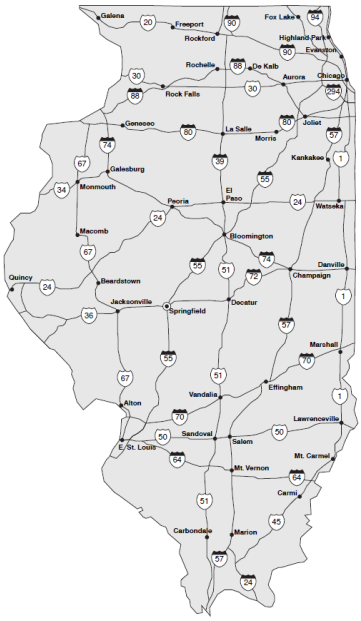
INFILTRATOR®
water technologies

Design and Installation Manual for the Infiltrator ATL™ System in Illinois



The purpose of this manual is to provide the minimum specifications for design and installation of the Infiltrator ATL (Advanced Treatment Leachfield) System in the State of Illinois. All local ordinances, requirements, and procedures must be followed. Each revised version of this manual supersedes the previous version.

The systems presented in this document are common configurations and are provided for illustrative purposes. They are not intended to restrict the use of other configurations.

For more detailed design and installation information, please contact Infiltrator at 1-800-221-4436.

Revised: December 2017
October 2018

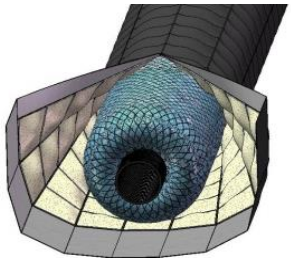
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ILLINOIS

The Infiltrator ATL System

The Infiltrator ATL System (ATL System) is a patent-pending, proprietary system consisting of six components. Upon entering the ATL System, septic tank effluent progresses through each component as follows:

- nominally 12-inch-diameter conduit
  - 4-inch-diameter pipe
  - large-diameter synthetic aggregate
  - coarse geotextile
  - small-diameter synthetic aggregate
  - fine geotextile
- 6-inch depth specified system sand



System Sand

"System sand" is the term used to describe the coarse sand material that surrounds the ATL System conduits (conduits). Acceptable material for use as system sand is material which meets ASTM C33 specifications.

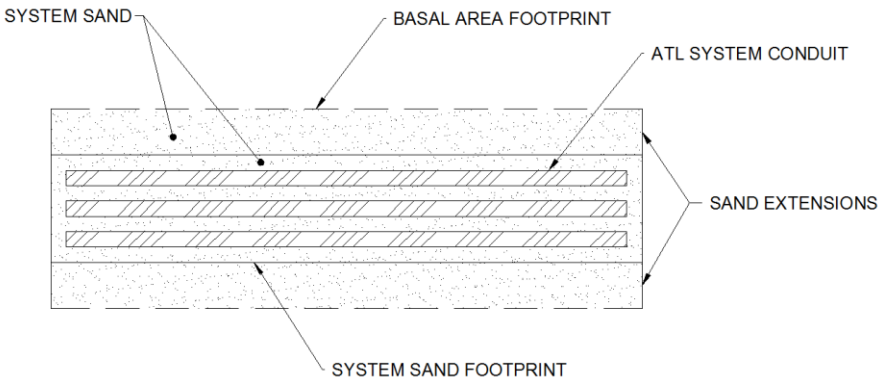
The following minimum system sand dimensions are required for all ATL System configurations:

- 6 inches of system sand below the conduit rows;
- 12 inches of system sand extension on both ends of the conduit rows; and
- 12 inches of system sand adjacent to and between each conduit row.

There is no minimum requirement for system sand on top of the conduit rows. Cover soil shall be a minimum of 6 inches in accordance with the Section 905.60(a)(3) of Part 905 Private Sewage Disposal Code (Code).

System Sand Footprint: area that is created by considering the amount of conduit and the system sand between and beside the individual conduit rows.

Basal Area Footprint: area at the bottom of the 6-inch system sand layer created in order to meet the minimum infiltrative surface area requirements.



The ATL System is certified by NSF International as complying with NSF/ANSI Standard 40 for the production of Class I effluent, and is approved for use in the State of Illinois by the Illinois Department of Public Health (IDPH) in accordance with Section 905.20(t) of the Private Sewage Disposal Code (Code). The IDPH approval allows for design and installation of the ATL System in the State of Illinois in accordance with the specifications and instructions in this manual. If design, installation, operation, or maintenance specifications are not specifically addressed in this manual, relevant requirements in the Code shall be applicable.

This manual is intended to provide system design, installation, and use information to the users in Illinois, including system designers, local health officials, system installers, and system owners. Illustrations presented in this manual are common configurations and are not intended to restrict the use of other configurations.

System Sizing
ATL System design specification and instructions are detailed on pages 7 through 11 of this manual.

Daily design flows shall be in accordance with the Section 905.APPENDIX A ILLUSTRATION A of the Code.

Effluent Distribution
The ATL System can accommodate all methods of effluent distribution, including gravity, pump-to-gravity, serial, and pressure distribution.

Dosed Systems
If effluent is pumped to the ATL System, the maximum volume per cycle shall be 1/4 of the daily design flow.

Elevated Systems
If any aspect of the ATL System extends above original grade, the system shall be considered to be an elevated system. In elevated system applications on sloped sites, the conduit rows shall be installed on the upslope side of the system sand footprint, maintaining the 12-inch separation between rows.

