

Hydraulic Calculations

Project Name: 775 Vaughan

DESIGN DATA:

Remote Area Location: Parking – P1

System Type: Dry System

Hazard: Ordinary Hazard Group-1

Design Density: 0.15 gpm/ sq. ft

Remote Area: Maximum 1950 SQ. FT (1500 sq.ft times 1.3)

Sprinkler Classification: Extended Coverage Upright

Maximum Sprinkler Coverage: 400 sq. ft

Sprinkler K-Factor: K14

CALCULATING END SPRINKLER FLOW IN REMOTE AREA

Design Density = 0.15 gpm/sq ft

Maximum area covered by one sprinkler = 400 sq. ft

Flow required at end sprinkler = 0.15 x 400 gpm

$$= 60 \text{ gpm}$$

CALCULATING END SPRINKLER PRESSURE

Using equation.

$$Q = K \times \sqrt{P}$$

Where, Q = Flow in gpm (gallons per minute)

K = Sprinkler constant given by manufacture data sheet

P = Pressure at sprinkler in psi (pound per square inch)

Once the flow (Q) is calculated, the required pressure (P) can be calculated by simply rearranging the above formula:

$$P = \left(\frac{Q}{K}\right)^2$$

$$Q = 60 \text{ gpm}$$

$$K = 14$$

$$\text{Therefore, Pressure required at end sprinkler} = (60/14)^2 = 18.36 \text{ psi.}$$

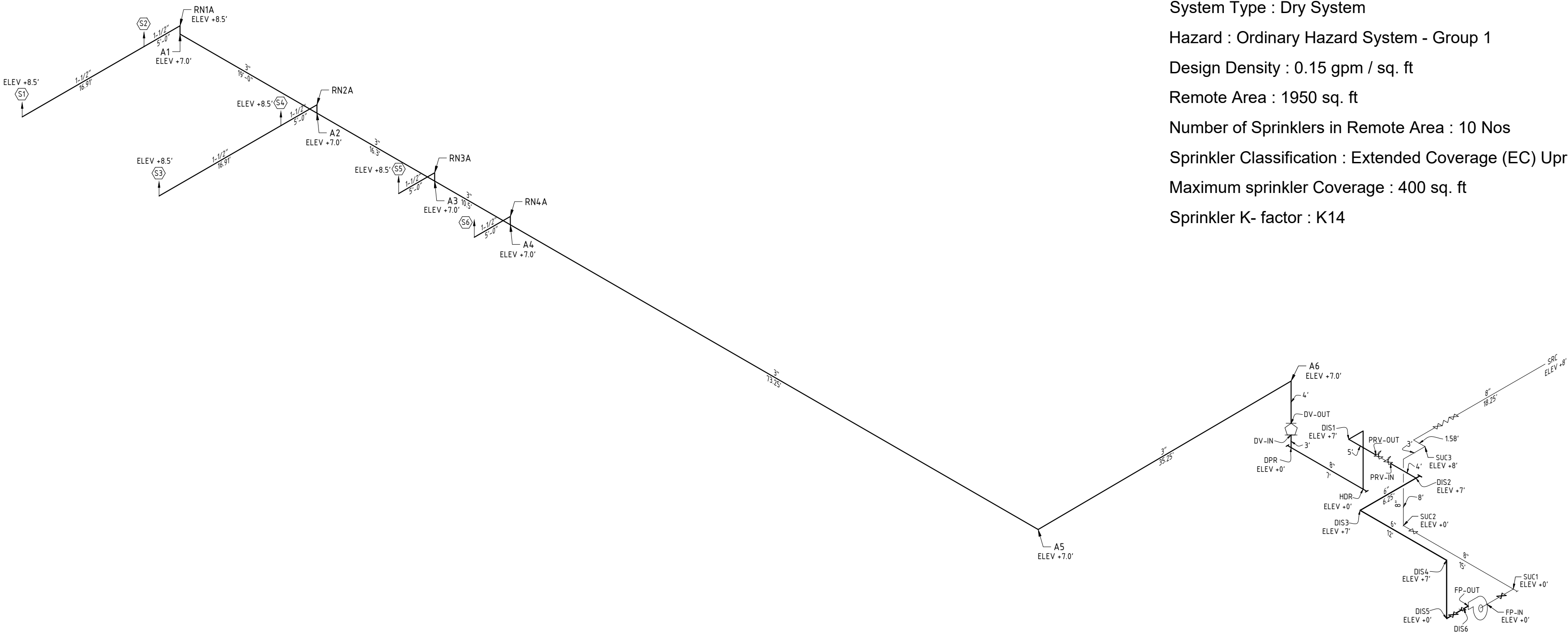
Therefore, our calculation shall start at Pressure P = 18.36 psi.

This pressure shall be inserted into hydraulic calculation software of minimum end conditions.

HYDRAULIC CALCULATIONS
FOR DRY PIPE SYSTEM
PARKING P1

DESIGN DATA:

Remote Area Location : Parking P1
System Type : Dry System
Hazard : Ordinary Hazard System - Group 1
Design Density : 0.15 gpm / sq. ft
Remote Area : 1950 sq. ft
Number of Sprinklers in Remote Area : 10 Nos
Sprinkler Classification : Extended Coverage (EC) Upright
Maximum sprinkler Coverage : 400 sq. ft
Sprinkler K- factor : K14



LIFELINE FIRE PROTECTION
www.lifelinefireprotection.com
50 Casimir Court, Concord, ON
L4K 4J5
(416)850-9477

PROPOSED MIXED-USED DEVELOPMENT

ADDRESS:
775-783 Vaughan Rd & 670-680
Northcliffe Blvd, York, ON

HYDRAULIC CALCULATIONS
ISOMETRIC DIAGRAM
DRY PIPE SYSTEM
PARKING P1

Project No.: 2127
Scale: As indicated
Date: MAY 13, 2024
Drawn by: STUDIO JCI

Drawing No.:

CALC.05

DATE: 6/6/2024 775 VAUGHAN\HYDRAULIC CALC\DRYPIPE SYSTEM - PARKING P1.SDF

JOB TITLE: 775 Vaughan

DEMAND CALCULATIONS

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	52.0	1082.0	58.8	395.1	20.0

AGGREGATE FLOW ANALYSIS:

TOTAL FLOW AT SOURCE	395.1 GPM
TOTAL HOSE STREAM ALLOWANCE AT SOURCE	0.0 GPM
OTHER HOSE STREAM ALLOWANCES	0.0 GPM
TOTAL DISCHARGE FROM ACTIVE SPRINKLERS	395.1 GPM

