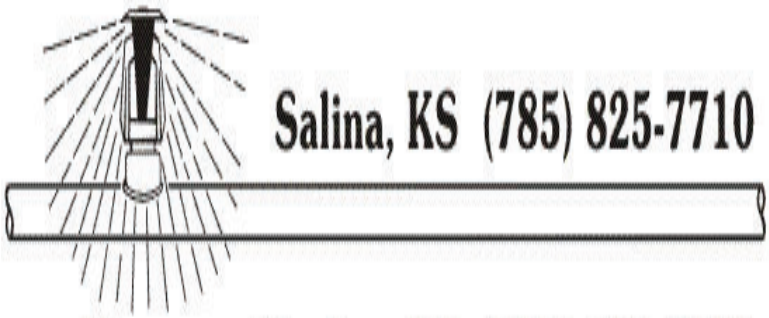
BAMFORD FIRE SPRINKLER CO., INC.



Salina, KS (785) 825-7710

Shawnee Mission, KS (913) 432-6688

Manhattan, KS (785) 532-9161

Bamford Fire Sprinkler
5134 Merriam Dr.
Shawnee Mission, KS 66203
913 432-6688

5-12-2025

Job Name	:	Douglas Station- Building 3 (A)
Drawing	:	
Location	:	NW Sloan & NE Sycamore St - Lee's Summit MO
Remote Area	:	A1
Contract	:	25M-3554
Data File	:	M3554-DOUGLASSTATION-CALC-AREAA1-2025.05.05.wxtmp

HYDRAULIC CALCULATIONS
for

JOB NAME Douglas Station - Building 3 (A)
Location NW Sloan & NE Sycamore St - Lee's Summit MO
Drawing #
Contract # 25M-3554
Date 5-5-2025

DESIGN

Remote area # A1
Remote area location Bld A, 3rd Floor, B1 Unit
Occupancy classification Residential
Density See Notes - Gpm/SqFt
Area of application See Notes - SqFt
Coverage/sprinkler See notes - SqFt
Type of sprinkler calculated Reliable F1Res44
 # Sprinklers calculated 3
In-rack demand N.A. - GPM
Hose streams N.A. - GPM
Total water required (including hose streams) 56 - GPM @ 83.1 - Psi
Type of system Wet
Volume of system (dry or pre-action) N.A. - Gal

WATER SUPPLY INFORMATION

Test date 12-30-2024
Location Sycamore St immediately N of project
Source of info Lee's Summit Water Utilties

CONTRACTOR INFO Bamford Fire Sprinkler
Address 5134 Merriam Dr. / / Shawnee Mission, KS 66203
Phone # 913 432-6688
Name of designer FEK
Authority having jurisdiction City of Lee's Summit
NOTES:
Calc all sprinks in compartment up to 4 max.
Min flow for F1Res44 sprink @ 16'x16' spacing = 16 gpm.
Min flow for F1Res44 sprink @ 16'x18' spacing = 18 gpm.

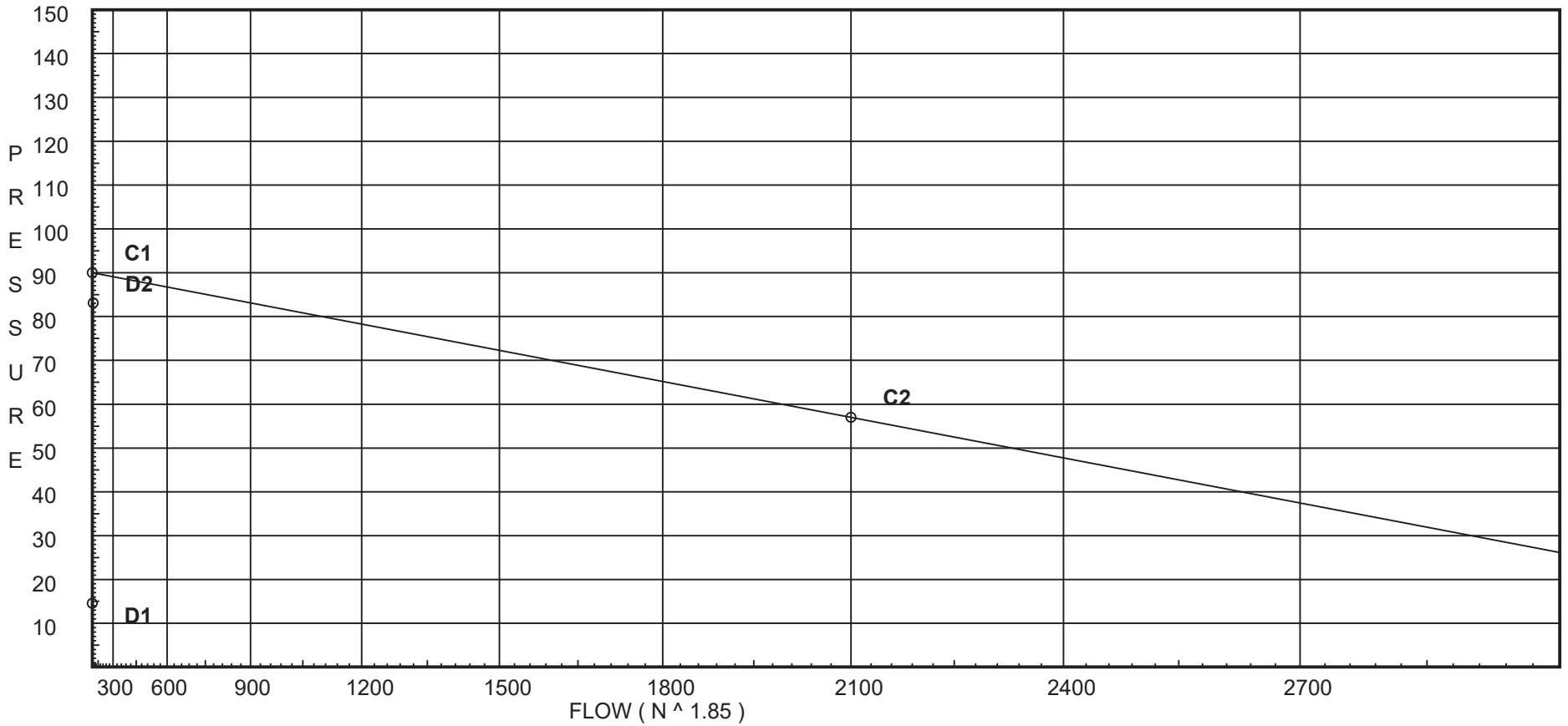
Water Supply Curve

Bamford Fire Sprinkler
Douglas Station- Building 3 (A)

Date 5-5-2025

City Water Supply:
- C1 - Static Pressure : 90
- C2 - Residual Pressure: 57
- C2 - Residual Flow : 2100

Demand:
- D1 - Elevation : 14.543
- D2 - System Flow : 56.399
- D2 - System Pressure : 83.087
- Hose (Demand) : _____
- D3 - System Demand : 56.399
- Safety Margin : 6.872



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
Ball	B Ball Milw BB-SC100			2.25	2	2.5	2.25	10													
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	1	1	1	1	1	2	2	3	4	5	6	7	8	10	11	13
N *	CPVC 90'Ell Harvel-Spears		7	7	8	9	11	12	13	0	0	0	0	0	0	0	0	0	0	0	0
O *	CPVC Tee - Branch	3	3	5	6	8	10	12	15	0	0	0	0	0	0	0	0	0	0	0	0
R *	CPVC Coupling Tee - Run	1	1	1	1	1	1	2	2	0	0	0	0	0	0	0	0	0	0	0	0
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
Zic	Wilkins 350ADA	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.

