

FLOWTECH[®] WASTEWATER TRENCH SYSTEMS

Manufactured with 100% Recycled Artificial Aggregate



STATE OF NORTH CAROLINA

INSTALLATION MANUAL

May 8, 2012

Manufactured by

ICC TECHNOLOGIES, LLC

MARLBORO, N.J.

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Flowtech® Installation Instructions

General standards for installation of Flowtech® on-site wastewater treatment and disposal trench product systems in accordance with 15A NCAC 18A .1900 and the innovative product approval.

Prior to installation, ICC Technologies Flowtech® or its representatives must certify the installers of Flowtech® as having passed the Flowtech® Certified Training Program.

Materials and Equipment Needed

- Back Hoe
- Laser, Transit, or Level
- Rake and Shovel
- Flowtech® Wastewater Trench System Units
- Internal Pipe Couplings
- Pipe for Headers

Installation Instructions

The Flowtech® trench product may be installed on sites that meet all criteria of the North Carolina Sewage Treatment and Disposal Rules for the installation of gravel trenches. The product must be installed in compliance with 15A NCAC 18A .1900 and any local health department rules or design requirements.

The Flowtech® Wastewater Trench System units are 12-inch diameter units manufactured in 5 or 10 foot lengths. See description and sketches attached on page 6.

1. A Construction Authorization for each individual system must be obtained from the local health department having jurisdiction prior to the start of system installation. The Construction Authorization must specify that the authorization is for the Flowtech Wastewater Trench Product.
2. Once the Construction Authorization is obtained for the system, mark with paint or stake the location of the trenches and lines. Set the correct tank, invert pipe, header line or distribution box and trench bottom elevations before installation of the Flowtech® trench product.
3. Ensure that the elevation of the effluent header pipes are installed to ensure compliance with the trench depth allowed on the Improvement Permit/Construction Authorization. Also ensure that each trench meets the minimum separation requirements of the Construction Authorization.
4. Maximum trench depth shall not exceed 36 inches.
5. The trench shall be dug to a width of 36 inches. As with any gravel system intended to transport fluid by gravity, the trenches for the system must be downgrade from the tank and distribution system.

- a. If smearing or glazing of trench sidewalls or bottom occurs during installation in clay soils (Group III or IV soils), those soil surfaces must be raked or scarified.
 - b. Before installing the Flowtech[®] System, the trench shall be level in all directions (both across and along the trench bottom), and shall follow the contour of the ground's surface elevation (uniform depth), with all continuous adjoining 5 or 10-foot cylindrical bundles placed end to end, with the central bundle distribution pipe interconnected, without any dams, stepdowns or other water stops.
 - c. Systems installed on sloping sites may use distribution devices or step downs as described in 15A NCAC 18A .1955(j) and (l) when it is necessary to change level nitrification line segments from upper to lower elevations.
 - d. The 10-foot cylindrical bundles shall be used to make up the majority of the drainline length with the 5-foot cylindrical bundles being used only at the distal end of the trench. Example: A 65-foot trench would utilize six (6) 10-foot cylindrical bundles and one (1) 5-foot cylindrical bundle. The manufactured length of the cylindrical bundles cannot be modified in the field.
 - e. An engineer's level or equivalent shall be used for installation and inspection. When the surface slope is greater than two percent, the bottom of the trenches shall follow the contour of the ground.
6. The plastic wrap or bag shall be removed before the 5-foot or 10-foot long bundles are placed in the trenches or beds. Remove any plastic wrap from the bundles and trench before the system is covered and dispose of it properly.
 7. Once the plastic wrap has been removed, inspect the bundles to make sure they are free of tears. If any tears are present, repair them by sewing them shut using the ICC provided repair kit. The total maximum acceptable tear length in any one bundle is 18 inches, whether this includes one tear or a combination of tears. Any bundle with a total combined tear length greater than 18 inches must be replaced with a new bundle of equal length. The bundles must be free of tears or all tears repaired prior to being placed in the trench and prior to backfilling.
 8. The tie straps on the bundles must be left in place on the cylindrical bundles prior to placing in the trench or bed. This will assist in keeping the side flanges in the upward position. In places where the bundles must turn a curve and the straps interfere with its movement, the straps can be removed. However, once removed the product must be pushed against one sidewall with the flanges extended in the upper position. If the trench is wider than 36 inches, it may be necessary to backfill a portion of the trench by hand to ensure the flanges remain in the upper position. Once the flanges are held in place, normal backfilling can be used to complete the installation. Once all bundles are placed into the trench, be sure to walk the trench and inspect flange positions to ensure they are in place to prevent soil infiltration.
 9. Place Flowtech[®] unit(s) in the configuration approved by the Construction Authorization specified for the particular site. The center-most units containing the

