

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

**LEACHING TRENCHES**

Trench Depth (inches)	Trench Width (inches)	Effective Leaching Credit (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

**LEACHING GALLERIES**

Gallery Height (inches)	Effective Leaching Credit (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 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

**ELJEN IN-DRAINS**

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

**MINIMUM SEPTIC TANK CAPACITIES**

<b>(Residential)</b>	<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 250 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.
- 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

**LEACHING SYSTEM SIZING**

**TABLE 6 - RESIDENTIAL BUILDING**

<b>Percolation Rate (Minutes to Drop One Inch)</b>	<b>Square Feet of Required Effective Leaching Area (ELA)</b>			
	<b>2-Bedroom Building</b>	<b>3-Bedroom Building</b>	<b>For Each Bedroom Above 3</b>	
			<b>Single Family</b>	<b>Multi-family</b>
LESS THAN 10.1	375	495	82.5	165
10.1-20.0	500	675	112.5	225
20.1-30.0	565	750	125	250
30.1-45.0	675	900	150	300
45.1-60.0	745	990	165	330

- The required ELA for a multi-family residential building shall be based on a minimum of 4-bedrooms.

**TABLE NO. 7 - RESTAURANTS, RESIDENTIAL INSTITUTIONS, AND  
NONRESIDENTIAL BUILDINGS WITH PROBLEMATIC SEWAGE**

<b>Percolation Rate (Minutes to Drop One Inch)</b>	<b>Application Rate (GPD per square foot of ELA)</b>
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

**TABLE NO. 8 - NONRESIDENTIAL BUILDINGS  
WITH NON-PROBLEMATIC SEWAGE**

<b>Percolation Rate (Minutes to Drop One Inch)</b>	<b>Application Rate (GPD per square foot of ELA)</b>
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

$$\text{REQUIRED EFFECTIVE LEACHING AREA} = \frac{\text{DESIGN FLOW}}{\text{APPLICATION RATE}}$$

**APPENDIX A: MINIMUM LEACHING SYSTEM SPREAD (MLSS)**

Section VIII A includes stipulations for leaching system compliance with MLSS for new and repair SSDSs, and the necessity for new SSDSs to have sufficient naturally occurring soil (a.k.a., natural soil) to disperse effluent from the leaching system. Code-complying areas identified pursuant to PHC Section 19-13-B100a (B100a) are also required to be laid out in an area with sufficient naturally occurring soil to accommodate MLSS compliant leaching systems. Receiving soil utilized for a leaching system repair can consider fill material if sufficient naturally occurring soil is not available.

Separate leaching systems that rely on the same receiving soil for the dispersal of effluent shall be evaluated collectively as a single leaching system. This applies to leaching systems on sloped lots less than 50 feet apart within the same hydraulic window, and leaching systems less than 25 feet apart on radial flow lots. A single leaching system row shall contain leaching units with similar ELA ratings (within 10 percent) or shall be analyzed to ensure no portion of the receiving soil is overloaded, unless MLSS is not applicable.

**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.

**Definitions & Factor Information**

**Hydraulic gradient** means the percent slope of the naturally occurring grade, or when demonstrated, the percent slope of the restrictive layer. The hydraulic gradient on a lot with radial flow over a flat groundwater table shall be confirmed to be level (essentially 0 percent) by evaluating groundwater elevations in the leaching system area and surrounding soil. The hydraulic gradient on a lot that utilizes the slope of the naturally occurring soil as the gradient shall evaluate the naturally occurring grade within and at least 25 feet down-gradient of the leaching system.

**Leaching system spread** means the leaching system length of effluent application to the receiving soil. The leaching system spread for a leaching system that disperses effluent via radial flow over a flat groundwater table shall be measured around the perimeter of the leaching system. The leaching system spread for a leaching system that disperses effluent along a hydraulic gradient shall be measured perpendicular to the hydraulic gradient, and shall take into account converging and diverging contours at least 25 feet down-gradient of the leaching system.

**Restrictive layer** means the first layer beneath the receiving soil that impedes downward movement of effluent. Restrictive layers include ledge rock, maximum groundwater, and impervious soil (percolation rate slower than 60 minutes per inch). The depth to maximum groundwater shall be determined by field verification of redoximorphic features or groundwater monitoring. Standpipe readings used for groundwater monitoring shall utilize the average of at least 5 consecutive weekly readings taken during the most restrictive 30-day period of the wet season.

**Receiving soil** (per Section I) means the soil in the leaching system area and surrounding soil that is available to disperse effluent. Surrounding soil for a leaching system that disperses effluent via radial flow over a flat groundwater table includes the soil within 25 feet around the perimeter of the leaching system. Surrounding soil for a leaching system that disperses effluent along a hydraulic gradient includes the soil within 50 feet down-gradient of a large (2,000 to 7,500 GPD) system, and at least 25 feet down-gradient of a small system.

**Receiving soil depth (RS Depth)** means the average depth of receiving soil (soil in a leaching system area and surrounding soil) measured down to the restrictive layer.

**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**

**Residential:** Design Flow for each bedroom is 150 GPD except for bedrooms beyond 3 in single-family residential buildings, which have a 75 GPD per bedroom design flow.

**Single-family lots:**

**FF**

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

**Multi-family buildings:**

Minimum FF is 2.0 (4 bedrooms) and each additional bedroom increases FF by 0.5.

**Non-Residential:**

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*

\*If leaching system is entirely in select fill and the bottom of system is above existing grade and at least 24 inches above maximum groundwater

**TABLE 1 (Separating Distances – 2 Pages!!)**

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 as long as 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 or sewage tank 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.

CT PHC Technical Standards 2018 (Exam Attachment)

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.
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 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	50	Distance to leaching system shall be reduced to 25 feet as long as geothermal system is not down-gradient of leaching system. Distance to sewage tank shall be reduced to 25 feet.
Geothermal piping to Borehole/Trench	10	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).