SUPPLY ANALYSIS

Node at Source	Static Pressure	Residual Pressure	Flow	Available Pressure	Total Demand	Required Pressure
TEST	90.0	57	2100.0	89.959	56.4	83.087

NODE ANALYSIS

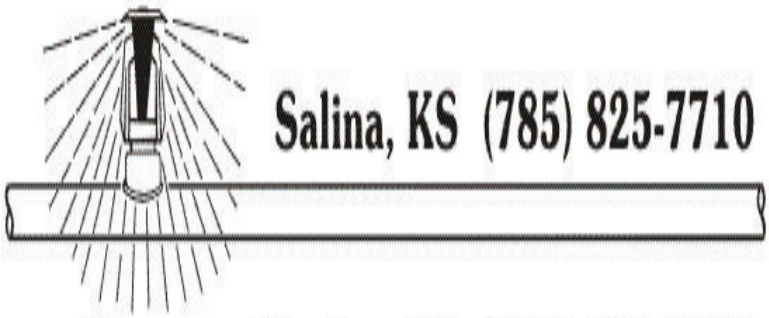
Node Tag	Elevation	Node Type	Pressure at Node	Discharge at Node	Notes	
A1A	29.83	4.4	20.26	19.8	0.1	160
301	29.83		20.92			
302	20.33		28.6			
303	20.33		36.14			
304	9.67		44.32			
305	9.67		45.26			
306	9.67		45.42			
307	1.0		52.95			
308	1.0		54.68			
309	9.67		54.05			
310	9.67		54.75			
311	1.0		63.19			
312	1.0		64.35			
TRA	6.0		66.26			
BRA	1.0		72.02			
UG3	-5.0		74.71			
UG4	-5.0		74.72			
UG5	-5.0		74.72			
UG6	-5.0		83.62			
TEST	-3.75		83.09			
A1B	29.83	4.4	16.74	18.0	0.1	180
313	29.83		17.3			
314	20.33		26.21			
315	20.33		26.5			
316	20.33		30.45			
317	9.67		43.04			
A1C	29.83	4.4	17.86	18.6	0.1	160
318	29.83		19.19			
A2A	29.83		45.32			
319	29.83		45.32			
A2B	29.83		46.02			
320	29.83		46.02			
321	20.33		50.13			
322	20.33		50.13			
323	20.33		50.13			
A2C	29.83		46.02			
324	29.33		46.23			

Node1 / to / Node2	Elev1 / Elev2	K / Fact	Qa / Qt	Nom / Act	Fitting or Eqiv	Len	Pipe Ftngs Total	CFact / Pf/Ft	Pt Pe Pf	******* Notes ******
A1A	29.830	4.40	19.80	0.75	O	3.0	0.250	150	20.255	
to							3.000		0.0	
301	29.830		19.8	0.874			3.250	0.2058	0.669	Vel = 10.59
301	29.830		0.0	0.75	2O	6.0	11.330	150	20.924	
to							6.000		4.114	
302	20.330		19.8	0.874			17.330	0.2057	3.564	Vel = 10.59
302	20.330		0.0	0.75	N	7.0	22.660	150	28.602	
to					2O	6.0	14.000		0.0	
303	20.330		19.8	0.874	R	1.0	36.660	0.2057	7.540	Vel = 10.59
303	20.330		0.0	0.75	2O	6.0	11.330	150	36.142	
to							6.000		4.617	
304	9.670		19.8	0.874			17.330	0.2056	3.563	Vel = 10.59
304	9.670		0.0	0.75	O	3.0	1.580	150	44.322	
to							3.000		0.0	
305	9.670		19.8	0.874			4.580	0.2057	0.942	Vel = 10.59
305	9.670		0.0	1.5	R	1.0	13.080	150	45.264	
to							1.000		0.0	
306	9.67		19.8	1.598			14.080	0.0109	0.154	Vel = 3.17
306	9.67		36.60	1.5	3N	27.0	23.090	150	45.418	
to							27.000		3.755	
307	1		56.4	1.598			50.090	0.0755	3.780	Vel = 9.02
307	1		0.0	2	2N	22.0	20.590	150	52.953	
to							22.000		0.0	
308	1		56.4	1.816			42.590	0.0405	1.725	Vel = 6.99
308	1		0.0	1.5	2N	18.0	22.420	150	54.678	
to					R	1.0	19.000		-3.755	
309	9.67		56.4	1.598			41.420	0.0755	3.126	Vel = 9.02
309	9.67		0.0	1.5	2R	2.0	7.250	150	54.049	
to							2.000		0.0	
310	9.67		56.4	1.598			9.250	0.0755	0.698	Vel = 9.02
310	9.67		0.0	1.5	2N	18.0	41.170	150	54.747	
to					3R	3.0	21.000		3.755	
311	1		56.4	1.598			62.170	0.0755	4.692	Vel = 9.02
311	1		0.0	2	2E	8.044	20.620	150	63.194	
to							8.044		0.0	
312	1		56.4	1.816			28.664	0.0405	1.161	Vel = 6.99
312	1		0.0	2	8N	88.0	69.990	150	64.355	
to					4R	4.0	92.000		-2.166	
TRA	6		56.4	2.003			161.990	0.0251	4.070	Vel = 5.74
TRA	6		0.0	2	Ball	2.25	5.000	120	66.259	
to					S	11.0	13.250		5.166	* * Fixed Loss = 3
BRA	1		56.4	2.067	Fsp	0.0	18.250	0.0325	0.594	Vel = 5.39
BRA	1		0.0	4	E	14.534	54.000	140	72.019	
to					F	5.813	52.321		2.599	
UG3	-5		56.4	4.1	G	2.907	106.321	0.0009	0.092	Vel = 1.37
					T	29.067				
UG3	-5		0.0	8	2F	28.468	190.000	140	74.710	
to							28.468		0.0	
UG4	-5		56.4	8.27			218.468	0	0.006	Vel = 0.34

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqiv	Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	******* Notes ******
UG4	-5		0.0	8	Eql	221.418	8.000	140	74.716	
to							221.418		0.0	
UG5	-5		56.4	8.27			229.418	0	0.007	Vel = 0.34
UG5	-5		0.0	8	Zic	0.0	6.000	120	74.723	
to									8.900	* * Fixed Loss = 8.9
UG6	-5		56.4	7.981			6.000	0	0.0	Vel = 0.36
UG6	-5		0.0	8	2F	28.468	97.000	140	83.623	
to					G	6.326	90.148		-0.541	
TEST	-3.75		56.4	8.27	T	55.354	187.148	0	0.005	Vel = 0.34
			0.0							
TEST			56.40						83.087	K Factor = 6.19
A1B	29.830	4.40	18.00	0.75	O	3.0	0.250	150	16.736	
to							3.000		0.0	
313	29.830		18.0	0.874			3.250	0.1723	0.560	Vel = 9.63
313	29.830		0.0	0.75	N	7.0	14.830	150	17.296	
to					2O	6.0	13.000		4.114	
314	20.330		18.0	0.874			27.830	0.1724	4.797	Vel = 9.63
314	20.330		0.0	0.75	R	1.0	0.670	150	26.207	
to							1.000		0.0	
315	20.330		18.0	0.874			1.670	0.1725	0.288	Vel = 9.63
315	20.330		18.60	1	O	5.0	13.000	150	26.495	
to					R	1.0	6.000		0.0	
316	20.330		36.6	1.101			19.000	0.2081	3.954	Vel = 12.33
316	20.330		0.0	1	N	7.0	15.330	150	30.449	
to					3O	15.0	23.000		4.617	
317	9.670		36.6	1.101	R	1.0	38.330	0.2081	7.975	Vel = 12.33
317	9.670		0.0	1	O	5.0	5.420	150	43.041	
to					R	1.0	6.000		0.0	
306	9.67		36.6	1.101			11.420	0.2081	2.377	Vel = 12.33
			0.0							
306			36.60						45.418	K Factor = 5.43
A1C	29.830	4.40	18.60	0.75	N	7.0	0.250	150	17.864	
to							7.000		0.0	
318	29.830		18.6	0.874			7.250	0.1830	1.327	Vel = 9.95
318	29.830		0.0	0.75	2O	6.0	11.420	150	19.191	
to							6.000		4.114	
315	20.330		18.6	0.874			17.420	0.1831	3.190	Vel = 9.95
			0.0							
315			18.60						26.495	K Factor = 3.61
A2A	29.830		0.0	0.75	N	7.0	1.580	150	45.318	
to					O	3.0	10.000		0.0	
319	29.830		0.0	0.874			11.580	0	0.0	Vel = 0
319	29.830		0.0	0.75	3O	9.0	48.900	150	45.318	
to							9.000		8.731	
309	9.67		0.0	0.874			57.900	0	0.0	Vel = 0
			0.0							
309			0.0						54.049	K Factor = 0
A2B	29.830		0.0	0.75	N	7.0	0.250	150	46.016	
to							7.000		0.0	
320	29.830		0.0	0.874			7.250	0	0.0	Vel = 0

