

. . . Fire Protection by Computer Design

SPRINKLER SYSTEMS INC.
4 AVON STREET
P O BOX 1285
LEWISTON, ME. 04243
207-782-0104

Job Name : Jewish Community Center Area 1
Building : NEW
Location : 1342 CONGRESS STREET PORTLAND, MAINE
System : 1 WET
Contract : 16-099
Data File : Jewish Community Cen Area 1.WXF

Hydraulic Design Information Sheet

Name - JEWISH COMMUNITY CENTER AREA 1 Date - 12-15-16
 Location - 1342 CONGRESS STREET PORTLAND, MAINE
 Building - NEW System No. - 1 WET
 Contractor - SPRINKLER SYSTEMS INC Contract No. - 16-099
 Calculated By - CDS Drawing No. - 1-2 OF 2
 Construction: () Combustible (X) Non-Combustible Ceiling Height - VARIES
 Occupancy - COMMUNITY CENTER

S (X) NFPA 13 (X) Lt. Haz. Ord.Haz.Gp. () 1 () 2 () 3 () Ex.Haz.
 Y () NFPA 231 () NFPA 231C () Figure Curve

S Other

T Specific Ruling Made By Date

E				
M	Area of Sprinkler Operation	- 900	System Type	Sprinkler/Nozzle
	Density	- .10	(X) Wet	Make RELIABLE
D	Area Per Sprinkler	- 196	() Dry	Model F1FR56
E	Elevation at Highest Outlet	- 64.750	() Deluge	Size 1/2" X 1/2"
S	Hose Allowance - Inside	- 0	() Preaction	K-Factor 5.6
I	Rack Sprinkler Allowance	- 0	() Other	Temp.Rat.155 DEG
G	Hose Allowance - Outside	- 100		

N Note

Calculation Flow Required - 169.07 Press Required - 58.218 AT BASE
 Summary C-Factor Used: 120 Overhead 140 Underground

W Water Flow Test: Pump Data: Tank or Reservoir:
 A Date of Test - 07/15/2009 Cap. -
 T Time of Test - AM Rated Cap.- Elev.-
 E Static Press - 97 @ Press -
 R Residual Press - 93 Elev. - Well
 Flow - 1984 Proof Flow
 S Elevation - 43

U Location - ON SITE

P Source of Information - OWNER AND WATER DISTRICT

C Commodity Class Location
 O Storage Ht. Area Aisle W.
 M Storage Method: Solid Piled % Palletized % Rack
 M () Single Row () Conven. Pallet () Auto. Storage () Encap.
 S R () Double Row () Slave Pallet () Solid Shelf () Non
 T A () Mult. Row () Open Shelf

O C
 R K Flue Spacing Clearance:Storage to Ceiling
 A Longitudinal Transverse

G
 E Horizontal Barriers Provided:

Fittings Used Summary

SPRINKLER SYSTEMS INC.
Jewish Community Center Area 1

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Date

Fitting Legend		1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	5	6	8	10	12	14	16	18	20	24
E	NFPA 13 90° Standard Elbow	1	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61
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
Fsp	Flow Switch Potter VSR	Fitting generates a Fixed Loss Based on Flow																			
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
T	NFPA 13 90° Flow thru Tee	3	4	5	6	8	10	12	15	17	20	25	30	35	50	60	71	81	91	101	121
Zac	Ames 2000SS	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

SPRINKLER SYSTEMS INC.
Jewish Community Center Area 1

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Date

Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
TYP	0.0	5.6	12.25	na	19.6	0.1	196	7.0
ARM1	64.79	5.6	14.69	na	21.46	0.1	196	7.0
ARM2	64.79	5.6	13.91	na	20.89	0.1	196	7.0
10	64.79	K = K @ ARM	22.06	na	24.68			
6	64.75	K = K @ ARM	16.84	na	21.56			
7	64.75		17.1	na				
8	64.75		18.04	na				
1	64.75	K = K @ ARM	13.91	na	19.6			
2	64.75	K = K @ ARM	14.08	na	19.72			
3	64.75	K = K @ ARM	14.69	na	20.14			
4	64.75	K = K @ ARM	15.99	na	21.02			
5	64.75		22.25	na				
9	64.75		22.48	na				
11	64.75		22.85	na				
12	62.42		36.5	na				
32	62.42		44.92	na				
TOR	62.42		47.62	na				
BKFL	57.0		53.35	na				
BASE	52.0		58.22	na				
HOSE	52.0		58.46	na	100.0			
TEST	43.0		62.95	na				

