

**PRESSURE DISTRIBUTION COMPONENT MANUAL FOR  
ONSITE WASTEWATER TREATMENT SYSTEMS**

**Low Pressure Pipe**

**RENO COUNTY, KANSAS  
ENVIRONMENTAL HEALTH DEPARTMENT  
December 2017**

## INTRODUCTION AND SPECIFICATIONS

This Onsite Wastewater System (OWS) component manual provides design, construction, inspection, operation, and maintenance specifications for a pressure distribution component. However, these items must accompany a properly prepared and reviewed plan acceptable to the Environmental Health Section to help provide a system that can be installed and function properly. The design provides equal distribution of effluent from a pump tank into a distribution cell of a soil treatment or dispersal component. To ensure that equal distribution is achieved, specifications in Tables 1, 2, and 3 must be met.

**Note:** Detailed plans and specifications must be developed and submitted for review and approval by the Environmental Health Section.

**Table 1  
FLOWS AND LOADS**

Design Wastewater Flow (DWF) for a single family residence.	150 Gallons per day per bedroom.
Number of effluent doses	Must conform to the requirements of the receiving component design.
Wastewater particle size	$\leq 1/8$ inch diameter
Volume of a single dose to a distribution cell	$\geq 5$ times the void volume of the distribution lateral(s) and = 20% of the Design Wastewater Flow
Head pressure at distal end of lateral(s)	$\geq 2.5$ ft. for $1/4$ and $3/16$ inch orifices, $\geq 3.5$ ft. for $5/32$ inch orifices, and $\geq 5$ ft. for $1/8$ inch orifices
Network pressure compensation for fittings	= Distal head pressure x 30 percent
Flow velocity in force main and manifold	$\geq 2$ ft/sec and $\leq 10$ ft/sec

**Table 2  
SIZE AND ORIENTATION**

Diameter of force main	$\leq 6$ inch
Diameter of manifold	$\geq 1-1/4$ inch, but not $> 3$ inch
Diameter of lateral	$\geq 3/4$ inch, but not $> 3$ inch
Diameter of discharge orifice	= $1/8$ , $5/32$ , $3/16$ or $1/4$ inch
Distance between laterals	$\leq 4$ feet within same cell
Distance from lateral to edge of distribution cell	$\leq 1/2$ the distance between laterals, but not $> 2$ feet
Distance from discharge orifice to end of distribution cell	$\geq 6$ inches, but not $> 2$ feet
Elevation of laterals	Level or $\leq 1$ inch slope back to manifold

<b>Table 2 Size and Orientation (continued)</b>	
Orifice Orientation	At least one at the beginning and one at the end of lateral.
Orifice Shields	Must be used on each orifice.

**Table 3  
OTHER SPECIFICATIONS**

Connection to manifold or laterals	By use of tee patterned fitting or 90 degree elbow
Turn ups	Provide a means of flushing out all laterals. Turn-ups are installed in a protective enclosure
Pump	Rated by pump manufacturer as an effluent or sewage pump
Piping material	≥ 200 psi pressure rated
Compartment volume employing one pump Pump Chamber	<p>≥ Volume of a single dose + reserve capacity* + drain back volume** + (6 inches x average gal/inch of tank).***</p> <p><b>Minimum Volume Required; Larger pump chamber=more storage</b></p> <p>* equals the estimated daily flow.</p> <p>** greater than or equal to the volume of wastewater that will drain into the dose tank from the distribution cell.</p> <p>*** four inches of this dimension ≥ vertical distance from pump intake to bottom of tank. Two inches of this dimension ≥ vertical distance between pump on elevation and high water alarm activation elevation.</p>
Electrical Panel	Meet requirements of 1999 NEC electrical Code; pump & electrical panel must be visible from pump chamber
Access to pump	Means of removing pump while maintaining compliance with confined space entry requirements must be provided
Alarm or warning system	Provide an audible and visual alarm

### **DESCRIPTION AND PRINCIPLE OF OPERATION**

Pressure distribution is a method to provide a specific volume of effluent to a specific area with each dosing cycle. The design of a pressure distribution component on one elevation is such that the volume of water passing out each hole in the network is approximately equal. This is achieved by designing for 75 to 85 percent of the total head loss in the network to be lost when liquid passes through the distribution hole and only 10 to 15 percent of the total head loss to occur in the delivery piping.

The component consists of a dosing chamber (containing a pump or siphon with appropriate controls) that discharges effluent into a network of small diameter perforated pipes designed to discharge equal amounts of effluent from each orifice.

In a pressure distribution component using a pump, partially or fully treated wastewater enters a pump chamber through the inlet. As liquid begins to fill the dose chamber, it raises the “off” float. When the liquid level in the tank is lifted to the “pump on” level, the “on” float activates the pump and the predetermined dose is pumped from the pump chamber through the force main to the distribution network. The “on” and “off” float may be one float.

The laterals are designed to fill quickly to provide equalization throughout the system. Air is pushed ahead of the liquid through the force main, manifold (if a manifold is required), laterals, and discharged through the drilled holes, entering the distribution cell.

A properly designed and installed pressure distribution component uniformly distributes effluent over the entire distribution cell. This strives to prevent the soil from becoming overloaded in one area. It also allows for a period of time between doses to drain the infiltrative surface to maintain unsaturated flow conditions in the soil.

Will allow 2’ reduction to limited layer/condition vertically with aerobic treatment.  
Pump tank capacity, annual maintenance required

The primary application of a pressure distribution component is in locations where it is desirable to:

1. Maintain a uniform effluent application rate throughout the distribution cell;
2. Aid in mitigating the potential contamination of groundwater in areas of excessively permeable soils;
3. Improve the performance and increase the life span of a dispersal cell; and
4. Reduce the chance of breakout or seepage on slopes.
5. Reduce any biomat build up
6. Provider for more aeration and oxygen in the trenches

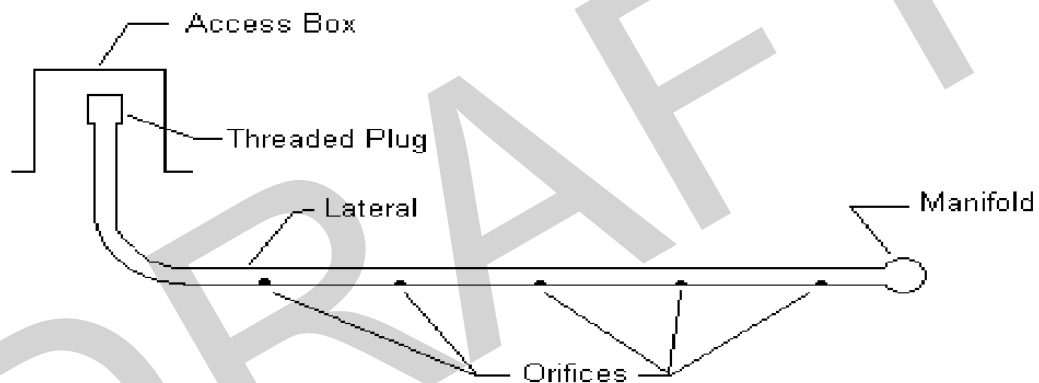
Pressure distribution components are used in at-grades, in-ground soil absorption, mounds, single pass sand filters and other components. Also pressure distribution may be appropriate for larger dispersal cell components.

