

Life Safety Fire Protection  
Fire Sprinklers Save Lives  
97 Lower Jaffrey Road - Dublin NH

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

15 Merrill Street - Portland ME

W A T E R S U P P L Y

STATIC PRESSURE (psi) 50  
RESIDUAL PRESSURE (psi) 44  
RESIDUAL FLOW (gpm) 919

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

MINIMUM FLOW PER SPRINKLER (gpm) 16  
MINIMUM PRESSURE PER SPRINKLER (psi) 13.22

THIS SYSTEM OPERATES AT A FLOW OF 0.00 gpm AT A PRESSURE OF 0.00 psi  
AT THE BASE OF THE RISER (REF. PT. 0)

PIPES USED FOR THIS SYSTEM

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111 DUCTILE IRON (350)  
002 SCHEDULE 10  
001 SCHEDULE 40  
009 BLAZEMASTER CPVC

Life Safety Fire Protection  
Fire Sprinklers Save Lives

15 Merrill Street - Portland ME

PAGE 1

SYSTEM ANALYSIS TO SHOW MAXIMUM FLOW  
WITH ZERO PRESSURE REMAINING

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
50	4.40	37.00	18.81	18.27
51	4.40	37.00	18.71	18.07

THE SPRINKLER SYSTEM FLOW IS 37.52 gpm

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

THE INSIDE HOSE     RACK SPKLR'S.    IS    0.00 gpm

YARD HYDT. FLOW    IS    0.00 gpm

THE FOLLOWING PRESSURES & FLOWS OCCUR

---> AT REF. PT. 1 <---

STATIC PRESSURE	50.00 psi		
RESIDUAL PRESSURE	44.00 psi	AT	919.00 gpm
TOTAL SYSTEM FLOW	37.52 gpm		
AVAILABLE PRESSURE	49.98 psi	AT	37.52 gpm
OPERATING PRESSURE	49.98 psi	AT	37.52 gpm
PRESSURE REMAINING	0.00 psi		

THE ABOVE RESULTS INCLUDE 8.00 psi FRICTION LOSS AT REF. PT. # 2 FOR A

BACKFLOW PREVENTER     METER  
 DETECTOR CHECK VALVE     OTHER DEVICE

HYDRAULIC CALCULATIONS AT SPECIFIED FLOW

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
50	4.40	37.00	16.10	13.38
51	4.40	37.00	16.00	13.22

THE SPRINKLER SYSTEM FLOW IS 32.10 gpm

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

THE INSIDE HOSE             RACK SPKLR'S.

YARD HYDT. FLOW IS 0.00 gpm

THE FOLLOWING PRESSURES & FLOWS OCCUR

----> AT REF. PT. 1 <---

STATIC PRESSURE	50.00 psi		
RESIDUAL PRESSURE	44.00 psi	AT	919.00 gpm
TOTAL SYSTEM FLOW	32.10 gpm		
AVAILABLE PRESSURE	49.99 psi	AT	32.10 gpm
OPERATING PRESSURE	43.16 psi	AT	32.10 gpm
PRESSURE REMAINING	6.83 psi		

THE ABOVE RESULTS INCLUDE 8.00 psi FRICTION LOSS AT REF. PT. # 2 FOR A

BACKFLOW PREVENTER             METER  
 DETECTOR CHECK VALVE         OTHER DEVICE

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15 Merrill Street - Portland ME

