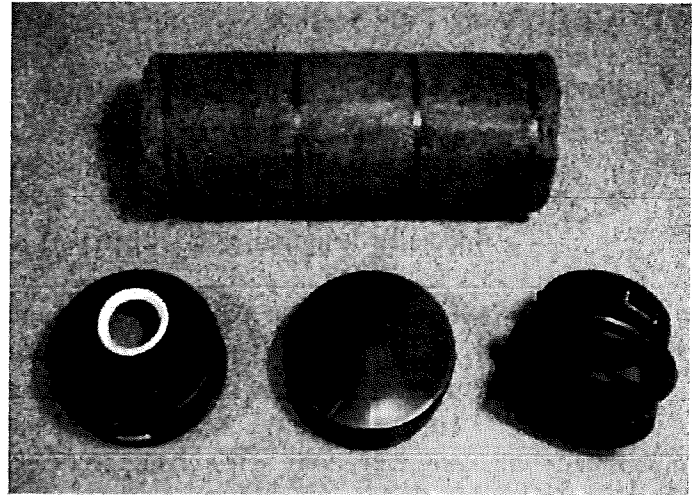


ADS GEO-Flow[®] Pipe

Design and Installation Instructions

State of Kansas



INTRODUCTION

The purpose of this document is to provide the basic design and installation information for the use of GEO-Flow[®] pipe in the State of Kansas.

GEO-Flow[®] pipe is an advanced alternative to the stone and pipe dispersal component of a conventional onsite wastewater absorption system. The GEO-Flow[®] pipe product is fabricated at our plants using ADS manufactured corrugated polyethylene pipe. This large diameter pipe is encased in a symmetrical polypropylene grid, which is then wrapped in a specifically designed geotextile. This patented design creates a treatment system within the absorption component of the conventional septic tank system that is significantly more efficient than pipe and stone.

GEO-Flow[®] pipe is lightweight, and does not require the use of stone. Therefore, it may be delivered to and constructed in areas where conventional pipe and stone systems would be difficult to install. GEO-Flow[®] pipe has been used successfully for more than 20 years in both residential and commercial installations throughout Maine and New Hampshire.

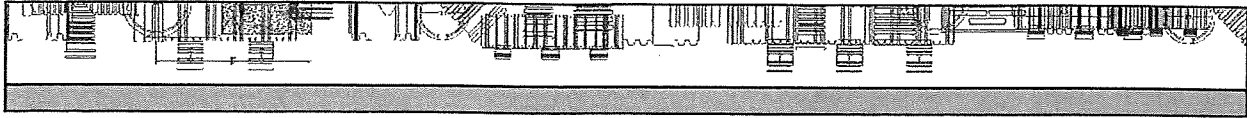
System designers and installers can specify GEO-Flow[®] pipe with confidence in the knowledge that the GEO-Flow[®] pipe product they install in each and every system will be fully backed by ADS.

For more information, or for answers to questions or concerns, please call ADS at our Midwest Zone office at the number listed below, or contact your local ADS representative.

GEO-Flow[®] Pipe Components

An installed GEO-Flow[®] pipe system is comprised of some or all of the following components:

- Complete 10' GEO-Flow[®] pipe sections
- Offset adapters
- End caps
- Couplers



1. GEO-Flow® Pipe Sections

GEO-Flow® pipe sections come in 10-foot lengths. Each section is comprised of the following:

- ADS manufactured corrugated high-density polyethylene pipe. This pipe is perforated to allow for effluent to pass through its sidewalls easily and at varying heights. This pipe is encased in a:
- Symmetrical polypropylene grid, which is wrapped in a:
- Specially designed, non-woven plastic geotextile fabric.

The GEO-flow® pipe sections function in a number of ways. The geotextile fabric establishes a distinct surface at which bacterial growth and activity will take place. This material will restrict the flow of effluent leaving the corrugated pipe, and biomat will naturally occur on its surface as a result. In addition, the large-diameter corrugated pipe creates a dispersal medium where effluent introduced into the system is constantly changing elevations. This changing of elevations encourages and enhances the bacterial activity within the biomat, thereby maximizing its function. The large diameter pipe also serves as a repository for suspended solids that may inadvertently exit the septic tank. Finally, the polypropylene grid between the pipe serves several purposes. Its own surface area creates a substrate for bacterial communities. In addition, by separating the pipe's peak corrugations from the geotextile, the grid also serves to aid in the distribution of effluent around the entire circumference of the pipe, thereby exposing nearly the entire surface area of the outer fabric for biological growth and activity.

2. Offset Adapters

Offset adapters are end caps fitted with a 4-inch offset hole at the 12 o'clock position.

3. End Caps

End caps are molded to fit snugly on the end of any GEO-flow® pipe section to close the line.

4. Couplers

Internal couplers fit within the ends of two GEO-flow® pipe sections to create a GEO-flow® pipeline.