The maximum velocity is 12.68 and it occurs in the pipe between nodes 4 and 5

Final Calculations - Hazen-Williams

SPRINKLER SYSTEMS INC.
Jewish Community Center Area 1

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Date

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv. Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
TYP to ARM	19.60 19.6	1.049 120.0 0.1254	2E T	4.0 5.0 0.0	4.250 9.000 13.250	12.250 0.0 1.661		K Factor = 5.60 Vel = 7.28	
	0.0 19.60					13.911		K Factor = 5.26	
ARM1 to 8	21.46 21.46	1.049 120.0 0.1483	T Eqv	5.0 17.0 0.0	0.500 22.000 22.500	14.688 0.017 3.336		K Factor = 5.60 Vel = 7.97	
	0.0 21.46					18.041		K Factor = 5.05	
ARM2 to 7	20.89 20.89	1.049 120.0 0.1410	T Eqv	5.0 17.0 0.0	0.500 22.000 22.500	13.909 0.017 3.172		K Factor = 5.60 Vel = 7.75	
	0.0 20.89					17.098		K Factor = 5.05	
10 to 11	24.68 24.68	1.61 120.0 0.0238	T	8.0 0.0 0.0	24.000 8.000 32.000	22.065 0.017 0.763		K Factor @ node ARM Vel = 3.89	
	0.0 24.68					22.845		K Factor = 5.16	
6 to 7	21.56 21.56	1.61 120.0 0.0185		0.0 0.0 0.0	14.000 0.0 14.000	16.839 0.0 0.259		K Factor @ node ARM Vel = 3.40	
7 to 8	20.89 42.45	1.61 120.0 0.0650		0.0 0.0 0.0	14.500 0.0 14.500	17.098 0.0 0.943		Vel = 6.69	
8 to 9	21.46 63.91	1.61 120.0 0.1386	T	8.0 0.0 0.0	24.000 8.000 32.000	18.041 0.0 4.435		Vel = 10.07	
	0.0 63.91					22.476		K Factor = 13.48	
1 to 2	19.60 19.6	1.610 120.0 0.0155		0.0 0.0 0.0	11.000 0.0 11.000	13.911 0.0 0.171		K Factor @ node ARM Vel = 3.09	
2 to 3	19.72 39.32	1.610 120.0 0.0565		0.0 0.0 0.0	10.750 0.0 10.750	14.082 0.0 0.607		K Factor @ node ARM Vel = 6.20	
3 to 4	20.14 59.46	1.610 120.0 0.1212		0.0 0.0 0.0	10.750 0.0 10.750	14.689 0.0 1.303		K Factor @ node ARM Vel = 9.37	
4 to 5	21.02 80.48	1.610 120.0 0.2123	T	8.0 0.0 0.0	21.500 8.000 29.500	15.992 0.0 6.262		K Factor @ node ARM Vel = 12.68	
5 to 9	0.0 80.48	2.635 120.0 0.0193		0.0 0.0 0.0	11.500 0.0 11.500	22.254 0.0 0.222		Vel = 4.73	

Final Calculations - Hazen-Williams

SPRINKLER SYSTEMS INC.
Jewish Community Center Area 1

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Date

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv. Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
9	63.91	2.635		6.500	22.476				
to		120.0		0.0	0.0				
11	144.39	0.0568		6.500	0.369		Vel = 8.50		
11	24.68	2.635	7E	57.66	92.000	22.845			
to		120.0	T	16.474	74.134	1.009			
12	169.07	0.0761		0.0	166.134	12.643	Vel = 9.95		
12	0.0	2.635	4E	32.948	53.000	36.497			
to		120.0	2F	8.237	57.659	0.0			
32	169.07	0.0761	T	16.474	110.659	8.421	Vel = 9.95		
32	0.0	2.635	T	16.474	19.000	44.918			
to		120.0		0.0	16.474	0.0			
TOR	169.07	0.0761		0.0	35.474	2.700	Vel = 9.95		
TOR	0.0	2.635	Fsp	0.0	5.000	47.618			
to		120.0		0.0	0.0	5.347	** Fixed Loss = 3		
BKFL	169.07	0.0762		0.0	5.000	0.381	Vel = 9.95		
BKFL	0.0	2.469	Zac	0.0	0.500	53.346			
to		120.0		0.0	0.0	4.820	** Fixed Loss = 2.655		
BASE	169.07	0.1040		0.0	0.500	0.052	Vel = 11.33		
BASE	0.0	6.16	2E	40.168	175.000	58.218			
to		140.0	T	43.037	87.509	0.0			
HOSE	169.07	0.0009	G	4.304	262.509	0.241	Vel = 1.82		
HOSE	100.00	8.27		0.0	1150.000	58.459	Qa = 100		
to		140.0		0.0	0.0	3.898			
TEST	269.07	0.0005		0.0	1150.000	0.592	Vel = 1.61		
	0.0								
	269.07					62.949	K Factor = 33.91		

