

JW FIRE SPRINKLER DESIGN
5 MEZABISH PL. UNIT 201
MONROE, NY 10950



HYDRAULIC CALCULATIONS FOR

1325 59TH STREET
BROOKLYN, NEW YORK

DRAWING NUMBER: SP-003

DATE: FEB 23, 2014

-DESIGN DATA-

REMOTE AREA NUMBER: 1 OF 1

REMOTE AREA LOCATION: THIRD FLOOR

OCCUPANCY CLASSIFICATION: LIGHT HAZARD - RESIDENTIAL

DENSITY: .05 gpm/450

AREA OF APPLICATION: 450 sq. ft.

HYDRAULIC CALCULATIONS I.A.W. NFPA 13R

COVERAGE PER SPRINKLER: 16x16 sq. ft.

TYPE OF SPRINKLERS CALCULATED: RELIABLE MODEL RFC

"K" FACTOR: 4.9

NUMBER OF SPRINKLERS CALCULATED: 4



TOTAL WATER REQUIRED (INCLUDING HOSE): 155.3 gpm

FLOW AND PRESSURE (AT BASE OF RISER): 55.3 gpm @ 29.6 psi

TYPE OF SYSTEM: WET

WATER SUPPLY

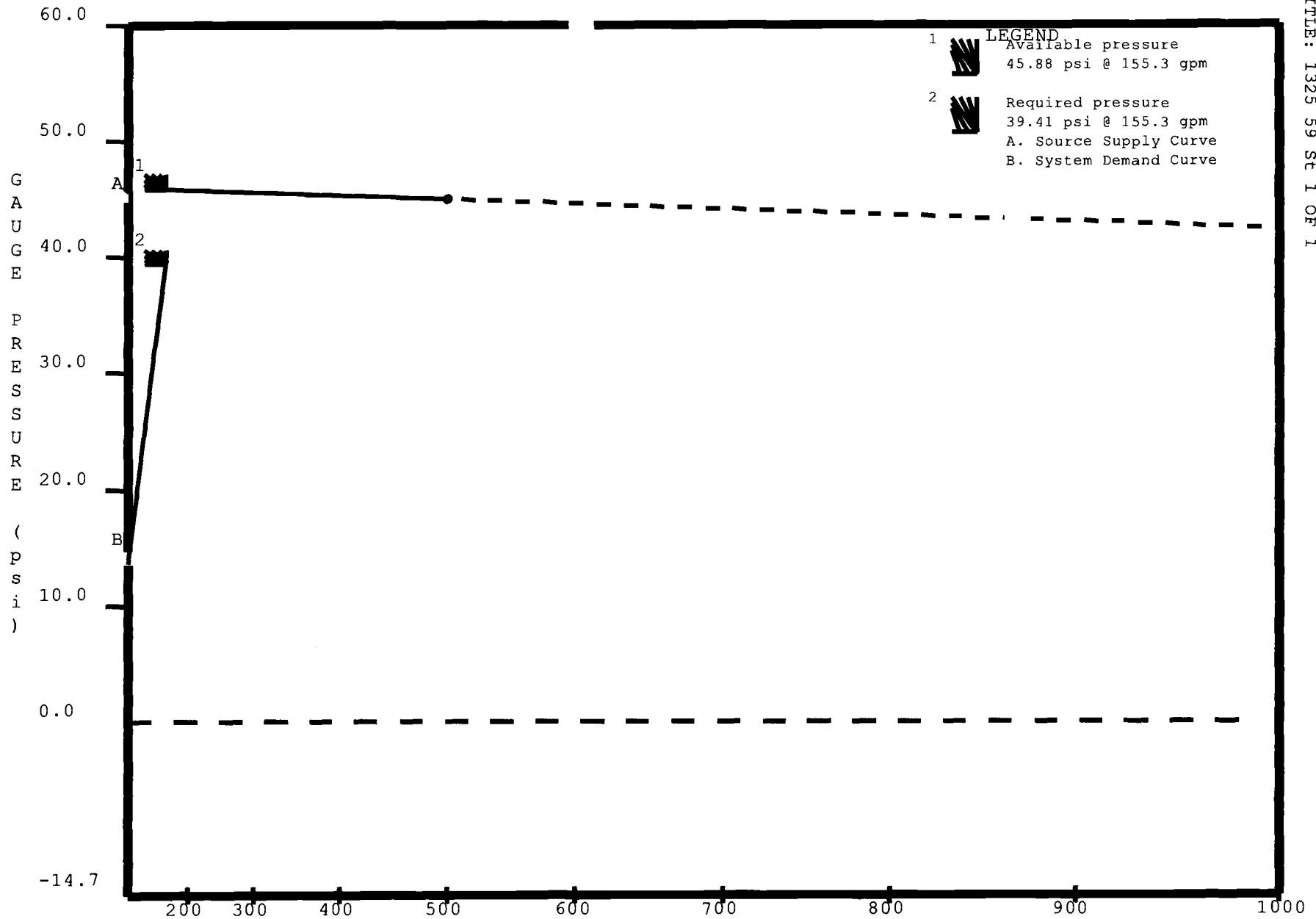
Source: CITY Test Date: 8/28/2013 Test By: NYCDEP

Location: THE STATIC PRESSURE WAS TAKEN ON THE NORTH SIDE OF 59TH ST.
1st HYDRANT WEST OF NEW UTRECHT AVENUE. THE RESIDUAL WAS TAKEN
WHEN 500 GPM WERE FLOWING FROM THE NORTH SIDE OF 59TH ST.
2nd HYDRANT EAST OF 13TH AVENUE.