Elevated systems require the installation of fill material extensions. Fill material extensions shall be added on all four sides of an elevated ATL System, and shall be a minimum of 3-feet wide, measured from the outside edge of the conduit. In sloped site applications, the fill material extension on the downslope side (only) shall be increased to 5-feet wide.

Maximum taper along the sides of an elevated ATL System shall be 3/1.

Fill and Cover Materials
All cover and fill materials must conform to the requirements of the Code. Use of system sand in fill material extensions is allowed.

The ATL System is designed and approved for use with a minimum 6 inches of cover material.

Minimum Separation Distances
Minimum separation distances shall comply with the requirements of the Code, and local regulations where applicable.

Horizontal separation distances (setbacks) shall be measured from the outside aspect of the system sand.

Vertical separation distances shall be measured from the bottom of the 6-inch layer of system sand below the conduit rows.

Minimum Conduit Lengths
The minimum design length of conduit in residential applications is 70 feet per bedroom.

Minimum System Size
Each ATL System shall contain a minimum of 140 lf of conduit and a minimum 300 sf of basal area footprint.

System Sand Extensions
When the system sand footprint must be increased to meet the minimum basal area footprint design requirement, and/or the ATL System is to be installed on a sloped site, sand extensions are required. Sand extensions shall be comprised of system sand and shall be a minimum of 6 inches deep.

On sloped sites, the minimum downslope sand extension shall be 2.5 feet, measured from the edge of the system sand footprint.

Sloped Sites
With use of the ATL System in Illinois, a site is considered to be sloped when the slope is greater than 10 percent. In sloped site applications, the ATL System shall be constructed utilizing serial distribution. In serial distribution applications, use of raised connections is recommended. See page 18 for an example of one method of fabricating a raised connection.

On sloped sites, any sand extensions as required in the system design process shall be placed on the downslope side of the ATL System. On all slopes sites, a minimum 2.5-foot-wide sand extension must be added on the downslope side of the bed along its entire length, measured from the end of the system sand footprint.

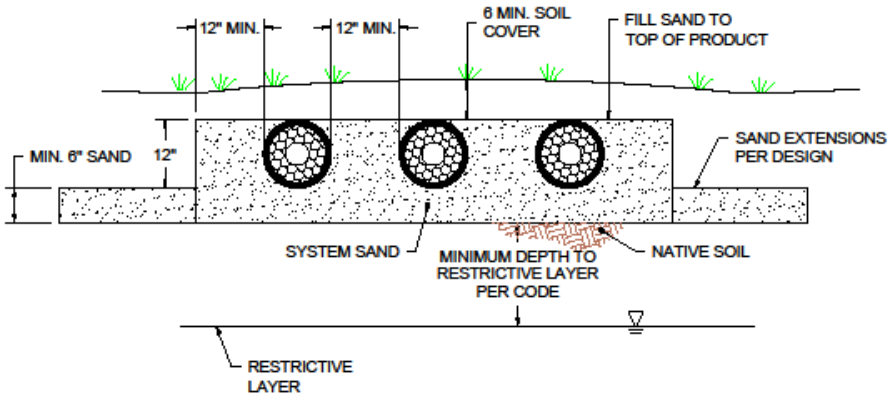
Use of the ATL System on sloped sites shall be restricted as follows:

ATL Soil Loading Rate (gpd/ft^2)	Maximum Site Slope (%)
0.75 – 1.0	33
0.35 – 0.70	20
0.25-0.3	15

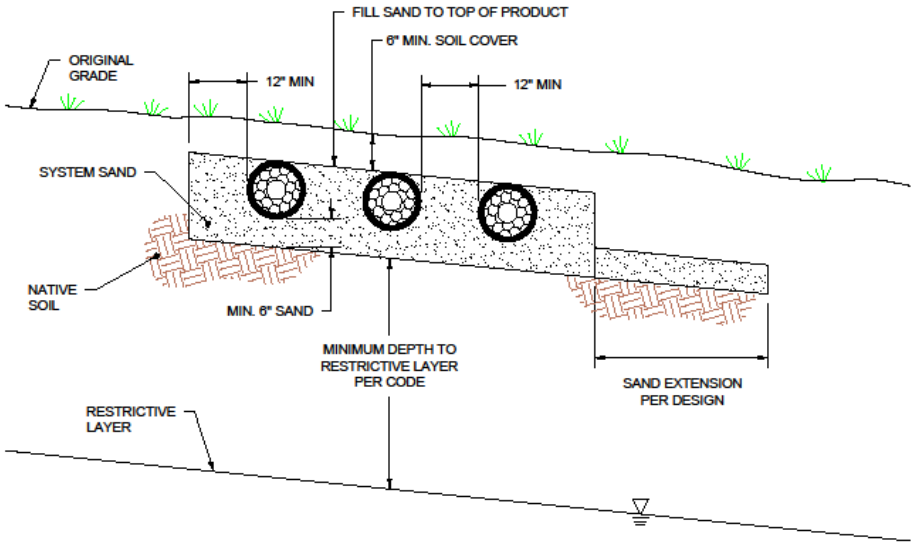
Multiple Bed Systems
If site conditions prevent design and installation of a single ATL System bed along the contour, the ATL System may be installed in multiple bed configurations, with the following conditions:

- each bed must run along the length of any contour; and
- each bed must receive proportional flow.