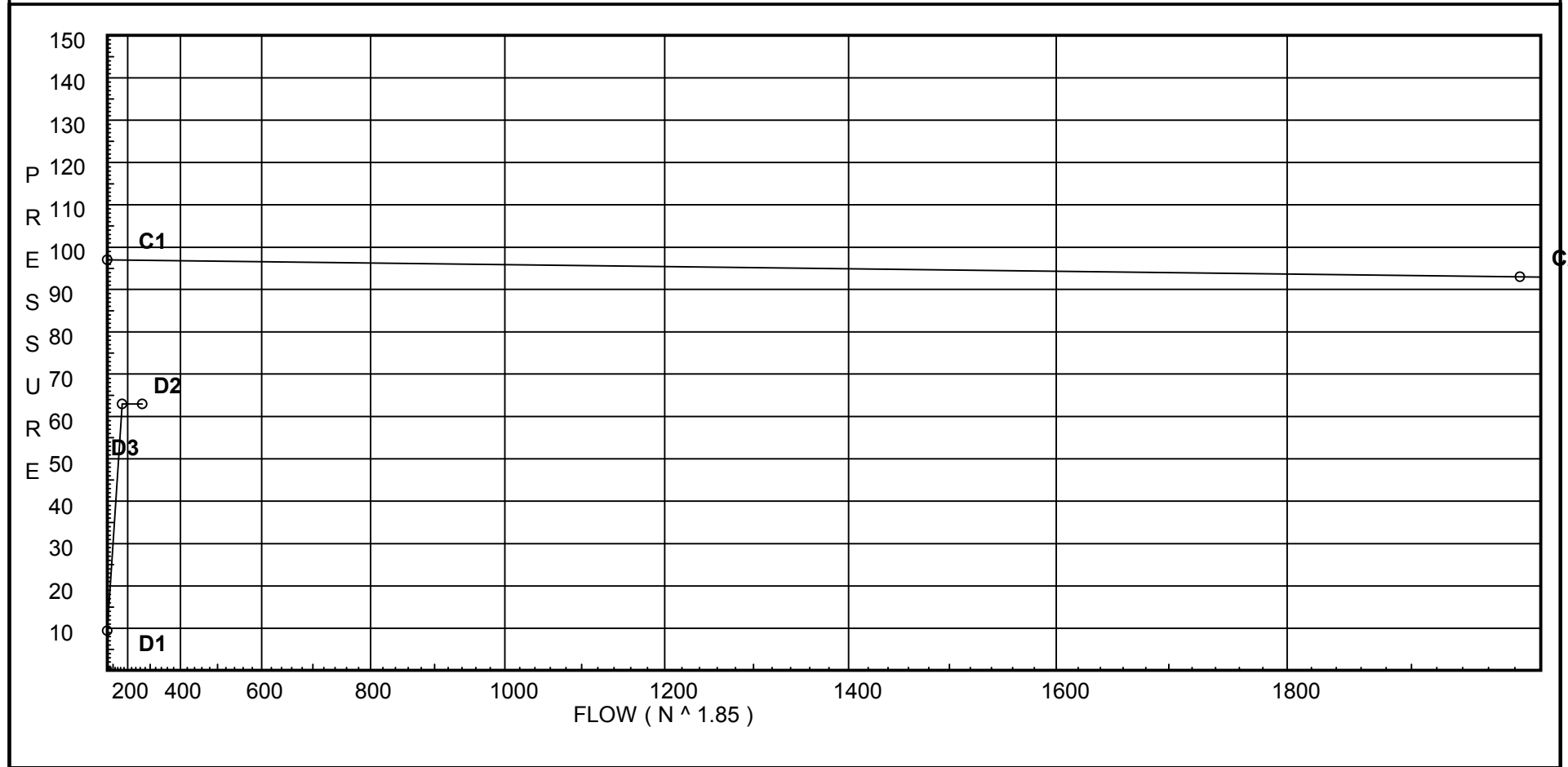
Water Supply Curve C

SPRINKLER SYSTEMS INC.
Jewish Community Center Area 1

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Date

City Water Supply:
C1 - Static Pressure : 97
C2 - Residual Pressure: 93
C2 - Residual Flow : 1984

Demand:
D1 - Elevation : 9.420
D2 - System Flow : 169.071
D2 - System Pressure : 62.949
Hose (Demand) : 100
D3 - System Demand : 269.071
Safety Margin : 33.952



Hydraulic Design Information Sheet

Name - JEWISH COMMUNITY CENTER AREA 2 Date - 12-15-16
 Location - 1342 CONGRESS STREET PORTLAND, MAINE
 Building - NEW System No. - 1 WET
 Contractor - SPRINKLER SYSTEMS INC Contract No. - 16-099
 Calculated By - CDS Drawing No. - 1-2 OF 2
 Construction: () Combustible (X) Non-Combustible Ceiling Height - VARIES
 Occupancy - COMMUNITY CENTER

S (X) NFPA 13 (X) Lt. Haz. Ord.Haz.Gp. () 1 () 2 () 3 () Ex.Haz.
 Y () NFPA 231 () NFPA 231C () Figure Curve

S Other

T Specific Ruling Made By Date

E				
M	Area of Sprinkler Operation	- 1500	System Type	Sprinkler/Nozzle
	Density	- .10	(X) Wet	Make RELIABLE
D	Area Per Sprinkler	- 210	() Dry	Model F1FR56
E	Elevation at Highest Outlet	- 74.170	() Deluge	Size 1/2" X 1/2"
S	Hose Allowance - Inside	- 0	() Preaction	K-Factor 5.6
I	Rack Sprinkler Allowance	- 0	() Other	Temp.Rat.200 DEG
G	Hose Allowance - Outside	- 100		

N Note

Calculation Flow Required - 174.61 Press Required - 49.380 AT BASE
 Summary C-Factor Used: 120 Overhead 140 Underground

W	Water Flow Test:	Pump Data:	Tank or Reservoir:
A	Date of Test - 07/15/2009		Cap. -
T	Time of Test - AM	Rated Cap.-	Elev.-
E	Static Press - 97	@ Press -	
R	Residual Press - 93	Elev. -	Well
	Flow - 1984		Proof Flow
S	Elevation - 43		

U Location - ON SITE

P Source of Information - OWNER AND WATER DISTRICT

C	Commodity	Class	Location
O	Storage Ht.	Area	Aisle W.
M	Storage Method:	%	Palletized % Rack
M	() Single Row	() Conven. Pallet	() Auto. Storage () Encap.
S	() Double Row	() Slave Pallet	() Solid Shelf () Non
T	() Mult. Row		() Open Shelf

R K Flue Spacing Clearance:Storage to Ceiling
 A Longitudinal Transverse

E Horizontal Barriers Provided:

Pressure / Flow Summary - STANDARD

SPRINKLER SYSTEMS INC.
Jewish Community Center Area 2

Page 8
Date

Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
TYP	0.0	5.6	14.06	na	21.0	0.1	210	7.0
26	74.17	K = K @ ARM	16.28	na	21.15			
27	74.17	K = K @ ARM	16.54	na	21.31			
28	74.17	K = K @ ARM	17.51	na	21.93			
29	74.17	K = K @ ARM	19.62	na	23.21			
21	74.17	K = K @ ARM	16.06	na	21.0			
22	74.17	K = K @ ARM	16.31	na	21.17			
23	74.17	K = K @ ARM	17.27	na	21.78			
24	74.17	K = K @ ARM	19.35	na	23.06			
25	74.17		22.85	na				
30	74.17		23.16	na				
31	74.17		27.48	na				
32	62.42		35.92	na				
TOR	62.42		38.78	na				
BKFL	57.0		44.53	na				
BASE	52.0		49.38	na				
HOSE	52.0		49.64	na	100.0			
TEST	43.0		54.15	na				

