

Job Name : Lee's Summit Municipal Airport - LTX Hangar 2
Address : 2751 NE Douglas St. - Lee's Summit, MO 64064

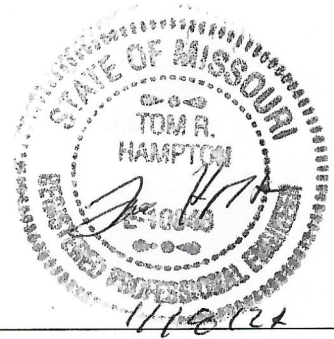
Date : 11/6/2024

Sprinkler Contractor : Aegis Fire Protection, LLC

Area Info :

Calculation Summary :

<u>Area #1</u> : Hangar Bay
<u>Area #2</u> : Storage Bays
<u>Area #3</u> : Office Area



Water Supply :

Flow Test :

Date : 8-10-223

Static : 101 PSI

Residual : 76 PSI

Flow : 2300 GPM

Elevation : Same as Main F.F.

Location of Flow Test : City Main in NE Hagan Rd.

Source of Flow Test : City of Lee's Summit

Notes :

Revision #1 (11-6-2024) - Revised Calcs for New Undg. Location.

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Address : 2751 NE Douglas St. - Lee's Summit, MO 64064

Date : 11/6/2024

Sprinkler Contractor : Aegis Fire Protection, LLC

Area Info : Area #1 - Hangar Bay

Area Design : Per NFPA 409 / NFPA-13, 2016

System Type : Wet System

Design Criteria :

Density: **0.17** gpm/sq. ft. Operating Area: **5000** sq. ft.

Max. Area Per Sprinkler: **130** Total Sprinklers Operating: **47** Sprinkler K Factor: **5.6**

Outside Hose Allowance: **500**

Calculation Summary :

GPM Required : 1137.65	PSI Required : 68.92	@ Base of Riser
GPM Required : 1637.65	PSI Required : 77.93	@ Connection to City Main

Area Safety Margin: **9.7** PSI **11** %

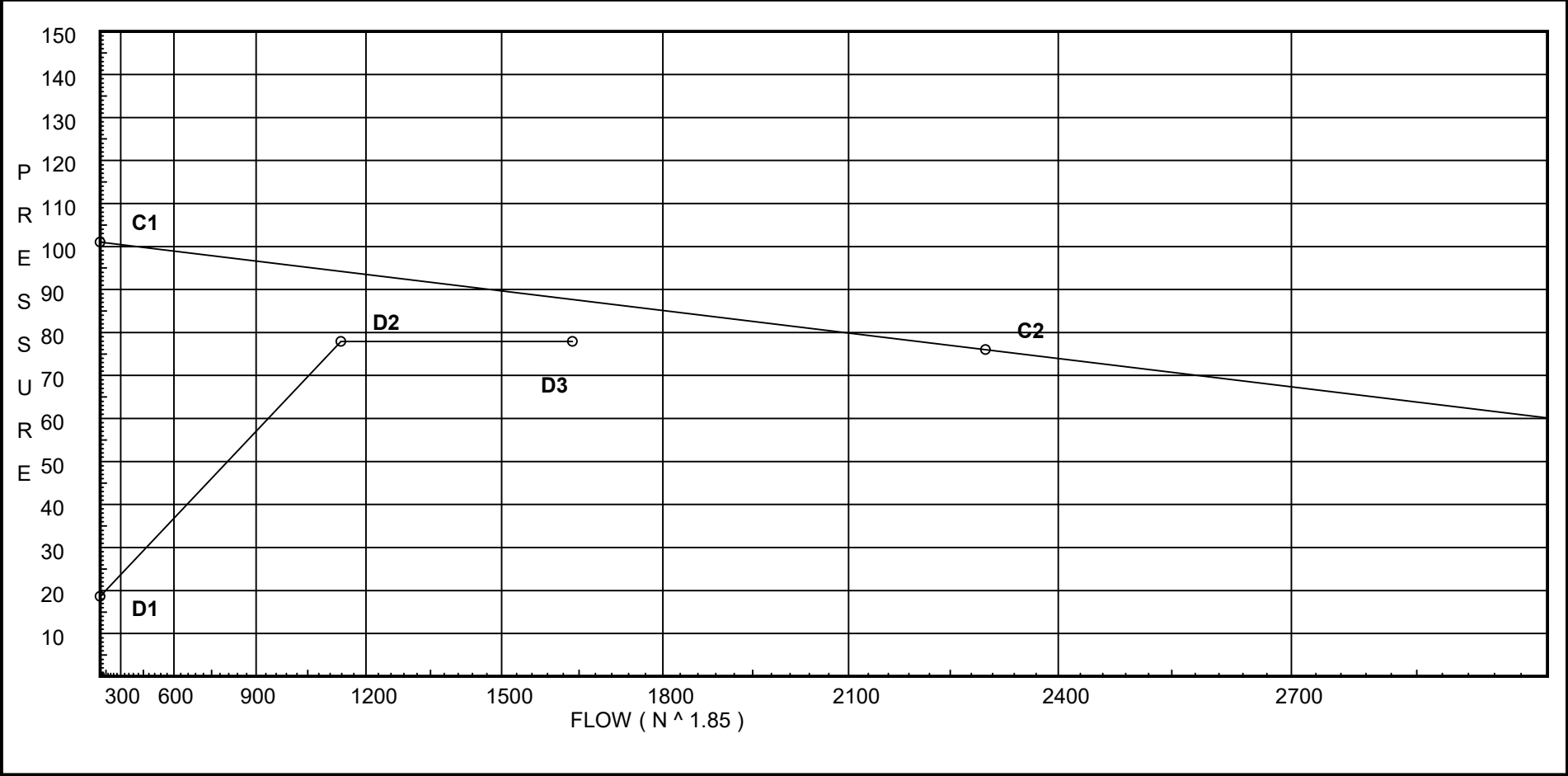
Notes : **Includes Column Sprinkler Flow for Columns In Remote Area.**