PAGE 3

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

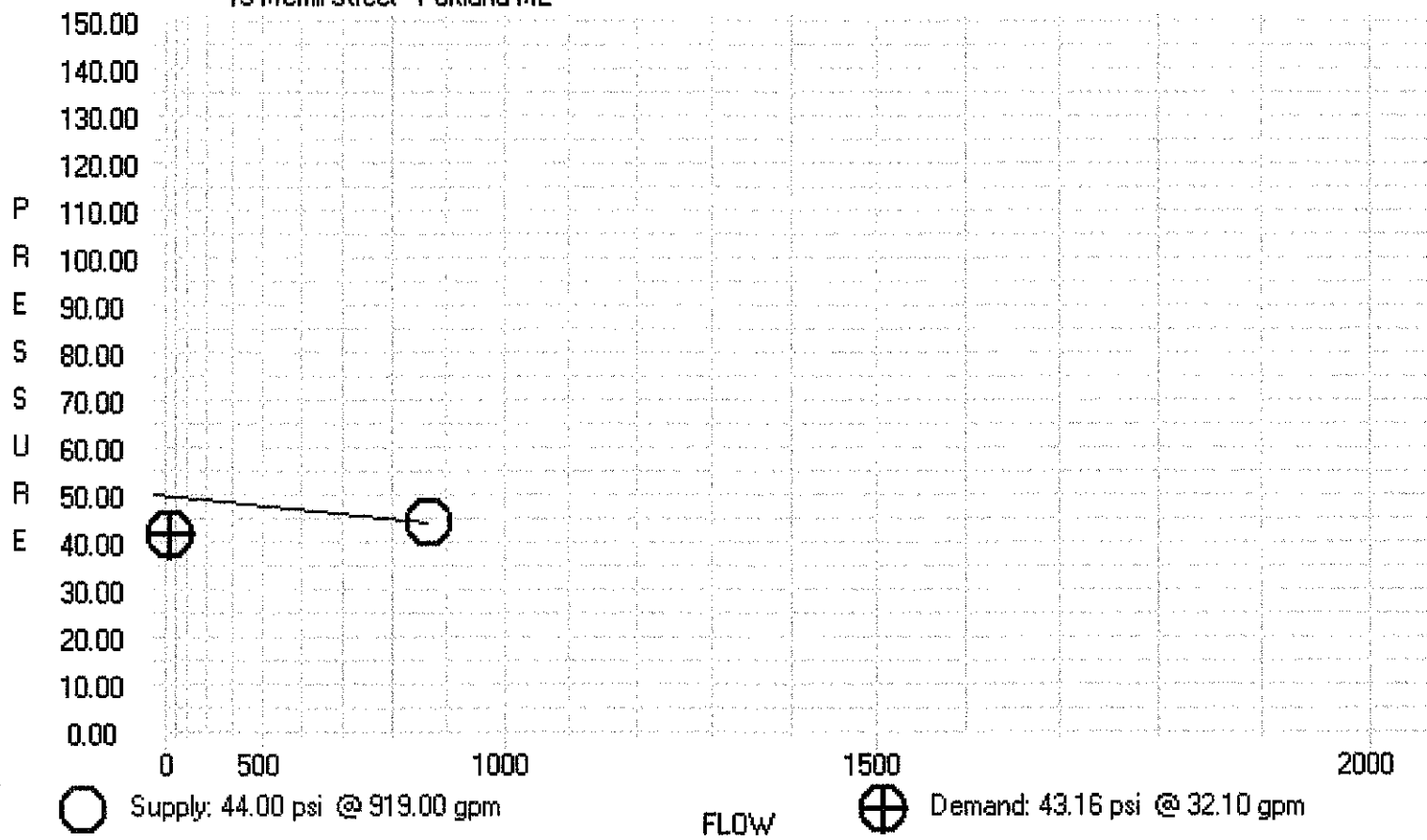
FROM	TO	FLOW (gpm)	PIPE (ft)	FITS	EQV. (ft)	H-W C	PIPE TYPE	DIA. (in)	FRIC. (psi)	ELEV. (psi)	FROM (psi)	TO (psi)	DIFF (psi)
1	2	32.10	40.00	35	45.84	150	111	4.300	0.000	0.000	43.16	43.14	0.02
2	3	32.10	10.00	22	11.78	120	2	2.635	0.004	0.000	43.14	35.06	8.08
3	4	32.10	17.00	33	29.60	120	2	2.635	0.004	0.000	35.06	34.90	0.16
4	5	32.10	11.00	0	0.00	120	2	2.635	0.004	0.000	34.90	34.86	0.04
4	70	0.00	1.00	3	7.94	120	2	1.682	0.000	0.000	34.90	34.90	0.00
5	71	32.10	1.00	3	7.94	120	2	1.682	0.031	0.000	34.86	34.58	0.28
70	72	0.00	10.00	0	0.00	120	2	1.682	0.000	0.000	34.90	34.90	0.00
71	73	32.10	10.00	0	0.00	120	2	1.682	0.031	0.000	34.58	34.27	0.31
72	74	0.00	10.00	0	0.00	120	2	1.682	0.000	0.000	34.90	34.90	0.00
73	6	32.10	8.50	0	0.00	120	2	1.682	0.031	0.000	34.27	34.00	0.26
6	7	32.10	4.00	223	11.60	120	1	1.610	0.039	0.000	34.00	33.40	0.60
6	75	0.00	1.50	0	0.00	120	2	1.682	0.000	0.000	34.00	34.00	0.00
74	76	0.00	10.00	0	0.00	120	2	1.682	0.000	0.000	34.90	34.90	0.00
75	77	0.00	10.00	0	0.00	120	2	1.682	0.000	0.000	34.00	34.00	0.00
76	78	0.00	10.00	0	0.00	120	2	1.682	0.000	0.000	34.90	34.90	0.00
77	79	0.00	10.00	0	0.00	120	2	1.682	0.000	0.000	34.00	34.00	0.00
7	8	32.10	16.00	333	24.04	150	9	1.602	0.026	3.900	33.40	28.45	1.05
8	9	32.10	13.00	23	17.03	150	9	1.602	0.026	3.900	28.45	23.76	0.79
9	10	32.10	11.50	23	17.03	150	9	1.602	0.026	3.900	23.76	19.12	0.75
10	11	16.10	6.50	3	6.01	150	9	1.400	0.014	0.000	19.12	18.94	0.17
11	12	0.00	3.50	0	0.00	150	9	1.400	0.000	0.000	18.94	18.94	0.00
12	60	0.00	1.50	3	5.01	150	9	1.109	0.000	0.000	18.94	18.94	0.00
60	61	0.00	10.00	0	0.00	150	9	1.109	0.000	0.000	18.94	18.94	0.00
12	13	0.00	12.00	0	0.00	150	9	1.109	0.000	0.000	18.94	18.94	0.00
13	62	0.00	1.00	3	5.01	150	9	1.109	0.000	0.000	18.94	18.94	0.00
13	63	0.00	11.50	3	5.01	150	9	1.109	0.000	0.000	18.94	18.94	0.00
10	51	16.00	19.00	233	17.03	150	9	1.109	0.043	4.333	19.12	13.22	1.56
11	50	16.10	16.00	23	12.02	150	9	1.109	0.044	4.333	18.94	13.38	1.23

