



FIRE PROTECTION HYDRAULIC CALCULATIONS

PROJECT:

ULTA SHELL SPACE

1733 ST LUCIE BLVD
PORT ST LUCIE, FL. 34946

CONTACT:

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(203)804-6299

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SKYWAY SPRINKLER, LLC
3920 31st N Suite B
St. Petersburg, FL 33714

HYDRAULIC CALCULATIONS

FOR

REMOTE AREA A

Ulta Retail Shell
1733 Saint Lucie Blvd.
Port Saint Lucie, FL 34946

-DESIGN DATA-

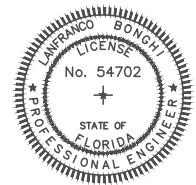
OCCUPANCY CLASSIFICATION:	Ord Haz Gp II
DENSITY:	.2 gpm / sq. ft.
AREA OF APPLICATION:	1,605 sq. ft.
COVERAGE PER SPRINKLER:	128.25 sq. ft.
NUMBER OF SPRINKLERS CALCULATED:	13 sprinklers
TOTAL SPRINKLER WATER FLOW REQUIRED:	343.7 gpm
FLOW AND PRESSURE (@ BOR):	343.7 gpm @ 34.6 psi
SPRINKLER ORIFICE SIZE:	8.0 K
NAME OF CONTRACTOR:	Skyway Sprinkler, LLC
DESIGN/LAYOUT BY:	John Wheeler
AUTHORITY HAVING JURISDICTION:	Port Saint Lucie FD
DESIGNER CERTIFICATION NUMBER:	NICET level IV No. 081267

CALCULATIONS BY HASS COMPUTER PROGRAM
HRS SYSTEMS, INC.

LANNCO, INC
ENGINEERING CONSULTING
CERTIFICATE OF AUTHORIZATION
26222

P.O. BOX 41481
ST. PETERSBURG
FLORIDA 33743
(727) 345-8556

PROFESSIONAL SEAL



FRANK BONGHI
FLORIDA P.E. 54702

DATE: 2/8/2024

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JOB TITLE: Ultra shell Remote Calc A .2/1,605 128.25 s.f. spacing

WATER SUPPLY DATA

SOURCE NODE TAG	STATIC PRESS. (PSI)	RESID. PRESS. (PSI)	FLOW @ (GPM)	AVAIL. PRESS. (PSI)	TOTAL @ DEMAND (GPM)	REQ'D PRESS. (PSI)
SRC	60.0	55.0	1190.0	58.6	593.7	39.3

AGGREGATE FLOW ANALYSIS:

TOTAL FLOW AT SOURCE	593.7 GPM
TOTAL HOSE STREAM ALLOWANCE AT SOURCE	0.0 GPM
OTHER HOSE STREAM ALLOWANCES	250.0 GPM
TOTAL DISCHARGE FROM ACTIVE SPRINKLERS	343.7 GPM

NODE ANALYSIS DATA

NODE TAG	ELEVATION (FT)	NODE TYPE	PRESSURE (PSI)	DISCHARGE (GPM)
A1	23.6	K= 7.51	14.5	28.6
A2	23.6	K= 7.51	11.8	25.8
A3	23.6	K= 7.51	11.9	25.9
A4	23.6	K= 7.51	12.2	26.2
A5	23.6	K= 7.51	13.3	27.4
A6	23.6	K= 7.51	11.7	25.7
A7	23.6	K= 7.51	11.8	25.8
A8	23.6	K= 7.51	12.1	26.1
A9	23.6	K= 7.51	13.2	27.3
A10	23.6	K= 7.51	11.7	25.7
A11	23.6	K= 7.51	11.8	25.8
A12	23.6	K= 7.51	12.1	26.1
A13	23.6	K= 7.51	13.2	27.2
1	19.8	- - - -	19.3	- - -
2T	23.6	- - - -	14.6	- - -
2B	22.4	- - - -	15.2	- - -
3T	23.6	- - - -	13.4	- - -
3B	22.4	- - - -	15.0	- - -
4T	23.6	- - - -	13.3	- - -
4B	22.4	- - - -	14.9	- - -
5T	23.6	- - - -	13.3	- - -
5B	22.4	- - - -	14.9	- - -
TR	14.3	- - - -	27.0	- - -
POC	2.5	- - - -	34.4	- - -
FL	2.0	- - - -	34.6	- - -
BF1	3.0	- - - -	38.3	- - -
BF2	3.0	- - - -	34.3	- - -
U1	-3.0	HOSE STREAM	41.0	250.0
SRC	2.0	SOURCE	39.3	593.7