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqiv	Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	*******	Notes	******
320	29.830		0.0	0.75	2O	6.0	16.920	150	46.016			
to							6.000		4.114			
321	20.330		0.0	0.874			22.920	0	0.0	Vel = 0		
321	20.330		0.0	0.75			5.080	150	50.130			
to									0.0			
322	20.330		0.0	0.874			5.080	0	0.0	Vel = 0		
322	20.330		0.0	1	O	5.0	6.250	150	50.130			
to							5.000		0.0			
323	20.330		0.0	1.101			11.250	0	0.0	Vel = 0		
323	20.330		0.0	1	3O	15.0	14.090	150	50.130			
to							15.000		4.617			
310	9.67		0.0	1.101			29.090	0	0.0	Vel = 0		
			0.0									
310			0.0						54.747	K Factor = 0		
A2C	29.830		0.0	0.75	2N	14.0	2.750	150	46.016			
to					O	3.0	17.000		0.217			
324	29.330		0.0	0.874			19.750	-0.0001	-0.001	Vel = 0		
324	29.330		0.0	0.75	O	3.0	10.170	150	46.232			
to							3.000		3.898			
322	20.330		0.0	0.874			13.170	0	0.0	Vel = 0		
			0.0									
322			0.0						50.130	K Factor = 0		

BAMFORD FIRE SPRINKLER CO., INC.



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Bamford Fire Sprinkler
5134 Merriam Dr.
Shawnee Mission, KS 66203
913 432-6688

Job Name	:	Douglas Station- Building 5 (C)
Drawing	:	
Location	:	NW Sloan & NE Sycamore St - Lee's Summit MO
Remote Area	:	C1
Contract	:	25M-3554
Data File	:	M3554-DOUGLASSTATION-CALC-AREAC1-2025.05.05.wxtmp

HYDRAULIC CALCULATIONS
for

JOB NAME Douglas Station - Building 5 (C)
Location NW Sloan & NE Sycamore St - Lee's Summit MO
Drawing #
Contract # 25M-3554
Date 5-5-2025

DESIGN

Remote area # C1
Remote area location Bld 5, 3rd Floor, B1 Unit
Occupancy classification Residential
Density See Notes - Gpm/SqFt
Area of application See Notes - SqFt
Coverage/sprinkler See notes - SqFt
Type of sprinkler calculated Reliable F1Res44
 # Sprinklers calculated 3
In-rack demand N.A. - GPM
Hose streams N.A. - GPM
Total water required (including hose streams) 57 - GPM @ 74.7 - Psi
Type of system Wet
Volume of system (dry or pre-action) N.A. - Gal

WATER SUPPLY INFORMATION

Test date 12-30-2024
Location Sycamore St immediately N of project
Source of info Lee's Summit Water Utilties

CONTRACTOR INFO Bamford Fire Sprinkler
Address 5134 Merriam Dr. / / Shawnee Mission, KS 66203
Phone # 913 432-6688
Name of designer FEK
Authority having jurisdiction City of Lee's Summit
NOTES:
Calc all sprinks in compartment up to 4 max.
Min flow for F1Res44 sprink @ 16'x16' spacing = 16 gpm.
Min flow for F1Res44 sprink @ 16'x18' spacing = 18 gpm.

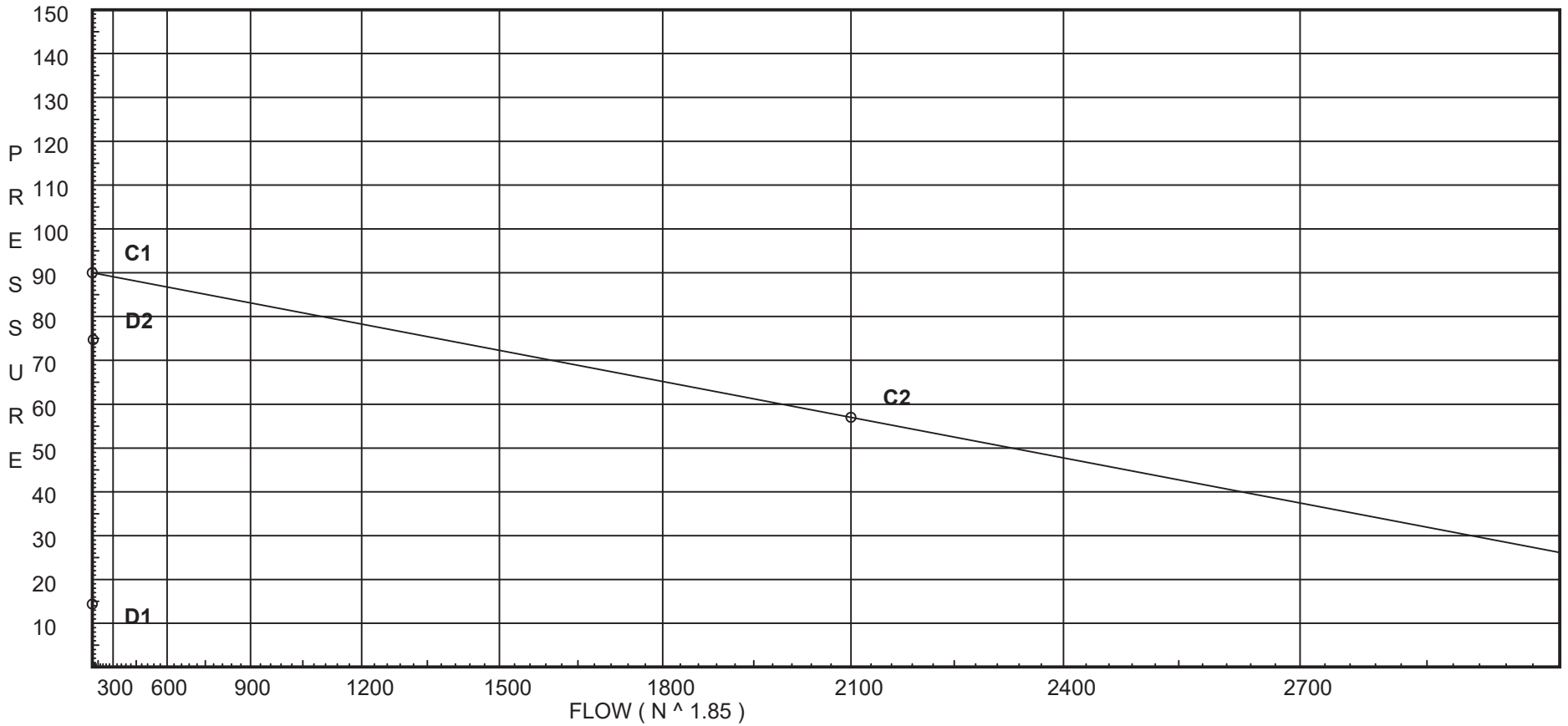
Water Supply Curve

Bamford Fire Sprinkler
Douglas Station- Building 5 (C)

Date 5-5-2025

City Water Supply:
- C1 - Static Pressure : 90
- C2 - Residual Pressure: 57
- C2 - Residual Flow : 2100

Demand:
- D1 - Elevation : 14.366
- D2 - System Flow : 57.301
- D2 - System Pressure : 74.714
- Hose (Demand) : _____
- D3 - System Demand : 57.301
- Safety Margin : 15.244



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
Ball	B Ball Milw BB-SC100			2.25	2	2.5	2.25	10													
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	1	1	1	1	1	2	2	3	4	5	6	7	8	10	11	13
N *	CPVC 90'Ell Harvel-Spears		7	7	8	9	11	12	13	0	0	0	0	0	0	0	0	0	0	0	0
O *	CPVC Tee - Branch	3	3	5	6	8	10	12	15	0	0	0	0	0	0	0	0	0	0	0	0
R *	CPVC Coupling Tee - Run	1	1	1	1	1	1	2	2	0	0	0	0	0	0	0	0	0	0	0	0
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
Zic	Wilkins 350ADA	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.

