

Septic System Standards

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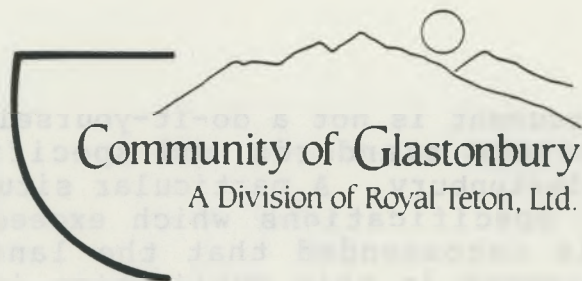
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Community of Glastonbury
A Division of Royal Teton, Ltd.

**Specifications and Standards
For Septic Systems**

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This document is not a do-it-yourself manual and sets forth only minimum standards and specifications for the Community of Glastonbury. A particular situation may require standards and specifications which exceed those set forth herein. It is recommended that the landowner study the material referenced in this publication in order to become more informed. It is also recommended that the landowner use qualified personnel in the planning and execution of this type of project. The Glastonbury Administrative Office maintains a list of contractors who have submitted at least three (3) references for this type of work, which is available for inspection.

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1.0 INTRODUCTION

The purpose of this document is to help Glastonbury landowners plan and contract for the construction of a septic system.

This document is not a do-it-yourself manual and sets forth only minimum standards and specifications for the Community of Glastonbury. A particular situation may require standards and specifications which exceed those set forth herein. It is recommended that the landowner study the material referenced in this publication in order to become more informed. It is also recommended that the landowner use qualified personnel in the planning and execution of this type of project. The Glastonbury Administrative Office maintains a list of contractors who have submitted at least three (3) references for this type of work, which is available for inspection.

The landowner should carefully plan his project, solicit bids from several contractors, and enter into a written agreement with the chosen bidder for execution of the project. We strongly recommend that verbal understandings or agreements be avoided.

2.0 PLANNING AND REVIEW

In order to plan a septic system it is necessary to prepare a parcel master plan, select a site and make a system layout, obtain percolation test data, obtain a county sanitary permit, fill out and submit the Glastonbury Project Review and Evaluation Application, including Sheet "D.1." with the required attachments, and await the approval of the project.

An experienced contractor or consultant can and should be engaged in the planning process.

The application and review process with the Glastonbury Project Review Committee is required before any construction or installation work can take place.

2.1 PARCEL MASTER PLANNING

The landowner should consider in reasonable detail the possible short-term and long-term usages of their property. The considerations should include at a minimum the following: possible subdivisions and new lot boundaries; routes of roads; home sites; fallout shelters; locations of septic tanks, absorption fields, pipelines, wells and drainage courses; and easements required around wells and absorption fields when used for subdivided parcels.

A detailed on-site inspection of the property by the landowner and any other interested parties is recommended before final decisions are made.

2.2 SYSTEM REQUIREMENTS

The septic tank, absorption field and connecting piping are the three major components of the system. Each component has individual requirements which must be met for proper system operation. These components must be sized for maximum anticipated wastewater flow and located on site according to the minimum distances as shown in Figure 1, below, and as stated in Table 1, page 3.

The terrain, soil conditions, rock outcroppings, location of streams and water courses, and the presence of ground water must be considered in the selection of the site. The septic tank and absorption field should ideally be located downhill from the residence to provide gravity flow through the system. A topo map should be used for the general layout of the system components and the locations and elevations should be verified and staked on site prior to finalizing the application.

