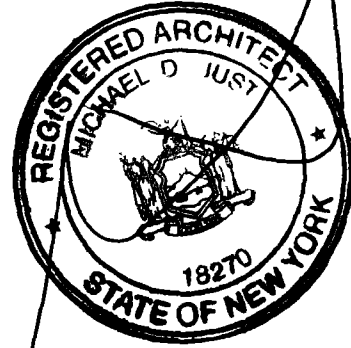


HYDRAULIC CALCULATIONS

FOR

367 KNICKERBOCKER AVENUE
BROOKLYN, N.Y. 11237
3rd FLOOR

FILE NUMBER: JA14130-W
DATE: MAY 4, 2017



-DESIGN DATA-

OCCUPANCY CLASSIFICATION:	LIGHT HAZARD (RESIDENTIAL)
DENSITY:	.10 gpm/sq. ft.
AREA OF APPLICATION:	282 sq. ft.
COVERAGE PER SPRINKLER:	141 sq. ft.
NUMBER OF SPRINKLERS CALCULATED:	2 sprinklers (NFPA 13D)
TOTAL SPRINKLER WATER FLOW REQUIRED:	30.0 gpm @ 34.0 psi (@ PT.A)
TOTAL WATER REQUIRED @ SERVICE:	30.0 gpm
FLOW AND PRESSURE AVAIL.@ SERVICE:	500 gpm 53.0 psi
SPRINKLER ORIFICE SIZE:	1/2 inch
DESIGN/LAYOUT BY:	KDL
AUTHORITY HAVING JURISDICTION:	NYC DEPT.OF BUILDINGS

CALCULATIONS BY HASS COMPUTER PROGRAM
HRS SYSTEMS, INC.



SPRINKLER SYSTEM HYDRAULIC ANALYSIS

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JOB TITLE: 367 Knickerbocker Ave, Brooklyn,N.Y. 11237 - 3rd Floor

WATER SUPPLY DATA

SOURCE NODE TAG	STATIC PRESS. (PSI)	RESID. PRESS. (PSI)	FLOW @ (GPM)	AVAIL. PRESS. (PSI)	TOTAL @ DEMAND (GPM)	REQ'D PRESS. (PSI)
A	54.0	53.0	500.0	54.0	30.0	34.0

AGGREGATE FLOW ANALYSIS:

TOTAL FLOW AT SOURCE	30.0 GPM
TOTAL HOSE STREAM ALLOWANCE AT SOURCE	0.0 GPM
OTHER HOSE STREAM ALLOWANCES	0.0 GPM
TOTAL DISCHARGE FROM ACTIVE SPRINKLERS	30.0 GPM

NODE ANALYSIS DATA

NODE TAG	ELEVATION (FT)	NODE TYPE	PRESSURE (PSI)	DISCHARGE (GPM)
A	4.0	SOURCE	34.0	30.0
S1	38.5	K= 5.60	7.0	14.8
S2	38.5	K= 5.60	7.4	15.2
1	39.0	- - - -	7.9	- - -
2	39.0	- - - -	10.7	- - -
3	39.0	- - - -	10.9	- - -
4	39.0	- - - -	11.4	- - -
5	39.0	- - - -	11.6	- - -
6	17.3	- - - -	21.3	- - -
7	17.3	- - - -	21.5	- - -
8	6.0	- - - -	26.6	- - -
D	6.5	- - - -	26.8	- - -
C	6.0	- - - -	27.1	- - -
B	2.5	- - - -	28.6	- - -
DCAOUT	2.5	- - - -	28.6	- - -
DCAIN	2.5	- - - -	34.6	- - -

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JOB TITLE: 367 Knickerbocker Ave, Brooklyn,N.Y. 11237 - 3rd Floor