Water Supply Curve

LTX Hangar 2 - Area #1

City Water Supply:
C1 - Static Pressure : 101
C2 - Residual Pressure: 76
C2 - Residual Flow : 2300

Demand:
D1 - Elevation : 18.619
D2 - System Flow : 1137.65
D2 - System Pressure : 77.930
Hose (Demand) : 500
D3 - System Demand : 1637.65
Safety Margin : 9.733



Fittings Used Summary

LTX Hangar 2 - Area #1

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
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
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

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.

LTX Hangar 2 - Area #1

SUPPLY ANALYSIS

<i>Node at Source</i>	<i>Static Pressure</i>	<i>Residual Pressure</i>	<i>Flow</i>	<i>Available Pressure</i>	<i>Total Demand</i>	<i>Required Pressure</i>
TEST	101.0	76	2300.0	87.663	1637.65	77.93

NODE ANALYSIS

<i>Node Tag</i>	<i>Elevation</i>	<i>Node Type</i>	<i>Pressure at Node</i>	<i>Discharge at Node</i>	<i>Notes</i>	
HB1	10.0	4.2	19.19	18.4	0.25	50
HB2	20.0	4.2	15.21	16.38	0.25	50
HB3	30.0	4.2	11.76	14.4	0.25	50
BX1	10.0		19.8			
BX2	20.0		15.71			
BX3	30.0		12.15			
B1	36.0		27.9			
D1	36.0		12.31			
D2	36.0		11.19	49.15		
D3	36.0		11.29	49.15		
D4	36.0		13.78	49.15		
B2	36.0		27.91			
H101	42.17	5.6	12.9	20.11	0.17	110
H102	42.38	5.6	11.93	19.34	0.17	110
H103	42.58	5.6	11.43	18.94	0.17	110
H104	42.79	5.6	11.24	18.77	0.17	110
H105	42.99	5.6	11.15	18.7	0.17	110
H106	42.79	5.6	11.36	18.88	0.17	110
H107	42.58	5.6	11.89	19.31	0.17	110
H108	42.38	5.6	12.9	20.12	0.17	110
H109	42.17	5.6	14.61	21.4	0.17	110
B3	36.0		27.98			
H110	42.17	5.6	13.11	20.28	0.17	110
H111	42.38	5.6	12.11	19.48	0.17	110
H112	42.58	5.6	11.6	19.07	0.17	110
H113	42.79	5.6	11.39	18.9	0.17	110
H114	42.99	5.6	11.3	18.83	0.17	110
H115	42.79	5.6	11.51	19.0	0.17	110
H116	42.58	5.6	12.03	19.42	0.17	110
H117	42.38	5.6	13.04	20.22	0.17	110
H118	42.17	5.6	14.74	21.5	0.17	110
B4	36.0		28.13			
H119	42.17	5.6	12.92	20.13	0.17	110
H120	42.38	5.6	11.95	19.36	0.17	110
H121	42.58	5.6	11.47	18.97	0.17	110
H122	42.79	5.6	11.28	18.81	0.17	110
H123	42.99	5.6	11.19	18.73	0.17	110
H124	42.79	5.6	11.41	18.91	0.17	110
H125	42.58	5.6	11.95	19.36	0.17	110
H126	42.38	5.6	12.98	20.17	0.17	110
H127	42.17	5.6	14.7	21.47	0.17	110
B5	36.0		28.39			

