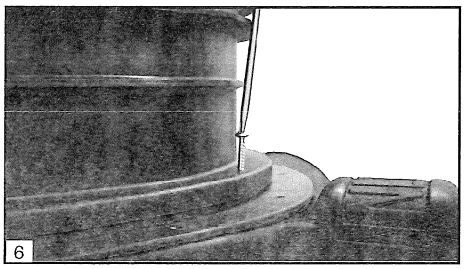
3. Invert the EZset riser and center over Infiltrator connector ring.

4. Verify that the sealant remains properly aligned on EZset riser.

5. Align the 10 pre-drilled pilot holes on the riser with the 10 receiving holes on the Infiltrator connector ring.

6. Fasten the EZset riser to the Infiltrator connector ring with 10 factory-supplied screws. If the factory-supplied screws are not available, use ten #14 x 1¼-inch (4.9 mm x 37 mm) stainless steel screws.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7. Tighten screws in a "star" pattern, tightening screws on opposite sides of the EZset riser. Repeat the star pattern at least twice, without over tightening screws. This will compress the sealant to the tank evenly during fastening.

8. Connect additional EZset riser sections or EZset lid as needed.

Note: Do not use the supplied Infiltrator tank lid, as it does not provide a watertight seal with the EZset riser. Instead, use EZset lid with the EZset riser.

9. Backfill tank in accordance with Infiltrator's 1060-Gallon septic tank installation instructions.

10. Following tank backfilling, visually examine the riser to Infiltrator connector ring joint for damage resulting from backfill placement. Repair or replace if damaged.

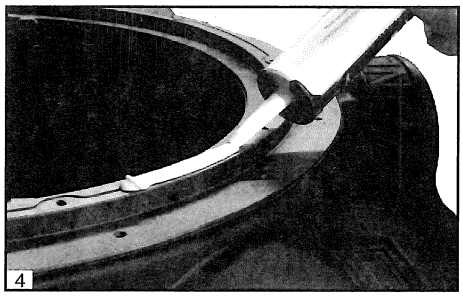
Tuf-Tite® Corporation Riser

1. Install riser assembly prior to backfilling tank.

2. Align Tuf-Tite adapter ring over Infiltrator connector ring and mark 10 evenly spaced pilot hole locations so that they match up to receiving holes on the Infiltrator connector ring.

3. Drill new pilot holes into Tuf-Tite adapter ring.

4. Apply ISI 1500 Adhesive Sealant in alignment with the factory-drilled screw holes on the top surface of the Infiltrator connector ring. The sealant thickness must be adequate to fill the gap beneath the Tuf-Tite adapter ring.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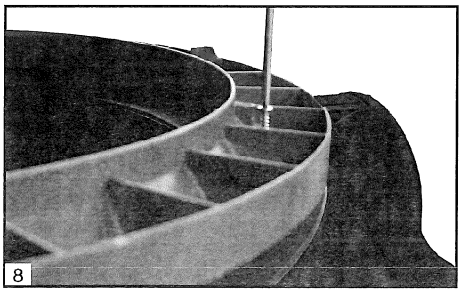
5. Invert Tuf-Tite adapter ring and center over the Infiltrator connector ring.

6. Verify that the ISI 1500 Adhesive Sealant remains properly aligned on the Tuf-Tite adapter ring.

7. Align the 10 drilled pilot holes on the Tuf-Tite adapter ring with the 10 receiving holes on the Infiltrator connector ring.

8. Fasten the Tuf-Tite adapter ring to the Infiltrator connector ring with ten #14 x 1¼-inch (4.9 mm x 38 mm) stainless steel screws.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9. Tighten screws in a "star" pattern, tightening screws on opposite sides of the Tuf-Tite adapter ring. Repeat the star pattern at least twice, without over tightening screws. Compress the ISI 1500 Adhesive Sealant to tank evenly during fastening.

10. Connect the Tuf-Tite riser to the Tuf-Tite adapter ring and install lid according to Tuf-Tite's instructions.

Note: The Infiltrator tank lid provides a watertight seal with the Tuf-Tite riser and may be used.

11. Backfill tank in accordance with Infiltrator's 1060-Gallon septic tank installation instructions.

12. Following tank backfilling, visually examine the riser to Infiltrator connector ring joint for damage resulting from backfill placement. Repair or replace if damaged.

PolyLok™, Inc. Riser

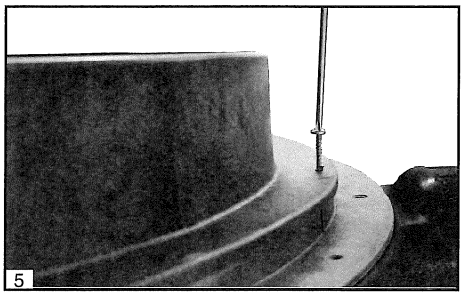
PolyLok riser must be installed using Infiltrator Pipe Adapter Ring.

1. Install riser assembly prior to backfilling tank.

2. Apply ISI 1500 Adhesive Sealant in alignment with the factory-drilled screw holes on the top surface of Infiltrator connector ring. Sealant thickness must fill gap beneath pipe adapter.

4. Align the pre-drilled pilot holes on the Infiltrator Pipe Adapter Ring with the receiving holes on the Infiltrator connector ring. Center and press to create an even seal.

5. Fasten Infiltrator Pipe Adapter Ring to Infiltrator connector ring using ten #14 x 1¼-inch (6.2 mm x 32 mm) stainless steel counter sink screws. Tighten in a star pattern. ***Note: counter sink screws are not supplied with the Infiltrator Pipe Adapter Ring.***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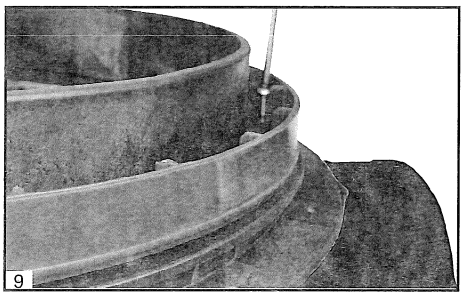
6. Center the PolyLok Riser-to-Riser Adapter ring over Infiltrator Pipe Adapter Ring and mark ten even locations on the Infiltrator Pipe Adapter Ring for pilot holes.

7. Drill 1/8-inch (3.5-mm) pilot holes at marked locations on the PolyLok Riser-to-Riser Adapter Ring so that screws will connect to adjacent Infiltrator Pipe Adapter Ring.

8. Center the PolyLok Riser-to-Riser Adapter Ring over the Infiltrator Pipe Adapter Ring and apply ISI 1500 Adhesive Sealant in the space between the PolyLok Riser-to-Riser Adapter Ring and Infiltrator Pipe Adapter Ring to fill the gap.

9. Fasten PolyLok Riser-to-Riser Adapter Ring to Infiltrator Pipe Adapter Ring using ten #12 x ¾-inch (5.5 mm x 19 mm) stainless steel screws.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10. Tighten screws in a "star" pattern, tightening screws on opposite sides of the PolyLok and Infiltrator rings. Repeat star pattern at least twice, without over tightening screws.

11. Connect PolyLok riser to PolyLok Riser-to-Riser Adapter Ring and install according to PolyLok's instructions.

12. Backfill tank in accordance with Infiltrator's 1060-Gallon tank installation instructions.

13. Following tank backfilling, visually examine the riser to Infiltrator Tank Adapter Ring connection for damage resulting from backfill placement. Repair or replace if damaged.

24-inch (600-mm) HDPE Pipe

Note: The 24" HDPE pipe must be installed using the Infiltrator Pipe Adapter Ring.

1. Install riser assembly prior to backfilling tank.

2. Cut HDPE pipe along an inner corrugation to allow lid to fit properly. Cut should be smooth and even.

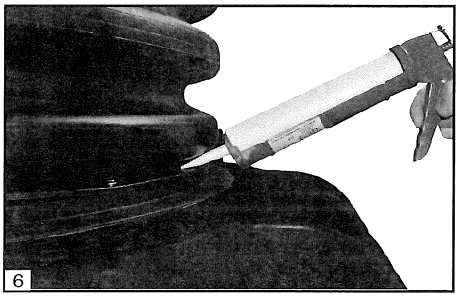
3. Apply ISI 1500 Adhesive Sealant in alignment with the factory-drilled screw holes on the top surface of Infiltrator connector ring. Sealant thickness must fill gap beneath Infiltrator Pipe Adapter Ring.

