JUNIPER VILLAGE
BUILDING 300

1208 North Main Steet
Lillington, North Carolina

Hydraulic Calculations

Wayne Automatic Fire Sprinklers Job Number: 1020001

Wayne Automatic Fire Sprinklers, Inc.
4370 Motorsport Drive, Concord NC 28027 - 8977

Hydrant Flow Test Report

LOCATION: JUNIPER VILLAGE APTS PARKER LANE & NORTH MAIN ST. DATE: 3-20-24

TEST MADE BY: PJAMES TIME: 8:30 AM

REPRESENTATIVE OF: LILLINGTON FIRE DEPT.

WITNESS: JAMEY

STATE PURPOSE OF TEST:

CONSUMPTION RATE DURING TEST:

IF PUMPS AFFECT TEST, INDICATE PUMPS OPERATING:

TEST #225

FLOW HYDRANTS: #224 A1 A2 FLOW A3 A4

Size Nozzle: 2.5"

Pilot Reading: 40 psi

Discharge Coefficient: .9 Total GPM

GPM: 1060

STATIC P 80 psi RESIDUAL B 68 psi

PROJECTED RESULTS: At 20 psi Residual _____gpm, or At _psi Residual_____gpm

REMARKS:

LOCATION MAP: Show line sizes and distance to next cross connected line. Show valves and Hydrant branch size. Indicate North. Show flowing hydrants – Label A1, A2, A3, A4. Show location of Static and Residual – Label B.

Indicate B. Hydrant:_____ Sprinkler:_____Other (Identify): _____

WAYNE

Automatic Fire Sprinklers, Inc.

Hydraulic Calculations

Wayne Automatic
Fire Sprinklers, Inc.
4370 Motorsport Drive
Concord, NC 28027
704-782-3032

Job Name	:	Juniper Village- Building 300 - 3rd Floor - Unit C - Common - DA 3.1
Sheet Number	:	FP3.3
Location	:	Building 300
Design Area	:	Design Area 3.1
Contract	:	102001
Data File	:	Building 300- 3rd Floor - Unit C - Common DA 3.1.WXF

HYDRAULIC CALCULATIONS
for

Project name: Juniper Villiage
Location: Building 300
Drawing no: FP3.3
Date: 4-5-2024

Design

Remote area number: Design Area 3.1
Remote area location: Building 300 - 3rd Floor - Unit C Common Area
Occupancy classification: NFPA 13R
Density: .05 - Gpm/SqFt
Area of application: 4 Sprinklers - SqFt
Coverage per sprinkler: 256 - SqFt
Type of sprinklers calculated: Reliable Mod. F1 Res 44 Residential HSW
No. of sprinklers calculated: 4
In-rack demand: - GPM
Hose streams: - GPM
Total water required (including hose streams): 212.8 - GPM @ 72.1 - Psi
Type of system: Wet Residential NFPA 13R
Volume of dry or preaction system: - Gal

Water supply information

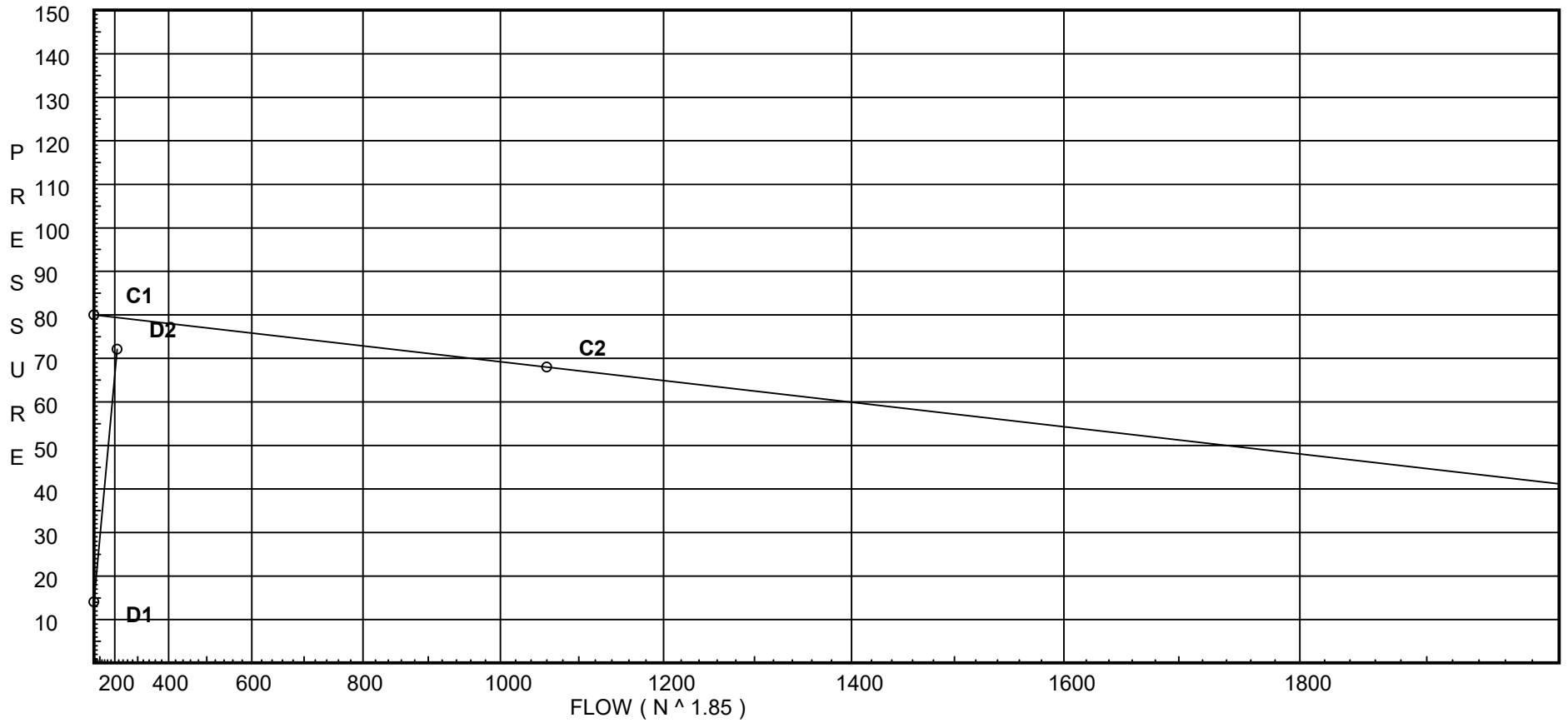
Date: 3-20-2024
Location: Parker Lane and North Main Street - Hydrant #224
Source: Lillington Fire Department

Name of contractor: Wayne Automatic Fire Sprinklers
Address: 4370 Motorsport Drive / Concord, NC
Phone number: 407-877-5514
Name of designer: Donald Hawkins
Authority having jurisdiction: Town of Lillington
Notes: (Include peaking information for gridded systems here.)
(1) The Finished Floor Elevation is 169'. For clarity the Finished Floor elevation on the hydraulic calculations is shown as 0'-0"
(2) A domestic demand of 147 was added at node point DD3 as required by NFPA 13R Section 9.6.

Water Supply Curve C

City Water Supply:
- C1 - Static Pressure : 80
- C2 - Residual Pressure: 68
- C2 - Residual Flow : 1060

Demand:
- D1 - Elevation : 14.076
- D2 - System Flow : 212.751
- D2 - System Pressure : 72.096
- Hose (Demand) : _____
- D3 - System Demand : 212.751
- Safety Margin : 7.289



Fittings Used Summary

Fitting Legend

Abbrev.	Name	½	¾	1	1¼	1½	2	2½	3	3½	4	5	6	8	10	12	14	16	18	20	24
F	NFPA 13 45' Elbow	1	1	1	1	2	2	3	3	3	4	5	7	9	11	13	17	19	21	24	28
G	NFPA 13 Gate Valve	0	0	0	0	0	1	1	1	1	2	2	3	4	5	6	7	8	10	11	13
L	NFPA 13 Long Turn Elbow	1	1	2	2	2	3	4	5	5	6	8	9	13	16	18	24	27	30	34	40
T	NFPA 13 Tee Branch	3	4	5	6	8	10	12	15	17	20	25	30	35	50	60	71	81	91	101	121
U *	CPVC 90' Elbow Tyco	0	4	5	6	7	9	12	13	0	0	0	0	0	0	0	0	0	0	0	0
V *	CPVC Tee Branch Tyco	0	3	5	6	8	10	12	15	0	0	0	0	0	0	0	0	0	0	0	0
Z	Generic Flow Switch	2	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61
Zai	Ames 4000SS	Fitting generates a Fixed Loss Based on Flow																			

Units Summary

Diameter Units	Inches
Length Units	Feet
Flow Units	US Gallons per Minute
Pressure Units	Pounds per Square Inch

Note: Fitting Legend provides equivalent pipe lengths for fittings types of various diameters. Equivalent lengths shown are standard for actual diameters of Sched 40 pipe and CFactors of 120 except as noted with *. The fittings marked with a * show equivalent lengths values supplied by manufacturers based on specific pipe diameters and CFactors and they require no adjustment. All values for fittings not marked with a * will be adjusted in the calculation for CFactors of other than 120 and diameters other than Sched 40 per NFPA.