This manual specifies the design, construction, inspection, operation, and maintenance criteria for one method of providing equal distribution of wastewater in a soil treatment and/or dispersal component. The designer must also be familiar with the requirements of the component for which the pressure distribution component will be used in order to have a complete system design.

## DESIGN

The following steps need to be followed to design a pressure distribution component:

1. Determine soil treatment and/or dispersal component layout - This is based on the type of component and the design soil application rate.
2. Determine lateral length and spacing in accordance with the soil treatment/dispersal component design or Table 2, if not specified in the soil treatment/dispersal component design. See Figure 1.

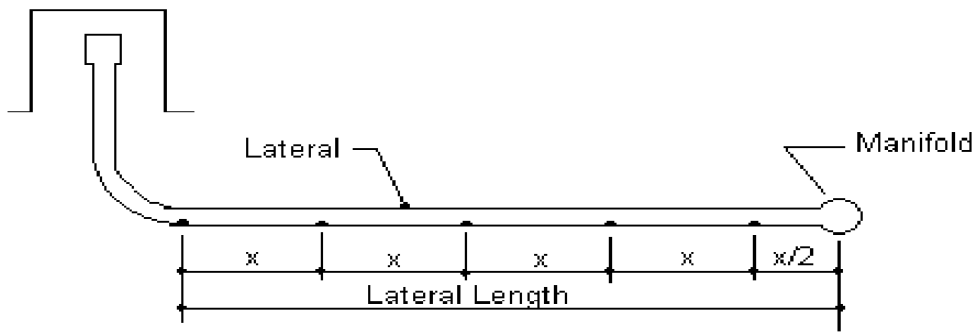


**Figure 1 – Lateral Length**

3. Determine manifold length and location.
4. Determine number of orifices in a lateral. How many orifices should be drilled in a lateral depends on the type of system, area allowed per orifice, and the design loading rate of the distribution cell. The number of orifices is determined by using the following equation. See Figure 2.

$$n = L/x + .5$$

Where: n = number of orifices  
L = lateral length  
x = orifice spacing

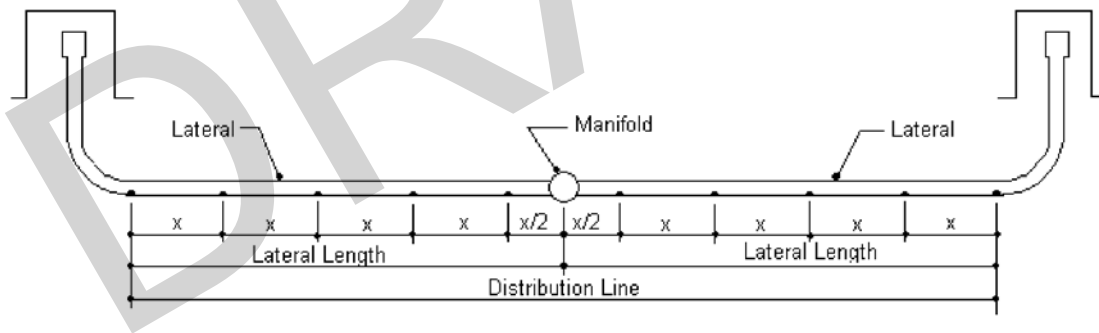


**Figure 2 – Number of Orifices in a Lateral**

- Determine the number of orifices in a distribution lateral. The number of orifices is determined by using the following equation. See figure 3.

$$n = d/x + 1$$

Where:  $n$  = number of orifices  
 $d$  = distribution lateral length  
 $x$  = orifice spacing



**Figure 3 – Number of Orifices in a Distribution Line**

- Select orifice size of 1/8, 5/32, 3/16, or 1/4 inch.
- Determine lateral diameter - Using Graphs 1 through 8.
- Select distal pressure – A design option based on site specific elevations and effluent delivery preferences and requirements of Tables 1 through 3.

9. Calculate lateral discharge rate using Table 4. (orifice discharge rate at selected distal pressure multiplied by the number of holes per lateral).
10. Determine manifold diameter - Determined by using Table 5.
11. Calculate component discharge rate - By multiplying the lateral discharge rate by the number of laterals.
12. Select a pipe size for the force main by using the calculated discharge rate and Table 6.
13. Determine the void volume of the distribution laterals by multiplying the summation of the laterals by the volume given in Table 7 for the diameter of the laterals.

If a pump is selected follow step #14.

14. Determine volume of dose chamber for components pressurized by a pump.

The dose chamber employing one pump shall contain sufficient volume to dose the distribution cell as required by its system design, retain drain back volume, contain a one day reserve zone, provide minimum 2 inch separation between alarm activation and pump-on activation, and allow for protection of the pump from solids.

The reserve volume is at least equal to the estimated daily flow from the building. Reserve capacity may be calculated based using 100 gallons per bedroom per day for one and two family residences. Reserve capacity must also meet requirements in the manual for a component type, which contains the pressure distribution component.

The dose volume shall be included in the sizing of the dose chamber.

The pump alarm activation point must be at least 2 inches above the pump activation point.

Allow “dead” space below the pump intake to permit settling of solids in the pump tank. This can be accomplished by placing the pump on concrete blocks or other material that can form a pedestal.

The pump manufacturer requirements shall be followed. This may include the “pump off” switch located high enough to allow for complete immersion of the pump in the tank.

15. Select a pump that will provide an average flow equal to or greater than the total discharge rate of the orifices at a pressure equal to or greater than the sum of the distal pressure, network pressure compensation, and pressure loss due to friction

in the force main. The system head will be insufficient if the perforation discharge rate is greater than the pump discharge rate.