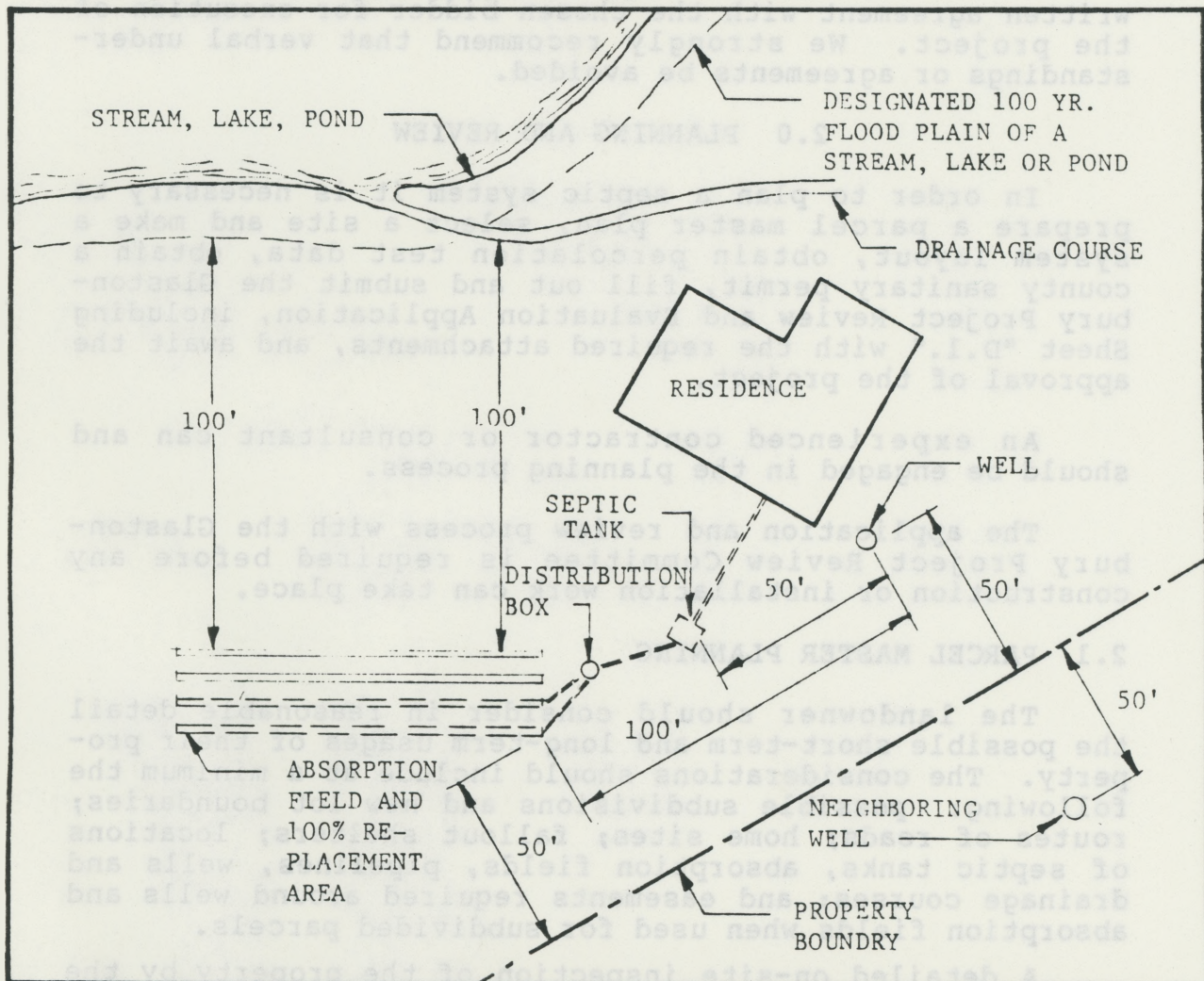


Figure 1: MINIMUM DISTANCES FOR SEPTIC SYSTEM LAYOUT

Table 1: MINIMUM DISTANCES BETWEEN SYSTEM
COMPONENTS AND SITE FEATURES

<u>FROM</u>	<u>TO SEPTIC TANK</u>	<u>TO ABSORPTION FIELD</u>
Well.....	50	100
Property or Lot Line.....	10	50
Foundation Wall.....	5	10
Water Lines.....	10	10
Stream, Lake or Pond.....	50	100
100-Year Flood Plain.....	50	100
Roadcuts, Cliffs or Banks.....	10	25

The site investigation required prior to the design of a system is usually limited to the percolation test. The percolation test defines the soil's capacity to absorb water under saturated conditions. This information is required to size the area of the absorptive surface of the absorption field trench bottom. Refer to Bulletin 332, "Septic Tanks", from the Montana State Department of Health and Environmental Sciences for the standard percolation test procedure. In conditions where ground water, shallow bed rock or impervious soil stratum is possible, an inspection pit to a depth of approximately 7 feet should be included in the site investigation.

