Arc by Infiltrator DESIGN & INSTALLATION MANUAL – RHODE ISLAND





AUGUST 2021

INTRODUCTION

- This manual provides general design and installation information for use of Arc plastic leaching chambers in the State of Rhode Island.
- Arc chamber designs, configurations, and installations must comply with all applicable RIDEM OWTS and local rules, and the RIDEM Alternative/Experimental component certification.
- This manual contains a brief description for each chamber model and general design and installation procedures. For more detailed Information please contact Infiltrator Water Technologies at 1-800-221-4436.
- For CAD drawings refer to our website at: www.infiltratorwater.com.

Arc Chambers in Rhode Island	
Product Specifications	3-11
Arc 18	4-5
Arc 24	6-7
Arc 36	8-9
Arc 36 HC	10-11
Chamber System Design and Sizing	12-15
I. General Design	12
II. Sizing	13-15
Installation Instructions	16-18
Pressurized Shallow Narrow Drainfield (PSND) Systems	18
Warranty	19

Arc 18

• 16" wide chamber

• Lightweight design with articulating joints

• AASHTO H-10 load rated with proper installation NOTE: The Arc 18 Chamber may be installed in a conventional trench configuration receiving septic tank effluent, or in a PSND according to the design parameters in the Refer to RIDEM OWTS Rule 6.37.D (Pressurized Shallow Narrow Drainfield) or updates thereto and the product-specific guidance in this document on page 18.





- 22" wide chamber
- Lightweight design with articulating joints
- AASHTO H-10 load rated with proper installation



Arc 36

- 34" wide chamber
- · Lightweight design with articulating joints
- AASHTO H-10 load rated with proper installation.
- 13" height ideal for low profile applications.



Arc 36 HC

- 34" wide chamber
- · Lightweight design with articulating joints
- AASHTO H-10 load rated with proper installation
- · Offers increased storage volume for high flow applications.



Arc 18

Arc 18 Chambers may be installed in a conventional trench configuration receiving septic tank effluent, or in a PSND according to the design parameters in the Refer to RIDEM OWTS Rule 6.37.D (Pressurized Shallow Narrow Drainfield), or updates thereto and the product-specific guidance in this document on page 20.

Each chamber end is either marked "Dome" or "Post" on the round observation/vent knockout ports. These indicate direction of assembly, dome over post.

Arc 18 Chamber Specifications			
Length	67"		
Effective Length	60"		
Overall Width	16"		
Invert Height	6.25"		
Overall Height	12"		

Calculations and dimensions are nominal



Top, Side, and End Views (not to scale)





Arc 18 Endcap Side and End Views (not to scale)



Arc 18 Features

- Base flanges on the chambers ends overlock during final engagement to form a strong joint.
- The Arc 18 chamber feet are designed with sufficient surface area to provide support.
- Sidewall louvers are designed to allow effluent to exit the chamber sidewalls while preventing soils from migrating into the chamber.
- Observation/venting knockout ports provide inspection of system performance as well as a convenient location for drainfield ventilation pipes (only if required).
- Each chamber end has small knockouts on the top positioned in the "Post" end joint. When removed, these knockouts are for the use of zip ties to support piping in dosing systems.







Overlocking Ends

Louvers and Feet



Observation Port







Arc 18 Endcap

- Upper and lower knockouts accommodate both Schedule 40 and SDR 35 piping. Dimples are also offered for the positioning of hole saw pilot drills.
- Endcaps are designed to attach to either end of Arc 18 chamber.

Arc 18 Swivel Feature

- Each chamber's post end has swivel lockout tabs at either base flange. When removed, the incoming chamber will turn up to ten degrees in the direction of the removed lockout tab. Without removal of the swivel lockout tab, the chambers will align in a straight pattern.
- Swivel lockout tabs may be removed carefully with a utility knife.

Arc 18 Side Port Coupler (SPC)

• SPC component snaps in place to allow side entry into the trench line. This accessory provides a variety of design and installation options.

Arc 24

Each chamber end is either marked "Dome" or "Post" on the round observation/vent knockout ports. These indicate section of assembly, dome over post.