## **SITE PREPARATION AND CONSTRUCTION**

Procedures used in the construction of a pressure distribution component are just as critical as the design of the treatment and/or dispersal component. A good design with poor construction results in failure. Construction procedures for a pressure distribution component are as follows:

1. Review design and installation requirements for the type of treatment and/or dispersal component for which the pressurized system is to be installed.
2. Drill holes for the orifices at the locations required by the design. Remember it is very important to use a sharp drill bit and to remove all burrs from the pipe and orifices in order for the system to work as designed.
3. Assemble the distribution network as determined by the pressure distribution component design, making sure to solvent cement all joints in the system.
4. Extend the end of each lateral up with the use of long turn or 45 degree fitting to a point within six inches of the final grade. Terminate the ends of the laterals with a valve. Provide access from final grade for the valve.
5. 5. Install the pump as required by manufacturer's specifications

## **OPERATION, MAINTENANCE AND PERFORMANCE MONITORING**

- A. The component owner is responsible for the operation and maintenance of the component. The Environmental Health Department or OWS service contractor may make periodic inspections of the components, checking for sludge accumulation in the dose chamber, condition of electrical components, alarms, dose rate, dose volume and frequency, etc.
- B. Other routine and preventative maintenance aspects are:
  1. Dose chambers are to be inspected routinely and maintained when necessary.
  2. Inspection of the component performance is recommended at least every three years. Inspection includes checking the dose rate, volume and frequency.
  3. Partial plugging of the distribution network may be detected by extremely long dosing times. The ends of the distribution laterals should be exposed and the pump activated to flush out any solid material. The liquid that is flushed out of the laterals is to be directed back into the distribution cell. The

liquid may also be directed into an acceptable container and disposed of properly. If necessary, the laterals can be cleaned.

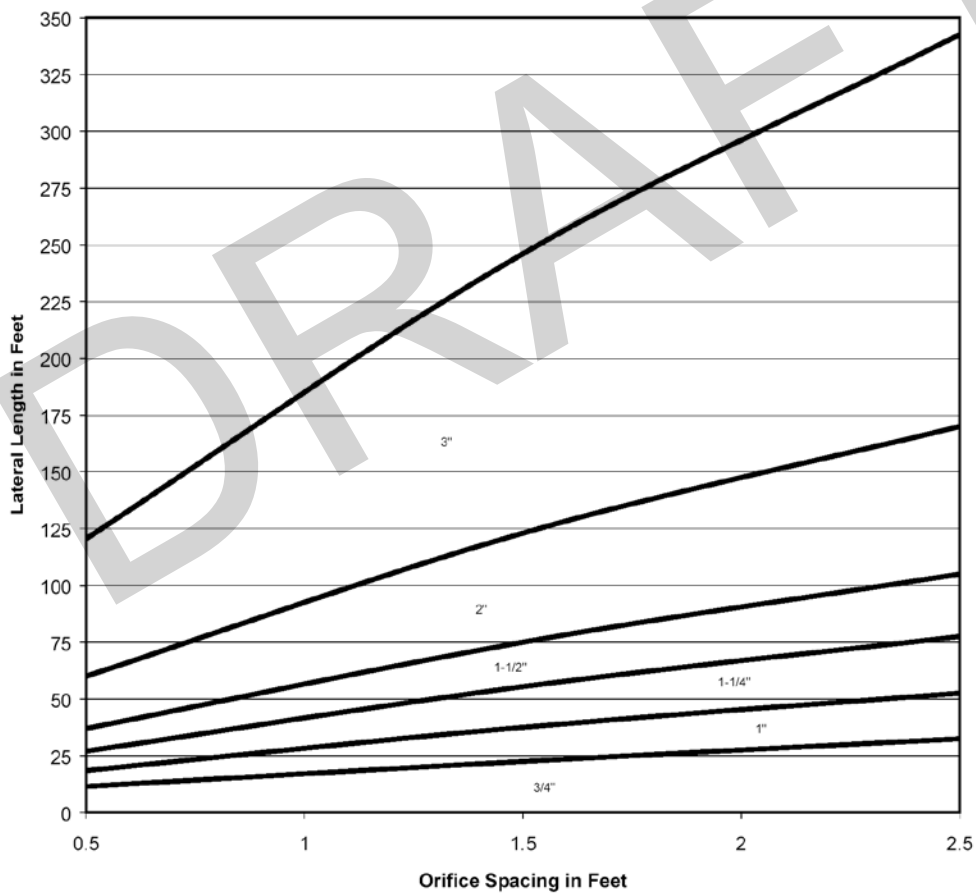
C. Performance monitoring must be performed on pressure distribution systems installed under this manual.

1. The frequency of monitoring should be:

- a. At least once annually following installation and, b. At time of problem, complaint, or failure.

**Graph 1**

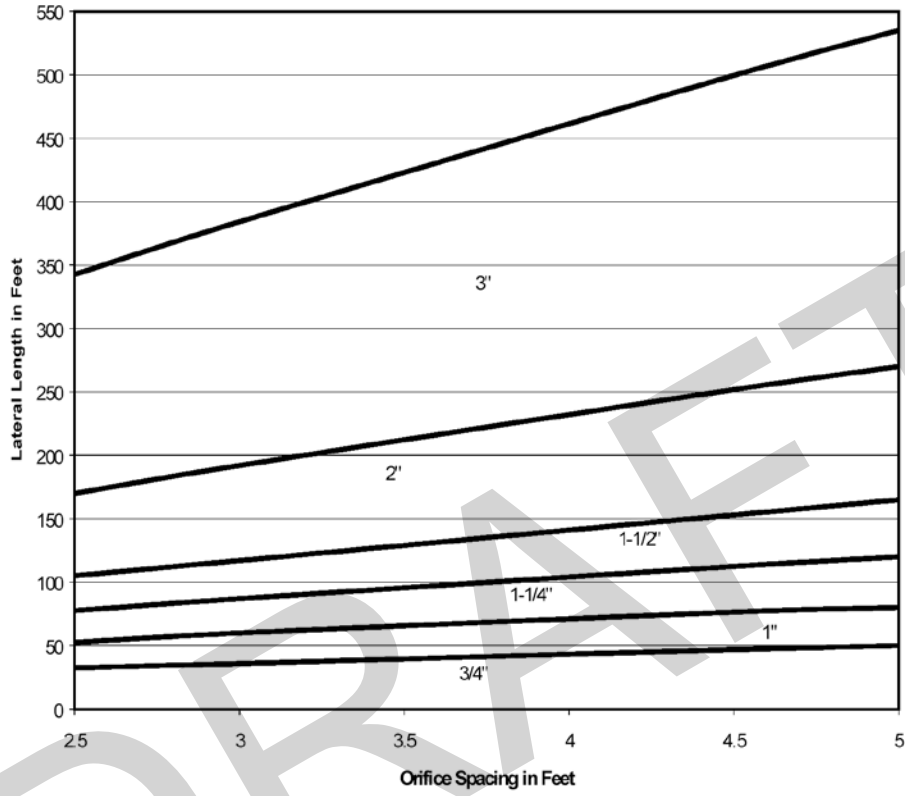
**Minimum Lateral Diameters Based on Orifice Spacing for 1/8" Diameter Orifices**



