

HYDRAULIC CALCULATIONS AT SPECIFIED DENSITY

THE FOLLOWING SPRINKLERS ARE OPERATING IN:

TEST AREA 1 TEST AREA 2 TEST AREA 3 REMOTE AREA

Elevation of sprinklers = Elevation above water test.

REF. PT.	K	ELEV. ft	FLOW gpm	PRESSURE psi
901	11.00	4.92	53.35	23.52
902	11.00	4.92	51.55	21.96
903	11.00	4.92	51.00	21.50
904	11.00	4.92	50.89	21.40
905	11.00	4.92	53.11	23.31
906	11.00	4.92	50.45	21.03
907	11.00	4.92	49.96	20.62
908	11.00	4.92	49.63	20.35
909	11.00	4.92	53.04	23.25
910	11.00	4.92	49.89	20.57
911	11.00	4.92	49.20	20.00
912	11.00	4.92	49.06	19.89
913	11.00	2.75	54.12	24.20
914	11.00	7.08	48.33	19.30
915	11.00	7.08	47.83	18.90
916	11.00	7.08	47.69	18.79
917	11.00	11.41	46.08	17.55
918	11.00	11.41	45.38	17.02
919	11.00	11.41	45.23	16.91
920	11.00	17.91	42.22	14.73
921	11.00	17.91	41.71	14.38
922	11.00	17.91	41.36	14.14
923	11.00	17.91	42.42	14.87
924	11.00	17.91	41.94	14.53
925	11.00	17.91	41.83	14.46
926	11.00	11.41	46.81	18.10
927	11.00	11.41	46.37	17.77
928	11.00	11.41	46.28	17.70

THE SPRINKLER SYSTEM FLOW IS 1336.73 gpm

THE OUTSIDE HOSE FLOW AT REFERENCE POINT NO. 1 IS 0.00 gpm

THE INSIDE HOSE RACK SPKLR'S.

YARD HYDT. FLOW IS 500.00 gpm

THE MINIMUM DENSITY PROVIDED BY THIS SYSTEM IS 0.450 gpm/sq. ft.

THE FOLLOWING PRESSURES & FLOWS OCCUR
---> AT REF. PT. 1 <---

STATIC PRESSURE	182.00 psi		
RESIDUAL PRESSURE	84.50 psi	AT	3750.00 gpm
TOTAL SYSTEM FLOW	1836.73 gpm		
AVAILABLE PRESSURE	156.00 psi	AT	1836.73 gpm
OPERATING PRESSURE	91.62 psi	AT	1836.73 gpm
PRESSURE REMAINING	64.39 psi		

FITTING Equivalent Length per NFPA 13 1994, 6-4.3

'-' Indicates Equivalent Length. 'T' Indicates Threaded Fitting

1=45 Elbow, 2=90 Elbow, 3='T'/Cross, 4=Butterfly Valve, 5=Gate Valve, 6=Swing Check Valve