A MAX. VELOCITY OF 5.34 ft./sec. OCCURS BETWEEN REF. PT. 11 AND 50

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

# WATER SUPPLY/DEMAND GRAPH

15 Merrill Street - Portland ME



**Sprinkler-CALC 7.2 Win**

Life Safety Fire Protection  
Fire Sprinklers Save Lives  
97 Lower Jaffrey Road - Dublin NH

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

15 Merrill Street - Portland ME

W A T E R S U P P L Y

STATIC PRESSURE (psi) 50  
RESIDUAL PRESSURE (psi) 44  
RESIDUAL FLOW (gpm) 919

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

MINIMUM FLOW PER SPRINKLER (gpm) 13  
MINIMUM PRESSURE PER SPRINKLER (psi) 7.04

THIS SYSTEM OPERATES AT A FLOW OF 0.00 gpm AT A PRESSURE OF 0.00 psi  
AT THE BASE OF THE RISER (REF. PT. 0)

PIPES USED FOR THIS SYSTEM

=====

111 DUCTILE IRON (350)  
002 SCHEDULE 10  
001 SCHEDULE 40  
009 BLAZEMASTER CPVC

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15 Merrill Street - Portland ME

PAGE 1

SYSTEM ANALYSIS TO SHOW MAXIMUM FLOW  
WITH ZERO PRESSURE REMAINING

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
60	4.90	27.00	16.34	11.11
61	4.90	27.00	16.01	10.67
62	4.90	27.00	15.61	10.14
63	4.90	27.00	15.29	9.74