NODE ANALYSIS DATA

NODE TAG	ELEVATION (FT)	NODE TYPE	PRESSURE		DISCHARGE (GPM)
			TOTAL (PSI)	NORMAL (PSI)	
S1	8.5	K=14.00	18.4	18.4	60.0
S2	8.5	K=14.00	21.3	18.8	60.8
RN1A	8.5	- - - -	26.2	23.8	- - -
S3	8.5	K=14.00	18.7	18.7	60.5
S4	8.5	K=14.00	21.6	19.2	61.3
RN2A	8.5	- - - -	26.7	24.2	- - -
S5	8.5	K=14.00	28.9	28.9	75.3
RN3A	8.5	- - - -	31.0	30.1	- - -
S6	8.5	K=14.00	30.5	30.5	77.3
RN4A	8.5	- - - -	32.6	31.6	- - -
A1	7.0	- - - -	31.4	31.2	- - -
A2	7.0	- - - -	31.9	31.2	- - -
A3	7.0	- - - -	33.6	32.3	- - -
A4	7.0	- - - -	35.3	33.3	- - -
A5	7.0	- - - -	54.4	52.4	- - -
A6	7.0	- - - -	63.5	62.8	- - -
DV-IN	3.0	- - - -	85.5	85.5	- - -
DV-OUT	3.0	- - - -	65.5	65.5	- - -
DPR	0.0	- - - -	86.9	86.9	- - -
HDR	0.0	- - - -	87.0	86.9	- - -
DIS1	7.0	- - - -	84.2	84.1	- - -
PRV-OUT	7.0	- - - -	84.2	84.1	- - -
PRV-IN	7.0	- - - -	85.1	85.0	- - -
DIS2	7.0	- - - -	85.1	85.0	- - -
DIS3	7.0	- - - -	85.2	85.1	- - -
DIS4	7.0	- - - -	85.4	85.3	- - -
DIS5	0.0	- - - -	88.6	88.4	- - -
DIS6	0.0	- - - -	88.8	88.7	- - -
FP-OUT	0.0	- - - -	88.8	88.8	- - -
FP-IN	0.0	- - - -	23.1	23.1	- - -
SUC1	0.0	- - - -	23.1	23.1	- - -
SUC2	0.0	- - - -	23.2	23.1	- - -
SUC3	8.0	- - - -	19.8	19.7	- - -
SRC	8.0	SOURCE	20.0	20.0	395.1

DATE: 6/6/2024 775 VAUGHAN\HYDRAULIC CALC\DRYPIPE SYSTEM - PARKING P1.SDF
JOB TITLE: 775 Vaughan

PIPE DATA

PIPE TAG		ELEV. (FT)	PT (PSI)	P2 (PSI)	DISC. (GPM)	Q (GPM)		DIA (IN)		LENGTH (FT)	PRESS.	
END						VEL (FPS)	HW (C) FL/FT		SUM. (PSI)			
NODES												
Pipe: 1												
S1		8.5	18.4	18.4	60.0	-60.0 9.5	1.610 100	PL FTG	16.91 ----	PF PE	2.9 0.0	
S2		8.5	21.3	18.8	60.8		0.173	TL	16.91	PV	0.6	
Pipe: 2												
S2		8.5	21.3	18.8	60.8	-120.8 19.0	1.610 100	PL FTG	5.00 E	PF PE	4.9 0.0	
RN1A		8.5	26.2	23.8	0.0		0.630	TL	7.85	PV	2.4	
Pipe: 3												
S3		8.5	18.7	18.7	60.5	-60.5 9.5	1.610 100	PL FTG	16.91 ----	PF PE	3.0 0.0	
S4		8.5	21.6	19.2	61.3		0.175	TL	16.91	PV	0.6	
Pipe: 4												
S4		8.5	21.6	19.2	61.3	-121.8 19.2	1.610 100	PL FTG	5.00 E	PF PE	5.0 0.0	
RN2A		8.5	26.7	24.2	0.0		0.640	TL	7.85	PV	2.5	
Pipe: 5												
S5		8.5	28.9	28.9	75.3	-75.3 11.9	1.610 100	PL FTG	5.00 E	PF PE	2.1 0.0	
RN3A		8.5	31.0	30.1	0.0		0.263	TL	7.85	PV	0.9	
Pipe: 6												
S6		8.5	30.5	30.5	77.3	-77.3 12.2	1.610 100	PL FTG	5.00 E	PF PE	2.2 0.0	
RN4A		8.5	32.6	31.6	0.0		0.276	TL	7.85	PV	1.0	
Pipe: 7												
RN1A		8.5	26.2	23.8	0.0	-120.8 19.0	1.610 100	PL FTG	1.50 T	PF PE	4.5 0.6	
A1		7.0	31.4	31.2	0.0		0.630	TL	7.21	PV	2.4	
Pipe: 8												
A1		7.0	31.4	31.2	0.0	-120.8 5.2	3.068 100	PL FTG	19.00 ----	PF PE	0.5 0.0	
A2		7.0	31.9	31.2	0.0		0.027	TL	19.00	PV	0.2	
Pipe: 9												
RN2A		8.5	26.7	24.2	0.0	-121.8 19.2	1.610 100	PL FTG	1.50 T	PF PE	4.6 0.6	
A2		7.0	31.9	31.2	0.0		0.640	TL	7.21	PV	2.5	
Pipe: 10												
A2		7.0	31.9	31.2	0.0	-242.6 10.5	3.068 100	PL FTG	16.30 ----	PF PE	1.6 0.0	
A3		7.0	33.6	32.3	0.0		0.099	TL	16.30	PV	0.7	
Pipe: 11												
RN3A		8.5	31.0	30.1	0.0	-75.3 11.9	1.610 100	PL FTG	1.50 T	PF PE	1.9 0.6	
A3		7.0	33.6	32.3	0.0		0.263	TL	7.21	PV	0.9	
Pipe: 12												
A3		7.0	33.6	32.3	0.0	-317.9 13.8	3.068 100	PL FTG	10.50 ----	PF PE	1.7 0.0	
A4		7.0	35.3	33.3	0.0		0.163	TL	10.50	PV	1.3	
Pipe: 13												
RN4A		8.5	32.6	31.6	0.0	-77.3 12.2	1.610 100	PL FTG	1.50 T	PF PE	2.0 0.6	
A4		7.0	35.3	33.3	0.0		0.276	TL	7.21	PV	1.0	
Pipe: 14												
A4		7.0	35.3	33.3	0.0	-395.1 17.1	3.068 100	PL FTG	73.25 E	PF PE	19.1 0.0	
A5		7.0	54.4	52.4	0.0		0.244	TL	78.25	PV	2.0	

