

LOW PRESSURE DOSING
SEWAGE DISPOSAL SYSTEM
1909 Long Corner Road

MDE MINIMUM REQUIREMENTS FOR SUBMISSION OF PLANS & DESIGN SPECIFICATIONS

These general specifications were developed to be applicable throughout the State of Maryland. Specific site conditions or problems may not be adequately covered and modifications may be needed by the designer. **The designer is responsible for review of the design criteria specifications, site verification and all calculations. It is strongly preferred that the designer has an adequate knowledge of on-site system design and general engineering practices.** Qualified designers could include individuals with soils and on-site systems design experience including but not limited to Registered Professional Engineers, Private Soil Evaluators/Registered Sanitarians, or other Environmental Consultants. The appropriate criteria should be incorporated into final plans and specifications. All plans submitted shall include the following items:

- I. **SITE PLAN** - The plan should be appear of a professional nature and be drawn to an appropriate scale and include the following:
 - A. Property boundaries, accurate topography(2 ft contours) and acreage. Special exemptions may be granted to show only 3 corners of the property and contour over the area of the sewage disposal system on larger properties. Property lines may need to be verified by a Licensed Professional Surveyor.
 - B. House location.
 - C. Existing sewage disposal system and the existing platted 10,000 ft² sewage disposal area or if an existing 10,000 ft² area does not exist, an area designated for the installation of the new system along with additional area designated for future repair.
 - D. Any structure or proposed structure within 50 ft. of an existing or proposed sewage disposal area.
 - E. Any proposed or existing well on-site or within 100 ft. of the property line. If any wells exist within 200 feet downgradient from the proposed system, they should also be shown. Wells should be depicted with their associated 100 radius.
 - F. Locations of all components of the disposal system including monitoring wells and observation ports if applicable.
 - G. Location of all above or below ground utility lines and easements when in vicinity of the sewage disposal system/area and well.
 - H. Spot elevations which include, four corners of the sewage disposal area, pretreatment units, the pump chamber, the house where the

sewer line exits and the highest and lowest elevations within the sewage disposal area and any actual locations of test pits, auger locations or observation holes.

II. **PROFILE PLAN** - A properly scaled profile plan showing all invert elevations at major turning points starting from the house sewer to the distribution lateral or drain pipe should be included. These turning points may include house sewer pipe at the foundation, inlet and outlet of the septic tank and pump chamber, manifold at the lateral, junction or distribution box, and the highest elevation of the force mains. A profile of artificial drainage trenches should be included when applicable.

III. **TYPICAL DETAIL DRAWINGS** - The plans should include typical details of the major units proposed in the treatment and disposal system including the following units:

A. **SEPTIC TANK(S)**

1. A two compartment tank or two tanks in series is required. At a minimum the first compartment should be sized for 2/3 of the required volume. Details should include locations and sizes of all manholes, normal liquid depth in the tank, baffles, interior and exterior dimensions and location of seams.
2. The total minimum capacity of the septic tank(s) must be 1,500 gallons.
3. All tanks must be watertight and meet all horizontal separation distances specified in State and County regulations.
4. Tanks that are constructed with seams and joints above the high water table are required.
5. A 24-hour leakage test may be conducted to demonstrate watertightness prior to final construction approval.

B. **PUMPING SYSTEM AND CONTROLS**

1. The pump chamber must provide sufficient capacity to allow for storage of the dose and one day design flow between the high water alarm and the inlet of the first septic tank or at a minimum storage of an average day's design flow. It is also recommended that sufficient capacity be provided so that the pump can be set on a block and remain submerged at all times. Details should include pump control and alarm levels, pump location, locations of gate valves and check valves if applicable, dimensions of pump chamber and locations of seams.