THE SPRINKLER SYSTEM FLOW IS 63.25 gpm

THE OUTSIDE HOSE FLOW AT REFERENCE POINT NO. 1 IS 0.00 gpm  
 THE INSIDE HOSE     RACK SPKLR'S.  
 YARD HYDT. FLOW IS 0.00 gpm

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

STATIC PRESSURE	50.00 psi		
RESIDUAL PRESSURE	44.00 psi	AT	919.00 gpm
TOTAL SYSTEM FLOW	63.25 gpm		
AVAILABLE PRESSURE	49.96 psi	AT	63.25 gpm
OPERATING PRESSURE	49.96 psi	AT	63.25 gpm
PRESSURE REMAINING	0.00 psi		

THE ABOVE RESULTS INCLUDE 8.00 psi FRICTION LOSS AT REF. PT. # 2 FOR A

BACKFLOW PREVENTER     METER  
 DETECTOR CHECK VALVE     OTHER DEVICE

HYDRAULIC CALCULATIONS AT SPECIFIED FLOW

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
60	4.90	27.00	13.91	8.06
61	4.90	27.00	13.62	7.72
62	4.90	27.00	13.26	7.33
63	4.90	27.00	13.00	7.04

THE SPRINKLER SYSTEM FLOW IS 53.79 gpm

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

THE INSIDE HOSE       RACK SPKLR'S.

YARD HYDT. FLOW      IS 0.00 gpm

THE FOLLOWING PRESSURES & FLOWS OCCUR

----> AT REF. PT. 1 <---

STATIC PRESSURE	50.00	psi		
RESIDUAL PRESSURE	44.00	psi	AT	919.00 gpm
TOTAL SYSTEM FLOW	53.79	gpm		
AVAILABLE PRESSURE	49.97	psi	AT	53.79 gpm
OPERATING PRESSURE	41.94	psi	AT	53.79 gpm
PRESSURE REMAINING	8.03	psi		

