DESIGNER'S GUIDE

AMERICAN "PERC-RITE®"

WASTEWATER DRIP SYSTEMS

2 ZONE or 4 ZONE -- SIMPLEX or DUPLEX

PATENT NO. 5,200,065

TABLE OF CONTENTS

SYSTEM LAYOUT

SYSTEM COMPONENTS

DESIGN PROCEDURES

DESIGNERS' WORKSHEET

LOADING RATE TABLE

ZONE DETAIL NUMBERING SYSTEM

STANDARD ZONE DETAIL TABLE

LIFT AND DISTANCE TABLE

HYDRAULIC PROFILE

RUN TIME TABLES

ELECTRICAL AND OPERATIONAL SPECIFICATIONS

INSTALLATION INSTRUCTIONS

OPERATION AND MONITORING

INTRODUCTION

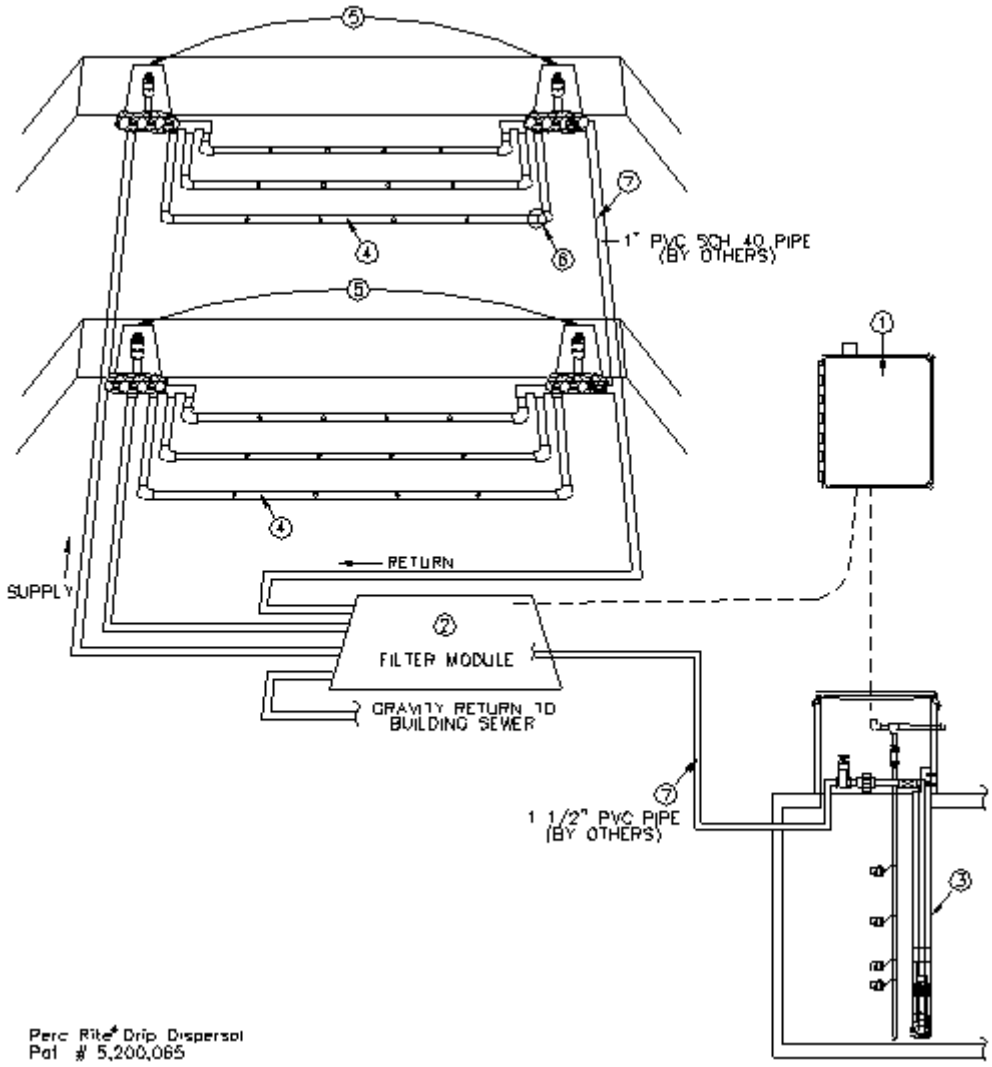
This ***Perc-Rite® Drip System Designer's Guide*** is for the non-engineer designer. Procedures have been developed to size, layout and design a ***Perc-Rite® Drip*** system using tables instead of performing calculations. The tables have conditions, which allow the designer considerable flexibility to layout systems in a variety of citing conditions without being required to do engineering calculations to determine design suitability. When advanced system design is required, outside the limitations of this design procedure, the designer must reference the design manual located on our web site and complete a detailed calculation sheet to determine suitability. Reference our web site at ***"www.americanonsite.com".***

The ***Perc-Rite® Drip System*** is a unique fluid handling system for dispersal of effluent wastewater in soil systems. The system incorporates filtration, time, and level controlled application and ultra low rate drip distribution. In conditions where aerobic dispersal, such as "Low Pressure Distribution", of septic effluent is required or where land application with the use of conventional soil absorption fields are not acceptable, this system offers a unique method for subsurface distribution of the waste water effluent.

Preconditioning Treatment requirements for Perc-Rite® Drip Systems are minimum. The process will accommodate virtually any type of pretreatment process, septic tank (anaerobic), aerobic, lagoon, or any type of treatment facility. Only primary treatment (the removal of large settleable solids) of sewage is necessary for the operation of the system. Local soil and site conditions may require additional treatment for excessive organics, oil and grease or other contaminants.

Virtually *No Site Disturbance during* installation of the field distribution lines causes very little soil disturbance. The effluent discharge volume from each emitter hole is very small. The installation of the system has very little site impact even in established lawns or park areas. After installation there are virtually no visible indications that the installation site is being used for disposal purposes. This system is especially suited for landscaped or wooded areas near buildings, trailer parks, apartment complexes or residential subdivisions.