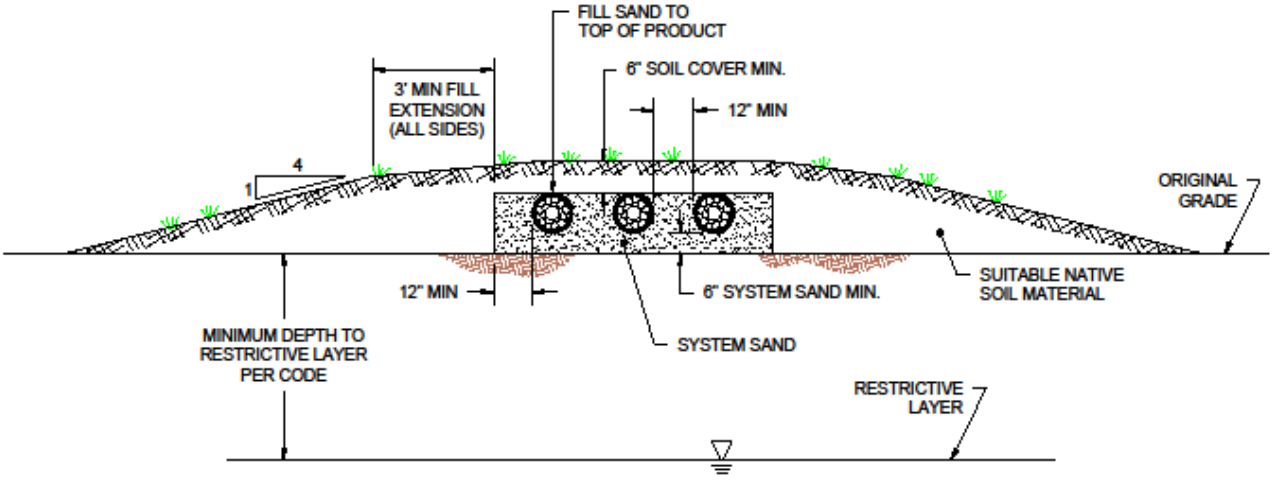
Level Subsurface Cross Section (≤10% slope)



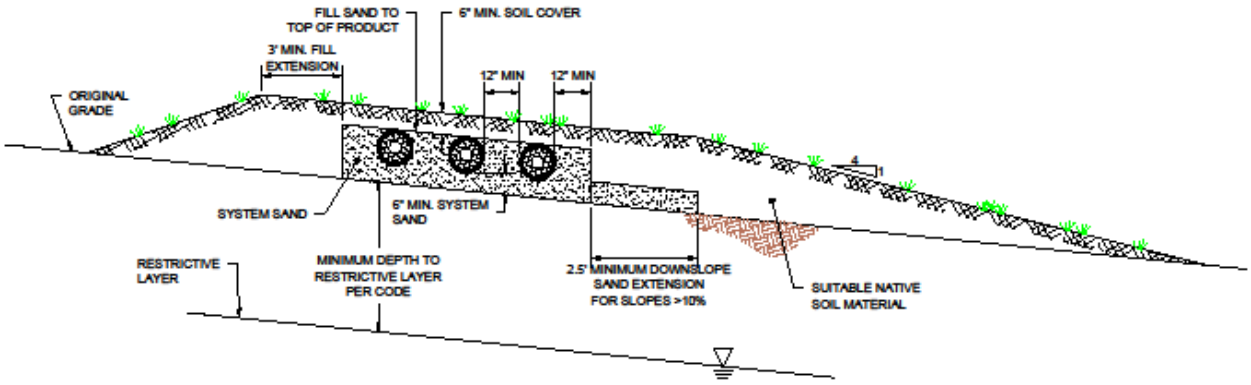
Sloped Subsurface Cross Section (>10% slope)



Level Elevated Cross Section (≤10% slope)



Sloped Elevated Cross Section (>10% slope)



NOTES:

1. Drawings are not to scale.
2. Number and length of conduits per design.
3. Venting is not required but is optional at the discretion of the designer.
4. Pumping is not required unless gravity flow cannot be achieved.
5. Observation ports are optional, per design.
6. The ATL System is intended for use in non-traffic applications.

Designing the ATL System in Illinois is a five-step process.

1. *Determine the minimum total conduit length*
2. *Design the system sand configuration*
3. *Determine the appropriate minimum system size per bedroom or soil loading rate*
4. *Determine the minimum basal area*
5. *Design the basal area footprint*

Step 1: Determine the minimum total conduit length

The minimum length of conduit per bedroom is 70 feet. Determine the minimum total length of conduit from Table 1, based on the number of bedrooms.

Number of bedrooms	Minimum Conduit Length Required (ft)
2	140
3	210
4	280
5	350
Each additional	70

Table 1: Minimum total length of conduit required

NOTES: *Commercial and large-flow applications:*

1. *The minimum conduit length shall be determined by dividing the daily design flow by 2.14 gallons per linear foot.*
2. *The system designer shall consider the strength of the wastewater and design accordingly. The designer shall either reduce the wastewater quality to residential strength via advanced treatment or provide design strategies that will address the specific project's wastewater characteristics, such as but not limited to: additional tankage, remediation devices, alternating fields, reduced application rates (increased system sizing), etc.*
3. *For questions and additional support, contact Infiltrator's Technical Services Department at 1-800-221-4436.*

Step 2: Design the system sand configuration

Use Table 2 to determine the minimum system sand footprint using the minimum length of conduit (determined using Table 1) and the number of rows into which the total length of conduit will be divided. The system should be designed as long and narrow as site conditions allow.