Static: 46 psi Residual: 45 psi Flow: 500 gpm

WATER SUPPLY ANALYSIS

Static: 46.00 psi Resid: 45.00 psi Flow: 500.0 gpm



SPRINKLER SYSTEM HYDRAULIC ANALYSIS

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NFPA WATER SUPPLY DATA

SOURCE NODE TAG	STATIC PRESS. (PSI)	RESID. PRESS. (PSI)	FLOW @ (GPM)	AVAIL. PRESS. (PSI)	TOTAL DEMAND (GPM)	REQ'D PRESS. (PSI)
SOURCE	46.0	45.0	500.0	45.9	155.3	39.4

AGGREGATE FLOW ANALYSIS:

TOTAL FLOW AT SOURCE	155.3 GPM
TOTAL HOSE STREAM ALLOWANCE AT SOURCE	100.0 GPM
OTHER HOSE STREAM ALLOWANCES	0.0 GPM
TOTAL DISCHARGE FROM ACTIVE SPRINKLERS	55.3 GPM

NODE ANALYSIS DATA

NODE TAG	ELEVATION (FT)	NODE TYPE	PRESSURE (PSI)	DISCHARGE (GPM)	NOTES
1	34.0	- - - -	15.4	- - -	
2	24.0	- - - -	20.0	- - -	
3	14.0	- - - -	24.6	- - -	
4	4.0	- - - -	29.2	- - -	
5	4.0	- - - -	29.6	- - -	
6	-2.0	- - - -	32.9	- - -	
7	-2.0	- - - -	33.8	- - -	
8	-2.0	- - - -	39.4	- - -	
9	-2.0	- - - -	39.8	- - -	
10	34.0	- - - -	8.6	- - -	
11	34.0	- - - -	9.0	- - -	
12	34.0	- - - -	9.6	- - -	
13	34.0	- - - -	12.4	- - -	
14	34.0	- - - -	7.1	- - -	
15	34.0	- - - -	8.0	- - -	
10A	33.5	K= 4.90	8.4	14.2	
11A	33.5	K= 4.90	8.8	14.5	
14A	33.5	K= 4.90	7.0	13.0	
15A	33.5	K= 4.90	7.8	13.7	
SOURCE	2.0	SOURCE	39.4	55.3	

SPRINKLER SYSTEM HYDRAULIC ANALYSIS

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NFPA PIPE DATA

Pipe Tag	K-fac	Add Fl	Add Fl To	Fit:	L	C	(Pt)	
Frm Node	E1 (ft)	PT	(q)	Node/	Nom ID	Eq.Ln.	F	(Pe)
To Node	E1 (ft)	PT	Tot.(Q)	Disch	Act ID	(ft.)	T	Pf/ft.
								(Pf)
Pipe: 1		0.0	0.0				10.00	120
2	24.0	20.0	55.3	13	2.000	L: 3.0	3.00	-4.3
1	34.0	15.4	55.3		2.157		13.00	0.026
Pipe: 2		0.0	0.0				10.00	120
3	14.0	24.6	55.3	1	2.000	----	0.00	-4.3
2	24.0	20.0	55.3		2.157		10.00	0.026
Pipe: 3		0.0	0.0				10.00	120
4	4.0	29.2	55.3	2	2.000	----	0.00	-4.3
3	14.0	24.6	55.3		2.157		10.00	0.026
Pipe: 4		0.0	0.0				13.00	120
5	4.0	29.6	55.3	3	2.000	L: 3.0	3.00	0.0
4	4.0	29.2	55.3		2.157		16.00	0.026
Pipe: 5		0.0	0.0				23.00	120
6	-2.0	32.9	55.3	4	2.000	L: 3.0	3.00	-2.6
5	4.0	29.6	55.3		2.157		26.00	0.026
Pipe: 6		0.0	0.0			L: 3.0	8.00	120
7	-2.0	33.8	55.3	5	2.000	C:14.0	29.00	0.0
6	-2.0	32.9	55.3		2.157	A:12.0	37.00	0.026
Pipe: 7		0.0	0.0					
8	-2.0	39.4	55.3	6		Fixed Pressure Loss Device		
7	-2.0	33.8	55.3			5.6 psi, 55.3 gpm		
Pipe: 8		0.0	0.0				6.00	120
9	-2.0	39.8	55.3	7	2.000	2L: 6.0	9.00	0.0
8	-2.0	39.4	55.3		2.157	3G: 3.0	15.00	0.026
Pipe: 9		Source	0.0				50.00	150
SOURCE	2.0	39.4	55.3	8	E2.000	L: 3.9	5.15	1.7
9	-2.0	39.8	55.3		2.000	G: 1.3	55.15	0.024
Pipe: 10		0.0	26.6	15			5.00	120
11	34.0	9.0	14.2	10A	A1.500	L: 2.0	2.00	0.0
10	34.0	8.6	40.8		1.610		7.00	0.061
Pipe: 11		0.0	40.8	10			5.50	120
12	34.0	9.6	14.5	11A	A1.500	----	0.00	0.0
11	34.0	9.0	55.3		1.610		5.50	0.106
Pipe: 12		0.0	0.0				26.00	120
13	34.0	12.4	55.3	11	A1.500	----	0.00	0.0
12	34.0	9.6	55.3		1.610		26.00	0.106