SUPPLY ANALYSIS

Node at Source	Static Pressure	Residual Pressure	Flow	Available Pressure	Total Demand	Required Pressure
TEST	90.0	57	2100.0	89.958	57.3	74.714

NODE ANALYSIS

Node Tag	Elevation	Node Type	Pressure at Node	Discharge at Node	Notes	
C1A	29.92	4.4	22.43	20.84	0.1	160
101	29.92		22.82			
102	20.37		28.51			
103	20.37		32.14			
104	9.67		40.05			
501	9.67		40.57			
105	9.67		41.2			
128	9.67		41.24			
106	9.67		42.36			
107	1.0		46.89			
108	1.0		47.47			
109	1.0		55.37			
110	1.0		55.88			
111	9.67		53.69			
TRC	6.0		58.03			
BRC	1.0		63.81			
UG1	-5.0		66.55			
UG2	-5.0		66.55			
UG3	-5.0		66.56			
UG4	-5.0		66.56			
UG5	-5.0		66.57			
UG6	-5.0		75.47			
TEST	-3.25		74.71			
C1B	29.92	4.4	16.74	18.0	0.1	180
112	29.92		17.03			
113	20.37		22.99			
114	20.37		23.08			
115	20.37		26.67			
116	9.67		35.98			
C1C	29.92	4.4	17.6	18.46	0.1	160
117	29.92		18.03			
118	1.0		46.88			
119	1.0		47.44			
126	9.67		45.54			
123	9.67		45.84			
120	1.0		55.24			
121	1.0		55.73			

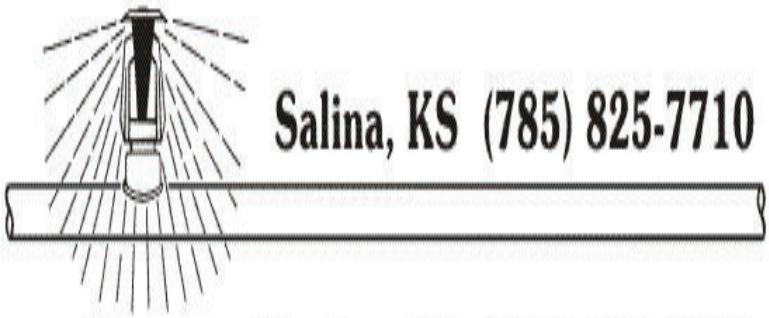
Final Calculations : Hazen-Williams

Node1 / to / Node2	Elev1 / Elev2	K / Fact	Qa / Qt	Nom / Act	Fitting or Eqiv	Len	Pipe Ftngs Total	CFact / Pf/Ft	Pt Pe Pf	******* Notes ******
C1A	29.920	4.40	20.84	1	O	5.0	0.250	150	22.434	
to							5.000		0.0	
101	29.920		20.84	1.101			5.250	0.0735	0.386	Vel = 7.02
101	29.920		0.0	1	2O	10.0	11.170	150	22.820	
to							10.000		4.136	
102	20.370		20.84	1.101			21.170	0.0734	1.554	Vel = 7.02
102	20.370		0.0	1	2N	14.0	28.420	150	28.510	
to					O	5.0	21.000		0.0	
103	20.370		20.84	1.101	2R	2.0	49.420	0.0734	3.629	Vel = 7.02
103	20.370		0.0	1	N	7.0	20.580	150	32.139	
to					3O	15.0	24.000		4.634	
104	9.670		20.84	1.101	2R	2.0	44.580	0.0734	3.273	Vel = 7.02
104	9.670		0.0	1.25	N	8.0	11.580	150	40.046	
to					3R	3.0	11.000		0.0	
501	9.670		20.84	1.394			22.580	0.0233	0.526	Vel = 4.38
501	9.670		0.0	1.25	N	8.0	16.920	150	40.572	
to					2R	2.0	10.000		0.0	
105	9.670		20.84	1.394			26.920	0.0233	0.626	Vel = 4.38
105	9.670		0.0	1.25	R	1.0	0.670	150	41.198	
to							1.000		0.0	
128	9.670		20.84	1.394			1.670	0.0234	0.039	Vel = 4.38
128	9.670		36.46	1.25	O	6.0	1.420	150	41.237	
to							6.000		0.0	
106	9.67		57.3	1.394			7.420	0.1512	1.122	Vel = 12.05
106	9.67		-28.55	1.25	N	8.0	10.330	150	42.359	
to							8.000		3.755	
107	1		28.75	1.394			18.330	0.0422	0.773	Vel = 6.04
107	1		0.0	2	2N	22.0	28.375	150	46.887	
to							22.000		0.0	
108	1		28.75	1.816			50.375	0.0117	0.587	Vel = 3.56
108	1		0.0	1.25	6N	48.0	127.170	150	47.474	
to					12R	12.0	60.000		0.0	
109	1		28.75	1.394			187.170	0.0422	7.897	Vel = 6.04
109	1		0.0	2	2N	22.0	21.500	150	55.371	
to							22.000		0.0	
110	1		28.75	1.816			43.500	0.0116	0.506	Vel = 3.56
110	1		0.0	1.25	2N	16.0	15.170	150	55.877	
to					O	6.0	22.000		-3.755	
111	9.67		28.75	1.394			37.170	0.0422	1.569	Vel = 6.04
111	9.67		28.55	2	5N	55.0	47.330	150	53.691	
to					4R	4.0	59.000		1.589	
TRC	6		57.3	2.003			106.330	0.0259	2.751	Vel = 5.83
TRC	6		0.0	2	Fsp	0.0	5.000	120	58.031	
to					Ball	2.25	13.250		5.166	* * Fixed Loss = 3
BRC	1		57.3	2.067	S	11.0	18.250	0.0335	0.611	Vel = 5.48
BRC	1		0.0	4	2E	29.067	96.000	140	63.808	
to					G	2.907	61.041		2.599	
UG1	-5		57.3	4.1	T	29.067	157.041	0.0009	0.141	Vel = 1.39

Node1 / to / Node2	Elev1 / Elev2	K / Fact	Qa / Qt	Nom / Act	Fitting or Eqiv	Len	Pipe Ftngs Total	CFact / Pf/Ft	Pt / Pe / Pf	******* Notes ******
UG1	-5		0.0	8			76.000	140	66.548	
to									0.0	
UG2	-5		57.3	8.27			76.000	0	0.002	Vel = 0.34
UG2	-5		0.0	8	2F	28.468	218.000	140	66.550	
to							28.468		0.0	
UG3	-5		57.3	8.27			246.468	0	0.008	Vel = 0.34
UG3	-5		0.0	8	2F	28.468	190.000	140	66.558	
to							28.468		0.0	
UG4	-5		57.3	8.27			218.468	0	0.006	Vel = 0.34
UG4	-5		0.0	8	Eql	221.418	8.000	140	66.564	
to							221.418		0.0	
UG5	-5		57.3	8.27			229.418	0	0.007	Vel = 0.34
UG5	-5		0.0	8	Zic	0.0	6.000	120	66.571	
to									8.896	* * Fixed Loss = 8.896
UG6	-5		57.3	7.981			6.000	0	0.0	Vel = 0.37
UG6	-5		0.0	8	2F	28.468	97.000	140	75.467	
to					G	6.326	90.148		-0.758	
TEST	-3.25		57.3	8.27	T	55.354	187.148	0	0.005	Vel = 0.34
			0.0							
TEST			57.30						74.714	K Factor = 6.63
C1B	29.920	4.40	18.00	1	O	5.0	0.250	150	16.736	
to							5.000		0.0	
112	29.920		18.0	1.101			5.250	0.0560	0.294	Vel = 6.07
112	29.920		0.0	1	N	7.0	15.590	150	17.030	
to					2O	10.0	17.000		4.136	
113	20.370		18.0	1.101			32.590	0.0560	1.824	Vel = 6.07
113	20.370		0.0	1	R	1.0	0.670	150	22.990	
to							1.000		0.0	
114	20.370		18.0	1.101			1.670	0.0563	0.094	Vel = 6.07
114	20.370		18.46	1	O	5.0	12.330	150	23.084	
to							5.000		0.0	
115	20.370		36.46	1.101			17.330	0.2066	3.581	Vel = 12.29
115	20.370		0.0	1	N	7.0	10.670	150	26.665	
to					O	5.0	12.000		4.634	
116	9.670		36.46	1.101			22.670	0.2067	4.685	Vel = 12.29
116	9.670		0.0	1	2N	14.0	6.420	150	35.984	
to					O	5.0	19.000		0.0	
128	9.670		36.46	1.101			25.420	0.2066	5.253	Vel = 12.29
			0.0							
128			36.46						41.237	K Factor = 5.68
C1C	29.920	4.40	18.46	1	N	7.0	0.250	150	17.603	
to							7.000		0.0	
117	29.920		18.46	1.101			7.250	0.0586	0.425	Vel = 6.22
117	29.920		0.0	1	O	5.0	10.670	150	18.028	
to							5.000		4.136	
114	20.370		18.46	1.101			15.670	0.0587	0.920	Vel = 6.22
			0.0							
114			18.46						23.084	K Factor = 3.84