LTX Hangar 2 - Area #1

NODE ANALYSIS (cont.)

Node Tag	Elevation	Node Type	Pressure at Node	Discharge at Node	Notes	
H128	42.17	5.6	13.06	20.24	0.17	110
H129	42.38	5.6	12.09	19.47	0.17	110
H130	42.58	5.6	11.6	19.07	0.17	110
H131	42.79	5.6	11.41	18.91	0.17	110
H132	42.99	5.6	11.32	18.84	0.17	110
H133	42.79	5.6	11.54	19.02	0.17	110
H134	42.58	5.6	12.08	19.47	0.17	110
H135	42.38	5.6	13.13	20.29	0.17	110
H136	42.17	5.6	14.87	21.6	0.17	110
B6	36.0		28.75			
H137	42.17	5.6	13.26	20.39	0.17	110
H138	42.38	5.6	12.28	19.62	0.17	110
H139	42.58	5.6	11.79	19.23	0.17	110
H140	42.79	5.6	11.59	19.07	0.17	110
H141	42.99	5.6	11.51	18.99	0.17	110
H142	42.79	5.6	11.73	19.18	0.17	110
H143	42.58	5.6	12.28	19.62	0.17	110
H144	42.38	5.6	13.34	20.45	0.17	110
H145	42.17	5.6	15.11	21.77	0.17	110
B7	36.0		29.29			
H146	42.17	5.6	26.43	28.79	0.17	110
H147	42.38	5.6	26.49	28.82	0.17	110
B8	36.0		29.81			
B9	36.0		30.28			
B10	24.67		36.89			
B11	24.67		37.3			
B12	24.67		37.53			
B13	24.67		38.41			
B14	24.67		38.47			
B15	24.67		38.59			
B16	24.67		38.65			
B17	24.67		38.67			
B18	24.67		38.67			
CB	24.67		36.8			
A1	36.0		37.73			
A2	36.0		37.74			
A3	36.0		37.86			
A4	36.0		38.09			
A5	36.0		38.5			
A6	36.0		39.08			
A7	36.0		39.94			
A8	36.0		40.88			
A9	36.0		42.0			
A10	36.0		43.16			
A11	36.0		44.51			
A12	36.0		45.91			
A13	36.0		47.55			
A14	36.0		49.22			
A18	36.0		49.85			
A17	36.0		49.85			
A16	36.0		49.87			

LTX Hangar 2 - Area #1

NODE ANALYSIS (cont.)

