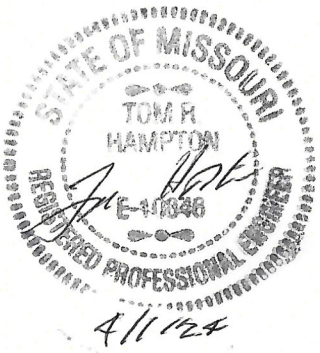


Hydraulic Calculations For:

Streets of West Pryor
Lot 13
1020 NW Pryor Road
Lees Summit, Missouri

Hydraulic Calculated Areas

Area #1: SHELL SPACE TENANT G

Aegis Fire Protection, LLC 13415 W 98th St Lenexa, KS 66215
Phone: 913-825-0343

HYDRAULIC CALCULATIONS
for

JOB NAME STREETS OF WEST PRYOR LOT 13 CALCULATION
Location 1020 NW PRYOR ROAD LEES SUMMIT, MISSOURI
Drawing # FP1
Contract # DPC-19187-140
Date 03/19/2024

DESIGN
Remote area # DESIGN AREA-1
Remote area location SHELL SPACE TENANT G
Occupancy classification ORDINARY HAZARD GROUP II
Density 0.2 - Gpm/SqFt
Area of application 1500 - SqFt
Coverage/sprinkler 120 - SqFt
Type of sprinkler calculated STANDARD COVERAGE QUICK RESPONSE
 # Sprinklers calculated 15
In-rack demand - GPM
Hose streams 250 - GPM
Total water required (including hose streams) 634.081 - GPM @ 56.6691 - Psi
Type of system WET
Volume of system (dry or pre-action) N/A - Gal

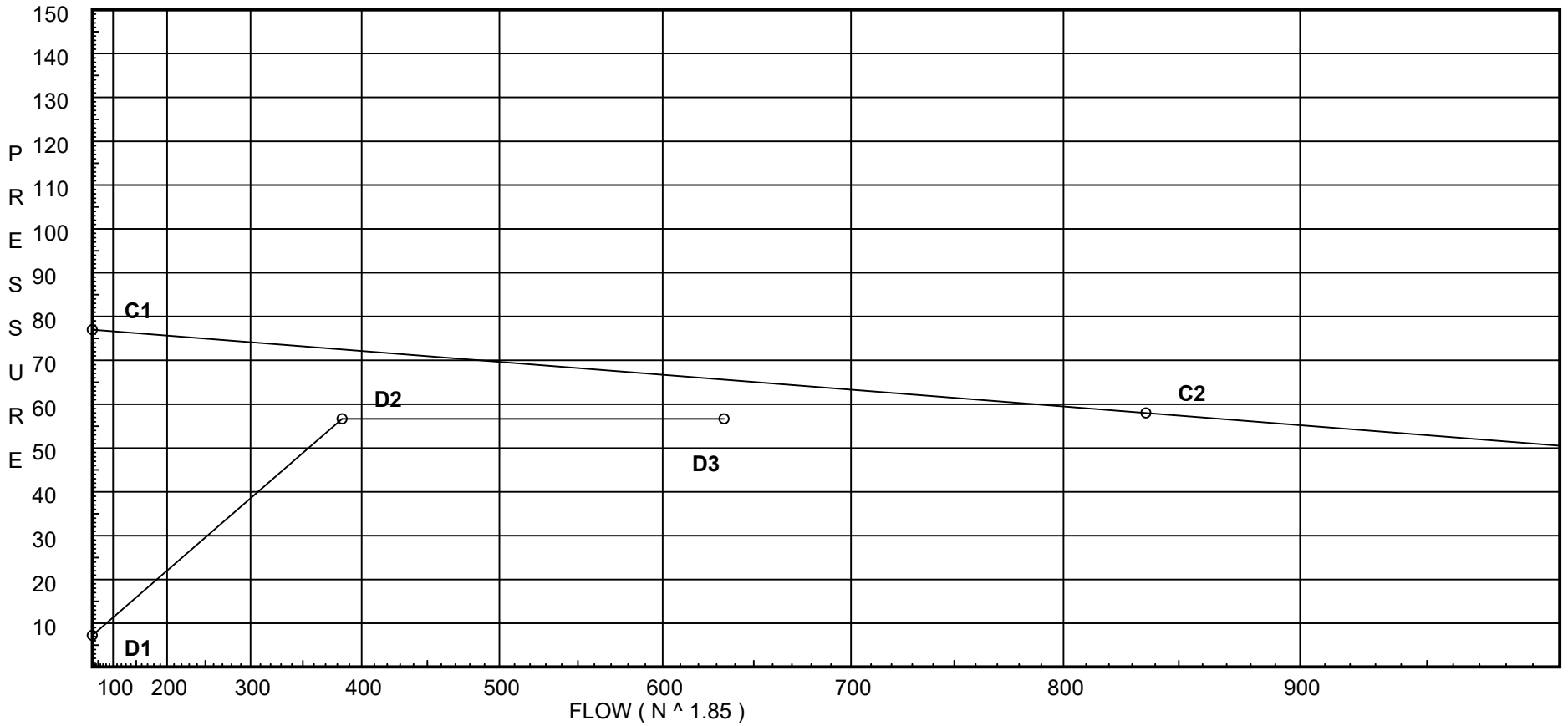
WATER SUPPLY INFORMATION
Test date 05/22/2023
Location SITE
Source of info AEGIS FIRE PROTECTION