Arc 24 Chamber Specifications			
Length	67"		
Effective Length	60"		
Overall Width	22"		
Invert Height	6.25"		
Overall Height	12"		

Calculations and dimensions are nominal



Arc 24 Chamber

Top, Side, and End Views (not to scale)





Arc 24 Endcap Side and End Views (not to scale)



Arc 24 Features

- Base flanges on the chambers ends overlock during final engagement to form a strong joint.
- The Arc 24 chamber feet are designed with sufficient surface area to provide support.
- Sidewall louvers are designed to allow effluent to exit the chamber sidewalls while preventing soils from migrating into the chamber.
- Observation/venting knockout ports provide inspection of system performance as well as a convenient location for drainfield ventilation pipes (only if required).
- Each chamber end has small knockouts on the top positioned in the "Post" end joint. When removed, these knockouts are for the use of zip ties to support piping in dosing systems.

Arc 24 Endcap

- Upper and lower knockouts expand to accommodate both Schedule 40 and SDR 35 piping in a single hole tap. Dimples are also offered for the positioning of 4.25" hole saw pilot drills.
- Endcaps are designed to attach to either end of the Arc 24 chamber.

Arc 24 Swivel Feature

- Each chamber's post end has swivel lockout tabs at either base flange. When removed, the incoming chamber will turn up to ten degrees in the direction of the removed lockout tab. Without removal of the swivel lockout tab, the chambers will align in a straight pattern.
- Swivel lockout tabs may be removed carefully with a utility knife.

Arc 24 Side Port Coupler (SPC)

• SPC component snaps in place to allow side entry into the trench line. This accessory provides a variety of design and installation options.







Overlocking Ends

Louvers and Feet











Each chamber end is either marked "Dome" or "Post" on the round observation/vent knockout ports. These indicate section of assembly, dome over post.

Arc 36 Chamber Specifications			
Length	63"		
Effective Length	60"		
Overall Width	34"		
Invert Height	7"		
Overall Height	13"		

Calculations and dimensions are nominal



Arc 36 Chamber







Arc 36 Endcap Side and End Views (not to scale)



Arc 36 Features

- The post and dome creates a positive lock securing the chambers for final engagement. Lock and drop feature for fast installation.
- The Arc 36 chamber feet are designed with a sufficient surface area to provide support.
- Sidewall louvers are designed to allow effluent to exit the chamber sidewalls, while preventing soils from migrating into the chamber.
- Observation/venting knockout ports provide for inspection of system performance as well as a convenient location for drainfield ventilation pipes.
- Each chamber end has small knockouts on the top positioned in the "Post" end joint. When removed, these knockouts allow for the use of zip ties to support piping in dosing systems.
- The Arc 36 chamber is approved for use in Rhode Island for AASHTO H-10 load rated applications with proper installation.

Arc 36 Universal Endcap

- Upper and lower knockouts accommodate both Schedule 40 and SDR 35 piping. Knockouts can be removed with a knife or hole saw. Dimples are also offered for the positioning of hole saw pilot drills.
- Endcaps are designed to attach to either end of the Arc 36 chamber.

Arc 36 Swivel Feature

• Swivel lockout tabs may be removed carefully with a utility knife.

Arc 36 Side Port Coupler (SPC)

• SPC component snaps in place to allow side entry into the trench line. This accessory provides a variety of design and installation options.





Lock and Drop

Louvers and Feet



Observation Port







Arc 36 HIGH CAPACITY

Each chamber end is either marked "Dome" or "Post" on the round observation/vent knockout ports. These indicate direction of assembly, dome over post.

Arc 36 HC Chamber Specifications			
Length	63"		
Effective Length	60"		
Overall Width	34.5"		
Invert Height	10.5"		
Overall Height	16"		

Calculations and dimensions are nominal



Arc 36 HC Chamber

Top, Side, and End Views (not to scale)







Arc 36 HC Endcap

Side and End Views (not to scale)



Arc 36 HC Features

- The post and dome creates a positive lock securing the chambers for final engagement. Lock and drop feature for faster installation.
- The Arc 36 HC chamber feet are designed with a sufficient surface area to provide support.
- Sidewall louvers are designed to allow effluent to exit the chamber sidewalls, while preventing soils from migrating into the chamber.
- Observation/venting knockout ports provide for inspection of system performance as well as a convenient location for drainfield ventilation pipes.
- Each chamber end has small knockouts on the top positioned in the "Post" end joint. When removed, these knockouts allow for the use of zip ties to support piping in dosing systems.
- The Arc AASHTO H-10 is approved for use in Rhode Island for H-10 load rated applications with proper installation.

Arc 36 HC Universal Endcap

- Upper and lower knockouts accommodate both Schedule 40 and SDR 35 piping. Knockouts can be removed with a knife or hole saw. Dimples are also offered for the positioning of hole saw pilot drills.
- Endcaps are designed to attach to either end of the Arc 36 HC chamber.

