

# Hydraulic Calculations for

**Project:** Your First System version 2  
**Drawing no.:**  
**Date:** 10/16/2009

## Design

**Remote area number:**  
**Remote area location:** Hydraulically most remote  
**Occupancy classification:** ordinary hazard group II  
**Density:** 0.20 gpm/sq.ft.  
**Area of application:** 1500 sq.ft.  
**Coverage per sprinkler:** 100 sq.ft.  
**Type of sprinklers calculated:** Standard 1/2" upright  
**No. of sprinklers calculated:** 16  
**In rack demand:** none  
**Hose streams:** 250 gpm outside + none inside  
**Total water required (including hose streams):** 623.8 gpm at 54.03 psi [ 5.53 psi safety margin ]  
**Total water required at base of system riser:** 373.8 gpm at 39.51 psi  
**Type of system:** wet pipe  
**Volume of dry or preaction system:**

## Water Supply Information

**Date:** Sept. 15, 2009  
**Location:** at site  
**Source:** Igneus Inc.

**Contractor:** Fire Pro Corporation  
P.O. Box 46  
404 North Cedar  
Shelbyville, IL 62565  
Ph: (217)774-5342

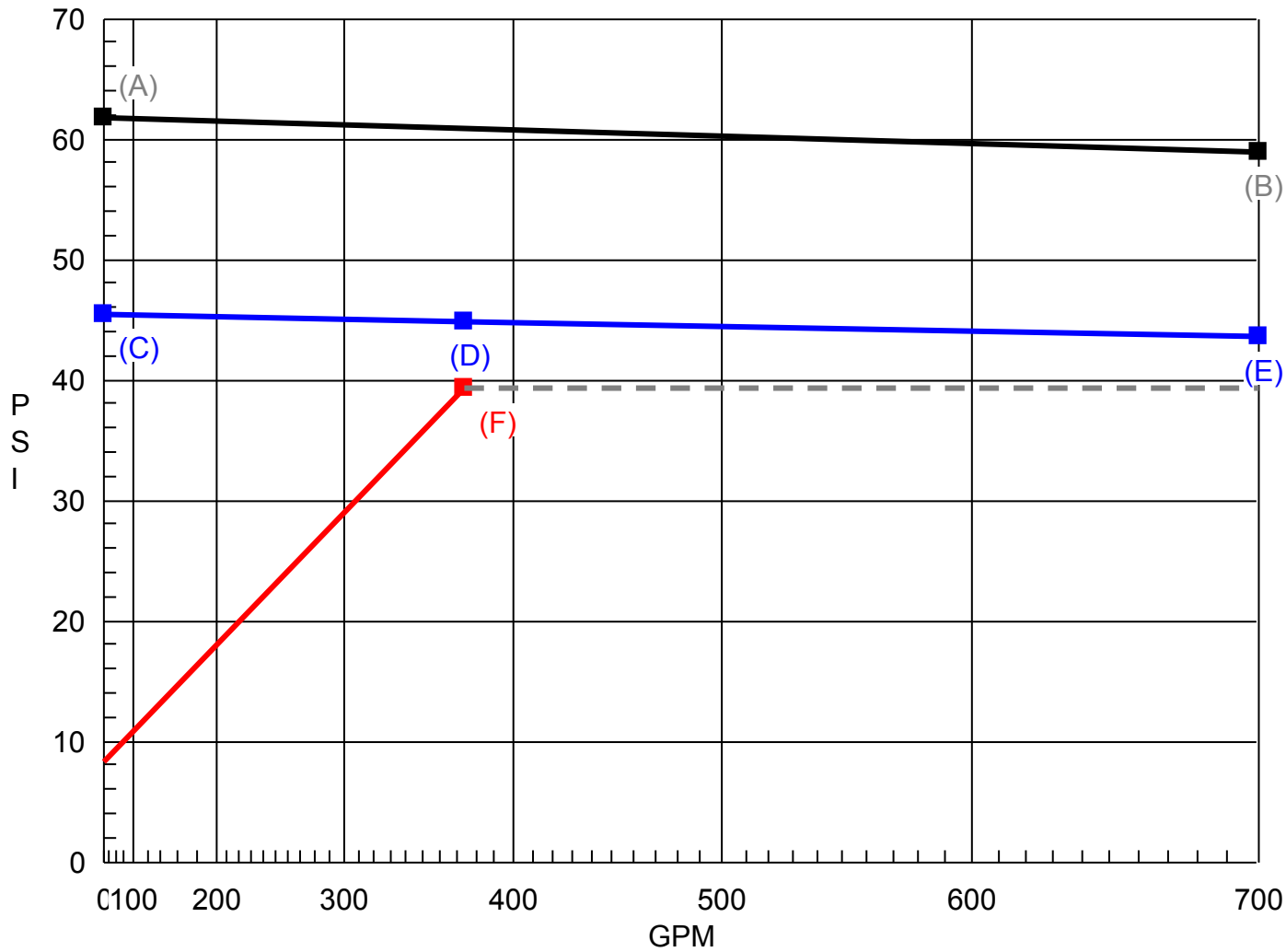
**Under contract with:** Igneus Incorporated  
**Name of designer:** Trevor Spain, NICET #113061  
Automatic Sprinkler System Layout Level IV

**Authority having jurisdiction:** None

## Notes

Basic tree system piping layout using the "system helper" commands. Crossmain modified for obstruction. See the "Getting Started" guide for instruction.