4. Align the pre-drilled pilot holes on the Infiltrator Pipe Adapter Ring with the receiving holes on the Infiltrator connector ring. Center and press to create an even seal.

5. Fasten Infiltrator Pipe Adapter Ring to Infiltrator reinforcing ring using ten #14 x 1¼-inch (6.2 mm x 31 mm) stainless steel screws. Tighten in star pattern. Repeat star pattern at least twice, without over tightening screws.

6. Center the HDPE pipe over the Infiltrator Pipe Adapter Ring and apply ISI 1500 Adhesive Sealant in the space between the pipe and Infiltrator Pipe Adapter Ring to fill the gap.

Note: Use additional butyl sealant or ISI 1500 Adhesive Sealant to fill gap and seal space between the HDPE pipe and Infiltrator Pipe Adapter Ring.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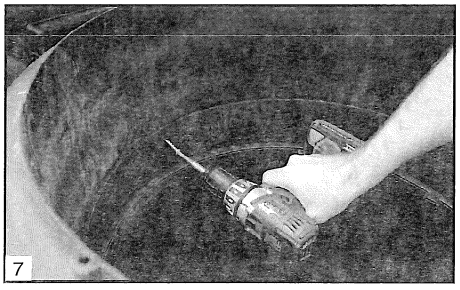
7. Fasten HDPE pipe to Infiltrator Pipe Adapter Ring using ten #12 x 1¼-inch (5.5 mm x 31 mm) stainless steel screws from inside the pipe.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8. Tighten screws in a "star" pattern, tightening screws on opposite sides of the Infiltrator Pipe Adapter Ring. Repeat the star pattern at least twice, without over tightening screws.

9. Use the Infiltrator TW-Series septic tank lid, or equivalent product as a lid for the HDPE pipe. Follow lid manufacturer's instructions to complete riser installation.

10. Backfill tank in accordance with Infiltrator's 1060-Gallon tank installation instructions.

11. Following tank backfilling, visually examine the riser to Infiltrator Pipe Adapter Ring connection for damage resulting from backfill placement. Repair or replace if damaged.

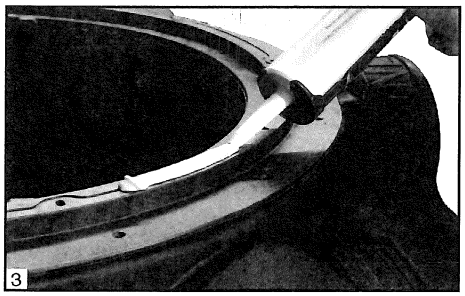
24-inch (600-mm) IPEX Ultra-Rib™ PVC Pipe

24" IPEX pipe must be installed using the Infiltrator Pipe Adapter Ring.

1. Install riser assembly prior to backfilling tank.

2. Cut IPEX pipe along an inner corrugation to allow lid to fit properly. Cut should be smooth and even.

3. Apply ISI 1500 Adhesive Sealant in alignment with the factory-drilled screw holes in the channel on the top surface of Infiltrator connector ring. Sealant thickness must fill gap beneath Infiltrator Pipe Adapter Ring.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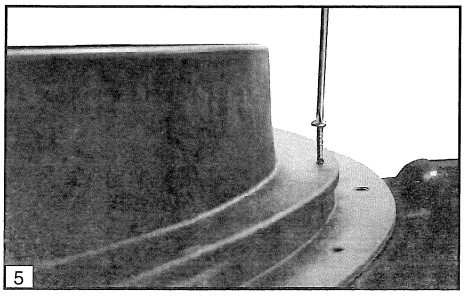
4. Align the pre-drilled pilot holes on the Infiltrator Pipe Adapter Ring using the indexing tabs on the inside of the ring with the receiving holes on the Infiltrator connector ring. Center and press to create an even seal.

5. Fasten Infiltrator Pipe Adapter Ring to Infiltrator connector ring using ten #14 x 1¼-inch (6.2 mm x 31 mm) stainless steel screws. Tighten in star pattern. Repeat the star pattern at least twice, without over tightening screws.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6. Center the IPEX pipe over Infiltrator Pipe Adapter Ring and mark ten even locations on the pipe for pilot holes.

7. Drill 1/8-inch (3.5-mm) pilot holes at marked locations on the IPEX pipe so that screws will connect to the adjacent Infiltrator Pipe Adapter Ring.

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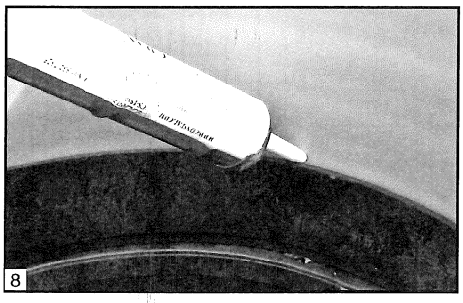
8. Center the IPEX pipe over the Infiltrator Pipe Adapter Ring and apply ISI 1500 Adhesive Sealant in the space between the pipe and Infiltrator Pipe Adapter Ring to fill the gap.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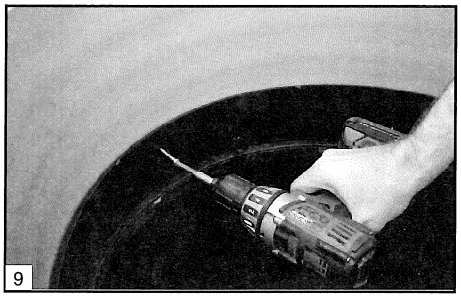
9. Fasten IPEX pipe to Infiltrator Pipe Adapter Ring using ten #14 x 1¼-inch (6.2 mm x 31 mm) stainless steel screws from the inside of pipe.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10. Tighten screws in a "star" pattern, tightening screws on opposite sides of the Infiltrator Pipe Adapter Ring. Repeat the star pattern at least twice, without over tightening screws.

11. Use the ISI TW-Series septic tank lid, or equivalent product as a lid. Follow lid manufacturer's instructions to complete riser installation.

12. Backfill tank in accordance with Infiltrator's 1060-Gallon septic tank installation instructions.

13. Following tank backfilling, visually examine the riser to Infiltrator Pipe Adapter Ring connection for damage resulting from backfill placement. Repair or replace if damaged

Disclaimer: These recommended procedures have been developed to identify best practices for achieving a watertight connection between tank and riser under typical tank installation conditions. These procedures have been shown to result in a watertight connection between the riser assemblies identified in this document and the Infiltrator 1060-Gallon tank. Infiltrator does not guarantee a watertight connection between tank and riser because achieving a watertight connection is dependent upon a combination of installer practices and procedures, and field conditions. Please contact Infiltrator's Technical Services Department at 800-221-4436 if difficulty is encountered during riser connection installation. Additionally, Infiltrator developed these recommendations in cooperation with the specific riser manufacturers (excluding the HDPE and IPEX alternatives) referenced above. Please contact the appropriate riser manufacturer for concerns associated with anything that does not involve the tank-to-riser connection.

Infiltrator and EZset are registered trademarks of Infiltrator Systems Inc. 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.

Infiltrator IM-Series Septic Tank General Installation Instructions

MARCH 2020

INFILTRATOR® tanks

BEFORE YOU BEGIN

Infiltrator Water Technologies' tanks must be installed according to state and/or local regulations and approvals, which supersede the manufacturer's installation instructions. If unsure of the installation requirements for a specific site, contact the health department or permitting authority. The IM-Series referred to in this document includes the IM-540, IM-1060, and IM-1530 models.