Minimum Length of Conduit (ft)	Minimum system sand dimensions and area							
	3 conduit rows		4 conduit rows		5 conduit rows		6 conduit rows	
	Dimensions (W' x L')	Area (sf)	Dimensions (W' x L')	Area (sf)	Dimensions (W' x L')	Area (sf)	Dimensions (W' x L')	Area (sf)
140	7 x 52	364	9 x 42	378	11 x 32	352	13 x 32	416
210	7 x 72	504	9 x 62	558	11 x 52	572	13 x 42	546
280	7 x 102	714	9 x 72	648	11 x 62	682	13 x 52	676
350	7 x 122	854	9 x 92	828	11 x 72	792	13 x 62	806

Table 2: Minimum system sand dimensions and area

NOTES:

1. *Any system with a conduit length greater than 100 ft must be center-fed or split into multiple beds.*
2. *The conduits come in 10-foot lengths; all conduit row length calculations in Table 2 are to be rounded up to the nearest 10 feet.*
3. *The conduit rows must be extended to within 12 inches of each end of the bed. The dimensions above include 12 inches of sand on each end of the conduit rows.*
4. *The system should be designed as long and narrow as site conditions allow. Therefore, the number of conduit rows should be minimized.*
5. *Multiple bed systems: where site conditions or other considerations require multiple beds, the row-specific length dimensions in Table 2 may be modified to account for the number of beds.*

Step 3: Determine the appropriate minimum system size per bedroom or soil loading rate

Investigate the site in accordance with Section 905.55 of the Code and reference Tables 3 and/or 4 below to determine the appropriate minimum system size per bedroom or soil loading rate for designing the ATL System. The system designer will at this point chose to design the system based upon either minimum system size per bedroom or soil loading rate.

Design Group	Soil Group (Most Limiting Layer)	Permeability Range	Minimum System Size/Loading Rate	
			Residential Absorption (ft^2/bedroom)	Institutional/ Commercial Application Rate (gpd/ft^2)
I	1A	Very Rapid	NR	NR
II	2A; 2B; 2K	Rapid	133	1.50
III	3B; 3K	High Moderately Rapid	147	1.36
IV	3A; 3L; 4D; 4K	Low Moderately Rapid	160	1.25
V	4A; 4B; 4H; 4L; 5D	Very High Moderate	179	1.12
VI	4F; 4M; 5B	High Moderate	194	1.03
VII	4N; 5A; 5C; 5H; 5K; 6D	Moderate	215	0.93
VIII	4O; 5E; 5I; 5L; 6A; 6B; 6E; 6H; 6K	Low Moderate	256	0.78
IX	5F; 5M; 6C; 6L; 7D; 7F	High Moderately Slow	299	0.67
X	5G; 6F; 6I; 7E; 7C; 7H	Low Moderately Slow	333	0.60
XI	5N; 6G; 6J; 6M; 7F; 7I	Slow	500	0.40
XII	7G; 7J; 7L; 8E; 8I	Very Slow	667	0.30
XII	5O; 6N; 6O; 7M; 7N; 7O; 8J; 8M; 8O	NR	NR	0.00
XIII	9	SUBSURFACE NOT RECOMMENDED		

Table 3: ATL System soil loading rates in square feet per bedroom and gpd/ft^2

Structure and Parent Material	Single Grain; Weak; Platy	Granular, Angular and Subangular Blocky; Prismatic									Structureless or Massive				
		Loess; Outwash; Alluvium; Lacustrine						Till							
		Weak		Moderate; Strong		Strong		Moderate; Strong			Loess; Outwash; Alluvium; Lacustrine			Till	
Moist Consistence	lo vfr fr	vfr fr	fi	vfr	fi	vfr fr	fi	fr	fi	vfi	vfr	fr	fi	vfr fr	fi vfi
Texture	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1. Fragmental; Ext. or Very gravelly sand	1.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2. Sand; Loamy course sand; Loamy sand; Gravelly sand; Coarse sand; Gravelly loamy sand	1.5	1.5	--	--	--	--	--	--	--	--	1.5	--	--	--	--
3. Fine sand; Loamy fine sand; Coarse sandy loam	1.25	1.4	--	--	--	--	--	--	--	--	1.4	1.3	--	--	--
4. Sandy loam; Fine sandy loam; Gravelly sandy loam; Gravelly loam; Gravelly silt loam	1.12	1.1	--	1.3	--	1	--	--	1.1	--	1.3	1.1	1	0.9	0.8
5. Loam; Silt loam; Very fine sandy loam; Sandy clay loam; Silt; Very fine sand; Loamy very fine sand; Gravelly clay loam	0.93	1	0.9	1.1	0.8	0.7	0.6	0.9	0.8	--	0.9	0.8	0.7	0.4	--
6. Silty clay loam (<35% c); Clay loam (< 35% c)	0.78	0.8	0.7	0.9	0.8	0.6	0.4	0.8	0.6	0.4	0.8	0.7	0.4	--	--
7. Silty clay loam (>35% c); Clay loam (>35% c)	--	--	0.6	0.7	0.7	0.4	0.3	0.6	0.4	0.3	--	0.3	--	--	--
8. Sandy clay; Clay	--	--	--	--	0.3	--	--	--	0.3	--	--	--	--	--	--
9. Organics; Fragic; Lithic; Paralithic	SOIL PROPERTIES HAVE VERY SEVERE LIMITATIONS; SUBSURFACE DISPOSAL NOT RECOMMENDED														

Table 4: ATL System soil loading rates (g/sq.ft/d)

Step 4: Determine the minimum basal area

If designing the ATL System by using minimum size per bedroom, multiply the minimum system size as derived from Table 3 in Step 3 by the number of bedrooms in the residence.