### Hydraulic Demand Graph



Water Source:  
A) 62 psi Static  
B) 700 gpm at 58.99 psi

Source at BOR:  
C) 45.65 psi Static  
D) 373.8 gpm at 45.04 psi  
E) 700 gpm at 43.71 psi

Demand at BOR:  
F) 373.8 gpm at 39.51 psi

## Supply Analysis

Node at	Static Pressure [psi]	Residual Pressure [psi]	Flow [gpm]	Available Pressure [psi]	Total Demand [gpm]	Required Pressure [psi]
Src	62.0	54.0	1187.0	59.57	623.8	54.03

## Node Analysis

Node Tag	Elev [ft]	Type	Pressure [psi]	ReqDisch [gpm]	Discharge [gpm]	Node Tag	Elev [ft]	Type	Pressure [psi]	ReqDisch [gpm]	Discharge [gpm]
Src	-6.000	source	54.033		-623.797	L6-6	19.417	ref	30.846		0.000
Tap	-6.000	ref	53.692	250.000	250.000	L7-1	23.583	ref	29.360		0.000
Spq	1.000	ref	50.334		0.000	L7-2	22.750	ref	29.721		0.000
Bor	4.042	ref	39.510		0.000	L7-3	21.917	ref	30.082		0.000
Tor	17.083	ref	32.567		0.000	L7-4	21.083	ref	30.443		0.000
M1-1	17.083	ref	30.040		0.000	L7-5	20.250	ref	30.804		0.000
M1-2	17.083	ref	30.076		0.000	L7-6	19.417	ref	31.165		0.000
M1-3	17.083	ref	30.944		0.000	L8-1	23.583	ref	29.679		0.000
M1-4	17.083	ref	31.220		0.000	L8-2	22.750	ref	30.039		0.000
M1-5	17.083	ref	31.538		0.000	L8-3	21.917	ref	30.400		0.000
M1-6	17.083	ref	31.857		0.000	L8-4	21.083	ref	30.761		0.000
M1-7	17.083	ref	32.175		0.000	L8-5	20.250	ref	31.122		0.000
M1-8	17.083	ref	32.493		0.000	L8-6	19.417	ref	31.483		0.000
L1-1	23.583	K=5.60	12.755	20.000	20.000	R1-1	19.250	ref	27.626		0.000
L1-2	22.750	K=5.60	14.417	20.000	21.263	R1-2	19.250	ref	27.660		0.000
L1-3	21.917	K=5.60	16.085	20.000	22.459	R1-3	19.250	ref	28.485		0.000
L1-4	21.083	K=5.60	19.366	20.000	24.644	R1-4	19.250	ref	30.177		0.000
L1-5	20.250	K=5.60	22.250	20.000	26.415	R1-5	19.250	ref	30.600		0.000
L1-6	19.417	ref	26.705		0.000	R1-6	19.250	ref	30.918		0.000
L2-1	23.583	K=5.60	12.773	20.000	20.014	R1-7	19.250	ref	31.237		0.000
L2-2	22.750	K=5.60	14.437	20.000	21.278	R1-8	19.250	ref	31.555		0.000
L2-3	21.917	K=5.60	16.106	20.000	22.474						
L2-4	21.083	K=5.60	19.391	20.000	24.659						
L2-5	20.250	K=5.60	22.278	20.000	26.432						
L2-6	19.417	ref	26.738		0.000						
L3-1	23.583	K=5.60	13.206	20.000	20.350						
L3-2	22.750	K=5.60	14.911	20.000	21.624						
L3-3	21.917	K=5.60	16.620	20.000	22.830						
L3-4	21.083	K=5.60	19.994	20.000	25.040						
L3-5	20.250	K=5.60	22.957	20.000	26.831						
L3-6	19.417	ref	27.538		0.000						
L4-1	23.583	K=5.60	24.084	20.000	27.482						
L4-2	22.750	ref	26.787		0.000						
L4-3	21.917	ref	27.764		0.000						
L4-4	21.083	ref	28.741		0.000						
L4-5	20.250	ref	29.393		0.000						
L4-6	19.417	ref	30.045		0.000						
L5-1	23.583	ref	28.724		0.000						
L5-2	22.750	ref	29.085		0.000						
L5-3	21.917	ref	29.445		0.000						
L5-4	21.083	ref	29.806		0.000						
L5-5	20.250	ref	30.167		0.000						
L5-6	19.417	ref	30.528		0.000						
L6-1	23.583	ref	29.042		0.000						
L6-2	22.750	ref	29.403		0.000						
L6-3	21.917	ref	29.764		0.000						
L6-4	21.083	ref	30.125		0.000						
L6-5	20.250	ref	30.485		0.000						