CONTRACTOR INFO AEGIS FIRE PROTECTION, LLC
Address 13415 W 98TH STREET / LENEXA, KS 66215
Phone # 913-825-0343
Name of designer APEX DESIGN FP LLC
Authority having jurisdiction CITY OF LEES SUMMIT
NOTES:

text1(35) - invisible

City Water Supply:
- C1 - Static Pressure : 77
- C2 - Residual Pressure: 58
- C2 - Residual Flow : 836

Demand:
- D1 - Elevation : 7.220
- D2 - System Flow : 384.081
- D2 - System Pressure : 56.669
- Hose (Demand) : 250
- D3 - System Demand : 634.081
- Safety Margin : 8.938



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
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
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
Zcb	Colt C200 Vert Butt	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	77.0	58	836.0	65.607	634.08	56.669

NODE ANALYSIS

Node Tag	Elevation	Node Type	Pressure at Node	Discharge at Node	Notes
SP01	19.38	8	9.0	24.0	0.2 120
EQ01	16.67		11.58		
SP03	19.0	8	9.0	24.0	0.2 120
EQ03	16.67		11.35		
SP04	18.81	8	9.0	24.0	0.2 120
EQ04	16.67		11.23		
SP05	18.62	8	9.0	24.0	0.2 120
EQ05	16.67		11.11		
SP02	19.19	8	9.0	24.0	0.2 120
EQ02	16.67		11.46		
100	16.67	7.05	11.58	24.0	K=K @ EQ01
101	16.67		12.64		
102	16.67		12.81		
103	16.67		13.41		
104	16.67		14.72		
105	16.67		16.97		
106	16.67		38.44		
107	16.67		38.47		
108	16.67		38.66		
TOR	16.67		42.11		
BOR	1.0		55.09		
UG	-5.0		58.57		
TEST	0.0		56.67	250.0	
109	16.67	7.09	11.72	24.27	K=K @ EQ02
110	16.67	7.13	12.27	24.96	K=K @ EQ03
111	16.67	7.16	13.46	26.28	K=K @ EQ04
112	16.67	7.2	15.52	28.37	K=K @ EQ05
113	16.67	7.05	11.59	24.01	K=K @ EQ01
114	16.67		12.66		
115	16.67		12.82		
116	16.67		13.43		
117	16.67		14.73		
118	16.67		16.99		
119	16.67	7.09	11.73	24.28	K=K @ EQ02
120	16.67	7.13	12.28	24.97	K=K @ EQ03
121	16.67	7.16	13.48	26.29	K=K @ EQ04
122	16.67	7.2	15.54	28.38	K=K @ EQ05
123	16.67	7.05	11.65	24.07	K=K @ EQ01
124	16.67		12.72		
125	16.67		12.89		
126	16.67		13.5		
127	16.67		14.81		

NODE ANALYSIS (cont.)

Node Tag	*Elevation*	*Node Type*	*Pressure at Node*	*Discharge at Node*	*Notes*
128	16.67		17.08		
129	16.67	7.09	11.8	24.35	K=K @ EQ02
130	16.67	7.13	12.35	25.04	K=K @ EQ03
131	16.67	7.16	13.55	26.36	K=K @ EQ04
132	16.67	7.2	15.62	28.45	K=K @ EQ05