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqiv	Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	*******	Notes	******
106	9.67		28.55	1.25	N	8.0	10.330	150	42.359			
to							8.000		3.755			
118	1		28.55	1.394			18.330	0.0416	0.763	Vel = 6.00		
118	1		0.0	2	2N	22.0	27.290	150	46.877			
to							22.000		0.0			
119	1		28.55	1.816			49.290	0.0115	0.567	Vel = 3.54		
119	1		0.0	1.25	3N	24.0	18.330	150	47.444			
to					2R	2.0	26.000		-3.755			
126	9.670		28.55	1.394			44.330	0.0417	1.847	Vel = 6.00		
126	9.670		0.0	1.25	R	1.0	6.250	150	45.536			
to							1.000		0.0			
123	9.670		28.55	1.394			7.250	0.0417	0.302	Vel = 6.00		
123	9.670		0.0	1.25	3N	24.0	102.590	150	45.838			
to					9R	9.0	33.000		3.755			
120	1		28.55	1.394			135.590	0.0417	5.649	Vel = 6.00		
120	1		0.0	2	2N	22.0	20.500	150	55.242			
to							22.000		0.0			
121	1		28.55	1.816			42.500	0.0115	0.488	Vel = 3.54		
121	1		0.0	1.25	2N	16.0	19.170	150	55.730			
to					O	6.0	22.000		-3.755			
111	9.67		28.55	1.394			41.170	0.0417	1.716	Vel = 6.00		
			0.0									
111			28.55						53.691	K Factor = 3.90		

BAMFORD FIRE SPRINKLER CO., INC.



Salina, KS (785) 825-7710

Shawnee Mission, KS (913) 432-6688

Manhattan, KS (785) 532-9161

Bamford Fire Sprinkler
5134 Merriam Dr.
Shawnee Mission, KS 66203
913 432-6688

Job Name	:	Douglas Station- Building 5 (C)
Drawing	:	
Location	:	NW Sloan & NE Sycamore St - Lee's Summit MO
Remote Area	:	C2
Contract	:	25M-3554
Data File	:	M3554-DOUGLASSTATION-CALC-AREAC2-2025.05.05.wxtmp

HYDRAULIC CALCULATIONS
for

JOB NAME Douglas Station - Building 5 (C)
Location NW Sloan & NE Sycamore St - Lee's Summit MO
Drawing #
Contract # 25M-3554
Date 5-5-2025

DESIGN

Remote area # C2
Remote area location Bld 5, 3rd Floor, A2 Unit
Occupancy classification Residential
Density See Notes - Gpm/SqFt
Area of application See Notes - SqFt
Coverage/sprinkler 16' x 16' - SqFt
Type of sprinkler calculated Reliable F1Res44
 # Sprinklers calculated 3
In-rack demand N.A. - GPM
Hose streams N.A. - GPM
Total water required (including hose streams) 50 - GPM @ 58.7 - Psi
Type of system Wet
Volume of system (dry or pre-action) N.A. - Gal

WATER SUPPLY INFORMATION

Test date 12-30-2024
Location Sycamore St immediately N of project
Source of info Lee's Summit Water Utilties

CONTRACTOR INFO Bamford Fire Sprinkler
Address 5134 Merriam Dr. / / Shawnee Mission, KS 66203
Phone # 913 432-6688
Name of designer FEK
Authority having jurisdiction City of Lee's Summit
NOTES:
Calc all sprinks in compartment up to 4 max.
Min flow for F1Res44 sprink @ 16'x16' spacing = 16 gpm.

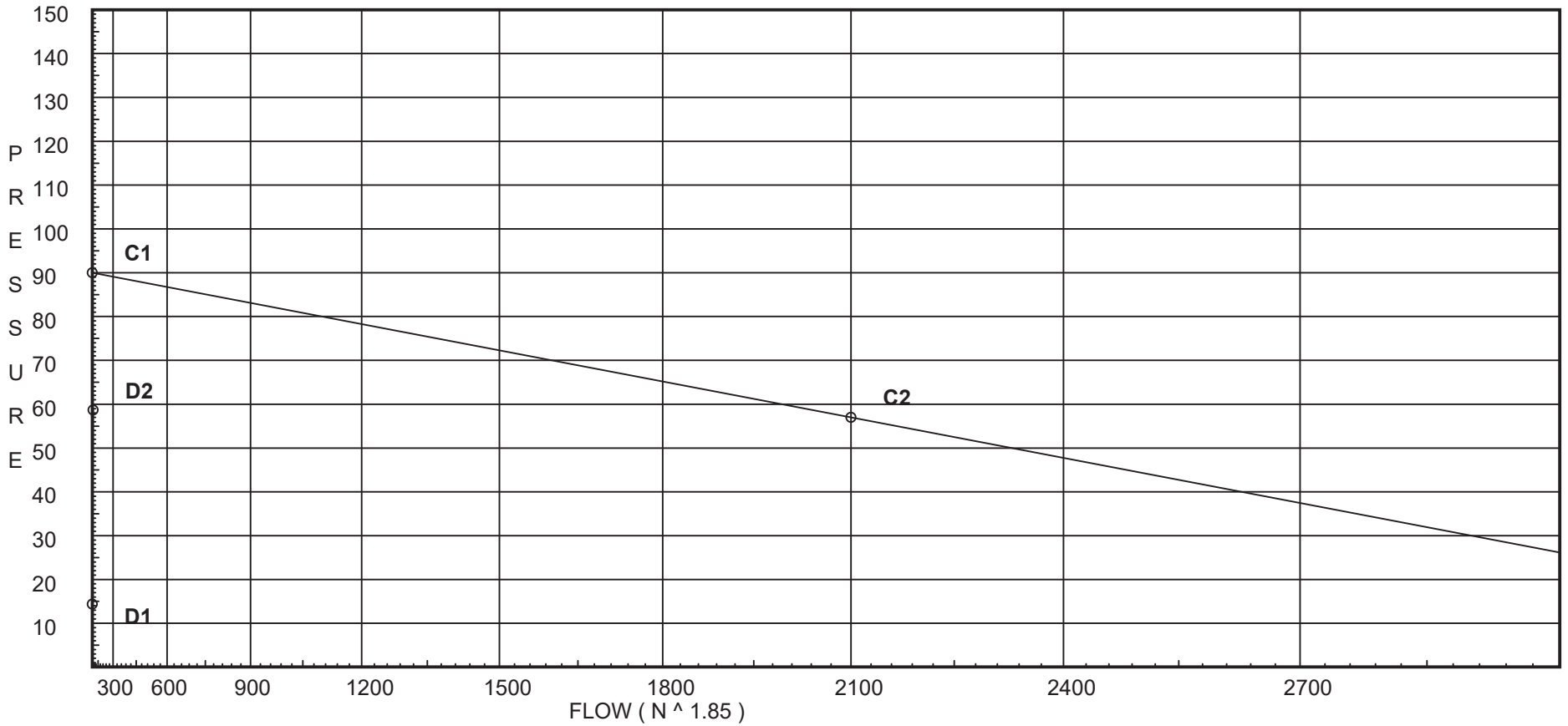
Water Supply Curve

Bamford Fire Sprinkler
Douglas Station- Building 5 (C)

Date 5-5-2025

City Water Supply:
- C1 - Static Pressure : 90
- C2 - Residual Pressure: 57
- C2 - Residual Flow : 2100

Demand:
- D1 - Elevation : 14.366
- D2 - System Flow : 50.397
- D2 - System Pressure : 58.679
- Hose (Demand) : _____
- D3 - System Demand : 50.397
- Safety Margin : 31.287



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
Ball	B Ball Milw BB-SC100			2.25	2	2.5	2.25	10													
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	1	1	1	1	1	2	2	3	4	5	6	7	8	10	11	13
N *	CPVC 90'Ell Harvel-Spears		7	7	8	9	11	12	13	0	0	0	0	0	0	0	0	0	0	0	0
O *	CPVC Tee - Branch	3	3	5	6	8	10	12	15	0	0	0	0	0	0	0	0	0	0	0	0
R *	CPVC Coupling Tee - Run	1	1	1	1	1	1	2	2	0	0	0	0	0	0	0	0	0	0	0	0
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
Zic	Wilkins 350ADA	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.

