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

INNOVATIVE WASTEWATER SYSTEM APPROVAL

INNOVATIVE WASTEWATER SYSTEM NO: IWWS-2002-02-R4

Issued To: Damon Hunley
Advanced Drainage Systems, Inc.
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For: Septic Stack (11-Pipe Model)

Approval Date:

April 18, 2002	
April 9, 2003	Minor revision
August 2, 2004	Modification for six inches of cover
May 1, 2012	Name Change
April 20, 2018	Company change to Advanced Drainage Systems, Inc. and product name change to Septic Stack (11-Pipe Model)*

*Prior approvals were issued to Plastic Tubing Industries of Georgia, Inc. or predecessor companies

In accordance with General Statute 130A-343 and 15A NCAC 18A .1969, an application by Advanced Drainage Systems, Inc., of Hilliard, OH for modifications to the existing innovative approval for the Plastic Tubing Industries of Georgia, Inc. PTI Multi-Pipe System (11-Pipe Model) has been reviewed and found to meet the standards of an innovative system when all the following conditions are met:

I. General

A. Scope of this Innovative Approval
1. Use, design and installation requirements for the Advanced Drainage Systems, Inc. Septic Stack (11-Pipe Model) nitrification trench system.
2. The Advanced Drainage Systems, Inc. Septic Stack (11-Pipe Model) is the system previously approved by Innovative Wastewater System Approval No. IWWS-2002-02 and its successors.

II. System Description

A. Minimum pretreatment by septic tank as required in 15A NCAC 18A .1952.

B. The Septic Stack trench system is a patented drain field trench system comprised of multiple four-inch diameter corrugated polyethylene perforated pipes, which are used in lieu of aggregate. The Septic Stack (11-Pipe Model) is comprised of two 5-pipe void "bundles" and one distribution pipe.

C. The Septic Stack (11-Pipe Model) trench system void pipes are 10-foot long, 4-inch diameter corrugated polyethylene pipes with a minimum open area of no less than six square inches per linear foot (6 in^2/lf). This open area is achieved by a combination of slots and holes. Void pipes are pre-packaged and shipped in "bundles" of five pipes, secured by the manufacturer using soldered plastic bands.

D. The Septic Stack (11-Pipe Model) trench system distribution pipe is a 10-foot long, 4-inch diameter corrugated polyethylene pipe with two rows of holes from 45 to 60 degrees off the bottom centerline. The distribution pipe has a reference line along its longitudinal axis, which is placed on top of the installation to ensure proper placement of the distribution holes.

E. A spun-bonded, non-woven filter fabric covers the top and encases the sidewall areas of the installed Septic Stack trench system.

III. Siting Criteria

The Septic Stack trench system may be utilized on any site that one can use rock aggregate and pipe which meet the following criteria:

A. Sites which are classified Suitable or Provisionally Suitable for a conventional nitrification field system in accordance with 15A NCAC 18A .1948(a) or (b).

B. Sites which have been reclassified as Provisionally Suitable in accordance with 15A NCAC 18A .1956(1), (2), (4), (5), and (6).

C. Sites that meet the criteria for new or existing fill in accordance with 15A NCAC 18A .1957(b). The provisions of 15A NCAC 18A .1957(b) are applicable whenever any portion of the void or distribution pipe in a Septic Stack trench system extends into fill material. There shall be no reduction in trench length compared to conventional gravel trench as computed per 15A NCAC 18A .1955 (sizing for all models shall be based on minimum excavated trench width in Table II, Section IV.D of this Approval, without the application of an Equivalency Factor). This reference to "fill material" applies to the site fill and not the backfill placed between the trench and the pipe sidewall.

D. The required vertical separation shall be measured from the bottom edge of the lower void pipes.

IV. System Sizing

A. The maximum long-term acceptance rate (LTAR) shall be as specified in Table I:

Table I – LTAR for Septic Stack (11-Pipe Model)

<table>
<tr><th colspan="2" rowspan="2">Textural Group</th><th colspan="2">LTAR (gpd/sq ft)</th></tr>
<tr><th>Natural Soil</th><th>Saprolite</th></tr>
<tr><td rowspan="2">Soil/Group I
(Sands)</td><td>Sands</td><td rowspan="2">0.8-1.0*</td><td>0.6-0.8</td></tr>
<tr><td>Loamy Sand</td><td>0.5-0.7</td></tr>
<tr><td rowspan="2">Soil Group II
(Coarse Loams)</td><td>Sandy Loam</td><td rowspan="2">0.6-0.8</td><td>0.4-0.6</td></tr>
<tr><td>Loam</td><td>0.2-0.4</td></tr>
<tr><td rowspan="2">Soil Group III
(Fine Loams)</td><td>Silt Loam</td><td rowspan="2">0.3-0.6</td><td>0.1-0.3</td></tr>
<tr><td>Other Fine Loams</td><td>NA</td></tr>
<tr><td>Soil Group IV</td><td>Clays</td><td>0.1-0.4</td><td>NA</td></tr>
</table>

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

B. The LTAR shall be based on the most hydraulically limiting naturally occurring soil horizon within three feet of the ground surface or to a depth of one foot below trench bottom, whichever is deeper.