TYPICAL LAYOUT



SYSTEM COMPONENTS

1. The **PERC-RITE® DRIP SYSTEM CONTROLLER** is a "state of the art" control panel, activated by level sensing devices (standard mechanical differential float switches) located in a dosing tank downstream from the pretreatment process or processes. When activated by the rising level of effluent in the dosing tank, the controller will enable the disposal cycle. The system controller on a time clock basis will pump the effluent through the filter module and then to final drip dispersal.

2. **FILTER MODULE** - Disc filters, automatic control valves, solenoid activated diaphragm valves, the flow meter are assembled in a heated enclosure and provided with a labeled wire harness for easy connection the control panel.

3. **PUMP SYSTEM** - The pump, Cool Guide™ and float switches for level indication are provided for installation into the pump tank. The pump is a turbine 15 gpm pump and will be suitable for most residential installation. Reference lift and run table for pumping limits.

4. **DRIPPER TUBING** - The dripper tubing is pressure compensating dripper line for wastewater. The tubing delivers a nominal 0.65 gallons per hour (+/- 5% flow rate from 7 to 60 psi). The tubing functions as a turbulent flow emitter between 0 and 7 psi, ensuring that the nominal design flow is not exceeded at system start-up. The tubing is polyethylene with a 120-psi pressure rating.

5. **TOP FEED MANIFOLD SYSTEM** - The Top Feed Manifolds are located at the highest point in the drip zone and provided with air release valves to prevent drain down of upper laterals in the zone to lower laterals in the zone, thus preventing saturation of the lower laterals after the pump shuts off. The system provides for the fastest possible pressurization of the zone and the most efficient method of providing drain down control. If the site is flat, Top Feed Manifolds may not be required.
   Patent No. 5,984,574.

6. **SPECIAL FIELD MATERIALS** - All special drip fittings and equipment are supplied by American Manufacturing Company, Inc. including the tubing insert fittings, connectors, flex tube and non- schedule 40 PVC standard fittings.

7. **STANDARD FIELD MATERIALS** - All tanks, wire, standard pipe, and fittings are provided by the contractor at the local site. The 1" supply and return pipes, the 1/2" pipe for installation between the top feed manifold system and the laterals and other misc. PVC pipe are to be purchased locally.

DESIGN PROCEDURES

1. DEMAND ANALYSIS - Local codes determine the amount of wastewater to design for. Many codes have a safety factor or peak flow factor in the prescribed design flow. Others are based on more of an average usage. In either event, the designer must determine what the peak (design) flow is. The ***Perc-Rite® Drip System*** will disperse the average flow through out each day unless the "Peak " float is enabled at which time the system will disperse effluent at an accelerated design daily flow rate. Record the peak design flow on ***line 1*** of the worksheet.

2. SITE AND SOILS EVALUATION - Soil evaluation is required on each site and the procedures used are not included in this manual. However, the results of the evaluation are used. The designer must determine from the information provided by the evaluator the "Design loading rate". The design-loading rate may be expressed as the "area" or as the linear feet of tubing required. The delineated area for installation and the installation depth needs to be determined. Long and narrow runs along contour are best. Be sure to adhere to applicable State and local codes. The ***Soil Loading Rate Table*** provided should be used as a guidance tool only. The professional judgment of the evaluator and designer should determine the wastewater application rate for any specific site. Record the selected loading rate on ***line 2*** of the worksheet. The total linear feet of tubing required is ***line 1*** divided by ***line 2***. Record the total linear feet of tubing required on ***line 3*** of the worksheet.

3. DELINEATE AREA - On a site plan or a site sketch, the designer should layout the area of installation on contour. The width along contour should be determined and this distance will determined the necessary down slope distance in order to allocate sufficient total area. The distance down slope will dictate the number of runs, which can be install in the dispersal site. Make sure enough runs can be installed for the total wastewater capacity and the amount of tubing required. Site conditions determine the run separation. Runs can vary from 1' to 3' separation but are more frequently from1-1/2' to 2' on center.

4. SELECT ZONE DETAL - Once the area and number of possible runs is determined, a standard zone detail is selected based on the width across contour and the number of runs that are needed and can be installed. See the Zone Detail Table. Determine how wide the system can be based on the delineated area on the plan, and then determine how many linear feet of tubing are needed. Match the number of runs across contour that can be installed. From the table select the zone detail for the site. Record the selected zone detail on ***line 4***. Record the total linear feet provided on ***line 5***. Record the total linear feet per zone provided on ***line 6***. Record the dose gpm and FF gpm provided on ***line 7***. See the ***Zone Detail Table*** and ***Dosing & FF Flow Table***.

5. LAYOUT SITE - On a site plan or site sketch show the route for the supply and return pipes. Show the distance the supply and return pipes travel. On a site plan or site sketch show the layout of the tanks, hydraulic and the control panel. Determine the length of supply line run and record on ***line 8***, determine the lift to the field and record on ***line 9***.

6. DETERMINE SUITABILITY - Reference the ***Lift and Run Table*** to determined by the length of run to the farthest field and the number of laterals, if the layout is suitable for 1" supply and return only. If the selected zone detail is included in the zone table and the lift is in excess of the required for the length of run in the pump table, record a Yes in ***line 10*** of the worksheet.

AMERICAN MANUFACTURING

PERC-RITE® WORKSHEET - Dispersal system design worksheet for residential systems.