Node Tag	Elevation	Node Type	Pressure at Node	Discharge at Node	Notes
A15	36.0		49.92		
AX	36.0		50.24		
TOR	36.0		51.45		
UG	1.0		68.93		
HOSE	0.0		77.2	500.0	
TEST	0.0		77.93		

Final Calculations : Hazen-Williams

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LTX Hangar 2 - Area #1

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Equiv Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	*****	Notes	*****
HB1 to BX1	10 10	4.20	18.40 18.4	1 1.049	T 5.0	0.500 5.000 5.500	120 0.1116	19.188 0.0 0.614		Vel = 6.83	
BX1			0.0 18.40					19.802		K Factor = 4.13	
HB2 to BX2	20 20	4.20	16.38 16.38	1 1.049	T 5.0	0.500 5.000 5.500	120 0.0900	15.212 0.0 0.495		Vel = 6.08	
BX2			0.0 16.38					15.707		K Factor = 4.13	
HB3 to BX3	30 30	4.20	14.40 14.4	1 1.049	T 5.0	0.500 5.000 5.500	120 0.0707	11.756 0.0 0.389		Vel = 5.35	
BX3			0.0 14.40					12.145		K Factor = 4.13	
BX1 to BX2	10 20		18.40 18.4	1.25 1.442		10.000 10.000	120 0.0236	19.802 -4.331 0.236		Vel = 3.61	
BX2 to BX3	20 30		16.38 34.78	1.25 1.442		10.000 10.000	120 0.0769	15.707 -4.331 0.769		Vel = 6.83	
BX3			0.0 34.78					12.145		K Factor = 9.98	
BX3 to D1	30 36		49.18 49.18	1.25 1.442	E T 3.716 7.432	7.750 11.148 18.898	120 0.1460	12.145 -2.599 2.759		Vel = 9.66	
D1			0.0 49.18					12.305		K Factor = 14.02	
B1 to D1	36 36		-87.84 -87.84	1.5 1.682	T 2E 9.9 9.9	57.500 19.800 77.300	120 -0.2017	27.898 0.0 -15.593		Vel = 12.68	
D1 to D2	36 36		49.18 -38.66	1.5 1.682		25.330 25.330	120 -0.0442	12.305 0.0 -1.119		Vel = 5.58	
D2 to D3	36 36	+ 49.15	49.15 10.49	1.5 1.682		25.330 25.330	120 0.0039	11.186 0.0 0.100		Vel = 1.51	
D3 to D4	36 36	+ 49.15	49.15 59.64	1.5 1.682		25.330 25.330	120 0.0985	11.286 0.0 2.496		Vel = 8.61	
D4 to A1	36 36	+ 49.15	49.15 108.79	1.5 1.682	2E T 9.9 9.9	60.150 19.800 79.950	120 0.2996	13.782 0.0 23.953		Vel = 15.71	
A1			0.0 108.79					37.735		K Factor = 17.71	
B2 to H101	36 42.17		-76.33 -76.33	1.5 1.682	E T 4.95 9.9	64.440 14.850 79.290	120 -0.1555	27.905 -2.672 -12.333		Vel = 11.02	

Final Calculations : Hazen-Williams

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LTX Hangar 2 - Area #1

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Equiv Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	*****	Notes	*****
H101 to H102	42.17 42.38	5.60	20.12 -56.21	1.5 1.682		10.000	120 -0.0883	12.900 -0.091 -0.883	Vel =	8.12	
H102 to H103	42.38 42.58	5.60	19.34 -36.87	1.5 1.682		10.000	120 -0.0404	11.926 -0.087 -0.404	Vel =	5.32	
H103 to H104	42.58 42.79	5.60	18.93 -17.94	1.5 1.682		10.000	120 -0.0107	11.435 -0.091 -0.107	Vel =	2.59	
H104 to H105	42.79 42.99	5.60	18.78 0.84	1.5 1.682		10.000	120 0.0001	11.237 -0.087 0.001	Vel =	0.12	
H105 to H106	42.99 42.79	5.60	18.70 19.54	1.5 1.682		10.000	120 0.0124	11.151 0.087 0.124	Vel =	2.82	
H106 to H107	42.79 42.58	5.60	18.87 38.41	1.5 1.682		10.000	120 0.0437	11.362 0.091 0.437	Vel =	5.55	
H107 to H108	42.58 42.38	5.60	19.31 57.72	1.5 1.682		10.000	120 0.0927	11.890 0.087 0.927	Vel =	8.33	
H108 to H109	42.38 42.17	5.60	20.12 77.84	1.5 1.682		10.000	120 0.1613	12.904 0.091 1.613	Vel =	11.24	
H109 to A2	42.17 36	5.60	21.40 99.24	1.5 1.682	2T	19.799 61.150 19.799 80.949	120 0.2528	14.608 2.672 20.464	Vel =	14.33	
A2			0.0 99.24					37.744	K Factor =	16.15	
B3 to H110	36 42.17		-77.48 -77.48	1.5 1.682	E T	4.95 9.9	120	27.982 -2.672	Vel =	11.19	
H110 to H111	42.17 42.38	5.60	20.27 -57.21	1.5 1.682		10.000	120 -0.0912	13.108 -0.091 -0.912	Vel =	8.26	
H111 to H112	42.38 42.58	5.60	19.49 -37.72	1.5 1.682		10.000	120 -0.0422	12.105 -0.087 -0.422	Vel =	5.45	
H112 to H113	42.58 42.79	5.60	19.06 -18.66	1.5 1.682		10.000	120 -0.0115	11.596 -0.091 -0.115	Vel =	2.69	
H113 to H114	42.79 42.99	5.60	18.90 0.24	1.5 1.682		10.000	120 0.0001	11.390 -0.087 0.001	Vel =	0.03	
H114 to H115	42.99 42.79	5.60	18.83 19.07	1.5 1.682		10.000	120 0.0119	11.304 0.087 0.119	Vel =	2.75	
H115 to H116	42.79 42.58	5.60	19.00 38.07	1.5 1.682		10.000	120 0.0430	11.510 0.091 0.430	Vel =	5.50	