### Pipe Information

Pipe	Node 1 Node 2	Elev [ft]	K-factor	Discharge & Flow [gpm]	Nom i.d. [in]	Fittings num & length [ft]	L [ft] F [ft] T [ft]	material C factor psi/ft	Pressure Summary [psi]	Notes
City	Src	-6.000		q=-623.797	8		150.000	CDI	Pt= 54.033 Pe= 0.000	
	Tap	-6.000		Q= 623.797	8.39		0.000	C=140	Pf= -0.341 Pv= 0.088	
				q= 250.000			150.000	0.002	Pt= 53.692 Vel= 3.62	
Leadin	Tap	-6.000		q= 250.000	6	1LE=14.183	29.000	CDI	Pt= 53.692 Pe= 3.031	
				Q= 373.797	6.28	1T=47.277	61.460	C=140	Pf= -0.327 Pv= 0.101	
	Spg	1.000		q= 0.000			90.460	0.004	Pt= 50.334 Vel= 3.87	
Rpz	Spg	1.000		q= 0.000	4		0.958	S10	Pt= 50.334 Pe= 1.317 Pdev=9.48 psi	
				Q= 373.797	4.26		0.000	C=120	Pf= -0.031 Pv= 0.476	
	Bor	4.042		q= 0.000			0.958	0.032	Pt= 39.510 Vel= 8.41	
Riser	Bor	4.042		q= 0.000	4	2E=26.334	14.375	S10	Pt= 39.510 Pe= 5.647	
				Q= 373.797	4.26		26.334	C=120	Pf= -1.296 Pv= 0.476	
	Tor	17.083		q= 0.000			40.709	0.032	Pt= 32.567 Vel= 8.41	
Bulk	Tor	17.083		q= 0.000	4		2.333	S10	Pt= 32.567 Pe= 0.000	
				Q= 373.797	4.26		0.000	C=120	Pf= -0.074 Pv= 0.476	
	M1-8	17.083		q= 0.000			2.333	0.032	Pt= 32.493 Vel= 8.41	
M1-1	M1-1	17.083		q= 0.000	4		10.000	S10	Pt= 30.040 Pe= 0.000	
				Q=-114.782	4.26		0.000	C=120	Pf= 0.036 Pv= 0.045	
	M1-2	17.083		q= 0.000			10.000	0.004	Pt= 30.076 Vel= 2.58	
M1-2	M1-2	17.083		q= 0.000	4	4E=52.668	14.500	S10	Pt= 30.076 Pe= 0.000	
				Q=-229.639	4.26		52.668	C=120	Pf= 0.868 Pv= 0.180	
	M1-3	17.083		q= 0.000			67.168	0.013	Pt= 30.944 Vel= 5.17	
M1-3	M1-3	17.083		q= 0.000	4		10.000	S10	Pt= 30.944 Pe= 0.000	
				Q=-346.315	4.26		0.000	C=120	Pf= 0.276 Pv= 0.409	
	M1-4	17.083		q= 0.000			10.000	0.028	Pt= 31.220 Vel= 7.80	
M1-4	M1-4	17.083		q= 0.000	4		10.000	S10	Pt= 31.220 Pe= 0.000	
				Q=-373.797	4.26		0.000	C=120	Pf= 0.318 Pv= 0.476	
	M1-5	17.083		q= 0.000			10.000	0.032	Pt= 31.538 Vel= 8.41	
M1-5	M1-5	17.083		q= 0.000	4		10.000	S10	Pt= 31.538 Pe= 0.000	
				Q=-373.797	4.26		0.000	C=120	Pf= 0.318 Pv= 0.476	
	M1-6	17.083		q= 0.000			10.000	0.032	Pt= 31.857 Vel= 8.41	
M1-6	M1-6	17.083		q= 0.000	4		10.000	S10	Pt= 31.857 Pe= 0.000	
				Q=-373.797	4.26		0.000	C=120	Pf= 0.318 Pv= 0.476	
	M1-7	17.083		q= 0.000			10.000	0.032	Pt= 32.175 Vel= 8.41	
M1-7	M1-7	17.083		q= 0.000	4		10.000	S10	Pt= 32.175 Pe= 0.000	
				Q=-373.797	4.26		0.000	C=120	Pf= 0.318 Pv= 0.476	
	M1-8	17.083		q= 0.000			10.000	0.032	Pt= 32.493 Vel= 8.41	
L1-1	L1-1	23.583	5.6	q= 20.000	1		10.000	S40	Pt= 12.755 Pe= -0.361	
				Q= -20.000	1.049		0.000	C=120	Pf= 1.301 Pv= 0.371	
	L1-2	22.750	5.6	q= 21.263			10.000	0.13	Pt= 14.417 Vel= 7.42	
L1-2	L1-2	22.750	5.6	q= 21.263	1.25		10.000	S40	Pt= 14.417 Pe= -0.361	
				Q= -41.263	1.38		0.000	C=120	Pf= 1.307 Pv= 0.527	
	L1-3	21.917	5.6	q= 22.459			10.000	0.131	Pt= 16.085 Vel= 8.85	

Pipe Information, cont.