The maximum velocity is 13.81 and it occurs in the pipe between nodes 29 and 30

Final Calculations - Hazen-Williams

SPRINKLER SYSTEMS INC.
Jewish Community Center Area 2

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Date

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
TYP to ARM	21.00 21.0	1.049 120.0 0.1424	2T E	10.0 2.0 0.0	2.000 12.000 14.000	14.062 0.0 1.994			K Factor = 5.60	
	0.0 21.00						16.056		K Factor = 5.24	
26 to 27	21.15 21.15	1.61 120.0 0.0179		0.0 0.0 0.0	14.330 0.0 14.330	16.281 0.0 0.256			K Factor @ node ARM	
									Vel = 3.33	
27 to 28	21.31 42.46	1.61 120.0 0.0651		0.0 0.0 0.0	15.000 0.0 15.000	16.537 0.0 0.976			K Factor @ node ARM	
									Vel = 6.69	
28 to 29	21.93 64.39	1.61 120.0 0.1405		0.0 0.0 0.0	15.000 0.0 15.000	17.513 0.0 2.108			K Factor @ node ARM	
									Vel = 10.15	
29 to 30	23.21 87.6	1.61 120.0 0.2484	T	8.0 0.0 0.0	6.250 8.000 14.250	19.621 0.0 3.539			K Factor @ node ARM	
	0.0 87.60						23.160		K Factor = 18.20	
21 to 22	21.00 21.0	1.610 120.0 0.0177		0.0 0.0 0.0	14.330 0.0 14.330	16.056 0.0 0.254			K Factor @ node ARM	
									Vel = 3.31	
22 to 23	21.16 42.16	1.610 120.0 0.0642		0.0 0.0 0.0	15.000 0.0 15.000	16.310 0.0 0.963			K Factor @ node ARM	
									Vel = 6.64	
23 to 24	21.79 63.95	1.610 120.0 0.1387		0.0 0.0 0.0	15.000 0.0 15.000	17.273 0.0 2.081			K Factor @ node ARM	
									Vel = 10.08	
24 to 25	23.05 87.0	1.610 120.0 0.2452	T	8.0 0.0 0.0	6.250 8.000 14.250	19.354 0.0 3.494			K Factor @ node ARM	
									Vel = 13.71	
25 to 30	0.0 87.0	2.635 120.0 0.0223		0.0 0.0 0.0	14.000 0.0 14.000	22.848 0.0 0.312				Vel = 5.12
30 to 31	87.61 174.61	2.635 120.0 0.0808	T	16.474 0.0 0.0	37.000 16.474 53.474	23.160 0.0 4.319				Vel = 10.27
31 to 32	0.0 174.61	2.635 120.0 0.0808	2E	16.474 0.0 0.0	25.000 16.474 41.474	27.479 5.089 3.350				Vel = 10.27
32 to TOR	0.0 174.61	2.635 120.0 0.0808	T	16.474 0.0 0.0	19.000 16.474 35.474	35.918 0.0 2.865				Vel = 10.27
TOR to BKFL	0.0 174.61	2.635 120.0 0.0808	Fsp	0.0 0.0 0.0	5.000 0.0 5.000	38.783 5.347 0.404			* * Fixed Loss = 3	Vel = 10.27

Final Calculations - Hazen-Williams

SPRINKLER SYSTEMS INC.
Jewish Community Center Area 2

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Date

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv. Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
BKFL to BASE	0.0 174.61	2.469 120.0 0.1120	Zac	0.0 0.0 0.0	0.500 0.0 0.500	44.534 4.790 0.056		* * Fixed Loss = 2.625 Vel = 11.70	
BASE to HOSE	0.0 174.61	6.16 140.0 0.0010	2E T G	40.168 43.037 4.304	175.000 87.509 262.509	49.380 0.0 0.255		Vel = 1.88	
HOSE to TEST	100.00 274.61	8.27 140.0 0.0005		0.0 0.0 0.0	1150.000 0.0 1150.000	49.635 3.898 0.615		Qa = 100 Vel = 1.64	
	0.0 274.61					54.148		K Factor = 37.32	

