NORTH CAROLINA DEPARTMENT OF HEALTH AND HUMAN SERVICES
DIVISION OF PUBLIC HEALTH
ENVIRONMENTAL HEALTH SECTION
ON-SITE WASTEWATER BRANCH

INNOVATIVE WASTEWATER SYSTEM APPROVAL

Innovative Wastewater System Approval Number: IWWS 2012-01-R2

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For: Flowtech Wastewater Trench System Bundled Expanded Polystyrene Synthetic Aggregate Units Model FTSG123H-1 OC

Approval Date: May 22, 2012
December 31, 2024 Updated for 18E and renewed for 2025
December 31, 2025 Renewed for 2026

In accordance with G.S. 130A-343 and 15A NCAC 18E, Section .1700, an application by Infiltrator Water Technologies for a renewal of their gravelless trench system has been reviewed and found to meet the requirements of an innovative system when the following conditions are met.

I. General

Scope of this Innovative Approval
Use, design, and installation requirements for the Flowtech Wastewater Trench System.

II. System Description

A. Minimum pretreatment by septic tank as required in 15A NCAC 18E .0801.

B. Flowtech expanded polystyrene aggregate particles (EPS) shall meet the following requirements:
1. EPS shall consist of three-dimensional rectangular shapes with void channels and surface area protuberances.
2. EPS shall range in size from 0.75 inches to 1.75 inches along any axis.

C. The Flowtech Wastewater Trench System units (also referred to as cylindrical units) shall meet the following general specifications:
1. EPS shall be contained in 180 degrees of high strength netting and 180 degrees of geotextile fabric.

2. The physical and chemical properties of the netting and geotextile fabric shall be durable and resistive enough to retain the shape of the units and to withstand system installation, backfilling, corrosion, and loss of aggregate under intended use.
3. Cylindrical units shall be 12-inches in diameter ± ½ inch.
4. Cylindrical units shall be manufactured in 5- and 10-foot long sections, +/- 2 inches.
5. The taper, or reduction in diameter, at each end of the cylindrical units shall not begin more than three inches from the point of enclosure, as measured along the linear axis of the unit.
6. Cylindrical units shall be able to withstand an AASHTO H-10 axle load of 16,000 pounds when covered with 12 inches of compacted soil and a shallow cover axle load of 4,000 pounds when covered with six inches of compacted soil without collapsing, fracturing or breaking when installed in a trench equaling the product configuration width.

D. The FTS123GH-1 OC shall meet the following description and specifications:
1. The product shall be comprised of three 12-inch-diameter units 5- or 10-feet long placed side-by-side across the bottom of a 36-inch-wide trench.
2. The outer units shall contain aggregate only, with the netting and geotextile fabric tied off at both ends to prevent the escape of aggregate.
3. The central unit shall contain aggregate and a 4-inch diameter perforated flexible plastic pipe as is typically used in trench lines.
4. The pipe shall be certified as complying with ASTM F667, Standard Specifications for 3 through 24 inch Corrugated Polyethylene Pipe and Fittings, and shall be in accordance with 15A NCAC 18E .0703(d).
5. The netting and geotextile fabric for the central unit shall be tied off at both ends of the pipe to prevent the escape of aggregate.
6. The 4-inch pipe shall be offset from center towards the top of the unit whereby five to six inches of aggregate is located between the bottom of the pipe and the bottom of the unit, and 1¼ to 2½ inches of aggregate is located between the top of the pipe and the top of the unit.
7. The three bundles are banded and stretch-wrapped using UV-resistant plastic for packaging and shipping.
8. The pipe shall be connected by an internal coupling device to allow continuous connection from one section to the next.
9. The end-to-end gap distance between pipe containing cylinders, as measured from the straps fixing the netting and geotextile fabric to the pipe or from the face edges of aggregate on adjoining cylinders, shall be no greater than three inches.
10. The geotextile fabric shall be sewn to the netting and span 180 degrees along the top of each cylinder. Flanges of the fabric extend up to 1½ inches outwards from the center of the bundle at the attachment point with netting on both sides. The geotextile shall have the minimum average value specifications described in Table I.

