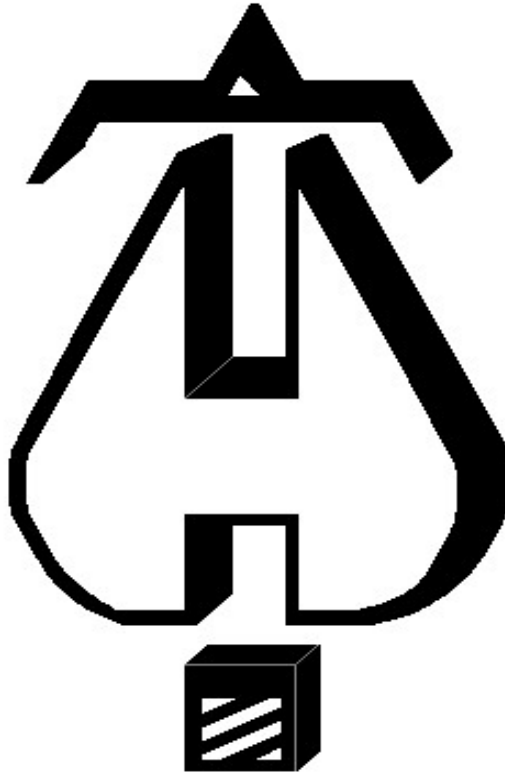




... Fire Protection by Computer Design

STAR FIRE SPRINKLERS
686 EDGEWOOD DR N
32254
9043841066

Job Name : KINGDOM CULTURE ACADEMY - RENOVATION
Building : CLASSROOM
Location : 359 SW DYAL AVE LAKE CITY, FL 32024
System : WET
Contract : NA
Data File : KINGDOM CHURCH LAKE CUTY - CALCS.WXF

Hydraulic Design Information Sheet

Name - KINGDOM CULTURE ACADEMY Date - 04/09/2024
Location - 359 SW DYAL AVE LAKE CITY, FL 32024
Building - CLASSROOM System No. - WET
Contractor - Star Fire Sprinklers Contract No. - NA
Calculated By - Drawing No. - FP-2
Construction: () Combustible (X) Non-Combustible Ceiling Height - EXP
Occupancy - LH

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

S Other

T Specific Ruling Made By Date

M	Area of Sprinkler Operation	- 960	System Type	Sprinkler/Nozzle
	Density	- 0.10	(x) Wet	Make
D	Area Per Sprinkler	- VERIES	() Dry	Model PENDENT
E	Elevation at Highest Outlet	- 9'	() Deluge	Size 1/2
S	Hose Allowance - Inside	-	() Preaction	K-Factor 5.6
I	Rack Sprinkler Allowance	-	() Other	Temp.Rat.155
G	Hose Allowance - Outside	- 100		

N Note

Calculation Flow Required - 397.6 Press Required - 86.3
Summary C-Factor Used: 120 Overhead 150 Underground

W	Water Flow Test:	Pump Data:	Tank or Reservoir:
A	Date of Test - 03/08/2024		Cap. -
T	Time of Test - 9:30 AM	Rated Cap.-	Elev.-
E	Static Press - 120	@ Press -	
R	Residual Press - 91	Elev. -	Well
	Flow - 1500		Proof Flow
S	Elevation - NA		