Pressure / Flow Summary - STANDARD

Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
C1	27.5	4.4	13.3	na	16.05	0.05	256	13.3
C2	27.5	4.4	15.19	na	17.15	0.05	256	13.3
C3	27.5	4.4	13.9	na	16.41	0.05	256	13.3
C4	27.5	4.4	13.47	na	16.15	0.05	256	13.3
31	19.25		18.58	na				
36	19.25		20.14	na				
72	19.25		21.66	na				
32	19.25		20.69	na				
37	19.25		22.12	na				
33	19.25		19.26	na				
34	19.25		18.77	na				
46	19.25		19.48	na				
38	19.25		20.82	na				
73	19.25		22.66	na				
47	19.25		25.16	na				
48	19.25		30.92	na				
203	19.25		33.66	na				
204	19.25		34.53	na				
202	19.25		37.52	na				
102	9.25		44.97	na				
101	9.25		45.32	na				
100	9.25		48.0	na				
103	9.25		52.49	na				
TR	1.0		58.3	na				
BR	-3.0		60.53	na				
UG3	-3.0		60.54	na				
BFS3	2.0		58.44	na				
BFD3	2.0		68.41	na	147.0			
DD3	-3.0		70.65	na				
M1	-3.0		71.08	na				
M2	-3.0		71.07	na				
M3	-3.0		71.08	na				
M4	-3.0		71.08	na				
M5	-3.0		71.08	na				
CC1	-10.0		74.14	na				
CC2	-10.0		74.14	na				
TEST	-5.0		72.1	na				

The maximum velocity is 17.75 and it occurs in the pipe between nodes 37 and 203

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes ******
C1	16.05	0.874	U	4.0	8.250	13.300		K Factor = 4.40
to		150.0		0.0	4.000	3.573		
31	16.05	0.1393		0.0	12.250	1.707		Vel = 8.58
	0.0							
	16.05					18.580		K Factor = 3.72
C2	17.15	0.874	U	4.0	8.250	15.189		K Factor = 4.40
to		150.0		0.0	4.000	3.573		
32	17.15	0.1576		0.0	12.250	1.930		Vel = 9.17
	0.0							
	17.15					20.692		K Factor = 3.77
C3	16.41	0.874	U	4.0	8.250	13.904		K Factor = 4.40
to		150.0		0.0	4.000	3.573		
33	16.41	0.1452		0.0	12.250	1.779		Vel = 8.78
	0.0							
	16.41					19.256		K Factor = 3.74
C4	16.15	0.874	U	4.0	8.250	13.472		K Factor = 4.40
to		150.0		0.0	4.000	3.573		
34	16.15	0.1410		0.0	12.250	1.727		Vel = 8.64
	0.0							
	16.15					18.772		K Factor = 3.73
31	16.05	0.874	V	3.0	8.170	18.580		
to		150.0		0.0	3.000	0.0		
36	16.05	0.1394		0.0	11.170	1.557		Vel = 8.58
36	0.0	0.874		0.0	10.920	20.137		
to		150.0		0.0	0.0	0.0		
72	16.05	0.1394		0.0	10.920	1.522		Vel = 8.58
72	0.0	0.874		0.0	3.330	21.659		
to		150.0		0.0	0.0	0.0		
37	16.05	0.1393		0.0	3.330	0.464		Vel = 8.58
	0.0							
	16.05					22.123		K Factor = 3.41
32	17.15	0.874	U	4.0	2.080	20.692		
to		150.0	V	3.0	7.000	0.0		
37	17.15	0.1576		0.0	9.080	1.431		Vel = 9.17
37	16.04	0.874	V	3.0	18.580	22.123		
to		150.0		0.0	3.000	0.0		
203	33.19	0.5348		0.0	21.580	11.541		Vel = 17.75
	0.0							
	33.19					33.664		K Factor = 5.72
33	16.41	0.874	U	4.0	3.750	19.256		
to		150.0	V	3.0	7.000	0.0		
38	16.41	0.1452		0.0	10.750	1.561		Vel = 8.78
	0.0							
	16.41					20.817		K Factor = 3.60
34	16.15	0.874	V	3.0	2.000	18.772		
to		150.0		0.0	3.000	0.0		
46	16.15	0.1412		0.0	5.000	0.706		Vel = 8.64

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes ******
46	0.0	0.874	V	3.0	6.500	19.478		
to		150.0		0.0	3.000	0.0		
38	16.15	0.1409		0.0	9.500	1.339		Vel = 8.64
38	16.41	0.874		0.0	3.580	20.817		
to		150.0		0.0	0.0	0.0		
73	32.56	0.5159		0.0	3.580	1.847		Vel = 17.41
73	0.0	0.874		0.0	4.830	22.664		
to		150.0		0.0	0.0	0.0		
47	32.56	0.5159		0.0	4.830	2.492		Vel = 17.41
47	0.0	0.874		0.0	11.170	25.156		
to		150.0		0.0	0.0	0.0		
48	32.56	0.5159		0.0	11.170	5.763		Vel = 17.41
48	0.0	0.874	V	3.0	4.000	30.919		
to		150.0		0.0	3.000	0.0		
204	32.56	0.5160		0.0	7.000	3.612		Vel = 17.41
	0.0							
	32.56					34.531		K Factor = 5.54
203	33.19	1.394		0.0	15.750	33.664		
to		150.0		0.0	0.0	0.0		
204	33.19	0.0550		0.0	15.750	0.867		Vel = 6.98
204	32.56	1.394	U	6.0	9.330	34.531		
to		150.0		0.0	6.000	0.0		
202	65.75	0.1949		0.0	15.330	2.988		Vel = 13.82
	0.0							
	65.75					37.519		K Factor = 10.73
202	65.75	1.394	V	6.0	10.000	37.519		
to		150.0		0.0	6.000	4.331		
102	65.75	0.1950		0.0	16.000	3.120		Vel = 13.82
	0.0							
	65.75					44.970		K Factor = 9.80
102	65.75	2.003		0.0	10.580	44.970		
to		150.0		0.0	0.0	0.0		
101	65.75	0.0334		0.0	10.580	0.353		Vel = 6.69
101	0.0	2.003		0.0	80.250	45.323		
to		150.0		0.0	0.0	0.0		
100	65.75	0.0334		0.0	80.250	2.677		Vel = 6.69
100	0.0	2.003		0.0	134.500	48.000		
to		150.0		0.0	0.0	0.0		
103	65.75	0.0334		0.0	134.500	4.488		Vel = 6.69
103	0.0	2.003	5U	45.0	22.170	52.488		
to		150.0		0.0	45.000	3.573		
TR	65.75	0.0334		0.0	67.170	2.241		Vel = 6.69
	0.0							
	65.75					58.302		K Factor = 8.61
TR	65.75	2.003	Z	6.482	8.250	58.302		
to		150.0		0.0	6.482	1.732		
BR	65.75	0.0334		0.0	14.732	0.492		Vel = 6.69
BR	0.0	4.28	L	10.75	4.000	60.526		
to		140.0		0.0	10.750	0.0		
UG3	65.75	0.0009		0.0	14.750	0.014		Vel = 1.47