JOB NAME: _____ JOB NUMBER: _____

	Y N ( ) ( ) ( ) ( )	Are supply and return pipes 1"? Is the lift from the pump to the Filter Unit < 8' and the distance < 30' with 1-1/2" pipe?
1	_____ gpd	Quantity of wastewater to disperse.
2	_____ gpd/LF	Tubing loading rate required to treat and disperse wastewater. Reference Soil Loading Rate Table. (Area Rate X 2)
3	_____ LF Tubing	Required total linear feet of tubing to treat and disperse wastewater. (#1 / #2 = #3)
4	_____ Zone Detail	Standard Zone detail description indicating number of zones, laterals, and runs per zone.
5	_____ LF Total	Total linear feet of tubing provided to disperse wastewater. Total number of runs times the length of run along contour. Reference Standard Detail Zone Table.
6	_____ LF/Zone	Total linear feet per zone. (#5 / Number of Zones)
7	_____ gpm dose _____ gpm FF	Dosing flow rate. See "dosing & FF flow table." Field flush (FF) flow rate. See dosing & FF flow table.
8	_____ Supply LF	Length of run between hydraulic unit and farthest zone.
9	_____ Lift Ft.	Vertical lift from off level in the pump chamber and highest zone elevation.
10	Will zone flush? Y N ( ) ( )	Reference "lift and run table" for pump capacity determined by the length of run to the farthest field and the number of laterals. For 1" supply and return only.

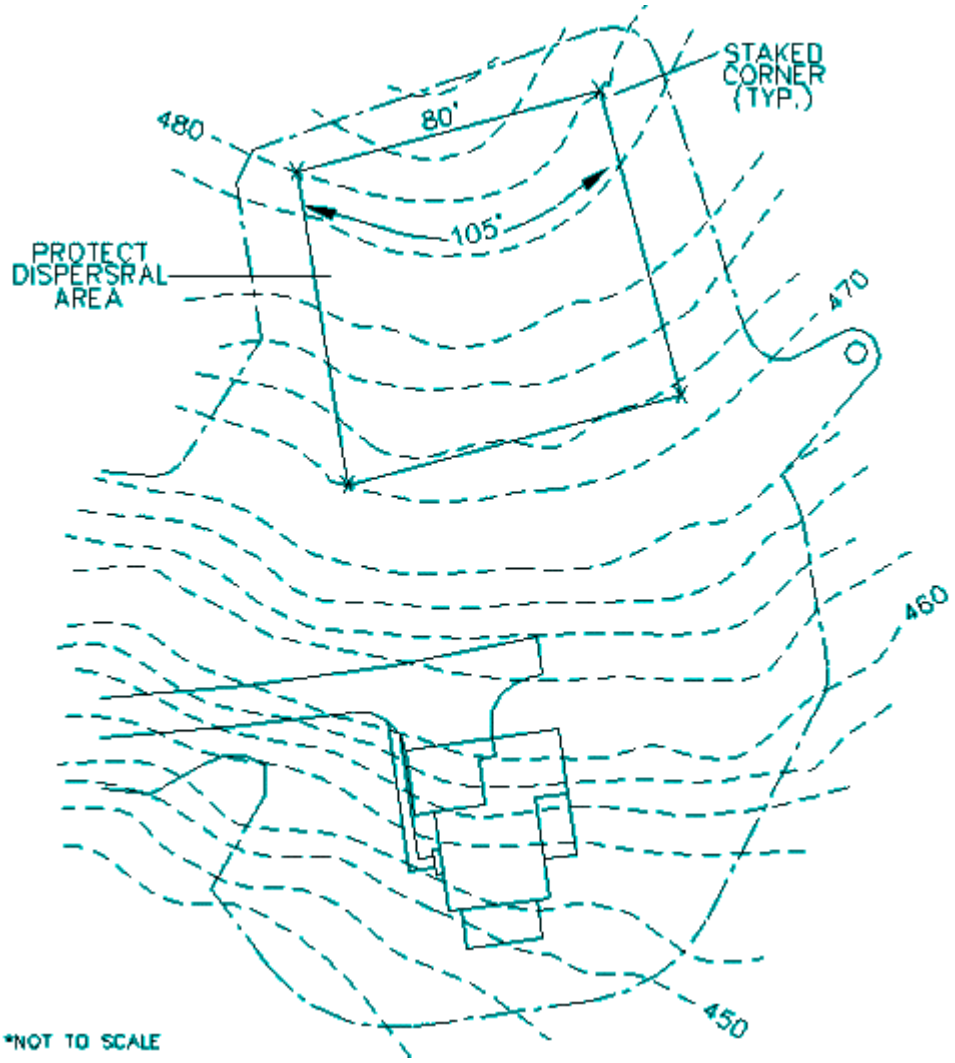
_____ _____ _____

DESIGNER'S NAME: Signature Date

AREA DELINIATION

A complete site evaluation includes a surface characterization of topographic features and horizontal setbacks, a subsurface (soil) evaluation, and the accurate delineation of the soil adsorption area. This delineation is best performed by the site evaluator. The area should be marked and measured in the field to insure protection of the area and a representative final adsorption area design. Tools required would include a measuring tape to dimension the site, stakes to delineate the area, and a leveling device such as a builders level, lock level, or clinometer to determine contour.

Care should be exercised to insure accuracy on sites with limited area, and those that are topographically complex to minimize site skewing, account for topographic contour wrapping, and verification of available area. The header ditch(es) area should be as perpendicular to topographic contour as possible.



SOIL LOADING RATE TABLE

This is based on a standard tubing spacing between runs of 2 feet on center. Therefore a typical area-loading rate would be a number that is one half the linear feet loading rate number. For example, for a 1.2 gallons/L.ft./day rate would be equivalent to 0.6 gallons/ft^2/day. Spacing may be changed for specific site conditions. For example: a tubing-loading rate of 0.4 is an area load of 0.2. By placing the tubing 1' on center, the resulting area loading would be at 0.4, or 1/2 of the area. This can only be done with proper site and soil evaluation.