WARNING: IMPLOSIONS MAY CAUSE SERIOUS INJURY
Follow Infiltrator Water Technologies vacuum test instructions

MATERIALS AND EQUIPMENT NEEDED

- ☐ IM-Series tank
- ☐ Access port lid(s)*
- ☐ 10 screws per lid*
- ☐ 2 inlet/outlet gaskets (included)
- ☐ Inlet/outlet tees*
- ☐ Tape measure
- ☐ Pipe, risers, etc.
- ☐ Socket wrench
- ☐ Excavator
- ☐ Shovel
- ☐ Level
- ☐ 5-inch-diameter (125 mm) hole saw
- ☐ Utility knife
- ☐ PVC pipe glue with primer

*tee and lid inclusion varies by state/province

INSTALLATION SITE SELECTION

1. Do not install the tank in vehicular traffic areas. The tank is designed for non-traffic applications.

2. The allowable soil cover depth is 6 to 48* inches (150 to 1,200 mm). *18-inch (450 mm) max. in Florida for Cat. 3 IM-Series tanks; 48-inch (1,200 mm) max. in Florida for Cat. 4 IM-Series tanks; 36-inch (900 mm) max. in Massachusetts, New Hampshire, North Carolina, and Oregon.

3. Do not install where uninterrupted saturated soil could be present from the tank bottom to a height exceeding that of the outlet pipe saddle. See page 4 illustration.

EXCAVATING AND PREPARING THE SITE

1. Unless buoyancy control measures are required, the excavation width and length should be 18 to 36 inches (450 to 900 mm) larger than the tank on each side or sized as necessary to ensure proper backfill compaction, as outlined in Steps 5-10 of "Backfilling the Tank" in this document. See Infiltrator IM-Series Tank Buoyancy Control Guidance document, available online at www.infiltratorwater.com, for specific excavation requirements when installing buoyancy control measures.

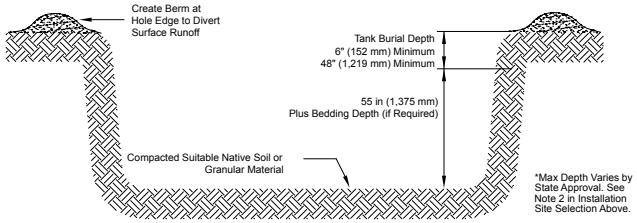
2. Excavation depth shall account for the 55-inch (1,375 mm) tank height. Also account for 4 inches (100 mm) of bedding (if required) and cover depth (permissible cover depth is 0.5 to 4 feet (150 to 1,200 mm) of soil).
Note: If uninterrupted saturated soil conditions exist from the tank bottom to a height exceeding that of the outlet pipe saddle, tank structural integrity may be compromised. See page 4 illustration.

Indiana installations: If the depth of the uninterrupted saturated soil conditions cannot be determined from the site soil evaluation report or other site-related data and other information indicates the possible presence of a perched ground water table, tank installation is permissible.

3. Inspect bottom of excavation to verify suitability of native soil for tank installation. Soils with large, protruding, or sharp stones or other similar objects that may damage the tank are not suitable.

4. The tank may be installed either in suitable native soil (see Backfilling the Tank section) or a minimum 4-inch (100 mm) layer of well-graded granular soil having particles less than 3 inches (75 mm) in diameter, or maximum 0.5-inch (13 mm) diameter crushed stone.

5. Create a uniform, compacted, level surface to ensure that the bottom of the tank is evenly supported. Verify that the installation surface is flat.



INSTALLING THE TANK

1. Inspect the tank for damage before installation.

2. If the tank inlet and outlet penetrations are not drilled, drill holes using the drill points provided at each of the inlet and outlet ports according to Table 3 in the Inlet and Outlet Hole Locations section. The inlet and outlet may be drilled on either the sides or ends of the tank, as required based on applicable codes and site conditions.*
* Kentucky, Oregon, West Virginia, and certain Florida and Texas tanks are factory-drilled.

3. The gaskets supplied with the tank are compatible with Schedule 40 and SDR 35 pipe using a 5-inch-diameter (125 mm) hole saw.

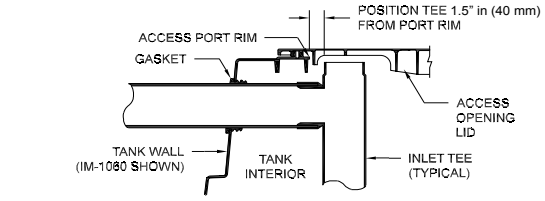
4. Install the rubber gaskets at the inlet and outlet.

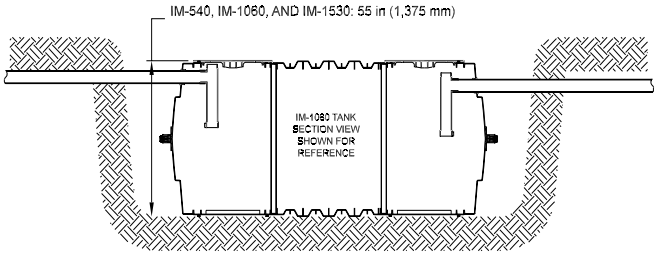
5. Using all four of the tank's integral lifting lugs, lower tank into excavation.

6. Slide the inlet and outlet pipes* through the gaskets. Soapy lubricant may be used to slide the pipe in.
*For North Carolina, the inlet pipe shall be a straight pipe with no tee.

7. Horizontally position the tee 1½ inches (40 mm) from the access port rim, allowing the tee to fit into the recess in the access port lid (see detail).

8. Install lids and risers (see Installing Risers section) as necessary. Rotate lid over access opening until it indexes to tank and drops into position.





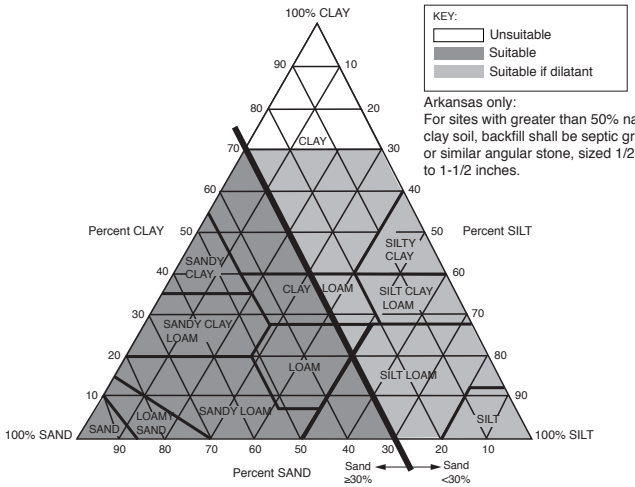
BACKFILLING THE TANK

Note: Infiltrator tanks do not require filling with water prior to backfill placement. Water filling and backfilling to the tank mid-height is required if the tank is left in either an open or backfilled excavation that may fill with water from rain or other sources.

1. Backfill with suitable native soil (max. 3-inch (75-mm) stone diameter). If native soil is unsuitable, replace unsuitable fraction with suitable soil. If suitable soil is not locally available, contact Infiltrator for assistance.

2. Suitable soil shall include soil textural classes defined in the United States Department of Agriculture soil triangle.

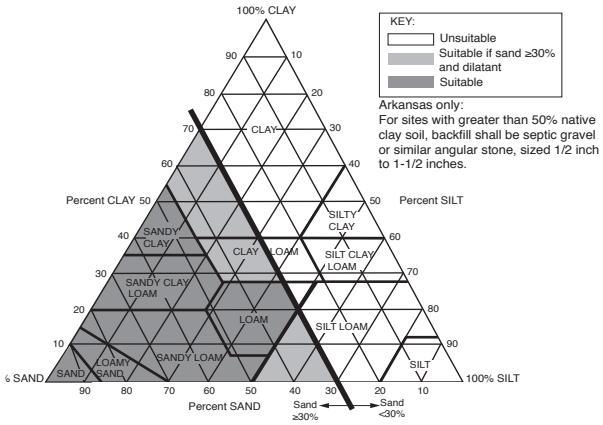
a) For a tank soil cover depth of 0.5 to 2.0 feet (150 to 600 mm), suitable soil textures include:



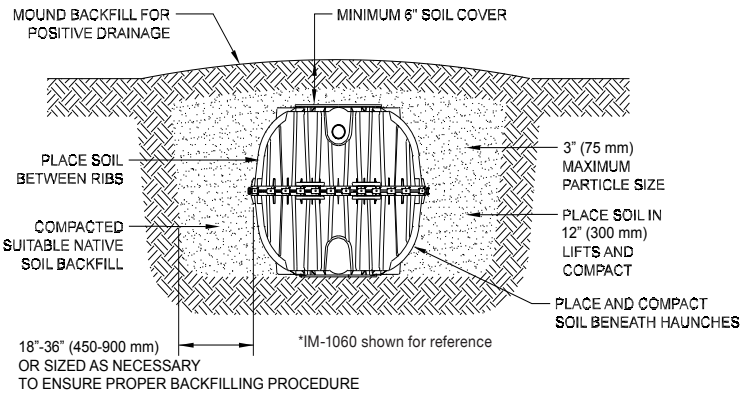
Arkansas only:
For sites with greater than 50% native clay soil, backfill shall be septic gravel or similar angular stone, sized 1/2-inch to 1-1/2 inches.