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 ******
SP01	19.38	8.00	24.00	1	T	5.0	2.710	120	9.000	
to							5.000		1.174	
EQ01	16.67		24.0	1.049			7.710	0.1824	1.406	Vel = 8.91
			0.0							
EQ01			24.00						11.580	K Factor = 7.05
SP03	19	8.00	24.00	1	T	5.0	2.330	120	9.000	
to							5.000		1.009	
EQ03	16.67		24.0	1.049			7.330	0.1824	1.337	Vel = 8.91
			0.0							
EQ03			24.00						11.346	K Factor = 7.13
SP04	18.81	8.00	24.00	1	T	5.0	2.140	120	9.000	
to							5.000		0.927	
EQ04	16.67		24.0	1.049			7.140	0.1824	1.302	Vel = 8.91
			0.0							
EQ04			24.00						11.229	K Factor = 7.16
SP05	18.62	8.00	24.00	1	T	5.0	1.960	120	9.000	
to							5.000		0.845	
EQ05	16.67		24.0	1.049			6.960	0.1823	1.269	Vel = 8.91
			0.0							
EQ05			24.00						11.114	K Factor = 7.20
SP02	19.19	8.00	24.00	1	T	5.0	2.520	120	9.000	
to							5.000		1.091	
EQ02	16.67		24.0	1.049			7.520	0.1824	1.372	Vel = 8.91
			0.0							
EQ02			24.00						11.463	K Factor = 7.09
100	16.67	7.05	24.00	1	T	5.0	0.830	120	11.580	K = K @ EQ01
to							5.000		0.0	
101	16.67		24.0	1.049			5.830	0.1822	1.062	Vel = 8.91
101	16.67		0.0	1.5			9.070	120	12.642	
to									0.0	
102	16.67		24.0	1.682			9.070	0.0183	0.166	Vel = 3.47
102	16.67		24.27	1.5			9.070	120	12.808	
to									0.0	
103	16.67		48.27	1.682			9.070	0.0667	0.605	Vel = 6.97
103	16.67		24.96	1.5			9.070	120	13.413	
to									0.0	
104	16.67		73.23	1.682			9.070	0.1440	1.306	Vel = 10.57
104	16.67		26.28	1.5			8.870	120	14.719	
to									0.0	
105	16.67		99.51	1.682			8.870	0.2541	2.254	Vel = 14.37
105	16.67		28.36	1.5	T	9.9	43.220	120	16.973	
to							9.900		0.0	
106	16.67		127.87	1.682			53.120	0.4040	21.463	Vel = 18.46
106	16.67		0.0	4			8.330	120	38.436	
to									0.0	
107	16.67		127.87	4.26			8.330	0.0043	0.036	Vel = 2.88
107	16.67		127.94	4			12.000	120	38.472	
to									0.0	
108	16.67		255.81	4.26			12.000	0.0158	0.190	Vel = 5.76

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 ******
108	16.67		128.27	4	T	26.334	76.800	120	38.662	
to							26.334		0.0	
TOR	16.670		384.08	4.26			103.134	0.0335	3.451	Vel = 8.65
TOR	16.670		0.0	4	Zcb	0.0	15.667	120	42.113	
to									12.452	* * Fixed Loss = 5.666
BOR	1		384.08	4.26			15.667	0.0335	0.525	Vel = 8.65
BOR	1		0.0	6	E	20.084	100.000	140	55.090	
to					2T	86.075	110.463		2.599	
UG	-5		384.08	6.16	G	4.304	210.463	0.0042	0.878	Vel = 4.13
UG	-5		0.0	8	E	28.468	185.000	140	58.567	
to					T	55.354	83.822		-2.166	
TEST	0		384.08	8.27			268.822	0.0010	0.268	Vel = 2.29
			250.00							Qa = 250.00
TEST			634.08						56.669	K Factor = 84.23
109	16.67	7.09	24.27	1	T	5.0	0.830	120	11.723	K = K @ EQ02
to							5.000		0.0	
102	16.67		24.27	1.049			5.830	0.1861	1.085	Vel = 9.01
			0.0							
102			24.27						12.808	K Factor = 6.78
110	16.67	7.13	24.96	1	T	5.0	0.830	120	12.270	K = K @ EQ03
to							5.000		0.0	
103	16.67		24.96	1.049			5.830	0.1961	1.143	Vel = 9.27
			0.0							
103			24.96						13.413	K Factor = 6.82
111	16.67	7.16	26.28	1	T	5.0	0.830	120	13.462	K = K @ EQ04
to							5.000		0.0	
104	16.67		26.28	1.049			5.830	0.2156	1.257	Vel = 9.76
			0.0							
104			26.28						14.719	K Factor = 6.85
112	16.67	7.2	28.37	1	T	5.0	0.830	120	15.525	K = K @ EQ05
to							5.000		0.0	
105	16.67		28.37	1.049			5.830	0.2484	1.448	Vel = 10.53
			0.0							
105			28.37						16.973	K Factor = 6.89
113	16.67	7.05	24.01	1	T	5.0	0.830	120	11.591	K = K @ EQ01
to							5.000		0.0	
114	16.67		24.01	1.049			5.830	0.1825	1.064	Vel = 8.91
114	16.67		0.0	1.5			9.070	120	12.655	
to									0.0	
115	16.67		24.01	1.682			9.070	0.0183	0.166	Vel = 3.47
115	16.67		24.29	1.5			9.070	120	12.821	
to									0.0	
116	16.67		48.3	1.682			9.070	0.0667	0.605	Vel = 6.97
116	16.67		24.97	1.5			9.070	120	13.426	
to									0.0	
117	16.67		73.27	1.682			9.070	0.1442	1.308	Vel = 10.58
117	16.67		26.29	1.5			8.870	120	14.734	
to									0.0	
118	16.67		99.56	1.682			8.870	0.2543	2.256	Vel = 14.38

