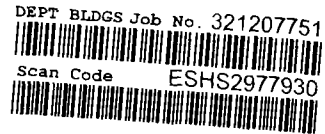


HYDRAULIC CALCULATION NOTES

SPRINKLER SYSTEM, 1ST FLOOR

(1) CALCULATION SUMMARY

DATE	12/3/2015
LOCATION	1ST FLOOR
PROJECT	SPRINKLER SYSTEM
ADDRESS	112 44TH STREET, BROOKLYN, N.Y.
HAZARD	ORDINARY HAZARD GROUP 2
CONTRACTOR	BSA ENGINEERS
AUTHORITY	LOCAL JURISDICTIONS
CRITERIA	0.20 gpm/sq.ft./1500 sq.ft. PLUS 0.00 gpm
SUPPLY	59.00 psi STATIC, 58.00 psi RESIDUAL FLOWING 500.00 gpm
DEMAND	54.25 psi AT 381.58 gpm
AVAILABLE	58.39 psi AT 381.58 gpm

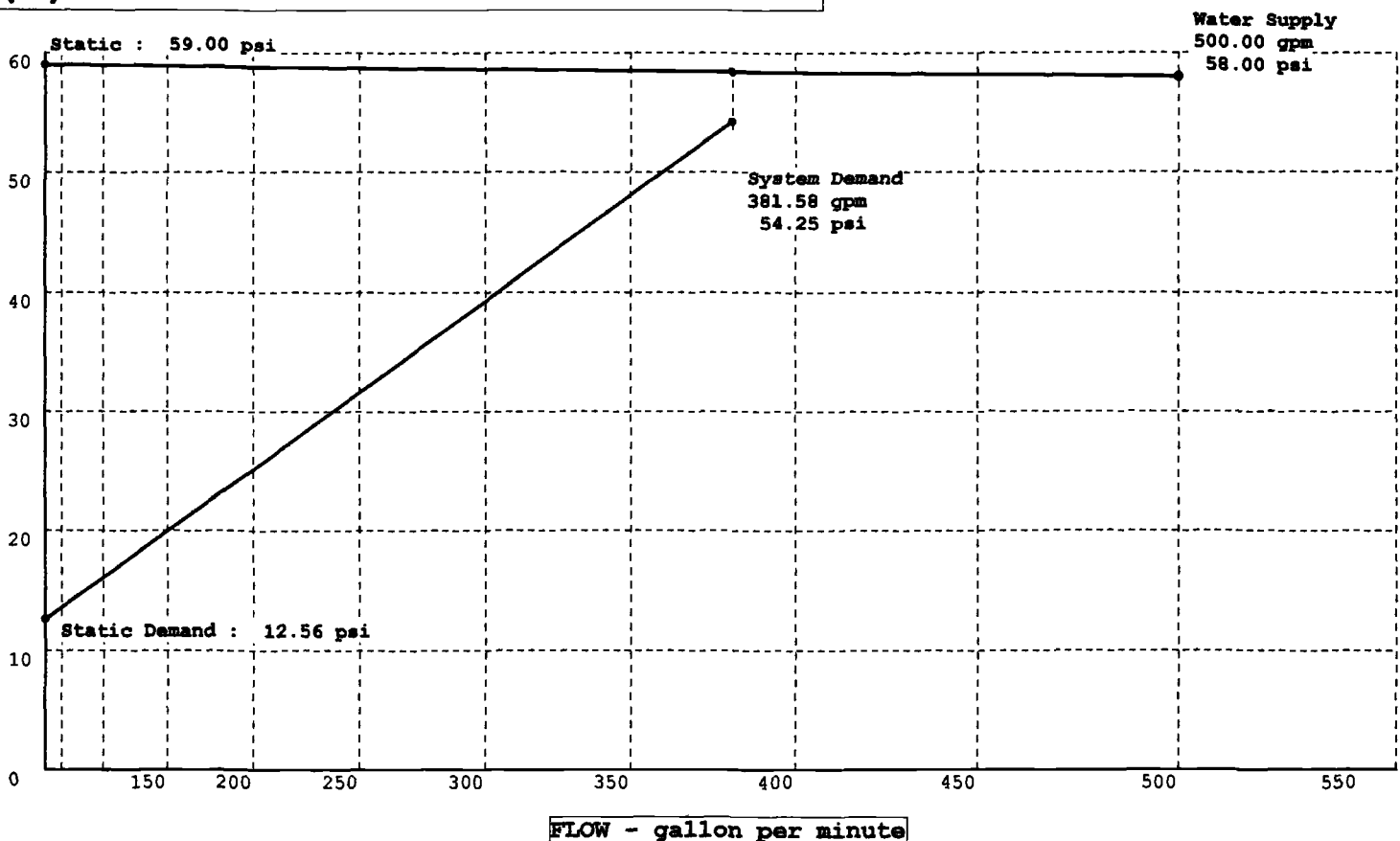


(2) SYMBOLS AND ABBREVIATION

T Tee	BV Butterfly Valves
E Elbow	CV Check Valve
EE 45-degree Elbow	AV Alarm Valve
LE Long Turn Elbow	DV Dry Pipe Valve
GV Gate Valve	DL Deluge Valve



