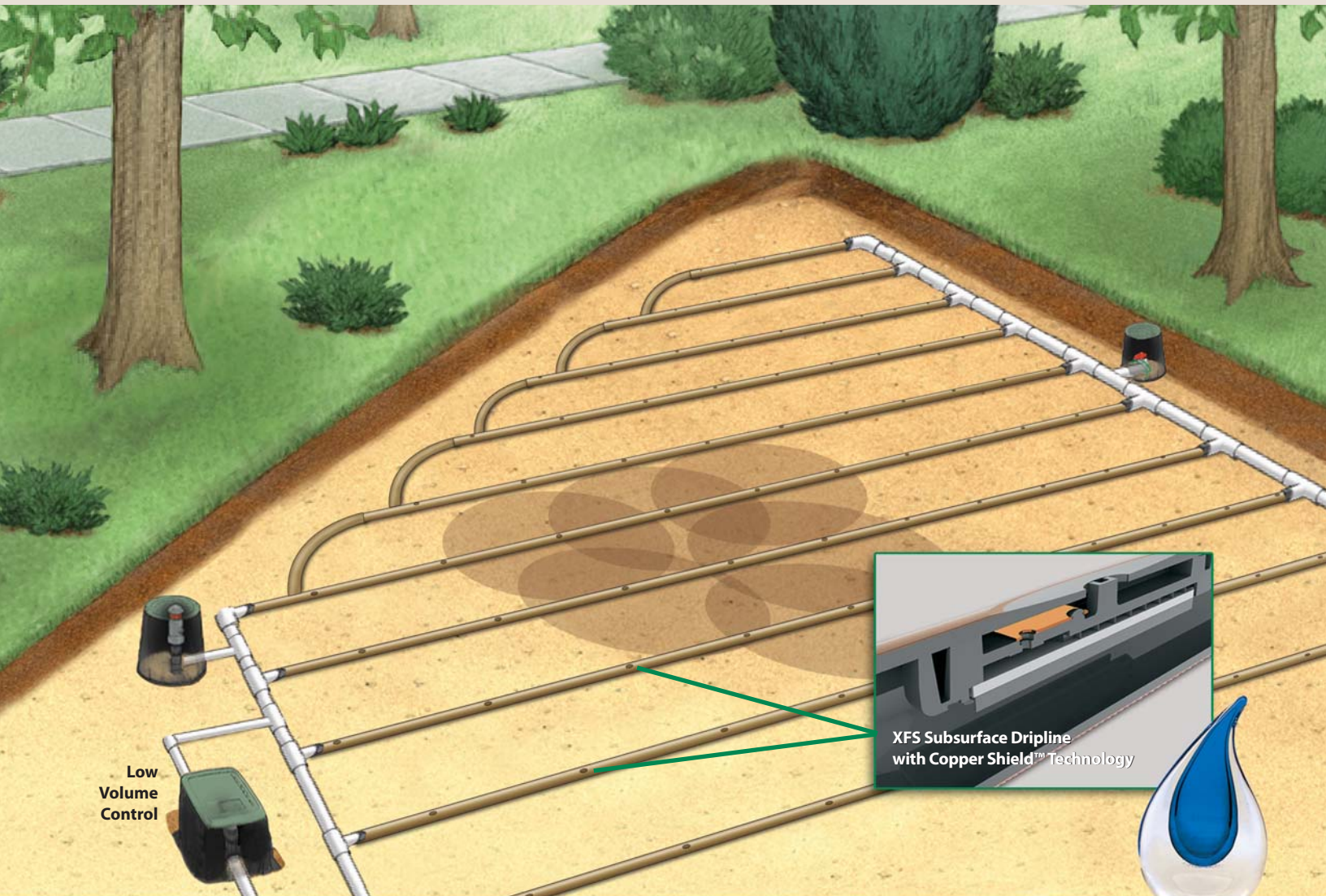




XFS Subsurface Dripline with Copper Shield™ Technology Installation Guide



Rain Bird XFS Subsurface Dripline uses our leading XF dripline and adds patent pending Copper Shield Technology to protect the emitter against root intrusion in sub-surface applications