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PIPE DATA

PIPE TAG					Q (GPM)	DIA (IN)	LENGTH		PRESS.	
END	ELEV.	NOZ.	PT	DISC.	VEL (FPS)	HW (C)		(FT)	SUM.	
NODES	(FT)	(K)	(PSI)	(GPM)		FL/FT			(PSI)	
SRC U1	Pipe: 1				593.7	8.270	PL	140.00	PF	0.4
	2.0	SRCE	39.3	(N/A)	3.5	140	FTG	T	PE	2.2
	-3.0	H.S.	41.0	250.0		0.002	TL	195.35	PV	
U1 BF1	Pipe: 2				343.7	8.270	PL	17.50	PF	0.1
	-3.0	H.S.	41.0	250.0	2.1	140	FTG	2ETG	PE	-2.6
	3.0	0.0	38.3	0.0		0.001	TL	136.12	PV	
BF1 BF2	Pipe: 3					FIXED PRESSURE LOSS DEVICE				
	3.0	0.0	38.3	0.0		4.0 psi,	343.7 gpm			
	3.0	0.0	34.3	0.0						
BF2 FL	Pipe: 4				343.7	8.270	PL	41.00	PF	0.1
	3.0	0.0	34.3	0.0	2.1	140	FTG	4E	PE	0.4
	2.0	0.0	34.6	0.0		0.001	TL	154.87	PV	
FL POC	Pipe: 5				343.7	4.260	PL	0.50	PF	0.0
	2.0	0.0	34.6	0.0	7.7	120	FTG	----	PE	-0.2
	2.5	0.0	34.4	0.0		0.027	TL	0.50	PV	
POC TR	Pipe: 6				343.7	4.260	PL	14.25	PF	2.2
	2.5	0.0	34.4	0.0	7.7	120	FTG	ETCB	PE	-5.1
	14.3	0.0	27.0	0.0		0.027	TL	82.05	PV	
TR 1	Pipe: 7				343.7	4.260	PL	170.12	PF	5.4
	14.3	0.0	27.0	0.0	7.7	120	FTG	4E	PE	-2.4
	19.8	0.0	19.3	0.0		0.027	TL	197.32	PV	
1 2B	Pipe: 8				343.7	4.260	PL	90.00	PF	2.9
	19.8	0.0	19.3	0.0	7.7	120	FTG	T	PE	-1.2
	22.4	0.0	15.2	0.0		0.027	TL	106.00	PV	
2B 3B	Pipe: 9				315.1	4.260	PL	9.50	PF	0.2
	22.4	0.0	15.2	0.0	7.1	120	FTG	----	PE	0.0
	22.4	0.0	15.0	0.0		0.023	TL	9.50	PV	
3B 4B	Pipe: 10				209.8	4.260	PL	9.50	PF	0.1
	22.4	0.0	15.0	0.0	4.7	120	FTG	----	PE	0.0
	22.4	0.0	14.9	0.0		0.011	TL	9.50	PV	
4B 5B	Pipe: 10A				104.8	4.260	PL	9.50	PF	0.0
	22.4	0.0	14.9	0.0	2.4	120	FTG	----	PE	0.0
	22.4	0.0	14.9	0.0		0.003	TL	9.50	PV	
2B 2T	Pipe: 11				28.6	2.157	PL	1.17	PF	0.1
	22.4	0.0	15.2	0.0	2.5	120	FTG	T	PE	-0.5
	23.6	0.0	14.6	0.0		0.008	TL	13.48	PV	

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JOB TITLE: Ultra shell Remote Calc A .2/1,605 128.25 s.f. spacing