## Graph 2

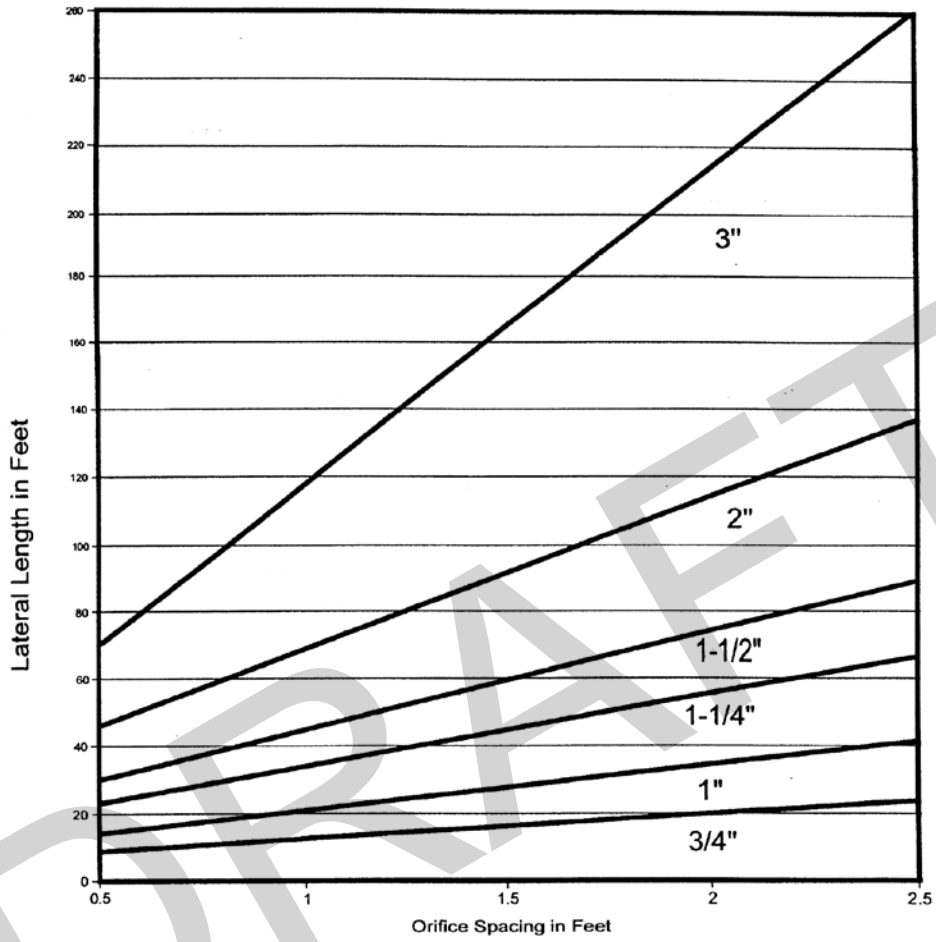
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Minimum Lateral Diameters Based on Orifice Spacing for 1/8" Diameter Orifices