DATE: 6/6/2024 775 VAUGHAN\HYDRAULIC CALC\DRYPIPE SYSTEM - PARKING P1.SDF

JOB TITLE: 775 Vaughan

PIPE TAG	END	ELEV.	PT	P2	DISC.	Q (GPM)	DIA (IN)	LENGTH	PRESS.	
NODES	(FT)	(PSI)	(PSI)	(GPM)	VEL (FPS)	HW (C)	FL/FT	(FT)	SUM.	
									(PSI)	
Pipe: 15					-395.1	3.068	PL	32.25	PF	9.1
A5	7.0	54.4	52.4	0.0	17.1	100	FTG	E	PE	0.0
A6	7.0	63.5	62.8	0.0		0.244	TL	37.25	PV	2.0
Pipe: 16					-395.1	4.026	PL	4.00	PF	0.3
A6	7.0	63.5	62.8	0.0	10.0	100	FTG	----	PE	1.7
DV-OUT	3.0	65.5	65.5	0.0		0.065	TL	4.00	PV	0.7
Pipe: 17										
DV-IN	3.0	0.0	85.5	0.0		20.0 psi,		395.1 gpm		
DV-OUT	3.0	0.0	65.5	0.0						
Pipe: 18					-395.1	4.026	PL	3.00	PF	0.1
DV-IN	3.0	85.5	85.5	0.0	10.0	120	FTG	----	PE	1.3
DPR	0.0	86.9	86.9	0.0		0.046	TL	3.00	PV	0.7
Pipe: 19					-395.1	7.981	PL	7.00	PF	0.1
DPR	0.0	86.9	86.9	0.0	2.5	120	FTG	T	PE	0.0
HDR	0.0	87.0	86.9	0.0		0.002	TL	42.00	PV	0.0
Pipe: 20					-395.1	6.065	PL	7.00	PF	0.2
HDR	0.0	87.0	86.9	0.0	4.4	120	FTG	2E	PE	-3.0
DIS1	7.0	84.2	84.1	0.0		0.006	TL	35.00	PV	0.1
Pipe: 21					-395.1	6.065	PL	5.00	PF	0.0
DIS1	7.0	84.2	84.1	0.0	4.4	120	FTG	----	PE	0.0
PRV-OUT	7.0	84.2	84.1	0.0		0.006	TL	5.00	PV	0.1
Pipe: 22										
PRV-IN	7.0	0.0	85.1	0.0		160.0 psi,		395.1 gpm		
PRV-OUT	7.0	0.0	84.2	0.0		-0.9 psi				
Pipe: 23					-395.1	6.065	PL	4.00	PF	0.0
PRV-IN	7.0	85.1	85.0	0.0	4.4	120	FTG	----	PE	0.0
DIS2	7.0	85.1	85.0	0.0		0.006	TL	4.00	PV	0.1
Pipe: 24					-395.1	6.065	PL	6.25	PF	0.1
DIS2	7.0	85.1	85.0	0.0	4.4	120	FTG	E	PE	0.0
DIS3	7.0	85.2	85.1	0.0		0.006	TL	20.25	PV	0.1
Pipe: 25					-395.1	6.065	PL	12.00	PF	0.2
DIS3	7.0	85.2	85.1	0.0	4.4	120	FTG	E	PE	0.0
DIS4	7.0	85.4	85.3	0.0		0.006	TL	26.00	PV	0.1
Pipe: 26					-395.1	6.065	PL	7.00	PF	0.1
DIS4	7.0	85.4	85.3	0.0	4.4	120	FTG	E	PE	3.0
DIS5	0.0	88.6	88.4	0.0		0.006	TL	21.00	PV	0.1
Pipe: 27					395.1	6.065	PL	3.00	PF	0.2
DIS6	0.0	88.8	88.7	0.0	4.4	120	FTG	CG	PE	0.0
DIS5	0.0	88.6	88.4	0.0		0.006	TL	38.00	PV	0.1
Pipe: 28					-395.1	6.065	PL	2.00	PF	0.0
DIS6	0.0	88.8	88.7	0.0	4.4	120	FTG	----	PE	0.0
FP-OUT	0.0	88.8	88.8	0.0		0.006	TL	2.00	PV	0.1
Pipe: 29										
FP-IN	0.0	0.0	23.1	0.0		Rating:		750.0 gpm @ 225.0 psi		
FP-OUT	0.0	0.0	88.8	0.0		Avail.:		395.2 gpm @ 225.0 psi		
						Req'd.:		395.2 gpm @ 65.8 psi		

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 JOB TITLE: 775 Vaughan

PIPE TAG	END	ELEV.	PT	P2	DISC.	Q (GPM)	DIA (IN)	LENGTH	PRESS.	
NODES	(FT)	(PSI)	(PSI)	(GPM)	VEL (FPS)	HW (C)	FL/FT	(FT)	SUM.	(PSI)
Pipe: 30					395.1	6.065	PL	4.00	PF	0.0
SUC1	0.0	23.1	23.1	0.0	4.4	120	FTG	G	PE	0.0
FP-IN	0.0	23.1	23.1	0.0		0.006	TL	7.00	PV	0.1
Pipe: 31					-395.1	7.981	PL	15.00	PF	0.1
SUC1	0.0	23.1	23.1	0.0	2.5	120	FTG	EG	PE	0.0
SUC2	0.0	23.2	23.1	0.0		0.002	TL	37.00	PV	0.0
Pipe: 32					-395.1	7.981	PL	11.00	PF	0.1
SUC2	0.0	23.2	23.1	0.0	2.5	120	FTG	2E	PE	-3.5
SUC3	8.0	19.8	19.7	0.0		0.002	TL	47.00	PV	0.0
Pipe: 33					395.1	7.981	PL	19.83	PF	0.2
SRC	8.0	20.0	20.0	(N/A)	2.5	120	FTG	E2C2G	PE	0.0
SUC3	8.0	19.8	19.7	0.0		0.002	TL	135.83	PV	0.0

NOTES (HASS):

- Calculations were performed by the HASS 2023 D computer program in accordance with (2020) under license no. 65699794 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 0.001 gpm and a maximum imbalance at any node of 0.007 gpm.
- Velocity pressures have been included in the calculation of the system pressures and flows. Maximum water velocity is 19.2 ft/sec at pipe 9.
- The Minimum pump suction pressure under maximum calculated demand is 23.06 (psi)
- 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 57.34 psi with a flow of 596.34 gpm.
- PIPE FITTINGS TABLE