Soil Textures	Soil Structure	Maximum Monthly Average BOD5 > 30mg/L BOD < 220mg/L (gal./ft^2/day)	(gal./LF/day)	Maximum Monthly Average BOD5 < 30mg/L (gal./ft^2/day)	(gal./LF/day)
Course sand or courser	N/A	.3 - .4	.6 - .8	.3 - 1.6	.6 - 3.2
Loamy coarse sand	N/A	.25 - .3	.5 - .6	.25 - 1.4	.5 - 2.8
Sand	N/A	.25 - .3	.5 - .6	.25 - 1.2	.5 - 2.4
Loamy sand	Weak to strong	.25 - .3	.5 - .6	.25 - 1.4	.5 - 2.4
	Massive	.15 - .2	.3 - .4	.15 - .7	.3 - 1.4
Fine sand	Moderate to strong	.25 - .3	.5 - .6	.25 - .9	.1 - 1.8
	Massive or weak	.15 - .2	.3 - .4	.15 - 0.6	.3 - 1.2
Loamy fine sand	Moderate to strong	.2 - .3	.4 - 0.6	.2 - 0.9	.4 - 1.8
	Massive or weak	.15 - .2	.3 - .4	.15 - .6	.3 - 1.2
Very fine sand	N/A	.15 - .2	.3 - .4	.15 - .6	.3 - 1.2
Loamy very fine sand	N/A	.15 - 0.2	.3 - .4	.15 - .6	.3 - 1.2
Sandy loam	Moderate to strong	.15 - 0.2	.3 - .4	.15 - 1	.3 - 2
	Weak, weak platy	.15 - 0.2	.3 - .4	.15 - .6	.3 - 1.2
	Massive	< .1	< .2	.1 - .5	.2 - 1
Loam	Moderate to strong	.15 - .2	.3 - .4	.15 - .9	.3 - 1.8
	Weak, weak platy	.1 - 0.2	.2 - .4	.1 - .6	.2 - 1.2
	Massive	< .1	< .2	.1 - .5	.2 - 1
Silt loam	Moderate to strong	.15 - .2	.3 - .4	.15 - .8	.3 - 1.6
	Weak, weak platy	< .1	< .2	.1 - .3	.2 - .6
	Massive	0	0	.1 - .2	.2 - .4
Sandy clay loam	Moderate to strong	.15 - .2	.3 - .4	.15 - .6	.3 - 1.2
Clay loam	Weak, weak platy	< .1	< .2	.1 - .3	.2 - .6
	Weak, weak platy	< .1	< .2	.1 - .3	.2 - .6
	Moderate to strong	.1 - .2	.2 - .4	.1 - .6	.2 - 1.2
Silty clay loam	Weak, weak platy	< .1	< .2	.1 - .3	.2 - .6
	Massive	0	0	0	0
	Moderate to strong	.1 - .2	.2 - .4	.1 - .6	.2 - 1.2
Sandy clay	Moderate to strong	< .1	< .2	.1 - .3	.2 - .6
	Massive to weak	0	0	0	0
Clay	Moderate to strong	< .1	< .2	.1 - .3	.2 - .6
	Massive to weak	0	0	0	0
Silty clay	Moderate to strong	< .1	< .2	.1 - .3	.2 - .6
	Massive to weak	0	0	0	0

Site suitability, loading rate, and installation depth determination must be assigned based on thorough site/soil evaluation. The characterization of a soil based receiver site involves a systematic evaluation by trained individuals. Conditions to consider consist of a variety of topographic and soil conditions such as landscape position, slope, soil depth, depth to water table, depth to restriction, soil consistence, clay mineralogy, compaction, density, and site geometry and uniformity.

Drip disposal lends itself to shallow installation. Typical depths are from 6-18", with 8-10" preferred and 18-24" installations infrequent. Separation to limitations should always be maximized while maintaining a consistent depth on contour in a permeable horizon.

Refer to state and local regulatory requirements for appropriate site suitability guidance.

ZONE DETAIL NUMBERING SYSTEM

Each zone is designated by a "Z" indicating it is a Zone Detail Designation followed by three groups of numbers, the first is the number of zones, the second is the number of laterals per zone, the third is the runs per lateral.

_____	_____	_____	_____
Z = Zone	# Zones	# Laterals	# Runs/Lat

EXAMPLE 1

Z	3	3	3
Z = Zone	# Zones	# Laterals	# Runs/Lat

This example shows a three-zone detail with three laterals per zone and three runs per lateral.

ZONE DETAIL SELECTION PROCEDURE

Reference the site plan layout to determine the width across contour of the delineated area. From the site and soils evaluation determine the total amount of tubing required. The area divided by two is the total linear feet of tubing required. The total linear feet of tubing required. The total linear feet of tubing required. The total linear feet of tubing divided by the length across contour equals the minimum number of runs.

The total number of linear feet of tubing and runs will typically be more than the minimum since the preferred layout for flushing the supply and return lines will typically result in more than the minimum tubing. The preferred layout is the next largest zone detail. Increasing the number of runs in order to install a standard zone configuration is encouraged. This provides an additional safety factor to the tubing interface loading rate. Use the following step-by-step procedure to select a zone detail.

1. Determine width across contour.
2. Determining number of runs that can be installed in area.
3. Select a standard zone detail from under the column for contour with which has enough tubing to satisfy total tubing requirements.
4. In the event more runs are needed to yield enough tubing for the site, the tubing may be placed closer than 2' on center.

EXAMPLE;