Final Calculations : Hazen-Williams

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LTX Hangar 2 - Area #1

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Equiv	Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	*****	Notes	*****
H116 to H117	42.58 42.38	5.60	19.43 57.5	1.5 1.682			10.000 10.000	120 0.0920	12.031 0.087 0.920		Vel = 8.30	
H117 to H118	42.38 42.17	5.60	20.22 77.72	1.5 1.682			10.000 10.000	120 0.1608	13.038 0.091 1.608		Vel = 11.22	
H118 to A3	42.17 36	5.60	21.49 99.21	1.5 1.682	2T	19.799	61.150 19.799 80.949	120 2.672 0.2527	14.737 2.672 20.453		Vel = 14.32	
A3			0.0 99.21						37.862		K Factor = 16.12	
B4 to H119	36 42.170		-76.01 -76.01	1.5 1.682	2T	19.799	61.440 19.799 81.239	120 -0.1543	28.128 -2.672 -12.537		Vel = 10.98	
H119 to H120	42.170 42.380	5.60	20.13 -55.88	1.5 1.682			10.000 10.000	120 -0.0874	12.919 -0.091 -0.874		Vel = 8.07	
H120 to H121	42.380 42.580	5.60	19.36 -36.52	1.5 1.682			10.000 10.000	120 -0.0397	11.954 -0.087 -0.397		Vel = 5.27	
H121 to H122	42.580 42.790	5.60	18.97 -17.55	1.5 1.682			10.000 10.000	120 -0.0103	11.470 -0.091 -0.103		Vel = 2.53	
H122 to H123	42.790 42.99	5.60	18.81 1.26	1.5 1.682			10.000 10.000	120 0.0002	11.276 -0.087 0.002		Vel = 0.18	
H123 to H124	42.99 42.79	5.60	18.73 19.99	1.5 1.682			10.000 10.000	120 0.0130	11.191 0.087 0.130		Vel = 2.89	
H124 to H125	42.79 42.58	5.60	18.91 38.9	1.5 1.682			10.000 10.000	120 0.0447	11.408 0.091 0.447		Vel = 5.62	
H125 to H126	42.58 42.38	5.60	19.36 58.26	1.5 1.682			10.000 10.000	120 0.0943	11.946 0.087 0.943		Vel = 8.41	
H126 to H127	42.38 42.17	5.60	20.17 78.43	1.5 1.682			10.000 10.000	120 0.1635	12.976 0.091 1.635		Vel = 11.32	
H127 to A4	42.17 36	5.60	21.47 99.9	1.5 1.682	2T	19.799	61.150 19.799 80.949	120 2.672 0.2559	14.702 2.672 20.717		Vel = 14.42	
A4			0.0 99.90						38.091		K Factor = 16.19	
B5 to H128	36 42.17		-76.39 -76.39	1.5 1.682	2T	19.799	61.440 19.799 81.239	120 -0.1558	28.387 -2.672 -12.654		Vel = 11.03	
H128 to H129	42.17 42.38	5.60	20.24 -56.15	1.5 1.682			10.000 10.000	120 -0.0881	13.061 -0.091 -0.881		Vel = 8.11	