HASS Pipe Table Name: standard

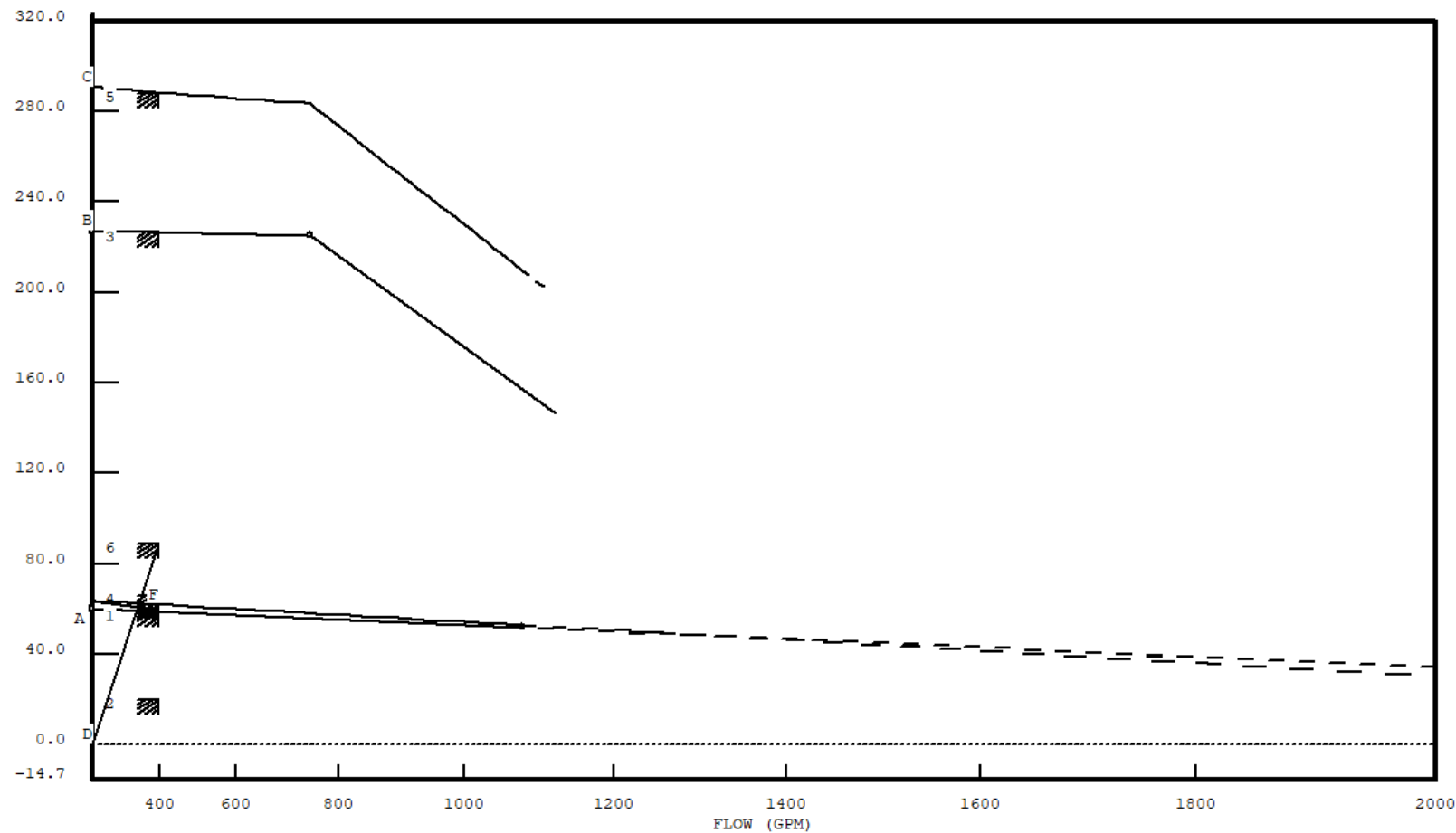
DATE: 6/6/2024 775 VAUGHAN\HYDRAULIC CALC\DRYPIPE SYSTEM - PARKING P1.SDF
 JOB TITLE: 775 Vaughan

PAGE: A MATERIAL: S40 HWC: 120

Diameter (in)	Equivalent Fitting Lengths in Feet								
	E Ell	T Tee	L LngEll	C ChkVlv	B BfyVlv	G GatVlv	A AlmChk	D DPVlv	N NTee

	F								
	F45Ell								
1.610	4.00	8.00	2.00	9.00	6.00	1.00	10.00	10.00	8.00
	2.00								
3.068	7.00	15.00	5.00	16.00	10.00	1.00	13.00	13.00	15.00
	3.50								
4.026	10.00	20.00	6.00	22.00	12.00	2.00	20.00	20.00	20.00
	5.00								
6.065	14.00	30.00	9.00	32.00	10.00	3.00	28.00	28.00	30.00
	7.00								
7.981	18.00	35.00	13.00	45.00	12.00	4.00	31.00	31.00	35.00
	9.00								

Static: 60.00 psi Resid: 52.00 psi Flow: 1082.0 gpm



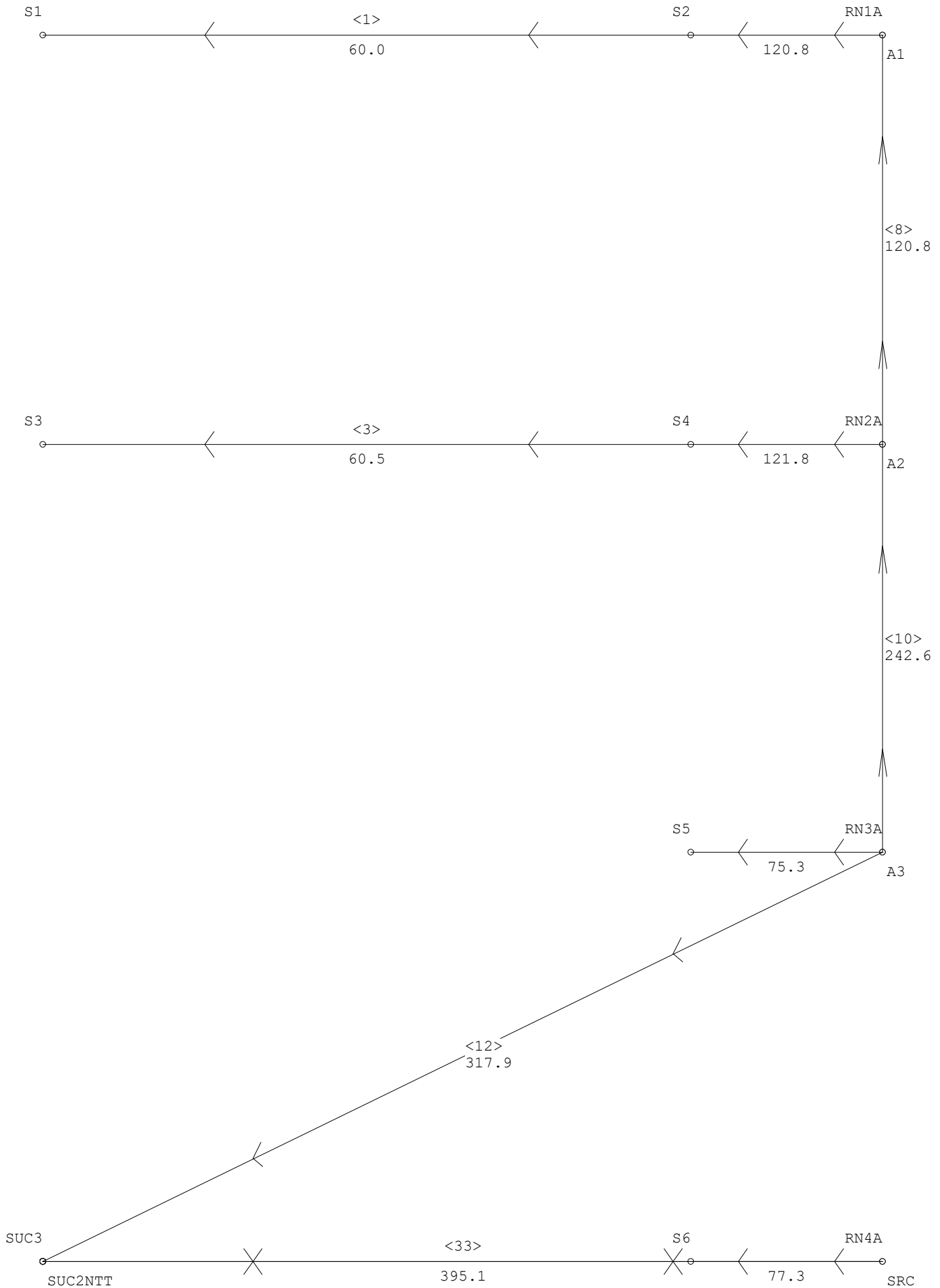
Note: (1) Dashed Lines indicate extrapolated values from Test Results