(3) WATER SUPPLY & DEMAND GRAPH



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HYDRAULIC CALCULATION FOR SPRINKLER SYSTEM:

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PROJECT NAME: SPRINKLER SYSTEM
 PROJECT ADDRESS: 112 44TH STREET, BROOKLYN, N.Y.
 CALCULATION AREA: 1ST FLOOR

DESIGN CRITERIA: DENSITY = 0.20 gpm/sq.ft./1500 sq.ft. PLUS 0.00 gpm
 WATER SUPPLY: STATIC 59.00 psi, RESIDUAL 58.00 psi AT 500.00 gpm

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SPRINKLER SYSTEM DATA: (Pipe & Fittings)

FROM NODE	TO NODE	SIZE (inch)	LENGTH (feet)	HW-C VALUE	ELEV.DIFF. (feet)	FTG.EQV. LENGTH	TOTAL LENGTH	FITTINGS & DEVICES
1	3	3.850	30.00	140	0.00	44.93	74.93	1T 1GV 2E
3	10	4.260	130.00	120	29.00	193.56	323.56	1T 6E 3GV 2CV 1AV
10	15	4.260	10.00	120	0.00	0.00	10.00	none
15	16	1.610	15.00	120	0.00	8.00	23.00	1T
16	17	1.610	5.00	120	0.00	0.00	5.00	none
17	18	1.380	10.00	120	0.00	0.00	10.00	none
18	19	1.049	10.00	120	0.00	0.00	10.00	none
15	20	4.260	10.00	120	0.00	0.00	10.00	none
20	21	1.610	15.00	120	0.00	8.00	23.00	1T
21	22	1.610	5.00	120	0.00	0.00	5.00	none
22	23	1.380	10.00	120	0.00	0.00	10.00	none
23	24	1.049	10.00	120	0.00	0.00	10.00	none
20	25	4.260	10.00	120	0.00	0.00	10.00	none
25	26	1.610	15.00	120	0.00	8.00	23.00	1T
26	27	1.610	5.00	120	0.00	0.00	5.00	none
27	28	1.380	10.00	120	0.00	0.00	10.00	none
28	29	1.049	10.00	120	0.00	0.00	10.00	none
25	30	4.260	10.00	120	0.00	0.00	10.00	none
30	31	1.610	15.00	120	0.00	8.00	23.00	1T
31	32	1.610	5.00	120	0.00	0.00	5.00	none
32	33	1.380	10.00	120	0.00	0.00	10.00	none
33	34	1.049	10.00	120	0.00	0.00	10.00	none
30	35	4.260	17.00	120	0.00	26.33	43.33	2E
35	36	1.610	8.00	120	0.00	8.00	16.00	1T
36	37	1.610	5.00	120	0.00	0.00	5.00	none
37	38	1.380	10.00	120	0.00	0.00	10.00	none
38	39	1.049	10.00	120	0.00	0.00	10.00	none
35	40	4.260	10.00	120	0.00	0.00	10.00	none
40	41	1.610	8.00	120	0.00	8.00	16.00	1T
41	42	1.610	5.00	120	0.00	0.00	5.00	none
42	43	1.380	10.00	120	0.00	0.00	10.00	none
43	44	1.049	10.00	120	0.00	0.00	10.00	none

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SPRINKLER SYSTEM INPUT DATA: (Sprinkler "K", Node & Area)

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OPERATING SPRINKLERS LOCATED AS FOLLOWS HAVE A "K" OF 5.60

NODE:	17	18	19	22	23	24	27	28	29	32	33	34	37	38
AREA:	100	100	100	100	100	100	100	100	100	100	100	100	100	100

NODE:	39	42	43	44
AREA:	100	100	100	100

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SUMMARY OF SPRINKLER SYSTEM INPUT DATA:

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SYSTEM CONSISTS OF 32 PIPES, 33 JUNCTIONS, 0 LOOPS

AREA CALCULATED = 1800.00 sq.ft., MINIMUM DENSITY = 0.200 gpm/sq.ft.