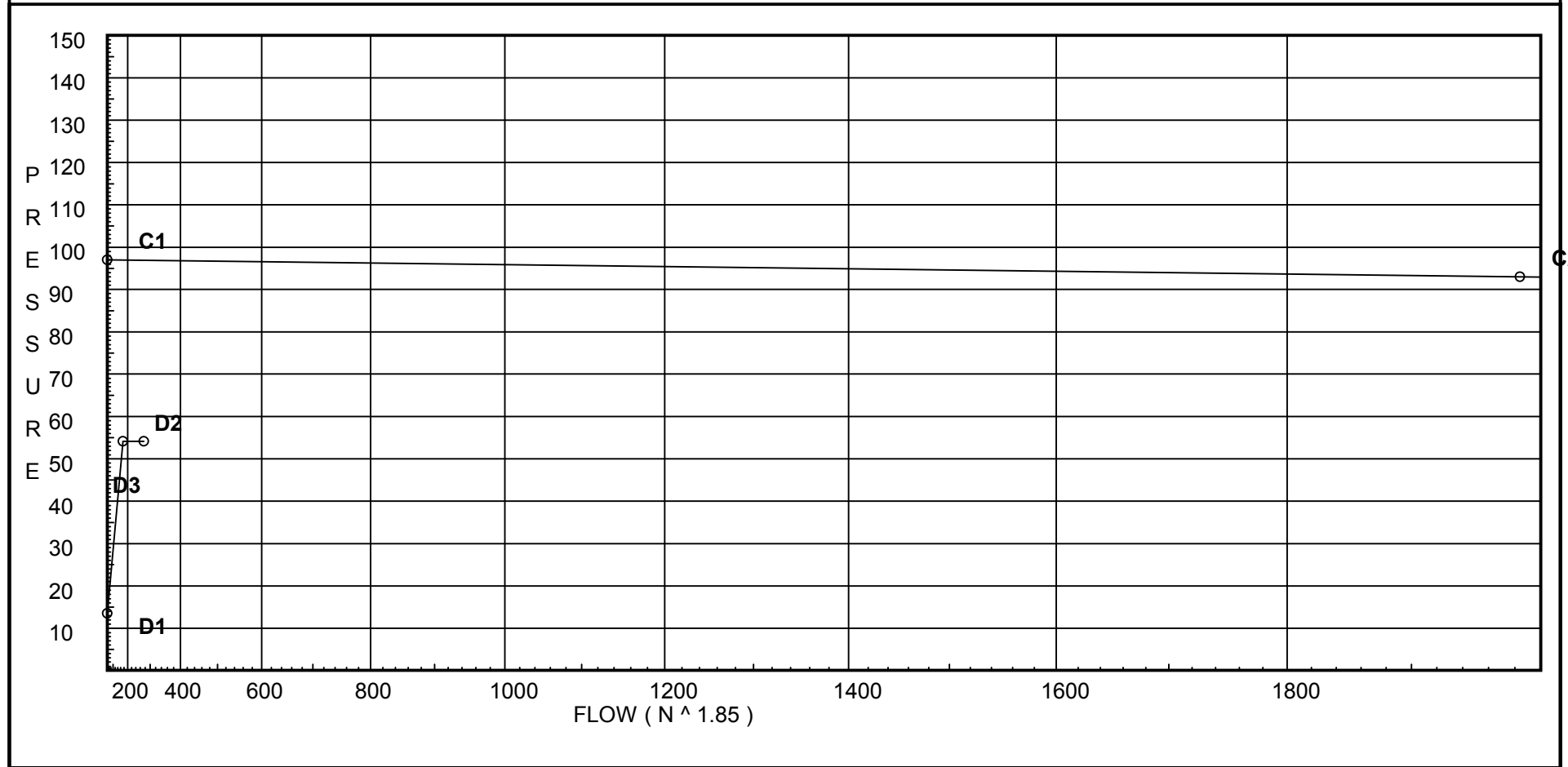
Water Supply Curve C

SPRINKLER SYSTEMS INC.
Jewish Community Center Area 2

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Date

City Water Supply:
C1 - Static Pressure : 97
C2 - Residual Pressure: 93
C2 - Residual Flow : 1984

Demand:
D1 - Elevation : 13.500
D2 - System Flow : 174.606
D2 - System Pressure : 54.148
Hose (Demand) : 100
D3 - System Demand : 274.606
Safety Margin : 42.749



Hydraulic Design Information Sheet

Name - JEWISH COMMUNITY CENTER AREA 3 Date - 12-15-16
 Location - 1342 CONGRESS STREET PORTLAND, MAINE
 Building - NEW System No. - 1 WET
 Contractor - SPRINKLER SYSTEMS INC Contract No. - 16-099
 Calculated By - CDS Drawing No. - 1-2 OF 2
 Construction: () Combustible (X) Non-Combustible Ceiling Height - VARIES
 Occupancy - COMMUNITY CENTER

S (X) NFPA 13 (X) Lt. Haz. Ord.Haz.Gp. () 1 () 2 () 3 () Ex.Haz.
 Y () NFPA 231 () NFPA 231C () Figure Curve

S Other

T Specific Ruling Made By Date

E				
M	Area of Sprinkler Operation	- 900	System Type	Sprinkler/Nozzle
	Density	- .10	(X) Wet	Make RELIABLE
D	Area Per Sprinkler	- 196	() Dry	Model F1FR56
E	Elevation at Highest Outlet	- 62.420	() Deluge	Size 1/2" X 1/2"
S	Hose Allowance - Inside	- 0	() Preaction	K-Factor 5.6
I	Rack Sprinkler Allowance	- 0	() Other	Temp.Rat.155 DEG
G	Hose Allowance - Outside	- 100		

N Note

Calculation Flow Required - 237.86 Press Required - 60.936 AT BASE
 Summary C-Factor Used: 120 Overhead 140 Underground

W	Water Flow Test:	Pump Data:	Tank or Reservoir:
A	Date of Test - 07/15/2009		Cap. -
T	Time of Test - AM	Rated Cap.-	Elev.-
E	Static Press - 97	@ Press -	
R	Residual Press - 93	Elev. -	Well
	Flow - 1984		Proof Flow
S	Elevation - 43		

U Location - ON SITE

P Source of Information - OWNER AND WATER DISTRICT

C	Commodity	Class	Location
O	Storage Ht.	Area	Aisle W.
M	Storage Method:	%	Palletized % Rack
	() Single Row	() Conven. Pallet	() Auto. Storage () Encap.
S	() Double Row	() Slave Pallet	() Solid Shelf () Non
T	() Mult. Row		() Open Shelf

R K Flue Spacing Clearance:Storage to Ceiling
 A Longitudinal Transverse

E Horizontal Barriers Provided:

Pressure / Flow Summary - STANDARD

SPRINKLER SYSTEMS INC.
Jewish Community Center Area 3

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Date

Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
TYP	0.0	5.6	12.25	na	19.6	0.1	196	7.0
51	62.42	K = K @ ARM	21.61	na	24.35			
52	62.42	K = K @ ARM	21.82	na	24.46			
52A	62.42	K = K @ ARM	22.41	na	24.79			
46	62.42	K = K @ ARM	14.0	na	19.6			
47	62.42	K = K @ ARM	14.19	na	19.73			
48	62.42	K = K @ ARM	14.76	na	20.12			
49	62.42	K = K @ ARM	15.94	na	20.91			
41	62.42	K = K @ ARM	15.27	na	20.47			
42	62.42	K = K @ ARM	15.47	na	20.6			
43	62.42	K = K @ ARM	16.09	na	21.01			
44	62.42	K = K @ ARM	17.37	na	21.83			
45	62.42		28.14	na				
50	62.42		28.43	na				
53	62.42		28.88	na				
69	62.42		39.11	na				
70	62.42		44.05	na				
TOR	62.42		49.73	na				
BKFL	57.0		55.79	na				
BASE	52.0		60.94	na				
HOSE	52.0		61.39	na	100.0			
TEST	43.0		66.19	na				

The maximum velocity is 15.94 and it occurs in the pipe between nodes BKFL and BASE