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes ******
	0.0							
	65.75					60.540		K Factor = 8.45
UG3	65.75	4.24	2L	23.335	54.000	60.540		
to		150.0		0.0	23.335	-2.166		
BFS3	65.75	0.0009		0.0	77.335	0.068		Vel = 1.49
BFS3	0.0	4.026	Zai	0.0	10.000	58.442		
to		120.0		0.0	0.0	9.950		* * Fixed Loss = 9.95
BFD3	65.75	0.0016		0.0	10.000	0.016		Vel = 1.66
BFD3	147.00	4.24		0.0	9.420	68.408		Qa = 147.00
to		150.0		0.0	0.0	2.166		
DD3	212.75	0.0075		0.0	9.420	0.071		Vel = 4.83
DD3	0.0	4.24	G	3.889	13.670	70.645		
to		150.0	T	38.891	42.780	0.0		
M2	212.75	0.0076		0.0	56.450	0.429		Vel = 4.83
	0.0							
	212.75					71.074		K Factor = 25.24
M1	-179.62	7.98		0.0	31.580	71.082		
to		150.0		0.0	0.0	0.0		
M2	-179.62	-0.0003		0.0	31.580	-0.008		Vel = 1.15
M2	212.75	7.98	2F	27.183	193.580	71.074		
to		150.0		0.0	27.182	0.0		
M3	33.13	0.0		0.0	220.762	0.003		Vel = 0.21
M3	0.0	7.98	F	13.591	287.750	71.077		
to		150.0		0.0	13.592	0.0		
M4	33.13	0.0		0.0	301.342	0.003		Vel = 0.21
M4	0.0	7.98	T	52.855	76.670	71.080		
to		150.0		0.0	52.855	0.0		
M5	33.13	0.0		0.0	129.525	0.002		Vel = 0.21
M5	0.0	11.68	F	17.661	422.000	71.082		
to		150.0		0.0	17.661	0.0		
M1	33.13	0.0		0.0	439.661	0.0		Vel = 0.10
M1	179.62	11.68	T	81.513	372.830	71.082		
to		150.0	G	8.151	89.664	3.032		
CC1	212.75	0.0001		0.0	462.494	0.025		Vel = 0.64
CC1	0.0	19.76		0.0	321.000	74.139		
to		150.0		0.0	0.0	0.0		
CC2	212.75	0.0		0.0	321.000	0.002		Vel = 0.22
CC2	0.0	6.08	G	4.038	65.000	74.141		
to		140.0	L	12.115	16.153	-2.166		
TEST	212.75	0.0015		0.0	81.153	0.121		Vel = 2.35
	0.0							
	212.75					72.096		K Factor = 25.06

WAYNE

Automatic Fire Sprinklers, Inc.

Hydraulic Calculations

Wayne Automatic
Fire Sprinklers, Inc.
4370 Motorsport Drive
Concord, NC 28027
704-782-3032

Job Name	:	Juniper Villiage - Building 300 - 3rd Floor - Corridor - DA 3.2
Sheet Number	:	FP3.3
Location	:	Building 300
Design Area	:	Design Area 3.2
Contract	:	102001
Data File	:	Building 300 - 3rd Floor - Corridor - DA 3.2.WXF

HYDRAULIC CALCULATIONS
for

Project name: Juniper Villiage
Location: Building 300
Drawing no: FP3.3
Date: 4-5-2024

Design

Remote area number: Design Area 3.2
Remote area location: Building 300 - 3rd Floor - Corridor
Occupancy classification: NFPA 13R
Density: .10 - Gpm/SqFt
Area of application: 4 Sprinklers - SqFt
Coverage per sprinkler: 122 - SqFt
Type of sprinklers calculated: Reliable Mod. F3QR Quick Response Dry HSW
No. of sprinklers calculated: 4
In-rack demand: - GPM
Hose streams: - GPM
Total water required (including hose streams): 209.3 - GPM @ 49.3 - Psi
Type of system: Wet Residential NFPA 13R
Volume of dry or preaction system: - Gal

Water supply information

Date: 3-20-2024
Location: Parker Lane and North Main Steet - Hydrant #224
Source: Lillington Fire Department

Name of contractor: Wayne Automatic Fire Sprinklers
Address: 4370 Motorsport Drive / Concord, NC
Phone number: 407-877-5514
Name of designer: Donald Hawkins
Authority having jurisdiction: Town of Lillington
Notes: (Include peaking information for gridded systems here.)
(1) The Finished Floor elevation is 169'. For clarity the finished floor elevation on the hydraulic calculations is shown as 0'-0"
(2) A domestic demand of 147 was added at node point DD3 as required by NFPA 13R Section 9.6.

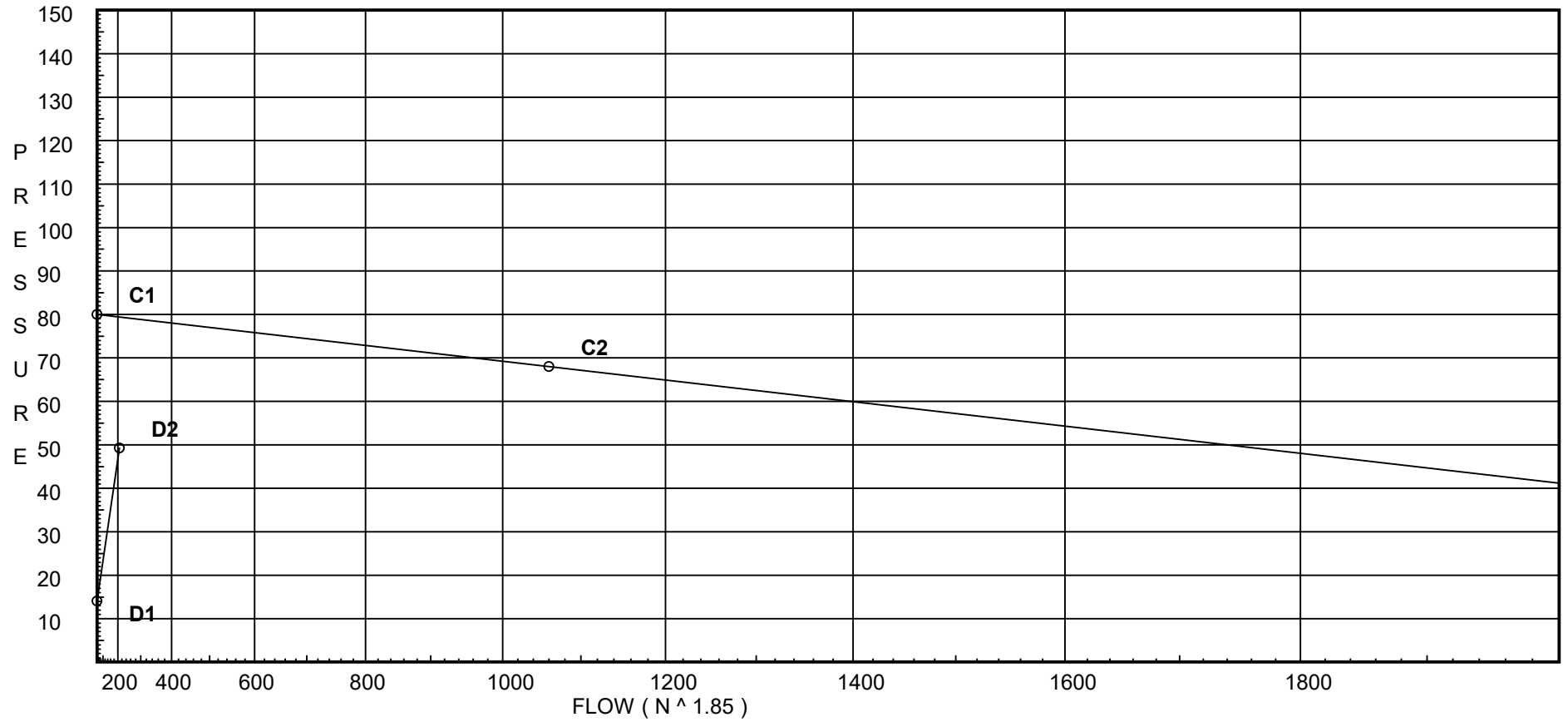
Water Supply Curve C

Wayne Automatic
Juniper Villiage - Building 300 - 3rd Floor - Corridor - DA 3.2

Date 4-5-2024

City Water Supply:
- C1 - Static Pressure : 80
- C2 - Residual Pressure: 68
- C2 - Residual Flow : 1060

Demand:
- D1 - Elevation : 14.076
- D2 - System Flow : 209.298
- D2 - System Pressure : 49.283
- Hose (Demand) : _____
- D3 - System Demand : 209.298
- Safety Margin : 30.120



Fittings Used Summary

Fitting Legend

Abbrev.	Name	½	¾	1	1¼	1½	2	2½	3	3½	4	5	6	8	10	12	14	16	18	20	24
F	NFPA 13 45' Elbow	1	1	1	1	2	2	3	3	3	4	5	7	9	11	13	17	19	21	24	28
G	NFPA 13 Gate Valve	0	0	0	0	0	1	1	1	1	2	2	3	4	5	6	7	8	10	11	13
L	NFPA 13 Long Turn Elbow	1	1	2	2	2	3	4	5	5	6	8	9	13	16	18	24	27	30	34	40
T	NFPA 13 Tee Branch	3	4	5	6	8	10	12	15	17	20	25	30	35	50	60	71	81	91	101	121
U *	CPVC 90' Elbow Tyco	0	4	5	6	7	9	12	13	0	0	0	0	0	0	0	0	0	0	0	0
V *	CPVC Tee Branch Tyco	0	3	5	6	8	10	12	15	0	0	0	0	0	0	0	0	0	0	0	0
Z	Generic Flow Switch	2	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61
Zai	Ames 4000SS	Fitting generates a Fixed Loss Based on Flow																			

Units Summary

Diameter Units	Inches
Length Units	Feet
Flow Units	US Gallons per Minute
Pressure Units	Pounds per Square Inch

Note: Fitting Legend provides equivalent pipe lengths for fittings types of various diameters. Equivalent lengths shown are standard for actual diameters of Sched 40 pipe and CFactors of 120 except as noted with *. The fittings marked with a * show equivalent lengths values supplied by manufacturers based on specific pipe diameters and CFactors and they require no adjustment. All values for fittings not marked with a * will be adjusted in the calculation for CFactors of other than 120 and diameters other than Sched 40 per NFPA.