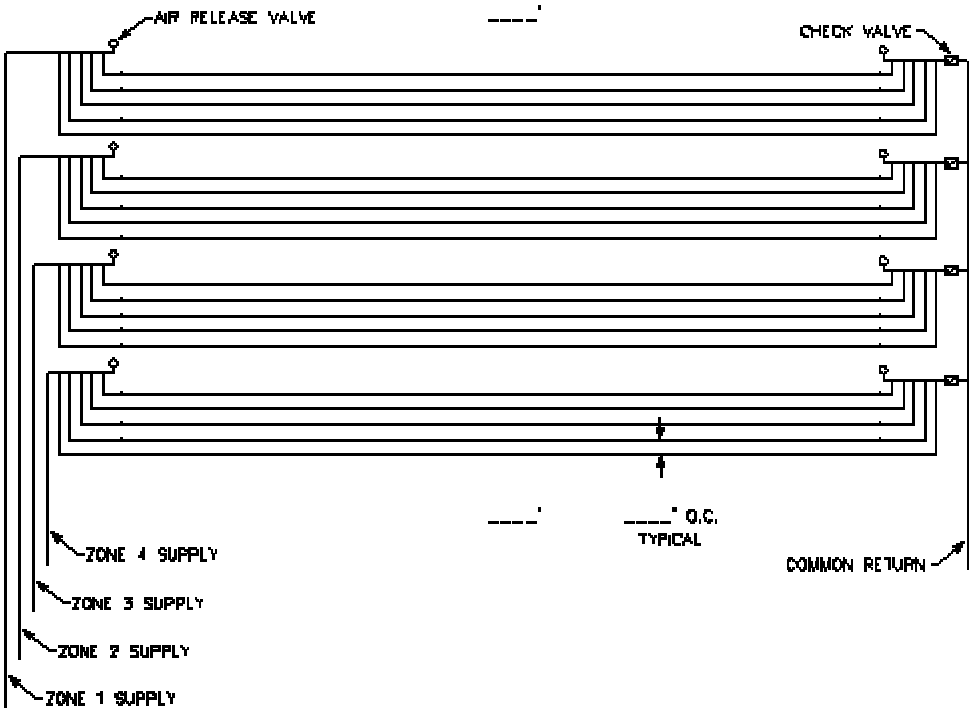
Contour width = 125 Feet

Tubing required = 2400 Linear Feet

From the table the linear feet of tubing provided in 125 foot runs will be between 2250 LF and 2500 LF. Therefore select 20 runs for 2500 LF. The zone detail could be:

Z	4	5	1
Z = Zone	# Zones	# Laterals	# Runs/Lat

Finally confirm that the number of runs can be installed into the delineated area.



PERC-RITE® -- STANDARD ZONE DETAIL TABLE

RUN LGTH #RUN	50' ZD LF	75' ZD LF	100' ZD LF	125' ZD LF	150' ZD LF	200' ZD LF	225' ZD LF	250' ZD LF	300' ZD LF
4									Z221 1200
5									
6						Z231 1200	Z231 1350	Z231 1500	Z231 1800 Z321 1800
7									
8					Z222 1200	Z241 1600	Z241 1800	Z241 2000	Z241 2400
9						Z331 1800	Z331 2025	Z331 2250	Z331 2700
10				Z251 1250	Z251 1500	Z251 2000	Z251 2250		
11									
12			Z223 1200 Z232 1200	Z232 1500	Z232 1800 Z322 1800	Z341 2400 Z431 2400	Z341 2700 Z431 2700	Z341 3000 Z431 3000	Z341 3600 Z431 3600
13									
14			Z271 1400						
15				Z351 1875	Z351 2250	Z351 3000	Z351 3375		
16		Z224 1200	Z242 1600	Z242 2000	Z242 2400 Z422 2400	Z441 3200	Z441 3600	Z441 4000	Z441 4800
17									
18		Z233 1350	Z233 1800 Z323 1800	Z332 2250	Z332 2700				
19									
20		Z252 1500	Z252 2000	Z451 2500	Z451 3000	Z451 4000	Z451 4500		
21			Z371 2100						
22									
23									
24	Z226 1200	Z234 1800 Z324 1800	Z243 2400 Z342 2400 Z423 2400	Z342 3000 Z432 3000	Z342 3600 Z432 3600				
25									
26									
27		Z333 2025	Z333 2700						
28	Z272 1400		Z471 2800						
29									
30	Z235 1500	Z253 2250 Z352 2250	Z352 3000						
31									
32	Z244 1600	Z244 2400 Z424 2400	Z442 3200	Z442 4000	Z442 4800				
33									
34									
35									
36	Z236 1800 Z326 1800	Z334 2700 Z334 2700	Z343 3600 Z433 3600						
37									
38									
39									
40	Z254 2000	Z452 3000	Z452 4000						
41									
42	Z372 2100								
43									
44									
45	Z335 225	Z353 3375							
46									
47									
48	Z246 2400 Z344 2400	Z344 3600 Z434 3600	Z443 4800						

DOSING & FLOW TABLE (GPM)

LF/ ZONE	GPM DOSE RATE	FF NO. LATS	FF NO. LATS	FF NO. LATS	FF NO. LATS	FF NO. LATS	FF NO. LATS
		2	3	4	5	6	7
600	3.3	6.5	8.1	9.7	11.3	12.9	14.5
650	3.5	6.7	8.3	9.9	11.5	13.1	14.7
700	3.8	7.0	8.6	10.2	11.8	13.4	15.0
750	4.1	7.3	8.9	10.5	12.1	13.7	15.3
800	4.3	7.5	9.1	10.7	12.3	13.9	15.5
850	4.6	7.8	9.4	11.0	12.6	14.2	15.8
900	4.9	8.1	9.7	11.3	12.9	14.5	16.1
950	5.1	8.3	9.9	11.5	13.1	14.7	16.3
1000	5.4	8.6	10.2	11.8	13.4	15.0	16.6
1050	5.7	8.9	10.5	12.1	13.7	15.3	16.9
1100	6.0	9.2	10.8	12.4	14.0	15.6	17.2
1150	6.2	9.4	11.0	12.6	14.2	15.8	17.4
1200	6.5	9.7	11.3	12.9	14.5	16.1	17.7

LIFT & DISTANCE TABLE INSTRUCTIONS

1. The vertical lift is the elevation difference between the "off float" and the highest point in any zone.
2. The diameter of the pipe from the pump tank to the hydraulic unit is 1-1/2" minimum.
3. All supply and return pipes are 1".
4. The flush return pipe from the hydraulic unit to the pretreatment tank is 1-1/2" gravity.
5. The maximum distance from the pump tank to the hydraulic unit is 30'.
6. The tables may be used with the standard zone detail configuration only. A calculation sheet must be filled out for any other configuration.
7. Top feed manifolds must be used when any discernible slope is encountered.