FROM	TO	FLOW (gpm)	PIPE (ft)	FITS	EQV. (ft)	H-W C	PIPE TYPE	DIA. (in)	FRIC. (psi)	ELEV. (psi)	FROM (psi)	TO (psi)	DIFF (psi)
1	2	1836.73	130.20	22226	123.00	120	1	10.020	0.009	5.685	91.62	83.54	2.39
2	3	1836.73	134.48	36	78.00	120	1	7.981	0.029	0.000	83.54	77.45	6.08
3	4	1836.73	59.00	0	0.00	120	1	7.981	0.029	0.000	77.45	75.76	1.69
4	5	1836.73	63.96	0	0.00	120	1	7.981	0.029	0.000	75.76	73.93	1.83
5	6	1836.73	96.76	226	71.00	120	1	7.981	0.029	-8.528	73.93	77.65	4.80
6	27	1836.73	154.16	222	39.00	120	1	7.981	0.029	0.000	77.65	72.12	5.53
27	25	1836.73	98.40	0	0.00	120	1	7.981	0.029	0.000	72.12	69.30	2.82
25	301	1836.73	209.67	3	33.00	120	1	7.981	0.029	-2.132	69.30	64.49	6.95
301	302	1336.73	19.68	2	10.00	120	1	6.065	0.061	0.000	64.49	62.69	1.80
302	303	1336.73	52.00	22	20.00	120	1	6.065	0.061	7.107	62.69	51.22	4.36
303	101	1336.73	0.82	2	10.00	120	1	6.065	0.061	0.000	51.22	50.57	0.65
101	102	1175.41	9.84	0	0.00	120	1	4.026	0.351	0.000	50.57	47.12	3.45
102	103	1043.44	9.84	0	0.00	120	1	4.026	0.281	0.000	47.12	44.35	2.77
103	104	937.51	9.84	0	0.00	120	1	4.026	0.231	0.000	44.35	42.08	2.27
104	105	854.46	9.84	0	0.00	120	1	4.026	0.194	0.000	42.08	40.19	1.88
105	106	791.18	9.84	0	0.00	120	1	4.026	0.169	0.000	40.19	38.53	1.66
106	107	744.70	9.84	0	0.00	120	1	4.026	0.151	0.000	38.53	37.05	1.48
107	108	712.18	9.84	0	0.00	120	1	4.026	0.139	0.000	37.05	35.68	1.37
108	109	690.87	9.84	0	0.00	120	1	4.026	0.131	0.000	35.68	34.39	1.29
109	110	678.17	9.84	0	0.00	120	1	4.026	0.127	0.000	34.39	33.15	1.25
110	111	671.20	9.84	0	0.00	120	1	4.026	0.124	0.000	33.15	31.92	1.22
111	112	666.78	9.84	0	0.00	120	1	4.026	0.123	0.000	31.92	30.72	1.21
112	113	660.51	9.84	0	0.00	120	1	4.026	0.121	0.000	30.72	29.53	1.19
113	114	649.06	9.84	0	0.00	120	1	4.026	0.117	0.000	29.53	28.38	1.15
114	115	629.97	9.84	0	0.00	120	1	4.026	0.111	0.000	28.38	27.29	1.09
115	116	600.71	9.84	0	0.00	120	1	4.026	0.101	0.000	27.29	26.29	1.00
116	117	558.13	9.84	0	0.00	120	1	4.026	0.088	0.000	26.29	25.43	0.87
117	118	476.43	9.84	0	0.00	120	1	4.026	0.066	0.000	25.43	24.78	0.64
118	119	318.47	9.84	0	0.00	120	1	4.026	0.031	0.000	24.78	24.50	0.28
119	120	159.38	9.84	0	0.00	120	1	4.026	0.009	0.000	24.50	24.44	0.06
201	202	161.32	9.84	0	0.00	120	1	4.026	0.009	0.000	39.85	39.73	0.12
202	203	293.29	9.84	0	0.00	120	1	4.026	0.027	0.000	39.73	39.43	0.30
203	204	399.22	9.84	0	0.00	120	1	4.026	0.047	0.000	39.43	39.00	0.42
204	205	482.27	9.84	0	0.00	120	1	4.026	0.067	0.000	39.00	38.34	0.66
205	206	545.55	9.84	0	0.00	120	1	4.026	0.085	0.000	38.34	37.51	0.83
206	207	592.03	9.84	0	0.00	120	1	4.026	0.099	0.000	37.51	36.54	0.97
207	208	624.55	9.84	0	0.00	120	1	4.026	0.109	0.000	36.54	35.47	1.07
208	209	645.86	9.84	0	0.00	120	1	4.026	0.116	0.000	35.47	34.33	1.14
209	210	658.55	9.84	0	0.00	120	1	4.026	0.120	0.000	34.33	33.15	1.18
210	211	665.52	9.84	0	0.00	120	1	4.026	0.122	0.000	33.15	31.94	1.20
211	212	669.95	9.84	0	0.00	120	1	4.026	0.124	0.000	31.94	30.72	1.22

