ALPINE LANDSCAPE CONSULTANTS

FRICTION
LOSS
CALCULATION

Date _____
Project _____
Ref. Tables _____

Avail. Static PSI _____ Zone _____
Tap Size _____ Head _____
Meter Elev. _____ Nozzle _____

#	SIZE	COMPONENT	GPM	DISTANCE	PSI LOSS
1		poly lateral			
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21		TOTAL DISTANCE (line#1thru#20)			

[L_c=(line #21)÷100=_____] [F_f=_____PSI/100ft]

22		TOTAL LATERAL LOSS (line#1thru#20)			
23		control valve			**
24		minimum head pressure			
25		elev.± (ft x.433)			
26		TOTAL VALVE LOSS=V_p (#22thru#25)			

27					
28		PVC main			
29		PVC main			
30		PVC main			
31					
32		TOTAL DISTANCE (#27thru#31)			

[L_m=(line #32)÷100=_____] [F_m=_____PSI/100ft]

33		TOTAL MAIN LINE LOSS (#27thru#31)			
34		elev.± (ft x.433)			

35					
36		copper pipe			
37		B. P.			
38		copper pipe			
39		water meter			**
40		copper service line			
41					
42					
43		TOTAL PSI LOSS (#26+(#33thru#42))			
44		% margin			
45		MINIMUM OPERATING PSI (#43+#44)			
46					
47					

** should not exceed 10% of Avail. Static PSI

LATERAL LINE FRICTION-FACTOR $F_f = \frac{P_o \times P_v}{L_c}$

F_f - amount of allowable PSI loss per 100 ft. of pipe, regardless of pipe size.

P_o - operating pressure of sprinkler head (PSI).

P_v - allowable PSI variation (max. is 20% = insert .20 for P_v).

L_c - length of pipe to furthest head (in hundreds of feet).

$$\frac{X}{\qquad} ==$$

MAIN LINE FRICTION-FACTOR $F_m = \frac{V_p \times P_v}{L_m}$

F_m - amount of allowable PSI loss per 100 ft. of pipe, regardless of pipe size.

V_p - min. PSI required at inlet of most distant zone control valve.

P_v - allowable PSI variation (10%-20% = insert .10-.20 for P_v).

L_m - length of main line to farthest valve (in hundreds of feet).

$$\frac{X}{\qquad} ==$$

SURGE PRESSURE $P_t = P_s + [\frac{V \times L_m \times (7.0)}{t}]$

P_t - total PSI during surge (should not exceed burst pressure rating of plastic pipe; which for PVC pipe is 2.5-2.8 times the operating pressure rating).

P_s - operating pressure of the sprinkler system.

V - velocity of flow of water in the system (ft/sec).

L_m - length of main line to zone control valve (in hundreds of feet).

t - valve closing time (seconds).

$$[\quad] + [\frac{X \qquad X\ (7)}{\qquad}] ==$$

SPRAY PRECIP. RATE (in/hr) $P_r = \frac{(96.3) \times gpm}{S \times S}$ DRIP PRECIP. RATE (in/hr) $P_r = \frac{(1.6) \times gph}{S \times S}$

gpm - gal/min applied to area by full-circle sprinkler.

gph - gal/hr rating of emitter.

S - spacing between rows in ft. (2^{nd} "S" $\doteq$ [(.866) x S] for triangular spacing).

$$\frac{X}{X} ==$$

SPRINKLER ZONE OPERATING TIME $T = \frac{I \times (60)}{P_r \times D}$

T - operating time (min/day).

I - irrigation requirement of plantings (inches/week).

P_r - precipation rate of sprinkler zone (inches/hour).

D - days available to irrigate (days/week).

$$\frac{X\ (60)}{X} ==$$