

4.28 Two-Cell Infiltrative System

Revision: December 10, 2014

4.28.1 Description

Domestic sewage is discharged into a two-cell infiltrative system (TCIS). The cells provide sewage storage during wet seasons. The second cell provides very slow infiltration into the surrounding soils. Evaporation and more rapid infiltration occur during dry seasons, reducing the liquid volume and replenishing the cell's storage capacity.

4.28.2 Approval Conditions

1. Cells may not be placed within 100 feet of the owner's property line and may not be placed within 300 feet from a neighboring dwelling.
2. Bottom of the finished cells must meet the effective soil depths for a design group C soil.
3. Soil design group must be C or *unsuitable clays*.
4. Site must be located in an area of maximum exposure to the sun and wind.
5. Slope must not be greater than 6%.
6. System cannot be placed on fill.
7. Source of make-up water with a backflow prevention system between the source and TCIS must be readily available.
8. Lot size shall be at least 5 acres.
9. This design is for an individual residential dwelling with up to six bedrooms and is not to be used for commercial or industrial nondomestic wastewater.
10. In areas of Idaho where the precipitation exceeds evaporation by more than 6 inches, this design would be considered experimental.
11. A reserve area equal to the size of the second cell shall be required.

4.28.3 Design

1. The first cell is approximately 32,100 gallons at a liquid depth of 4 feet and should operate full or nearly full at all times.
2. If the water level of the first cell drops below 2 feet, make-up water is added to raise the water level up to the 2-foot minimum pool.
3. The second cell is approximately 51,000 gallons at a liquid depth of 4 feet, which provides 182 days or about 6 months of storage when this cell is dry.
4. Total minimum volume of both cells combined is 83,100 gallons at a liquid depth of 4 feet.

4.28.4 Construction

1. Shallow permeable topsoils shall be removed before starting excavation and construction (topsoils may be saved and used to provide vegetative cover on the dike embankments).
2. Dike levees, embankments, and inlet piping trenches shall be compacted to 95% standard proctor density.

3. No vehicles with pneumatic tires shall be permitted on the basal area or inside slope of the second cell.
4. Sewage discharge inlet must be placed in the center of the basal area of both cells.
5. Concrete splash pad must be constructed around the discharge inlets.
6. Water depth gauges clearly visible from the edge of both cells shall be installed.
7. Cleanout must be placed on the gravity effluent lines at a point above the maximum liquid elevation.
8. If the sewage is pumped to the system, a check valve and shutoff valve must be placed between the pump and system so that repairs can be completed without draining the cells.
9. Excavation must provide the following dike and embankment details:
 - a. Inner slope – 3:1
 - b. Outer slope – 2:1 or flatter
 - c. Embankment width – 4 feet minimum
10. System must be fenced to exclude children, pets, and livestock. A sign on the fence indicating *Danger—Human Sewage* shall be erected.
11. Diversion ditches or curtain drains must be installed on sloping terrain to prevent surface runoff from entering the system.
12. Before operation of the system, the first cell shall be filled with 2 feet of make-up water.
13. Top and outer embankment shall be seeded or adequately protected from erosion.

4.28.5 Inspection

1. A preconstruction conference should be held between the health district and installer.
2. Site must be inspected at the time the cells are excavated.
3. All required system components and design elements shall be inspected.
4. Inspection is required during embankment construction to verify that all fill material is compacted to 95% proctor density.
5. Prior to operation and before filling the first cell with make-up water, a final inspection shall be completed.

4.28.6 Operation and Maintenance

1. The first cell must be kept filled with at least 2 feet of liquid.
2. Annual maintenance and testing of the backflow prevention device installed on the make-up water supply line shall be performed at least annually and completed according to the manufacturer's recommendations.
3. Permanent vegetation should be maintained on the top and outer slopes of the embankment except where a foot or vehicle path is in use.
4. Woody vegetation should be removed from the embankments, grasses should be mowed, and other vegetation should not be allowed to grow in either of the cells.
5. Floating aquatic weeds must be physically removed on a regular basis.
6. The fence and all gates surrounding the system must be maintained to exclude animals, children, and other unwanted intrusion.

Figure 4-40 shows a cross-sectional view of a TCIS. Figure 4-41 provides an overhead view of a TCIS.

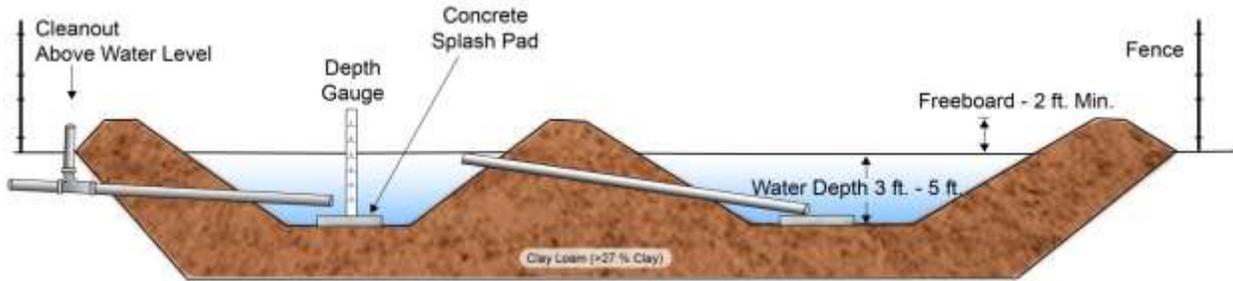


Figure 4-40. Cross-sectional view of a two-cell infiltrative system.

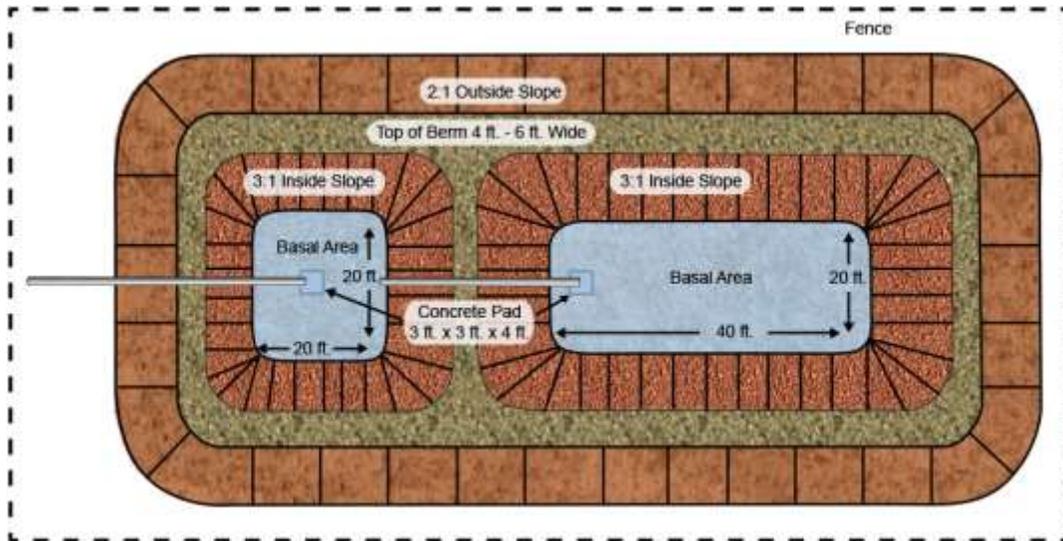


Figure 4-41. Overhead view of a two-cell infiltrative system.