If designing the ATL System by using soil loading rates derived from Tables 3 or 4 in Step 3, determine the minimum basal area per bedroom required for the ATL System using the soil loading rate and referencing Table 5.

Soil Infiltration Loading Rate (gpd/sf)	Minimum Basal Area (sf)				
	2 Bedrooms	**3 Bedrooms**	**4 Bedrooms**	**5 Bedrooms**	**Each Add'l Bedroom**
1.5	267	400	533	667	133
1.4	286	429	571	714	142
1.36	294	441	588	735	147
1.3	307	462	615	769	154
1.25	320	480	640	800	160
1.12	357	536	714	893	179
1.1	333	545	727	909	167
1.03	388	583	777	971	194
1.0	400	600	800	1000	200
0.93	430	645	860	1075	215
0.8	500	750	1000	1250	250
0.78	513	769	1026	1282	256
0.7	571	857	1142	1429	286
0.67	597	896	1194	1493	299
0.60	667	1000	1333	1667	333
0.40	1000	1500	2000	2500	500
0.30	1333	2000	2667	3333	667

Table 5: Minimum basal area per bedroom required for the ATL System

Step 5: Design the basal area footprint

The minimum areas required in Step 2 (system sand configuration) and Step 4 (basal area) cannot be reduced. These areas must be maintained to ensure adequate area for placement of the conduits and infiltration of treated effluent into the native soil.

Sand extensions are necessary as follows:

- If the minimum basal area determined in Step 4 is smaller than the area of the system sand footprint determined in Step 2, no sand extensions are necessary.

- If the minimum basal area determined in Step 4 is larger than the area of the system sand footprint determined in Step 2, sand extensions* must be added to meet the minimum basal area footprint requirements. When adding sand extensions:

- In level system applications, additional width shall be evenly divided on each side of the ATL System;
- In sloped system applications, additional width shall be entirely placed on the downslope side of the ATL System.

***NOTE:** The length of the bed area may be altered, but only by extending the conduit rows. This method may be preferred over increasing the width of the system under certain site and system design considerations.*

The following sample system design calculations are intended to illustrate the methodology for designing the ATL System. The sample system design calculations are provided in the step-by-step format described above.

Example I.

System sample specifications:

- 4-bedroom home
- Soil: from site investigation, soil is determined to be a weak, platy sandy clay loam
- System design based upon soil loading rate
- 3% slope on site

Step 1: Determine the minimum total conduit length

The minimum length of conduit from Table 1 based on the number of bedrooms is 280 ft.

Number of bedrooms	Minimum Conduit Length Required (ft)
2	140
3	210
4	280
5	350
Each additional	70

Table 1: Minimum total length of ATL conduit required

Step 2: Design the system sand configuration

Per Table 2 below, for a 280-foot conduit length, the following configurations could be used, as allowed per site conditions. Assume that a 3-conduit-row system has been chosen for this example.

- 2 conduit rows – 5 ft wide x 142 ft long (710 sf)
- **3 conduit rows – 7 ft wide x 102 ft long (714 sf)**
- 4 conduit rows – 9 ft wide x 72 ft long (648 sf)
- 5 conduit rows – 11 ft wide x 62 ft long (682)

Minimum Conduit Length (ft)	Minimum System Sand Dimensions and Area							
	2 Conduit Rows		3 Conduit Rows		4 Conduit Rows		5 Conduit Rows	
	Dimensions (W' x L')	Area (sf)	Dimensions (W' x L')	Area (sf)	Dimensions (W' x L')	Area (sf)	Dimensions (W' x L')	Area (sf)
140	5 x 52	260	7 x 52	364	9 x 42	378	11 x 32	352
210	5 x 112	560	7 x 72	504	9 x 62	558	11 x 52	572
280	~~5 x 142~~	~~710~~	7 x 102	714	9 x 72	648	11 x 62	682
350	5 x 182	910	7 x 122	854	9 x 92	828	11 x 72	792

Table 2: Minimum system sand dimensions and area

Step 3: Determine the appropriate minimum system size per bedroom or soil loading rate

From the information learned in the site investigation undertaken in accordance with Section 905.55 of the Code, the soil is determined to be a weak, platy sandy clay loam. The system designer has chosen to design the system by utilizing the soil loading rate and referencing Table 4. The appropriate soil loading rate for designing the ATL System is therefore determined to be 0.93 gallons/square foot/day.

Structure and Parent Material	Single Grain; Weak; Platy	Granular, Angular and Subangular Blocky; Prismatic									Structureless or Massive				
		Loess; Outwash; Alluvium; Lacustrine						Till			Loess; Outwash; Alluvium; Lacustrine			Till	
		Weak		Moderate; Strong		Strong		Moderate; Strong							
Moist Consistence	lo vfr fr	vfr fr	fi	vfr	fi	vfr fr	fi	fr	fi	vfi	vfr	fr	fi	vfr fr	fi vfi
Texture	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1. Fragmental; Ext. or Very gravelly sand	1.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2. Sand; Loamy course sand; Loamy sand; Gravelly sand; Coarse sand; Gravelly loamy sand	1.5	1.5	--	--	--	--	--	--	--	--	1.5	--	--	--	--
3. Fine sand; Loamy fine sand; Coarse sandy loam	1.25	1.4	--	--	--	--	--	--	--	--	1.4	1.3	--	--	--
4. Sandy loam; Fine sandy loam; Gravelly sandy loam; Gravelly loam; Gravelly silt loam	1.12	1.1	--	1.3	--	1	--	--	1.1	--	1.3	1.1	1	0.9	0.8
5. Loam; Silt loam; Very fine sandy loam; Sandy clay loam; Silt; Very fine sand; Loamy very fine sand; Gravelly clay loam	0.93	1	0.9	1.1	0.8	0.7	0.6	0.9	0.8	--	0.9	0.8	0.7	0.4	--
6. Silty clay loam (<35% c); Clay loam (< 35% c)	0.78	0.8	0.7	0.9	0.8	0.6	0.4	0.8	0.6	0.4	0.8	0.7	0.4	--	--
7. Silty clay loam (>35% c); Clay loam (>35% c)	--	--	0.6	0.7	0.7	0.4	0.3	0.6	0.4	0.3	--	0.3	--	--	--
8. Sandy clay; Clay	--	--	--	--	0.3	--	--	--	0.3	--	--	--	--	--	--
9. Organics; Fragic; Lithic; Paralithic	SOIL PROPERTIES HAVE VERY SEVERE LIMITATIONS; SUBSURFACE DISPOSAL NOT RECOMMENDED														