Pressure / Flow Summary - STANDARD

Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
D1	27.5	5.6	7.0	na	14.82	0.1	122	7.0
D2	27.5	5.6	8.07	na	15.91	0.1	122	7.0
D3	27.5	5.6	7.72	na	15.56	0.1	122	7.0
D4	27.5	5.6	8.18	na	16.01	0.1	122	7.0
41	19.25		12.67	na				
57	19.25		14.1	na				
45	19.25		14.7	na				
42	19.25		13.32	na				
47	19.25		15.64	na				
43	19.25		12.91	na				
44	19.25		13.45	na				
48	19.25		16.35	na				
204	19.25		18.82	na				
201	19.25		19.63	na				
205	19.25		18.52	na				
206	19.25		18.96	na				
207	19.25		19.51	na				
200	19.25		21.33	na				
202	19.25		19.38	na				
102	9.25		24.29	na				
101	9.25		24.36	na				
100	9.25		25.85	na				
103	9.25		29.91	na				
TR	1.0		35.51	na				
BR	-3.0		37.69	na				
UG3	-3.0		37.7	na				
BFS3	2.0		35.59	na				
BFD3	2.0		45.68	na				
DD3	-3.0		47.85	na	147.0			
M1	-3.0		48.27	na				
M2	-3.0		48.27	na				
M3	-3.0		48.27	na				
M4	-3.0		48.27	na				
M5	-3.0		48.27	na				
CC1	-10.0		51.33	na				
CC2	-10.0		51.33	na				
TEST	-5.0		49.28	na				

The maximum velocity is 14.18 and it occurs in the pipe between nodes 48 and 204

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes ******
D1	14.82	0.874	U	4.0	10.420	7.000		K Factor = 5.60
to		150.0	V	3.0	7.000	3.573		
41	14.82	0.1203		0.0	17.420	2.095		Vel = 7.93
	0.0							
	14.82					12.668		K Factor = 4.16
D2	15.91	0.874	U	4.0	8.250	8.069		K Factor = 5.60
to		150.0		0.0	4.000	3.573		
42	15.91	0.1371		0.0	12.250	1.680		Vel = 8.51
	0.0							
	15.91					13.322		K Factor = 4.36
D3	15.56	0.874	U	4.0	8.250	7.723		K Factor = 5.60
to		150.0		0.0	4.000	3.573		
43	15.56	0.1318		0.0	12.250	1.614		Vel = 8.32
	0.0							
	15.56					12.910		K Factor = 4.33
D4	16.01	0.874	U	4.0	8.250	8.175		K Factor = 5.60
to		150.0		0.0	4.000	3.573		
44	16.01	0.1388		0.0	12.250	1.700		Vel = 8.56
	0.0							
	16.01					13.448		K Factor = 4.37
41	14.82	0.874	U	4.0	7.920	12.668		
to		150.0		0.0	4.000	0.0		
57	14.82	0.1202		0.0	11.920	1.433		Vel = 7.93
57	0.0	0.874	V	3.0	2.000	14.101		
to		150.0		0.0	3.000	0.0		
45	14.82	0.1202		0.0	5.000	0.601		Vel = 7.93
45	0.0	0.874	V	3.0	28.750	14.702		
to		150.0		0.0	3.000	0.0		
205	14.82	0.1203		0.0	31.750	3.818		Vel = 7.93
	0.0							
	14.82					18.520		K Factor = 3.44
42	15.91	0.874	U	4.0	9.920	13.322		
to		150.0	V	3.0	7.000	0.0		
47	15.91	0.1372		0.0	16.920	2.321		Vel = 8.51
47	5.06	0.874	V	3.0	9.580	15.643		
to		150.0		0.0	3.000	0.0		
205	20.97	0.2287		0.0	12.580	2.877		Vel = 11.21
	0.0							
	20.97					18.520		K Factor = 4.87
43	15.56	0.874	U	4.0	10.750	12.910		
to		150.0	2V	6.0	10.000	0.0		
47	15.56	0.1317		0.0	20.750	2.733		Vel = 8.32
47	-5.06	0.874		0.0	11.170	15.643		
to		150.0		0.0	0.0	0.0		
48	10.5	0.0635		0.0	11.170	0.709		Vel = 5.62
	0.0							
	10.50					16.352		K Factor = 2.60

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes ******
44	16.01	0.874	U	4.0	10.920	13.448		
to		150.0	2V	6.0	10.000	0.0		
48	16.01	0.1388		0.0	20.920	2.904		Vel = 8.56
48	10.50	0.874	V	3.0	4.000	16.352		
to		150.0		0.0	3.000	0.0		
204	26.51	0.3527		0.0	7.000	2.469		Vel = 14.18
	0.0							
	26.51					18.821		K Factor = 6.11
204	26.51	1.394	U	6.0	9.330	18.821		
to		150.0		0.0	6.000	0.0		
202	26.51	0.0363		0.0	15.330	0.557		Vel = 5.57
	0.0							
	26.51					19.378		K Factor = 6.02
201	-21.41	1.101	U	5.0	9.420	19.633		
to		150.0		0.0	5.000	0.0		
205	-21.41	-0.0772		0.0	14.420	-1.113		Vel = 7.21
205	35.79	1.101		0.0	12.000	18.520		
to		150.0		0.0	0.0	0.0		
206	14.38	0.0370		0.0	12.000	0.444		Vel = 4.85
206	0.0	1.101		0.0	14.750	18.964		
to		150.0		0.0	0.0	0.0		
207	14.38	0.0369		0.0	14.750	0.545		Vel = 4.85
207	0.0	1.101	U	5.0	44.250	19.509		
to		150.0		0.0	5.000	0.0		
200	14.38	0.0370		0.0	49.250	1.820		Vel = 4.85
	0.0							
	14.38					21.329		K Factor = 3.11
200	14.38	1.394	V	6.0	10.000	21.329		
to		150.0		0.0	6.000	4.331		
100	14.38	0.0117		0.0	16.000	0.187		Vel = 3.02
	0.0							
	14.38					25.847		K Factor = 2.83
201	21.41	1.394	V	6.0	10.000	19.633		
to		150.0		0.0	6.000	4.331		
101	21.41	0.0245		0.0	16.000	0.392		Vel = 4.50
	0.0							
	21.41					24.356		K Factor = 4.34
202	26.51	1.394	V	6.0	10.000	19.378		
to		150.0		0.0	6.000	4.331		
102	26.51	0.0363		0.0	16.000	0.581		Vel = 5.57
	0.0							
	26.51					24.290		K Factor = 5.38
102	26.51	2.003		0.0	10.580	24.290		
to		150.0		0.0	0.0	0.0		
101	26.51	0.0062		0.0	10.580	0.066		Vel = 2.70
101	21.41	2.003		0.0	80.250	24.356		
to		150.0		0.0	0.0	0.0		
100	47.92	0.0186		0.0	80.250	1.491		Vel = 4.88

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes ******
100	14.38	2.003		0.0	134.500	25.847		
to		150.0		0.0	0.0	0.0		
103	62.3	0.0302		0.0	134.500	4.061		Vel = 6.34
103	0.0	2.003	5U	45.0	22.170	29.908		
to		150.0		0.0	45.000	3.573		
TR	62.3	0.0302		0.0	67.170	2.029		Vel = 6.34
	0.0							
	62.30					35.510		K Factor = 10.45
TR	62.30	2.003	Z	6.482	8.250	35.510		
to		150.0		0.0	6.482	1.732		
BR	62.3	0.0302		0.0	14.732	0.445		Vel = 6.34
BR	0.0	4.28	L	10.75	4.000	37.687		
to		140.0		0.0	10.750	0.0		
UG3	62.3	0.0009		0.0	14.750	0.013		Vel = 1.39
	0.0							
	62.30					37.700		K Factor = 10.15
UG3	62.30	4.24	2L	23.335	54.000	37.700		
to		150.0		0.0	23.335	-2.166		
BFS3	62.3	0.0008		0.0	77.335	0.061		Vel = 1.42
BFS3	0.0	4.026	Zai	0.0	10.000	35.595		
to		120.0		0.0	0.0	10.067		* * Fixed Loss = 10.067
BFD3	62.3	0.0015		0.0	10.000	0.015		Vel = 1.57
BFD3	0.0	4.24		0.0	9.420	45.677		
to		150.0		0.0	0.0	2.166		
DD3	62.3	0.0007		0.0	9.420	0.007		Vel = 1.42
DD3	147.00	4.24	G	3.889	13.670	47.850		Qa = 147.00
to		150.0	T	38.891	42.780	0.0		
M2	209.3	0.0074		0.0	56.450	0.416		Vel = 4.76
	0.0							
	209.30					48.266		K Factor = 30.13
M1	-176.71	7.98		0.0	31.580	48.274		
to		150.0		0.0	0.0	0.0		
M2	-176.71	-0.0003		0.0	31.580	-0.008		Vel = 1.13
M2	209.30	7.98	2F	27.183	193.580	48.266		
to		150.0		0.0	27.182	0.0		
M3	32.59	0.0		0.0	220.762	0.002		Vel = 0.21
M3	0.0	7.98	F	13.591	287.750	48.268		
to		150.0		0.0	13.592	0.0		
M4	32.59	0.0		0.0	301.342	0.003		Vel = 0.21
M4	0.0	7.98	T	52.855	76.670	48.271		
to		150.0		0.0	52.855	0.0		
M5	32.59	0.0		0.0	129.525	0.002		Vel = 0.21
M5	0.0	11.68	F	17.661	422.000	48.273		
to		150.0		0.0	17.661	0.0		
M1	32.59	0.0		0.0	439.661	0.001		Vel = 0.10
M1	176.71	11.68	T	81.513	372.830	48.274		
to		150.0	G	8.151	89.664	3.032		
CC1	209.3	0.0001		0.0	462.494	0.024		Vel = 0.63