Maximum Static Lift ("Off Level Float" to Drip Field)							
	Supply/						
1	Return Line	2-Lat	3-Lat	4-Lat	5-Lat	6-Lat	7-Lat
	(feet)	300'	300'	300'	240'	165'	100'
2							
3	100	98	88	75	74	79	77
4	150	96	84	69	66	70	68
5	200	94	81	63	58	61	59
6	250	92	77	57	51	52	49
7	300	90	73	50	43	44	40
8	350	88	70	44	35	35	31
9	400	86	66	38	27	26	21
10	450	84	63	32	19	17	
11	500	82	59	26	12		
12	550	80	55	20			
13	600	78	52	14			
14	650	76	48	8			
15	700	74	45	2			
16	750	72	41				
17	800	70	37				
18	850	68	34				
19	900	66	30				
20	950	64	27				
21	1000	62	23				

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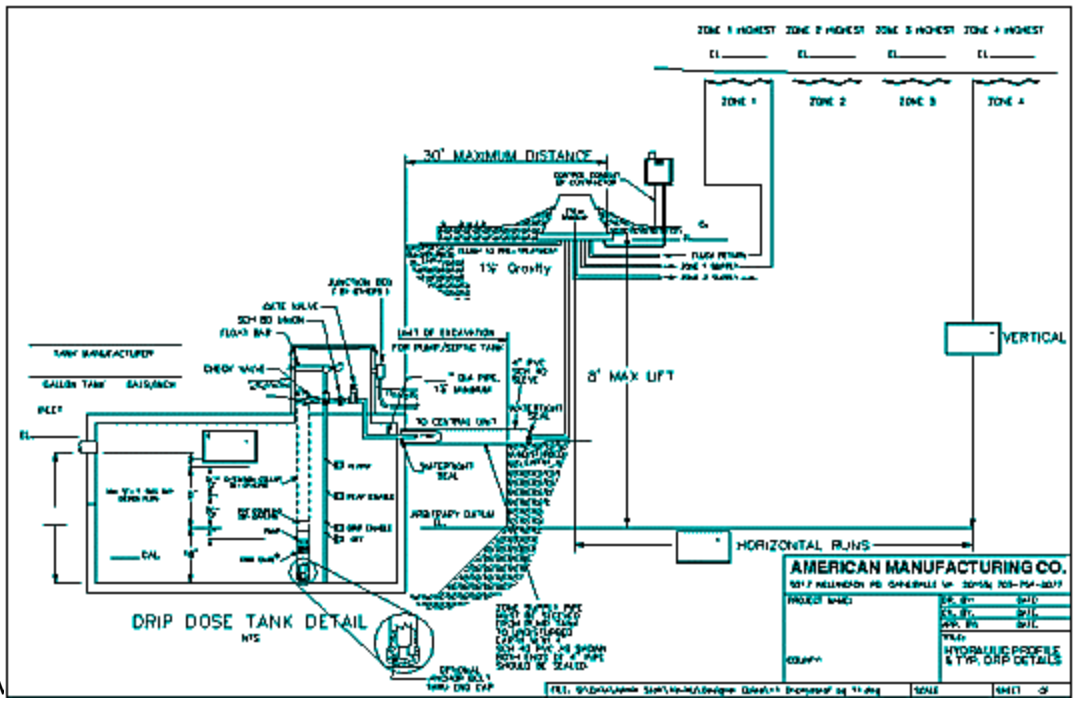

RUN TIME TABLES

The run timetables are based on the gallons per day the system is designed for. The run time numbers are based on the **average daily flow rate**. Selecting the run time is the last design step that is performed. Based on the number of zones and the number of laterals per zone, the run time is selected based on the average gallons per day. For even distribution and minimizing drain down events, the run time is calculated to provide from **3 to 5 times the volume of drip tubing** plus the top feed manifolds. Therefore, the number of doses per zone will vary in order to maintain optimum dispersal.

American Manufacturing 2-Zone							
		2-Lat	3-Lat	4-Lat	5-Lat	6-Lat	7-lat
		300'	300'	300'	240'	165'	100
Design	Avg.	3.25	4.875	6.5	6.5	5.4	3.8
GPD	GPD	Min/ Dose	Min/ Dose	Min/ Dose	Min/ Dose	Min/ Dose	Min/ Dose
300	**180**	7.48	7.69	5.53	5.41	6.51	5.38
320	**192**	5.64	8.30	6.00	5.87	7.07	5.88
340	**204**	6.10	8.92	6.46	6.33	7.63	6.41
360	**216**	6.56	5.84	6.92	6.79	8.18	4.56
380	**228**	7.02	6.25	7.38	7.25	5.20	4.96
400	**240**	7.48	6.66	7.84	7.72	5.57	5.35
420	**252**	7.95	7.07	8.30	8.18	5.95	5.75
440	**264**	8.41	7.48	8.76	8.64	6.32	6.14
450	**270**	8.64	7.69	9.00	8.87	6.51	6.34
460	**276**	8.87	7.89	5.69	9.10	6.69	6.54
480	**288**	9.33	5.84	6.00	5.87	7.07	6.93
500	**300**	9.79	6.15	6.30	6.18	7.44	7.33
520	**312**	10.25	6.46	6.61	6.48	5.39	7.73
540	**324**	10.71	6.76	6.92	6.79	5.67	8.12
560	**336**	11.18	7.07	7.23	7.10	5.95	8.52
580	**348**	11.64	7.38	7.53	7.41	6.23	8.91
600	**360**	12.10	7.69	7.84	7.72	6.51	9.31
620	**372**	12.56	7.99	5.76	5.64	6.79	9.70
640	**384**	13.02	8.30	6.00	5.87	7.07	10.10
660	**396**	13.48	8.61	6.23	6.10	7.35	10.49
680	**408**	13.95	8.92	6.46	6.33	7.63	10.89
700	**420**	14.41	9.22	6.69	6.56	7.90	11.29
720	**432**	14.87	9.53	6.92	6.79	8.18	11.68
750	**450**	15.56	9.99	7.26	7.14	8.60	12.28
Total LF in		1200	1200	1200	1200	990	700

