LPP Worksheet

Absorption Area

Step 1 is calculating daily waste flow

_____ Bedrooms at 120 gal/day/bedroom= _____gal/day

Step 2 Determine loading rate (1st page of site evaluation)
_____gal/day/ft^2

Step 3 Total area needed for absorption area=

_____gal/day divided _____(load rate)= _____total ft^2 needed in absorption area

Step 4 Determine total feet of lateral lines. Spacing between trenches is 5' minimum to prevent overloading. Divide total ft^2 by 5 to get total feet of lateral lines.

_____ft^2 divided by 5'=_____linear feet of lateral lines

***Remember..... lines *cannot* exceed 70 ft!**

Number of lines _____

Septic and Pumping Tanks

Septic tank size_____

Pump tank size _____ (must be at least 2x the total gal/day)

Dosing Rate

Use Constants

5/32" hole diameter
5' hole spacing
3' head pressure

Step 1 Calculate the number of holes
Each line is _____ ft divided by 5' spacing =_____ holes per line
_____ holes x _____ lines = _____ total number of holes

Step 2 Flow rate is measured in gal/min
Flow rate per hole—Use Table 3 for flow rates
At 3' pressure head + 5/32" holes= .50gal/min
.50GPM x _____total holes=_____gal/min

Pump Selection

Use table 5 to determine the pump size needed _____

Total Dynamic Head (TDH)

Static Head + Operating Head + Friction Head = TDH

Static head = vertical distance from pump turnoff level to the point of discharge.
Operating head (pressure head)= 3 ft (this is a constant)
Fiction head = Resistance to flow from fittings (measured length and loss from fittings) Use table 6.

1. Static head = _____ft
2. Operating head = 3ft
3. Friction head = _____ measured length + _____ loss from fittings = total friction head
   Divide total friction head by 100 (_____divided by 100) = _____per 100ft
   This gives you feet in 100' increments
   Using table 5 multiple your friction head per 100ft increments by the figure in table 5 at _____gal/min in **2"** pipe
   _____ x _____= _____total friction head

Then add your static head _____+ operating head_____+ fiction head _____= _____TDH

Make sure you use the right pump curve that goes with your individual pump
Compare the TDH in feet by the total gallon/min to get correct pump size

Dosing Volume
Use table 4 to find storage capacity.

Volume dose= volume supply line + 5(volume lateral lines)

1. Supply line = _____ft for 2" pipe
   Volume supply = (Length of the supply line divided by 100ft) x 16.2 gal (table 4)
   = _____gallons
2. Lateral lines =_____ft total of 1 ½ " pipeline
   Volume laterals = (_____ft divided by 100ft) x _____gallons (table 4)
   =_____gallons
3. Volume dosing =volume of laterals ____ x 5=- _____gallons + volume of supply _____

Dosing Depth
Dosing depth = (volume dosed divided by volume tank) x liquid depth of tank in inches
(_____) divided by (_____) x (_____)= _____inches
The float control switch for the pump should be set for a _____inch draw down to provide automatic doses of _____gallons.
Check Valve Calculation
Use check valve only when total storage volume is greater than ¼ of the total daily waste flow.
Volume storage= Volume supply line + volume lateral lines
(_____) + (_____) =GPD _____GPD x .25 = +_____

Table 3

FLOW RATES
(GPM)

Pressure Head Ft	Psi	Hole Diameter (inches) 5/32	3/16	7/32	1/4
1	0.43	0.29	0.42	0.56	0.74
1.5		0.35			
2	0.87	0.41	0.59	0.80	1.04
2.5		0.45			
3	1.30	0.50	0.72	0.98	1.28
3.5		0.54			
4	1.73	0.58	0.83	1.13	1.48
4.5		0.61			
5	2.16	0.64	0.94	1.26	1.65
5.5		0.66			
6	2.58	0.69	1.04	1.37	1.81

Table 4

Storage capacity per 100 ft of PVC pipe

Pipe Diameter (inch)	Storage Capacity 60 PSI gal/100 feet	Storage Capacity Schedule 40 gal/100 feet
1	5.8	4.1
1 ¼	9.0	6.4
1 ½ lateral	12.5	9.2
2 supply	19.4	16.2
3	42.0	36.7

Table 5

Friction loss per 100 feet of plastic pipe

Flow Rate GPM	Pipe size (inches)						
	1"	1 ¼"	1 ½"	2"	2 ½"	3"	4"
2	0.3						
3	0.6						
4	1.0	0.3					
5	1.5	0.4	0.2				
6	2.1	0.6	0.3				
7	2.9	0.8	0.4				
8	3.6	1.0	0.5				
9	4.6	1.2	0.6				
10	5.5	1.5	0.7	0.2			
12		2.1	1.1	0.3			
14		2.7	1.3	0.4			
16		3.5	1.7	0.5	0.2		
18		4.4	2.1	0.6	0.3		
20		5.2	2.5	0.9	0.3		
21				0.975			
25			3.8	1.3	0.5		
30			5.2	1.8	0.6		
35				2.5	0.8		
40				3.1	1.0	0.4	
45				3.8	1.3	0.6	
50				4.7	1.6	0.7	
60					2.2	0.9	0.2
70					2.9	1.2	0.3
80					3.7	1.5	0.4
90					4.6	1.9	0.5
100						2.3	0.6

Table 6

Friction losses through plastic fittings

In terms of equivalent lengths of plastic pipe

Type Of Fitting	1 ¼"	1 ½"	2"	2 ½"	3"	4"
90° STD Elbow	7.0	8.0	9.0	10.0	12.0	14.0
45° Elbow	3.0	3.0	4.0	4.0	6.0	8.0
STD. Tee (Diversion)	7.0	9.0	11.0	14.0	17.0	22.0
Check Valve	11.0	13.0	17.0	21.0	26.0	33.0
Coupling or Quick Disconnect	1.0	1.0	2.0	3.0	4.0	5.0
Ball Valve	0.9	1.1	1.4	1.7	2.0	2.3