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FROM	TO	FLOW (gpm)	PIPE (ft)	FITS	EQV. (ft)	H-W C	PIPE TYPE	DIA. (in)	FRIC. (psi)	ELEV. (psi)	FROM (psi)	TO (psi)	DIFF (psi)
212	213	676.21	9.84	0	0.00	120	1	4.026	0.126	0.000	30.72	29.48	1.24
213	214	687.66	9.84	0	0.00	120	1	4.026	0.130	0.000	29.48	28.20	1.28
214	215	706.76	9.84	0	0.00	120	1	4.026	0.137	0.000	28.20	26.86	1.35
215	216	736.02	9.84	0	0.00	120	1	4.026	0.147	0.000	26.86	25.41	1.45
216	217	778.60	9.84	0	0.00	120	1	4.026	0.164	0.000	25.41	23.80	1.61
217	218	646.68	9.84	0	0.00	120	1	4.026	0.116	0.000	23.80	22.68	1.11
218	219	426.89	9.84	0	0.00	120	1	4.026	0.054	0.000	22.68	22.19	0.50
219	220	212.59	9.84	0	0.00	120	1	4.026	0.015	0.000	22.19	22.08	0.11
101	201	161.32	111.74	0	0.00	120	1	2.469	0.096	0.000	50.57	39.85	10.72
102	202	131.97	111.74	0	0.00	120	1	2.469	0.066	0.000	47.12	39.73	7.39
103	203	105.93	111.74	0	0.00	120	1	2.469	0.044	0.000	44.35	39.43	4.92
104	204	83.05	111.74	0	0.00	120	1	2.469	0.028	0.000	42.08	39.00	3.07
105	205	63.28	111.74	0	0.00	120	1	2.469	0.017	0.000	40.19	38.34	1.85
106	206	46.47	111.74	0	0.00	120	1	2.469	0.010	0.000	38.53	37.51	1.03
107	207	32.52	111.74	0	0.00	120	1	2.469	0.005	0.000	37.05	36.54	0.51
108	208	21.31	111.74	0	0.00	120	1	2.469	0.002	0.000	35.68	35.47	0.22
109	209	12.69	111.74	0	0.00	120	1	2.469	0.001	0.000	34.39	34.33	0.07
110	210	6.97	111.74	0	0.00	120	1	2.469	0.000	0.000	33.15	33.15	0.00
111	211	4.43	111.74	0	0.00	120	1	2.469	0.000	0.000	31.92	31.94	-0.02
112	212	6.26	111.74	0	0.00	120	1	2.469	0.000	0.000	30.72	30.72	-0.01
113	213	11.45	111.74	0	0.00	120	1	2.469	0.001	0.000	29.53	29.48	0.04
114	214	19.10	111.74	0	0.00	120	1	2.469	0.002	0.000	28.38	28.20	0.17
115	215	29.26	111.74	0	0.00	120	1	2.469	0.004	0.000	27.29	26.86	0.43
116	216	42.58	111.74	0	0.00	120	1	2.469	0.008	0.000	26.29	25.41	0.89
217	901	131.92	4.24	0	0.00	120	1	2.469	0.066	0.000	23.80	23.52	0.28
218	902	219.80	4.24	0	0.00	120	1	2.469	0.170	0.000	22.68	21.96	0.72
219	903	214.29	4.24	0	0.00	120	1	2.469	0.162	0.000	22.19	21.50	0.69
220	904	212.59	4.24	0	0.00	120	1	2.469	0.160	0.000	22.08	21.40	0.68
901	905	78.57	9.34	0	0.00	120	1	2.469	0.025	0.000	23.52	23.31	0.21
902	906	168.24	9.34	0	0.00	120	1	2.469	0.104	0.000	21.96	21.03	0.93
903	907	163.29	9.34	0	0.00	120	1	2.469	0.098	0.000	21.50	20.62	0.87
904	908	161.70	9.34	0	0.00	120	1	2.469	0.096	0.000	21.40	20.35	1.05
905	909	25.46	9.34	0	0.00	120	1	2.469	0.003	0.000	23.31	23.25	0.06
906	910	117.79	9.34	0	0.00	120	1	2.469	0.054	0.000	21.03	20.57	0.46
907	911	113.33	9.34	0	0.00	120	1	2.469	0.050	0.000	20.62	20.00	0.62
908	912	112.08	9.34	0	0.00	120	1	2.469	0.049	0.000	20.35	19.89	0.46
909	913	-27.58	9.34	0	0.00	120	1	2.469	0.004	-0.938	23.25	24.20	-0.02
910	914	67.90	9.34	0	0.00	120	1	2.469	0.019	0.938	20.57	19.30	0.33
911	915	64.13	9.34	0	0.00	120	1	2.469	0.017	0.938	20.00	18.90	0.16
912	916	63.02	9.34	0	0.00	120	1	2.469	0.017	0.938	19.89	18.79	0.16
913	117	-81.70	79.37	0	0.00	120	1	2.469	0.027	0.938	24.20	25.43	-2.16
914	917	19.57	9.34	0	0.00	120	1	2.469	0.002	1.876	19.30	17.55	-0.12