- 1 Pressure available at source
58.76 psi @ 395.1 gpm
 - 2 Pressure required at source
20.00 psi @ 395.1 gpm
 - 3 Pressure available from pump
226.06 psi @ 395.2 gpm
 - 4 Pressure required from pump
65.77 psi @ 395.2 gpm
 - 5 Total Pressure available at pump dschg.
287.88 psi @ 395.2 gpm
 - 6 Total Pressure required at pump dschg.
88.83 psi @ 395.2 gpm
- A. Source Supply Curve
B. Net Pump Supply Curve
C. Pump Discharge Curve
D. System Demand Curve
F. Available at Pump Suction

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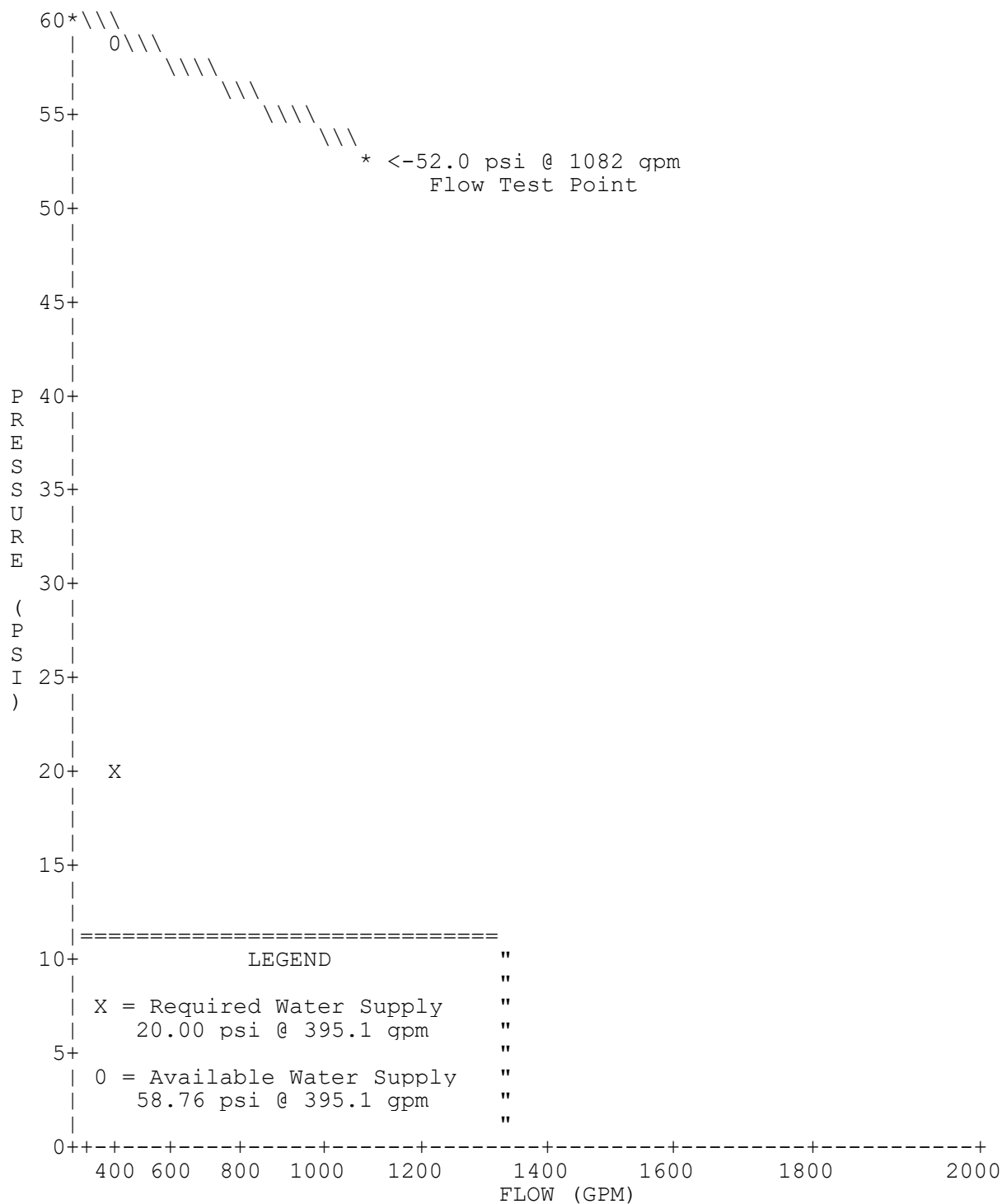
SPRINKLER SYSTEM DIAGRAM WITH FLOWPLOT



DATE: 6/6/2024 775 VAUGHAN\HYDRAULIC CALC\DRYPIPE SYSTEM - PARKING P1.SDF

JOB TITLE: 775 Vaughan

WATER SUPPLY CURVE



DATE: 6/6/2024 775 VAUGHAN\HYDRAULIC CALC\DRYPIPE SYSTEM - PARKING P1.SDF

JOB TITLE: 775 Vaughan

SUPPLY CALCULATIONS

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	52.0	1082.0	57.3	596.3	

AGGREGATE FLOW ANALYSIS:

TOTAL FLOW AT SOURCE	596.3 GPM
TOTAL HOSE STREAM ALLOWANCE AT SOURCE	0.0 GPM
OTHER HOSE STREAM ALLOWANCES	0.0 GPM
TOTAL DISCHARGE FROM ACTIVE SPRINKLERS	596.3 GPM