Failure to comply with these installation instructions will invalidate the warranty. Contact Infiltrator Water Technologies' Technical Services Department for assistance at 1-800-221-4436.

b) For a tank soil cover depth that is greater than 2.0 feet and up to 4.0 feet (600 to 1,200 mm), suitable soil textures include:



3. Backfill should not have stones greater than 3 inches (75 mm) in diameter or excessive clods that do not break apart during placement and compaction. Backfill must be capable of occupying the spaces between the tank ribs and beneath the haunches.
   Note: Rounded screened aggregate (e.g., pea gravel) is not a suitable backfill.
4. Standard field soil classification methods shall be used to determine the soil textural class.
   Note: Under most circumstances, the determination of soil dilatancy will not be required. Dilatancy shall be determined in the field using a test that does not require specialized equipment, per ASTM D2488, Section 14.3.
5. Place and compact soil by walking-in beneath the haunches of the tank.
   Note: Compacting soil beneath the haunches is critical for tank structural integrity.
6. Place backfill around the four sidewalls in an alternating manner, so that the backfill height along the four sidewalls is maintained within a 12-inch (300-mm) tolerance.
7. Do not backfill top of tank before sidewalls are completely backfilled.
8. **Continue to place backfill along the sidewalls in 12-inch (300-mm) lifts. Place backfill between the ribs on the sidewalls such that the space between the ribs is completely filled with soil.**
9. **Compact backfill material either by walking-in, hand tamping or mechanical compaction (includes backhoe bucket). If mechanical compaction is used, such as a walk-behind tamper or backhoe bucket, a single pass is recommended. Compact each lift prior to placement of next lift. Compact backfill from tank walls to excavation sidewalls.**
10. Complete backfilling and grade the area.
11. A minimum 6-inch (150-mm) depth of suitable soil must be placed over the top of the tank. The balance of backfill placed to finish grade above the tank may be either suitable or unsuitable soil.
12. Establish a strong stand of erosion-resistant vegetation.
    Grade to prevent the backfilled excavation from filling with surface runoff. If uninterrupted saturated soil conditions are present from the tank bottom to a height exceeding that of the outlet pipe saddle, tank structural integrity may be compromised.



SHORT AND LONG-TERM GROUNDWATER CONTROL

It may be necessary to implement groundwater control measures during tank installation. Maintain dry conditions by expanding the excavation to create a short-term groundwater collection sump for temporary placement of a dewatering pump if needed. Long-term groundwater control measures such as underdrains and interceptor trenches may be sensible if the site is amenable to construction of a control system and such systems are not prohibited by regulation or law, and the tank location is not subject to flooding. Properly installed underdrains and groundwater interceptor trenches may prevent the need for tank buoyancy control measures.

INSTALLING UNDER SHALLOW GROUNDWATER CONDITIONS

Buoyancy control measures may be required if the Infiltrator tank is to be installed with less than 12 inches (300 mm) of soil backfill cover, and where uninterrupted saturated soil conditions have the potential to rise 30 inches (750 mm) or more above the tank bottom. Otherwise, no buoyancy control measures are required (see Table 1). The need for buoyancy control measures must be determined based on backfill cover depth and height of uninterrupted saturated soil conditions above the tank bottom according to Table 1. Refer to Infiltrator IM-Series Tank Buoyancy Control Guidance document for more information.

Table 1: Tank models[1] and conditions requiring buoyancy control[2]

Position of uninterrupted saturated soil conditions above tank bottom	Soil cover depth above tank[3]	
	6 in (150 mm) to 12 in (300 mm)	Above 12 in (300 mm)
Above outlet pipe saddle	Do not install tank	Do not install tank
36 in (900 mm) to outlet pipe saddle[4]	All models	None
30 in (750 mm) to 36 in (900 mm)	IM-1530	None
Less than 30 in (750 mm)	None	None

1. IM-540, IM-1060 and IM-1530.
2. See Infiltrator IM-Series Tank Buoyancy Control Guidance for detailed information on the use of controls.
3. No controls are required for soil cover depths exceeding 12 in (300 mm).
4. The tank shall not be installed where uninterrupted saturated soil conditions could be present from the tank bottom to a height above that of the outlet pipe saddle. See page 4 illustration. For Indiana installations,if the depth of uninterrupted saturated soil conditions cannot be determined from the site soil evaluation report or other site-related data and other information indicates the possible presence of a perched ground water table, no buoyancy controls are required.

INSTALLING RISERS

1. Compatible risers include 24-inch (600 mm) diameter products such as the Infiltrator EZsnap, TW-Riser, and EZset by Infiltrator, PolyLok®, Inc., and Tuf-Tite® Corporation, in addition to 24-inch (600 mm) diameter corrugated HDPE and IPEX Ultra Rib® PVC pipe. Follow Infiltrator's IM-Series Tank Riser Connection Guidance.
2. In Oregon only, watertightness testing shall include filling with water at least 2 inches above riser connection, with no more than 1 gallon leakage per 24 hours, per OAR 340-073-0025(3).

INSTALLING PUMPS AND RELATED EQUIPMENT

Pumps may be supported on a stable, level 16x16-inch (400x400-mm) platform positioned on the bottom of the tank. One 16x16-inch block or two 8x16-inch (200 -mm x 400-mm) side-by-side blocks may be used. Limit block height to account for pump height and liquid levels during pump cycles. Block(s) should be placed below an access opening and level upon the tank bottom. For two blocks, orient them perpendicular to ribs on the tank bottom, if present, for stability.

Installation of products such as electrical conduit and wiring, pumps, water level control equipment, valves, siphon equipment, etc. shall be in accordance with the product manufacturer's instructions and compliant with applicable state or local rules and regulations. Appurtenances shall be fastened to the tank riser system and not the tank body or access opening rim. Where possible, appurtenances shall be installed to facilitate maintenance and repair access via the tank access openings.
Note: Prefabricated pump vaults may be installed.

GENERAL SPECIFICATIONS

- Failure to comply with installation instructions will void warranty.
- Prior to ground disturbance, check for subsurface obstructions and utilities in conformance with applicable requirements.
- Operating water temperature shall be less than 100° F (40° C).
- In cold conditions, handle and backfill tank with care to prevent impact damage.
- Tanks are not fire resistant. Store away from ignition sources.
- Removal of structural bulkheads is prohibited; removal of locking clips on the IM-Series tank mid-seam connection is also prohibited.
- Only suitable for potable applications if the tank bears the NSF/ANSI 61 certification mark. Otherwise, tank is recommended for use in septic, rainwater/ stormwater storage, holding, and pump applications, or other non-potable uses.
- Infiltrator tanks shall not be installed above ground. Contact Infiltrator if the 6-inch (150-mm) minimum soil cover depth cannot be met.

