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LPP MANUAL

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INTRODUCTION

Many proposed building sites in Christian County are unsuitable for on-site sewage disposal by conventional Subsurface Sewage Disposal (SSD) due to the presence of such limiting site conditions as a high water table, shallow depth to rock or other restrictive layers or because of the heavy clay content of the soil. Some of these unsuitable conditions can be overcome and sanitary disposal of wastewater can be accomplished by utilizing alternative SSD systems. Alternative subsurface sewage disposal systems are those systems and techniques, approved by the Christian County Health Department that vary from the construction and installation procedures of conventional SSD systems. However, alternative systems should not be misrepresented as a panacea for all unsuitable soil conditions found in Missouri but only as a means to increase the range of suitable site conditions.

This manual specifies the procedures and material to be used for successful siting, design, installation and maintenance of one alternative system, the low-pressure pipe (LPP) system. Use of proper materials and techniques is critical to the success of LPP systems as well as to all other alternatives.

CHAPTER 1

What Is Low-Pressure Pipe Distribution?

A subsurface soil-absorption system must serve two purposes: 1) keep untreated effluent below the surface, and 2) purify the effluent before it reaches ground or surface water. The system works best when the distribution area is not saturated with water or effluent, allowing efficient aerobic bacteria to treat the wastes.

There are several conditions which frequently hinder the operations of soil-absorption systems. Clogging of the soil can occur from localized overloading during use or from the mechanical sealing of the soil-trench interface during construction. This clogging can cause effluent to break through to the surface, especially in fine-textured soils. Anaerobic conditions caused by continuous saturation due to overloading or a high-water table retard treatment, increasing the potential for a failure. Shallow soils may not be deep enough to purify the effluent.

The LPP system has three design improvements over conventional systems that help overcome these problems. They are:

- uniform distribution of effluent
- dosing and resting cycles
- shallow placement of trenches

Problems from local overloading are decreased when effluent is distributed over the entire absorption area. Dosing and resting cycles help maintain aerobic conditions in the soil improving treatment. Shallow placement increases the vertical separation from the system to any restrictive horizon or seasonal high-water table.

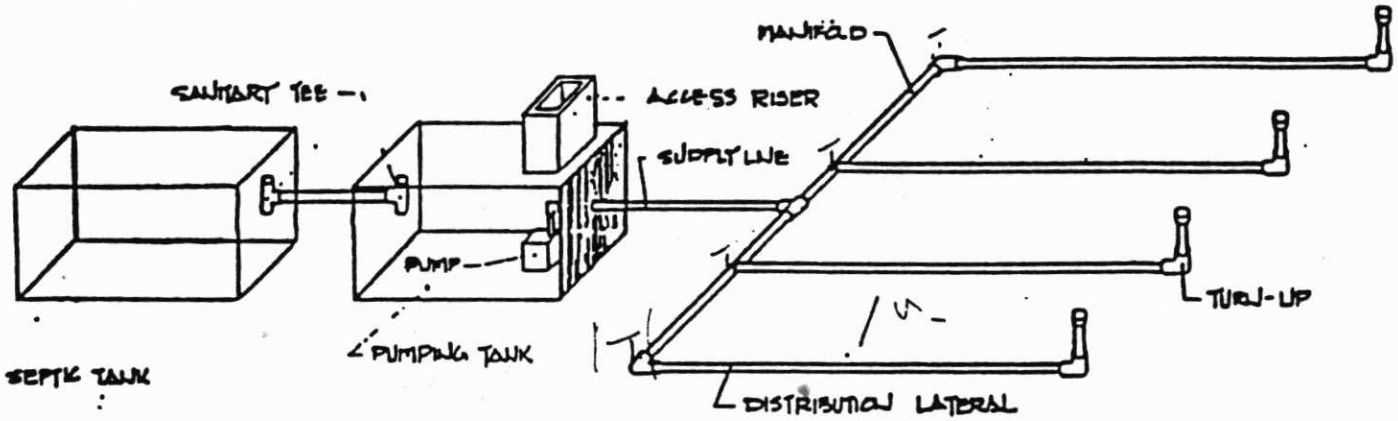
An LPP system is a shallow, pressure-dosed soil-absorption system (Figure 1). It consists of:

- septic tank
- single compartment dosing tank
- submersible effluent pump and level controls
- high water alarm
- supply line and manifold
- distribution system
- suitable area and depth of soil

When septic tank effluent rises to the level of the upper pump control, the pump turns on and effluent moves through the supply line and distribution laterals. These laterals are Schedule 40 PVC pipe containing small holes (5/32 inch to 1/4 inch) spaced 2.5 to 7.5 feet apart. The pipes are placed in narrow trenches 12 to 18 inches deep and spaced 5 or more feet apart. The hole diameter and spacing would be uniform if ball valves are located on each lateral line. Under low pressure (0.7 to 2 pounds per square inch) supplied by the pump, septic tank effluent flows through the holes and into the trenches. It diffuses from the trenches into the soil where it is treated.

The pump turns off when the effluent level falls to the lower control. The level controls are set so that the effluent is pumped two to four times daily with resting periods in between to allow aerobic treatment of effluent. If the pump or level controls should fail, the effluent would rise to the level of the alarm control and the alarm would turn on, signaling the homeowner of failure.

Figure 1. Basic components of a low pressure pipe system.



CHAPTER 2

Site and Soil Requirements for LPP Systems

The suitability of a LPP system for a given site is determined by the soil, slope and available space, as well as by the anticipated wastewater flow.

Space Requirements

The distribution network of most residential LPP systems occupies from 1000 square feet to 5000 square feet of area depending on soil permeability and design waste load. In addition, an area of suitable soil must be set aside for duplication or replacement of the system should a failure occur. This duplication area must be of sufficient size to install a complete system in accordance with regulations. Space between the existing lateral lines is not a suitable repair area. The septic tank, pumping chamber, distribution field and repair area are all subject to horizontal setbacks from wells, property lines, building foundations, etc., as specified in regulations.