1.2.13. **Building sewer** means the pipe connecting the house or building drain to the public sewer or private sewer.

1.2.14. **Cleanout** means access to a sewer line, extending from the sewer line to the ground surface or inside the foundation, used for access to clean a sewer line.

1.2.15. **Commercial unit** means the area under one roof occupied by a business. For example, a building housing two businesses under one roof is considered two commercial units.

1.2.16. **Composting toilet** means a system consisting of a compartment or a vault that contains or will receive composting materials sufficient to reduce human waste by aerobic decomposition.

1.2.17. **Connection** means a line that provides water or sewer service to a single building or main building with accessory buildings. The term is synonymous with "service connection."

1.2.18. **Design flow** means the flow used for sizing hydraulic facilities, such as pumps, piping, storage, and absorption systems.

1.2.19. **Distribution box** means a watertight receptacle that receives septic tank effluent and distributes it equally into two or more pipes leading to the absorption area.

1.2.20. **Distribution pipe** means a perforated pipe used in the dispersion of septic tank or other treatment facility effluent into a subsurface wastewater treatment system.

1.2.21. **Dosed system** means any system that utilizes a pump, siphon, or actuated valves to deliver treated effluent to a subsurface absorption area.

1.2.22. **Dosing frequency** means the number of times per day that effluent is applied to an absorption system or sand filter.

1.2.23. **Dosing tank** means a watertight receptacle receiving effluent from the septic tank or another treatment device, equipped with a siphon or a pump designed to discharge effluent.

1.2.24. **Dosing volume** means the volume of effluent, in gallons applied to an absorption system or sand filter each time a pump is activated or each time a siphon functions.

1.2.25. **Drain rock** means the rock or coarse aggregate used in an absorption system, sand filter, or seepage pit. Drain rock must be washed, be a maximum of 2.5 inches in diameter and larger than the orifice size unless shielding is provided to protect the orifice, and contain no more than 2 percent passing the No. 8 sieve. The material must be of sufficient competency to resist slaking or dissolution. Gravels of shale, sandstone, or limestone may degrade and may not be used.

1.2.26. **Drop box** means a watertight structure that receives septic tank effluent and distributes it into one or more distribution pipes and into an overflow leading to another drop box

4. COLLECTION, PUMPING, AND EFFLUENT DISTRIBUTION SYSTEMS

4.1 COLLECTION SYSTEMS

4.1.1. General

4.1.1.1. Sewer collection systems, as described in this subchapter, are the system of pipes and other appurtenances that receive and convey wastewater or effluent either by gravity or through force mains to a treatment system. This subchapter discusses sewer service connections, gravity mains, force mains, alternative collection systems, and necessary setbacks.

4.1.1.2. Sewer collection systems, including sewer service lines and sewer mains, must maintain the setback distances required in ARM Title 17, Chapter 36, subchapter 3 or 9, as applicable.

4.1.1.3. Sewer collection systems that include inverted siphons or those to be constructed near stream crossings, at water main crossings, or with aerial crossings must be designed in accordance with Department Circular DEQ-2.

4.1.1.4. Sewer collection systems must be designed for wastewater only. Rain water from roofs, streets, and other areas; cooling water, surface water drainage, ground water from foundation drains, etc., are not permitted in wastewater sewers.

4.1.1.5. In general, flow used for designing sewers must consider the ultimate population to be served, maximum hourly wastewater flow, and possible infiltration. Sewer extensions should be designed for projected flows even when the diameter of the receiving sewer is less than the diameter of the proposed extension. A schedule for future downstream sewer relief may be required by the reviewing authority.

4.1.1.6. Sewer collection systems must be designed to prevent freezing. The minimum depth of bury must not be less than 4 feet to the top of the pipe without justification by the designer. Insulation must be provided for sewers that cannot be placed at a depth sufficient to prevent freezing. Insulation used for this purpose must be specifically designed to withstand compaction and for use in subsurface locations. It must retain the insulating value for the design life of the sewer.

4.1.1.7. Schedule 40 PVC sewer pipe must be used leading into and out of the septic tank, and in the area of backfill around the tank for a minimum length of at least 10 feet. Other sewer collection pipes must be made of PVC or High Density Polyethylene (HDPE).

A. PVC sewer pipes must meet the requirements of ASTM D 3034-08, Schedule 40, or Schedule 80 and meet ASTM D 1785-12. Sewer collection pipes must be joined by an integral bell-and-spigot joint with rubber

6. SOIL ABSORPTION SYSTEMS

6.1. STANDARD ABSORPTION TRENCHES

6.1.1. General

The satisfactory operation of the wastewater treatment system is largely dependent upon wastewater quality, proper site selection, and the design and construction of absorption trenches.