C. To determine the total trench bottom area (ft^2) required the design daily sewage flow is divided by the applicable LTAR from Table I below. The minimum linear footage for Septic Stack trench systems shall be determined by dividing the total trench bottom area by the following equivalency factors:

Table II – Trench Widths and Equivalency Factors

Product	Excavated Trench Width (inches)	Approved Equivalency Factor Linear Foot Basis (sf/lf)[1, 2]
Septic Stack (11-Pipe Model)	30	3.00

[1] Reduction in nitrification trench length allowed by use of these Equivalency Factors, as compared to sizing requirements delineated in 15A NCAC 18A .1955 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 18A .1969(m).

[2] When advanced pretreatment pursuant to 15A NCAC 18A .1970 is used to gain a trench length reduction or LTAR increase, system sizing shall be initially based on the minimum excavated trench width in this Table without use of an Equivalency Factor.

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 Septic Stack (11-Pipe Model) trench system is:
720 ft^2/3.0 ft = 240 linear ft
Where 3.0 ft is the equivalency factor for the Septic Stack (11-Pipe Model) trench system

D. The minimum area (without reduction or equivalency factor) for a bed system shall be determined as required in 15A NCAC 18A .1955(d) except that the Septic Stack (11-Pipe Model) bundles shall be placed in rows next to each other.

E. The available space requirements of 15A NCAC 18A .1945 shall be met, and this approved innovative system may be designated as the required replacement system.

V. Special Site Evaluation

A special site evaluation may be required based on the proposed ground absorption system. Refer to 15A NCAC 18A .1970(p).

VI. Design Criteria

Refer to Siting Criteria (Section III) and Installation (Section VII) for design details

VII. Installation

A. The Septic Stack (11-Pipe Model) trench system used in nitrification trenches shall be installed with a minimum trench width of 30 inches and a maximum trench width of 36 inches. The minimum trench spacing shall be 9 feet on center.

B. Septic Stack (11-Pipe Model) pipe bundles come in 10-foot long bundles. The bundles may not be cut. For trenches with line lengths that do not end in a round number (e.g., 10, 20, 30, etc.), the trench length should be extended for the full bundle length. The health department should be contacted prior to installation to confirm the additional trench line length is in suitable or provisionally suitable soil and site conditions per 15A NCAC 18A .1950.

C. The distribution pipe shall be on top of the installation, between the two void pipe bundles, with its centered reference line pointing upward.

C. Individual Septic Stack (11-Pipe Model) trenches shall be constructed level in all directions (both across and along the trench bottom) and shall follow the contour of the ground surface elevation (uniform depth) without any dams, stepdowns, or other water stops. Distribution pipe in adjoining bundle sections shall be interconnected as in a conventional system, and the adjoining void pipe shall butt up against each other. Installation may include turns of up to, but not greater than, 45-degrees by uniformly bending individual 10-foot bundles within the excavation. Turns of greater than 45-degrees over the course of a single 10-foot long section of the product shall not be allowed (Note: to make a 90-degree turn, the installer must combine two 45-degree turns made over the course of two 10-foot long sections of product within a 20-foot long trench segment).

D. The Septic Stack trench systems installed on a sloping site may use distribution devices or stepdowns 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.

E. Filter fabric shall be installed over the top and encasing the sidewalls of the installed bundles prior to backfilling. This barrier shall in no instance be placed beneath the Septic Stack trench system.

F. Backfill shall be placed between the trench and bundle sidewalls to a minimum compacted (carefully walked in) height that is equal to the top of the void and distribution pipe. Septic Stack trench systems can be installed utilizing native soil backfill (Group I, II, III, or IV). Backfill shall be free of trash or debris. The area adjacent to void pipe shall be free of large (8-inch or greater) clods that do not break apart during the walk-in procedure. The latest version of the manufacturer's installation procedure shall be followed. Additional soil backfill (Group I, II, III, or IV) shall be placed above the system to a minimum compacted height of 6 inches above the top of the void and distribution pipe.

No vehicular traffic or construction equipment shall traverse the Septic Stack trench system unless the load will be temporarily bridged over the trench so as not to disturb the void and distribution pipe.

G. Manufacturer's installation instructions for the Septic Stack trench system used in septic tank systems shall be followed except as required herein or 15A NCAC 18A.1900 et. seq.

H. All Septic Stack trench systems shall be installed by a contractor or installer appropriately certified in writing by the manufacturer or its authorized representative.

VIII. Operation, Maintenance, Monitoring, and Reporting

Septic Stack (11-Pipe Model) trench systems shall be classified as a Type IIIg system (other non -conventional trench systems) in accordance with Table V(a) of 15A NCAC 18A .1961(b).

IX. Responsibilities and Permitting

Prior to the installation of the approved Septic Stack (11-Pipe Model) trench system at a site, the owner or owner's agent shall fill out an application at the local health department for the proposed used of this system. The local health department shall issue an Improvement Permit or Construction Authorization or amend the previously issued Improvement Permit or Construction Authorization allowing use of Septic Stack (11-Pipe Model) trench system upon a finding that all provisions of this approval and all other applicable rules shall be met. Use of the proposed innovative system and any conditions shall be described in the Construction Authorization or amended Construction Authorization, as applicable. Such information shall also be described on the Operation Permit to be issued upon the acceptable completion of the system installation.

X. Repair of Systems

The provisions of 15A NCAC 18A .1961(l) shall apply to the use of Septic Stack trench systems for repairs to existing malfunctioning septic tank systems.

Approved by: _____ Date: _____

11-PIPE MPS 45° TURN
ALL PIPES ARE 120" LONG