3-Zone							
		2-Lat	3-Lat	4-Lat	5-Lat	6-Lat	7-lat
		300'	300'	300'	240'	165'	100
Design	Avg.	3.25	4.875	6.5	6.5	5.4	3.8
GPD	GPD	Min/ Dose	Min/ Dose	Min/ Dose	Min/ Dose	Min/ Dose	Min/ Dose
300	**180**	7.48	10.76	7.84	7.72	9.30	5.35
320	**204**	8.10	11.58	8.46	8.33	10.05	5.88
340	**204**	8.71	12.40	9.07	8.95	10.80	6.41
360	**216**	5.64	5.84	9.69	9.56	11.54	6.93
380	**228**	6.05	6.25	10.30	10.18	5.20	7.46
400	**240**	6.46	6.66	10.92	10.79	5.57	7.99
420	**252**	6.87	7.07	11.53	11.41	5.95	4.82
440	**264**	7.28	7.48	12.15	12.02	6.32	5.18
450	**270**	7.48	7.69	12.46	12.33	6.51	5.35
460	**276**	7.69	7.89	12.76	12.64	6.69	5.53
480	**288**	5.64	8.30	6.00	5.87	7.07	5.88
500	**300**	5.95	8.71	6.30	6.18	7.44	6.23
520	**312**	6.25	5.57	6.61	6.48	7.81	6.58
540	**324**	6.56	5.84	6.92	6.79	8.18	4.56
560	**336**	6.87	6.11	7.23	7.10	8.56	4.82
580	**348**	7.18	6.39	7.53	7.41	5.33	5.09
600	**360**	7.48	6.66	7.84	7.72	5.57	5.35
620	**372**	7.79	6.93	8.15	8.02	5.82	5.62
640	**384**	8.10	7.21	8.46	8.33	6.07	5.88
660	**396**	8.41	7.48	8.76	8.64	6.32	6.14
680	**408**	8.71	7.75	9.07	8.95	6.57	6.41
700	**420**	9.02	5.63	5.79	5.66	6.82	6.67
720	**432**	9.33	5.84	6.00	5.87	7.07	6.93
750	**450**	9.79	6.15	6.30	6.18	7.44	7.33
Total LF in		1200	1200	1200	1200	990	700

4-Zone							
		2-Lat	3-Lat	4-Lat	5-Lat	6-Lat	7-lat
		300'	300'	300'	240'	165'	100
Design	Avg.	3.25	4.875	6.5	6.5	5.4	3.8
GPD	GPD	Min/ Dose	Min/ Dose	Min/ Dose	Min/ Dose	Min/ Dose	Min/ Dose
300	**180**	12.10	7.69	5.53	5.41	6.51	9.31
320	**204**	5.64	8.30	6.00	5.87	7.07	10.10
340	**204**	6.10	8.92	6.46	6.33	7.63	10.89
360	**216**	6.56	9.53	6.92	6.79	8.18	4.56
380	**228**	7.02	10.15	7.38	7.25	8.74	4.96
400	**240**	7.48	10.76	7.84	7.72	9.30	5.35
420	**252**	7.95	11.38	8.30	8.18	9.86	5.75
440	**264**	8.41	11.99	8.76	8.64	10.42	6.14
450	**270**	8.64	12.30	9.00	8.87	10.70	6.34
460	**276**	8.87	12.61	9.23	9.10	10.98	6.54
480	**288**	5.64	5.84	9.69	9.56	11.54	6.93
500	**300**	5.95	6.15	10.15	10.02	12.10	7.33
520	**312**	6.25	6.46	10.61	10.48	5.39	7.73
540	**324**	6.56	6.76	11.07	10.95	5.67	4.56
560	**336**	6.87	7.07	11.53	11.41	5.95	4.82
580	**348**	7.18	7.38	12.00	11.87	6.23	5.09
600	**360**	7.48	7.69	12.46	12.33	6.51	5.35
620	**372**	5.41	7.99	5.76	5.64	6.79	5.62
640	**384**	5.64	8.30	6.00	5.87	7.07	5.88
660	**396**	5.87	8.61	6.23	6.10	7.35	6.14
680	**408**	6.10	8.92	6.46	6.33	7.63	6.41
700	**420**	6.33	5.63	6.69	6.56	7.90	6.67
720	**432**	6.56	5.84	6.92	6.79	8.18	4.56
750	**450**	6.91	6.15	7.26	7.14	8.60	4.86
Total LF in		1200	1200	1200	1200	1200	990

STANDARD & PEAK REST TIMES TO BE SET AT SYSTEM START-UP

		2 ZONE Rest Time		3 ZONE Rest Time		4 ZONE Rest Time	
		Standard (min)	Peak (min)	Standard (min)	Peak (min)	Standard (min)	Peak (min)
4	Doses/day/zone	180	108	120	72	90	54
3	Doses/day/zone	240	144	160	96	120	72
2	Doses/day/zone	360	216	240	144	180	108
1	Doses/day/zone	720	432	480	288	360	216

ELECTRICAL AND OPERATIONAL SPECIFICATIONS

CUST. NAME: _____
ADDRESS: _____
_____
_____

JOB NAME: _____
JOB NUMBER: _____
ADDRESS: _____
_____
_____

PERMIT INFO: _____
_____
_____

DESIGNER NAME: _____
ADDRESS: _____
_____
_____

SYSTEM INFORMATION

GPD _____
MAX GPM _____
NO. ZONES _____
ZONE DETAIL NO. _____
DOSES PER DAY _____

MODEL NUMBER		RUN TIME
1. ASD152-S122	_____	_____
2. ASD151-S122**	_____	_____
3. ASD153-S124	_____	_____
4. ASD154-S124	_____	_____

Check the model number that has the number of zones per the zone detail. Record the run time from the Run Time Table.