The completed design of the septic system must be submitted for approval to the Park County Sanitarian on the County's standard application form in addition to being submitted to the Glastonbury Project Review Committee.

Further system considerations are contained in the following subsections.

2.2.1 Safety

Pumped out tanks may still contain toxic gases that can be deadly. Only experienced personnel should attempt to enter tanks for repair purposes. Tanks and absorption fields should be situated in such a manner that they will not be driven on. Tank lids should not be surface mounted but buried underground approximately 6"-12" to prevent accidental entry.

2.2.2 Additives

Biological or chemical additives are not generally required. A qualified expert should be consulted prior to using any of these agents.

2.2.3 System Maintenance

Periodic inspection of septic tanks is recommended. Septage should not be allowed to accumulate to within 12" of the tank outlet baffle or submerged tee. A yearly pumping schedule is recommended to eliminate excessive accumulation of septage.

2.2.4 Alternate Designs

Subsurface soil absorption is the preferred on-site disposal method for the Community of Glastonbury because it has greater reliability with a minimum of attention. This system is the one described in this document. In areas with extreme soil or terrain conditions, alternative systems not included in these specifications may be required. In such cases, designs would require special considerations by a qualified professional, and a thorough review by the Project Review Committee and the Park County Sanitarian.

2.2.5 Accessibility

Maintain tank opening accessibility to facilitate servicing and maintenance.

2.2.6 Discharge Considerations

Liquid waste and wash water (black and graywater) are usually discharged into a septic tank. Roof, footing, garage, and surface runoff should be excluded. Graywater may, optionally, be disposed of into a separate clarifier tank. This would prevent excessive anti-bacterial wash water liquids from entering the blackwater and interrupting the bacterial digestion of solids. All wastewater must discharge from the septic tank and clarifier tank into an approved absorption field.

2.3 PROJECT REVIEW

Before construction can begin on the septic system installation, the project must be evaluated and approved by the Glastonbury Project Review Committee (the "Committee"). The purpose for this review is to insure that the technical standards and aesthetic values of the Community are uniformly administered and maintained at a minimum level for the benefit of all residents.

The review is initiated by the landowner filling out the Glastonbury Project Review and Evaluation Application, together with Sheet "D.1.", from the information obtained in the site planning phase. Once the forms have been executed, and all of the required submittals appended,

they should be forwarded to the Projects Coordinator for the Committee. In most cases, the Projects Coordinator will arrange for the site and proposed development to be visited and independently evaluated by one of the members of the Royal Teton Ranch Engineering and Planning Department. The Committee will then review the project and communicate its decision and any recommendations or conditions to the landowner. Once the project has been approved, the landowner is free to begin the construction necessary to install the septic system.

3.0 SEPTIC SYSTEM STANDARDS

Septic systems installed in the Community require the following components: (1) sewer line, (2) septic tank, (3) effluent line, (4) distribution box, and (5) absorption field.

The minimum horizontal distances between components and other site features and appurtenances are presented in Table 1, page 3, as well as in Figure 1, page 2.

If unknown subsurface conditions exist, inspection pits are recommended. They will reveal whether there is a high water table, bedrock or hardpan close to the surface. The minimum recommended depth of an inspection pit is 7 feet. The following soil factors should be noted by an experienced consultant: (1) Thickness and texture of soil layers, (2) Presence of mottling or other evidence of high groundwater level, (3) Depth to water table, and (4) Depth to bedrock, rocky soil, hardpan or other prominent subsurface features.

The State of Montana does not normally allow site slopes of greater than 12% (i.e. 12 feet of rise in elevation for each 100' of horizontal distance) for the construction of absorption fields. Where greater slopes occur, special consideration in design is required.

