

SUBSURFACE SEWAGE PROGRAM
HOMEWORK ASSIGNMENT (PHASE 1)

EXAMPLE #1:

- proposed 3-bedroom single family house
- percolation rate readings are as follows:

Date: 3/15/97 Depth: 30" Presoak: 2 hours-dry

Time (T)	Readings (H)	Readings (decimal)	ΔT (min)	ΔH (inches)	Perc Rate ($\Delta T/\Delta H$) (min/inch)
2:15	3"		----	----	----
2:25	5 1/2"				
2:35	7"				
2:45	8"				
2:55	8 3/4"				
3:05	9 1/2"				
3:15	10 1/4"				

1. Determine the design percolation rate? _____(min/in)
2. How much effective leaching area (ELA) is required? _____(sq ft)
3. How many linear feet of 12-inch high trenches would be required? _____(ft)
4. How many linear feet of 30-inch wide trenches would be required? _____(ft)
5. How many linear feet of 27-inch high galleries would be required? _____(ft)
6. What is the minimum the center-to-center distance required between 12-inch high trenches?
 _____(ft)
7. What is the minimum the center-to-center distance required between 30-inch wide trenches?
 _____(ft)
8. What is the minimum the center-to-center distance required between 27-inch high galleries?
 _____(ft)

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EXAMPLE #2

- proposed 5-bedroom single family house with garbage grinder
- maximum ground water at 38 inches
- ledge found a 60 inches
- slope of the ground in the proposed leaching area = 4.5%
- percolation rate readings are as follows:

Date: 4/27/2012 Depth: 24" Presoak: 2 hours-dry

Time (T)	Readings (H)	Readings (decimal)	ΔT (min)	ΔH (inches)	Perc Rate ($\Delta T/\Delta H$) (min/inch)
3:55	3 1/4"		----	----	----
4:05	4 1/2"				
4:15	5 1/4"				
4:26	5 3/4"				
4:40	6 1/4"				
4:58	6 3/4"				
5:20	7 1/4"				

1. Determine the design percolation rate? _____ (min/in)

2. What is the minimum size septic tank required? _____ (gal)

3. How much effective leaching area (ELA) is required? _____ (sf)

4. How many linear feet of 12-inch galleries would be required? _____ (ft)

5. What is the maximum depth the bottom of the leaching system can be located below the original grade? _____ (inches)

6. Determine the minimum leaching system spread (MLSS) for the system:
 MLSS = HF _____ X FF _____ X PF _____ = _____ (ft)

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EXAMPLE #3

- 15,000 S.F. office/retail building (no food services)
- maximum groundwater at 28 inches; groundwater seepage at 35 inches
- ledge found at 5 feet
- percolation rate is 25 min/inch
- slope in area of leaching system = 7.1%

1. What is the daily design flow? _____(gpd)

2. How much effective leaching area (ELA) is required? _____(sf)

3. What is the maximum depth the bottom of the leaching system can be located below the original grade? _____(inches)

4. Is the leaching system area defined as an area of “Special Concern”? _____(yes/no)
 Explain:_____

5. Does this plan have to be sent to the State Health Department for review/approval?
 _____(yes/no)

6. For each individual leaching system product, determine how many linear feet would be needed to provide the effective leaching area (ELA) as determined in Question #2 above:

Leaching System Product	Effective Leaching Credit (SF/LF)	Linear feet required
30-inch high concrete gallery		
Eljen Mantis 536-8		
Greenleach GLF 21.37		
Geomatrix GST 3718		
Ruck A Fins – R1032C		
24-inch wide stone trench		
Living Filter – LF 3010		

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EXAMPLE #4

- 125 seat restaurant with public restrooms serving lunch and dinner only
- maximum ground water at 28 inches
- ledge found at 54 inches
- slope of ground in proposed area drops 6 feet over a distance of 45 feet
- Perc rate A = 7 min/inch; Perc rate B = 12 min/inch

1. What is the daily design flow? _____(gpd)

2. How much effective leaching area (ELA) is required? _____(sf)

3. What is the minimum size septic tank required? _____(gal)

4. How many grease interceptor tanks (grease traps) are needed and what minimum sizes are required? _____

5. What is the maximum depth the bottom of the leaching system can be located below the original grade? _____(inches)

6. Is the leaching system area defined as an area of "Special Concern"? _____(yes/no)
Explain: _____

7. Does this plan have to be sent to the State Health Department for review/approval?
_____ (yes/no)

8. Determine the minimum leaching system spread (MLSS) for the system:

MLSS = HF _____ X FF _____ X PF _____ = _____ (ft)

9. A plan is submitted proposing the use of 24-inch high concrete galleries with an additional 6 inches of approved stone aggregate placed on top of the concrete galleries. How many linear feet of this design is needed to provide the effective leaching area as determined in Question #2 above? _____(ft)

10. Would a septic system design using leaching pits be appropriate for this site? _____(yes/no)
Explain: _____

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EXAMPLE #5

- retail shopping center (no food services) with a Design Flow of 1,700 GPD
- maximum ground water at 30 inches
- ledge found at 6 feet
- slope in area of leaching area = 9%,
- percolation rate is 6 min/inch

1. How much effective leaching area (ELA) is required? _____(sf)

2. Determine the minimum leaching system spread (MLSS) for the system:

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

3. Based on the site information and sizing requirements, choose a leaching product that you feel would be appropriate for this site and calculate how many linear feet would be needed?

4. Using the product chosen in Question #3 above, draw a sketch (plan view) of a leaching system that provides the ELA and MLSS required, and shows acceptable distribution box locations.