Pipe	Node 1 Node 2	Elev [ft]	K-factor	Discharge & Flow [gpm]	Nom i.d. [in]	Fittings num & length [ft]	L [ft] F [ft] T [ft]	material C factor psi/ft	Pressure Summary [psi]	Notes
L1-3	L1-3	21.917	5.6	q= 22.459	1.25		10.000	S40	Pt= 16.085 Pe= -0.361	
				Q= -63.723	1.38		0.000	C=120	Pf= 2.920 Pv= 1.257	
	L1-4	21.083	5.6	q= 24.644			10.000	0.292	Pt= 19.366 Vel= 13.67	
L1-4	L1-4	21.083	5.6	q= 24.644	1.5		10.000	S40	Pt= 19.366 Pe= -0.361	
				Q= -88.366	1.61		0.000	C=120	Pf= 2.524 Pv= 1.305	
	L1-5	20.250	5.6	q= 26.415			10.000	0.252	Pt= 22.250 Vel= 13.93	
L1-5	L1-5	20.250	5.6	q= 26.415	1.5		10.000	S40	Pt= 22.250 Pe= -0.361	
				Q= -114.782	1.61		0.000	C=120	Pf= 4.094 Pv= 2.202	
	L1-6	19.417		q= 0.000			10.000	0.409	Pt= 26.705 Vel= 18.09	
L1-6	L1-6	19.417		q= 0.000	2	1E=5.000	2.000	S40	Pt= 26.705 Pe= -0.072	
				Q= -114.782	2.067		5.000	C=120	Pf= 0.849 Pv= 0.811	
	R1-1	19.250		q= 0.000			7.000	0.121	Pt= 27.626 Vel= 10.97	
L2-1	L2-1	23.583	5.6	q= 20.014	1		10.000	S40	Pt= 12.773 Pe= -0.361	
				Q= -20.014	1.049		0.000	C=120	Pf= 1.303 Pv= 0.371	
	L2-2	22.750	5.6	q= 21.278			10.000	0.13	Pt= 14.437 Vel= 7.43	
L2-2	L2-2	22.750	5.6	q= 21.278	1.25		10.000	S40	Pt= 14.437 Pe= -0.361	
				Q= -41.292	1.38		0.000	C=120	Pf= 1.309 Pv= 0.528	
	L2-3	21.917	5.6	q= 22.474			10.000	0.131	Pt= 16.106 Vel= 8.86	
L2-3	L2-3	21.917	5.6	q= 22.474	1.25		10.000	S40	Pt= 16.106 Pe= -0.361	
				Q= -63.766	1.38		0.000	C=120	Pf= 2.924 Pv= 1.259	
	L2-4	21.083	5.6	q= 24.659			10.000	0.292	Pt= 19.391 Vel= 13.68	
L2-4	L2-4	21.083	5.6	q= 24.659	1.5		10.000	S40	Pt= 19.391 Pe= -0.361	
				Q= -88.425	1.61		0.000	C=120	Pf= 2.527 Pv= 1.307	
	L2-5	20.250	5.6	q= 26.432			10.000	0.253	Pt= 22.278 Vel= 13.94	
L2-5	L2-5	20.250	5.6	q= 26.432	1.5		10.000	S40	Pt= 22.278 Pe= -0.361	
				Q= -114.857	1.61		0.000	C=120	Pf= 4.099 Pv= 2.205	
	L2-6	19.417		q= 0.000			10.000	0.41	Pt= 26.738 Vel= 18.10	
L2-6	L2-6	19.417		q= 0.000	2	1E=5.000	2.000	S40	Pt= 26.738 Pe= -0.072	
				Q= -114.857	2.067		5.000	C=120	Pf= 0.850 Pv= 0.812	
	R1-2	19.250		q= 0.000			7.000	0.121	Pt= 27.660 Vel= 10.98	
L3-1	L3-1	23.583	5.6	q= 20.350	1		10.000	S40	Pt= 13.206 Pe= -0.361	
				Q= -20.350	1.049		0.000	C=120	Pf= 1.344 Pv= 0.384	
	L3-2	22.750	5.6	q= 21.624			10.000	0.134	Pt= 14.911 Vel= 7.55	
L3-2	L3-2	22.750	5.6	q= 21.624	1.25		10.000	S40	Pt= 14.911 Pe= -0.361	
				Q= -41.974	1.38		0.000	C=120	Pf= 1.349 Pv= 0.546	
	L3-3	21.917	5.6	q= 22.830			10.000	0.135	Pt= 16.620 Vel= 9.00	
L3-3	L3-3	21.917	5.6	q= 22.830	1.25		10.000	S40	Pt= 16.620 Pe= -0.361	
				Q= -64.805	1.38		0.000	C=120	Pf= 3.012 Pv= 1.300	
	L3-4	21.083	5.6	q= 25.040			10.000	0.301	Pt= 19.994 Vel= 13.90	
L3-4	L3-4	21.083	5.6	q= 25.040	1.5		10.000	S40	Pt= 19.994 Pe= -0.361	
				Q= -89.845	1.61		0.000	C=120	Pf= 2.602 Pv= 1.349	
	L3-5	20.250	5.6	q= 26.831			10.000	0.26	Pt= 22.957 Vel= 14.16	

Pipe Information, cont.