THE ABOVE RESULTS INCLUDE 8.00 psi FRICTION LOSS AT REF. PT. # 2 FOR A

BACKFLOW PREVENTER       METER  
 DETECTOR CHECK VALVE       OTHER DEVICE



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Fire Sprinklers Save Lives

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PAGE 3

FITTING Equivalent Length per NFPA 13 1994, 6-4.3

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

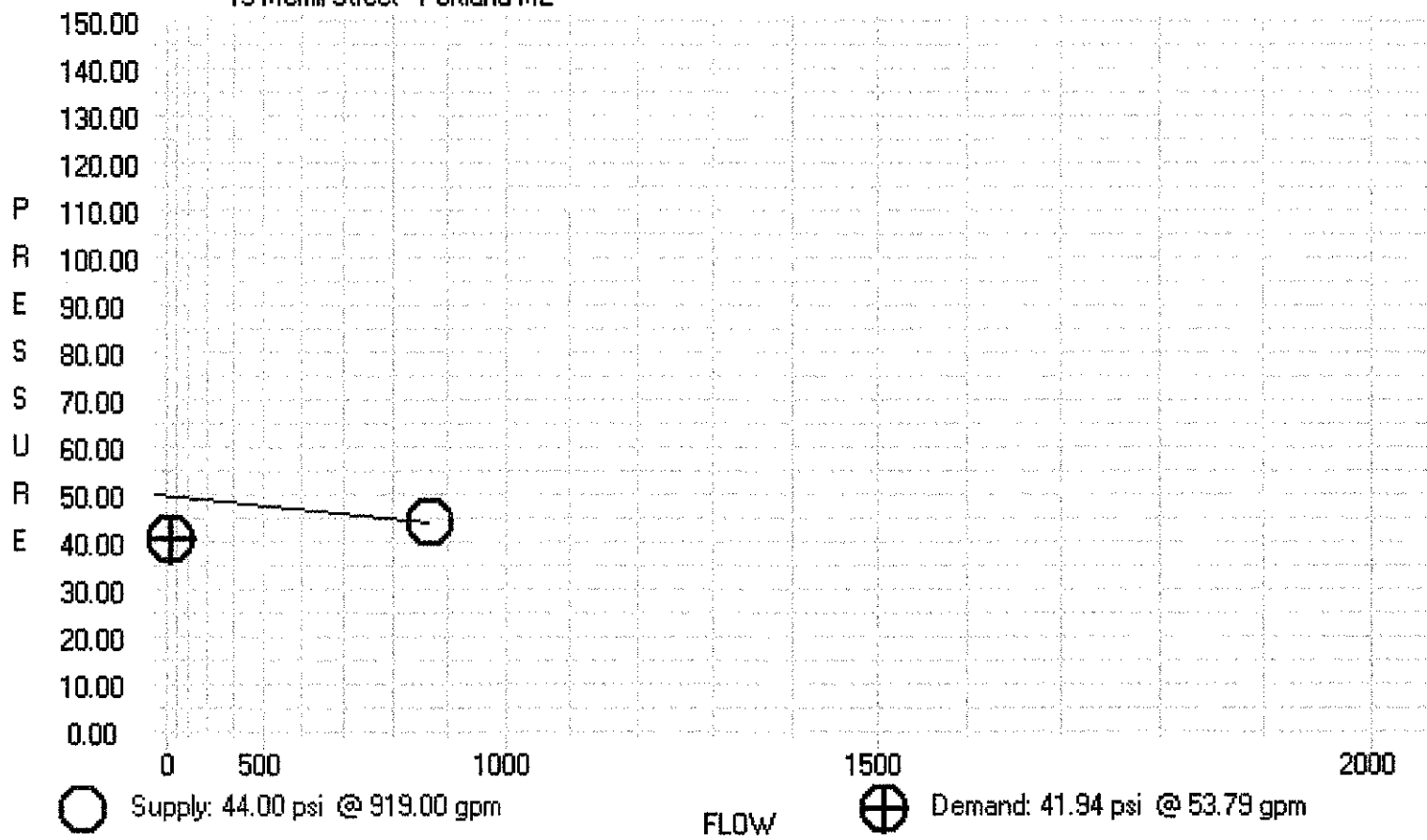
FROM	TO	FLOW (gpm)	PIPE (ft)	FITS	EQV. (ft)	H-W C	PIPE TYPE	DIA. (in)	FRIC. (psi)	ELEV. (psi)	FROM (psi)	TO (psi)	DIFF (psi)
1	2	53.79	40.00	35	45.84	150	111	4.300	0.001	0.000	41.94	41.89	0.05
2	3	53.79	10.00	22	11.78	120	2	2.635	0.009	0.000	41.89	33.69	8.20
3	4	53.79	17.00	33	29.60	120	2	2.635	0.009	0.000	33.69	33.26	0.43
4	5	53.79	11.00	0	0.00	120	2	2.635	0.009	0.000	33.26	33.16	0.10
4	70	0.00	1.00	3	7.94	120	2	1.682	0.000	0.000	33.26	33.26	0.00
5	71	53.79	1.00	3	7.94	120	2	1.682	0.081	0.000	33.16	32.44	0.73
70	72	0.00	10.00	0	0.00	120	2	1.682	0.000	0.000	33.26	33.26	0.00
71	73	53.79	10.00	0	0.00	120	2	1.682	0.081	0.000	32.44	31.62	0.81
72	74	0.00	10.00	0	0.00	120	2	1.682	0.000	0.000	33.26	33.26	0.00
73	6	53.79	8.50	0	0.00	120	2	1.682	0.081	0.000	31.62	30.93	0.69
6	7	53.79	4.00	223	11.60	120	1	1.610	0.101	0.000	30.93	29.36	1.57
6	75	0.00	1.50	0	0.00	120	2	1.682	0.000	0.000	30.93	30.93	0.00
74	76	0.00	10.00	0	0.00	120	2	1.682	0.000	0.000	33.26	33.26	0.00
75	77	0.00	10.00	0	0.00	120	2	1.682	0.000	0.000	30.93	30.93	0.00
76	78	0.00	10.00	0	0.00	120	2	1.682	0.000	0.000	33.26	33.26	0.00
77	79	0.00	10.00	0	0.00	120	2	1.682	0.000	0.000	30.93	30.93	0.00
7	8	53.79	16.00	333	24.04	150	9	1.602	0.068	3.900	29.36	22.73	2.73
8	9	53.79	13.00	23	17.03	150	9	1.602	0.068	3.900	22.73	16.78	2.05
9	10	53.79	11.50	23	17.03	150	9	1.602	0.068	3.900	16.78	10.93	1.95
10	11	53.79	6.50	3	6.01	150	9	1.400	0.132	0.000	10.93	9.29	1.65
11	12	53.79	3.50	0	0.00	150	9	1.400	0.132	0.000	9.29	8.83	0.46
12	60	27.53	1.50	3	5.01	150	9	1.109	0.118	0.000	8.83	8.06	0.77
60	61	13.62	10.00	0	0.00	150	9	1.109	0.032	0.000	8.06	7.72	0.33
12	13	26.26	12.00	0	0.00	150	9	1.109	0.108	0.000	8.83	7.51	1.32
13	62	13.26	1.00	3	5.01	150	9	1.109	0.031	0.000	7.51	7.33	0.18
13	63	13.00	11.50	3	5.01	150	9	1.109	0.029	0.000	7.51	7.04	0.47
10	51	0.00	19.00	233	17.03	150	9	1.109	0.000	4.333	10.93	6.60	0.00
11	50	0.00	16.00	23	12.02	150	9	1.109	0.000	4.333	9.29	4.95	0.00