Final Calculations - Hazen-Williams

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*******	Notes	******
CC1	0.0	19.76		0.0	321.000	51.330				
to		150.0		0.0	0.0	0.0				
CC2	209.3	0.0		0.0	321.000	0.001		Vel = 0.22		
CC2	0.0	6.08	G	4.038	65.000	51.331				
to		140.0	L	12.115	16.153	-2.166				
TEST	209.3	0.0015		0.0	81.153	0.118		Vel = 2.31		
	0.0									
	209.30					49.283		K Factor = 29.81		

WAYNE

Automatic Fire Sprinklers, Inc.

Hydraulic Calculations

Wayne Automatic
Fire Sprinklers, Inc.
4370 Motorsport Drive
Concord, NC 28027
704-782-3032

Job Name	:	Juniper Villiage - Building 300 - 3rd Floor - Unit B - Common - DA 3.3
Sheet Number	:	FP3.3
Location	:	Building 300
Design Area	:	Design Area 3.3
Contract	:	102001
Data File	:	Building 300- 3rd Floor - Unit B - Common DA 3.3.WXF

HYDRAULIC CALCULATIONS
for

Project name: Juniper Village
Location: Building 300
Drawing no: FP3.3
Date: 4-5-2024

Design

Remote area number: Design Area 3.3
Remote area location: Building 300 - 3rd Floor - Unit B Common Area
Occupancy classification: NFPA 13R
Density: .05 - Gpm/SqFt
Area of application: 4 Sprinklers - SqFt
Coverage per sprinkler: 256 - SqFt
Type of sprinklers calculated: Reliable Mod. F1 Res 44 Residential HSW
No. of sprinklers calculated: 4
In-rack demand: - GPM
Hose streams: - GPM
Total water required (including hose streams): 218.2 - GPM @ 69.8 - Psi
Type of system: Wet Residential NFPA 13R
Volume of dry or preaction system: - Gal

Water supply information

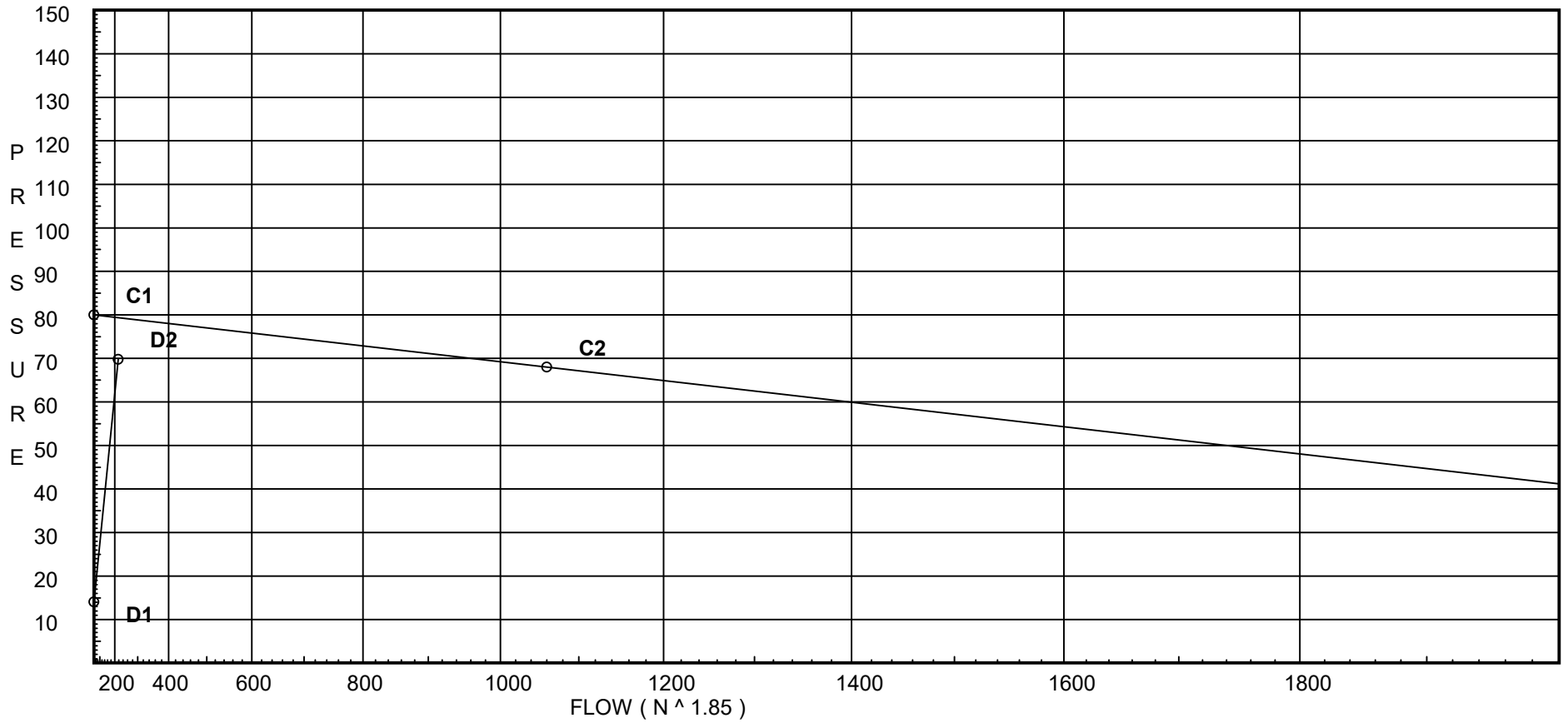
Date: 3-20-2024
Location: North Main Street (Hydrant 224)
Source: Lillington Fire Department

Name of contractor: Wayne Automatic Fire Sprinklers
Address: 4370 Motorsport Drive / Concord, NC
Phone number: 407-877-5514
Name of designer: Donald Hawkins
Authority having jurisdiction: Town of Lillington
Notes: (Include peaking information for gridded systems here.)
(1) The Finished Floor Elevation is 169'. For clarity the Finished Floor elevation on the hydraulic calculations is shown as 0'-0"
(2) A domestic demand of 147 was added at node point DD3 as required by NFPA 13R Section 9.6.

Water Supply Curve C

City Water Supply:
- C1 - Static Pressure : 80
- C2 - Residual Pressure: 68
- C2 - Residual Flow : 1060

Demand:
- D1 - Elevation : 14.076
- D2 - System Flow : 218.219
- D2 - System Pressure : 69.810
- Hose (Demand) : _____
- D3 - System Demand : 218.219
- Safety Margin : 9.545



Fittings Used Summary

Fitting Legend

Abbrev.	Name	½	¾	1	1¼	1½	2	2½	3	3½	4	5	6	8	10	12	14	16	18	20	24
F	NFPA 13 45' Elbow	1	1	1	1	2	2	3	3	3	4	5	7	9	11	13	17	19	21	24	28
G	NFPA 13 Gate Valve	0	0	0	0	0	1	1	1	1	2	2	3	4	5	6	7	8	10	11	13
L	NFPA 13 Long Turn Elbow	1	1	2	2	2	3	4	5	5	6	8	9	13	16	18	24	27	30	34	40
T	NFPA 13 Tee Branch	3	4	5	6	8	10	12	15	17	20	25	30	35	50	60	71	81	91	101	121
U *	CPVC 90' Elbow Tyco	0	4	5	6	7	9	12	13	0	0	0	0	0	0	0	0	0	0	0	0
V *	CPVC Tee Branch Tyco	0	3	5	6	8	10	12	15	0	0	0	0	0	0	0	0	0	0	0	0
Z	Generic Flow Switch	2	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61
Zai	Ames 4000SS	Fitting generates a Fixed Loss Based on Flow																			

Units Summary

Diameter Units	Inches
Length Units	Feet
Flow Units	US Gallons per Minute
Pressure Units	Pounds per Square Inch

Note: Fitting Legend provides equivalent pipe lengths for fittings types of various diameters. Equivalent lengths shown are standard for actual diameters of Sched 40 pipe and CFactors of 120 except as noted with *. The fittings marked with a * show equivalent lengths values supplied by manufacturers based on specific pipe diameters and CFactors and they require no adjustment. All values for fittings not marked with a * will be adjusted in the calculation for CFactors of other than 120 and diameters other than Sched 40 per NFPA.