Dosing (storing effluent from the septic tank in a smaller tank and discharging it periodically at one time) is required when design flow requires more than 500' of drainline. The preferred dosing method is by a gravity siphon if adequate change in elevation is available.

Specific component specifications follow.

3.1 SEPTIC TANK SPECIFICATIONS

Septic tanks may be sized based on the number of bedrooms, as indicated in Table 2, page 6. For each additional bedroom in excess of six, add 250 gallons.

Required retention time, for both blackwater and graywater, is 24 hours. If the tank is designed based on flow-rate, a 50% sludge factor is required in calculating tank size.

Table 2: RESIDENTIAL TANK SIZE REQUIREMENTS

<u>Number of Bedrooms</u>	<u>Minimum Liquid Capacity in Gallons</u>
1 & 2	750
3	1,000
4	1,250
5	1,500
6	1,750

Tanks should be installed level, within $\pm 1/2"$, on an undisturbed, graded surface free of rocks larger than 2". Tanks can also be installed on a firm, compacted 6" base of select bedding material brought to grade. Refer to Figure 2, page 7. Acceptable tank materials are concrete, PVC and fiberglass, but not wood or steel.

3.2 PIPING SPECIFICATIONS

Septic system piping consists of a sewer line to the tank, an effluent line from the tank to the distribution box, and the drainlines from the distribution box. All lines must have a minimum diameter of 4". All pipe connections to tanks must be made with a watertight seal such as tar rope or an approved equivalent.

Maximum pipe bend allowed is 45° . Cleanouts of equal diameter and extending to ground level should be provided immediately upstream of all 45° bends.

Sewer and effluent lines should be placed on undisturbed soil free of rocks larger than $3/4"$, or on compacted bedding. Bedding used to level tanks and pipes in rocky or unstable soils and to protect sewer lines prior to mass backfilling should be select sand and gravel material ($3/4"$ minus). The top of the pipe should be covered with a minimum of 6"-12" of this material carefully compacted. Grade requirements are presented in Table 3, page 7.