A MAX. VELOCITY OF 11.21 ft./sec. OCCURS BETWEEN REF. PT. 11 AND 12

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

# WATER SUPPLY/DEMAND GRAPH

15 Merrill Street - Portland ME



**Sprinkler-CALC 7.2 Win**

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Fire Sprinklers Save Lives  
97 Lower Jaffrey Road - Dublin NH

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

15 Merrill Street - Portland ME

W A T E R S U P P L Y

STATIC PRESSURE (psi) 50  
RESIDUAL PRESSURE (psi) 44  
RESIDUAL FLOW (gpm) 919

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) 10  
MAXIMUM SPACING OF SPRINKLER LINES (ft) 11  
SPECIFIED DISCHARGE DENSITY (gpm/sq. ft.) .2

THIS SPRINKLER SYSTEM WILL DELIVER A DENSITY OF .2 gpm/sq. ft.  
FOR A DESIGN AREA OF 900 SQ. FT. OF FLOOR AREA

THIS SYSTEM OPERATES AT A FLOW OF 0.00 gpm AT A PRESSURE OF 0.00 psi  
AT THE BASE OF THE RISER (REF. PT. 0)

PIPES USED FOR THIS SYSTEM

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111 DUCTILE IRON (350)  
002 SCHEDULE 10  
001 SCHEDULE 40  
009 BLAZEMASTER CPVC

SPRINKLER SYSTEM ANALYSIS TO SHOW THE MAXIMUM DENSITY AVAILABLE  
WITH ZERO PRESSURE REMAINING

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
70	8.00	0.00	35.16	19.32
71	8.00	0.00	34.65	18.76
72	8.00	0.00	31.78	15.78
73	8.00	0.00	31.32	15.33
74	8.00	0.00	29.72	13.80
75	8.00	0.00	29.30	13.42
76	8.00	0.00	28.74	12.90
77	8.00	0.00	28.33	12.54
78	8.00	0.00	28.48	12.67
79	8.00	0.00	28.06	12.30

THE SPRINKLER SYSTEM FLOW IS 305.56 gpm  
THE OUTSIDE HOSE FLOW AT REFERENCE POINT NO. 1 IS 0.00 gpm  
 THE INSIDE HOSE     RACK SPKLR'S.  
 YARD HYDT. FLOW IS 0.00 gpm  
THE MINIMUM DENSITY PROVIDED BY THIS SYSTEM IS 0.255 gpm/sq. ft.