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CALCULATION RESULTS WITH REQUIRED FLOW AT REMOTE HEAD: (system demand)

NODE NO.	ELEV. (ft.)	PIPE SIZE	PIPE LENGTH	DISCH. (gpm)	INFLOW (gpm)	PRESS. (psi)	LOSS Pf	LOSS Pe	AREA PER HD.	DSCHRG DENSITY
44	30.00	1.05	10.00	20.41	-20.41	13.29	1.35	0.00	100.00	0.20
43	30.00	1.38	10.00	21.43	-41.84	14.64	1.34	0.00	100.00	0.21
42	30.00	1.61	5.00	22.39	-64.22	15.98	0.70	0.00	100.00	0.22
41	30.00	1.61	16.00	0.00	-64.22	16.68	2.24	0.00	0.00	0.00
40	30.00	4.26	10.00	0.00	-64.22	18.92	0.01	0.00	0.00	0.00

35	30.00					18.93				
=====										
39	30.00	1.05	10.00	20.42	-20.42	13.30	1.35	0.00	100.00	0.20
38	30.00	1.38	10.00	21.43	-41.85	14.65	1.34	0.00	100.00	0.21
37	30.00	1.61	5.00	22.39	-64.24	15.99	0.70	0.00	100.00	0.22
36	30.00	1.61	16.00	0.00	-64.24	16.69	2.24	0.00	0.00	0.00
35	30.00	4.26	43.33	0.00	-128.47	18.93	0.19	0.00	0.00	0.00

30	30.00					19.12				
=====										
34	30.00	1.05	10.00	20.00	-20.00	12.76	1.30	0.00	100.00	0.20
33	30.00	1.38	10.00	21.00	-41.00	14.06	1.29	0.00	100.00	0.21
32	30.00	1.61	5.00	21.94	-62.93	15.35	0.67	0.00	100.00	0.22
31	30.00	1.61	23.00	0.00	-62.93	16.02	3.10	0.00	0.00	0.00
30	30.00	4.26	10.00	0.00	-191.40	19.12	0.09	0.00	0.00	0.00

25	30.00					19.21				
=====										
29	30.00	1.05	10.00	20.05	-20.05	12.82	1.31	0.00	100.00	0.20
28	30.00	1.38	10.00	21.05	-41.10	14.13	1.30	0.00	100.00	0.21
27	30.00	1.61	5.00	21.99	-63.09	15.42	0.68	0.00	100.00	0.22
26	30.00	1.61	23.00	0.00	-63.09	16.10	3.11	0.00	0.00	0.00
25	30.00	4.26	10.00	0.00	-254.49	19.21	0.16	0.00	0.00	0.00

20	30.00					19.37				

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CALCULATION RESULTS WITH REQUIRED FLOW AT REMOTE HEAD: (system demand)

NODE NO.	ELEV. (ft.)	PIPE SIZE	PIPE LENGTH	DISCH. (gpm)	INFLOW (gpm)	PRESS. (psi)	LOSS Pf	LOSS Pe	AREA PER HD.	DSCHRG DENSITY
24	30.00	1.05	10.00	20.13	-20.13	12.93	1.32	0.00	100.00	0.20
23	30.00	1.38	10.00	21.13	-41.27	14.24	1.31	0.00	100.00	0.21
22	30.00	1.61	5.00	22.08	-63.35	15.55	0.68	0.00	100.00	0.22
21	30.00	1.61	23.00	0.00	-63.35	16.23	3.14	0.00	0.00	0.00
20	30.00	4.26	10.00	0.00	-317.84	19.37	0.24	0.00	0.00	0.00

15	30.00					19.60				
=====										
19	30.00	1.05	10.00	20.26	-20.26	13.09	1.33	0.00	100.00	0.20
18	30.00	1.38	10.00	21.27	-41.52	14.42	1.32	0.00	100.00	0.21
17	30.00	1.61	5.00	22.22	-63.74	15.74	0.69	0.00	100.00	0.22
16	30.00	1.61	23.00	0.00	-63.74	16.43	3.17	0.00	0.00	0.00
15	30.00	4.26	10.00	0.00	-381.58	19.60	0.33	0.00	0.00	0.00
10	30.00	4.26	323.56	0.00	-381.58	19.93	*18.70	12.57	0.00	0.00
3	1.00	3.85	74.93	0.00	-381.58	51.20	3.05	0.00	0.00	0.00

1	1.00					54.25				
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CALCULATION RESULTS SUMMARY:

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TOTAL SPRINKLER FLOW = 382 gpm WITH MIN.DENSITY OF 0.200 gpm/sq.ft.
 THE MAXIMUM VELOCITY OF 10.52 FT/S OCCURS BETWEEN NODES 1 AND 3

PRESSURE REQUIRED AT WATER SUPPLY (Node #1) = 54.25

AVAILABLE PRESSURE = 58.39 psi AT 381.58 gpm

* ADDITIONAL PRESSURE LOSS (psi) ADDED IN HEADER = 8.00

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