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LTX Hangar 2 - Area #1

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Equiv	Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	*****	Notes	*****
H129 to H130	42.38 42.58	5.60	19.47 -36.68	1.5 1.682			10.000	120	12.089 -0.087 -0.401		Vel = 5.30	
H130 to H131	42.58 42.79	5.60	19.08 -17.6	1.5 1.682			10.000	120	11.601 -0.091 -0.103		Vel = 2.54	
H131 to H132	42.79 42.99	5.60	18.91 1.31	1.5 1.682			10.000	120	11.407 -0.087 0.001		Vel = 0.19	
H132 to H133	42.99 42.79	5.60	18.84 20.15	1.5 1.682			10.000	120	11.321 0.087 0.132		Vel = 2.91	
H133 to H134	42.79 42.58	5.60	19.03 39.18	1.5 1.682			10.000	120	11.540 0.091 0.453		Vel = 5.66	
H134 to H135	42.58 42.38	5.60	19.46 58.64	1.5 1.682			10.000	120	12.084 0.087 0.955		Vel = 8.47	
H135 to H136	42.38 42.17	5.60	20.29 78.93	1.5 1.682			10.000	120	13.126 0.091 1.655		Vel = 11.40	
H136 to A5	42.17 36	5.60	21.60 100.53	1.5 1.682	2T	19.799	61.150 19.799 80.949	120	14.872 2.672 20.957		Vel = 14.52	
A5			0.0 100.53						38.501		K Factor = 16.20	
B6 to H137	36 42.17		-76.92 -76.92	1.5 1.682	2T	19.799	61.440 19.799 81.239	120	28.750 -2.672 -12.817		Vel = 11.11	
H137 to H138	42.17 42.38	5.60	20.40 -56.52	1.5 1.682			10.000	120	13.261 -0.091 -0.892		Vel = 8.16	
H138 to H139	42.38 42.58	5.60	19.62 -36.9	1.5 1.682			10.000	120	12.278 -0.087 -0.405		Vel = 5.33	
H139 to H140	42.58 42.79	5.60	19.23 -17.67	1.5 1.682			10.000	120	11.786 -0.091 -0.104		Vel = 2.55	
H140 to H141	42.79 42.99	5.60	19.06 1.39	1.5 1.682			10.000	120	11.591 -0.087 0.001		Vel = 0.20	
H141 to H142	42.99 42.79	5.60	19.00 20.39	1.5 1.682			10.000	120	11.505 0.087 0.135		Vel = 2.94	
H142 to H143	42.79 42.58	5.60	19.17 39.56	1.5 1.682			10.000	120	11.727 0.091 0.461		Vel = 5.71	
H143 to H144	42.58 42.38	5.60	19.63 59.19	1.5 1.682			10.000	120	12.279 0.087 0.972		Vel = 8.55	