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FROM	TO	FLOW (gpm)	PIPE (ft)	FITS	EQV. (ft)	H-W C	PIPE TYPE	DIA. (in)	FRIC. (psi)	ELEV. (psi)	FROM (psi)	TO (psi)	DIFF (psi)
915	918	16.31	9.34	0	0.00	120	1	2.469	0.001	1.876	18.90	17.02	0.01
916	919	15.33	9.34	0	0.00	120	1	2.469	0.001	1.876	18.79	16.91	0.01
917	920	-26.51	9.34	0	0.00	120	1	2.469	0.003	2.814	17.55	14.73	0.00
918	921	-29.08	9.34	0	0.00	120	1	2.469	0.004	2.814	17.02	14.38	-0.17
919	922	-29.90	9.34	0	0.00	120	1	2.469	0.004	2.814	16.91	14.14	-0.04
920	923	-68.72	9.34	0	0.00	120	1	2.469	0.020	0.000	14.73	14.87	-0.15
921	924	-70.79	9.34	0	0.00	120	1	2.469	0.021	0.000	14.38	14.53	-0.16
922	925	-71.26	9.34	0	0.00	120	1	2.469	0.021	0.000	14.14	14.46	-0.33
923	926	-111.15	9.34	0	0.00	120	1	2.469	0.048	-2.814	14.87	18.10	-0.42
924	927	-112.72	9.34	0	0.00	120	1	2.469	0.049	-2.814	14.53	17.77	-0.42
925	928	-113.09	9.34	0	0.00	120	1	2.469	0.050	-2.814	14.46	17.70	-0.42
926	118	-157.96	41.85	0	0.00	120	1	2.469	0.092	-2.814	18.10	24.78	-3.86
927	119	-159.09	41.85	0	0.00	120	1	2.469	0.094	-2.814	17.77	24.50	-3.91
928	120	-159.38	41.85	0	0.00	120	1	2.469	0.094	-2.814	17.70	24.44	-3.93

A MAX. VELOCITY OF 29.62 ft./sec. OCCURS BETWEEN REF. PT. 101 AND 102

Sprinkler-CALC Release 7.2 Win
By Walsh Engineering Inc.
North Kingstown R.I. U.S.A.

Ing. José Prada - Fire Engineer - Loss Prevention Consultant
jose.prada@cantv.net - 58 244 6632769 - 58 416 4326310
Venezuela

H Y D R A U L I C C A L C U L A T I O N S

C O V E R S H E E T

SISTEMA DE ROCIADORES EN GALPON DE MAT PRIMA 2 AL 2ABRIL05

W A T E R S U P P L Y

STATIC PRESSURE (psi) 182
RESIDUAL PRESSURE (psi) 84.5
RESIDUAL FLOW (gpm) 3750

B O O S T E R P U M P S

NUMBER OF BOOSTER PUMPS 0

S P R I N K L E R S

MAXIMUM SPACING OF SPRINKLERS (ft) 9.34
MAXIMUM SPACING OF SPRINKLER LINES (ft) 9.84
SPECIFIED DISCHARGE DENSITY (gpm/sq. ft.) .45

THIS SPRINKLER SYSTEM WILL DELIVER A DENSITY OF .45 gpm/sq. ft.
FOR A DESIGN AREA OF 2500 SQ. FT. OF FLOOR AREA

THIS SYSTEM OPERATES AT A FLOW OF 1336.73 gpm AT A PRESSURE OF 64.49 psi
AT THE BASE OF THE RISER (REF. PT. %301)

PIPES USED FOR THIS SYSTEM

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001 SCHEDULE 40