Pipe	Node 1 Node 2	Elev [ft]	K-factor	Discharge & Flow [gpm]	Nom i.d. [in]	Fittings num & length [ft]	L [ft] F [ft] T [ft]	material C factor psi/ft	Pressure Summary [psi]	Notes
L3-5	L3-5	20.250	5.6	q= 26.831 Q=-116.676	1.5 1.61		10.000 0.000	S40 C=120	Pt= 22.957 Pe= -0.361 Pf= 4.220 Pv= 2.275	
	L3-6	19.417		q= 0.000			10.000	0.422	Pt= 27.538 Vel= 18.39	
	L3-6	19.417		q= 0.000 Q=-116.676	2 2.067	1E=5.000	2.000 5.000	S40 C=120	Pt= 27.538 Pe= -0.072 Pf= 0.875 Pv= 0.837	
	R1-3	19.250		q= 0.000			7.000	0.125	Pt= 28.485 Vel= 11.16	
L4-1	L4-1	23.583	5.6	q= 27.482 Q= -27.482	1 1.049		10.000 0.000	S40 C=120	Pt= 24.084 Pe= -0.361 Pf= 2.343 Pv= 0.700	
	L4-2	22.750		q= 0.000			10.000	0.234	Pt= 26.787 Vel= 10.20	
L4-2	L4-2	22.750		q= 0.000 Q= -27.482	1.25 1.38		10.000 0.000	S40 C=120	Pt= 26.787 Pe= -0.361 Pf= 0.616 Pv= 0.234	
	L4-3	21.917		q= 0.000			10.000	0.062	Pt= 27.764 Vel= 5.89	
L4-3	L4-3	21.917		q= 0.000 Q= -27.482	1.25 1.38		10.000 0.000	S40 C=120	Pt= 27.764 Pe= -0.361 Pf= 0.616 Pv= 0.234	
	L4-4	21.083		q= 0.000			10.000	0.062	Pt= 28.741 Vel= 5.89	
L4-4	L4-4	21.083		q= 0.000 Q= -27.482	1.5 1.61		10.000 0.000	S40 C=120	Pt= 28.741 Pe= -0.361 Pf= 0.291 Pv= 0.126	
	L4-5	20.250		q= 0.000			10.000	0.029	Pt= 29.393 Vel= 4.33	
L4-5	L4-5	20.250		q= 0.000 Q= -27.482	1.5 1.61		10.000 0.000	S40 C=120	Pt= 29.393 Pe= -0.361 Pf= 0.291 Pv= 0.126	
	L4-6	19.417		q= 0.000			10.000	0.029	Pt= 30.045 Vel= 4.33	
L4-6	L4-6	19.417		q= 0.000 Q= -27.482	2 2.067	1E=5.000	2.000 5.000	S40 C=120	Pt= 30.045 Pe= -0.072 Pf= 0.060 Pv= 0.046	
	R1-4	19.250		q= 0.000			7.000	0.009	Pt= 30.177 Vel= 2.63	
L5-1	L5-1	23.583		q= 0.000 Q= 0.000	1 1.049		10.000 0.000	S40 C=120	Pt= 28.724 Pe= -0.361 Pf= 0.000 Pv= 0.000	
	L5-2	22.750		q= 0.000			10.000	0	Pt= 29.085 Vel= 0.00	
L5-2	L5-2	22.750		q= 0.000 Q= 0.000	1.25 1.38		10.000 0.000	S40 C=120	Pt= 29.085 Pe= -0.361 Pf= 0.000 Pv= 0.000	
	L5-3	21.917		q= 0.000			10.000	0	Pt= 29.445 Vel= 0.00	
L5-3	L5-3	21.917		q= 0.000 Q= 0.000	1.25 1.38		10.000 0.000	S40 C=120	Pt= 29.445 Pe= -0.361 Pf= 0.000 Pv= 0.000	
	L5-4	21.083		q= 0.000			10.000	0	Pt= 29.806 Vel= 0.00	
L5-4	L5-4	21.083		q= 0.000 Q= 0.000	1.5 1.61		10.000 0.000	S40 C=120	Pt= 29.806 Pe= -0.361 Pf= 0.000 Pv= 0.000	
	L5-5	20.250		q= 0.000			10.000	0	Pt= 30.167 Vel= 0.00	
L5-5	L5-5	20.250		q= 0.000 Q= 0.000	1.5 1.61		10.000 0.000	S40 C=120	Pt= 30.167 Pe= -0.361 Pf= 0.000 Pv= 0.000	
	L5-6	19.417		q= 0.000			10.000	0	Pt= 30.528 Vel= 0.00	
L5-6	L5-6	19.417		q= 0.000 Q= 0.000	2 2.067	1E=5.000	2.000 5.000	S40 C=120	Pt= 30.528 Pe= -0.072 Pf= 0.000 Pv= 0.000	
	R1-5	19.250		q= 0.000			7.000	0	Pt= 30.600 Vel= 0.00	

Pipe Information, cont.