Table 4: ATL System soil loading rates (g/sq.ft/d)

Step 4: Determine the minimum basal area

In Step 3, the system designer has chosen to design the ATL System by utilizing soil loading rates derived from Table 4, and has determined that the appropriate soil loading rate is 0.93 gallons/square foot/day. Referencing Table 5, the minimum basal area for a 4-bedroom home when utilizing the ATL System is 860 sf.

Soil Infiltration Loading Rate (gpd/sf)	Minimum Basal Area (sf)				
	2 Bedrooms	3 Bedrooms	4 Bedrooms	5 Bedrooms	Each Add'l Bedroom
1.5	267	400	533	667	133
1.36	294	441	588	735	147
1.25	320	480	640	800	160
1.12	357	536	714	893	179
1.03	388	583	777	971	194
0.93	~~430~~	~~645~~	860	1075	215
0.78	513	769	1026	1282	256
0.67	597	896	1194	1493	299
0.60	667	1000	1333	1667	333
0.40	1000	1500	2000	2500	500
0.30	1333	2000	2667	3333	667

Table 5: Minimum basal area per bedroom required for the ATL System

Step 5: Design the basal area footprint

As determined in Step 2, the minimum length of the system is 102 ft and the minimum width of the system is 7 ft, creating a system sand footprint of 714 sf. Since the 860-sf minimum basal area (Step 4) is larger than the 714-sf system sand footprint (Step 2), sand extensions must be added.

- *Divide the minimum basal area by the length of the system sand footprint.* — *860 sf ÷ 102 ft = 8.43 ft*
- *Subtract the original system sand footprint width from the above adjusted system sand footprint width.* — *8.43 ft - 7 ft = 1.43 ft*
- *Divide the total sand extension required by 2 to determine the minimum sand extension required on each side of the system.* — *1.43 ft ÷ 2 = 0.72 ft (8 3/4 in)*

  NOTE: *Round up and convert to feet/inches for ease of installation.*
- *The system sand width must be widened by1.43 ft by adding an 8 3/4-in wide sand extension to the entire length of each side of the system. This results in a total basal area footprint width of 8.43 ft.* — *8.43 ft x 102 ft = 860 sf*

Example II.

System sample specifications:

- 5-bedroom home
- Soil: from site investigation, soil is determined to be design group VII
- System design based upon minimum system size per bedroom
- 13% slope on site

Step 1: Determine the minimum total conduit length

The minimum length of conduit from Table 1 based on the number of bedrooms is 350 ft.

Number of bedrooms	Minimum Conduit Length Required (ft)
2	140
3	210
4	280
5	350
Each additional	70

Table 1: Minimum total length of ATL conduit required

Step 2: Design the system sand configuration

Per Table 2 below, for a 350-foot conduit length, the following configurations could be used, as allowed per site conditions. Assume that a 4-conduit-row system has been chosen for this example.

- 2 conduit rows – 5 ft wide x 182 ft long (910 sf)
- 3 conduit rows – 7 ft wide x 122 ft long (834 sf)
- **4 conduit rows – 9 ft wide x 92 ft long (828 sf)**
- 5 conduit rows – 11 ft wide x 72 ft long (792)

Minimum Conduit Length (ft)	Minimum System Sand Dimensions and Area							
	2 Conduit Rows		3 Conduit Rows		4 Conduit Rows		5 Conduit Rows	
	Dimensions (W' x L')	Area (sf)	Dimensions (W' x L')	Area (sf)	Dimensions (W' x L')	Area (sf)	Dimensions (W' x L')	Area (sf)
140	5 x 52	260	7 x 52	364	9 x 42	378	11 x 32	352
210	5 x 112	560	7 x 72	504	9 x 62	558	11 x 52	572
280	5 x 142	710	7 x 102	714	9 x 72	648	11 x 62	682
350	5 x 182	910	7 x 122	854	9 x 92	828	11 x 72	792

Table 2: Minimum system sand dimensions and area

Step 3: Determine the appropriate minimum system size per bedroom or soil infiltration loading rate

From the information learned in the site investigation undertaken in accordance with Section 905.55 of the Code, the soil is determined to be design group VII. The system designer has chosen to design based upon minimum system size per bedroom and referencing Table 3. The appropriate minimum system size for designing the ATL System is therefore determined to be 215 ft^2/bedroom.