Table 2: Nominal Volume Chart

Liquid height above tank bottom[1]		Liquid volume in tank at indicated height (measured from tank bottom to liquid surface)[1]					
		IM-540		IM-1060		IM-1530	
in	cm	U.S. Gal	Liters	U.S. Gal	Liters	U.S. Gal	Liters
1	3	3	11	3	11	17	64
2	5	8	30	13	49	34	128
3	8	14	53	28	106	51	192
4	10	21	80	46	174	68	256
5	13	29	109	65	246	94	357
6	15	37	141	86	326	122	463
7	18	46	173	107	405	152	573
8	20	55	207	129	488	180	681
9	23	64	243	152	575	212	802
10	25	74	279	176	666	245	928
11	28	84	317	200	757	280	1,061
12	30	94	356	225	852	312	1,182
13	33	105	396	251	950	351	1,328
14	36	116	437	277	1,049	387	1,463
15	38	127	480	303	1,147	422	1,597
16	40	138	523	330	1,249	464	1,756
17	43	150	566	357	1,351	500	1,892
18	46	161	611	384	1,454	537	2,034
19	48	173	656	411	1,556	575	2,177
20	50	186	702	438	1,658	614	2,322
21	53	198	749	465	1,760	652	2,468
22	56	210	796	493	1,866	690	2,612
23	58	223	843	521	1,972	729	2,758
24	61	235	891	549	2,078	770	2,914
25	64	248	940	577	2,184	808	3,058
26	66	261	988	605	2,290	847	3,208
27	69	274	1,038	633	2,396	887	3,356
28	71	287	1,088	662	2,506	928	3,513
29	74	300	1,137	691	2,616	968	3,665
30	76	313	1,185	719	2,722	1,007	3,814
31	79	326	1,233	747	2,828	1,048	3,966
32	81	338	1,281	775	2,934	1,087	4,113
33	84	351	1,328	802	3,036	1,126	4,262
34	86	363	1,375	830	3,142	1,165	4,410
35	89	375	1,421	857	3,244	1,204	4,557
36	91	387	1,466	884	3,346	1,242	4,701
37	94	399	1,511	911	3,449	1,280	4,846
38	97	411	1,555	938	3,551	1,318	4,988
39	99	422	1,598	965	3,653	1,355	5,131
40	102	433	1,640	992	3,755	1,393	5,272
41	104	444	1,681	1,018	3,854	1,430	5,412
42	107	455	1,722	1,044	3,952	1,466	5,550
43	109	465	1,761	1,069	4,047	1,502	5,685
44	112	475	1,799	1,094	4,141	1,537	5,817
45	114	485	1,836	1,118	4,232	1,572	5,950
46	117	494	1,871	1,142	4,323	1,604	6,070
47	119	503	1,905	1,165	4,410	1,638	6,201
48	122	512	1,938	1,187	4,493	1,667	6,310
49	124	520	1,970	1,208	4,573	1,697	6,422
50	127	528	1,999	1,228	4,648	1,724	6,527
51	130	535	2,027	1,247	4,720	1,749	6,621
52	132	542	2,050	1,265	4,789	1,766	6,684
53	135	547	2,071	1,278	4,838	1,777	6,726
54	137	551[3]	2,087	1,287	4,872	1,785[3]	6,758

1. Liquid height measured from lowermost inside surface at bottom of corrugation in tank to the liquid surface elevation.

2. To determine liquid volume between liquid heights, subtract the Table 2 volume indicated for the upper and lower heights. Example: IM-1060 volume between 50 in (127 cm) and 40 in (102 cm) = 1,228 gal (4,648 L) - 992 gal (3,755) L = 236 gal (893 L).

3. The total capacity of the IM-540 tank is 552 gallons; the total capacity of the IM-1530 tank is 1,787 gallons.

INLET AND OUTLET HOLE LOCATIONS

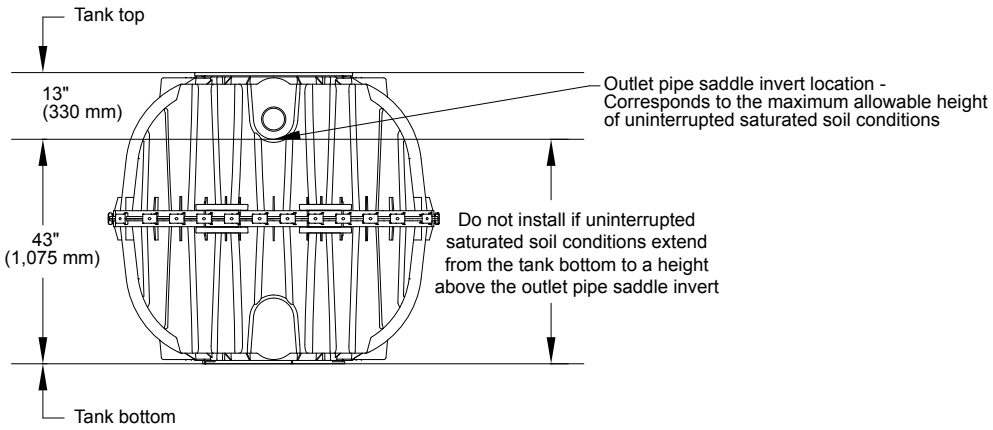
Drill height marks are provided on all Infiltrator tank models to guide inlet and outlet hole drilling. A single drill height mark is provided at each end or side port on IM-Series tanks (example illustrated below). Holes may be drilled at the end or side inlet and outlet locations, as allowed by state and/or local regulations. The drill height mark indicates the center point location for the hole saw. The pilot drill bit on the hole saw should be positioned at the center of the drill height mark to align the hole saw properly. Table 3 provides drilling and invert information by regulatory jurisdiction for the installation of 4-inch- (100-mm-) diameter pipe.

Table 3: Inlet and Outlet Hole Locations[4]

Jurisdiction[1]	Inlet Drill Location	Outlet Drill Location	Invert Drop (in) [mm]	Inlet Invert Height (in) [mm]		Outlet Invert Height[2] and Liquid Level (in) [mm]
				Above Inside Bottom of Tank[2]	Above Excavation Base[3]	
IM-540 and IM-1530						
All	All	All	3.00 [76]	47.00 [1,994]	47.20 [1,199]	44.00 [1,118]
IM-1060						
All	End	End	3.00 [76]	47.00 [1,994]	47.20 [1,199]	44.00 [1,118]
	Side	Side	3.00 [76]	47.50 [1,207]	47.70 [1,212]	44.50 [1,130]
	Side	End	3.50 [89]	47.50 [1,207]	47.70 [1,212]	44.00 [1,118]
	End	Side	2.50 [64]	47.00 [1,994]	47.20 [1,199]	44.50 [1,130]

1. Kentucky, Oregon, West Virginia, and certain Florida and Texas tanks are factory drilled.
2. Invert heights are measured from the lowest interior surface at the bottom of the tank to the invert.
3. Invert heights are measured from the base of the excavation to the invert.
4. State, provincial, and local regulatory requirements supersede Table 3 information.

Limitations When Saturated Soil Conditions are Present Above Tank Bottom



Infiltrator Water Technologies, LLC ("Infiltrator")

INFILTRATOR® SEPTIC TANK LIMITED WARRANTY FIVE (5) YEAR MATERIALS AND WORKMANSHIP LIMITED WARRANTY

(a) This limited warranty is extended to the end user of an Infiltrator Tank. A Tank manufactured by Infiltrator, when installed and operated in accordance with Infiltrator's installation instructions and local regulation by a person or company that is properly qualified to install the Infiltrator tank in accordance with applicable state and/or local requirements, is warranted to you: (i) against defective materials and workmanship for five (5) years after installation. Infiltrator will, at its option, (i) repair the defective product or (ii) replace the defective materials. Infiltrator's liability specifically excludes the cost of removal and/or installation of the Tank.

(b) In order to exercise its warranty rights, you must notify Infiltrator in writing at its corporate headquarters in Old Saybrook, Connecticut within fifteen (15) days of the alleged defect.

(c) YOUR EXCLUSIVE REMEDY WITH RESPECT TO ANY AND ALL LOSSES OR DAMAGES RESULTING FROM ANY CAUSE WHATSOEVER SHALL BE SPECIFIED IN SUBPARAGRAPH (a) ABOVE. INFILTRATOR SHALL IN NO EVENT BE LIABLE FOR ANY CONSEQUENTIAL OR INCIDENTAL DAMAGES OF ANY KIND, HOWEVER OCCASIONED, WHETHER BY NEGLIGENCE OR OTHERWISE. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THIS LIMITA- TION OR EXCLUSION MAY NOT APPLY TO YOU. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE.