Final Calculations - Hazen-Williams

SPRINKLER SYSTEMS INC.
Jewish Community Center Area 3

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Date

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
TYP to ARM	19.60 19.6	1.049 120.0 0.1254	2T E	10.0 2.0 0.0	2.000 12.000 14.000	12.250 0.0 1.755			K Factor = 5.60	
	0.0 19.60						14.005		K Factor = 5.24	
51 to 52	24.35 24.35	1.61 120.0 0.0232		0.0 0.0 0.0	8.750 0.0 8.750	21.614 0.0 0.203			K Factor @ node ARM	
									Vel = 3.84	
52 to 52A	24.46 24.46	1.61 120.0 0.0841		0.0 0.0 0.0	7.000 0.0 7.000	21.817 0.0 0.589			K Factor @ node ARM	
									Vel = 7.69	
52A to 53	24.79 24.79	1.61 120.0 0.1800	T	8.0 0.0 0.0	28.000 8.000 36.000	22.406 0.0 6.479			K Factor @ node ARM	
	0.0 73.60						28.885		K Factor = 13.69	
46 to 47	19.60 19.6	1.61 120.0 0.0156		0.0 0.0 0.0	12.000 0.0 12.000	14.005 0.0 0.187			K Factor @ node ARM	
									Vel = 3.09	
47 to 48	19.73 19.73	1.61 120.0 0.0564		0.0 0.0 0.0	10.000 0.0 10.000	14.192 0.0 0.564			K Factor @ node ARM	
									Vel = 6.20	
48 to 49	20.12 20.12	1.61 120.0 0.1212		0.0 0.0 0.0	9.750 0.0 9.750	14.756 0.0 1.182			K Factor @ node ARM	
									Vel = 9.37	
49 to 50	20.91 20.91	1.61 120.0 0.2117	2E T	8.0 8.0 0.0	43.000 16.000 59.000	15.938 0.0 12.490			K Factor @ node ARM	
	0.0 80.36						28.428		K Factor = 15.07	
41 to 42	20.47 20.47	1.610 120.0 0.0168		0.0 0.0 0.0	12.000 0.0 12.000	15.272 0.0 0.202			K Factor @ node ARM	
									Vel = 3.23	
42 to 43	20.60 20.60	1.610 120.0 0.0612		0.0 0.0 0.0	10.000 0.0 10.000	15.474 0.0 0.612			K Factor @ node ARM	
									Vel = 6.47	
43 to 44	21.00 21.00	1.610 120.0 0.1313		0.0 0.0 0.0	9.750 0.0 9.750	16.086 0.0 1.280			K Factor @ node ARM	
									Vel = 9.78	
44 to 45	21.83 21.83	1.610 120.0 0.2293	T	8.0 0.0 0.0	39.000 8.000 47.000	17.366 0.0 10.776			K Factor @ node ARM	
									Vel = 13.22	
45 to 50	0.0 0.0	2.635 120.0 0.0208		0.0 0.0 0.0	13.750 0.0 13.750	28.142 0.0 0.286				
	83.9								Vel = 4.94	

Final Calculations - Hazen-Williams

SPRINKLER SYSTEMS INC.
Jewish Community Center Area 3

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Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv. Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
50	80.36	2.635		6.330	28.428				
to		120.0		0.0	0.0				
53	164.26	0.0722		6.330	0.457		Vel = 9.66		
53	73.60	2.635	2E	16.474	55.000	28.885			
to		120.0		0.0	16.474	0.0			
69	237.86	0.1431		0.0	71.474	10.228	Vel = 13.99		
69	0.0	2.635	T	16.474	18.000	39.113			
to		120.0		0.0	16.474	0.0			
70	237.86	0.1431		0.0	34.474	4.933	Vel = 13.99		
70	0.0	2.635	E	8.237	15.000	44.046			
to		120.0	T	16.474	24.711	0.0			
TOR	237.86	0.1431		0.0	39.711	5.683	Vel = 13.99		
TOR	0.0	2.635	Fsp	0.0	5.000	49.729			
to		120.0		0.0	0.0	5.347	** Fixed Loss = 3		
BKFL	237.86	0.1432		0.0	5.000	0.716	Vel = 13.99		
BKFL	0.0	2.469	Zac	0.0	0.500	55.792			
to		120.0		0.0	0.0	5.046	** Fixed Loss = 2.88		
BASE	237.86	0.1960		0.0	0.500	0.098	Vel = 15.94		
BASE	0.0	6.16	2E	40.168	175.000	60.936			
to		140.0	T	43.037	87.509	0.0			
HOSE	237.86	0.0017	G	4.304	262.509	0.452	Vel = 2.56		
HOSE	100.00	8.27		0.0	1150.000	61.388	Qa = 100		
to		140.0		0.0	0.0	3.898			
TEST	337.86	0.0008		0.0	1150.000	0.902	Vel = 2.02		
	0.0								
	337.86					66.188	K Factor = 41.53		

