

**EFFECTIVE LEACHING CREDITS & CENTER TO CENTER SPACING****Leaching Trenches**

Trench Depth (inches)	Trench Width (inches)	Effective Leaching Area (SF/LF)	Center to Center Spacing (feet)
18	18	2.1	7
18	24	2.4	7
18	30	2.7	7
18	36	3.0	7
12	48	3.0	8

**Concrete Galleries and Plastic Units in Gallery Configuration**

Gallery Height (inches)	Effective Leaching Area (SF/LF)	Center to Center Spacing (feet)
48	9.2	12
36	8.0	12
30	7.4	12
27	7.1	12
24	6.8	12
18	6.2	12
12	5.9	12

**Plastic Leaching Chambers Backfilled with Approved Aggregate**

Product Name	Dimensions (W x H)	Effective Leaching Area (SF/LF)	Center to Center Spacing (feet)
Cultec - Contactor EZ-24	16" x 12"	1.9	7
Cultec - Contactor EZ-24 (PDS)	16" x 12"	2.5	7
Cultec - Contactor 100	36" x 12.5"	3.7	7
Cultec - Contactor 100 (PDS)	36" x 12.5"	4.3	7
Cultec - Recharger 180	36" x 20.5"	4.4	7
Cultec - Recharger 180 (PDS)	36" x 20.5"	5.1	9
Cultec - Recharger 280	46" x 26.5"	6.5	10
Cultec - Recharger 280 (PDS)	46" x 26.5"	7.1	10
Cultec - Recharger 330XLHD	52" x 30"	5.6	11
Infiltrator Quick4 Equalizer 24	16" x 11"	2.0	7
Infiltrator Quick4 Equalizer 36	22" x 12"	2.6	7
Infiltrator Quick4 Standard	34" x 12"	3.6	7
Infiltrator Quick4 High Capacity	34" x 16"	4.1	7
Infiltrator Arc 36	34.5" x 13"	3.7	7
Infiltrator Arc 36HC	34.5" x 16"	4.1	7
Infiltrator Quick4 Plus Equalizer 36 Low Profile	22" x 8"	2.4	7
Infiltrator Quick4 Plus Standard Low Profile	34" x 8"	3.4	7
Infiltrator Quick4 Plus Standard	34" x 12"	3.8	7
Infiltrator Quick4 Plus High Capacity	34" x 14"	3.9	7
Infiltrator Quick5 Standard	34" x 12"	3.7	7
Infiltrator Quick5 Equalizer 36	22" x 12"	2.7	7
Infiltrator Arc 24	22" x 12"	2.6	7
Infiltrator Arc 36 LP	34" x 8"	3.4	7

**Eljen**

Product Name	Dimensions (W x H)	Effective Leaching Area (SF/LF)	Center to Center Spacing (feet)
Eljen B43	36" x 7"	4.7	7
Mantis 536-8	36" x 18"	11.0	12
Mantis 536-8 LowPro	36" x 12"	6.5	9
Mantis Double-Wide 58	72" x 12"	11.6	14
Mantis Double-Wide 100	72" x 18"	20.0	14

## Residential Buildings

**Table 6**

Percolation Rate	Square Feet of Required Effective Leaching Area (ELA)			
(Minutes to Drop One Inch)	2-Bedroom Building	3-Bedroom Building	For Each Bedroom Above 3	
			Single Family	Multi-family
LESS THAN 10.1	375	495	82.5	137.5
10.1-20.0	500	675	112.5	187.5
20.1-30.0	565	750	125	208.5
30.1-45.0	675	900	150	250
45.1-60.0	745	990	165	275

## Restaurants, Residential Institutions, and Nonresidential Buildings with Problematic Sewage

The required ELA for a SSDS serving a restaurant, bakery, food service establishment, residential institution, laundromat, beauty salon, or other nonresidential building with problematic sewage shall be determined by dividing the design flow by the application rate listed in Table 7.

**Table 7**

Percolation Rate (Minutes to Drop One Inch)	Application Rate (GPD per square foot of ELA)
LESS THAN 10.1	0.8
10.1 to 20.0	0.7
20.1 to 30.0	0.6
30.1 to 45.0	0.5
45.1 to 60.0	0.4

## Nonresidential Buildings with Non-problematic Sewage

The required ELA for a SSDS for a nonresidential building, other than those covered by Table 7, shall be sized on the design flow and application rates listed in Table 8.

**Table 8**

Percolation Rate (Minutes to Drop One Inch)	Application Rate (GPD per square foot of ELA)
LESS THAN 10.1	1.5
10.1 to 20.0	1.2
20.1 to 30.0	0.9
30.1 to 45.0	0.7
45.1 to 60.0	0.6

$$\text{FOR TABLES 7 \& 8: REQUIRED ELA} = \frac{\text{DESIGN FLOW}}{\text{APPLICATION RATE}}$$

## Septic Tank Sizing

**Table 5**

	<b>Single-family</b>	<b>Multi-family</b>
<b>1-3 bedrooms</b>	1,000 gallons	1,250 gallons
<b>For Each Bedroom Beyond 3</b>	Add 125 gallons per bedroom	Add 225 gallons per bedroom

The liquid capacity of a septic tank serving a non-residential building, or a residential institution shall be a minimum of 1,000 gallons or the 24-hour design flow (Section IV), whichever is greater.