Design Group	Soil Group (Most Limiting Layer)	Permeability Range	Minimum System Size/Loading Rate	
			Residential Absorption (ft^2/bedroom)	Institutional/ Commercial Application Rate (gpd/ft^2)
I	1A	Very Rapid	NR	NR
II	2A; 2B; 2K	Rapid	133	1.50
III	3B; 3K	High Moderately Rapid	147	1.36
IV	3A; 3L; 4D; 4K	Low Moderately Rapid	160	1.25
V	4A; 4B; 4H; 4L; 5D	Very High Moderate	179	1.12
VI	4F; 4M; 5B	High Moderate	194	1.03
VII	**4N; 5A; 5C; 5H; 5K; 6D**	**Moderate**	**215**	0.93
VIII	4O; 5E; 5I; 5L; 6A; 6B; 6E; 6H; 6K	Low Moderate	256	0.78
IX	5F; 5M; 6C; 6L; 7D; 7F	High Moderately Slow	299	0.67
X	5G; 6F; 6I; 7E; 7C; 7H	Low Moderately Slow	333	0.60
XI	5N; 6G; 6J; 6M; 7F; 7I	Slow	500	0.40
XII	7G; 7J; 7L; 8E; 8I	Very Slow	667	0.30
XII	5O; 6N; 6O; 7M; 7N; 7O; 8J; 8M; 8O	NR	NR	0.00
XIII	9	SUBSURFACE NOT RECOMMENDED		

Table 3: ATL System soil loading rates in square feet per bedroom and gpd/ft^2

Step 4: Determine the minimum basal area

In Step 3, the system designer has chosen to design the ATL System based upon the minimum system size per bedroom as derived from Table 3. To determine the minimum basal area required with use of the ATL System, multiply the minimum system size per bedroom as derived from Table 3 by the number of bedrooms in the residence. In this example, the minimum basal area is determined to be 1,075 ft^2.

Step 5: Design the basal area footprint

As determined in Step 2, the minimum length of the system is 92 ft and the minimum width of the system is 9 ft, creating a system sand footprint of 828 sf. Since the 1,075-sf minimum basal area (Step 4) is larger than the 828-sf system sand footprint (Step 2), sand extensions must be added.

The site is considered to be sloped as the slope has been determined to be 13%. Accordingly, the entire sand extension as calculated below shall be placed on the downslope side of the ATL System bed.

- *Divide the minimum basal area by the length of the system sand footprint.* — *1075 sf ÷ 92 ft = 11.7 ft*
- *Subtract the original system sand footprint width from the above adjusted system sand footprint width.* — *11.7 ft - 9 ft = 2.7 ft*

  (2 ft 9 in)

  NOTE: *Round up and convert to feet/inches for ease of installation.*

- *The system sand width must be widened b 2.7 ft by adding a 2 ft 8 1/2-in sand extension on the downslope side of the system. This results in a total basal area footprint width of 11.7 ft.* — *11.7 ft x 92 ft = 1,076.4 sf*

Basic rules of onsite sewage treatment system use and care apply to the ATL System. System owners shall operate the system in accordance with the procedures and specifications described in the Code, all local regulations, and the following:

System Use and Abuse

Your ATL System is intended for use with residential-strength wastewater within the design daily flow volume. To ensure long-term function of your system:

- Keep daily wastewater flow within design parameters.
- Do not connect the rainwater management system to the ATL System.
- Direct water from the rainwater management system away from the ATL System.
- Solvents, paint, pharmaceuticals, aggressive cleaning products, and non-biodegradable items should not enter the ATL System.
- Solids, such as but not limited to, cigarette butts, diapers, feminine hygiene products, cat litter, and paper towels should not be introduced into the ATL system.

- Introduce only normal residential wastewater into the system
- Maintain leak-free household plumbing fixtures, such as faucets and toilets.
- Do not utilize a garbage grinder.
- The ATL System is intended for use in non-traffic applications.

Operation and Maintenance

Your ATL System has no specific operating instructions. Proper use of the system as noted above is the primary operating concern.

Maintenance of the ATL System includes the following:

- If the septic tank has an effluent filter, it should be cleaned by a qualified professional on an annual basis.
- The septic tank should be pumped on a regular basis and, if concrete, checked for leaks and cracks. The interval for septic tank pumping varies depending upon use. Check with a qualified professional or your local health department for the appropriate pumping interval.
- If present, the alarm system should be tested annually by a qualified professional to ensure that it is functional.

If at any time you have concerns about the use, operation, or maintenance of your ATL System, contact the Infiltrator's Technical Services Department at 1-800-221-4436.

System Start-up

There are no specific requirements for placing the ATL System into service. If the system has an alarm, a qualified professional should, after system use has been initiated, test the alarm to ensure it is functional.

Intermittent Use

The ATL System is designed for intermittent use, and requires no special attention if it is to be placed out of use for extended periods of time.

Trouble Shooting

In the event that any of the following indicators arise, contact a qualified professional.

- Wastewater back-up into the dwelling
- Persistent septic odor
- Unusually wet area atop and/or around the system
- "Breakout" of effluent along the side of a slope or other landscape feature

Repair

A qualified professional shall be contacted when there are indications of malfunction with the ATL System. When visiting the site, the qualified professional should, at a minimum, do the following:

- Assess the present condition of the ATL System and the surrounding area
- Research the history of use, including:
  - water volume use
  - contaminants
- Evaluate the site for groundwater intrusion
- Inspect the septic tank
- Inspect the conduit rows
- Check faucet and toilet function

Upon completion of the site visit, the qualified onsite wastewater system professional should contact the Infiltrator's Technical Services Department with the inspection report.

These installation instructions are for the ATL System in Illinois. ATL Systems may only be installed according to this manual, the Code, and any other local regulations.