SUPPLY ANALYSIS

Node at Source	Static Pressure	Residual Pressure	Flow	Available Pressure	Total Demand	Required Pressure
TEST	90.0	57	2100.0	89.967	50.4	58.679

NODE ANALYSIS

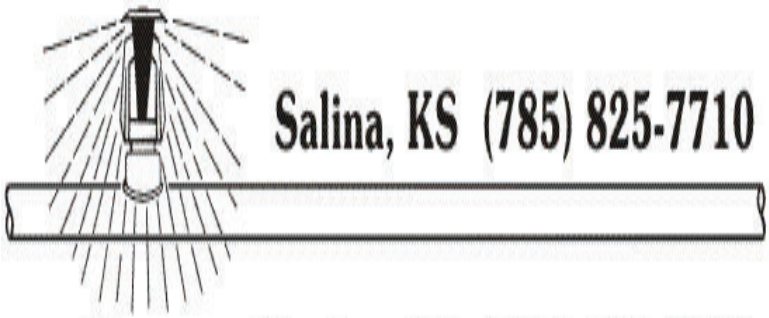
Node Tag	Elevation	Node Type	Pressure at Node	Discharge at Node	Notes	
C2A	29.92	4.4	17.34	18.32	0.1	160
122	29.92		18.13			
123	9.67		30.07			
120	1.0		39.8			
121	1.0		40.31			
111	9.67		38.37			
TRC	6.0		42.13			
BRC	1.0		47.78			
UG1	-5.0		50.49			
UG2	-5.0		50.49			
UG3	-5.0		50.49			
UG4	-5.0		50.5			
UG5	-5.0		50.5			
UG6	-5.0		59.43			
TEST	-3.25		58.68			
126	9.67		30.02			
119	1.0		34.82			
118	1.0		35.09			
106	9.67		31.98			
107	1.0		36.28			
108	1.0		36.56			
109	1.0		40.97			
110	1.0		41.25			
C2B	29.92	4.4	13.35	16.07	0.1	160
124	29.92		13.68			
125	20.37		19.35			
C2C	29.92	4.4	13.22	16.0	0.1	160
127	28.92		14.65			

Final Calculations : Hazen-Williams

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqiv	Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	******* Notes ******
C2A	29.920	4.40	18.32	1	N	7.0	1.580	150	17.342	
to					O	5.0	12.000		0.0	
122	29.920		18.32	1.101			13.580	0.0578	0.785	Vel = 6.17
122	29.920		0.0	1	3O	15.0	36.830	150	18.127	
to					3R	3.0	18.000		8.770	
123	9.670		18.32	1.101			54.830	0.0579	3.173	Vel = 6.17
123	9.670		11.10	1.25	3N	24.0	102.590	150	30.070	
to					9R	9.0	33.000		3.755	
120	1		29.42	1.394			135.590	0.0440	5.971	Vel = 6.18
120	1		0.0	2	2N	22.0	20.500	150	39.796	
to							22.000		0.0	
121	1		29.42	1.816			42.500	0.0121	0.516	Vel = 3.64
121	1		0.0	1.25	2N	16.0	19.170	150	40.312	
to					O	6.0	22.000		-3.755	
111	9.67		29.42	1.394			41.170	0.0440	1.813	Vel = 6.18
111	9.67		20.98	2	5N	55.0	47.330	150	38.370	
to					4R	4.0	59.000		1.589	
TRC	6		50.4	2.003			106.330	0.0204	2.170	Vel = 5.13
TRC	6		0.0	2	Fsp	0.0	5.000	120	42.129	
to					Ball	2.25	13.250		5.166	* * Fixed Loss = 3
BRC	1		50.4	2.067	S	11.0	18.250	0.0264	0.482	Vel = 4.82
BRC	1		0.0	4	2E	29.067	96.000	140	47.777	
to					G	2.907	61.041		2.599	
UG1	-5		50.4	4.1	T	29.067	157.041	0.0007	0.111	Vel = 1.22
UG1	-5		0.0	8			76.000	140	50.487	
to									0.0	
UG2	-5		50.4	8.27			76.000	0	0.001	Vel = 0.30
UG2	-5		0.0	8	2F	28.468	218.000	140	50.488	
to							28.468		0.0	
UG3	-5		50.4	8.27			246.468	0	0.006	Vel = 0.30
UG3	-5		0.0	8	2F	28.468	190.000	140	50.494	
to							28.468		0.0	
UG4	-5		50.4	8.27			218.468	0	0.005	Vel = 0.30
UG4	-5		0.0	8	Eql	221.418	8.000	140	50.499	
to							221.418		0.0	
UG5	-5		50.4	8.27			229.418	0	0.006	Vel = 0.30
UG5	-5		0.0	8	Zic	0.0	6.000	120	50.505	
to									8.928	* * Fixed Loss = 8.928
UG6	-5		50.4	7.981			6.000	0	0.0	Vel = 0.32
UG6	-5		0.0	8	2F	28.468	97.000	140	59.433	
to					G	6.326	90.148		-0.758	
TEST	-3.25		50.4	8.27	T	55.354	187.148	0	0.004	Vel = 0.30
			0.0							
TEST			50.40						58.679	K Factor = 6.58
123	9.670		-11.10	1.25	R	1.0	6.250	150	30.070	
to							1.000		0.0	
126	9.670		-11.1	1.394			7.250	-0.0072	-0.052	Vel = 2.33
126	9.670		32.08	1.25	3N	24.0	18.330	150	30.018	
to					2R	2.0	26.000		3.755	
119	1		20.98	1.394			44.330	0.0236	1.044	Vel = 4.41

Node1 / to / Node2	Elev1 / Elev2	K / Fact	Qa / Qt	Nom / Act	Fitting or Eqiv	Len	Pipe Ftngs Total	CFact / Pf/Ft	Pt Pe Pf	******* Notes ******
119	1		0.0	2	2N	22.0	20.500	150	34.817	
to							22.000		0.0	
118	1		20.98	1.816			42.500	0.0065	0.276	Vel = 2.60
118	1		0.0	1.25	N	8.0	19.330	150	35.093	
to							8.000		-3.755	
106	9.67		20.98	1.394			27.330	0.0236	0.644	Vel = 4.41
106	9.67		0.0	1.25	N	8.0	15.170	150	31.982	
to							8.000		3.755	
107	1		20.98	1.394			23.170	0.0235	0.545	Vel = 4.41
107	1		0.0	2	2N	22.0	20.500	150	36.282	
to							22.000		0.0	
108	1		20.98	1.816			42.500	0.0065	0.277	Vel = 2.60
108	1		0.0	1.25	6N	48.0	127.170	150	36.559	
to					12R	12.0	60.000		0.0	
109	1		20.98	1.394			187.170	0.0236	4.408	Vel = 4.41
109	1		0.0	2	2N	22.0	21.500	150	40.967	
to							22.000		0.0	
110	1		20.98	1.816			43.500	0.0065	0.283	Vel = 2.60
110	1		0.0	1.25	2N	16.0	15.170	150	41.250	
to					O	6.0	22.000		-3.755	
111	9.67		20.98	1.394			37.170	0.0235	0.875	Vel = 4.41
			0.0							
111			20.98						38.370	K Factor = 3.39
C2B	29.920	4.40	16.07	1	N	7.0	0.250	150	13.346	
to							7.000		0.0	
124	29.920		16.07	1.101			7.250	0.0454	0.329	Vel = 5.42
124	29.920		0.0	1	N	7.0	16.920	150	13.675	
to					2O	10.0	17.000		4.136	
125	20.370		16.07	1.101			33.920	0.0454	1.541	Vel = 5.42
125	20.370		16.00	1	N	7.0	14.000	150	19.352	
to					3O	15.0	23.000		4.634	
126	9.670		32.07	1.101	R	1.0	37.000	0.1630	6.032	Vel = 10.81
			0.0							
126			32.07						30.018	K Factor = 5.85
C2C	29.920	4.40	16.00	1	2N	14.0	3.000	150	13.223	
to					O	5.0	19.000		0.433	
127	28.920		16.0	1.101			22.000	0.0450	0.991	Vel = 5.39
127	28.920		0.0	1	O	5.0	15.250	150	14.647	
to					2R	2.0	7.000		3.703	
125	20.370		16.0	1.101			22.250	0.0450	1.002	Vel = 5.39
			0.0							
125			16.00						19.352	K Factor = 3.64

BAMFORD FIRE SPRINKLER CO., INC.