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

STATIC PRESSURE 50.00 psi  
RESIDUAL PRESSURE 44.00 psi AT 919.00 gpm  
TOTAL SYSTEM FLOW 305.55 gpm  
AVAILABLE PRESSURE 49.22 psi AT 305.55 gpm  
OPERATING PRESSURE 49.22 psi AT 305.55 gpm  
PRESSURE REMAINING 0.00 psi

THE ABOVE RESULTS INCLUDE 8.00 psi FRICTION LOSS AT REF. PT. # 2 FOR A

BACKFLOW PREVENTER     METER  
 DETECTOR CHECK VALVE     OTHER DEVICE



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FITTING Equivalent Length per NFPA 13 1994, 6-4.3

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

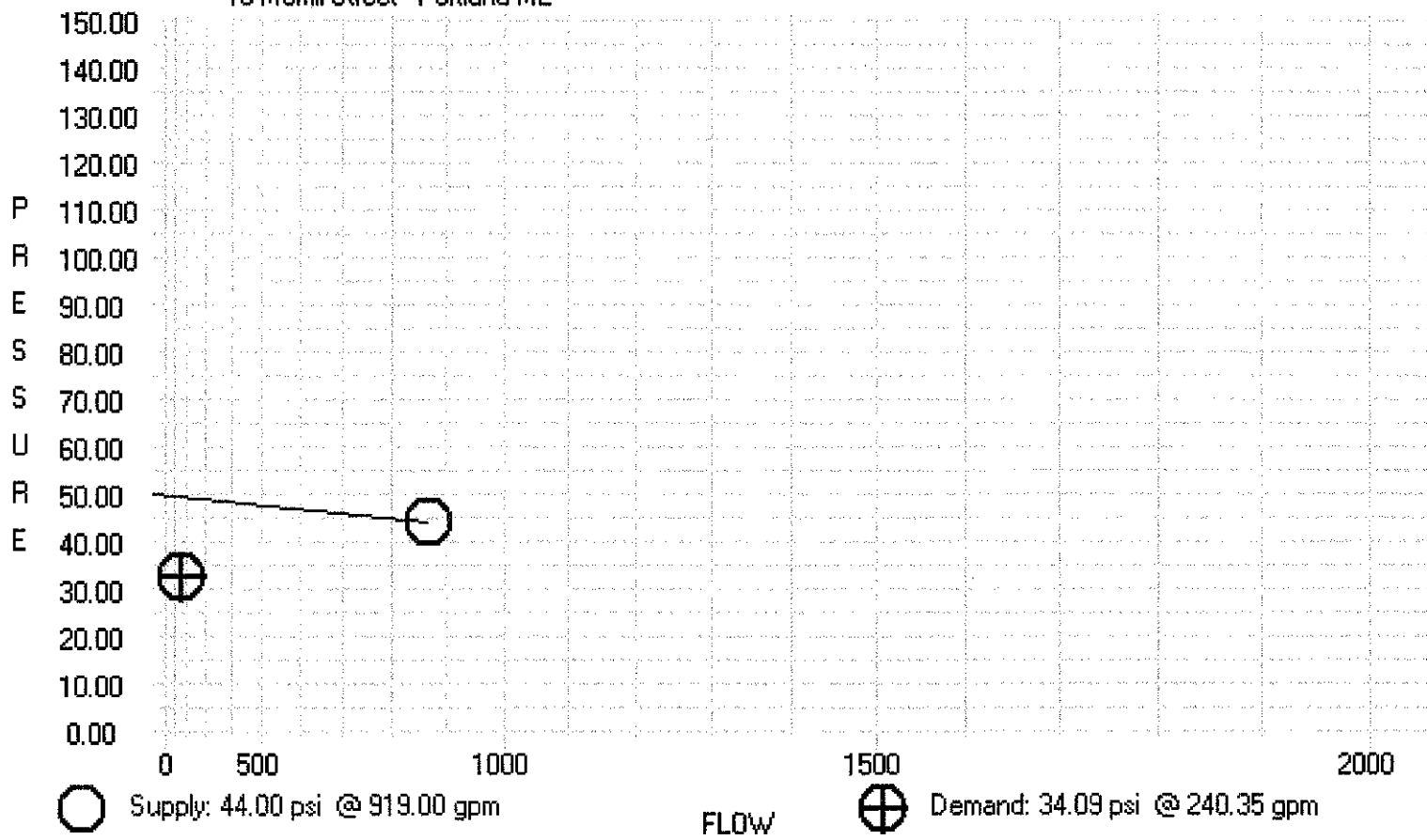
FROM	TO	FLOW (gpm)	PIPE (ft)	FITS	EQV. (ft)	H-W C	PIPE TYPE	DIA. (in)	FRIC. (psi)	ELEV. (psi)	FROM (psi)	TO (psi)	DIFF (psi)
1	2	240.35	40.00	35	45.84	150	111	4.300	0.009	0.000	34.09	33.32	0.76
2	3	240.35	10.00	22	11.78	120	2	2.635	0.146	0.000	33.32	22.14	11.19
3	4	240.35	17.00	33	29.60	120	2	2.635	0.146	0.000	22.14	15.32	6.82
4	5	119.27	11.00	0	0.00	120	2	2.635	0.040	0.000	15.32	14.88	0.44
4	70	121.08	1.00	3	7.94	120	2	1.682	0.366	0.000	15.32	12.05	3.27
5	71	119.27	1.00	3	7.94	120	2	1.682	0.356	0.000	14.88	11.70	3.18
70	72	93.30	10.00	0	0.00	120	2	1.682	0.226	0.000	12.05	9.79	2.27
71	73	91.91	10.00	0	0.00	120	2	1.682	0.219	0.000	11.70	9.51	2.19
72	74	68.27	10.00	0	0.00	120	2	1.682	0.127	0.000	9.79	8.54	1.25
73	6	67.24	8.50	0	0.00	120	2	1.682	0.123	0.000	9.51	8.46	1.05