(d) THIS LIMITED WARRANTY IS THE EXCLUSIVE WARRANTY GIVEN BY INFILTRATOR AND SUPERSEDES ANY PRIOR, CONTRARY, ADDITIONAL, OR SUBSEQUENT REPRESENTATIONS, WHETHER ORAL OR WRITTEN. INFILTRATOR DISCLAIMS AND EXCLUDES TO THE GREATEST EXTENT ALLOWED BY LAW ALL OTHER WARRANTIES, WHETHER EXPRESS OR IMPLIED, OR STATUTORY, INCLUDING ANY WARRANTY OF MERCHANTABILITY, FINESSE FOR A PARTICULAR PURPOSE AND ANY IMPLIED WARRANTIES OTHERWISE ARISING FROM COURSE OF DEALING, COURSE OF PERFORMANCE, OR USAGE OF TRADE. NO PERSON (INCLUDING ANY EMPLOYEE, AGENT, DEALER, OR REPRESENTATIVE) IS AUTHORIZED TO MAKE ANY REPRESENTATION OR WARRANTY CONCERNING THIS PRODUCT, EXCEPT TO REFER YOU TO THIS LIMITED WARRANTY. EXCEPT AS EXPRESSLY SET FORTH HEREIN, THIS WARRANTY IS NOT A WARRANTY OF FUTURE PERFORMANCE, BUT ONLY A WARRANTY TO REPAIR OR REPLACE.

(e) YOU MAY ASSIGN THIS LIMITED WARRANTY TO A SUBSEQUENT PURCHASER OF YOUR HOME.

(f) NO REPRESENTATIVE OF INFILTRATOR HAS THE AUTHORITY TO CHANGE THIS LIMITED WARRANTY IN ANY MANNER WHATSOEVER, OR TO EXTEND THIS LIMITED WARRANTY.

(g) NO WARRANTY OF ANY KIND IS MADE WITH REGARD TO ANY PRODUCT, COMPONENTS, DEVICES, MEDIA OR TREATMENT UNITS WHICH ARE MANUFACTURED BY OTHERS AND ARE INSTALLED IN AN INFILTRATOR TANK. USE OF THESE PRODUCTS ARE AT YOUR OWN RISK.

(h) THE INFILTRATOR TANK IS DESIGNED TO BE BURIED UNDERGROUND. NO WARRANTY OF ANY KIND IS MADE IF YOUR TANK IS NOT BURIED UNDERGROUND AS SPECIFIED IN THE PRODUCT'S INSTALLATION INSTRUCTIONS.

CONDITIONS AND EXCLUSIONS

There are certain conditions or applications over which Infiltrator has no control. Defects or problems as a result of such conditions or applications are not the responsibility of Infiltrator and are NOT covered under this warranty. They include failure to install the Tank in accordance with instructions or applicable regulatory requirements or guidance, altering the Tank contrary to the installation instructions and disposing of chemicals or other materials contrary to normal tank usage.

The above represents the Standard Limited Warranty offered by Infiltrator. A limited number of regulatory jurisdictions have different warranty requirements. Any purchaser of a Tank 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 a Tank.

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Infiltrator IM-Series Tank Buoyancy Control Guidance

MAY 2019

INFILTRATOR® tanks

Before you Begin

This document presents a method for assessing buoyancy control needs for Infiltrator Water Technologies (Infiltrator) IM-Series tanks. Tank buoyancy control measures must be implemented according to state and/or local regulations and approvals, which may supersede these guidelines. If unsure of the requirements for a particular site, contact the local health department or permitting authority.

If tank buoyancy control measures are implemented, refer to Infiltrator IM-Series Tank Installation Instructions and Riser Connection Guidance documents, as applicable, for completing the installation.

How to Use this Document

1. Using Step 1, Table 1, and Figures 1 and 2, verify that the level of uninterrupted saturated soil is below the height of the outlet pipe saddle and determine if buoyancy control is required.
2. Use the appropriate row in Step 2, Table 2 to determine the minimum buoyancy control methods for the site conditions.
3. Once the preferred buoyancy control method is selected, follow the implementation procedures provided in Step 3.

Step 1 – Determine Need for Buoyancy Control

Required information: (1) maximum height of uninterrupted saturated soil above the tank bottom; and (2) the depth of soil cover above the tank top. Tank buoyancy control may be required if:

- the level of uninterrupted saturated soil outside the tank has the potential to rise 30 inches (750 mm) or more above the bottom of the tank; and

- less than 12 inches (300 mm) of soil cover is to be placed as backfill over the tank top.

NO BUOYANCY CONTROL IS REQUIRED IF THERE ARE AT LEAST 12 INCHES (300 MM) OF SOIL COVER ABOVE THE TANK TOP.

Table 1 Instructions

1. In the left-hand column of Table 1, locate the row corresponding to the height of the uninterrupted saturated soil elevation outside the tank and above the tank bottom (Parameter I) for the site conditions. See Figure 2.
2. Follow that row to the right until reaching the column corresponding to the depth of soil cover above the tank top (Parameter II). See Figure 2.
3. If the tank model is listed in that cell, then buoyancy control is required (proceed to Step 2). If the tank model is not listed in that cell, then no buoyancy control is required.
4. IM-Series tanks shall not be installed where the uninterrupted saturated soil level outside the tank exceeds the height of the outlet pipe saddle.

Table 1:
Infiltrator Tank Models[1] and Conditions Requiring Buoyancy Control

Parameter I: Position of uninterrupted saturated soil conditions above tank bottom		Parameter II: Soil cover depth above tank top[2]	
		A	B
		6 in (150 mm) to 12 in (300 mm)	Above 12 in (300 mm)
1	Above outlet pipe saddle[3] (greater than 43” [1,075 mm])	Do not install tank	Do not install tank
2	36” (900 mm) to 43” (1,075 mm) (to outlet pipe saddle)	All models	Not Required
3	30” (750 mm) to 36” (900 mm)	IM-1530	Not Required
4	Less than 30” (750 mm)	Not Required	Not Required

NOTES:
1. Infiltrator tank models include: IM-540, IM-1060, and IM-1530.
2. Minimum 6 inches (150 mm) soil cover backfill is required.
3. IM-Series tanks shall not be installed where the uninterrupted saturated soil outside the tank exceeds the height of the outlet pipe saddle. See Figure 1. For Indiana installations, if the depth of uninterrupted saturated soil conditions cannot be determined from the site soil evaluation report or other site-related data and other information indicates the possible presence of a perched ground water table, no buoyancy controls are required.

Figure 1:
Limitations When Saturated Soil Conditions are Present Above Tank Bottom

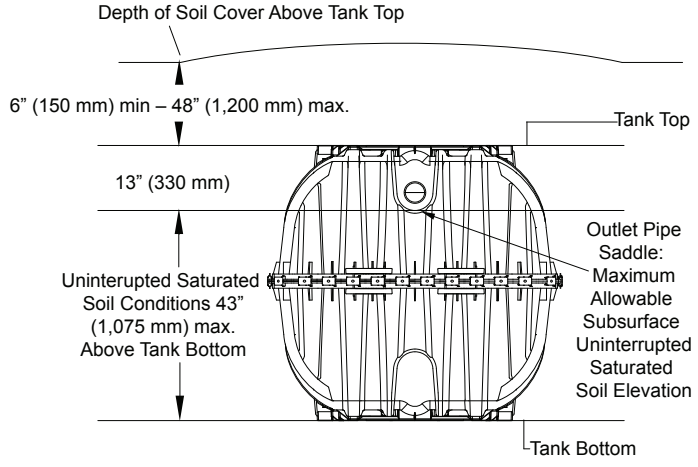
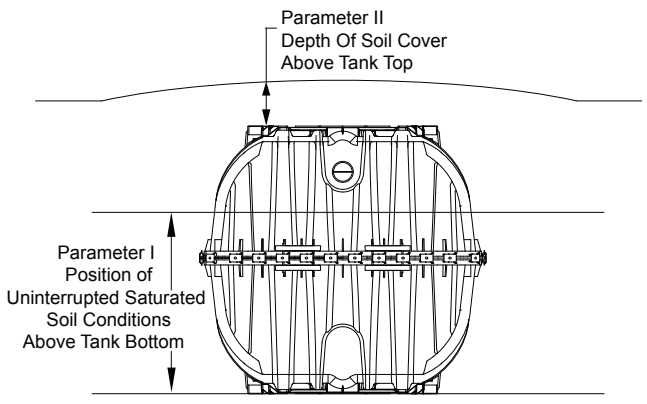


Figure 2:
Buoyancy Control Parameters for Table 1



Step 2 – Determine Buoyancy Control Method

Step 2 is used if the Step 1 analysis shows that buoyancy control is required for the tank model and installation conditions. The site-specific maximum height of uninterrupted saturated soil outside of the tank and above the tank bottom and the depth of soil cover above the tank top must be known to complete Step 2.