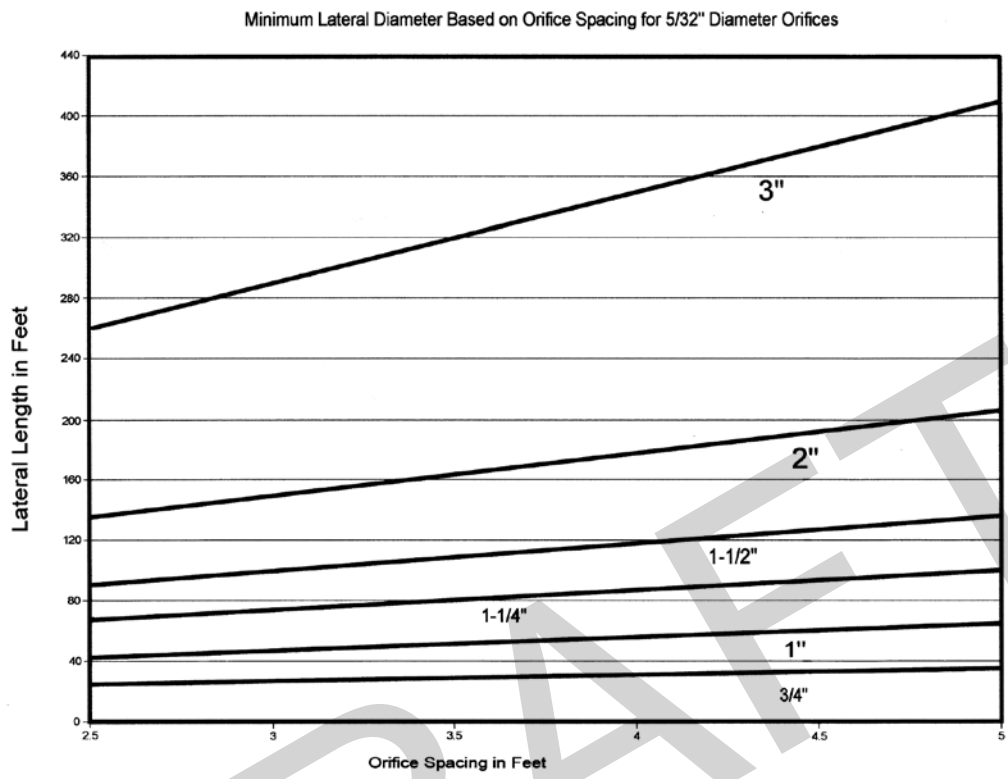


Graph 3

Minimum Lateral Diameter Based on Orifice Spacing for 5/32" Diameter Orifices

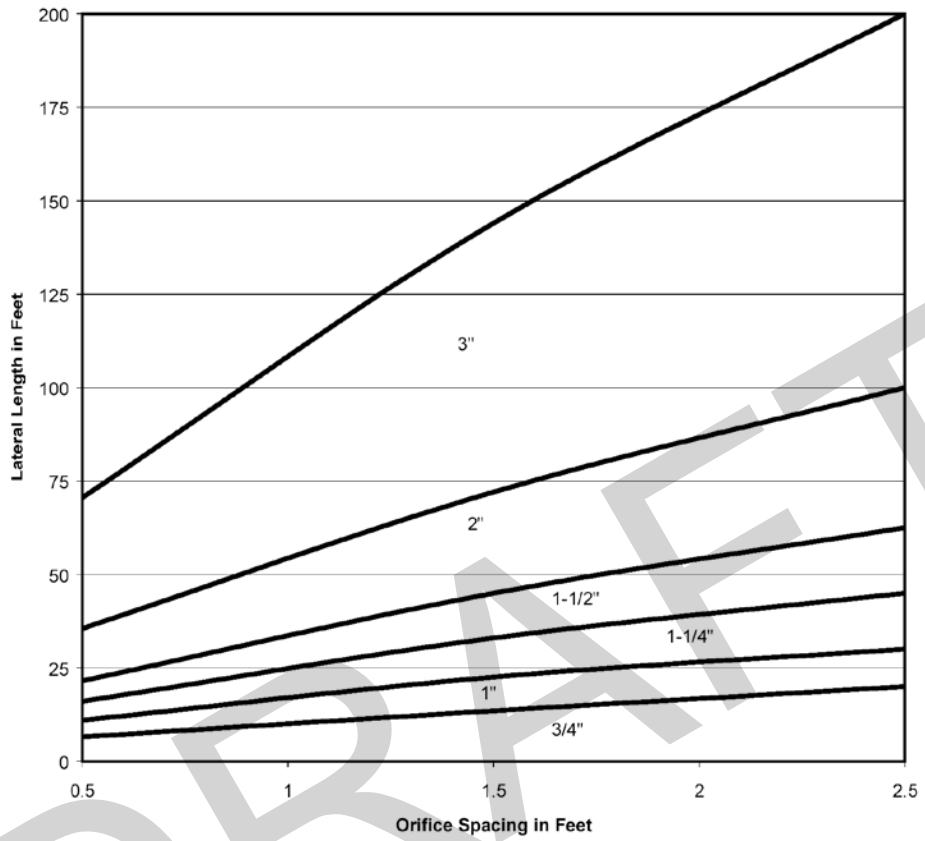


Graph 4



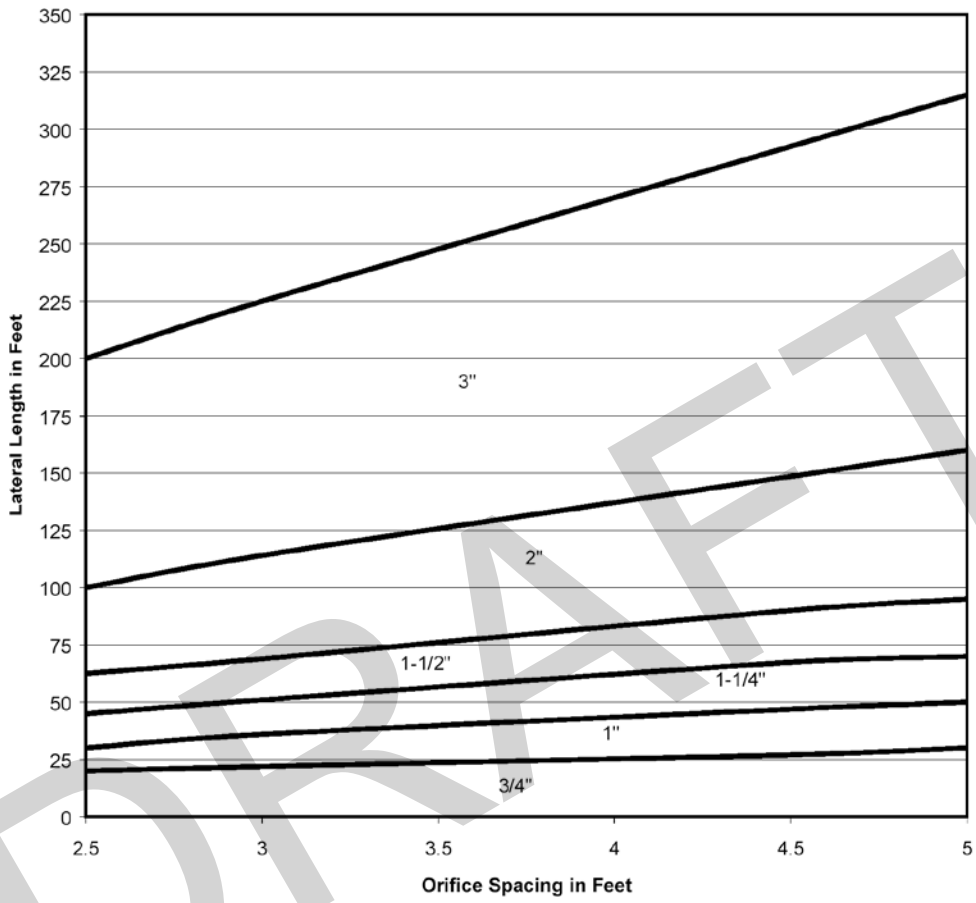
### Graph 5

Minimum Lateral Diameter Based on Orifice Spacing for 3/16" Diameter Orifices



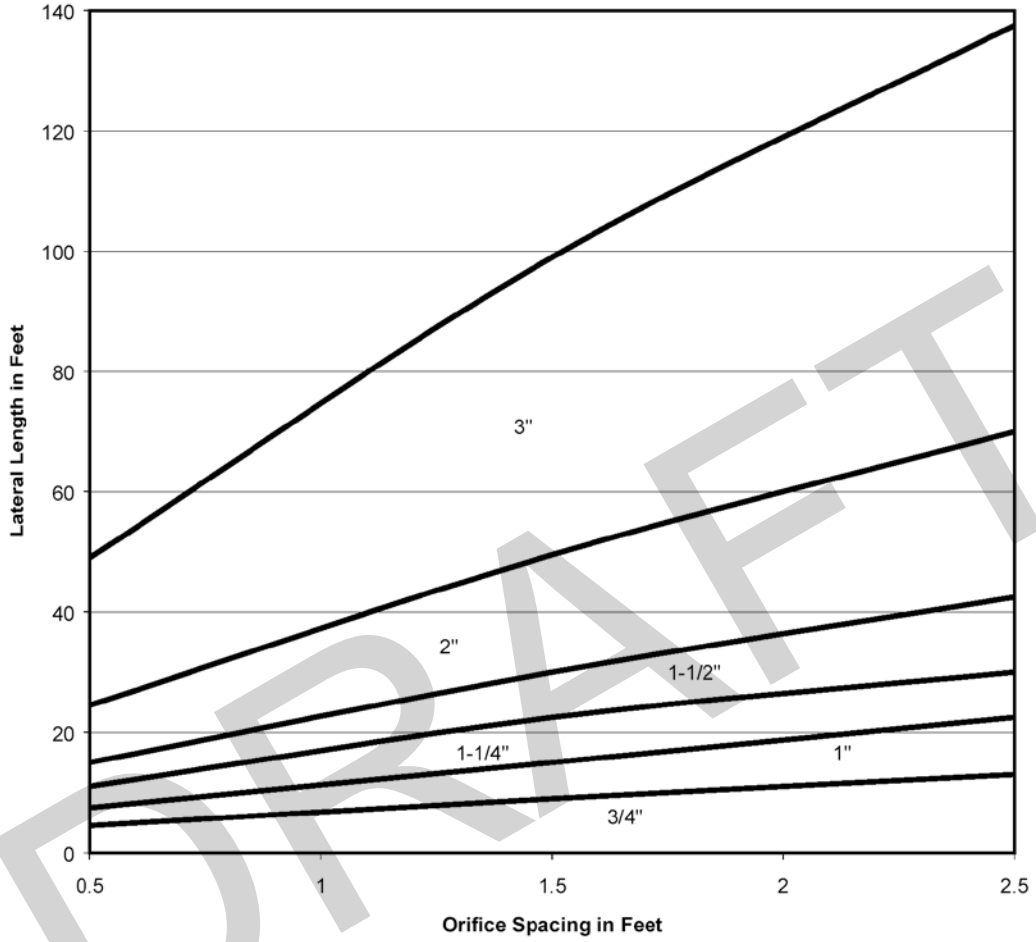
**Graph 6**

**Minimum Lateral Diameter Based on Orifice Spacing for 3/16" Diameter Orifices**



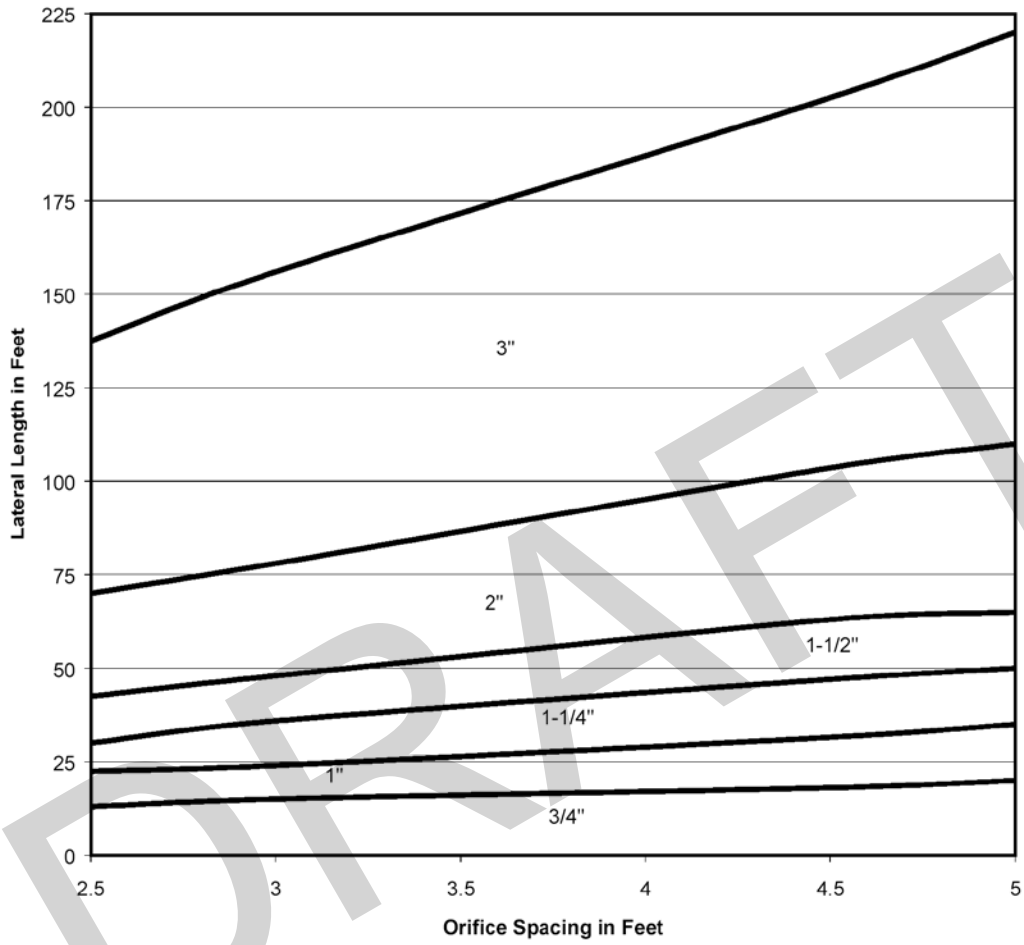
# Graph 7

Minimum Lateral Diameter Based on Orifice Spacing for 1/4" Diameter Orifices



### Graph 8

Minimum Lateral Diameter Based on Orifice Spacing for 1/4" Diameter Orifices



VIII. TABLES

<b>Table 4</b> Discharge Rates in Gallons per Minute from Orifices <sup>a</sup>				
Pressure in feet	Orifice Diameter			
	1/8	5/32	3/16	1/4
2.5	NP	NP	0.66	1.17
3	NP	NP	0.72	1.28
3.5	NP	0.54	0.78	1.38
4	NP	0.58	0.83	1.47
4.5	NP	0.61	0.88	1.56
5	0.41	0.64	0.93	1.65
5.5	0.43	0.68	0.97	1.73
6	0.45	0.71	1.02	1.80
6.5	0.47	0.73	1.06	1.88
7	0.49	0.76	1.10	1.95
7.5	0.50	0.79	1.14	2.02
8	0.52	0.81	1.17	2.08
8.5	0.54	0.84	1.21	2.15
9	0.55	0.86	1.24	2.21
9.5	0.57	0.89	1.28	2.27
10	0.58	0.91	1.31	2.33

Note a: Table is based on - Discharge in GPM = 11.79 x Orifice Diameter<sup>2</sup> in inches x (Pressure in Feet)<sup>1/2</sup>  