Pipe	Node 1 Node 2	Elev [ft]	K-factor	Discharge & Flow [gpm]	Nom i.d. [in]	Fittings num & length [ft]	L [ft] F [ft] T [ft]	material C factor psi/ft	Pressure Summary [psi]	Notes
L6-1	L6-1	23.583		q= 0.000	1		10.000	S40	Pt= 29.042 Pe= -0.361	
				Q= 0.000	1.049		0.000	C=120	Pf= 0.000 Pv= 0.000	
	L6-2	22.750		q= 0.000			10.000	0	Pt= 29.403 Vel= 0.00	
L6-2	L6-2	22.750		q= 0.000	1.25		10.000	S40	Pt= 29.403 Pe= -0.361	
				Q= 0.000	1.38		0.000	C=120	Pf= 0.000 Pv= 0.000	
	L6-3	21.917		q= 0.000			10.000	0	Pt= 29.764 Vel= 0.00	
L6-3	L6-3	21.917		q= 0.000	1.25		10.000	S40	Pt= 29.764 Pe= -0.361	
				Q= 0.000	1.38		0.000	C=120	Pf= 0.000 Pv= 0.000	
	L6-4	21.083		q= 0.000			10.000	0	Pt= 30.125 Vel= 0.00	
L6-4	L6-4	21.083		q= 0.000	1.5		10.000	S40	Pt= 30.125 Pe= -0.361	
				Q= 0.000	1.61		0.000	C=120	Pf= 0.000 Pv= 0.000	
	L6-5	20.250		q= 0.000			10.000	0	Pt= 30.485 Vel= 0.00	
L6-5	L6-5	20.250		q= 0.000	1.5		10.000	S40	Pt= 30.485 Pe= -0.361	
				Q= 0.000	1.61		0.000	C=120	Pf= 0.000 Pv= 0.000	
	L6-6	19.417		q= 0.000			10.000	0	Pt= 30.846 Vel= 0.00	
L6-6	L6-6	19.417		q= 0.000	2	1E=5.000	2.000	S40	Pt= 30.846 Pe= -0.072	
				Q= 0.000	2.067		5.000	C=120	Pf= 0.000 Pv= 0.000	
	R1-6	19.250		q= 0.000			7.000	0	Pt= 30.918 Vel= 0.00	
L7-1	L7-1	23.583		q= 0.000	1		10.000	S40	Pt= 29.360 Pe= -0.361	
				Q= 0.000	1.049		0.000	C=120	Pf= 0.000 Pv= 0.000	
	L7-2	22.750		q= 0.000			10.000	0	Pt= 29.721 Vel= 0.00	
L7-2	L7-2	22.750		q= 0.000	1.25		10.000	S40	Pt= 29.721 Pe= -0.361	
				Q= 0.000	1.38		0.000	C=120	Pf= 0.000 Pv= 0.000	
	L7-3	21.917		q= 0.000			10.000	0	Pt= 30.082 Vel= 0.00	
L7-3	L7-3	21.917		q= 0.000	1.25		10.000	S40	Pt= 30.082 Pe= -0.361	
				Q= 0.000	1.38		0.000	C=120	Pf= 0.000 Pv= 0.000	
	L7-4	21.083		q= 0.000			10.000	0	Pt= 30.443 Vel= 0.00	
L7-4	L7-4	21.083		q= 0.000	1.5		10.000	S40	Pt= 30.443 Pe= -0.361	
				Q= 0.000	1.61		0.000	C=120	Pf= 0.000 Pv= 0.000	
	L7-5	20.250		q= 0.000			10.000	0	Pt= 30.804 Vel= 0.00	
L7-5	L7-5	20.250		q= 0.000	1.5		10.000	S40	Pt= 30.804 Pe= -0.361	
				Q= 0.000	1.61		0.000	C=120	Pf= 0.000 Pv= 0.000	
	L7-6	19.417		q= 0.000			10.000	0	Pt= 31.165 Vel= 0.00	
L7-6	L7-6	19.417		q= 0.000	2	1E=5.000	2.000	S40	Pt= 31.165 Pe= -0.072	
				Q= 0.000	2.067		5.000	C=120	Pf= 0.000 Pv= 0.000	
	R1-7	19.250		q= 0.000			7.000	0	Pt= 31.237 Vel= 0.00	
L8-1	L8-1	23.583		q= 0.000	1		10.000	S40	Pt= 29.679 Pe= -0.361	
				Q= 0.000	1.049		0.000	C=120	Pf= 0.000 Pv= 0.000	
	L8-2	22.750		q= 0.000			10.000	0	Pt= 30.039 Vel= 0.00	
L8-2	L8-2	22.750		q= 0.000	1.25		10.000	S40	Pt= 30.039 Pe= -0.361	
				Q= 0.000	1.38		0.000	C=120	Pf= 0.000 Pv= 0.000	
	L8-3	21.917		q= 0.000			10.000	0	Pt= 30.400 Vel= 0.00	

Pipe Information, cont.