All new and replacement absorption systems must be designed to accept and treat residential strength waste. High strength wastewater or water treatment waste residuals must comply with Subchapters 3.2 and 3.3 of this Circular.

6.1.2. Location

Absorption trenches must meet the location criteria in ARM Title 17, Chapter 36, subchapter 3 or 9, as applicable.

All absorption trenches must meet the site requirements of Chapter 2.

6.1.3. Trench Design

6.1.3.1. The minimum area in any absorption trench system must be based upon the flow, as determined in Chapter 3 and sized by the soil type and percolation rate if percolation testing is required by the reviewing authority, whichever results in a larger absorption system, in accordance with Chapter 2, Section 6.1.4, and Appendix B. The reviewing authority may require a percolation test when the soils are variable or other conditions create the need to verify trench sizing.

6.1.3.2. An area that can be used as a replacement area for the original absorption trench system must be designated. Interim use of the area must be compatible with future absorption system use. The replacement area should be located separately from the primary area and must not be interlaced within the primary area.

6.1.3.3. Gravity-fed and gravity-dosed absorption trenches must be separated by at least 5 feet between trench walls. Pressure dosed absorption trenches must be separated by at least 4 feet between trench walls. Absorption trenches, utilizing proprietary design configurations, with effluent meeting NSF 40 criteria for 30 mg/L BOD_5 and 30 mg/L TSS, may have trench separation distances that meet manufacturer recommendations.

6.1.3.4. Gravity-fed and gravity-dosed absorption trenches must be at least 18 inches wide, but, for purposes of sizing, any width greater than 24 inches wide will not be considered. Systems utilizing pressure distribution may have absorption trenches 36 inches wide.

6.1.3.5. The bottom of the absorption trenches must be at least 24 inches and no more than 36 inches below the natural ground surface. There must be a minimum of 12 inches of soil or fill material above the drain rock.

6.1.3.6. Gravity-fed absorption trenches may not exceed 100 feet in length from where effluent is first applied to the soil. Gravity-fed absorption trenches may be connected through a manifold to accommodate serial configurations. If more than 500 lineal feet, or 1000 square feet, of absorption area, calculated before applying any reductions, is needed, then pressure distribution must be provided.

6.1.4. Sizing of the Absorption System

6.1.4.1. Application rates and absorption system length used for sizing onsite wastewater absorption systems can be determined using soil descriptions in accordance with Chapter 2, Appendix B, and the formula in Subsection 6.1.4.2. Comparison of the soil profile descriptions, at or near the depth of the infiltrative surface, percolation rate, if conducted, and USDA soils report must be submitted for review. If the submitted information shows a variable application rate, additional site-specific information may be required by the reviewing authority.

6.1.4.2. Absorption system sizing must be determined using the following formula:

The total square feet of the absorption system area is determined using the design wastewater flow rates from Chapter 3 (gpd) divided by the application rate in Section 2.1.7, Table 2.1-1 (gpd/ ft^2).

Total trench length is calculated by dividing the total square feet of the absorption system area by the trench width.

6.1.4.3. Systems that provide documentation or demonstrate, through a third independent party, that the unit is able to meet the testing criteria and performance requirements for NSF Standard No. 40 for Class 1 certification, or meet the testing requirements outlined in ARM 17.30.718 for 30 mg/L BOD_5 and 30 mg/L TSS, only, may utilize a reduced absorption area in accordance with the following criteria:

A. For subsurface absorption systems constructed in soils with percolation rates between 3 and 50 mpi, as described in Chapter 2 and Appendix B, the final absorption area may be reduced by 50 percent;
B. For subsurface absorption systems constructed in soils with percolation rates between 51 and 120 mpi as described in Chapter 2 and Appendix B, the final absorption area may be reduced by 25 percent.

A full-sized separate subsurface absorption replacement area, sized without reduction, must be designated for each site.

Further reductions in subsurface absorption system sizing, beyond those listed in this subsection, are not permissible.

6.1.5. Construction

6.1.5.1. Gravity-fed and gravity-dosed absorption field distribution pipes and trench bottoms must be level. Pressure-dosed distribution pipes in an absorption system or sand filter must be level, unless a hydraulic analysis indicates uniform distribution of effluent will occur with a sloped line.

6.1.5.2. When the trenches have been excavated, the sides and bottom must be raked to scarify any smeared soil surfaces. Construction equipment, unless needed to construct the system, should be kept off the area to be utilized for the absorption trench system to prevent undesirable compaction of the soils. Construction must not be initiated when the soil moisture content is high.