PIPE TAG	END	ELEV.	NOZ.	PT	DISC.	Q (GPM)	DIA (IN)	LENGTH	PRESS.	
	NODES	(FT)	(K)	(PSI)	(GPM)	VEL (FPS)	HW (C)	(FT)	SUM.	
							FL/FT		(PSI)	
	Pipe: 12					28.6	2.157	PL	1.42	PF 0.1
2T		23.6	0.0	14.6	0.0	2.5	120	FTG	T	PE 0.0
A1		23.6	7.5	14.5	28.6		0.008	TL	13.73	PV
	Pipe: 13					105.3	2.157	PL	1.17	PF 1.1
3B		22.4	0.0	15.0	0.0	9.2	120	FTG	T	PE -0.5
3T		23.6	0.0	13.4	0.0		0.084	TL	13.48	PV
	Pipe: 14					27.4	2.157	PL	1.42	PF 0.1
3T		23.6	0.0	13.4	0.0	2.4	120	FTG	T	PE 0.0
A5		23.6	7.5	13.3	27.4		0.007	TL	13.73	PV
	Pipe: 15					78.0	2.157	PL	12.08	PF 1.2
3T		23.6	0.0	13.4	0.0	6.8	120	FTG	T	PE 0.0
A4		23.6	7.5	12.2	26.2		0.048	TL	24.39	PV
	Pipe: 16					51.7	2.157	PL	13.50	PF 0.3
A4		23.6	7.5	12.2	26.2	4.5	120	FTG	----	PE 0.0
A3		23.6	7.5	11.9	25.9		0.023	TL	13.50	PV
	Pipe: 17					25.8	2.157	PL	12.50	PF 0.1
A3		23.6	7.5	11.9	25.9	2.3	120	FTG	----	PE 0.0
A2		23.6	7.5	11.8	25.8		0.006	TL	12.50	PV
	Pipe: 18					104.9	2.157	PL	1.17	PF 1.1
4B		22.4	0.0	14.9	0.0	9.2	120	FTG	T	PE -0.5
4T		23.6	0.0	13.3	0.0		0.083	TL	13.48	PV
	Pipe: 19					27.3	2.157	PL	1.42	PF 0.1
4T		23.6	0.0	13.3	0.0	2.4	120	FTG	T	PE 0.0
A9		23.6	7.5	13.2	27.3		0.007	TL	13.73	PV
	Pipe: 20					77.7	2.157	PL	12.08	PF 1.2
4T		23.6	0.0	13.3	0.0	6.8	120	FTG	T	PE 0.0
A8		23.6	7.5	12.1	26.1		0.048	TL	24.39	PV
	Pipe: 21					51.5	2.157	PL	13.50	PF 0.3
A8		23.6	7.5	12.1	26.1	4.5	120	FTG	----	PE 0.0
A7		23.6	7.5	11.8	25.8		0.022	TL	13.50	PV
	Pipe: 22					25.7	2.157	PL	12.50	PF 0.1
A7		23.6	7.5	11.8	25.8	2.3	120	FTG	----	PE 0.0
A6		23.6	7.5	11.7	25.7		0.006	TL	12.50	PV
	Pipe: 23					104.8	2.157	PL	1.17	PF 1.1
5B		22.4	0.0	14.9	0.0	9.2	120	FTG	T	PE -0.5
5T		23.6	0.0	13.3	0.0		0.083	TL	13.48	PV
	Pipe: 24					27.2	2.157	PL	1.42	PF 0.1
5T		23.6	0.0	13.3	0.0	2.4	120	FTG	T	PE 0.0
A13		23.6	7.5	13.2	27.2		0.007	TL	13.73	PV

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PIPE TAG					Q (GPM)	DIA (IN)	LENGTH	PRESS.	
END	ELEV.	NOZ.	PT	DISC.	VEL (FPS)	HW (C)	(FT)	SUM.	
NODES	(FT)	(K)	(PSI)	(GPM)		FL/FT		(PSI)	
Pipe: 25					77.6	2.157	PL	12.08	PF 1.2
5T	23.6	0.0	13.3	0.0	6.8	120	FTG	T	PE 0.0
A12	23.6	7.5	12.1	26.1		0.048	TL	24.39	PV
Pipe: 26					51.5	2.157	PL	13.50	PF 0.3
A12	23.6	7.5	12.1	26.1	4.5	120	FTG	----	PE 0.0
A11	23.6	7.5	11.8	25.8		0.022	TL	13.50	PV
Pipe: 27					25.7	2.157	PL	12.50	PF 0.1
A11	23.6	7.5	11.8	25.8	2.3	120	FTG	----	PE 0.0
A10	23.6	7.5	11.7	25.7		0.006	TL	12.50	PV

NOTES (HASS):

- Calculations were performed by the HASS 2023 D computer program in accordance with NFPA (2020) under license no. 64821788 granted by
HRS Systems, Inc.
208 Southside Square
Petersburg, TN 37144
(931) 659-9760
- The system has been calculated to provide an average imbalance at each node of 0.004 gpm and a maximum imbalance at any node of 0.125 gpm.
- Total pressure at each node is used in balancing the system. Maximum water velocity is 9.2 ft/sec at pipe 13.
- Items listed in bold print on the cover sheet

are automatically transferred from the calculation report.
- Available pressure at source node SRC under full flow conditions is 58.09 psi with a flow of 707.36 gpm.
- PIPE FITTINGS TABLE