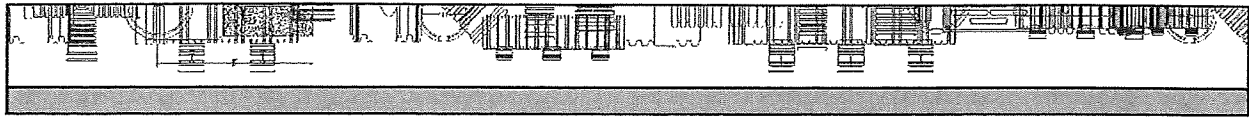
BASIC DESIGN CONSIDERATIONS

GEO-Flow® pipe may be used in almost any design configuration imaginable. The system allows great design flexibility in the length, width, slope, and shape of effluent disposal systems.

General Considerations

Common design practices shall apply. These include, but are not limited to:

- Product should be designed to be installed on a level plane;
- Product should be designed to run parallel to contours where possible;
- Longer (rather than shorter) product lines are recommended; and
- The outlet of the distribution box shall be at least 2 inches above the highest invert any GEO-Flow® pipe line in the installed system.



KANSAS STATE-SPECIFIC CONSIDERATIONS

Any and all information in this document is to be used in conjunction with the State of Kansas Department of Health and Environment rules and all other state and local regulations.

STANDARD SYSTEM CONSIDERATIONS

1. Cover Requirements

The minimum depth of cover for each GEO-flow® pipe system is six inches (6") of cover material. Maximum cover is 96 inches.

A minimum cover of 12" and 18" can be achieved for H-10 and H-20 loads, respectively, if the embedment material is compacted to a 90% minimum SPD. Precautions should be taken to mitigate or prevent rutting in all cover requirements and loading conditions.

2. Distribution Boxes:

All GEO-Flow® pipe systems shall include a distribution box - including serial distribution applications.

3. Line Lengths

Each single line of GEO-Flow® shall be no longer than 100 linear feet and no less than 30 linear feet.

4. Maximum Percentage of Slope Allowed on Site

Maximum slope of site shall be 3:1 (33%).

5. Cutting the GEO-Flow® pipe

The GEO-Flow® pipe product should not be cut unless necessary. Every effort should be made to keep line lengths in ten foot (10') increments.

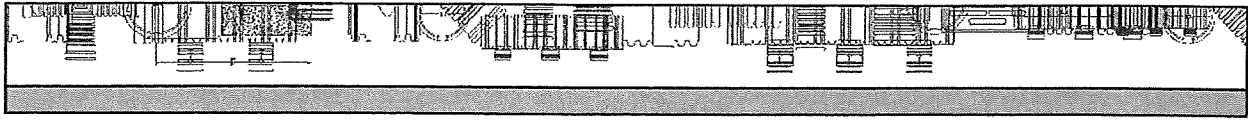
SIZING THE GEO-FLOW® PIPE SYSTEM

Each linear foot of GEO-Flow® pipe provides three square feet (3ft²) of infiltrative (treatment) surface area. As a result, ADS recommends that the GEO-Flow® pipe be designed and installed as equivalent to a three-foot (3') wide conventional pipe and stone trench when used in Kansas. Each linear-foot of GEO-Flow® pipe is equal to three square feet (3 ft²) of absorption system disposal area.

Step 1: Using soil and flow information for the system site, calculate required absorption system area in accordance with State of Kansas Department of Health and Environment rules and regulations, and Bulletin 4-2, March 1997, Minimum Standards for Design and Construction of Onsite Wastewater Systems.

Step 2: Divide the calculated area from Step 1 (above) by three (3). This is the actual length of GEO-Flow® pipe required for the system.

Step 3: Whenever possible, round-up the number calculated in Step 2 (above) to a number divisible by 10. This will allow for installation of full-length GEO-Flow® pipe lengths.



INSTALLING THE GEO-FLOW® PIPE SYSTEM

GEO-Flow® pipe is easy and convenient to install. Its lightweight design makes it easily portable, and ADS fittings make it a simple task to create a system from individual pipe lengths.

Common installation practices shall apply. These include, but are not limited to:

- Any smearing of the excavation should be scarified with a rake or shovel;
- Each line of GEO-flow® pipe should be installed on a level plane;
- Each line of GEO-flow® pipe should be installed parallel to contours where possible.

Excavation Width

Excavations shall be a minimum of 18” and a maximum of 24” for trench installations.

Trench Installations:

GEO-Flow® pipe may be designed and installed with each of the separate lines on the same plane, either in native soil, partially in native soil and partially in fill material, or entirely in fill material; provided the fill material in all instances meets the requirements of all State of Kansas Department of Health and Environment rules and regulations, and Bulletin 4-2, March 1997, Minimum Standards for Design and Construction of Onsite Wastewater Systems. This application is called a Level System.

GEO-Flow® pipe may also be designed and installed with each line, or several of the lines, on a slope. This application is called a Sloped System.

In all instances, distribution must take place by way a distribution box. This includes both equal distribution and individual line (serial) distribution.

Step 1: Excavate trenches to proper width and depth according to the system design.

Step 2: Introduce GEO-Flow® pipe lengths into the excavation.

Step 3: Connect individual lengths of GEO-Flow® pipe together with ADS internal couplers.

Step 4: Install end caps at each end of line, with pipe knockouts at top of end cap.

Step 5: Plumb system in accordance with system design.

Step 6: Backfill with native soil or approved fill material.