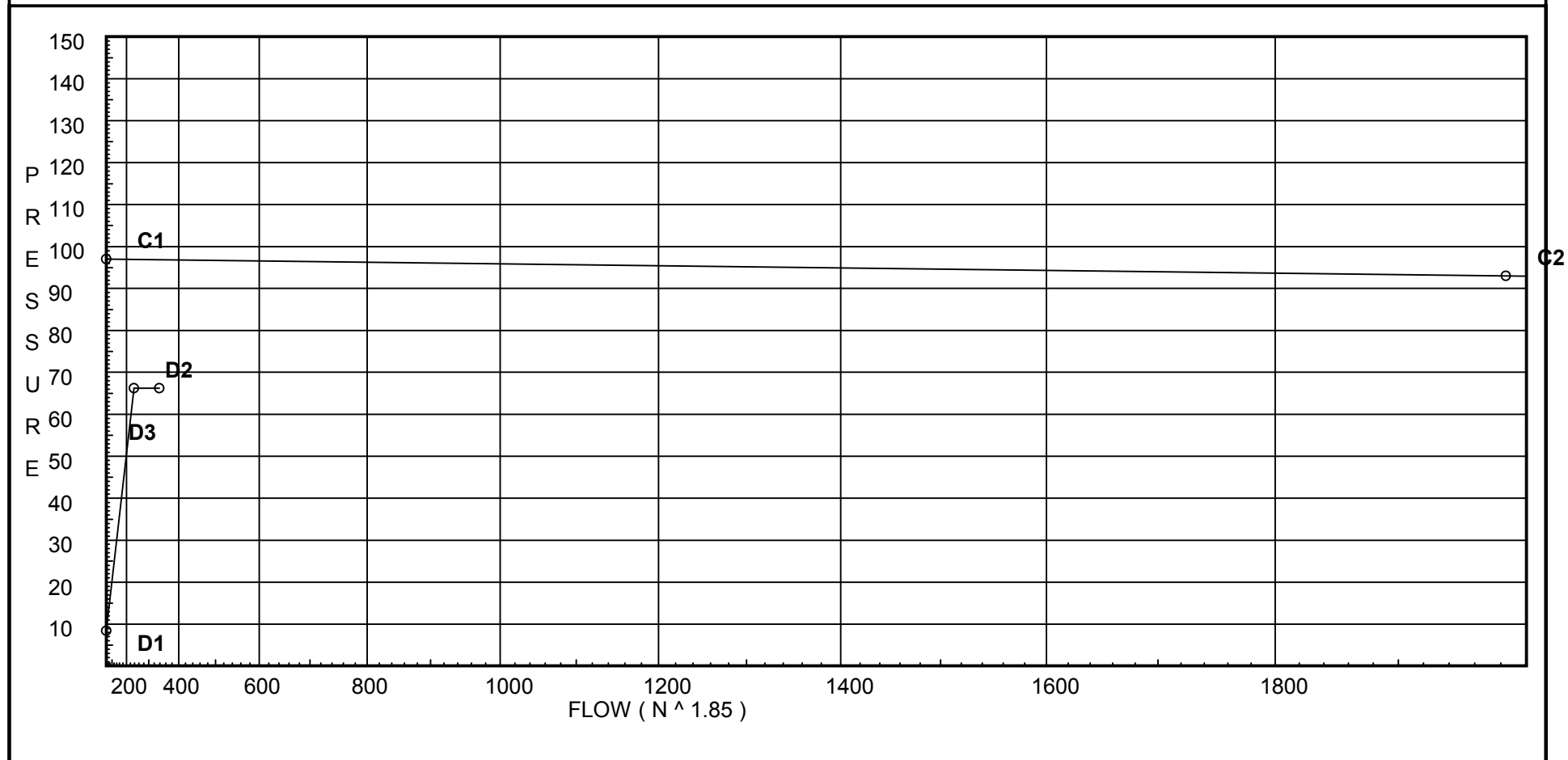
Water Supply Curve C

SPRINKLER SYSTEMS INC.
Jewish Community Center Area 3

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City Water Supply:
C1 - Static Pressure : 97
C2 - Residual Pressure: 93
C2 - Residual Flow : 1984

Demand:
D1 - Elevation : 8.411
D2 - System Flow : 237.862
D2 - System Pressure : 66.188
Hose (Demand) : 100
D3 - System Demand : 337.862
Safety Margin : 30.661



Hydraulic Design Information Sheet

Name - JEWISH COMMUNITY CENTER AREA 4 Date - 12-15-16
 Location - 1342 CONGRESS STREET PORTLAND, MAINE
 Building - NEW System No. - 1 WET
 Contractor - SPRINKLER SYSTEMS INC Contract No. - 16-099
 Calculated By - CDS Drawing No. - 1-2 OF 2
 Construction: () Combustible (X) Non-Combustible Ceiling Height - VARIES
 Occupancy - COMMUNITY CENTER

S (X) NFPA 13 (X) Lt. Haz. Ord.Haz.Gp. () 1 () 2 () 3 () Ex.Haz.
 Y () NFPA 231 () NFPA 231C () Figure Curve

S Other

T Specific Ruling Made By Date

E				
M	Area of Sprinkler Operation	- 900	System Type	Sprinkler/Nozzle
	Density	- .10	(X) Wet	Make RELIABLE
D	Area Per Sprinkler	- 196	() Dry	Model F1FR56
E	Elevation at Highest Outlet	- 62.420	() Deluge	Size 1/2" X 1/2"
S	Hose Allowance - Inside	- 0	() Preaction	K-Factor 5.6
I	Rack Sprinkler Allowance	- 0	() Other	Temp.Rat.155 DEG
G	Hose Allowance - Outside	- 100		

N Note

Calculation Flow Required - 121.75 Press Required - 60.019 AT BASE
 Summary C-Factor Used: 120 Overhead 140 Underground

W Water Flow Test: Pump Data: Tank or Reservoir:
 A Date of Test - 07/15/2009 Cap. -
 T Time of Test - AM Rated Cap.- Elev.-
 E Static Press - 97 @ Press -
 R Residual Press - 93 Elev. - Well
 Flow - 1984 Proof Flow
 S Elevation - 43

U Location - ON SITE

P Source of Information - OWNER AND WATER DISTRICT

C Commodity Class Location
 O Storage Ht. Area Aisle W.
 M Storage Method: Solid Piled % Palletized % Rack
 M
 () Single Row () Conven. Pallet () Auto. Storage () Encap.
 S R () Double Row () Slave Pallet () Solid Shelf () Non
 T A () Mult. Row () Open Shelf

O C
 R K Flue Spacing Clearance:Storage to Ceiling
 A Longitudinal Transverse

G
 E Horizontal Barriers Provided:

Pressure / Flow Summary - STANDARD

SPRINKLER SYSTEMS INC.
Jewish Community Center Area 4

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Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
TYP	0.0	5.6	12.25	na	19.6	0.1	196	7.0
ARM1	62.42	5.6	13.25	na	20.38	0.1	196	7.0
ARM2	62.42	5.6	13.61	na	20.66	0.1	196	7.0
ARM3	62.42	5.6	12.96	na	20.16	0.1	196	7.0
ARM4	62.42	5.6	12.25	na	19.6	0.1	196	7.0
ARM5	62.42	5.6	12.72	na	19.98	0.1	196	7.0
65	62.42		15.0	na				
66	62.42		15.2	na				
67	62.42		15.93	na				
62	62.42		14.26	na				
63	62.42		14.41	na				
ARM6	62.42	5.6	14.03	na	20.97	0.1	196	7.0
61	62.42		15.66	na				
64	62.42		15.71	na				
68	62.42		17.31	na				
69	62.42		46.3	na				
70	62.42		47.73	na				
TOR	62.42		49.38	na				
BKFL	57.0		54.94	na				
BASE	52.0		60.02	na				
HOSE	52.0		60.15	na	100.0			
TEST	43.0		64.46	na				