U Location - HYDRANT AT THE PROPERTY, ABOUT 200' AWAY FROM THE BUILDING

P Source of Information -

Y

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

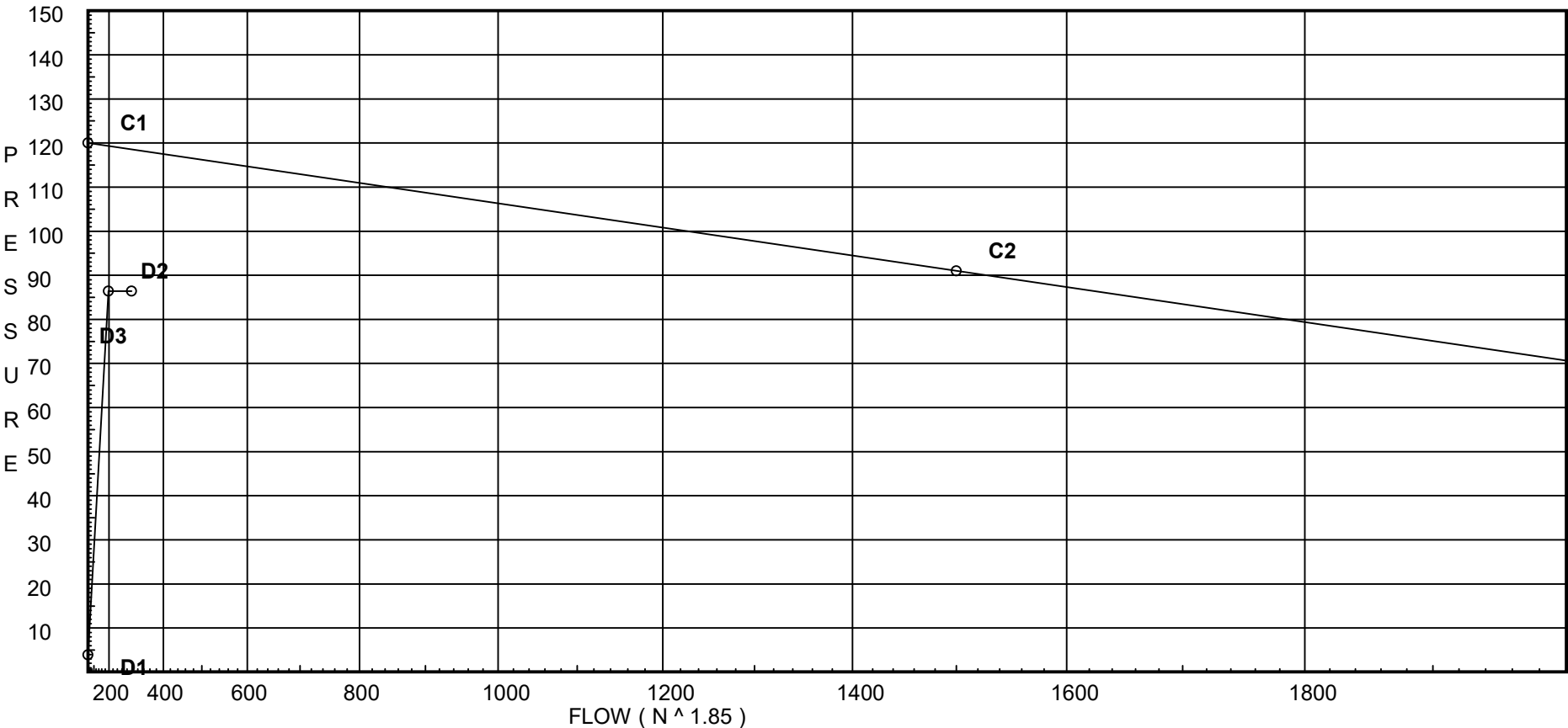
E Horizontal Barriers Provided:

Water Supply Curve C

STAR FIRE SPRINKLERS
KINGDOM CULTURE ACADEMY - RENOVATION

City Water Supply:
C1 - Static Pressure : 120
C2 - Residual Pressure: 91
C2 - Residual Flow : 1500

Demand:
D1 - Elevation : 3.898
D2 - System Flow : 197.694
D2 - System Pressure : 86.384
Hose (Demand) : 100
D3 - System Demand : 297.694
Safety Margin : 32.160



Fittings Used Summary

STAR FIRE SPRINKLERS
KINGDOM CULTURE ACADEMY - RENOVATION

Page 3
Date 04/03/2024

Fitting Legend

Abbrev.	Name	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
B	NFPA 13 Butterfly Valve	0	0	0	0	0	6	7	10	0	12	9	10	12	19	21	0	0	0	0	0
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
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
S	NFPA 13 Swing Check	0	0	5	7	9	11	14	16	19	22	27	32	45	55	65					
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
Zid	Wilkins 350DA	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