NODE ANALYSIS DATA

NODE TAG	ELEVATION (FT)	NODE TYPE	PRESSURE		DISCHARGE (GPM)
			TOTAL (PSI)	NORMAL (PSI)	
S1	8.5	K=14.00	42.3	42.3	91.1
S2	8.5	K=14.00	48.6	43.0	91.8
RN1A	8.5	- - - -	59.3	53.7	- - -
S3	8.5	K=14.00	43.0	43.0	91.8
S4	8.5	K=14.00	49.4	43.7	92.6
RN2A	8.5	- - - -	60.3	54.6	- - -
S5	8.5	K=14.00	65.3	65.3	113.1
RN3A	8.5	- - - -	69.7	67.5	- - -
S6	8.5	K=14.00	68.6	68.6	115.9
RN4A	8.5	- - - -	73.2	70.9	- - -
A1	7.0	- - - -	69.7	69.3	- - -
A2	7.0	- - - -	70.9	69.1	- - -
A3	7.0	- - - -	74.3	71.4	- - -
A4	7.0	- - - -	78.0	73.5	- - -
A5	7.0	- - - -	119.0	114.5	- - -
A6	7.0	- - - -	138.5	136.9	- - -
DV-IN	3.0	- - - -	160.7	160.7	- - -
DV-OUT	3.0	- - - -	140.7	140.7	- - -
DPR	0.0	- - - -	162.3	162.2	- - -
HDR	0.0	- - - -	162.5	162.2	- - -
DIS1	7.0	- - - -	159.9	159.6	- - -
PRV-OUT	7.0	- - - -	160.0	159.7	- - -
PRV-IN	7.0	- - - -	280.9	280.6	- - -
DIS2	7.0	- - - -	280.9	280.6	- - -
DIS3	7.0	- - - -	281.2	280.9	- - -
DIS4	7.0	- - - -	281.5	281.2	- - -
DIS5	0.0	- - - -	284.9	284.6	- - -
DIS6	0.0	- - - -	285.4	285.1	- - -
FP-OUT	0.0	- - - -	285.4	285.4	- - -
FP-IN	0.0	- - - -	59.9	59.9	- - -
SUC1	0.0	- - - -	60.0	59.9	- - -
SUC2	0.0	- - - -	60.2	60.1	- - -
SUC3	8.0	- - - -	56.9	56.8	- - -
SRC	8.0	SOURCE	57.3	57.3	596.3

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JOB TITLE: 775 Vaughan

PIPE DATA

PIPE TAG		ELEV. (FT)	PT (PSI)	P2 (PSI)	DISC. (GPM)	Q (GPM)	DIA (IN)	LENGTH	PRESS.		
END	VEL (FPS)					HW (C)	(FT)	SUM.			
NODES						FL/FT		(PSI)			
Pipe: 1											
S1		8.5	42.3	42.3	91.1	14.4	1.610	PL	16.91	PF	6.3
S2		8.5	48.6	43.0	91.8		100	FTG	----	PE	0.0
							0.374	TL	16.91	PV	1.4
Pipe: 2											
S2		8.5	48.6	43.0	91.8	28.8	1.610	PL	5.00	PF	10.7
RN1A		8.5	59.3	53.7	0.0		100	FTG	E	PE	0.0
							1.358	TL	7.85	PV	5.6
Pipe: 3											
S3		8.5	43.0	43.0	91.8	14.5	1.610	PL	16.91	PF	6.4
S4		8.5	49.4	43.7	92.6		100	FTG	----	PE	0.0
							0.380	TL	16.91	PV	1.4
Pipe: 4											
S4		8.5	49.4	43.7	92.6	29.1	1.610	PL	5.00	PF	10.8
RN2A		8.5	60.3	54.6	0.0		100	FTG	E	PE	0.0
							1.379	TL	7.85	PV	5.7
Pipe: 5											
S5		8.5	65.3	65.3	113.1	17.8	1.610	PL	5.00	PF	4.4
RN3A		8.5	69.7	67.5	0.0		100	FTG	E	PE	0.0
							0.558	TL	7.85	PV	2.1
Pipe: 6											
S6		8.5	68.6	68.6	115.9	18.3	1.610	PL	5.00	PF	4.6
RN4A		8.5	73.2	70.9	0.0		100	FTG	E	PE	0.0
							0.584	TL	7.85	PV	2.2
Pipe: 7											
RN1A		8.5	59.3	53.7	0.0	28.8	1.610	PL	1.50	PF	9.8
A1		7.0	69.7	69.3	0.0		100	FTG	T	PE	0.6
							1.358	TL	7.21	PV	5.6
Pipe: 8											
A1		7.0	69.7	69.3	0.0	7.9	3.068	PL	19.00	PF	1.1
A2		7.0	70.9	69.1	0.0		100	FTG	----	PE	0.0
							0.059	TL	19.00	PV	0.4
Pipe: 9											
RN2A		8.5	60.3	54.6	0.0	29.1	1.610	PL	1.50	PF	9.9
A2		7.0	70.9	69.1	0.0		100	FTG	T	PE	0.6
							1.379	TL	7.21	PV	5.7
Pipe: 10											
A2		7.0	70.9	69.1	0.0	15.9	3.068	PL	16.30	PF	3.5
A3		7.0	74.3	71.4	0.0		100	FTG	----	PE	0.0
							0.213	TL	16.30	PV	1.7
Pipe: 11											
RN3A		8.5	69.7	67.5	0.0	17.8	1.610	PL	1.50	PF	4.0
A3		7.0	74.3	71.4	0.0		100	FTG	T	PE	0.6
							0.558	TL	7.21	PV	2.1
Pipe: 12											
A3		7.0	74.3	71.4	0.0	20.8	3.068	PL	10.50	PF	3.7
A4		7.0	78.0	73.5	0.0		100	FTG	----	PE	0.0
							0.351	TL	10.50	PV	2.9
Pipe: 13											
RN4A		8.5	73.2	70.9	0.0	18.3	1.610	PL	1.50	PF	4.2
A4		7.0	78.0	73.5	0.0		100	FTG	T	PE	0.6
							0.584	TL	7.21	PV	2.2
Pipe: 14											
A4		7.0	78.0	73.5	0.0	25.9	3.068	PL	73.25	PF	40.9
A5		7.0	119.0	114.5	0.0		100	FTG	E	PE	0.0
							0.523	TL	78.25	PV	4.5