The maximum velocity is 19.19 and it occurs in the pipe between nodes 68 and 69

Final Calculations - Hazen-Williams

SPRINKLER SYSTEMS INC.
Jewish Community Center Area 4

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Date

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
TYP to ARM	19.60 19.6	1.049 120.0 0.1254	2T E	10.0 2.0 0.0	2.000 12.000 14.000	12.250 0.0 1.755			K Factor = 5.60	
	0.0 19.60									
										14.005 K Factor = 5.24
ARM1 to 65	20.38 20.38	1.049 120.0 0.1348	2E T	4.0 5.0 0.0	4.000 9.000 13.000	13.248 0.0 1.752			K Factor = 5.60	
	0.0 20.38									
										15.000 K Factor = 5.26
ARM2 to 66	20.66 20.66	1.049 120.0 0.1382	2E T	4.0 5.0 0.0	2.500 9.000 11.500	13.612 0.0 1.589			K Factor = 5.60	
	0.0 20.66									
										15.201 K Factor = 5.30
ARM3 to 67	20.16 20.16	1.049 120.0 0.1321	T Eqv	5.0 17.0 0.0	0.500 22.000 22.500	12.962 0.0 2.972			K Factor = 5.60	
	0.0 20.16									
										15.934 K Factor = 5.05
ARM4 to 62	19.60 19.6	1.049 120.0 0.1254	3E T	6.0 5.0 0.0	5.000 11.000 16.000	12.250 0.0 2.006			K Factor = 5.60	
	0.0 19.60									
										14.256 K Factor = 5.19
ARM5 to 63	19.98 19.98	1.049 120.0 0.1298	2E T	4.0 5.0 0.0	4.000 9.000 13.000	12.724 0.0 1.687			K Factor = 5.60	
	0.0 19.98									
										14.411 K Factor = 5.26
65 to 66	20.38 20.38	1.61 120.0 0.0168		0.0 0.0 0.0	12.000 0.0 12.000	15.000 0.0 0.201				Vel = 3.21
66 to 67	20.66 41.04	1.61 120.0 0.0611		0.0 0.0 0.0	12.000 0.0 12.000	15.201 0.0 0.733				Vel = 6.47
67 to 68	20.17 61.21	1.61 120.0 0.1279	T	8.0 0.0 0.0	2.750 8.000 10.750	15.934 0.0 1.375				Vel = 9.65
	0.0 61.21									
										17.309 K Factor = 14.71
62 to 63	19.60 19.6	1.610 120.0 0.0155		0.0 0.0 0.0	10.000 0.0 10.000	14.256 0.0 0.155				Vel = 3.09
63 to 64	19.98 39.58	1.610 120.0 0.0571	T	8.0 0.0 0.0	14.750 8.000 22.750	14.411 0.0 1.299				Vel = 6.24

Final Calculations - Hazen-Williams

SPRINKLER SYSTEMS INC.
Jewish Community Center Area 4

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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 39.58					15.710		K Factor = 9.99	
ARM6 to 61	20.97	1.049 120.0	2E T	4.0 5.0	2.500 9.000	14.028 0.0		K Factor = 5.60	
61 to 64	20.97	0.1421		0.0	11.500	1.634		Vel = 7.78	
64 to 64	0.0	1.61 120.0		0.0	2.750 0.0	15.662 0.0			
64 to 68	20.97	0.0175		0.0	2.750	0.048		Vel = 3.30	
68 to 68	39.58	1.61 120.0		0.0	12.750 0.0	15.710 0.0			
68 to 69	60.55	0.1254		0.0	12.750	1.599		Vel = 9.54	
69 to 69	61.21	1.61 120.0	2E T	8.0 8.0	47.500 16.000	17.309 0.0			
69 to 70	121.76	0.4566		0.0	63.500	28.996		Vel = 19.19	
70 to 70	0.0	2.635 120.0	T	16.474 0.0	18.000 16.474	46.305 0.0			
70 to TOR	121.76	0.0415		0.0	34.474	1.429		Vel = 7.16	
TOR to TOR	0.0	2.635 120.0	E T	8.237 16.474	15.000 24.711	47.734 0.0			
TOR to BKFL	121.76	0.0414		0.0	39.711	1.646		Vel = 7.16	
BKFL to BKFL	0.0	2.635 120.0	Fsp	0.0 0.0	5.000 0.0	49.380 5.347		** Fixed Loss = 3	
BKFL to BASE	121.76	0.0416		0.0	5.000	0.208		Vel = 7.16	
BASE to BASE	0.0	2.469 120.0	Zac	0.0 0.0	0.500 0.0	54.935 5.056		** Fixed Loss = 2.89	
BASE to HOSE	121.76	0.0560		0.0	0.500	0.028		Vel = 8.16	
HOSE to HOSE	0.0	6.16 140.0	2E T	40.168 43.037	175.000 87.509	60.019 0.0			
HOSE to TEST	121.76	0.0005	G	4.304	262.509	0.131		Vel = 1.31	
TEST to TEST	100.00	8.27 140.0		0.0 0.0	1150.000 0.0	60.150 3.898		Qa = 100	
TEST to TEST	221.76	0.0004		0.0	1150.000	0.414		Vel = 1.32	
	0.0 221.76					64.462		K Factor = 27.62	

Water Supply Curve C

SPRINKLER SYSTEMS INC.
Jewish Community Center Area 4

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Date

City Water Supply:
C1 - Static Pressure : 97
C2 - Residual Pressure: 93
C2 - Residual Flow : 1984

Demand:
D1 - Elevation : 8.411
D2 - System Flow : 121.755
D2 - System Pressure : 64.462
Hose (Demand) : 100
D3 - System Demand : 221.755
Safety Margin : 32.469