**2010 Irrigation Association
Award Winner**
Best New Product for Turf - Landscape

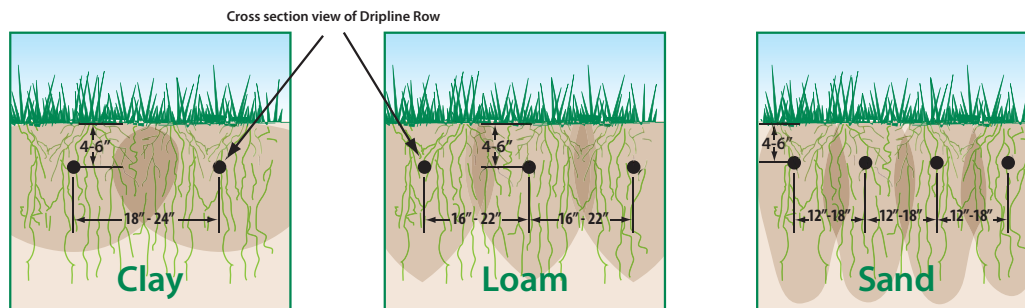
Sub-Surface Layout Installation Recommendations

1. WHAT IS YOUR SOIL TYPE?

Soil Infiltration Rates in Inches per Hour			
Percent of Slope	Clay	Loam	Sand
0% - 4%	0.13 - 0.44	0.44 - 0.88	0.88 - 1.25
5% - 8%	0.1 - 0.35	0.35 - 0.7	0.7 - 1

Soil Infiltration Rates in CM per Hour			
Percent of Slope	Clay	Loam	Sand
0% - 4%	0.33 - 1.12	1.12 - 2.24	2.24 - 3.18
5% - 8%	0.25 - 0.89	0.89 - 1.78	1.78 - 2.54

Note: As the slope increases, infiltration rates will continue to decrease. These values are derived from USDA information.



These illustrations show water movement in a sub-surface application. These guidelines apply to on-surface as well as sub-surface installations.

2. SELECT EMITTER FLOW RATE AND SPACING

XF Series Dripline Recommendations (English)			
Soil Type	Clay	Loam	Sand
Emitter Flow Rate (gallons per hour)	0.6 gph	0.6 gph/0.9 gph	0.9 gph
Emitter Spacing	24"	18"	12"
XF Series Dripline Lateral Spacing	18" - 24"	16" - 22"	12" - 18"

XF Series Dripline Recommendations (Metric)			
Soil Type	Clay	Loam	Sand
Emitter Flow Rate (liters per hour)	2.3	2.3 - 3.4	3.4
Emitter Spacing (meters)	0.61	0.45	0.3
XF Series Dripline Lateral Spacing (meters)	0.45 - 0.61	0.41 - 0.56	0.3 - 0.45

Note: These are general guidelines, field conditions may require modification to emitter flow rate, emitter spacing and lateral spacing. XF Series Dripline is to be installed at a depth of 4"-6" (10.2 - 15.24 cm) in sub-surface and groundcover applications. XF Series Dripline may also be installed on-surface under mulch in shrub and groundcover applications.

Burial Depth

- Turfgrass Applications:
Recommended burial depth of 4, 5, or 6"
- Shrub and Groundcover Applications:
 - On-surface under mulch
or
 - Sub-surface to a depth of 4, 5, or 6"

Irrigation Efficiency

- Sub-surface dripline efficiency will be over 90% for well-designed and installed zones
- Water applied by a grid of sub-surface dripline is transferred through the soil without the affect of wind and evaporation

"Cycle and Soak" or "Pulse" Irrigation

- Use the recommended flow rate emitter and spacing for the soil type in your application
- Use "Cycle and Soak" or pulse irrigation with short run times separated by at least one hour
- Clay soils, slopes or non-uniform soils may require more cycles that are shorter, or a longer soak interval

3. SELECT THE APPLICATION RATE BASED ON EMITTER CHOICE FROM STEP #2 ABOVE

Lateral Row Spacing (in Inches)											
Emitter Spacing	12"	13"	14"	15"	16"	17"	18"	19"	20"	22"	24"
0.6 GPH Emitter Flow (Inches per hour)											
12"	0.96	0.89	0.83	0.77	0.72	0.68	0.64	0.61	0.58	0.53	0.48
18"	0.64	0.59	0.55	0.51	0.48	0.45	0.43	0.4	0.39	0.35	0.32
24"	0.48	0.44	0.41	0.39	0.36	0.34	0.32	0.3	0.29	0.26	0.24
0.9 GPH Emitter Flow (Inches per hour)											
12"	1.44	1.33	1.24	1.16	1.08	1.02	0.96	0.91	0.87	0.79	0.72
18"	0.96	0.89	0.83	0.77	0.72	0.68	0.64	0.61	0.58	0.53	0.48
24"	0.72	0.67	0.62	0.58	0.54	0.51	0.48	0.46	0.43	0.39	0.36