Garbage grinders are not recommended for use with SSDSs. Only certain water treatment wastewater (WTW) is authorized to discharge to a SSDS (refer to Section X and Appendix E for WTW discharge requirements). The minimum liquid capacity of a septic tank shall be increased whenever a building contains a garbage grinder, large capacity bathtub, or WTW is discharged to the SSDS in accordance with the following:

Garbage grinder:	Add 250 gallons.
Large bathtub:	Add 250 gallons for 100 to 200 gallon bathtubs. Add 500 gallons for bathtubs over 200 gallons.
WTW:	Add 250 gallons for discharges of 50 to 150 gallons per cycle. Add 500 gallons for discharges greater than 150 gallons per cycle.

## **MINIMUM LEACHING SYSTEM SPREAD (MLSS)**

### **MLSS Formula**

$$\text{MLSS (feet)} = \text{HF} \times \text{FF} \times \text{PF}$$

HYDRAULIC FACTOR (HF) = Factor based on the hydraulic gradient and receiving soil depth.

FLOW FACTOR (FF) = Factor based on the design flow of the building served.

PERCOLATION FACTOR (PF) = Factor based on the percolation rate of the receiving soil.

**HYDRAULIC FACTORS (HF)**

Hydraulic Gradient (% Slope)

	<1.0	1.0-2.0	2.1-3.0	3.1-4.0	4.1-6.0	6.1-8.0	8.1-10.0	10.1-15.0	>15.0
0.1 - 17.9	See Comments in Section VIII A								
18.0 - 22.0	72	62	54	48	42	34	30	28	26
22.1 - 26.0	66	56	48	42	34	30	28	26	24
26.1 - 30.0	56	49	42	34	30	28	26	24	20
30.1 - 36.0	48	42	34	30	28	26	24	20	18
36.1 - 42.0	42	36	30	28	26	24	20	18	16
42.1 - 48.0	36	32	28	26	24	20	18	16	14
48.1 - 60.0	30	28	24	22	20	18	16	14	10
>60.0	MLSS Need Not be Considered								

Receiving  
Soil Depth  
(Inches)

**FLOW FACTORS (FF)**

Flow Factor = Design Flow/300	
<p><b>Residential:</b> The design flow for residential buildings is 150 GPD per bedroom up to three. Beyond three bedrooms, the design flow is 75 GPD per bedroom for single-family residential buildings and 125 GPD per bedroom for multi-family residential buildings.</p> <p>For a central SSDS serving a single-family residential dwelling and a residential outbuilding, the main dwelling shall utilize the FF based on the single-family criteria and the FF shall be increased by 0.50 for each bedroom in the outbuilding.</p>	
<b>Single-family buildings:</b>	<b>FF</b>
1 Bedroom = 150/300	0.5
2 Bedroom = 300/300	1.0
3 Bedroom = 450/300	1.5
4 Bedroom = 525/300	1.75    Increase FF by 0.25 for each additional bedroom
<p><b>Multi-family buildings:</b> Minimum FF is 1.92 (4 bedrooms) and each additional bedroom increases FF by 0.42.</p>	
<b>Non-Residential:</b> Design Flow (GPD) / 300	

**PERCOLATION FACTORS (PF)**

Percolation Rate	Percolation Factor (PF)
Up to 10.0 Minutes/Inch	1.0
10.1 to 20.0 Minutes/Inch	1.25
20.1 to 30.0 Minutes/Inch	1.5
30.1 to 45.0 Minutes/Inch	3.0, or 2.0*
45.1 to 60.0 Minutes/Inch	5.0, or 3.0*

**Table 1**

Separating distances are based on horizontal measurements except for non-vertical closed loop geothermal system bore holes that are from the closest point of the bore hole. Reference to sewage tank in Table 1 includes septic tank, grease interceptor tank, pump chamber, and sewage holding tank.