STAR FIRE SPRINKLERS
KINGDOM CULTURE ACADEMY - RENOVATION

Page 4
Date 04/03/2024

Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
P1	9.0	5.6	16.64	na	22.85	0.1	156	7.0
P2	9.0	5.6	16.93	na	23.04	0.1	156	7.0
P3	9.0	5.6	17.6	na	23.49	0.1	70	7.0
P4	9.0	5.6	19.44	na	24.69	0.1	208	7.0
P5	9.0	5.6	12.01	na	19.41	0.1	68	7.0
P6	9.0	5.6	12.13	na	19.5	0.15	130	7.0
P7	9.0	5.6	12.77	na	20.01	0.15	130	7.0
P8	9.0	5.6	14.47	na	21.3	0.1	168	7.0
P9	9.0	5.6	17.46	na	23.4	0.1	75	7.0
1	10.0		24.53	na				
2	10.0		24.96	na				
3	10.0		25.93	na				
4	10.0		28.62	na				
5	10.0		17.73	na				
6	10.0		17.9	na				
7	10.0		18.85	na				
8	10.0		21.34	na				
9	10.0		25.73	na				
10	10.0		56.82	na				
11	10.0		57.47	na				
12	10.0		64.61	na				
TOR	10.0		67.7	na				
BOR	1.0		80.32	na				
UG1	-3.0		82.45	na				
TEST	0.0		86.38	na	100.0			

The maximum velocity is 20.36 and it occurs in the pipe between nodes 9 and 11

Final Calculations - Hazen-Williams - 2007

STAR FIRE SPRINKLERS
KINGDOM CULTURE ACADEMY - RENOVATION

Page 5
Date 04/03/2024

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
P1 to 1	22.85 22.85	1.049 120.0 0.1664	1E 1T	2.0 5.0 0.0	43.000 7.000 50.000	16.643 -0.433 8.322			K Factor = 5.60	
	0.0 22.85								Vel = 8.48	
						24.532			K Factor = 4.61	
P2 to 2	23.04 23.04	1.049 120.0 0.1691	1E 1T	2.0 5.0 0.0	43.000 7.000 50.000	16.933 -0.433 8.457			K Factor = 5.60	
	0.0 23.04								Vel = 8.55	
						24.957			K Factor = 4.61	
P3 to 3	23.49 23.49	1.049 120.0 0.1753	1E 1T	2.0 5.0 0.0	43.000 7.000 50.000	17.600 -0.433 8.763			K Factor = 5.60	
	0.0 23.49								Vel = 8.72	
						25.930			K Factor = 4.61	
P4 to 4	24.69 24.69	1.049 120.0 0.1922	1E 1T	2.0 5.0 0.0	43.000 7.000 50.000	19.444 -0.433 9.609			K Factor = 5.60	
	0.0 24.69								Vel = 9.17	
						28.620			K Factor = 4.62	
P5 to 5	19.41 19.41	1.049 120.0 0.1231	1E 1T	2.0 5.0 0.0	43.000 7.000 50.000	12.009 -0.433 6.153			K Factor = 5.60	
	0.0 19.41								Vel = 7.21	
						17.729			K Factor = 4.61	
P6 to 6	19.50 19.5	1.049 120.0 0.1242	1E 1T	2.0 5.0 0.0	43.000 7.000 50.000	12.125 -0.433 6.209			K Factor = 5.60	
	0.0 19.50								Vel = 7.24	
						17.901			K Factor = 4.61	
P7 to 7	20.01 20.01	1.049 120.0 0.1302	1E 1T	2.0 5.0 0.0	43.000 7.000 50.000	12.768 -0.433 6.512			K Factor = 5.60	
	0.0 20.01								Vel = 7.43	
						18.847			K Factor = 4.61	
P8 to 8	21.30 21.3	1.049 120.0 0.1462	1E 1T	2.0 5.0 0.0	43.000 7.000 50.000	14.466 -0.433 7.310			K Factor = 5.60	
	0.0 21.30								Vel = 7.91	
						21.343			K Factor = 4.61	
P9 to 9	23.40 23.4	1.049 120.0 0.1740	1E 1T	2.0 5.0 0.0	43.000 7.000 50.000	17.464 -0.433 8.701			K Factor = 5.60	
	0.0 23.40								Vel = 8.69	
						25.732			K Factor = 4.61	
1 to 2	22.85 22.85	1.442 120.0 0.0354		0.0 0.0 0.0	12.000 0.0 12.000	24.532 0.0 0.425				
									Vel = 4.49	