PIPE DATA

PIPE TAG	END	ELEV.	NOZ.	PT	DISC.	Q(GPM)	DIA(IN)	LENGTH	PRESS.
NODES	(FT)	(K)	(PSI)	(GPM)	VEL(FPS)	HW(C)	FL/FT	(FT)	SUM.
									(PSI)
Pipe: 1									
S1	38.5	5.6	7.0	14.8	-14.8	1.049	PL	7.42	PF 1.1
1	39.0	0.0	7.9	0.0	5.5	120	FTG	ET	PE -0.2
						0.075	TL	14.42	PV
Pipe: 2									
1	39.0	0.0	7.9	0.0	-30.0	1.049	PL	10.25	PF 2.8
2	39.0	0.0	10.7	0.0	11.1	120	FTG	----	PE 0.0
						0.276	TL	10.25	PV
Pipe: 3									
2	39.0	0.0	10.7	0.0	-30.0	1.380	PL	3.00	PF 0.2
3	39.0	0.0	10.9	0.0	6.4	120	FTG	----	PE 0.0
						0.073	TL	3.00	PV
Pipe: 4									
3	39.0	0.0	10.9	0.0	-30.0	1.610	PL	5.33	PF 0.5
4	39.0	0.0	11.4	0.0	4.7	120	FTG	T	PE 0.0
						0.034	TL	13.33	PV
Pipe: 5									
4	39.0	0.0	11.4	0.0	-30.0	2.067	PL	9.50	PF 0.2
5	39.0	0.0	11.6	0.0	2.9	120	FTG	ET	PE 0.0
						0.010	TL	24.50	PV
Pipe: 6									
5	39.0	0.0	11.6	0.0	-30.0	2.067	PL	21.67	PF 0.3
6	17.3	0.0	21.3	0.0	2.9	120	FTG	E	PE 9.4
						0.010	TL	26.67	PV
Pipe: 7									
6	17.3	0.0	21.3	0.0	-30.0	2.067	PL	10.83	PF 0.2
7	17.3	0.0	21.5	0.0	2.9	120	FTG	2E	PE 0.0
						0.010	TL	20.83	PV
Pipe: 8									
7	17.3	0.0	21.5	0.0	-30.0	2.067	PL	11.33	PF 0.2
8	6.0	0.0	26.6	0.0	2.9	120	FTG	E	PE 4.9
						0.010	TL	16.33	PV
Pipe: 9									
8	6.0	0.0	26.6	0.0	-30.0	2.067	PL	28.92	PF 0.5
D	6.5	0.0	26.8	0.0	2.9	120	FTG	2ET	PE -0.2
						0.010	TL	48.92	PV
Pipe: 10									
D	6.5	0.0	26.8	0.0	-30.0	4.026	PL	2.50	PF 0.0
C	6.0	0.0	27.1	0.0	0.8	120	FTG	2E	PE 0.2
						0.000	TL	22.50	PV
Pipe: 11									
C	6.0	0.0	27.1	0.0	-30.0	4.026	PL	3.50	PF 0.0
B	2.5	0.0	28.6	0.0	0.8	120	FTG	EBA	PE 1.5
						0.000	TL	45.50	PV
Pipe: 12									
B	2.5	0.0	28.6	0.0	-30.0	4.026	PL	1.00	PF 0.0
DCAOUT	2.5	0.0	28.6	0.0	0.8	120	FTG	----	PE 0.0
						0.000	TL	1.00	PV
Pipe: 13									
DCAIN	2.5	0.0	34.6	0.0	FIXED PRESSURE LOSS DEVICE				
DCAOUT	2.5	0.0	28.6	0.0	6.0 psi, 30.0 gpm				

SPRINKLER SYSTEM HYDRAULIC ANALYSIS

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JOB TITLE: 367 Knickerbocker Ave, Brooklyn, N.Y. 11237 - 3rd Floor

PIPE TAG	END	ELEV.	NOZ.	PT	DISC.	Q(GPM)	DIA(IN)	LENGTH	PRESS.
NODES	(FT)	(K)	(PSI)	(GPM)	VEL(FPS)	HW(C)	FL/FT	(FT)	SUM.
									(PSI)
Pipe: 14					-30.0	4.026	PL	6.83	PF 0.0
DCAIN	2.5	0.0	34.6	0.0	0.8	120	FTG	3EG	PE -0.6
A	4.0	SRCE	34.0	(N/A)		0.000	TL	38.83	PV
Pipe: 15					-15.2	1.049	PL	2.00	PF 0.7
S2	38.5	5.6	7.4	15.2	5.6	120	FTG	ET	PE -0.2
1	39.0	0.0	7.9	0.0		0.078	TL	9.00	PV

NOTES (HASS):

- (1) Calculations were performed by the HASS 8.6 computer program in accordance with NFPA13 (2016) under license no. 49122021 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 0.007 gpm and a maximum imbalance at any node of 0.103 gpm.
- (3) Total pressure at each node is used in balancing the system. Maximum water velocity is 11.1 ft/sec at pipe 2.
- (4) Items listed in bold print on the cover sheet

are automatically transferred from the calculation report.
- (5) Available pressure at source node A under full flow conditions is 53.99 psi compared to the minimum required pressure of 20.00 psi.