2. The pump chamber must be watertight, protected against buoyant forces and meet all horizontal separation distances in State and County regulations.
3. Pump Chambers that are constructed with seams and joints above the high water table are required.
4. A 24-hour leakage test may be conducted to demonstrate watertightness prior to final construction approval.
5. The pump shall be capable of delivering the necessary gpm at the design head. Design head includes two feet of head at the distal end of the laterals.
6. The use of a three float system to control pump on, pump off and the high water alarm is recommended. The float system must be capable of delivering the specified dose.
7. The control box or panel should be located outside the chamber either on a pole elevated near the pump chamber in a waterproof enclosure or located outside on the house or in the house. All electrical connections should be located outside the chamber. A licensed electrician should perform the work subject to all State and County codes.
8. The high water alarm must be wired on a separate electrical circuit than the pump.
9. A flow meter or an event counter and an elapsed time meter (minutes) are required to determine gallons pumped to the system for timed dosed applications.
10. A pressure test of the pumping system and distribution network will be required prior to covering the system. The force main can be partially covered as long as all joints, elbows, tees, etc. are visible. The test will require sufficient water onsite to activate the pump through several pumping cycles. Provisions to protect the pumping system and distribution network from erosion and sedimentation should be made by the contractor.

C. DISPOSAL SYSTEM

1. Design Criteria

a) Design Flow = 600 gpd

Water saving fixtures and low flush toilets are _____ recommended to reduce wastewater to the system.

b) Hydraulic Loading Rates

Soil = .6 gpd/sq ft
 Linear loading rate = NA gpd/ft

c) Required Absorption Area

Design flow / soil loading rate = 1000 sq ft.

d) Effective Absorption Area Per 1ft Length of Trench = 3 sq ft

e) Total Length of Trench

Required absorption area / effective absorption area
 (Including credit for effective sidewall if applicable) = **284** linear feet of trench minimum.

f) Depth of Trench

1. Total = 6.5 feet

2. Depth of stone and sand below pipe = 5.5 feet

g) Width of Trench = 3 feet

h) Individual Trench Length = varies

i) Trench Spacing = 12 ft center to center

All trenches are to be installed on contour. The bottom of each trench must be level. A minimum of 12 inches of backfill is required over the geotextile fabric.

Trench Lengths = Trench 1 (Highest) = 56'
 Trench 2 = 56'
 Trench 3 = 54'
 Trench 4 = 57'
 Trench 5 (Lowest) = 61'

2. Distribution System - Using the above criteria, the distribution system would be designed as follows:

a) Manifold system = **End feed**

b) Number of laterals = 5

c) Length of laterals = **Lateral 1 (Highest) = 54'**
Lateral 2 = 53.5'
Lateral 3 = 51.75'
Lateral 4 = 54.63'
Lateral 5 (Lowest) = 58'

d) Diameter of laterals = 1½" (1.5")

e) Diameter of perforations = ¼" (.25")

f) Space between perforations = **Lateral 1 (Highest) = 4'**

Lateral 2 = 4.25'
 Lateral 3 = 4.5'
 Lateral 4 = 4.75'
 Lateral 5 (Lowest) = 5'

g) Holes per lateral = Lateral 1 (Highest) = 14
 Lateral 2 = 13
 Lateral 3 = 12
 Lateral 4 = 12
 Lateral 5 (Lowest) = 12

Distance from manifold to closest perforation
 Trench 1 (Highest) = 2'
 Trench 2 = 2.5'
 Trench 3 = 2.25'
 Trench 4 = 2.38'
 Trench 5 (Lowest) = 2.5'

o) Diameter of the force main = 3"
 p) Diameter of the manifold = 3"

Note - The length and diameter of laterals and perforation spacing and discharge rate may vary between trenches. This is to compensate for slope and other site factors.

Details should show layout detail of the lateral or drain pipe, such as manifold and lateral or drain pipe elevations in the trench, depths of bedding and fill materials, size of perforations and spacing between perforations, and spacing between laterals. Turn-ups are required as shown in the attachments or on page 39 (Figure 4.5) of the sand mound manual. The last perforation in all of the laterals should be placed as shown in the attachments or on page 31 (Figure 4.1) of the Sand Mound Manual.

D. SITE DRAINAGE

All surface water should be directed away from the tanks and system. This includes all water coming from down spouts and sump pumps.

E. MONITORING REQUIREMENTS

Observation ports are required in each trench.

- IV. SPECIFICATIONS AND ENGINEERING REPORT - Specifications for the materials and hardware to be used in the system can be included on the plan or prepared as a separate document. This should include specifications for the pump, pump curves, and pump controls if applicable. Specific procedures for site preparation and construction of the on-site system should also be included. Any calculations for designing the on-site system should be submitted along with the plans and specifications to facilitate the review.