 NP means not permitted

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**Table 5**  
Maximum Manifold Length Based on Individual Lateral Flow Rates and Lateral Spacing

Individual Lateral Discharge Rate		1-1/2" Diameter Manifold											
		Lateral Spacing				Lateral Spacing				Lateral Spacing			
End Manifold	Center Manifold	1.5	2	2.5	3	3.5	4	1.5	2	2.5	3	3.5	4
10	5	4.5	6	7.5	9	10.5	8	7.5	8	10	12	14	12
20	10	3	4	5	6	7	8	4.5	6	7.5	6	7	8
30	15	3	4					3	4	5	6	7	8
40	20							3	4	5	6		
50	25							3	4				
60	30							3	4				
Individual Lateral Discharge Rate		2" Diameter Manifold											
End Manifold	Center Manifold	1.5	2	2.5	3	3.5	4	1.5	2	2.5	3	3.5	4
10	5	12	14	15	18	21	20	22.5	28	32.5	36	38.5	44
20	10	7.5	8	10	12	14	12	15	18	20	24	24.5	28
30	15	6	6	7.5	9	10.5	12	12	14	15	18	21	20
40	20	4.5	6	7.5	6	7	8	9	12	12.5	15	17.5	16
50	25	4.5	4	5	6	7	8	7.5	10	12.5	12	14	16
60	30	3	4	5	6	7	8	7.5	8	10	12	14	12
70	35	3	4	5	6	7	8	6	8	10	9	10.5	12
80	40	3	4	5	6	7		6	8	7.5	9	10.5	12
90	45	3	4	5	6			4.5	6	7.5	9	10.5	12
100	50	3	4	5				4.5	6	7.5	9	10.5	12
110	55	3	4					4.5	6	7.5	9	10.5	8
120	60	3						4.5	6	7.5	6	7	8
130	65	3						4.5	6	5	6	7	8
140	70							4.5	6	5	6	7	8
150	75							4.5	6	5	6	7	8
160	80							4.5	4	5	6	7	8
170	85							4.5	4	5	6	7	8
180	90							3	4	5	6	7	8
190	95							3	4	5	6	7	8
200	100							3	4	5	6	7	8