Pipe	Node 1 Node 2	Elev [ft]	K-factor	Discharge & Flow [gpm]	Nom i.d. [in]	Fittings num & length [ft]	L [ft] F [ft] T [ft]	material C factor psi/ft	Pressure Summary [psi]	Notes
L8-3	L8-3	21.917		q= 0.000	1.25		10.000	S40	Pt= 30.400 Pe= -0.361	
				Q= 0.000	1.38		0.000	C=120	Pf= 0.000 Pv= 0.000	
	L8-4	21.083		q= 0.000			10.000	0	Pt= 30.761 Vel= 0.00	
L8-4	L8-4	21.083		q= 0.000	1.5		10.000	S40	Pt= 30.761 Pe= -0.361	
				Q= 0.000	1.61		0.000	C=120	Pf= 0.000 Pv= 0.000	
	L8-5	20.250		q= 0.000			10.000	0	Pt= 31.122 Vel= 0.00	
L8-5	L8-5	20.250		q= 0.000	1.5		10.000	S40	Pt= 31.122 Pe= -0.361	
				Q= 0.000	1.61		0.000	C=120	Pf= 0.000 Pv= 0.000	
	L8-6	19.417		q= 0.000			10.000	0	Pt= 31.483 Vel= 0.00	
L8-6	L8-6	19.417		q= 0.000	2	1E=5.000	2.000	S40	Pt= 31.483 Pe= -0.072	
				Q= 0.000	2.067		5.000	C=120	Pf= 0.000 Pv= 0.000	
	R1-8	19.250		q= 0.000			7.000	0	Pt= 31.555 Vel= 0.00	
R1-1	M1-1	17.083		q= 0.000	2	1T=10.000	2.167	S40	Pt= 30.040 Pe= 0.938	
				Q= 114.782	2.067		10.000	C=120	Pf= -1.475 Pv= 0.811	
	R1-1	19.250		q= 0.000			12.167	0.121	Pt= 27.626 Vel= 10.97	
R1-2	M1-2	17.083		q= 0.000	2	1T=10.000	2.167	S40	Pt= 30.076 Pe= 0.938	
				Q= 114.857	2.067		10.000	C=120	Pf= -1.477 Pv= 0.812	
	R1-2	19.250		q= 0.000			12.167	0.121	Pt= 27.660 Vel= 10.98	
R1-3	M1-3	17.083		q= 0.000	2	1T=10.000	2.167	S40	Pt= 30.944 Pe= 0.938	
				Q= 116.676	2.067		10.000	C=120	Pf= -1.521 Pv= 0.837	
	R1-3	19.250		q= 0.000			12.167	0.125	Pt= 28.485 Vel= 11.16	
R1-4	M1-4	17.083		q= 0.000	2	1T=10.000	2.167	S40	Pt= 31.220 Pe= 0.938	
				Q= 27.482	2.067		10.000	C=120	Pf= -0.105 Pv= 0.046	
	R1-4	19.250		q= 0.000			12.167	0.009	Pt= 30.177 Vel= 2.63	
R1-5	M1-5	17.083		q= 0.000	2	1T=10.000	2.167	S40	Pt= 31.538 Pe= 0.938	
				Q= 0.000	2.067		10.000	C=120	Pf= 0.000 Pv= 0.000	
	R1-5	19.250		q= 0.000			12.167	0	Pt= 30.600 Vel= 0.00	
R1-6	M1-6	17.083		q= 0.000	2	1T=10.000	2.167	S40	Pt= 31.857 Pe= 0.938	
				Q= 0.000	2.067		10.000	C=120	Pf= 0.000 Pv= 0.000	
	R1-6	19.250		q= 0.000			12.167	0	Pt= 30.918 Vel= 0.00	
R1-7	M1-7	17.083		q= 0.000	2	1T=10.000	2.167	S40	Pt= 32.175 Pe= 0.938	
				Q= 0.000	2.067		10.000	C=120	Pf= 0.000 Pv= 0.000	
	R1-7	19.250		q= 0.000			12.167	0	Pt= 31.237 Vel= 0.00	
R1-8	M1-8	17.083		q= 0.000	2	1T=10.000	2.167	S40	Pt= 32.493 Pe= 0.938	
				Q= 0.000	2.067		10.000	C=120	Pf= 0.000 Pv= 0.000	
	R1-8	19.250		q= 0.000			12.167	0	Pt= 31.555 Vel= 0.00	

**Material Codes****Pipe Material**

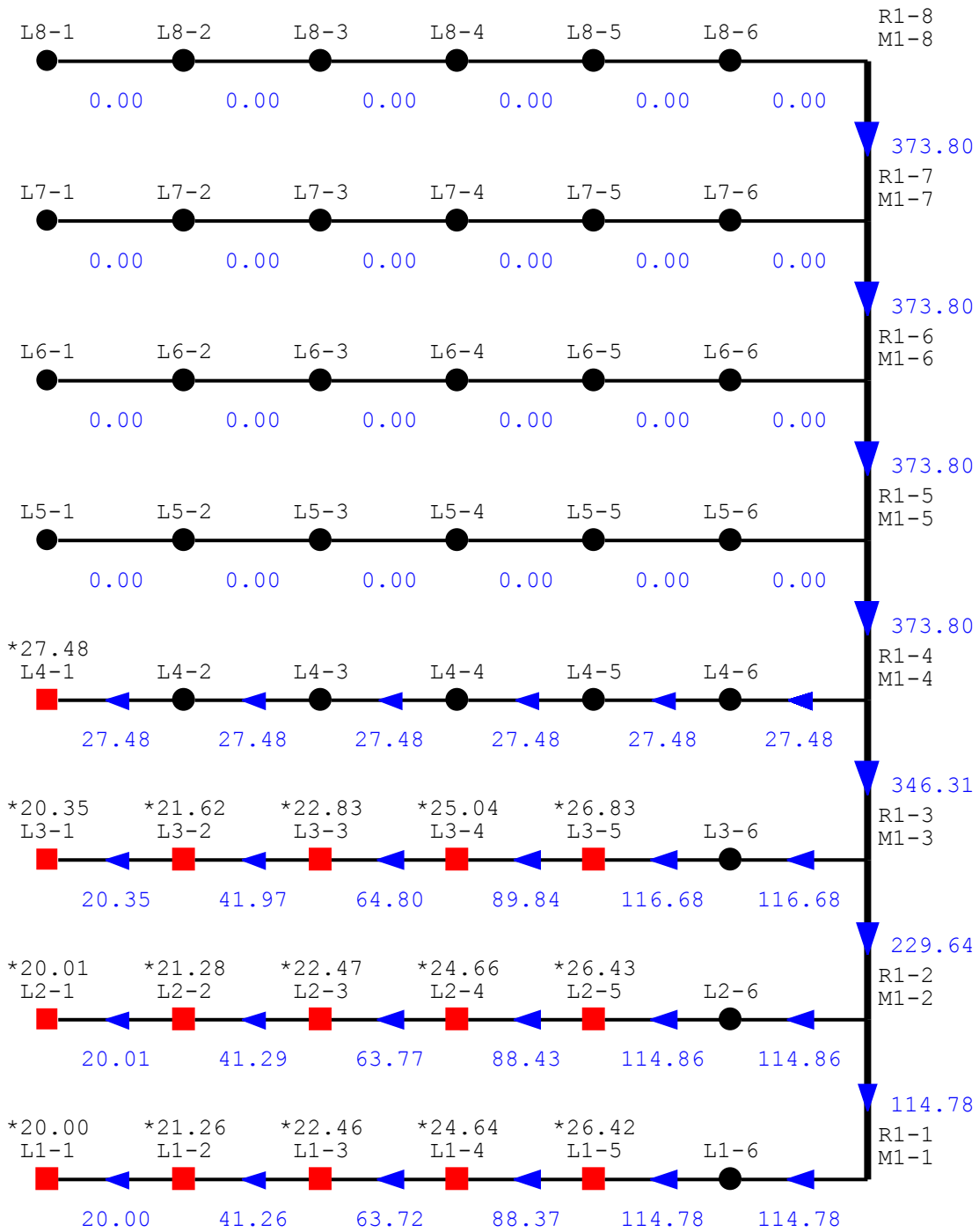
CDI - Cement Lined Ductile Iron Thickness Class 50  
S10 - Schedule 10 Steel  
S40 - Schedule 40 Steel