6	7	0.00	4.00	223	11.60	120	1	1.610	0.000	0.000	8.46	8.46	0.00
6	75	67.24	1.50	0	0.00	120	2	1.682	0.123	0.000	8.46	8.28	0.18
74	76	44.90	10.00	0	0.00	120	2	1.682	0.058	0.000	8.54	7.96	0.58
75	77	44.21	10.00	0	0.00	120	2	1.682	0.057	0.000	8.28	7.71	0.58
76	78	22.33	10.00	0	0.00	120	2	1.682	0.016	0.000	7.96	7.79	0.17
77	79	22.00	10.00	0	0.00	120	2	1.682	0.016	0.000	7.71	7.56	0.15
7	8	0.00	16.00	333	24.04	150	9	1.602	0.000	3.900	8.46	4.56	-0.00
8	9	0.00	13.00	23	17.03	150	9	1.602	0.000	3.900	4.56	0.66	0.00
9	10	0.00	11.50	23	17.03	150	9	1.602	0.000	3.900	0.66	-3.24	0.00
10	11	0.00	6.50	3	6.01	150	9	1.400	0.000	0.000	-3.24	-3.24	0.00
11	12	0.00	3.50	0	0.00	150	9	1.400	0.000	0.000	-3.24	-3.24	0.00
12	60	0.00	1.50	3	5.01	150	9	1.109	0.000	0.000	-3.24	-3.24	0.00
60	61	0.00	10.00	0	0.00	150	9	1.109	0.000	0.000	-3.24	-3.24	0.00
12	13	0.00	12.00	0	0.00	150	9	1.109	0.000	0.000	-3.24	-3.24	0.00
13	62	0.00	1.00	3	5.01	150	9	1.109	0.000	0.000	-3.24	-3.24	0.00
13	63	0.00	11.50	3	5.01	150	9	1.109	0.000	0.000	-3.24	-3.24	0.00
10	51	0.00	19.00	233	17.03	150	9	1.109	0.000	4.333	-3.24	-7.57	0.00
11	50	0.00	16.00	23	12.02	150	9	1.109	0.000	4.333	-3.24	-7.57	0.00

A MAX. VELOCITY OF 17.48 ft./sec. OCCURS BETWEEN REF. PT. 4 AND 70

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

# WATER SUPPLY/DEMAND GRAPH

15 Merrill Street - Portland ME



Sprinkler-CALC 7.2 Win