Pressure / Flow Summary - STANDARD

Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
E1	27.5	4.4	19.16	na	19.26	0.05	256	13.3
E2	27.5	4.4	13.3	na	16.05	0.05	256	13.3
E3	27.5	4.4	15.37	na	17.25	0.05	256	13.3
E4	27.5	4.4	17.99	na	18.66	0.05	256	13.3
51	19.25		25.13	na				
55	19.25		27.2	na				
52	19.25		18.58	na				
53	19.25		20.89	na				
56	19.25		21.81	na				
54	19.25		23.82	na				
57	19.25		24.96	na				
45	19.25		25.88	na				
201	19.25		35.42	na				
205	19.25		31.73	na				
206	19.25		30.73	na				
207	19.25		31.05	na				
200	19.25		38.21	na				
102	9.25		43.61	na				
101	9.25		43.61	na				
100	9.25		44.73	na				
103	9.25		49.93	na				
TR	1.0		56.1	na				
BR	-3.0		58.4	na				
UG3	-3.0		58.42	na				
BFS3	2.0		56.33	na				
BFD3	2.0		66.16	na				
DD3	-3.0		68.33	na	147.0			
M1	-3.0		68.79	na				
M2	-3.0		68.78	na				
M3	-3.0		68.78	na				
M4	-3.0		68.79	na				
M5	-3.0		68.79	na				
CC1	-10.0		71.85	na				
CC2	-10.0		71.85	na				
TEST	-5.0		69.81	na				

The maximum velocity is 17.81 and it occurs in the pipe between nodes 56 and 206

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes ******
E1	19.26	0.874	U	4.0	8.250	19.162		K Factor = 4.40
to		150.0		0.0	4.000	3.573		
51	19.26	0.1953		0.0	12.250	2.393		Vel = 10.30
	0.0							
	19.26					25.128		K Factor = 3.84
E2	16.05	0.874	U	4.0	8.250	13.300		K Factor = 4.40
to		150.0		0.0	4.000	3.573		
52	16.05	0.1393		0.0	12.250	1.707		Vel = 8.58
	0.0							
	16.05					18.580		K Factor = 3.72
E3	17.25	0.874	U	4.0	8.250	15.369		K Factor = 4.40
to		150.0		0.0	4.000	3.573		
53	17.25	0.1593		0.0	12.250	1.951		Vel = 9.22
	0.0							
	17.25					20.893		K Factor = 3.77
E4	18.66	0.874	U	4.0	8.250	17.991		K Factor = 4.40
to		150.0		0.0	4.000	3.573		
54	18.66	0.1843		0.0	12.250	2.258		Vel = 9.98
	0.0							
	18.66					23.822		K Factor = 3.82
51	19.26	0.874	V	3.0	7.580	25.128		
to		150.0		0.0	3.000	0.0		
55	19.26	0.1954		0.0	10.580	2.067		Vel = 10.30
55	0.0	0.874	V	3.0	16.750	27.195		
to		150.0		0.0	3.000	0.0		
207	19.26	0.1954		0.0	19.750	3.859		Vel = 10.30
	0.0							
	19.26					31.054		K Factor = 3.46
52	16.05	0.874		0.0	23.170	18.580		
to		150.0		0.0	0.0	0.0		
56	16.05	0.1394		0.0	23.170	3.229		Vel = 8.58
	0.0							
	16.05					21.809		K Factor = 3.44
53	17.25	0.874	V	3.0	2.750	20.893		
to		150.0		0.0	3.000	0.0		
56	17.25	0.1593		0.0	5.750	0.916		Vel = 9.22
56	16.05	0.874	V	3.0	13.580	21.809		
to		150.0		0.0	3.000	0.0		
206	33.3	0.5378		0.0	16.580	8.917		Vel = 17.81
	0.0							
	33.30					30.726		K Factor = 6.01
54	18.66	0.874	V	3.0	3.170	23.822		
to		150.0		0.0	3.000	0.0		
57	18.66	0.1843		0.0	6.170	1.137		Vel = 9.98
57	0.0	0.874	V	3.0	2.000	24.959		
to		150.0		0.0	3.000	0.0		
45	18.66	0.1842		0.0	5.000	0.921		Vel = 9.98

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes ******
45	0.0	0.874	V	3.0	28.750	25.880		
to		150.0		0.0	3.000	0.0		
205	18.66	0.1843		0.0	31.750	5.852		Vel = 9.98
	0.0							
	18.66					31.732		K Factor = 3.31
201	-41.04	1.101	U	5.0	9.330	35.418		
to		150.0		0.0	5.000	0.0		
205	-41.04	-0.2572		0.0	14.330	-3.686		Vel = 13.83
205	18.66	1.101		0.0	12.000	31.732		
to		150.0		0.0	0.0	0.0		
206	-22.38	-0.0838		0.0	12.000	-1.006		Vel = 7.54
206	33.29	1.101		0.0	14.750	30.726		
to		150.0		0.0	0.0	0.0		
207	10.91	0.0222		0.0	14.750	0.328		Vel = 3.68
207	19.26	1.101	U	5.0	44.170	31.054		
to		150.0		0.0	5.000	0.0		
200	30.17	0.1456		0.0	49.170	7.159		Vel = 10.17
	0.0							
	30.17					38.213		K Factor = 4.88
201	41.04	1.101	V	5.0	10.000	35.418		
to		150.0		0.0	5.000	4.331		
101	41.04	0.2573		0.0	15.000	3.860		Vel = 13.83
	0.0							
	41.04					43.609		K Factor = 6.21
200	30.17	1.101	V	5.0	10.000	38.213		
to		150.0		0.0	5.000	4.331		
100	30.17	0.1456		0.0	15.000	2.184		Vel = 10.17
	0.0							
	30.17					44.728		K Factor = 4.51
102	0.0	2.003		0.0	10.580	43.609		
to		150.0		0.0	0.0	0.0		
101	0.0	0.0		0.0	10.580	0.0		Vel = 0
101	41.04	2.003		0.0	80.250	43.609		
to		150.0		0.0	0.0	0.0		
100	41.04	0.0139		0.0	80.250	1.119		Vel = 4.18
100	30.18	2.003		0.0	134.500	44.728		
to		150.0		0.0	0.0	0.0		
103	71.22	0.0387		0.0	134.500	5.203		Vel = 7.25
103	0.0	2.003	5U	45.0	22.170	49.931		
to		150.0		0.0	45.000	3.573		
TR	71.22	0.0387		0.0	67.170	2.598		Vel = 7.25
	0.0							
	71.22					56.102		K Factor = 9.51
TR	71.22	2.003	Z	6.482	8.250	56.102		
to		150.0		0.0	6.482	1.732		
BR	71.22	0.0387		0.0	14.732	0.570		Vel = 7.25
BR	0.0	4.28	L	10.75	4.000	58.404		
to		140.0		0.0	10.750	0.0		
UG3	71.22	0.0011		0.0	14.750	0.016		Vel = 1.59