Salina, KS (785) 825-7710

Shawnee Mission, KS (913) 432-6688

Manhattan, KS (785) 532-9161

Bamford Fire Sprinkler
5134 Merriam Dr.
Shawnee Mission, KS 66203
913 432-6688

Job Name	:	Douglas Station- Building 5 (C)
Drawing	:	
Location	:	NW Sloan & NE Sycamore St - Lee's Summit MO
Remote Area	:	CH1
Contract	:	25M-3554
Data File	:	M3554-DOUGLASSTATION-CALC-AREACH1-2025.05.05.wxtmp

HYDRAULIC CALCULATIONS
for

JOB NAME Douglas Station - Building 5 (C)
Location NW Sloan & NE Sycamore St - Lee's Summit MO
Drawing #
Contract # 25M-3554
Date 5-5-2025

DESIGN

Remote area # CH1
Remote area location Bld 5, Clubhouse
Occupancy classification Residential
Density See Notes - Gpm/SqFt
Area of application See Notes - SqFt
Coverage/sprinkler 16' x 16' - SqFt
Type of sprinkler calculated Reliable F1Res49
 # Sprinklers calculated 4
In-rack demand N.A. - GPM
Hose streams N.A. - GPM
Total water required (including hose streams) 59 - GPM @ 50.4 - Psi
Type of system Wet
Volume of system (dry or pre-action) N.A. - Gal

WATER SUPPLY INFORMATION

Test date 12-30-2024
Location Sycamore St immediately N of project
Source of info Lee's Summit Water Utilties

CONTRACTOR INFO Bamford Fire Sprinkler
Address 5134 Merriam Dr. / / Shawnee Mission, KS 66203
Phone # 913 432-6688
Name of designer FEK
Authority having jurisdiction City of Lee's Summit
NOTES:
Calc all sprinks in compartment up to 4 max.
Min flow for F1Res49 sprink @ 16'x16' spacing = 13 gpm.

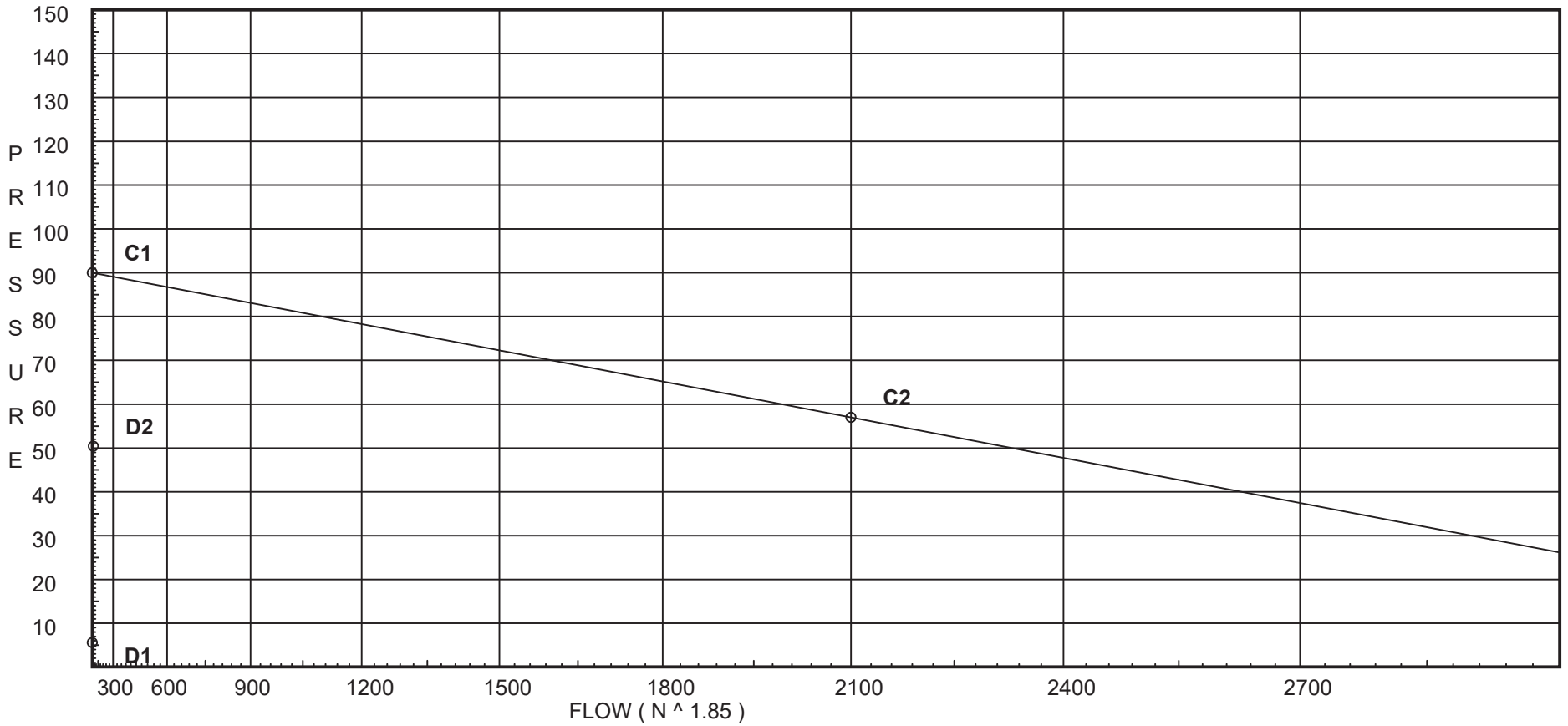
Water Supply Curve

Bamford Fire Sprinkler
Douglas Station- Building 5 (C)

Date 5-5-2025

City Water Supply:
- C1 - Static Pressure : 90
- C2 - Residual Pressure: 57
- C2 - Residual Flow : 2100

Demand:
- D1 - Elevation : 5.596
- D2 - System Flow : 58.765
- D2 - System Pressure : 50.403
- Hose (Demand) : _____
- D3 - System Demand : 58.765
- Safety Margin : 39.553



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
Ball	B Ball Milw BB-SC100			2.25	2	2.5	2.25	10													
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	1	1	1	1	1	2	2	3	4	5	6	7	8	10	11	13
N *	CPVC 90'Ell Harvel-Spears		7	7	8	9	11	12	13	0	0	0	0	0	0	0	0	0	0	0	0
O *	CPVC Tee - Branch	3	3	5	6	8	10	12	15	0	0	0	0	0	0	0	0	0	0	0	0
R *	CPVC Coupling Tee - Run	1	1	1	1	1	1	2	2	0	0	0	0	0	0	0	0	0	0	0	0
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
Zic	Wilkins 350ADA	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.