User Pipe Table Name: CUSTOM

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PAGE: A MATERIAL: S40-T 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
4.260	6.80	16.00	8.00	29.00	16.00	3.00	26.00	26.00	26.00

PAGE: * MATERIAL: Custom

Diameter (in)	Equivalent Fitting Lengths in Feet								
	E Ell	T Tee	L LngEll	C ChkVlv	B BfyVlv	G GatVlv	A AlmChk	D DPVlv	N NPTee
2.157	6.15 3.08	12.31	3.69	13.54	7.38	1.23	12.31	12.31	12.31
8.270	21.40 10.70	41.62	15.46	53.51	14.27	4.76	36.86	36.86	41.62

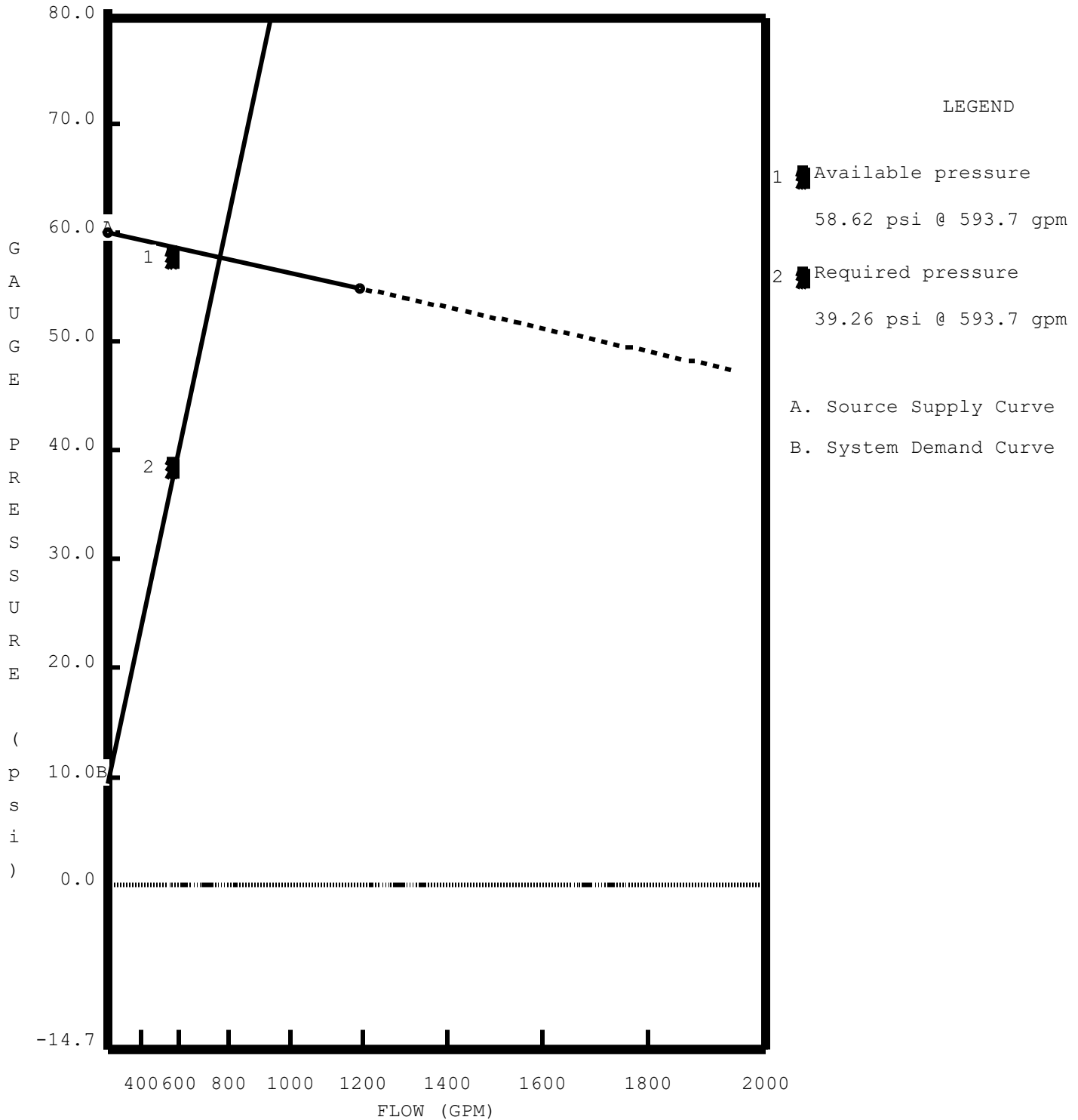
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WATER SUPPLY ANALYSIS