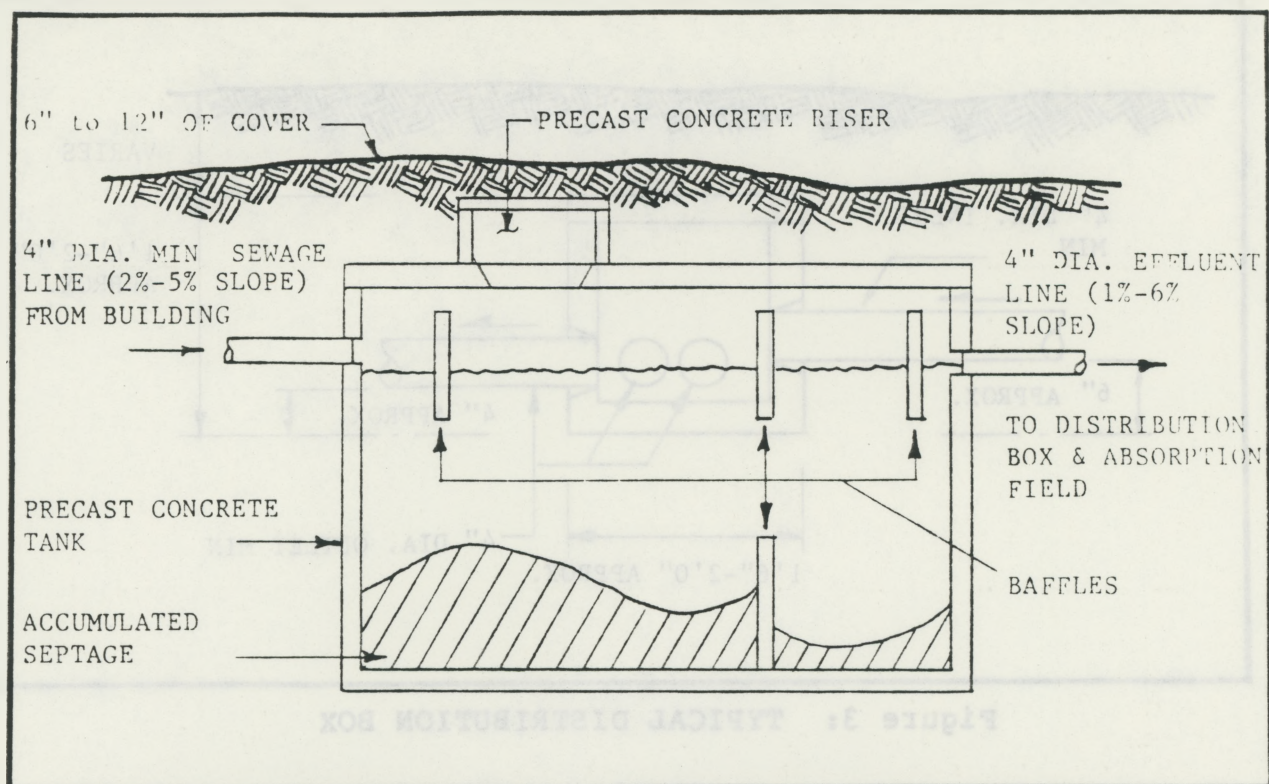


Figure 2: TYPICAL SEPTIC TANK

Table 3: PIPELINE GRADE ALLOWANCES

<u>PIPELINE</u>	<u>GRADE</u>
Sewage Line	2% to 5%
Effluent Line	1% to 6%
Drainline	0

3.3 DISTRIBUTION BOX SPECIFICATIONS

Distribution boxes are required in all systems having more than one absorption trench. Boxes should be placed so as to provide an even distribution of effluent to all drainlines. Drainlines are perforated 4" diameter pipelines which distribute effluent to absorption fields of gravel and underlying soil. Distribution boxes should be installed level, below grade, and immediately uphill from the absorption trenches. Each distribution line should connect to the distribution box individually. Refer to Figure 3, page 8.