Item	Separating Distance (Feet)	Special Provisions
A. Water supply well (potable, open loop geothermal, irrigation, spring) with a required withdrawal rate in gallons per minute (GPM): < 10 GPM 10 to 50 GPM > 50 GPM	75 150 200	Distance from a water supply well to a leaching system shall be doubled if the receiving soil percolation rate is faster than 1.0 minute per inch and the bottom of the leaching system is less than 8 feet above ledge rock.
B. Building served	10	See Item G for buildings with groundwater control drains.
C. Open watercourse	50	For lots in existence prior to 8/16/82 that are not on a public water supply watershed, the distance shall be reduced to not less than 25 feet.  In coastal areas, the Coastal Jurisdiction Line shall be considered the open watercourse limit, unless site specific information on high tide elevations on a property establishes the open watercourse limit.
D. Public water supply reservoir	100	
E. Solid piping for the conveyance of surface or groundwater drainage	25	Distance to tight pipe (See Table 3) shall be reduced to 5 feet if the pipe excavation is not backfilled with free draining material (FDM).
F. Storm water structure (e.g., catch basins, manholes)	25	Distance to sewage tank shall be reduced to 10 feet if storm water structure is watertight and constructed with rubber joint seals and watertight pipe connection seals (e.g., ASTM C 923). Storm water structures shall not be designed to collect groundwater (See Item G).
G. Groundwater drain (e.g., curtain, foundation, sumps) Up-gradient or on sides Down-gradient	25 50 <sup>(1)</sup>	No drain shall be constructed near a sewage system for the purpose of collecting partly treated sewage regardless of the distance. 1. Distance to sewage tank shall be reduced to 25 feet if tank is verified to be watertight.
H. Storm water infiltration system (SWIS)  Single-family residential building lots  Other lots (e.g., commercial, multi-family)	50 <sup>(1)</sup>  75 <sup>(2)(3)</sup>	Distance shall be reduced to 25 feet to sewage tank. 1. Distance shall be reduced to 25 feet to a leaching system if MLSS is not applicable or the SWIS is not up-gradient or down-gradient. Distances may be further reduced to 10 feet for minor SWIS (e.g., rain gardens) with the approval from the DOH if demonstrated that the leaching system or sewage tank shall not be adversely impacted. 2. Distance shall be reduced to 50 feet to a leaching system if MLSS is not applicable or the SWIS is not up-gradient or down-gradient, or with the approval from the DOH if demonstrated that the leaching system shall not be adversely impacted. Distances may be further reduced to 25 feet for minor SWIS (e.g., rain gardens) with the approval from the DOH if demonstrated that the leaching system shall not be adversely impacted. 3. The DOH may require increased distances or an engineered assessment on the operation of the leaching system if localized groundwater mounding is a concern.

I. Top of embankment (i.e., fill package around perimeter of leaching system)	10	See Figure 13. Distance does not apply to sewage tank.
J. Property line		Distance to sewage tank and reserve leaching area shall be reduced to 10 feet.
Up-gradient and on sides	15 <sup>(1)</sup>	1. Distance shall be reduced to 10 feet if the top of the leaching system is below original grade, grading rights from affected property owner are secured, or retaining walls are utilized (See Section VIII A for retaining wall provisions).
Down-gradient	25 <sup>(2)</sup>	2. Separating distance between the leaching system and down-gradient property line shall be reduced to 15 feet if MLSS is not applicable or on flat groundwater table lots; further reduction may be allowed as cited in footnote 1 if either condition exists.
K. Water Piping		
Pressure (e.g., potable, irrigation)	10 <sup>(1)</sup>	1. Water line trench excavations less than 25 feet from leaching system shall not be backfilled with FDM.
Water supply suction	75 <sup>(2)</sup>	2. Distance between water suction pipe and sewage tank shall be reduced to 25 feet if tank is verified to be watertight.
L. Below ground swimming pool	25	See Item G for down-gradient pools with groundwater control drains.
M. Above ground swimming pool	10	Includes hot tubs (except on decks).
N. Accessory structure	10	Distance to structure without full-wall, frost protected footings shall be reduced to 5 feet. See Item G if drains provided.
O. Utility service trench (e.g., electric, gas)	5	Utility trench excavations less than 25 feet from leaching system shall not be backfilled with FDM. It is recommended that detectable underground magnetic tracer / warning tape be provided at least 1 foot above buried utility lines within 25 feet of a SSDS. Distance does not apply to electrical and alarm connections to sewage tanks.
P. Buried fuel tanks	25	Distance to sewage tank shall be reduced to 10 feet. Distance to leaching system shall be reduced to 10 feet if not down-gradient of leaching system. See Item G if drains provided.
Q. Water treatment wastewater (WTW) dispersal system		Distance to sewage tank shall be reduced to 10 feet.
Small discharge (<150 GPD)	25 <sup>(1)</sup>	Distance to WTW dispersal system non-discharging settling or filtration structures and solid piping shall be reduced to 10 feet; however solid piping excavations shall not be backfilled with FDM.
Med. discharge (150 – 500 GPD)	50 <sup>(2)</sup>	1. Distance to leaching system shall be reduced to 10 feet if MLSS is not applicable or the WTW dispersal system does not discharge up-gradient or down-gradient of the leaching system.
Large discharge (>500 GPD)	75 <sup>(3)</sup>	2. Distance to leaching system shall be reduced to 25 feet if MLSS is not applicable or the WTW dispersal system does not discharge up-gradient or down-gradient of the leaching system. 3. The DOH may require an increased distance or an engineered assessment on the impacts of localized groundwater mounding in the vicinity of a SSDS.
R. Closed loop geothermal system		
Bore hole, Trench	25	
Geothermal piping to Borehole/Trench	5	Geothermal piping excavations less than 25 feet from leaching system shall not be backfilled with FDM.
S. Grade cuts or soil disturbance down-gradient of leaching system	50	A soil cut within 50 feet down-gradient of a leaching system shall not be allowed if bleed-out from cut is a concern. Distance may be reduced with the approval of the DOH if it is demonstrated the cut/soil disturbance preserves the leaching system's receiving soil (See MLSS Appendix A).