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes ******
	0.0							
	71.22					58.420		K Factor = 9.32
UG3	71.22	4.24	2L	23.335	54.000	58.420		
to		150.0		0.0	23.335	-2.166		
BFS3	71.22	0.0010		0.0	77.335	0.079		Vel = 1.62
BFS3	0.0	4.026	Zai	0.0	10.000	56.333		
to		120.0		0.0	0.0	9.804		* * Fixed Loss = 9.804
BFD3	71.22	0.0019		0.0	10.000	0.019		Vel = 1.79
BFD3	0.0	4.24		0.0	9.420	66.156		
to		150.0		0.0	0.0	2.166		
DD3	71.22	0.0010		0.0	9.420	0.009		Vel = 1.62
DD3	147.00	4.24	G	3.889	13.670	68.331		Qa = 147.00
to		150.0	T	38.891	42.780	0.0		
M2	218.22	0.0080		0.0	56.450	0.450		Vel = 4.96
	0.0							
	218.22					68.781		K Factor = 26.31
M1	-184.24	7.98		0.0	31.580	68.789		
to		150.0		0.0	0.0	0.0		
M2	-184.24	-0.0003		0.0	31.580	-0.008		Vel = 1.18
M2	218.22	7.98	2F	27.183	193.580	68.781		
to		150.0		0.0	27.182	0.0		
M3	33.98	0.0		0.0	220.762	0.002		Vel = 0.22
M3	0.0	7.98	F	13.591	287.750	68.783		
to		150.0		0.0	13.592	0.0		
M4	33.98	0.0		0.0	301.342	0.004		Vel = 0.22
M4	0.0	7.98	T	52.855	76.670	68.787		
to		150.0		0.0	52.855	0.0		
M5	33.98	0.0		0.0	129.525	0.001		Vel = 0.22
M5	0.0	11.68	F	17.661	422.000	68.788		
to		150.0		0.0	17.661	0.0		
M1	33.98	0.0		0.0	439.661	0.001		Vel = 0.10
M1	184.24	11.68	T	81.513	372.830	68.789		
to		150.0	G	8.151	89.664	3.032		
CC1	218.22	0.0001		0.0	462.494	0.026		Vel = 0.65
CC1	0.0	19.76		0.0	321.000	71.847		
to		150.0		0.0	0.0	0.0		
CC2	218.22	0.0		0.0	321.000	0.002		Vel = 0.23
CC2	0.0	6.08	G	4.038	65.000	71.849		
to		140.0	L	12.115	16.153	-2.166		
TEST	218.22	0.0016		0.0	81.153	0.127		Vel = 2.41
	0.0							
	218.22					69.810		K Factor = 26.12

WAYNE

Automatic Fire Sprinklers, Inc.

Hydraulic Calculations

Wayne Automatic
Fire Sprinklers, Inc.
4370 Motorsport Drive
Concord, NC 28027
704-782-3032

Job Name	:	Juniper Village- Building 300 - 2nd Floor - Unit C - Common - DA 3.4
Sheet Number	:	FP3.3
Location	:	Building 300
Design Area	:	Design Area 3.4
Contract	:	102001
Data File	:	Building 300- 2nd Floor - Unit C - Common DA 3.4.WXF

HYDRAULIC CALCULATIONS
for

Project name: Juniper Villiage
Location: Building 300
Drawing no: FP3.3
Date: 4-5-2024

Design

Remote area number: Design Area 3.4
Remote area location: Building 300 - 2nd Floor - Unit C Common Area
Occupancy classification: NFPA 13R
Density: .05 - Gpm/SqFt
Area of application: 3 Sprinklers - SqFt
Coverage per sprinkler: 256 - SqFt
Type of sprinklers calculated: Reliable Mod. F1FR Res Pendents
No. of sprinklers calculated: 3
In-rack demand: - GPM
Hose streams: - GPM
Total water required (including hose streams): 197.1 - GPM @ 57.7 - Psi
Type of system: Wet Residential NFPA 13R
Volume of dry or preaction system: - Gal

Water supply information

Date: 3-20-2024
Location: Parker Lane and North Main Street - Hydrant #224
Source: Lillington Fire Department

Name of contractor: Wayne Automatic Fire Sprinklers
Address: 4370 Motorsport Drive / Concord, NC
Phone number: 407-877-5514
Name of designer: Donald Hawkins
Authority having jurisdiction: Town of Lillington
Notes: (Include peaking information for gridded systems here.)
(1) The Finished Floor Elevation is 169'. For clarity the Finished Floor elevation on the hydraulic calculations is shown as 0'-0"
(2) A domestic demand of 147 was added at node point DD3 as required by NFPA 13R Section 9.6.

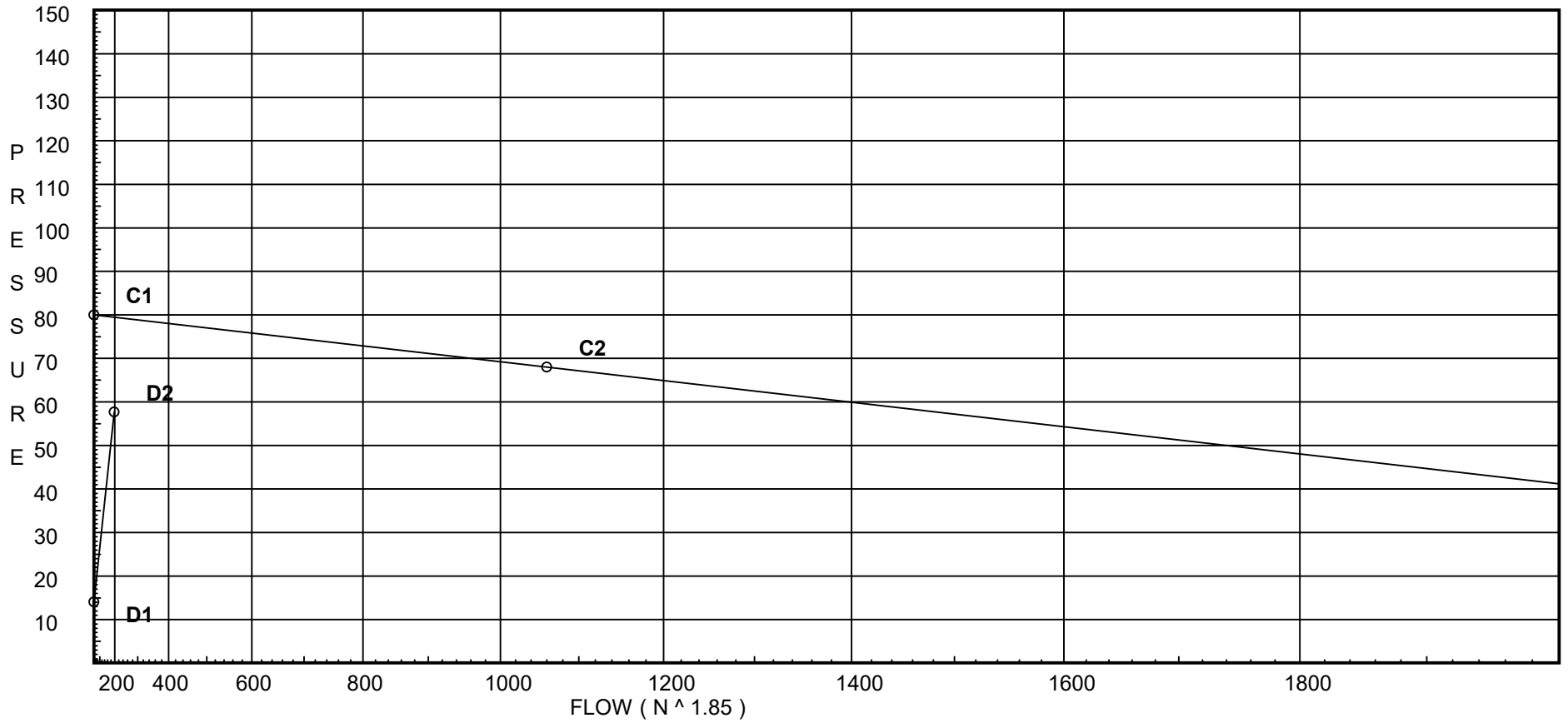
Water Supply Curve C

Wayne Automatic
Juniper Village- Building 300 - 2nd Floor - Unit C - Common - DA 3.4

Date 4-5-2024

City Water Supply:
- C1 - Static Pressure : 80
- C2 - Residual Pressure: 68
- C2 - Residual Flow : 1060

Demand:
- D1 - Elevation : 14.076
- D2 - System Flow : 197.081
- D2 - System Pressure : 57.690
- Hose (Demand) : _____
- D3 - System Demand : 197.081
- Safety Margin : 21.776



Fittings Used Summary

Fitting Legend

Abbrev.	Name	½	¾	1	1¼	1½	2	2½	3	3½	4	5	6	8	10	12	14	16	18	20	24
F	NFPA 13 45' Elbow	1	1	1	1	2	2	3	3	3	4	5	7	9	11	13	17	19	21	24	28
G	NFPA 13 Gate Valve	0	0	0	0	0	1	1	1	1	2	2	3	4	5	6	7	8	10	11	13
L	NFPA 13 Long Turn Elbow	1	1	2	2	2	3	4	5	5	6	8	9	13	16	18	24	27	30	34	40
T	NFPA 13 Tee Branch	3	4	5	6	8	10	12	15	17	20	25	30	35	50	60	71	81	91	101	121
U *	CPVC 90' Elbow Tyco	0	4	5	6	7	9	12	13	0	0	0	0	0	0	0	0	0	0	0	0
V *	CPVC Tee Branch Tyco	0	3	5	6	8	10	12	15	0	0	0	0	0	0	0	0	0	0	0	0
Z	Generic Flow Switch	2	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61
Zai	Ames 4000SS	Fitting generates a Fixed Loss Based on Flow																			

Units Summary

Diameter Units	Inches
Length Units	Feet
Flow Units	US Gallons per Minute
Pressure Units	Pounds per Square Inch

Note: Fitting Legend provides equivalent pipe lengths for fittings types of various diameters. Equivalent lengths shown are standard for actual diameters of Sched 40 pipe and CFactors of 120 except as noted with *. The fittings marked with a * show equivalent lengths values supplied by manufacturers based on specific pipe diameters and CFactors and they require no adjustment. All values for fittings not marked with a * will be adjusted in the calculation for CFactors of other than 120 and diameters other than Sched 40 per NFPA.