Final Calculations - Hazen-Williams

STAR FIRE SPRINKLERS
KINGDOM CULTURE ACADEMY - RENOVATION

Page 6
Date 04/03/2024

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
2 to 3	23.04 45.89	1.442 120.0 0.1284		0.0 0.0 0.0	7.580 0.0 7.580	24.957 0.0 0.973				
								Vel =	9.02	
3 to 4	23.49 69.38	1.442 120.0 0.2759		0.0 0.0 0.0	9.750 0.0 9.750	25.930 0.0 2.690				
								Vel =	13.63	
4 to 10	24.70 94.08	1.442 120.0 0.4847	2E 1T	7.432 7.432 0.0	43.330 14.864 58.194	28.620 0.0 28.204				
								Vel =	18.48	
	0.0 94.08					56.824		K Factor =	12.48	
5 to 6	19.41 19.41	1.442 120.0 0.0261		0.0 0.0 0.0	6.580 0.0 6.580	17.729 0.0 0.172				
								Vel =	3.81	
6 to 7	19.50 38.91	1.442 120.0 0.0946		0.0 0.0 0.0	10.000 0.0 10.000	17.901 0.0 0.946				
								Vel =	7.64	
7 to 8	20.01 58.92	1.442 120.0 0.2039		0.0 0.0 0.0	12.240 0.0 12.240	18.847 0.0 2.496				
								Vel =	11.58	
8 to 9	21.30 80.22	1.442 120.0 0.3609		0.0 0.0 0.0	12.160 0.0 12.160	21.343 0.0 4.389				
								Vel =	15.76	
9 to 11	23.40 103.62	1.442 120.0 0.5795	2E 1T	7.432 7.432 0.0	39.910 14.864 54.774	25.732 0.0 31.740				
								Vel =	20.36	
	0.0 103.62					57.472		K Factor =	13.67	
10 to 11	94.08 94.08	2.157 120.0 0.0682		0.0 0.0 0.0	9.500 0.0 9.500	56.824 0.0 0.648				
								Vel =	8.26	
11 to 12	103.61 197.69	2.157 120.0 0.2694		0.0 0.0 0.0	26.500 0.0 26.500	57.472 0.0 7.139				
								Vel =	17.36	
12 to TOR	0.0 197.69	2.157 120.0 0.2694	1E	6.153 0.0 0.0	5.330 6.153 11.483	64.611 0.0 3.094				
								Vel =	17.36	
TOR to BOR	0.0 197.69	2.635 120.0 0.1016	1T 1Fsp 1B 1S	16.474 0.0 9.61 19.22	11.000 45.304 56.304	67.705 6.898 5.722		* * Fixed Loss = 3		
								Vel =	11.63	
BOR to UG1	0.0 197.69	4.23 150.0 0.0067	1E	19.223 0.0 0.0	40.000 19.224 59.224	80.325 1.732 0.398				
								Vel =	4.51	
UG1 to TEST	0.0 197.69	4.23 150.0 0.0067	1G 1T 1Zid	3.845 38.446 0.0	250.000 42.290 292.290	82.455 1.968 1.961		* * Fixed Loss = 3.268		
								Vel =	4.51	
	100.00							Qa =	100.00	

Final Calculations - Hazen-Williams

STAR FIRE SPRINKLERS
KINGDOM CULTURE ACADEMY - RENOVATION

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv. Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
297.69					86.384		K Factor = 32.03		