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 ******
118	16.67		28.38	1.5	T	9.9	43.220	120	16.990	
to							9.900		0.0	
107	16.67		127.94	1.682			53.120	0.4044	21.482	Vel = 18.47
			0.0							
107			127.94						38.472	K Factor = 20.63
119	16.67	7.09	24.28	1	T	5.0	0.830	120	11.735	K = K @ EQ02
to							5.000		0.0	
115	16.67		24.28	1.049			5.830	0.1863	1.086	Vel = 9.01
			0.0							
115			24.28						12.821	K Factor = 6.78
120	16.67	7.13	24.97	1	T	5.0	0.830	120	12.282	K = K @ EQ03
to							5.000		0.0	
116	16.67		24.97	1.049			5.830	0.1962	1.144	Vel = 9.27
			0.0							
116			24.97						13.426	K Factor = 6.81
121	16.67	7.16	26.29	1	T	5.0	0.830	120	13.476	K = K @ EQ04
to							5.000		0.0	
117	16.67		26.29	1.049			5.830	0.2158	1.258	Vel = 9.76
			0.0							
117			26.29						14.734	K Factor = 6.85
122	16.67	7.2	28.38	1	T	5.0	0.830	120	15.540	K = K @ EQ05
to							5.000		0.0	
118	16.67		28.38	1.049			5.830	0.2487	1.450	Vel = 10.54
			0.0							
118			28.38						16.990	K Factor = 6.89
123	16.67	7.05	24.07	1	T	5.0	0.830	120	11.652	K = K @ EQ01
to							5.000		0.0	
124	16.67		24.07	1.049			5.830	0.1834	1.069	Vel = 8.94
124	16.67		0.0	1.5			9.070	120	12.721	
to									0.0	
125	16.67		24.07	1.682			9.070	0.0184	0.167	Vel = 3.48
125	16.67		24.35	1.5			9.070	120	12.888	
to									0.0	
126	16.67		48.42	1.682			9.070	0.0669	0.607	Vel = 6.99
126	16.67		25.04	1.5			9.070	120	13.495	
to									0.0	
127	16.67		73.46	1.682			9.070	0.1450	1.315	Vel = 10.61
127	16.67		26.36	1.5			8.870	120	14.810	
to									0.0	
128	16.67		99.82	1.682			8.870	0.2555	2.266	Vel = 14.41
128	16.67		28.45	1.5	T	9.9	43.220	120	17.076	
to							9.900		0.0	
108	16.67		128.27	1.682			53.120	0.4064	21.586	Vel = 18.52
			0.0							
108			128.27						38.662	K Factor = 20.63
129	16.67	7.09	24.35	1	T	5.0	0.830	120	11.796	K = K @ EQ02
to							5.000		0.0	
125	16.67		24.35	1.049			5.830	0.1873	1.092	Vel = 9.04

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 ******
			0.0							
125			24.35						12.888	K Factor = 6.78
130	16.67	7.13	25.04	1	T	5.0	0.830	120	12.346	K = K @ EQ03
to							5.000		0.0	
126	16.67		25.04	1.049			5.830	0.1971	1.149	Vel = 9.30
			0.0							
126			25.04						13.495	K Factor = 6.82
131	16.67	7.16	26.36	1	T	5.0	0.830	120	13.545	K = K @ EQ04
to							5.000		0.0	
127	16.67		26.36	1.049			5.830	0.2170	1.265	Vel = 9.79
			0.0							
127			26.36						14.810	K Factor = 6.85
132	16.67	7.2	28.45	1	T	5.0	0.830	120	15.620	K = K @ EQ05
to							5.000		0.0	
128	16.67		28.45	1.049			5.830	0.2497	1.456	Vel = 10.56
			0.0							
128			28.45						17.076	K Factor = 6.88