Pressure / Flow Summary - STANDARD

Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
G1	27.5	4.9	8.69	na	14.45	0.05	256	7.0
G2	27.5	4.9	10.15	na	15.61	0.05	256	7.0
G3	27.5	4.9	16.7	na	20.02	0.05	400	16.7
71	19.25		12.9	na				
36	19.25		13.2	na				
72	19.25		14.45	na				
37	19.25		15.93	na				
73	19.25		21.43	na				
47	19.25		22.44	na				
48	19.25		24.79	na				
203	19.25		25.53	na				
204	19.25		26.26	na				
202	19.25		28.06	na				
102	9.25		34.28	na				
101	9.25		34.49	na				
100	9.25		36.11	na				
103	9.25		38.82	na				
TR	1.0		43.75	na				
BR	-3.0		45.78	na				
UG3	-3.0		45.79	na				
BFS3	2.0		43.66	na				
BFD3	2.0		54.09	na	147.0			
DD3	-3.0		56.32	na				
M1	-3.0		56.7	na				
M2	-3.0		56.69	na				
M3	-3.0		56.69	na				
M4	-3.0		56.69	na				
M5	-3.0		56.7	na				
CC1	-10.0		59.75	na				
CC2	-10.0		59.75	na				
TEST	-5.0		57.69	na				

The maximum velocity is 16.08 and it occurs in the pipe between nodes 72 and 37

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes ******
G1	14.45	0.874	U	4.0	1.500	8.694		K Factor = 4.90
to		150.0		0.0	4.000	3.573		
71	14.45	0.1149		0.0	5.500	0.632		Vel = 7.73
	0.0							
	14.45					12.899		K Factor = 4.02
G2	15.61	0.874	U	4.0	1.500	10.147		K Factor = 4.90
to		150.0		0.0	4.000	3.573		
72	15.61	0.1324		0.0	5.500	0.728		Vel = 8.35
	0.0							
	15.61					14.448		K Factor = 4.11
G3	20.02	0.874	U	4.0	1.500	16.700		K Factor = 4.90
to		150.0		0.0	4.000	3.573		
73	20.02	0.2100		0.0	5.500	1.155		Vel = 10.71
	0.0							
	20.02					21.428		K Factor = 4.32
71	14.45	0.874		0.0	2.580	12.899		
to		150.0		0.0	0.0	0.0		
36	14.45	0.1147		0.0	2.580	0.296		Vel = 7.73
36	0.0	0.874		0.0	10.920	13.195		
to		150.0		0.0	0.0	0.0		
72	14.45	0.1147		0.0	10.920	1.253		Vel = 7.73
72	15.61	0.874		0.0	3.330	14.448		
to		150.0		0.0	0.0	0.0		
37	30.06	0.4450		0.0	3.330	1.482		Vel = 16.08
37	0.0	0.874	V	3.0	18.580	15.930		
to		150.0		0.0	3.000	0.0		
203	30.06	0.4451		0.0	21.580	9.605		Vel = 16.08
	0.0							
	30.06					25.535		K Factor = 5.95
73	20.02	0.874		0.0	4.830	21.428		
to		150.0		0.0	0.0	0.0		
47	20.02	0.2099		0.0	4.830	1.014		Vel = 10.71
47	0.0	0.874		0.0	11.170	22.442		
to		150.0		0.0	0.0	0.0		
48	20.02	0.2099		0.0	11.170	2.345		Vel = 10.71
48	0.0	0.874	V	3.0	4.000	24.787		
to		150.0		0.0	3.000	0.0		
204	20.02	0.2099		0.0	7.000	1.469		Vel = 10.71
	0.0							
	20.02					26.256		K Factor = 3.91
203	30.06	1.394		0.0	15.750	25.535		
to		150.0		0.0	0.0	0.0		
204	30.06	0.0458		0.0	15.750	0.721		Vel = 6.32
204	20.02	1.394	U	6.0	9.330	26.256		
to		150.0		0.0	6.000	0.0		
202	50.08	0.1178		0.0	15.330	1.806		Vel = 10.53
	0.0							
	50.08					28.062		K Factor = 9.45

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes ******
202	50.08	1.394	V	6.0	10.000	28.062		
to		150.0		0.0	6.000	4.331		
102	50.08	0.1178		0.0	16.000	1.885		Vel = 10.53
	0.0							
	50.08					34.278		K Factor = 8.55
102	50.08	2.003		0.0	10.580	34.278		
to		150.0		0.0	0.0	0.0		
101	50.08	0.0202		0.0	10.580	0.214		Vel = 5.10
101	0.0	2.003		0.0	80.250	34.492		
to		150.0		0.0	0.0	0.0		
100	50.08	0.0202		0.0	80.250	1.618		Vel = 5.10
100	0.0	2.003		0.0	134.500	36.110		
to		150.0		0.0	0.0	0.0		
103	50.08	0.0202		0.0	134.500	2.712		Vel = 5.10
103	0.0	2.003	5U	45.0	22.170	38.822		
to		150.0		0.0	45.000	3.573		
TR	50.08	0.0202		0.0	67.170	1.355		Vel = 5.10
	0.0							
	50.08					43.750		K Factor = 7.57
TR	50.08	2.003	Z	6.482	8.250	43.750		
to		150.0		0.0	6.482	1.732		
BR	50.08	0.0202		0.0	14.732	0.297		Vel = 5.10
BR	0.0	4.28	L	10.75	4.000	45.779		
to		140.0		0.0	10.750	0.0		
UG3	50.08	0.0005		0.0	14.750	0.008		Vel = 1.12
	0.0							
	50.08					45.787		K Factor = 7.40
UG3	50.08	4.24	2L	23.335	54.000	45.787		
to		150.0		0.0	23.335	-2.166		
BFS3	50.08	0.0005		0.0	77.335	0.041		Vel = 1.14
BFS3	0.0	4.026	Zai	0.0	10.000	43.662		
to		120.0		0.0	0.0	10.417		* * Fixed Loss = 10.417
BFD3	50.08	0.0010		0.0	10.000	0.010		Vel = 1.26
BFD3	147.00	4.24		0.0	9.420	54.089		Qa = 147.00
to		150.0		0.0	0.0	2.166		
DD3	197.08	0.0066		0.0	9.420	0.062		Vel = 4.48
DD3	0.0	4.24	G	3.889	13.670	56.317		
to		150.0	T	38.891	42.780	0.0		
M2	197.08	0.0066		0.0	56.450	0.372		Vel = 4.48
	0.0							
	197.08					56.689		K Factor = 26.18
M1	-166.39	7.98		0.0	31.580	56.696		
to		150.0		0.0	0.0	0.0		
M2	-166.39	-0.0002		0.0	31.580	-0.007		Vel = 1.07
M2	197.08	7.98	2F	27.183	193.580	56.689		
to		150.0		0.0	27.182	0.0		
M3	30.69	0.0		0.0	220.762	0.002		Vel = 0.20

Final Calculations - Hazen-Williams

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes ******
M3	0.0	7.98	F	13.591	287.750	56.691		
to		150.0		0.0	13.592	0.0		
M4	30.69	0.0		0.0	301.342	0.003		Vel = 0.20
M4	0.0	7.98	T	52.855	76.670	56.694		
to		150.0		0.0	52.855	0.0		
M5	30.69	0.0		0.0	129.525	0.001		Vel = 0.20
M5	0.0	11.68	F	17.661	422.000	56.695		
to		150.0		0.0	17.661	0.0		
M1	30.69	0.0		0.0	439.661	0.001		Vel = 0.09
M1	166.39	11.68	T	81.513	372.830	56.696		
to		150.0	G	8.151	89.664	3.032		
CC1	197.08	0.0		0.0	462.494	0.022		Vel = 0.59
CC1	0.0	19.76		0.0	321.000	59.750		
to		150.0		0.0	0.0	0.0		
CC2	197.08	0.0		0.0	321.000	0.001		Vel = 0.21
CC2	0.0	6.08	G	4.038	65.000	59.751		
to		140.0	L	12.115	16.153	-2.166		
TEST	197.08	0.0013		0.0	81.153	0.105		Vel = 2.18
	0.0							
	197.08					57.690		K Factor = 25.95