**Fittings**

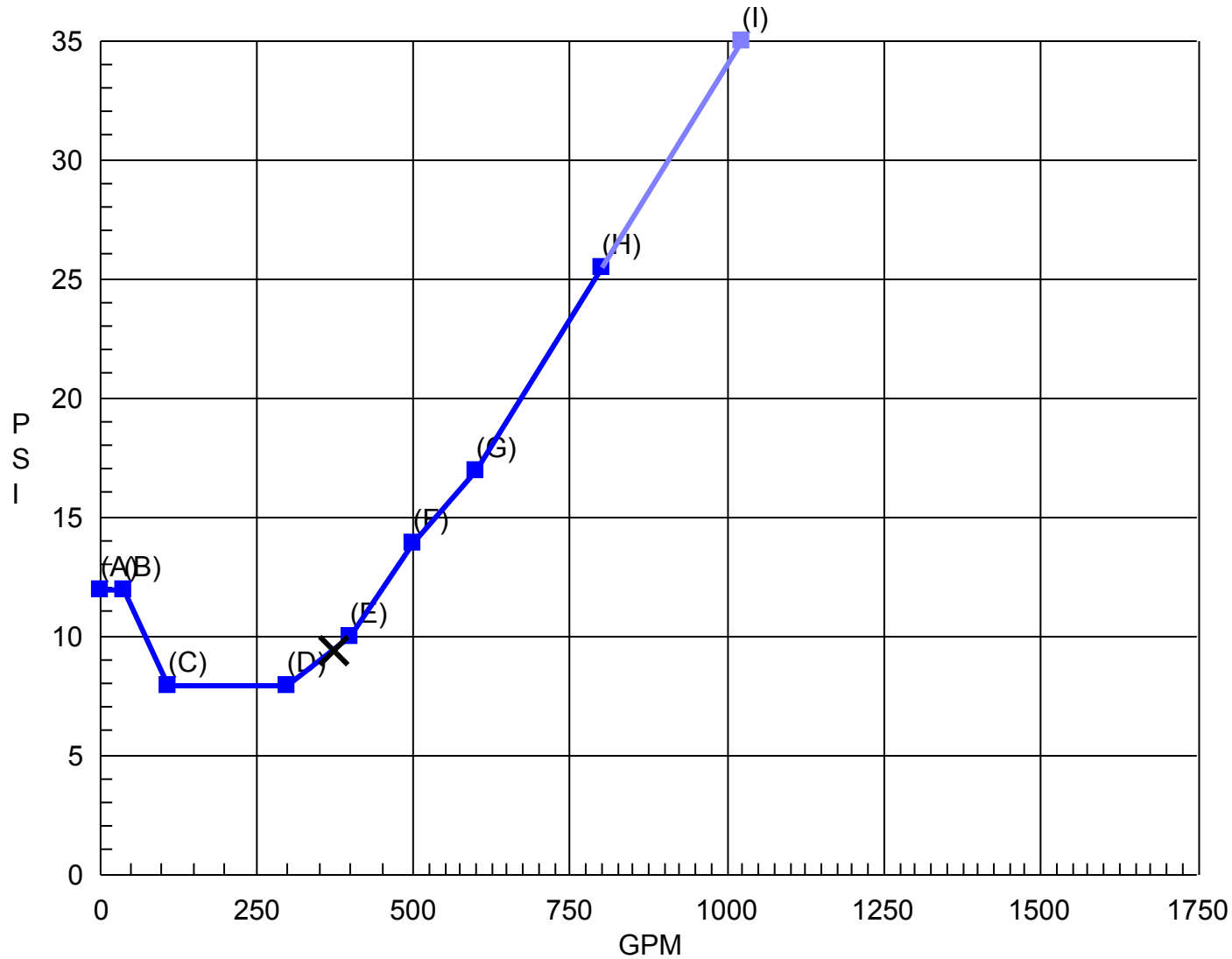
E - Standard 90 degree elbow  
T - Tee - Flow turn 90 degrees  
LE - Long Radius 90 degree elbow



### Flow Diagram ( 1 of 1 )



### Backflow Preventer in Pipe "Rpz"



Given Values:

- A) 12 psi at 0.0 gpm
- B) 40 gpm at 12 psi
- C) 110 gpm at 8 psi
- D) 300 gpm at 8 psi
- E) 400 gpm at 10 psi
- F) 500 gpm at 14 psi
- G) 600 gpm at 17 psi
- H) 800 gpm at 25.5 psi

Extrapolated:

- I) 1023.5 gpm at 35 psi

Calculated:

- X) 373.8 gpm at 9.48 psi