Lateral Row Spacing (in Centimeters)											
Emitter Spacing	30	33	36	38	41	43	46	48	51	56	61
2,3 LPH Emitter Flow (cm per hr)											
30cm	2.44	2.26	2.11	1.96	1.83	1.73	1.63	1.55	1.47	1.35	1.22
46cm	1.63	1.50	1.40	1.30	1.22	1.14	1.09	1.02	0.99	0.89	0.81
61cm	1.22	1.12	1.04	0.99	0.91	0.86	0.81	0.76	0.74	0.66	0.61
3,4 LPH Emitter Flow (cm per hr)											
30cm	3.66	3.38	3.15	2.95	2.74	2.59	2.44	2.31	2.21	2.01	1.83
46cm	2.44	2.26	2.11	1.96	1.83	1.73	1.63	1.55	1.47	1.35	1.22
61cm	1.83	1.70	1.57	1.47	1.37	1.30	1.22	1.17	1.09	0.99	0.91

At this point the emitter flow rate and spacing between emitters and rows has been selected. Use the tables to determine the overall water application rate for the turf area.

4. DETERMINE MAXIMUM LATERAL LENGTHS (FEET)

XFS Dripline Maximum Lateral Lengths (Feet)

PSI	12" Spacing Nominal flow (GPH)		18" Spacing Nominal flow (GPH)		24" Spacing Nominal flow (GPH)	
	0.6	0.9	0.6	0.9	0.6	0.9
15	273	155	314	250	424	322
20	318	169	353	294	508	368
30	360	230	413	350	586	414
40	395	255	465	402	652	474
50	417	285	528	420	720	488
60*	460	290	596	455	780	514

* When using 17mm insert fittings with design pressure over 50psi, it is recommended that stainless steel clamps be installed on each fitting.

XFS Dripline Maximum Lateral Lengths (Meters)

Bar	30.5cm Spacing Nominal flow (LPH)		45.7cm Spacing Nominal flow (LPH)		61.0cm Spacing Nominal flow (LPH)	
	.06	.09	.06	.09	.06	0.9
1.03	83.2	47.2	95.7	76.2	129.2	98.2
1.4	96.9	51.5	107.6	89.6	154.8	112.2
2.1	109.7	70.1	125.9	106.7	178.6	123.2
2.8	120.4	77.7	141.7	122.5	198.7	144.5
3.5	127.1	86.9	160.9	128.0	219.5	148.7
4.14*	140.2	88.4	181.7	138.7	237.7	156.7

* When using 17mm insert fittings with design pressure over 3.5 bar, it is recommended that stainless steel clamps be installed on each fitting.

5. CONVERSION FROM GPH TO GPM

XF Series Dripline Flow (per 100 feet)

Emitter Spacing Inches	0.6 GPH Emitter		0.9 GPH Emitter	
	GPH	GPM	GPH	GPM
12"	61.00	1.02	92.00	1.53
18"	41.00	0.68	61.00	1.02
24"	31.00	0.52	46.00	0.77

XF Series Dripline Flow (per 100 Meters)

Emitter Spacing Meters	2.31 L/Hr		3.41 L/Hr	
	L/Hr	L/Min	L/Hr	L/Min
0.30	757.9	12.6	1136.7	18.94
0.46	502.2	8.37	741.3	12.36
0.61	378.7	6.31	559.0	9.32

6. PROPER CONTROL ZONE FOR THE APPLICATION

Control Zone Selection Chart

Model	Size	Flow Range (gpm)	Inlet Pressure (psi)	Valve	Filter	Outlet Pressure (psi)
COMMERCIAL HIGH FLOW: 15-40 gpm						
XCZ-PBR-150-COM	1 1/2" x 2" @ 1"	15-40	20-150	150-PESB	1" Quick-Check Basket Filter (2)	40
COMMERCIAL MEDIUM PLUS FLOW: 3-20 gpm						
XCZ-PRB-100-COM	1" x 1"	3-20	20-150	100-PESB	1" Quick-Check Basket Filter	40
RESIDENTIAL / LIGHT COMMERCIAL MEDIUM FLOW: 3-15 gpm						
XCZ-100-PRF**	1" x 1"	3-15	20-120	100-DV	* 1" Pressure	40
XACZ-100-PRF	1" x 1"	3-15	20-120	100-ASVF	* 1" Pressure	40
RESIDENTIAL / LIGHT COMMERCIAL LOW FLOW: 0.2-5 gpm						
XCZ-075-PRF	3/4" x 3/4"	0.2-5	20-120	LFV-075	* 3/4" Pressure	30
XACZ-075-PRF	3/4" x 3/4"	0.2-5	20-120	ASV-LF-075	* 3/4" Pressure	30
XCZ-LF-100-PRF	1" x 3/4"	0.2-5	20-120	LFV-100	* 3/4" Pressure	30

* Pressure-Regulating RBY Filter

** Available with BSP threads



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