**Table 6 FRICTION LOSS (FOOT/100 FEET) IN PLASTIC PIPE**

Flow in GPM	Nominal Pipe Size							
	3/4	1	1-1/4	1-1/2	2	3	4	6
1	0.42	0.10	0.04	0.01	0.00	0.00	0.00	0.00
2	1.53	0.38	0.13	0.05	0.01	0.00	0.00	0.00
3	3.24	0.80	0.27	0.11	0.03	0.00	0.00	0.00
4	5.52	1.36	0.46	0.19	0.05	0.01	0.00	0.00
5	8.34	2.06	0.69	0.29	0.07	0.01	0.00	0.00
6	11.68	2.88	0.97	0.40	0.10	0.01	0.00	0.00
7	15.53	3.83	1.29	0.53	0.13	0.02	0.00	0.00
8	19.89	4.91	1.66	0.68	0.17	0.02	0.01	0.00
9	24.73	6.10	2.06	0.85	0.21	0.03	0.01	0.00
10	30.05	7.41	2.50	1.03	0.25	0.04	0.01	0.00
11	35.84	8.84	2.99	1.23	0.30	0.04	0.01	0.00
12	42.10	10.39	3.51	1.44	0.36	0.05	0.01	0.00
13	48.82	12.04	4.07	1.67	0.41	0.06	0.01	0.00
14	56.00	13.81	4.66	1.92	0.47	0.07	0.02	0.00
15	63.62	15.69	5.30	2.18	0.54	0.07	0.02	0.00
16	71.69	17.68	5.97	2.46	0.61	0.08	0.02	0.00
17	80.20	19.78	6.68	2.75	0.68	0.09	0.02	0.00
18	89.14	21.99	7.42	3.06	0.75	0.10	0.03	0.00
19	98.52	24.30	8.21	3.38	0.83	0.12	0.03	0.00
20	108.33	26.72	9.02	3.72	0.92	0.13	0.03	0.00
25	163.69	40.38	13.63	5.62	1.39	0.19	0.05	0.01
30	229.36	56.57	19.10	7.87	1.94	0.27	0.07	0.01
35	305.05	75.24	25.41	10.46	2.58	0.36	0.09	0.01
40	390.53	96.33	32.53	13.40	3.30	0.46	0.11	0.02
45	485.60	119.78	40.45	16.66	4.11	0.57	0.14	0.02
50	590.11	145.56	49.15	20.24	4.99	0.69	0.17	0.02
60	826.84	203.95	68.87	28.36	7.00	0.97	0.24	0.03
70	1099.69	271.26	91.59	37.72	9.31	1.29	0.32	0.04
80	1407.85	347.27	117.26	48.29	11.91	1.66	0.41	0.06
90	1750.60	431.82	145.81	60.05	14.81	2.06	0.51	0.07
100	2127.35	524.75	177.19	72.98	18.00	2.50	0.62	0.09
125	3214.57	792.93	267.74	110.27	27.20	3.78	0.93	0.13
150	4504.10	1111.01	375.15	154.51	38.11	5.30	1.31	0.18
175	5990.45	1477.65	498.95	205.49	50.69	7.05	1.74	0.24
200	7669.11	1891.71	638.76	263.08	64.89	9.02	2.23	0.31
250	11588.53	2858.50	965.21	397.53	98.06	13.64	3.36	0.47
300	16237.29	4005.20	1352.41	557.00	137.39	19.11	4.71	0.66
350	21595.60	5326.92	1798.71	740.80	182.73	25.41	6.27	0.87

Table is based on Hazen-Williams Formula:

$$h = 0.002082L \times (100/C)^{1.85} \times (\text{gpm}^{1.85} / d^{4.8655})$$

Where: h = feet of head

L = length in feet

C = Friction factor from Hazen-Williams (145 for plastic pipe)

gpm = gallons per minute

d = Nominal pipe size

\* Velocities exceeding 10 feet per second are too great for various flow rates and pipe diameter.

\*\*The grey areas on the left side of Table 6 are velocities that exceed 10 feet per second and the grey areas on the right side of the table are velocities that are below 2 feet per second.

**Table 7**  
**VOID VOLUME FOR VARIOUS DIAMETER PIPES**  
**BASED ON NOMINAL I.D. (a)**

Nominal Pipe Size	Gallons per Foot
3/4	0.023
1	0.041
1-1/4	0.064
1-1/2	0.092
2	0.163
3	0.367
4	0.65
6	1.469

Note a: Table is based on  $-\pi(d/2)^2 \times 12''/\text{ft} \times 231 \text{ cu.in./cu.ft.}$   
 Where: d = nominal pipe size in inches

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X. PRESSURE DISTRIBUTION WORKSHEET

**Information needed for Pressure Distribution Design:**

Daily wastewater flow = \_\_\_\_\_ gal/day

Design loading rate = \_\_\_\_\_ gal/ft<sup>2</sup>/day

**System Configuration:**

1. \_\_\_\_\_ ft. system width

2. \_\_\_\_\_ ft. system length

**Proposed Lateral Layout:**

3. \_\_\_\_\_ number of laterals

4. \_\_\_\_\_ central or end manifold

5. \_\_\_\_\_ ft. manifold length

6. \_\_\_\_\_ ft. distal pressure requirement (Based on orifice diameter, see Table 1)

7. \_\_\_\_\_ in. orifice diameter

8. \_\_\_\_\_ ft. estimated lateral length

**Choose the Orifice Spacing:**

9. \_\_\_\_\_ ft. orifice spacing divided by 12 to convert to feet.

10. \_\_\_\_\_ number of orifices per lateral

$$n = L/x + .5$$

Where: n = number of orifices

L = lateral length, in feet

x = orifice spacing, in feet

Note: Networks with central manifold have laterals on each side of the manifold. Therefore the number of laterals are two times as many as a network with an end manifold.

**Re-evaluate the Lateral Length:**

11. \_\_\_\_\_ **ft.** final lateral length  
(# of orifices x orifice spacing - 1/2 orifice spacing = optimal length)

**Choose the Lateral Diameter:**

12. \_\_\_\_\_ **in.** (Graphs 1-8)

**Calculate the Lateral Discharge Rate:**

13. \_\_\_\_\_ **gpm** lateral discharge rate.  
Discharge rate per orifice x # of orifices per lateral = lateral discharge rate.