(6) PIPE FITTINGS TABLE

Pipe Table Name: STANDARD.PIP

PAGE: A MATERIAL: S40 HWC: 120

Diameter (in)	Equivalent Fitting Lengths in Feet								
	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	2.00	5.00
1.380	3.00	6.00	2.00	7.00	6.00	1.00	10.00	10.00	6.00
1.610	4.00	8.00	2.00	9.00	6.00	1.00	10.00	10.00	8.00
2.067	5.00	10.00	3.00	11.00	6.00	1.00	10.00	10.00	10.00
4.026	10.00	20.00	6.00	22.00	12.00	2.00	20.00	20.00	20.00

SPRINKLER SYSTEM HYDRAULIC ANALYSIS

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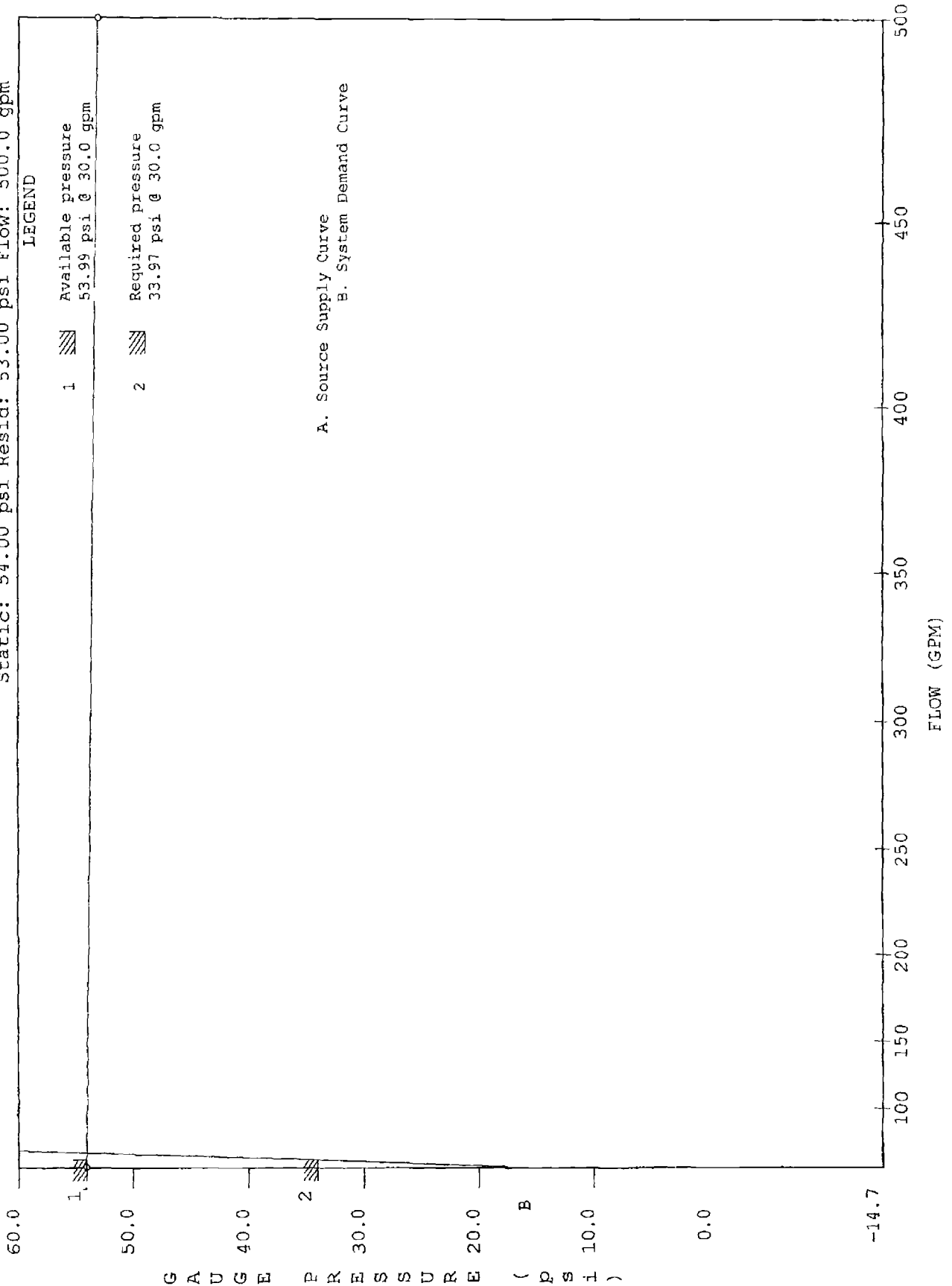
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JOB TITLE: 367 Knickerbocker Ave, Brooklyn,N.Y. 11237 - 3rd Floor

WATER SUPPLY ANALYSIS

Static: 54.00 psi Resid: 53.00 psi Flow: 500.0 gpm



Dashed Lines indicate extrapolated values from Test Results
Site pressures are based on hose stream deduction at the source

SPRINKLER SYSTEM HYDRAULIC ANALYSIS

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JOB TITLE: 367 Knickerbocker Ave, Brooklyn,N.Y. 11237 - 3rd Floor

WATER SUPPLY CURVE