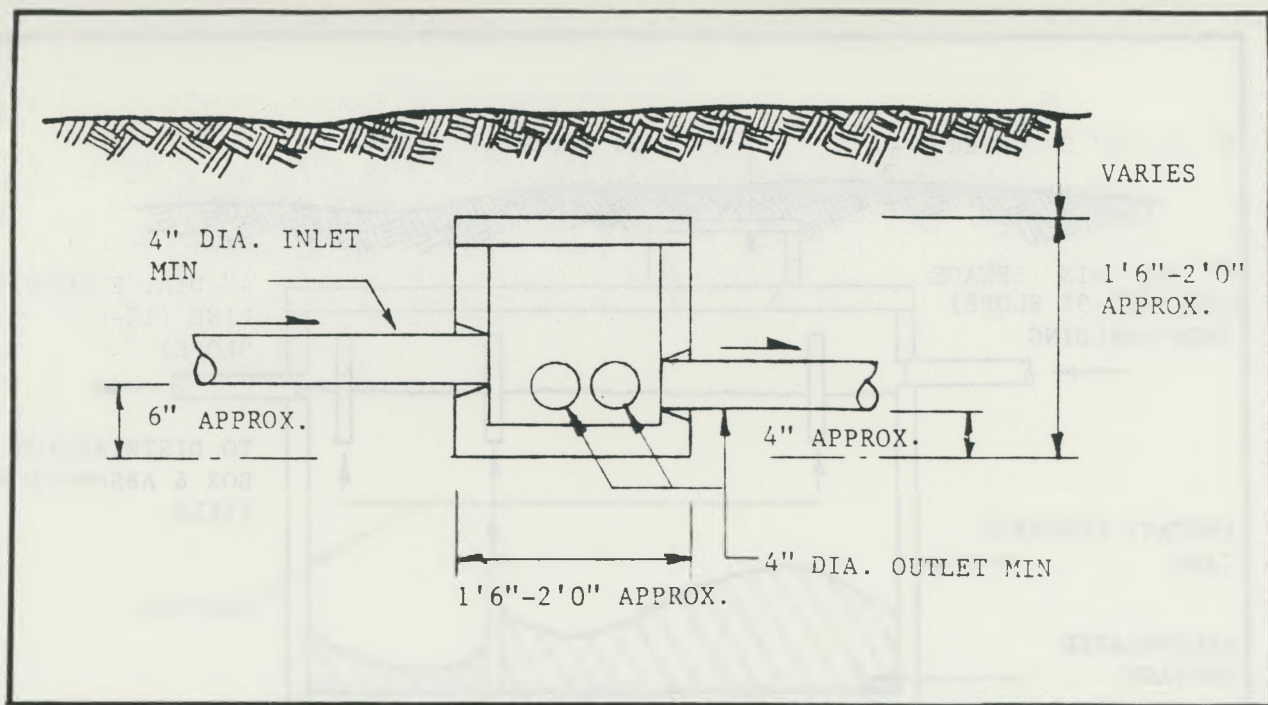


Figure 3: TYPICAL DISTRIBUTION BOX

3.4 ABSORPTION FIELD SPECIFICATIONS

Avoid unnecessary traffic over trench areas prior to and during construction in order to protect subsurface absorption values. In clay or easily glazed soils, avoid construction during rainfall or while moisture content of the soil is high. Avoid leaving excavated trenches incomplete and open longer than necessary. After back-filling the area, mark clearly to prevent future traffic by vehicles or heavy equipment over the absorption field. Fencing or some other surface barrier to prevent such traffic is preferable.

A 100% replacement area is required for all absorption fields in the event the original field should ever become unusable. Refer to Figure 4, page 9. All absorption fields and replacement areas should lie at least 100' outside of a defined drainage course or recorded flood plains.

Absorption fields should provide a minimum vertical separation of 3' between the bottom of the absorption field and bedrock or seasonal high groundwater.

Absorption trenches are not recommended on slopes of greater than 12% due to the possibility of horizontal seepage and the need for controlled pipe grades. Absorption trenches should, within reason, lie perpendicular to