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JOB TITLE: 775 Vaughan

PIPE TAG	END	ELEV.	PT	P2	DISC.	Q (GPM)	VEL (FPS)	DIA (IN)	LENGTH	PRESS.	SUM.
NODES	(FT)	(PSI)	(PSI)	(GPM)				FL/FT	(FT)	(PSI)	
Pipe: 15						-596.3		3.068	PL	32.25	PF 19.5
A5	7.0	119.0	114.5	0.0	25.9			100	FTG	E	PE 0.0
A6	7.0	138.5	136.9	0.0				0.523	TL	37.25	PV 4.5
Pipe: 16						-596.3		4.026	PL	4.00	PF 0.6
A6	7.0	138.5	136.9	0.0	15.0			100	FTG	----	PE 1.7
DV-OUT	3.0	140.7	140.7	0.0				0.139	TL	4.00	PV 1.5
Pipe: 17											
DV-IN	3.0	0.0	160.7	0.0				20.0 psi,	596.3 gpm		
DV-OUT	3.0	0.0	140.7	0.0							
Pipe: 18						-596.3		4.026	PL	3.00	PF 0.3
DV-IN	3.0	160.7	160.7	0.0	15.0			120	FTG	----	PE 1.3
DPR	0.0	162.3	162.2	0.0				0.099	TL	3.00	PV 1.5
Pipe: 19						-596.3		7.981	PL	7.00	PF 0.1
DPR	0.0	162.3	162.2	0.0	3.8			120	FTG	T	PE 0.0
HDR	0.0	162.5	162.2	0.0				0.004	TL	42.00	PV 0.1
Pipe: 20						-596.3		6.065	PL	7.00	PF 0.5
HDR	0.0	162.5	162.2	0.0	6.6			120	FTG	2E	PE -3.0
DIS1	7.0	159.9	159.6	0.0				0.014	TL	35.00	PV 0.3
Pipe: 21						-596.3		6.065	PL	5.00	PF 0.1
DIS1	7.0	159.9	159.6	0.0	6.6			120	FTG	----	PE 0.0
PRV-OUT	7.0	160.0	159.7	0.0				0.014	TL	5.00	PV 0.3
Pipe: 22											
PRV-IN	7.0	0.0	280.9	0.0				160.0 psi,	596.3 gpm		
PRV-OUT	7.0	0.0	160.0	0.0				-120.9 psi			
Pipe: 23						-596.3		6.065	PL	4.00	PF 0.1
PRV-IN	7.0	280.9	280.6	0.0	6.6			120	FTG	----	PE 0.0
DIS2	7.0	280.9	280.6	0.0				0.014	TL	4.00	PV 0.3
Pipe: 24						-596.3		6.065	PL	6.25	PF 0.3
DIS2	7.0	280.9	280.6	0.0	6.6			120	FTG	E	PE 0.0
DIS3	7.0	281.2	280.9	0.0				0.014	TL	20.25	PV 0.3
Pipe: 25						-596.3		6.065	PL	12.00	PF 0.4
DIS3	7.0	281.2	280.9	0.0	6.6			120	FTG	E	PE 0.0
DIS4	7.0	281.5	281.2	0.0				0.014	TL	26.00	PV 0.3
Pipe: 26						-596.3		6.065	PL	7.00	PF 0.3
DIS4	7.0	281.5	281.2	0.0	6.6			120	FTG	E	PE 3.0
DIS5	0.0	284.9	284.6	0.0				0.014	TL	21.00	PV 0.3
Pipe: 27						596.3		6.065	PL	3.00	PF 0.5
DIS6	0.0	285.4	285.1	0.0	6.6			120	FTG	CG	PE 0.0
DIS5	0.0	284.9	284.6	0.0				0.014	TL	38.00	PV 0.3
Pipe: 28						-596.3		6.065	PL	2.00	PF 0.0
DIS6	0.0	285.4	285.1	0.0	6.6			120	FTG	----	PE 0.0
FP-OUT	0.0	285.4	285.4	0.0				0.014	TL	2.00	PV 0.3
Pipe: 29											
FP-IN	0.0	0.0	59.9	0.0							
FP-OUT	0.0	0.0	285.4	0.0							
FIRE PUMP						Rating:	750.0 gpm @ 225.0 psi				
						Avail.:	596.3 gpm @ 225.0 psi				
						Req'd.:	596.3 gpm @ 225.0 psi				

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PIPE TAG	END	ELEV.	PT	P2	DISC.	Q (GPM)	DIA (IN)	LENGTH	PRESS.	
NODES	(FT)	(PSI)	(PSI)	(GPM)	VEL (FPS)	HW (C)	FL/FT	(FT)	SUM.	(PSI)
Pipe: 30					596.3	6.065	PL	4.00	PF	0.1
SUC1	0.0	60.0	59.9	0.0	6.6	120	FTG	G	PE	0.0
FP-IN	0.0	59.9	59.9	0.0		0.014	TL	7.00	PV	0.3
Pipe: 31					-596.3	7.981	PL	15.00	PF	0.1
SUC1	0.0	60.0	59.9	0.0	3.8	120	FTG	EG	PE	0.0
SUC2	0.0	60.2	60.1	0.0		0.004	TL	37.00	PV	0.1
Pipe: 32					-596.3	7.981	PL	11.00	PF	0.2
SUC2	0.0	60.2	60.1	0.0	3.8	120	FTG	2E	PE	-3.5
SUC3	8.0	56.9	56.8	0.0		0.004	TL	47.00	PV	0.1
Pipe: 33					596.3	7.981	PL	19.83	PF	0.5
SRC	8.0	57.3	57.3	(N/A)	3.8	120	FTG	E2C2G	PE	0.0
SUC3	8.0	56.9	56.8	0.0		0.004	TL	135.83	PV	0.1

NOTES (HASS):

- Calculations were performed by the HASS 2023 D computer program in accordance with (2020) under license no. 65699794 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 0.001 gpm and a maximum imbalance at any node of 0.009 gpm.
- Velocity pressures have been included in the calculation of the system pressures and flows. Maximum water velocity is 29.1 ft/sec at pipe 9.
- The Minimum pump suction pressure under maximum calculated demand is 59.93 (psi)
- 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 57.34 psi with a flow of 596.34 gpm.
- PIPE FITTINGS TABLE

HASS Pipe Table Name: standard

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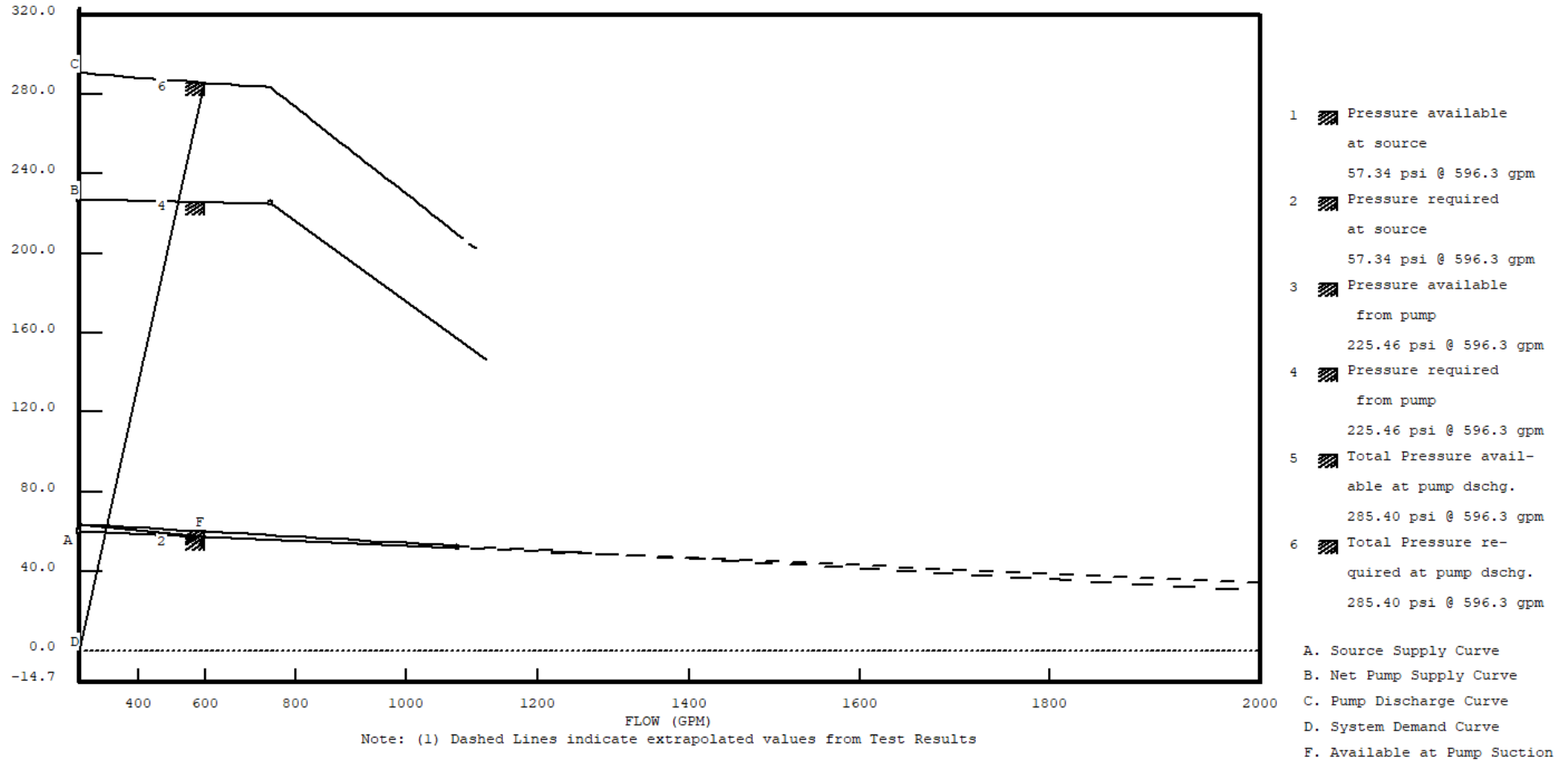
PAGE: A MATERIAL: S40 HWC: 120