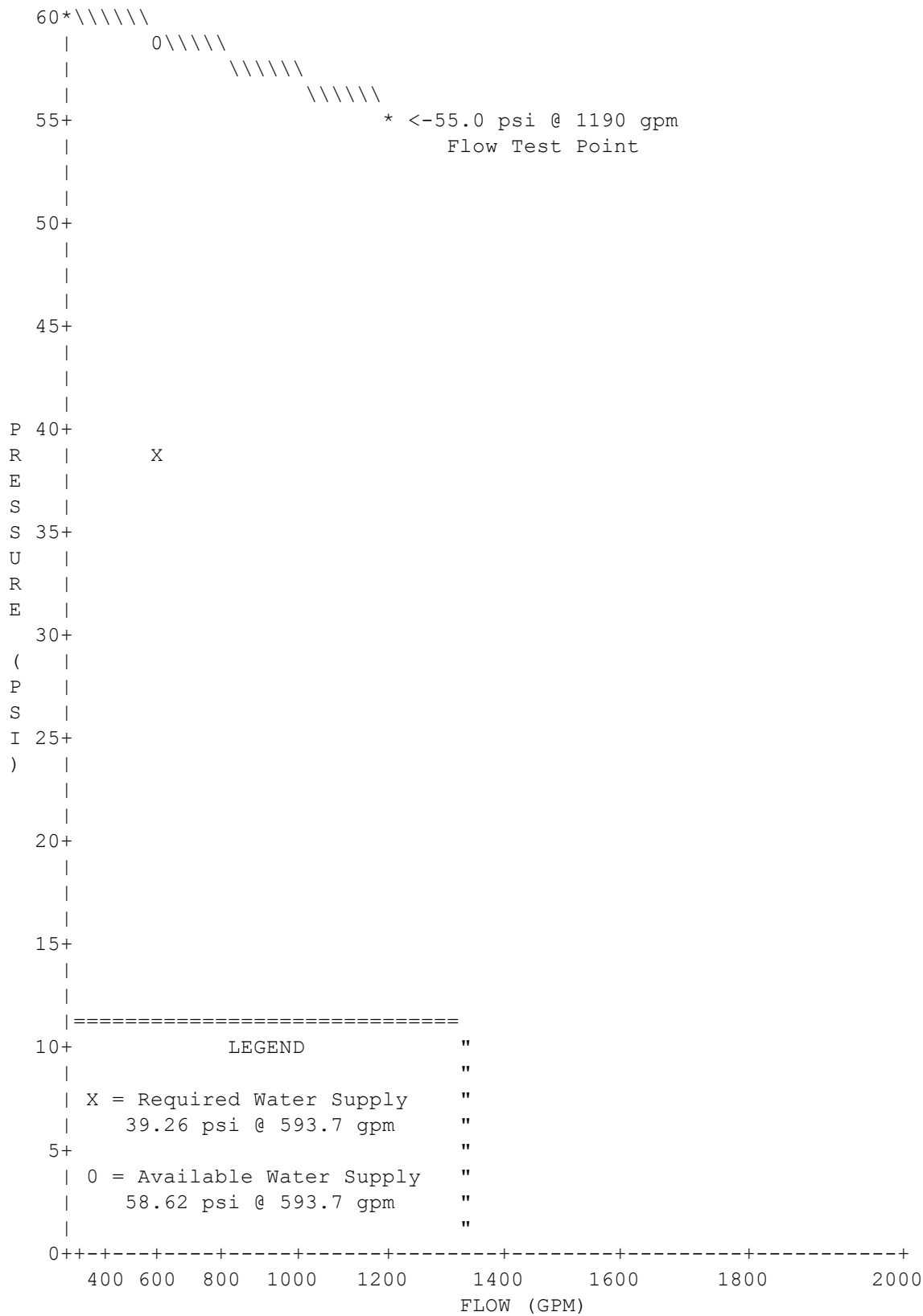
Static: 60.00 psi Resid: 55.00 psi Flow: 1190.0 gpm



Note: (1) Dashed Lines indicate extrapolated values from Test Results

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WATER SUPPLY CURVE



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Utility Report:

Equivalent K-Factor Calculator

Node Name	Sprinkler K-Factor	Pres. (psi)	Dia. (in)	Pipe Len.(ft)	Ftgs.	Total Len.(ft)	H-W coef.	Equivalent K-factor
a1-a13	8.00	7.00	1.049	1.50	T	6.50	120.00	7.51