Arc 36 HC Swivel Feature

 Swivel lockout tabs may be removed carefully with a utility knife.

Arc 36 HC Side Port Coupler (SPC)

• SPC component snaps in place to allow side entry into the trench line. This accessory provides a variety of design and installation options.





Louvers and Feet



Observation Port







SYSTEM DESGIN AND SIZING

Arc chamber systems may be designed in various configurations. All applicable RIDEM rules shall apply.

Trench System Applications

- All trench systems shall be designed in accordance with RIDEM OWTS rules.
- Arc chambers installed in trench systems shall be sized in accordance with Table 1 and the sizing tables herein.
- The minimum distance between walls of adjacent Arc chamber trenches shall be at least five feet (5'), with one exception: when the groundwater table is within 2 to 4 feet of the original ground surface, the minimum distance between Arc chamber trench walls shall be at least 10 feet.
- The distal ends of each chamber trench shall be interconnected in accordance with RIDEM OWTS rules.

Arc Chamber System Sizing

- When calculating the size of the Arc chamber system, the system designer shall follow the requirements in the RIDEM OWTS Rules (specifically Rule 6.16.K, Tables: 6.16.L, 6.22.B, 6.33.C, 6.34.A, 6.34.B as well as all applicable rules) in assessing site conditions, to determine the requisite leaching area.
- Step #1: Determine the leaching area required.
- **Step #2:** Referencing Table 1, the system designer simply divide the per-unit rating for the selected Arc chamber model into the leaching area as calculated to determine the number of chambers required.
- Note: The system designer shall "round-up" for any partial chamber that result from these calculations.
- **OR:** Referencing the sizing charts for individual Arc chamber models, select the minimum number of chambers required for a given soil loading rate and number of bedrooms.

SIZING CHARTS

Table 1: Arc Chamber Ratings

Model	Dimensions H x W x L (inches)	Invert Height (inches)	Trench Width (inches)	Rating Per Linear Foot (SF/LF)	Rating Per Unit (SF/Unit)
Arc 18	12 x 16 x 60	6.25	18	1.9	9.5
Arc 24	12 x 22 x 60	6.25	24	2.7	13.5
Arc 36	13 x 34 x 60	7	36	4.0	20.0
Arc 36 HC	16 x 34.5 x 60	10.5	36	4.0	20.0

Table 2: Arc 36 & Arc 36 HC Trench Sizing Per OWTS Rule 6.33.C (Soil Category)

	Loading Rate (gal/ft2/day)	Number of Arc 36 & Arc 36 HC Chambers		
Soil Category		2 Bedrooms (230 GPD)	3 Bedrooms (345 GPD)	Each Add'l Bedroom (115 GPD)
1	0.70	17	25	9
1m	0.61	19	29	10
2	0.61	19	29	10
3	0.70	17	25	9
4	0.61	19	29	10
4m	0.70	17	25	9
5	0.52	23	34	11
6	0.61	19	29	10
6m	0.70	17	25	9
7	0.52	23	34	11
7m	0.61	19	29	10
8	0.46	25	38	13
8m	0.48	24	36	12
9	0.40	29	44	15
9m	0.43	27	42	14
10	Not Allowed	Not Allowed	Not Allowed	Not Allowed

Note:

1. For OWTS Applications for Repair, a loading rate of 0.93 GPD/sq. ft. may be used for Soil Category 1.

SIZING CHARTS

Table 3: Arc 24 Tr	rench Sizing Per	OWTS Rule 6.33.C	(Soil Category)
--------------------	------------------	------------------	-----------------

	Loading Rate (gal/ft2/day)	Number of Arc 24 Chambers		
Soil Category		2 Bedrooms (230 GPD)	3 Bedrooms (345 GPD)	Each Add'l Bedroom (115 GPD)
1	0.70	25	37	13
1m	0.61	28	42	14
2	0.61	28	42	14
3	0.70	25	37	13
4	0.61	28	42	14
4m	0.70	25	37	13
5	0.52	33	50	17
6	0.61	28	42	14
6m	0.70	25	37	13
7	0.52	33	50	17
7m	0.61	28	42	14
8	0.46	37	56	19
8m	0.48	36	54	18
9	0.40	43	64	22
9m	0.43	40	60	20
10	Not Allowed	Not Allowed	Not Allowed	Not Allowed

Note:

1. For OWTS Applications for Repair, a loading rate of 0.93 GPD/sq. ft. may be used for Soil Category 1.

SIZING CHARTS

Table 4: Arc 18 Trei	nch Sizing Per OWTS	S Rule 6.33.C (Soil Category)
----------------------	---------------------	-------------------------------

	Loading Rate (gal/ft2/day)	Number of Arc 18 Chambers		
Soil Category		2 Bedrooms (230 GPD)	3 Bedrooms (345 GPD)	Each Add'l Bedroom (115 GPD)
1	0.70	35	52	18
1m	0.61	40	60	20
2	0.61	40	60	20
3	0.70	35	52	18
4	0.61	40	60	20
4m	0.70	35	52	18
5	0.52	47	70	24
6	0.61	40	60	20
6m	0.70	35	52	18
7	0.52	47	70	24
7m	0.61	40	60	20
8	0.46	53	79	27
8m	0.48	51	76	26
9	0.40	61	91	31
9m	0.43	57	85	29
10	Not Allowed	Not Allowed	Not Allowed	Not Allowed

Note:

1. For OWTS Applications for Repair, a loading rate of 0.93 GPD/sq. ft. may be used for Soil Category 1.

Preparation

- Excavate the bed or trench to proper width and depth per system design.
- Smooth irregularities in the excavation and clear any large rocks or debris from the bottom surface area. Slope of the bottom shall be determined by the system design, as well as state and local codes.

Installation

 Installation of Arc chambers begins with laying the first chamber onto the prepared bottom surface area dome end first. Each additional chamber is then laid dome over post by raising the post end of the incoming chamber and slightly pulling the chamber back until the dome stops at the underlying post. As the incoming chamber is laid flat on the bottom, slide the lower base flanges under the raised base





flanges of the previously installed chamber.

 As the incoming chamber is lowered down onto the excavation bottom, the two chambers fully engage in a straight-line pattern creating a very strong joint.



Note: If the following chamber is simply laid onto the preceding chamber the joint will not be fully engaged.

Turns

• The Arc chambers are designed with an articulating joint that allows for a turn of up to 20° of movement with maximum of 10° in either direction.

Note: The Arc 24 is designed with lockout tabs.



- If a turn application is desired with the Arc 24 chamber, the lockout tab should be removed before installing the incoming chamber. The lockout tab is located at the base flange of the previously-installed chamber (on its "Post" end).
- Strike or cut the lockout tab and tear the remaining tab material away from the chamber.
- If sharper turns are required, 4" pipe and fittings may be used.



Installation of Endcaps & Pipe Connections

• Prior to installing endcaps, remove the appropriate knockout for pipe connections. Snap an endcap on each end of the drain lines with the product or company logo facing out (knockouts can be removed with a knife or a 4" hole saw).





• Upper endcap 4" knockouts — always used as inlet for each line. A four-inch hole saw may be used.

Splash Plates

- Splash plates are mandatory on each inlet endcap for gravity distribution.
- Splash plates are installed by aligning the holes on the splash plate with the corresponding dimples on the endcap and snapping into place.



Filter Fabric

The use of filter fabric is recommended, and may be required in certain soil conditions. If used, drape the fabric to completely cover the louvered sidewalls of the chambers to prevent soil intrusion, while allowing water and air to pass through.

The following single or combination of conditions warrant the use of filter fabric:

- The backfill material is fine or very fine uniform sand.
- The drainfield will be left uncovered.
- The drainfield will not be protected from surface drainage (i.e. downspouts, roofs, paved areas, and neighboring property).

Filter fabric shall meet the following specifications, check distributor for availability.

- Fabric: Spun bonded, made up of nylon fibers, hydrophilic in nature
- Weight: 0.35 1 oz/yd²

Ventilation

Arc chambers can be vented, but it is not required.

- Knockouts are provided on the top of all Arc chambers. The dome/post feature of the Arc 24 chamber also acts as a knock-out for observation/vent ports. A pipe may be installed into the chamber and vented to atmosphere.
- Assemble the vent to prevent rainwater from entering, and effluent from exiting the chamber line.



Backfill

 Modestly compact the sidewall area backfill material by simply walking down the sides of the chambers. Sidewall compaction is important to begin the stabilization process of the soil, to support the chamber sidewalls, and help prevent fine sand migration into the chamber louvers. This procedure may be accomplished any time during the installation or covering process.