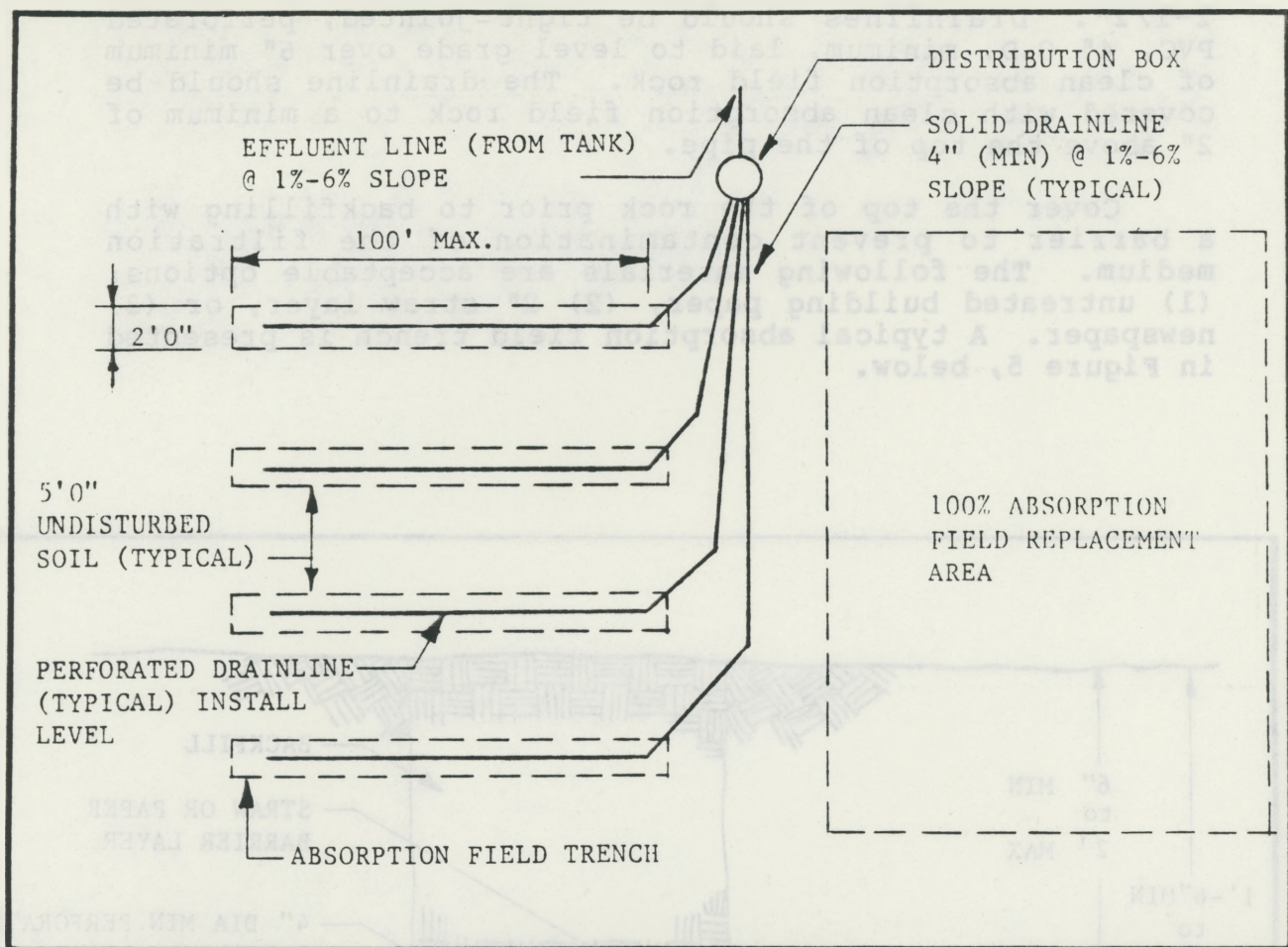


Figure 4: ABSORPTION FIELD

the prevailing direction of slope. Trenches should not be constructed in disturbed or unstable soil.

Maximum trench bottom is 3' below grade. Maximum individual trench length is 100'. Drainline ends must be capped. Recommended trench width is 2'. Trenches should be separated by a minimum of 5' of earth to facilitate straddling of trenches by construction equipment and to avoid traffic over newly-laid pipe.

In the case of clay or easily-compacted soils, care should be taken to avoid smearing or glazing trench surfaces. Scarify (scrape) such surfaces with a sharp-pointed tool following excavation in order to maintain maximum infiltration capacity after completion and back-filling.

Absorption field rock consists of washed and graded gravel suitable for use as a filtration medium. It should contain no dirt and range in average diameter from 3/4" to

2-1/2". Drainlines should be tight-jointed, perforated PVC, 4" O.D. minimum, laid to level grade over 6" minimum of clean absorption field rock. The drainline should be covered with clean absorption field rock to a minimum of 2" above the top of the pipe.

Cover the top of the rock prior to backfilling with a barrier to prevent contamination of the filtration medium. The following materials are acceptable options: (1) untreated building paper, (2) 2" straw layer, or (3) newspaper. A typical absorption field trench is presented in Figure 5, below.