Table I - Minimum Geotextile Barrier Material Specifications for FTSG123H-1 OC

Property	Value
Unit Weight	2.3 ounces per square yard
Tensile Strength	Cross Direction: 50 lbs Machine Direction: 40 lbs

Air Permeability	625 cubic feet per minute

III. Siting Criteria

Flowtech Wastewater Trench Systems may be utilized on any site that one can use rock aggregate and pipe which meet the following criteria:

A. Sites which are classified as Suitable for a conventional wastewater system in accordance with 15A NCAC 18E .0509(a) through (c).

B. Sites which meet the criteria for new or existing fill in accordance with 15A NCAC 18E .0909. The provisions of 15A NCA 18E .0909 are applicable whenever any portion of the aggregate bundles in a Flowtech Wastewater Trench System extends into fill material. There shall be no reduction in trench length compared to conventional gravel trench. This reference to fill material applies to the site fill and not the backfill placed between the trench and the cylinder sidewall.

C. The required vertical separation shall be measured from the trench bottom.

D. The maximum trench bottom depth is 36 inches in accordance with 15A NCAC 18E .0902(b).

IV. Dispersal Field System Sizing

A. The maximum long-term acceptance rate (LTAR) shall be as follows:

Table II

Textural Group		LTAR (gpd/sq ft)	
		Natural Soil	Saprolite
Soil Group I	Sand	0.8-1.0*	0.6-0.8
	Loamy Sand		0.5-0.7
Soil Group II	Sandy Loam	0.6-0.8	0.4-0.6
	Loam		0.2-0.4
Soil Group III	Silt Loam	0.3-0.6	0.1-0.3
	Other Fine Loams		NA
Soil Group IV	Clays	0.1-0.4	NA

***** For sites where the LTAR exceeds 1.0 gpd/sq ft, use 1.0 gpd/sq ft.

B. The LTAR shall be based on the most hydraulically limiting naturally occurring soil horizon to a depth of one foot below the trench bottom.

C. To determine the minimum total trench bottom area (ft^2) required, divide the design daily flow by the applicable LTAR shown in Table II above. The minimum linear footage for Flowtech Wastewater Trench System shall be determined by dividing the total trench bottom area by the following equivalency factors:

Table III

Product Configuration	Excavated Trench Width	Equivalency Factor* (SF/LF)
FTSG123H-1 OC	36-inch	4.0

* Reductions in trench length allowed by use of these Equivalency Factors, as compared to sizing requirements delineated in 15A NCAC 18E .0901(c) for conventional systems, apply only to dispersal fields receiving effluent of domestic strength or better quality. Any proposed use of the system for facilities producing higher strength wastewater shall be sized in adherence with conditions set forth in 15A NCAC 18E .1711(5).

Example:

Three bedroom residence with a design daily sewage flow of 360 gallons on a sandy clay loam (Group III) soil

Total computed trench bottom area is:
360 gpd/0.5 LTAR = 720 ft^2

The required linear footage for the Flowtech Wastewater Trench System is:
720 ft^2/4.0 ft = 180 linear ft
Where 4.0 ft. is the equivalency factor for the FTSG123H-1 OC

D. The Flowtech Wastewater Trench System may be used in a bed system with the three cylindrical bundles placed in rows next to each other. The minimum area (without reduction or equivalency factor) for a bed system shall be determined as required in 15A NCAC 18E .0903.

E. The available space requirements of 15A NCAC 18E .0508 shall be met, and this approved innovative system may be designated as the required repair system.

V. Special Site Evaluation

A special site evaluation may be required based on the proposed dispersal field. Refer to 15A NCAC 18E .0510.

VI. Design Criteria

Refer to Siting Criteria in Section III and Installation information in Section VII for installation details.

VII. Installation

A. The Flowtech Wastewater Trench System shall be configured in accordance with Section II and installed in trenches according to the minimum dimensions in Table IV.