- All Arc chambers are AASHTO H-10 load rated. Where vehicular loading is anticipated during installation of the system or construction of the facility. AASHTO H-10 loading (16,000 lbs/axle) is achieved by backfilling with a minimum of 12" of properly compacted cover. Traverse perpendicular to the trenches with a tracked vehicle (not a wheeled vehicle).
- Do not drive heavy equipment over a system comprised of non-compacted cover material without first bridging the excavation. Use lightweight or tracked equipment to push the soil onto the system to the proper height set forth by local and state codes.

Final Grade

- Make certain that storm water is diverted away from the drainfield. System final grade should be crested or sloped, never left flat or concave. Channel water away from the drainfield.
- Final grading subcontractors and landscapers should be notified of the system location and instructed to proper covering procedures, cover materials, and finish contours and elevations.
- Final grade material should be slightly to moderately limited soil to help maintain an aerobic state in the drainfield.
- Stabilize the drainfield area with grass-type vegetation prior to heavy rains if possible.

PRESSURIZED SHALLOW NARROW DRAINFIELD (PSND) SYSTEMS

Design Installation

- All Pressurized Shallow Narrow Drainfield (PSND) Systems shall be designed in accordance with the RIDEM RI Sand Filter Guidance 6.37.D (Pressurized Shallow Narrow Drainfield), or updates thereto.
- All PSND Systems shall utilize the Arc 18 chamber, and shall be sized equivalent in length (foot-for-foot) to that required in the Sand Filter Guidance Document.
- For purposes of sizing a PSND, the infiltrative surface (base of the PSND) is the bottom of the Arc 18 chamber.
- All PSND Systems shall be designed in accordance with RIDEM OWTS rules.
- The maximum chamber line length in all PSND Systems is 50 feet.
- The designer shall choose the size of the pipe based upon all system-specific considerations. Orifices shall be 1/8" diameter in accordance with RIDEM OWTS rules.
- When not specified on the approved plan, installation of the Arc 18 chamber as a PSND must be documented by the designer's submission of "As- Built" plans, to be submitted with the designer's Certificate of Construction.
- The Arc 18 chamber is approved for use in PSND Systems with the pressure distribution pipes hung along the underside of the top of the chambers, with primary orifices facing upward.
- Drill holes in llaterals per design. Every fifth orifice shall be drilled through both the top and the bottom of the pipe, in accordance with RIDEM OWTS rules.

Pressure Pipe Installation

- Use these instructions in connection with the typical chamber installation instructions.
- Install the Arc 18 chambers above the pressure pipe, taking care to keep the pipe centered within the trench Use these instructions in connection with the typical chamber installation instructions.
- Small knockouts or openings are provided on the roof of each chamber's post end to accommodate heavy duty black zip ties for the hanging of distribution pipes under the top of the chamber lines.
- Cut holes in chamber end caps. Choose a hole saw that matches the outside diameter of the specified PVC distribution pipe. Extend pressure pipe on each end of trench through end cap and affix end caps to chambers.
- Attach fittings for maintenance and inspection at distal end of line as per the design.
- Repeat above steps for each chamber/pressure pipe line.
- · Connect header assembly as per the design.
- Install cover to specification. Rhode Island rules allow for a minimum of 6" of cover in non-traffic-bearing areas.

Limited Septic Warranty for Arc Chambers

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

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

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

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

(d) No representative of Infiltrator has the authority to change or extend this Limited Warranty. No warranty applies to any party other than the original Holder. The above represents the Standard Limited Warranty offered by Infiltrator. A limited number of states and counties have different warranty requirements. Any purchaser of Units should contact Infiltrator's Corporate Headquarters in Old Saybrook, Connecticut, prior to such purchase, to obtain a copy of the applicable warranty, and should carefully read that warranty prior to the purchase of Units.

(e) All types of chamber systems must be installed in full compliance with the latest version of the product installation requirements. The system must be in full compliance with all aspects of the state regulations and codes.



4 Business Park Road P.O. Box 768 Old Saybrook, CT 06475 860-577-7000 • Fax 860-577-7001 **1-800-221-4436** www.infiltratorwater.com info@infiltratorwater.com

U.S. Patents: 8322948; 8337119; 8297880; 7914230; 7008138. Other patents pending. Infiltrator, Quick4 and EZflow are registered trademarks of Infiltrator Water Technologies. Infiltrator Water Technologies is a wholly-owned subsidiary of Advanced Drainage Systems, Inc. (ADS).

© 2021 Infiltrator Water Technologies, LLC. Not responsible for any typographic errors. Printed in U.S.A.

ARC09 0821

Contact Infiltrator Water Technologies' Technical Services Department for assistance at 1-800-221-4436