SUPPLY ANALYSIS

Node at Source	Static Pressure	Residual Pressure	Flow	Available Pressure	Total Demand	Required Pressure
TEST	90.0	57	2100.0	89.956	58.76	50.403

NODE ANALYSIS

Node Tag	Elevation	Node Type	Pressure at Node	Discharge at Node	Notes
DP01	9.0	4.9	7.04	13.0	0.05 260
EQ01	9.67		6.92		
DP02	8.0	4.9	7.04	13.0	0.05 260
EQ02	9.67		6.52		
CH1	9.67	4.94	6.92	13.0	K=K @ EQ01
CH2	9.67	4.94	7.32	13.37	K=K @ EQ01
CH3	9.67	5.09	8.61	14.94	K=K @ EQ02
501	9.67		13.68		
105	9.67		15.9		
128	9.67		16.17		
106	9.67		17.34		
107	1.0		21.91		
108	1.0		22.52		
109	1.0		30.8		
110	1.0		31.33		
111	9.67		29.22		
TRC	6.0		33.69		
BRC	1.0		39.5		
UG1	-5.0		42.24		
UG2	-5.0		42.24		
UG3	-5.0		42.25		
UG4	-5.0		42.26		
UG5	-5.0		42.27		
UG6	-5.0		51.16		
TEST	-3.25		50.4		
CH4	9.67	4.94	12.49	17.46	K=K @ EQ01
503	9.67		13.09		
118	1.0		21.9		
119	1.0		22.49		
126	9.67		20.67		
123	9.67		20.99		
120	1.0		30.66		
121	1.0		31.18		

Final Calculations : Hazen-Williams

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqiv	Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	******* Notes ******
DP01	9	4.90	13.00	1	O	5.0	0.670	150	7.039	
to							5.000		-0.290	
EQ01	9.67		13.0	1.101			5.670	0.0305	0.173	Vel = 4.38
			0.0							
EQ01			13.00						6.922	K Factor = 4.94
DP02	8	4.90	13.00	1	O	5.0	1.670	150	7.039	
to							5.000		-0.723	
EQ02	9.67		13.0	1.101			6.670	0.0306	0.204	Vel = 4.38
			0.0							
EQ02			13.00						6.520	K Factor = 5.09
CH1	9.67	4.94	13.00	1	2R	2.0	11.000	150	6.922	K = K @ EQ01
to							2.000		0.0	
CH2	9.67		13.0	1.101			13.000	0.0307	0.399	Vel = 4.38
CH2	9.67	4.94	13.37	1	R	1.0	10.330	150	7.321	K = K @ EQ01
to							1.000		0.0	
CH3	9.67		26.37	1.101			11.330	0.1135	1.286	Vel = 8.89
CH3	9.67	5.09	14.94	1	N	7.0	7.500	150	8.607	K = K @ EQ02
to					O	5.0	12.000		0.0	
501	9.67		41.31	1.101			19.500	0.2603	5.076	Vel = 13.92
501	9.67		0.0	1.25	N	8.0	16.930	150	13.683	
to					2R	2.0	10.000		0.0	
105	9.670		41.31	1.394			26.930	0.0825	2.221	Vel = 8.68
105	9.670		17.45	1.25	R	1.0	0.670	150	15.904	
to							1.000		0.0	
128	9.670		58.76	1.394			1.670	0.1587	0.265	Vel = 12.35
128	9.670		0.0	1.25	O	6.0	1.420	150	16.169	
to							6.000		0.0	
106	9.67		58.76	1.394			7.420	0.1584	1.175	Vel = 12.35
106	9.67		-29.28	1.25	N	8.0	10.330	150	17.344	
to							8.000		3.755	
107	1		29.48	1.394			18.330	0.0442	0.810	Vel = 6.20
107	1		0.0	2	2N	22.0	28.420	150	21.909	
to							22.000		0.0	
108	1		29.48	1.816			50.420	0.0122	0.615	Vel = 3.65
108	1		0.0	1.25	6N	48.0	127.170	150	22.524	
to					12R	12.0	60.000		0.0	
109	1		29.48	1.394			187.170	0.0442	8.275	Vel = 6.20
109	1		0.0	2	2N	22.0	21.500	150	30.799	
to							22.000		0.0	
110	1		29.48	1.816			43.500	0.0122	0.530	Vel = 3.65
110	1		0.0	1.25	2N	16.0	15.170	150	31.329	
to					O	6.0	22.000		-3.755	
111	9.67		29.48	1.394			37.170	0.0442	1.643	Vel = 6.20
111	9.67		29.28	2	5N	55.0	47.330	150	29.217	
to					4R	4.0	59.000		1.589	
TRC	6		58.76	2.003			106.330	0.0271	2.883	Vel = 5.98
TRC	6		0.0	2	Fsp	0.0	5.000	120	33.689	
to					Ball	2.25	13.250		5.166	* * Fixed Loss = 3
BRC	1		58.76	2.067	S	11.0	18.250	0.0351	0.641	Vel = 5.62

Node1 / to / Node2	Elev1 / Elev2	K / Fact	Qa / Qt	Nom / Act	Fitting or Eqiv	Len	Pipe Ftngs Total	CFact / Pf/Ft	Pt Pe Pf	******* Notes ******
BRC	1		0.0	4	2E	29.067	96.000	140	39.496	
to					G	2.907	61.041		2.599	
UG1	-5		58.76	4.1	T	29.067	157.041	0.0009	0.147	Vel = 1.43
UG1	-5		0.0	8			76.000	140	42.242	
to									0.0	
UG2	-5		58.76	8.27			76.000	0	0.002	Vel = 0.35
UG2	-5		0.0	8	2F	28.468	218.000	140	42.244	
to							28.468		0.0	
UG3	-5		58.76	8.27			246.468	0	0.008	Vel = 0.35
UG3	-5		0.0	8	2F	28.468	190.000	140	42.252	
to							28.468		0.0	
UG4	-5		58.76	8.27			218.468	0	0.007	Vel = 0.35
UG4	-5		0.0	8	Eql	221.418	8.000	140	42.259	
to							221.418		0.0	
UG5	-5		58.76	8.27			229.418	0	0.007	Vel = 0.35
UG5	-5		0.0	8	Zic	0.0	6.000	120	42.266	
to									8.889	* * Fixed Loss = 8.889
UG6	-5		58.76	7.981			6.000	0	0.0	Vel = 0.38
UG6	-5		0.0	8	2F	28.468	97.000	140	51.155	
to					G	6.326	90.148		-0.758	
TEST	-3.25		58.76	8.27	T	55.354	187.148	0	0.006	Vel = 0.35
			0.0							
TEST			58.76						50.403	K Factor = 8.28
CH4	9.67	4.94	17.46	1	R	1.0	10.330	150	12.486	K = K @ EQ01
to							1.000		0.0	
503	9.67		17.46	1.101			11.330	0.0530	0.600	Vel = 5.88
503	9.67		0.0	1	5N	35.0	12.250	150	13.086	
to					O	5.0	41.000		0.0	
105	9.670		17.46	1.101	R	1.0	53.250	0.0529	2.818	Vel = 5.88
			0.0							
105			17.46						15.904	K Factor = 4.38
106	9.67		29.28	1.25	N	8.0	10.330	150	17.344	
to							8.000		3.755	
118	1		29.28	1.394			18.330	0.0436	0.800	Vel = 6.16
118	1		0.0	2	2N	22.0	27.300	150	21.899	
to							22.000		0.0	
119	1		29.28	1.816			49.300	0.0120	0.594	Vel = 3.63
119	1		0.0	1.25	3N	24.0	18.330	150	22.493	
to					2R	2.0	26.000		-3.755	
126	9.670		29.28	1.394			44.330	0.0436	1.935	Vel = 6.16
126	9.670		0.0	1.25	R	1.0	6.250	150	20.673	
to							1.000		0.0	
123	9.670		29.28	1.394			7.250	0.0436	0.316	Vel = 6.16
123	9.670		0.0	1.25	3N	24.0	102.590	150	20.989	
to					9R	9.0	33.000		3.755	
120	1		29.28	1.394			135.590	0.0437	5.919	Vel = 6.16
120	1		0.0	2	2N	22.0	20.500	150	30.663	
to							22.000		0.0	
121	1		29.28	1.816			42.500	0.0120	0.512	Vel = 3.63

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqiv	Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	*******	Notes	******
121 to 111	1 9.67		0.0 29.28	1.25 1.394	2N O	16.0 6.0	19.170 22.000 41.170	150 0.0436	31.175 -3.755 1.797	Vel = 6.16		
			0.0									
111			29.28						29.217	K Factor = 5.42		