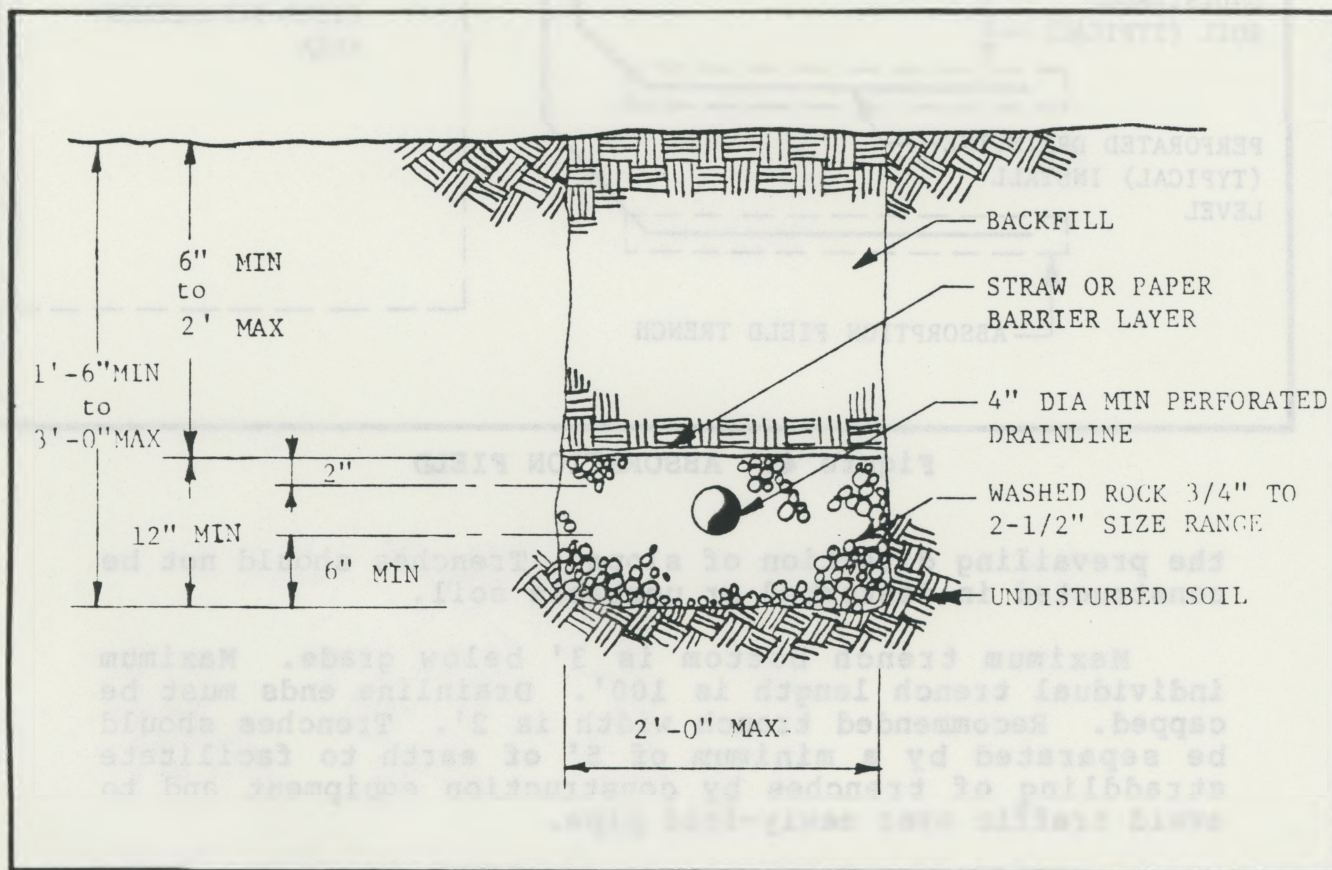


Figure 5: ABSORPTION FIELD TRENCH SECTION

4.0 REFERENCES

4.1 TECHNICAL REFERENCES

Design Manual: On-Site Wastewater Treatment and Disposal Systems U.S. Environmental Protection Agency, Office of Water Program Operations.

Recommended Standards for Individual Sewage Systems (10-State Standards), 1980 Ed. A report of the ten-state committee for individual sewage systems of the Great Lakes-Upper Mississippi River Board of State Sanitary Engineers.

Septic Tanks (Bulletin 332); March, 1983 (Rev.). Montana State Department of Health and Environmental Sciences; Helena, Montana (Also available through the Cooperative Extension Service, Montana State University; Bozeman, Montana).

Uniform Plumbing Code (UPC), 1982 Ed., as amended by Montana State Code.

4.2 AGENCIES

Montana State Dept. of Health & Environmental Sciences; Helena, Montana.

Park County Health Dept., 414 E. Callender, Livingston, Montana 59047, (406) 222-6120, ext. 240.

Cooperative Extension Service, Montana State University, Bozeman, Montana.