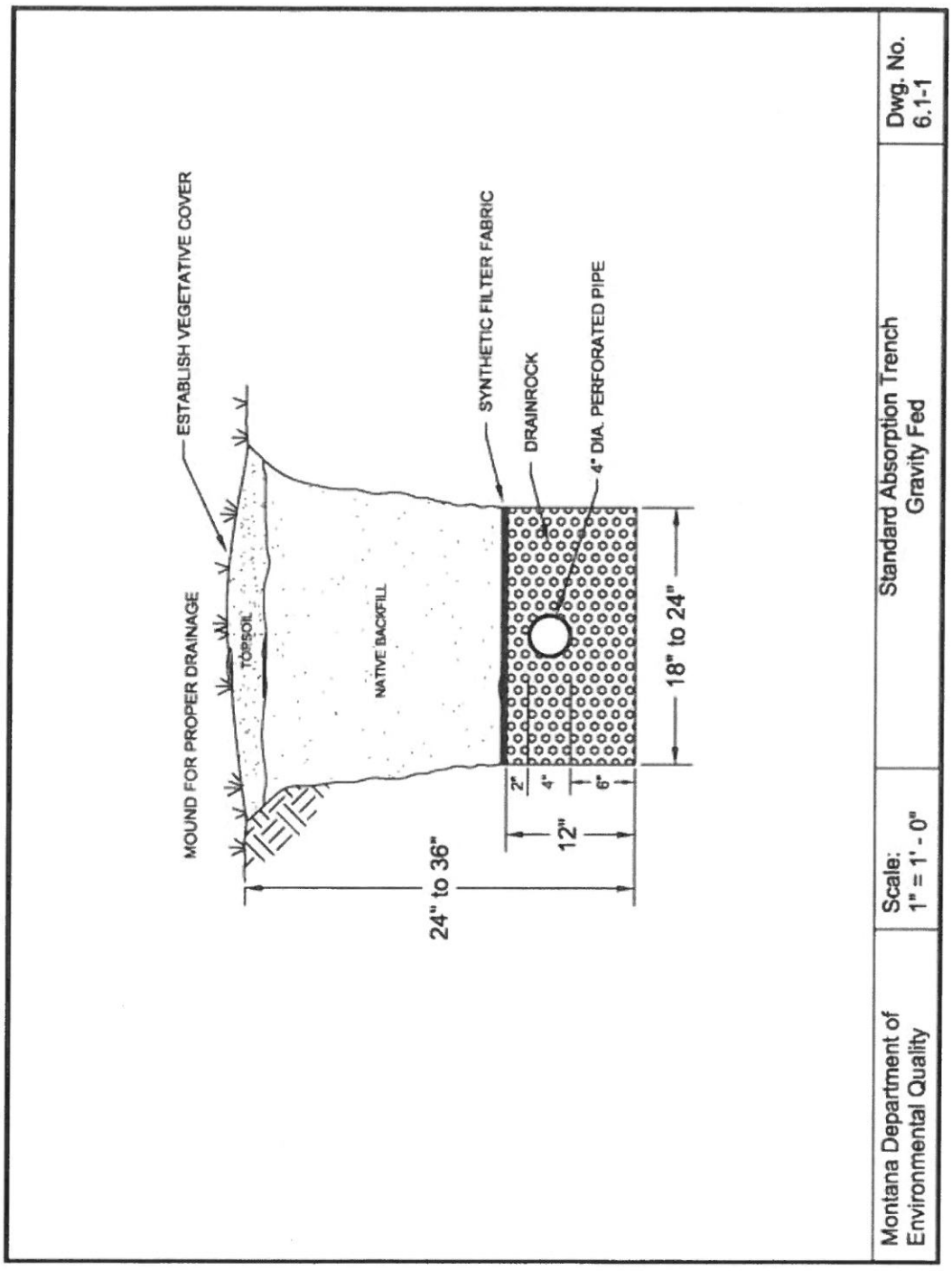
Note: If a sample of soil within the working depth can be easily rolled into the shape of a wire or ribbon, the soil moisture content is too high for construction purposes.

6.1.5.3. At least 6 inches of drain rock meeting the requirements of Section 1.2.25 must be placed in the bottom of the trench.

6.1.5.4. The distribution pipe must be covered with at least 2 inches of drain rock meeting the requirements of Section 1.2.25. An appropriate geotextile fabric, untreated building paper, or straw must be placed over the drain rock and covered with a minimum of 1 foot of soil or fill.

6.1.5.5. The ends of the distribution pipes must be capped or plugged.

6.1.5.6. Gravelless trenches and other absorption systems may be used in place of distribution pipe and drain rock in accordance with Subchapter 6.6.


ESTABLISH VEGETATIVE COVER
MOUND FOR PROPER DRAINAGE
TOPSOIL
NATIVE BACKFILL
SYNTHETIC FILTER FABRIC
DRAINROCK
4" DIA. PERFORATED PIPE
18" to 24"
2"
4"
6"
12"
24" to 36"
Montana Department of Environmental Quality
Scale: 1" = 1' - 0"
Standard Absorption Trench Gravity Fed
Dwg. No. 6.1-1