SPRINKLER SYSTEM HYDRAULIC ANALYSIS

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Pipe Tag	K-fac	Add Fl	Add Fl	To	Fit:	L	C	(Pt)	Notes
Frm Node	E1 (ft)	PT	(q)	Node/	Eq.Ln.	F		(Pe)	
To Node	E1 (ft)	PT	Tot.(Q)	Disch	Act ID	(ft.)	T	Pf/ft.	
								(Pf)	
Pipe: 13		0.0	0.0				20.00	120	3.0
1	34.0	15.4	55.3	12	A1.500	T: 8.0	8.00		0.0
13	34.0	12.4	55.3		1.610		28.00	0.106	3.0
Pipe: 14		0.0	0.0				12.00	120	0.8
15	34.0	8.0	13.0		A1.000	L: 2.0	2.00		0.0
14	34.0	7.1	13.0		1.049		14.00	0.058	0.8
Pipe: 15		0.0	13.0	14			3.00	120	0.7
10	34.0	8.6	13.7	15A	A1.000	----	0.00		0.0
15	34.0	8.0	26.6		1.049		3.00	0.221	0.7
Pipe: 10A		4.90	14.2	Disch			2.00	120	0.2
10	34.0	8.6	0.0		A1.000	2L: 4.0	4.00		0.2
10A	33.5	8.4	14.2		1.049		6.00	0.069	0.4
Pipe: 11A		4.90	14.5	Disch			3.00	120	0.3
11	34.0	9.0	0.0		A1.000	2L: 4.0	4.00		0.2
11A	33.5	8.8	14.5		1.049		7.00	0.072	0.5
Pipe: 14A		4.90	13.0	Disch			2.00	120	0.1
14	34.0	7.1	0.0		A1.000	2L: 4.0	4.00		0.2
14A	33.5	7.0	13.0		1.049		6.00	0.058	0.4
Pipe: 15A		4.90	13.7	Disch			2.00	120	0.2
15	34.0	8.0	0.0		A1.000	2L: 4.0	4.00		0.2
15A	33.5	7.8	13.7		1.049		6.00	0.064	0.4

NOTES (HASS):

- (1) Calculations were performed by the HASS 8.4 computer program under license no. 27011536 granted by
HRS Systems, Inc.
208 Southside Square
Petersburg, TN 37144
(931) 659-9760
- (2) The system has been calculated to provide an average imbalance at each node of 0.001 gpm and a maximum imbalance at any node of 0.010 gpm.
- (3) Total pressure at each node is used in balancing the system. Maximum water velocity is 9.9 ft/sec at pipe 15.
- (4) Items listed in bold print on the cover sheet

are automatically transferred from the calculation report.
- (5) Available pressure at source node SOURCE under full flow conditions is 45.87 psi compared to the minimum required pressure of 20.00 psi.

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(6) PIPE FITTINGS TABLE

Pipe Table Name: STANDARD.PIP

PAGE: * MATERIAL: S40 HWC: 120
 Diameter Equivalent Fitting Lengths in Feet
 (in) E T L C B G A D N
 Ell Tee LngEll ChkVlv BfyVlv GatVlv AlmChk DPVlv NPTee
 2.067 5.00 10.00 3.00 11.00 6.00 1.00 10.00 10.00 10.00

PAGE: A MATERIAL: S40 HWC: 120
 Diameter Equivalent Fitting Lengths in Feet
 (in) E T L C B G A D N
 Ell Tee LngEll ChkVlv BfyVlv GatVlv AlmChk DPVlv NPTee
 1.049 2.00 5.00 2.00 5.00 6.00 1.00 10.00 10.00 5.00
 1.610 4.00 8.00 2.00 9.00 6.00 1.00 10.00 10.00 8.00

PAGE: B MATERIAL: THNWL HWC: 120
 Diameter Equivalent Fitting Lengths in Feet
 (in) E T L C B G A D N
 Ell Tee LngEll ChkVlv BfyVlv GatVlv AlmChk DPVlv NPTee
 2.157 6.00 12.00 3.00 14.00 8.00 1.00 12.00 12.00 12.00