Table 2 Instructions

For the appropriate tank model, select the desired buoyancy control method under each method description column. Refer to Step 3 – Implementation and Compatible Devices and Products sections of this document for additional information on the buoyancy control methods shown in Table 2.

Table 2: Buoyancy Control Method Selection

Tank Model	Parameter I: Position of uninterrupted saturated soil conditions above tank bottom	Parameter II: Soil cover depth above tank top	Minimum supplemental downward force required[1] (total, both tank sides)	Buoyancy Control Methods				
				Concrete-filled half pipe (min. length/ side)	Concrete parking bumpers (min. length/ side)	Concrete traffic barriers (min. length/ side)	Helical anchors (min. no./side)	Concrete collar (min. width x min. height)
IM-540	36 in (900 mm) to outlet pipe saddle[2]	6 in (150 mm) to 12 in (300 mm)	2,200 lbs (1,000 kg)	3.8 ft (1.2 m)	3.8 ft (1.2 m)	3.8 ft (1.2 m)	2	6 in (150 mm) x 9 in (225 mm)
IM-1060	36 in (900 mm) to outlet pipe saddle[2]	6 in (150 mm) to 12 in (300 mm)	2,700 lbs (1,225 kg)	4.2 ft (1.3 m)	4.5 ft (1.4 m)	4.2 ft (1.3 m)	2	12 in (300 mm) x 9 in (225 mm)
IM-1530	30 in (750 mm) to outlet pipe saddle[2]	6 in (150 mm) to 12 in (300 mm)	4,300 lbs (1,955 kg)	6.3 ft (2.0 m)	6.5 ft (2.0 m)	6.3 ft (2.0 m)	2	12 in (300 mm) x 9 in (225 mm)

NOTES:
1. See Supplemental Downward Force discussion below.
2. IM-Series outlet pipe saddle height is 43 inches (1,075 mm) above tank bottom (see Figure 1).

Supplemental Downward Force

The minimum supplemental downward force required is included in Table 2 to allow custom buoyancy control methods. These values include a factor of safety of 1.5 applied to the calculated downward force required to restrain the tank. Custom-designed buoyancy control methods shall conservatively consider saturated soil conditions from the bottom-of-tank elevation to ground surface. As long as buoyancy control is provided that supplies the minimum downward force listed in the table (for poured-concrete blocks or other methods designed by third parties), the tanks are calculated to be stable for the uninterrupted saturated soil level outside the tank and above the tank bottom and corresponding soil cover conditions. All Infiltrator strapping and fastening recommendations apply for custom-designed buoyancy control methods. Contact Infiltrator's Technical Services Department with any questions regarding supplemental downward force requirements.

Step 3 – Implementation

Effective buoyancy control of Infiltrator tanks requires careful preparation, thorough excavation, precise placement, secure strapping and proper backfilling, as described and illustrated below.

Excavation Requirements

It is recommended that the excavation width provide a minimum of 36 inches (900 mm) clearance beyond the tank on all sides when utilizing buoyancy control. This will allow sufficient space within the excavation to place anchoring equipment and fasten strapping. The excavation should provide a minimum 48-inch (1,200 mm) clearance beyond the tank when using Chance™ No-Wrench Screw Anchors to allow for room to properly install the screw anchors. The actual excavation size shall be determined by the installer. Refer to Infiltrator IM-Series Tank Installation Instructions for additional excavation procedures.

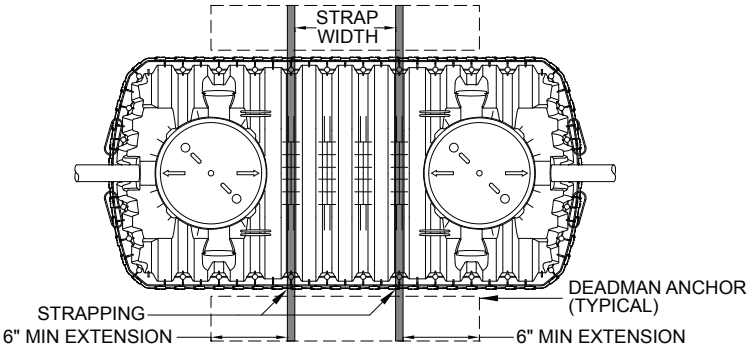
Concrete-filled Half Pipe Construction

Concrete-filled half pipe shall be supported with soil or other stabilizing means below the pipe haunches prior to concrete placement. The stabilization shall prevent the pipe from rolling during placement and curing of the concrete. Concrete shall be allowed to cure for a minimum of one day prior to tank backfilling.

Placement of Deadmen and Anchors

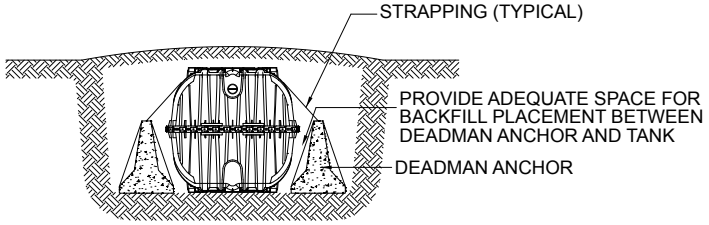
Concrete deadman anchors are to be installed at the bottom of the tank excavation, parallel to the long axis of the tank (see Figure 3).

Figure 3: Plan View



The deadmen should be placed close to, but not touching, the tank on both sides of the tank to allow the placement of backfill between the deadman anchor and tank sidewall (see Figure 4).

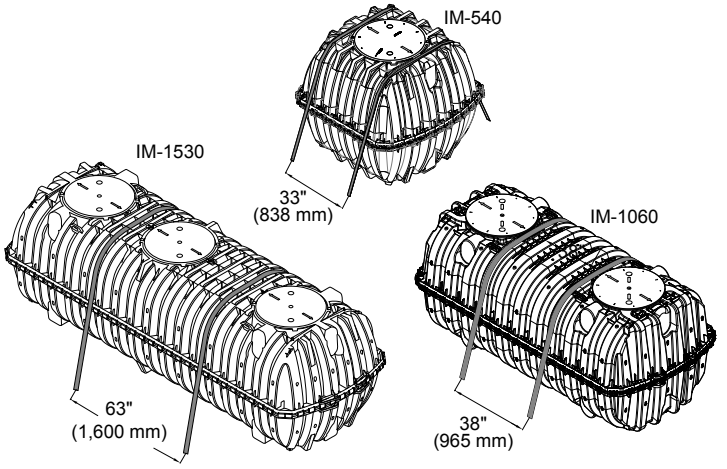
Figure 4: Section View



Step 3 – Implementation continued

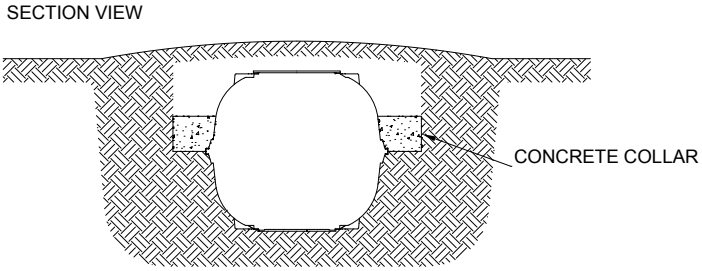
Helical anchors should be installed so that the eye loop is level with the bottom of the tank excavation. They must be in line with the tank model strapping locations (see Figure 5) or lifting lugs, as appropriate. Anchors must also be installed at such a distance from and angle to the tank so that the strapping is within 5° of alignment with the anchor shaft per the anchor manufacturer's recommendations.