Diameter (in)	Equivalent Fitting Lengths in Feet								
	E Ell	T Tee	L LngEll	C ChkVlv	B BfyVlv	G GatVlv	A AlmChk	D DPVlv	N NTee

	F								
	F45Ell								
1.610	4.00	8.00	2.00	9.00	6.00	1.00	10.00	10.00	8.00
	2.00								
3.068	7.00	15.00	5.00	16.00	10.00	1.00	13.00	13.00	15.00
	3.50								
4.026	10.00	20.00	6.00	22.00	12.00	2.00	20.00	20.00	20.00
	5.00								
6.065	14.00	30.00	9.00	32.00	10.00	3.00	28.00	28.00	30.00
	7.00								
7.981	18.00	35.00	13.00	45.00	12.00	4.00	31.00	31.00	35.00
	9.00								

WATER SUPPLY ANALYSIS

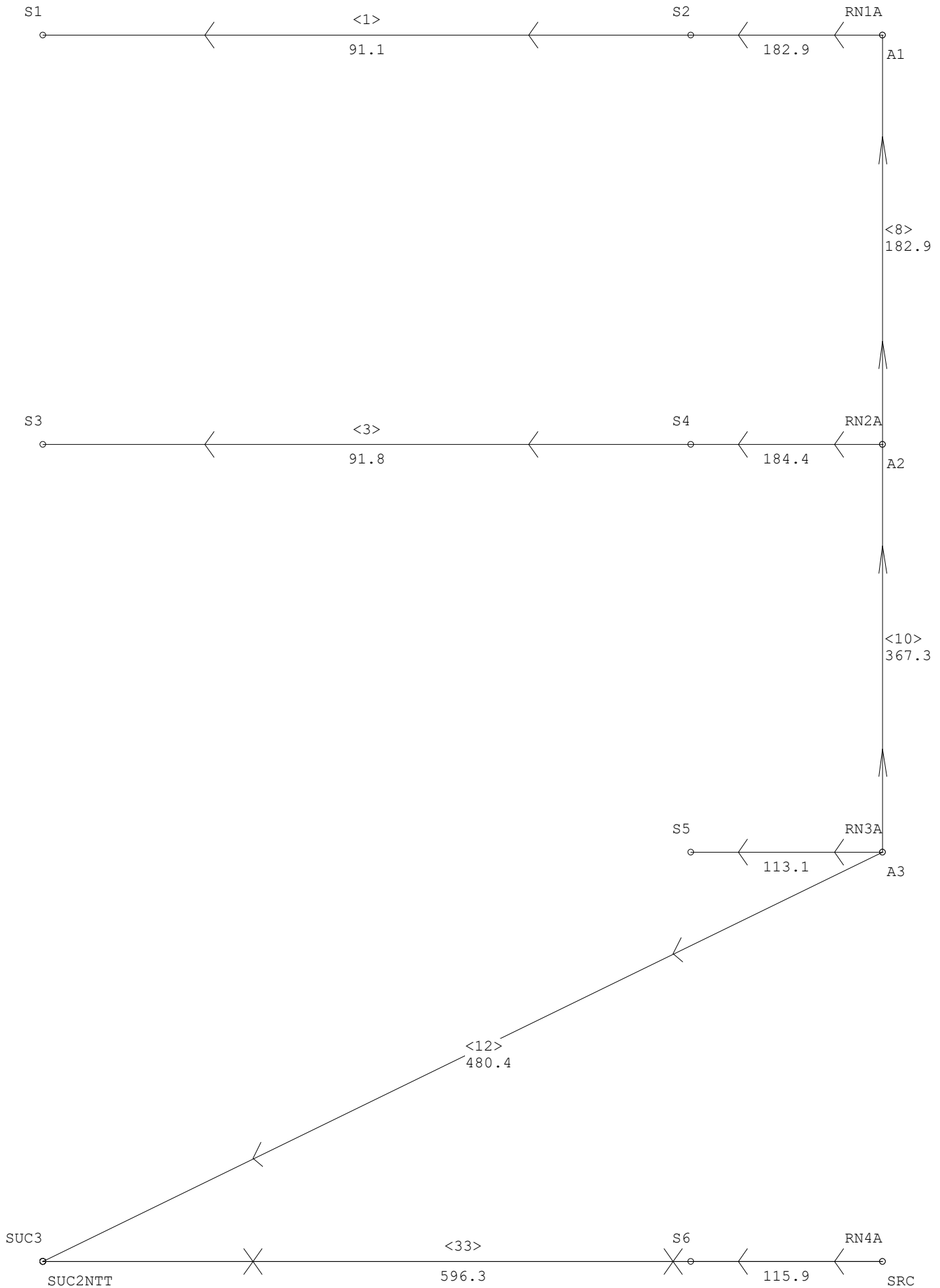
Static: 60.00 psi Resid: 52.00 psi Flow: 1082.0 gpm



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SPRINKLER SYSTEM DIAGRAM WITH FLOWPLOT



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JOB TITLE: 775 Vaughan

WATER SUPPLY CURVE