**Choose the Manifold Diameter:**

14. \_\_\_\_\_ **in.** (Table 5 )

**Calculate the System Discharge Rate:**

15. \_\_\_\_\_ **gpm** (# of laterals x lateral discharge rate)

**Calculate the Force Main Friction Loss (for each segment of different diameter or between tees in the force main):**

16. \_\_\_\_\_ **ft.** force main length  
17. \_\_\_\_\_ **in.** force main diameter (Table 6)  
18. \_\_\_\_\_ **gpm** system discharge rate (from #15)  
19. \_\_\_\_\_ **ft.** friction loss in ft/100 ft. x length ÷ 100 ft. (Table 6)

**Calculate the Total Dynamic Head:**

20. \_\_\_\_\_ **ft.** distal pressure #6  
21. \_\_\_\_\_ **ft.** network pressure compensation [losses due to fittings, etc. (0.3 x distal pressure)]  
22. \_\_\_\_\_ **ft.** vertical lift (pump off to lateral elevation)  
23. \_\_\_\_\_ **ft.** friction loss (in the force main in feet #19)  
24. \_\_\_\_\_ **ft.** Total Dynamic Head (TDH) (sum of #20 through #23)

**Calculate the Dose Volume:**

- 25. \_\_\_\_\_ **gal.** based on system type.
- 26. \_\_\_\_\_ **gal.** - drain back
- 27. \_\_\_\_\_ **gal.** - actual dose volume (#25 + #26)

**Pump Selection:**

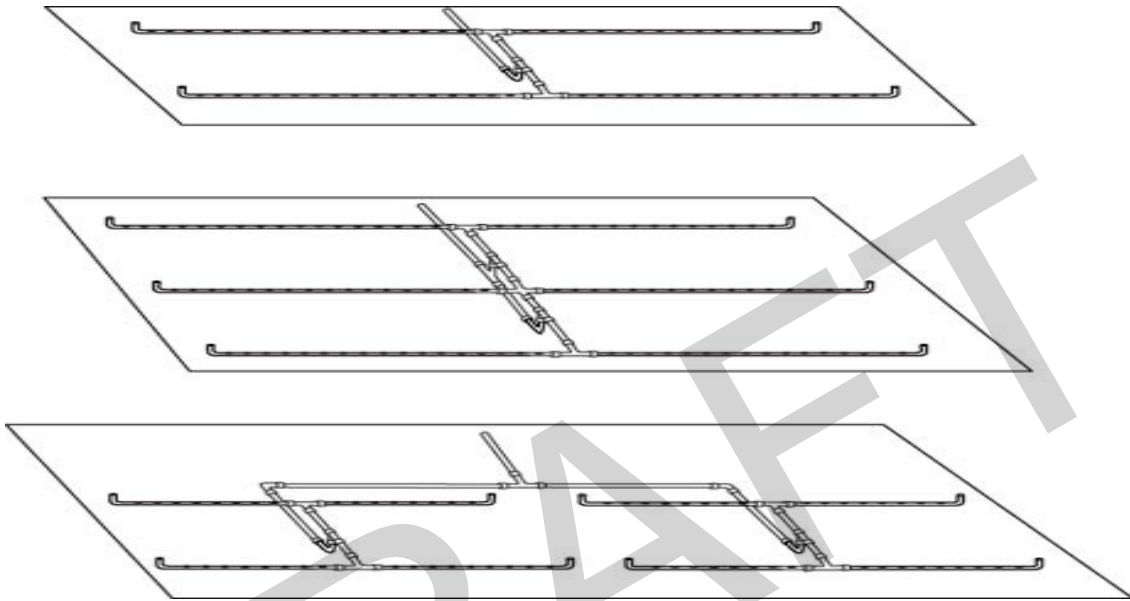
- 28. \_\_\_\_\_ **gpm** pump discharge rate at TDH (#24)  
(not less than system discharge rate, #15)

**Dose Chamber Sizing:** (Sizing of dose chamber serving a sand filter may have different requirements. See component manual or manufacturer's or designer's specifications for sizing criteria.)

- 29. \_\_\_\_\_ **in.** tank bottom to "off" switch \_\_\_\_\_ **gal.**
- 30. \_\_\_\_\_ **in.** dose volume (from #27) \_\_\_\_\_ **gal.**  
(“off” to “on” switch)
- 31. \_\_\_\_\_ **in.** “on” switch to alarm switch \_\_\_\_\_ **gal.**
- 32. \_\_\_\_\_ **in.** reserve capacity \_\_\_\_\_ **gal.**  
(residential = 100 gal/BR)
- 33. \_\_\_\_\_ **in.** dose chamber capacity \_\_\_\_\_ **gal.**

DRAFT

*Required: Network configuration for distribution area when more than two laterals are proposed.*



**LOW PRESSURE PIPE ABSORPTION SYSTEM CALCULATIONS**

# OF BEDROOMS		
VOLUME OF FLOW PER BEDROOM		
DESIGN DAILEY WASTEWATER FLOW		
SOIL LOADING RATE PER SOIL PROFILE		
MINIMUM SYSTEM TOTAL AREA		
TOTAL LATERAL PIPE LENGTH		
DISTANCE BETWEEN LATERAL LINES		
MAXIMUM TRENCH WIDTH		
TOTAL NUMBER OF ZONES		
TOTAL NUMBER OF LATERAL LINES		
TOTAL EFFECTIVE ABSORPTION AREA		
MAXIMUM TRENCH DEPTH		

**PIPING DESIGN & REQUIREMENTS**

MANIFOLD PIPING		
MANIFOLD LENGTH		
LATERAL PIPING		
ORIFICE DIAMETER		
NUMBER OF ORIFICES PER LATERAL		
ORIFICE SPACING		
ORIFICE DISTANCE FROM EACH END		
TOTAL NUMBER OF ORIFICES		
FLOW RATE PER ORIFICE		

OPERATING HEAD (distal pressure)		
FLOW RATE PER LATERAL		
TOTAL FLOW RATE		

**PUMP CAPACITY REQUIREMENTS**

FLOW CAPACITY		
HEAD CAPACITY		
DOSE VOLUME		

**OTHER DESIGN CRITERIA**

USE END MANIFOLD DESIGN

USE 90 DEGREE SWEEP AT LATERAL PIPE ENDS

COVER SWEEP WITH PROTECTIVE DEVICE TO GRADE

USE BALL VALVES IN SWEEPS FOR PRESSURE CLEANING EACH LATERAL

PUMP SELECTION BY INSTALLER PER CRITERIA SPECIFIED

DEMAND DOSING IS RECOMMENDED

ORIFICE ORIENTATION: 12 O'CLOCK WITH AT LEAST 1 AT 6 O'CLOCK

SET LATERAL PIPING IN 9" OF APPROVED GRAVEL. 6" BELOW THE PIPE AND  
3" ABOVE. COVER WITH APPROVED GEOTEXTILE FABRIC.