If unsure of the installation requirements for a site, contact the qualified professional responsible for the design. If unsure of the use of the ATL System, contact Infiltrator. A permit which includes the soil evaluation and the design of the onsite system must be filed with and accepted by the local health department before installation.

Before You Begin

Materials and Equipment Needed

- conduits
- System sand
- PVC pipe and couplings
- Backhoe
- Laser or transit
- Shovel and rake
- Observation port and cap per design
- Endcaps
- 4-in internal corrugated pipe couplers
- Tape measure

Common practices shall apply to the installation of the ATL System. These include, but are not limited to:

- avoid soil compaction on the infiltrative surface area, including all areas downslope of a sloped system; and
- install the conduits and system sand on the same day that the system footprint is excavated/exposed.

The use of tracked vehicles for material installation is preferred.

Excavating and Preparing the Site

NOTE: *The ATL System may not be installed during periods when the soil is sufficiently wet to exceed its plastic limit, as this causes machinery to smear the soil.*

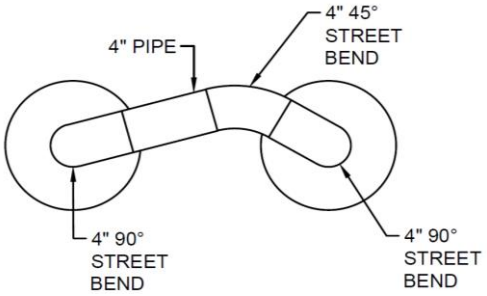
1. Stake out the locations of tank(s), pipes, conduit rows, and corners of the system to be scarified/excavated, per design. Set the elevations as shown on the approved plan. *[**NOTE:** The proper elevation of solid PVC header line going to each conduit row should be determined to ensure compliance with the required system bottom depth as shown* on *the approved permit. This height may vary dependent on system height and configuration used.]*
2. Install sedimentation and erosion control measures.
   *[**NOTE:** The installation of temporary drainage swales/berms (surface diversions) may be necessary to protect the site during rainfall events.]*
3. Excavate the bed area per design.
4. Rake the bed bottom and sides if smearing has occurred during excavation. Remove large stones and cut off protruding roots, fill voids with compacted system sand.
   *[**NOTE:** Smearing does not occur in sandy soils, so raking is not necessary. In fine textured soils (silts and clays), avoid walking on the excavation bottom to prevent compaction and loss of soil structure.]*
5. Verify that the bed area is at the proper slope from side-to-side and from end-to-end using a transit or laser.

Installing the System

1. Install the system sand footprint layer over the entire ATL System area as per design. System sand should be leveled and stabilized prior to introduction of the conduits. The installer should retain records verifying that system sand meets ASTM C-33 specifications.
2. Remove plastic stretch wrap from conduits.
3. Place conduits on the surface of the system sand with the white stripe/seam in the 12 o'clock position, arranged in the configuration shown on the system design. Using the provided 4-in-diameter internal pipe couplings, connect the conduits end-to-end to create rows of the required length.
4. Conduits shall be installed level. A laser level or transit is recommended to ensure proper alignment.
5. Conduit rows shall be:
   - installed on a level plane with one another;
   - be installed parallel to any contours;

- be separated by a minimum of 12 in of system sand; and
- be installed with the white stripe/seam oriented in the 12 o'clock position.

6. In serial distribution applications, use of a raised connection is recommended. One example of a raised connection is shown below:



7. Install a cap on the end of each conduit row that is not connected with piping.
8. Once the conduit is placed on the surface of the system sand and distribution piping is connected to the conduits per design, additional system sand shall be ladled beside and between, and to the top, of each of the conduit rows. System sand shall also be installed on each side and at each end of the backfilled conduit rows, per the design. This additional system sand shall be stabilized. Where possible, all machine work should be done from the uphill side of the infiltration area to reduce possible compaction of the receiving soil area.

Covering the System

NOTE: *Before backfilling, the system shall be inspected as required in the Code and in compliance with all local ordinances and procedures.*

1. Material placed around the system sand and atop the conduits may be additional system sand or material which meets the requirements of the Code. However, the final 6 in placed atop or adjacent to the ATL System shall be comprised of cover material that meets the requirements of the Code.
2. Backfill the bed by pushing material over the ATL System. It is best to mound several extra inches of soil over the finish grade to allow for settling. This also ensures that runoff is diverted away from the system.
   *[**NOTE:** Do not drive over the system while backfilling in sand.]*
3. After the system is covered, the site should be seeded or sodded. Ensure that sand-based sod, and not clay-based sod, is used to mitigate the potential for erosion.

NOTE: *If the system is for new home construction, it is important to leave marking stakes along the boundary of the system. This will notify contractors of the system location so they will not cross it with equipment or vehicles.*

INFILTRATOR WATER TECHNOLOGIES, LLC ("Infiltrator")
ATL SYSTEM STANDARD LIMITED WARRANTY

(a) The structural integrity of the Infiltrator ATL System conduits manufactured by Infiltrator (collectively referred to as "Units"), when installed and operated in a leachfield of an onsite septic system in accordance with Infiltrator's installation instructions, is warranted to the original purchaser ("Holder") against defective materials and workmanship for one year from the date upon which Letter of Certification is issued for the septic system containing the Units provided, however, that if a septic permit is not required for the septic system by applicable law, the one (1) year warranty period will begin upon the date that installation of the septic system commences. In order 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 those Units determined by Infiltrator to be defective and 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 ATL System components 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 this Limited Warranty in any manner whatsoever, or to 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.

INFILTRATOR®
water technologies

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