**Model ASD151-S122 has a master valve and remote zone valves for specifying when pumping downhill.

ELECTRICAL CIRCUIT REQUIREMENTS

1. PUMP 1/2 HP, 115V, 1 PHASE
2. CONTROL 15 AMP, 115V, 1 PHASE
3. OTHER _____

OPTIONS

Return Pressure Assembly _____ (Y)
Use pressure assembly anytime the lift from filter unit to drip field exceeds 10 feet.

Drain Down Assembly _____ (Y)
Blower Cut-out _____ (Y)
24" Riser _____" long _____ (Y)
24" Lid _____ (Y)
30" Riser _____" long _____ (Y)
30" Lid _____ (Y)

Tubing Rolls (1000') _____

SPECIAL INSTRUCTIONS
(use back if necessary)

_____
_____
_____
_____
_____
_____

AUTHORIZED SIGNATURE

_____ Date:_____
( )Owner ( )Agent

NOTE: ATTACHED SHOULD BE A ZONE DETAIL

AMERICAN USE ONLY

Sales Order Number _____
File No. _____
SBT Input BY _____

AMERICAN
Manufacturing Company, Inc.
www.americanonsite.com

INSTALLATION INSTRUCTIONS

1. Prepare field location for installation. Verify contour and design. No wet weather installation. No activity on drain field other than minimum to install system. Clearing of vegetation to be performed with minimal site disturbance. Do not park equipment or store materials on drain field area.

2. Set pretreatment and pump tanks.

3. Dig header ditch for field manifold.

4. Install dripper tubing. Horizontal spacing between dripper lines shall be as specified and installation depth shall be as specified. Install on contour.

5. Install loops (flex tubing) and construct field supply / return manifolds. All PVC pipe and fittings shall be PVC SCH 40 type 1 rated for pressure applications. All glued joints shall be cleaned and primed with purple (dyed) PVC primer prior to being glued. All cutting of PVC pipe, flexible PVC and/or dripper tubing shall be accomplished with pipe cutters. Sawing of PVC pipe, flexible PVC, and/or dripper tubing must be followed by cleaning all shavings, or else sawing should not be allowed. All open PVC pipe, flexible PVC and/or dripper tubing in the work area shall have the ends covered with duct tape during construction to prevent construction to prevent construction debris from entering the pipe. Prior to gluing all glue joints shall be inspected for and cleared of construction debris.

6. Dig ditches for conveyance lines, pump supply line, and flush return line. Install. Connect supply / return lines with manifolds.

7. Place Central Unit and mount control panel. Connect conveyance, supply, and flush return lines to hydraulic unit.

8. Set switch tree in pump tank.

9. Install electrical (and phone line if applicable). Check power supply and power up unit.

10. Provide one-day volume of clean water for startup. Prior to startup of the drip disposal system the air release valves shall be removed and each zone in the system shall be flushed as follows: a) using an appropriate length of flexible PVC pipe with a male fitting attached to the air release connection to direct the flushing away from the construction are, b) flush the zone with a volume of water (clean water to be provided by contractor) equal to 1.5 times the volume of the pipes from the central unit to the air release valve, c) repeat this procedure for each zone (the flushing of the system is accomplished by manual override of the control panel by the manufacturer of engineer.) Once completed replace and glue air relief valves.

    If existing septic tanks are to be used, they shall be pumped out by a commercial septic tank pumper, checked for leakage or other problems, and replaced if necessary. After the tank is emptied, the tank shall be rinsed, pumped, and refilled with clean water. Debris is septic tank shall be kept to a minimum since it could clog the disk filters during startup. (Disk filters are not back flushed during startup and any clogging could cause incorrect rate of flow readings for the controller.)

11. Pressure check all fittings and lines. Inspect field and loops. Find leaks and repair.

12. Check setup values against calculated values. Set run time for Central Unit.

13. Backfill once lines and fields are determined to have no leaks. backfilling is to be controlled to prevent the damaging of pipes or fittings. Once completed, drain field area should be graded to shed surface water with additional clean soil as necessary. Establish fescue or other turf cover, cut long (6-8").

OPERATION AND MAINTENANCE FOR PERC-RITE® DRIP SYSTEM

The **PERC-RITE® DRIP SYSTEM** has been developed to automatically monitor operational functions. The system is designed to be easily fixed if it breaks, in other words periodic monitoring can confirm good operating conditions but there are no maintenance procedures necessary until a mechanical component becomes in need of repair. Further, any malfunction or breakage of a mechanical component will result in a failure similar to any traditional system, a wet spot in the field, a backup or a high level alarm.

The **MONITORING FREQUENCY** should be no more than traditional systems. The most important component for the operational success is owner awareness. All onsite systems have a finite hydraulic capacity. Drip systems have no storage capacity in the soil system so storage or flow equalization must be provided in the pump tank. The owner must be aware system exists and the peak flow limitations for usage.

After a successful installation and startup the system should be inspected from one to three months after the owner takes occupancy to confirm operational compliance and to inform the owner of the operational characteristics of the system. The system should then go on a schedule of annual inspections to monitor usage and inspect system for wear in order to minimize emergency service requirements. Each system is provided with an owner's manual. The local dealer has a more detailed installation and maintenance supplement manual. If more than septic pretreatment is provided, more frequent monitoring may be required. Provide monitoring frequency at the rate determined by the most sensitive component.

An **OPERATIONAL CHECKLIST** is provided in the dealer's supplement manual for determining satisfactory operation of the system. The following topics are covered:

1. Field Conditions
2. Check septic tank and pump tank condition
3. Check operation of pump, control and valves
4. Check zone dose rates
5. Evaluate and record meter for usage

STANDARD MODEL *PERC-RITE*® DRIP SYSTEMS

ASD152-S122 : 2 ZONE SIMPLEX DRIP SYSTEM

ASD151-S122 : 2 ZONE SIMPLEX DRIP SYSTEM REMOTE VALVES

ASD153-S124 : 3 ZONE SIMPLEX DRIP SYSTEM

ASD154-S124 : 4 ZONE SIMPLEX DRIP SYSTEM

AMERICAN MANUFACTURING COMPANY, INC.