Table IV

Product Configuration	Minimum Trench Spacing on Center (ft)	Trench Width (in)	Minimum Soil Cover[1] (in)	Minimum Trench Depth (in)	Minimum Pipe Depth Below Grade[2] (in)	Pipe Height Above Trench Bottom[2] (in)
FTSG123H-1 OC	9	36	6	18	12	5 to 6

[1] On sloping lots, minimum required trench depths may be greater.
[2] Measurements for pipe height are to the pipe invert or bottom of pipe.

B. The FTSG123H-1 OC units are prefabricated with a geotextile backfill barrier attached to the netting. The FTSG123H-1 OC units shall be oriented in the trench with the geotextile covering the top of the system. No additional backfill barrier material shall be required.

C. The FTSG123H-1 OC units are distributed with four straps wrapped around all three bundles, keeping the bundles together and the "flaps" (flanges of geotextile fabric and netting) oriented in the upward direction. The straps should be kept on for installation and the "flaps" oriented in the upward direction. If the straps are removed, the upward orientation of the "flaps" must be verified by the local health department prior to final cover. The plastic wrap used for packaging and shipping the bundle units shall be removed prior to system installation.

D. Native soil removed from the trench excavation may be used as backfill. Backfill shall be free of trash or debris. Vehicular traffic and excavation equipment shall not travel over any uncovered dispersal field. The latest version of the manufacturer's installation procedures shall be followed.

E. The Flowtech Wastewater Trench System shall be installed in a level trench in all directions (both across and along the trench bottom) and shall follow the contour of the ground surface elevation (uniform depth), with all continuous adjoining 5- or 10-foot units placed end to end, with the central cylinder distribution pipe interconnected, and without any dams, stepdowns, or other water stops.

F. The 10-foot-long units shall be used to make up the majority of the line length, with the 5-foot units being used only at the distal end of the trench. A maximum of three 5-foot units may be used in any one line length. Examples: A 65-foot trench would utilize six 10-foot units and one 5-foot unit.

G. Flowtech Wastewater Trench Systems installed on sloping sites may use distribution devices or step downs as described in 15A NCAC 18E .0901(g)(9) and (11) when it is necessary to change level line segments from upper to lower elevations.

H. Manufacturer's installation instructions for Flowtech Wastewater Trench Systems shall be followed, except as required herein or by 15A NCAC 18E.

I. All Flowtech Wastewater Trench Systems shall be installed by an installer authorized in writing by the manufacturer or its authorized representative.

VIII. Operation, Maintenance, and Monitoring

The Flowtech Wastewater Trench System shall have a minimum classification as a Type IIIg system in accordance with 15A NCA 18E .1301(b), Table XXXII.

IX. Responsibilities and Permitting

A. An owner may submit an application or Notice of Intent (NOI) to the local health department (LHD) requesting the use of this approved product or may submit a request in writing to the LHD to use this product on a site for which an improvement permit and/or construction authorization has been previously issued. The LHD shall confirm the installation of the approved chamber is contained within the approved soil area and meets site conditions. The LHD shall include the change in system on the operation permit.

B. Improvement Permits (IP) or Construction Authorizations (CA) issued by the LHD shall have a soil and site evaluation conducted either by the LHD, LSS, or AOWE. The NOI shall include a soil and site evaluation conducted by an LSS.

C. The IP, CA, and NOI shall contain all the conditions the site approval is based upon, including the proposed use of the Innovative system. The OP will include all the conditions specified in the IP and the CA. The Authorization to Operate (ATO) should include all the conditions specified in the NOI.

D. The LHD shall issue the OP after the following:
   1. Field verification that the installation has been completed;
   2. Receipt of written documentation from the authorized designer or PE that the system has been designed, installed, and is operating in accordance with the approved plans; and
   3. All necessary legal documents have been completed, including the contract between the system owner and the authorized operator.

   The LHD shall issue the OP for an (a2) and (a5) application after all necessary legal documents have been completed, including the contract between the system owner and the authorized operator if required.

   The ATO shall be submitted to the LHD in accordance with G.S. 130A-336.1 and G.S. 130A-336.2.

X. Repair of Systems

The provisions of 15A NCAC 18E .1306 shall apply to the use of Flowtech Wastewater Trench System for repairs to existing malfunctioning septic tank systems.

Approved by:_____Date:_____