Figure 5: Strap Positioning



Concrete Collar

Backfill the tank to the mid-seam area. Concrete (minimum 3,000 psi at 28 days and minimum 6% air entrainment) shall be cast in contact with the exterior surface of the tank to allow interlock with sidewall ribs and the mid-height flange. The bottom of the concrete collar shall be cast at the top of the mid-seam flange.



Strapping

Proper installation of straps over the tank is critical for tank stability under changing conditions both inside and outside the tank. Straps must be placed at the specified strapping locations for each model, as illustrated in Figure 5. Strapping locations are embossed on the exterior surface of the tank with the following text: "SHIPPING/ANTI-BUOYANCY STRAP HERE." The IM-Series tank strapping locations correspond to structurally reinforced areas of the tank body. Straps must never be placed over access openings, lids, or inlet/outlet piping. (Straps must be tightened with a ratchet or turnbuckle system to remove slack and slightly pre-load the system).

Strapping Notes:

1. The buoyancy control shall be centered across the straps (excludes helical anchors). The control shall extend a minimum of 6 inches (150 mm) beyond the maximum strap width (see Figures 3 and 5).
2. The minimum deadman length corresponds to the tank model-specific strap width plus 12 inches (300 mm).

Backfill and Cover

Place backfill between deadman anchor and tank sidewall to fully fill void and tank body corrugations. A minimum 6" layer (150 mm) of suitable cover material is required over all Infiltrator tank installations. Mound cover to direct surface water drainage away from the tank excavation footprint to prevent filling of the tank excavation with precipitation. Establish erosion-resistant vegetation within the tank installation footprint. Refer to Infiltrator IM-Series Tank Installation Instructions for complete backfilling and cover procedures.

Parts and Supplies

The parts and supplies necessary are to be purchased separately from the tank. All parts and supplies are either commercially available or available through Infiltrator's network of tank distributors. Some parts may require fabrication on site using common construction practices.

General Specifications

Compatible Devices and Products

Infiltrator tanks are compatible with the following products for buoyancy control:

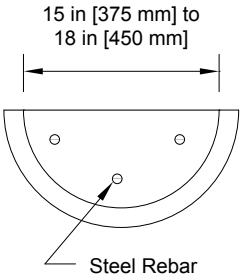
- Tie-down straps: high-tensile-strength, 10,000 lb (4,500 kg) minimum capacity, nylon or polyester, with corrosion-resistant hardware.
- Concrete deadmen anchors: concrete-filled plastic half pipe, precast parking bumper, precast traffic barrier, or precast block.
- Helical anchors: Chance™ No-Wrench Screw Anchors with minimum 6-inch (150 mm) diameter, Class 7 or equal.
- Mid-Seam Concrete Collar: cast-in-place concrete (minimum 3,000 psi compressive strength at 28 days and minimum 6% air entrainment).

Tie-Down Straps

Straps are commercially available in varying lengths and with assorted hardware and tightening options. Nylon or polyester strapping with minimum 8,000 lb (3,650 kg) capacity is required for buoyancy control use with Infiltrator tanks. Place straps over the tank at specified locations only (see Figure 5). (Tighten straps snugly with a ratchet or turnbuckle system to remove all slack and slightly pre-load the system). All connections, fittings, and hardware must be corrosion resistant or coated with epoxy or other corrosion-resistant materials to inhibit deterioration in the subsurface environment. Consider encapsulating such components in heat-shrink tubing or applying a corrosion-resistant coating prior to burial.

Concrete Deadmen Anchors

Recommended concrete deadmen anchors include filled plastic half pipe, precast parking bumpers and traffic barriers, and precast blocks. The weight of the deadmen anchors combined with the weight of soil above them provides buoyancy control when properly secured. Deadmen anchors are placed at the bottom of the tank excavation on opposite sides of the tank. The deadmen anchors are fastened to each other with tie-down straps placed over the tank at the locations specified for each tank model (see Figure 5).

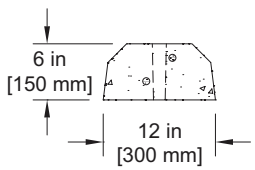


Concrete-filled Plastic Half Pipe

Use Schedule 40 PVC plastic pipe with a minimum inside diameter of 15 inches (375 mm) or HDPE corrugated pipe with a minimum inside diameter of 18 inches (450 mm) cut in half lengthwise. Fill with concrete having a minimum unit weight of 145 lbs/ft^3 (2.32 metric tons/m^3) reinforced with three equally spaced 40-grade, 1/2-inch (13 mm) diameter steel bars. Weight is 61 lbs/ft (91 kg/m) minimum.

Concrete Parking Bumper

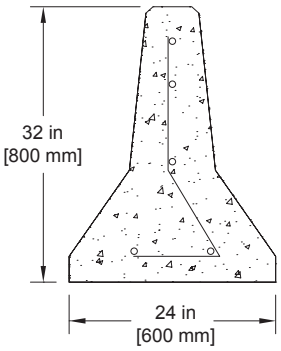
Use commercially available steel-reinforced parking bumpers with typical dimensions of 12 inches wide by 6 inches high (300 mm x 150 mm). Weight is 58 lbs/foot (86 kg/m) minimum.



General Specifications continued

Concrete Traffic Barrier

Use commercially available steel-reinforced concrete traffic barrier or equivalent. Typical dimensions include a 24-inch-wide base tapering to a 6-inch-wide top, with a height of approximately 32 inches (600 mm x 150 mm x 800 mm). Weight is 390 lbs/foot (580 kg/m) minimum.



Precast Blocks

Concrete precasters can fabricate blocks of various dimensions and weights. Blocks are often an affordable option if they satisfy the minimum weight requirements for use as buoyancy control (see Table 2 and the Supplemental Force section of Step 2 for more information).

Helical Anchors

Chance™ No-Wrench Screw Anchors with a 6-inch (150 mm) diameter flight, Class 7, or equal. These anchors rely on the shear strength of the soil combined with the weight of the soil above the anchor flight to provide holding strength. Proper installation is to 4 feet (1.2 m) below the bottom of the tank excavation and to within 5° of alignment with the strap alignment. Determine the proper locations for anchor installation to ensure that tie-down straps will be aligned properly for each tank model (see Step 3: Implementation), and follow the anchor manufacturer installation instructions.

Typical working torque:
¾" Rod 400 ft. lbs. (542 N·m)
1" Rod 1,000 ft. lbs. (1,356 N·m)
1¼" Rod 2,300 ft. lbs. (3,118 N·m)

Concrete Collar

A ballast may be constructed along the mid-height seam of the tank using cast-in-place concrete (minimum 3,000 psi compressive strength at 28 days and minimum 6% air entrainment). Concrete shall be cast in contact with the exterior surface of the tank to allow interlock with sidewall ribs and the mid-height flange. Reinforcing steel is not required, but may be added if desired.

General Information

- Prior to ground disturbance, check for subsurface obstructions and utilities in conformance with applicable regulatory requirements.
- Excavation safety provisions shall conform to applicable government regulations.
- Follow manufacturer instructions for all products and devices used for Infiltrator tank buoyancy control.
- Buoyancy control methods described herein do not account for unanticipated conditions such as surface flooding, temporary inundation or other natural occurrences, unintended removal of cover fill over tank, etc.
- Buoyancy control methods described herein are recommendations only; consult a professional engineer for customized designs, if desired.

Infiltrator Water Technologies, LLC ("Infiltrator")
INFILTRATOR® SEPTIC TANK LIMITED WARRANTY FIVE (5) YEAR MATERIALS AND WORKMANSHIP LIMITED WARRANTY

(a) This limited warranty is extended to the end user of an Infiltrator Tank. A Tank manufactured by Infiltrator, when installed and operated in accordance with Infiltrator's installation instructions and local regulation by a person or company that is properly qualified to install the Infiltrator tank in accordance with applicable state and/or local requirements, is warranted to you: (i) against defective materials and workmanship for five (5) years after installation. Infiltrator will, at its option, (i) repair the defective product or (ii) replace the defective materials. Infiltrator's liability specifically excludes the cost of removal and/or installation of the Tank.

(b) In order to exercise its warranty rights, you must notify Infiltrator in writing at its corporate headquarters in Old Saybrook, Connecticut within fifteen (15) days of the alleged defect.

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CONDITIONS AND EXCLUSIONS

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