- pipe are joined end-to-end with an internal pipe coupler. Outer units, without pipe, shall be butted against each other and do not require any type of connection.
10. Lead or header lines from the distribution box or such device shall be connected to the top or center-most Flowtech[®] unit with the pipe in each trench.
 11. Flowtech[®] units can flex and fit in curved trenches as may be necessary to avoid trees, boulders, or other obstacles in the way. As inspections require trenches to be left open. Please see note below.*
 12. The soil cover over the nitrification field shall be a minimum of 6 inches in depth.
 13. To prevent the ponding of surface water, final soil cover shall be a uniform depth over the entire nitrification field and graded to shed surface water.
 14. After proper preparation of the surface, soil cover shall be placed over the nitrification field and suitable vegetation (e.g., turf, sod or seed) shall be used to stabilize the soil surface.

Repeat steps 1 through 13 for each area of trenches.

*While it may sometimes be necessary to back fill some portions of completed trenches while excavating others, be sure to communicate with the local health department so that they can provide guidance as to the inspection of the system before trenches are covered.

No vehicular traffic shall be allowed over the sewage treatment and disposal system.

System Sizing

The sizing of the system is calculated by the local health department using the appropriate LTAR (long term acceptance rate), the most hydraulically limiting soil horizon, the daily design flow, and the approved equivalency factor of Flowtech[®]. The calculation steps are as follows:

1. The appropriate LTAR is shown in 15A NCAC 18A .1955 Design Installation Criteria for Conventional Sewage Systems, Table II; Rule .1956(1), (2), (4), (5), or (6) Modified System; Rule .1957(b) Alternative System.
2. The LTAR is based on the most hydraulically limiting naturally occurring soil horizon within three feet of the surface or to a depth of one foot below the trench bottom (whichever is deeper).
3. To calculate the total trench bottom area (ft²) required, divide the daily design flow by the applicable LTAR shown in Table II, or other applicable rule. This yields the total trench bottom area required for a conventional system, modified, or alternative system.
4. The approved equivalency factor for Flowtech[®] is 4. The linear footage of Flowtech[®] required for the system is determined by dividing the total trench bottom area required by 4. As an example, if the conventional system trench bottom area is 600 square feet, the system will require 150 feet of Flowtech[®].

5. Reduction in linear footage allowed by use of this equivalency factor, as compared to sizing requirements delineated in Rule .1955 for conventional systems, apply only to drainfields 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 Rule .1969(m).

Operation and Maintenance

As with all systems, the property owner or the person owning or controlling the system shall not expose the wastewater system to the following:

- loading the system with excessive amounts of water
- allowing fats, oil or grease into the system
- allowing non biodegradable materials to enter the system
- introducing chemicals or biodegradable additives into the system
- vehicular traffic over the system

In addition the property owner or the person owning or controlling the system shall do the following:

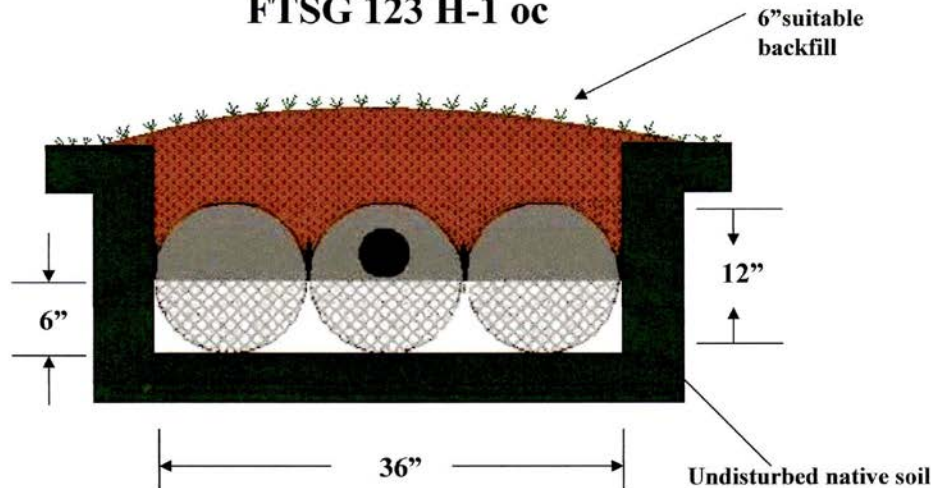
- promote even generation of wastewater to be distributed to the system
- promote water conservation practices
- allow ready access to the wastewater system components for maintenance and inspection

Inspection of the System

Inspection of systems utilizing Flowtech[®] is considerably easier than with traditional rock and pipe systems. A simple visual inspection by the local health department prior to final cover will confirm that the overhanging flanges are in the upward position on each side of the units, ensuring they are in the proper position to prevent soil infiltration into the system. Verification that the trench or bed bottom is level can easily be inspected by placing a grade rod in between the units to reach the trench bottom. Varying depths of stone in the trench is no longer a problem. Varying stone quality in regards to size or fines is also no longer a concern. Inspection of the trench is much easier with excavation, problems becoming obvious after a rudimentary inspection.

FLOWTECH[®] SYSTEM FOR NORTH CAROLINA

FTSG 123 H-1 oc



Specification

Overall System Height	12"
Invert Height	6"
Trench Width	36"
Trench Depth	18"
Trench Modification	25%

Example: 300 FT Design
 $300 \text{ SF} : 4\text{SF/LF} = 75 \text{ LF required}$

PRODUCT DESCRIPTION

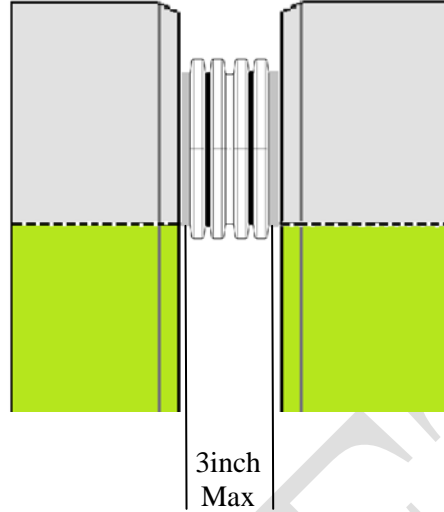
ICC Flowtech[®] FTSG123H-1 Horizontal Drainage System consisting of three, 12-inch diameter cylindrical units. One with a 4-inch diameter perforated plastic pipe surrounded by Flowtech[®] 100% recycled EPS aggregate and encased with 180 degrees each of netting and 180 degrees of geotextile, and two units without pipe. These units will each have flanges so as to deter the soil from falling between units, and between unit and trench walls. The geotextile and netting will be strong enough to retain the shape of the units during system installation and backfilling. The perforated flexible plastic pipe shall meet ASTM F 405 Standard Specifications for Corrugated Plastic Pipe. Each pipe unit will be connected with an internal coupling to allow flow from one unit to the next. (See product drawing)

DESCRIPTION OF NORTH CAROLINA PRODUCT CODE

FTS G 12 3 H-1 OC

Flowtech[®] System - 180 Degrees Geotextile - 12" Diameter - 3 Pcs. - Horizontal 1 Pipe - Off Center

FLOWTECH[®] COUPLING DRAWING



The above drawing shows two pieces coupled together with a two ring coupling; the netting and geotextile containing the aggregate are typically strapped to the pipe one rib in from the end of the pipe. The plastic strap is the point at which the coupled together pieces shall be measured to ensure that the gap between the aggregate portions of the pieces is less than 3 inches.