Final Calculations : Hazen-Williams

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LTX Hangar 2 - Area #1

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Equiv Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	*****	Notes	*****
H144 to H145	42.38 42.17	5.60	20.45 79.64	1.5 1.682		10.000	120	13.338 0.091 1.682		Vel = 11.50	
H145 to A6	42.17 36	5.60	21.77 101.41	1.5 1.682	2T 19.799	61.150 19.799 80.949	120	15.111 2.672 21.297		Vel = 14.64	
A6			0.0 101.41					39.080		K Factor = 16.22	
B7 to H146	36 42.17		-7.71 -7.71	1.5 1.682	2T 19.799	61.440 19.799 81.239	120	29.287 -2.672 -0.183		Vel = 1.11	
H146 to H147	42.17 42.38	5.60	28.79 21.08	1.5 1.682		10.000	120	26.432 -0.091 0.144		Vel = 3.04	
H147 to A7	42.38 36	5.60	28.82 49.9	1.5 1.682	2T 19.799	131.150 19.799 150.949	120	26.485 2.763 10.696		Vel = 7.21	
A7			0.0 49.90					39.944		K Factor = 7.90	
B8 to A8	36 36		39.39 39.39	1.5 1.682	4T 39.599	202.590 39.599 242.189	120	29.806 0.0 11.076		Vel = 5.69	
A8			0.0 39.39					40.882		K Factor = 6.16	
B9 to A9	36 36		40.60 40.6	1.5 1.682	4T 39.599	202.590 39.599 242.189	120	30.278 0.0 11.717		Vel = 5.86	
A9			0.0 40.60					41.995		K Factor = 6.27	
B10 to A10	24.67 36		38.94 38.94	1.5 1.682	3T 29.699 3E 14.849	204.950 44.548 249.498	120	36.890 -4.907 11.172		Vel = 5.62	
A10			0.0 38.94					43.155		K Factor = 5.93	
B11 to A11	24.67 36		39.68 39.68	1.5 1.682	3T 29.699 3E 14.849	216.840 44.548 261.388	120	37.299 -4.907 12.122		Vel = 5.73	
A11			0.0 39.68					44.514		K Factor = 5.95	
B12 to A12	24.67 36		41.76 41.76	1.5 1.682	3T 29.699 3E 14.849	216.180 44.548 260.728	120	37.530 -4.907 13.289		Vel = 6.03	
A12			0.0 41.76					45.912		K Factor = 6.16	
B13 to A13	24.67 36		43.00 43.0	1.5 1.682	3T 29.699 5E 24.749	206.440 54.448 260.888	120	38.414 -4.907 14.039		Vel = 6.21	

Final Calculations : Hazen-Williams

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LTX Hangar 2 - Area #1

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	*****
A13			0.0 43.00						47.546		K Factor = 6.24	
B14 to A14	24.67 36		45.44 45.44	1.5 1.682	3T 5E	29.699 24.749	208.380 54.448	120 0.0596	38.470 -4.907		Vel = 6.56	
A14			0.0 45.44						49.224		K Factor = 6.48	
B15 to A15	24.67 36		47.55 47.55	1.5 1.682	3T 3E	29.699 14.849	205.990 44.548	120 0.0648	38.592 -4.907		Vel = 6.87	
A15			0.0 47.55						49.918		K Factor = 6.73	
B16 to A16	24.67 36		47.51 47.51	1.5 1.682	3T 3E	29.699 14.849	204.770 44.548	120 0.0647	38.647 -4.907		Vel = 6.86	
A16			0.0 47.51						49.870		K Factor = 6.73	
B17 to A17	24.67 36		47.38 47.38	1.5 1.682	3T 3E	29.699 14.849	205.420 44.548	120 0.0644	38.665 -4.907		Vel = 6.84	
A17			0.0 47.38						49.849		K Factor = 6.71	
B18 to A18	24.67 36		47.43 47.43	1.5 1.682	3T 3E	29.699 14.849	204.780 44.548	120 0.0645	38.670 -4.907		Vel = 6.85	
A18			0.0 47.43						49.845		K Factor = 6.72	
B1 to B2	36 36		87.84 87.84	4 4.26			3.130 3.130	120 0.0022	27.898 0.0		Vel = 1.98	
B2 to B3	36 36		76.33 164.17	4 4.26			11.000 11.000	120 0.0070	27.905 0.0		Vel = 3.70	
B3 to B4	36 36		77.48 241.65	4 4.26			10.330 10.330	120 0.0141	27.982 0.0		Vel = 5.44	
B4 to B5	36 36		76.01 317.66	4 4.26			11.000 11.000	120 0.0235	28.128 0.0		Vel = 7.15	
B5 to B6	36 36		76.39 394.05	4 4.26			10.330 10.330	120 0.0351	28.387 0.0		Vel = 8.87	
B6 to B7	36 36		76.91 470.96	4 4.26			11.000 11.000	120 0.0488	28.750 0.0		Vel = 10.60	
B7 to B8	36 36		7.71 478.67	4 4.26			10.330 10.330	120 0.0502	29.287 0.0		Vel = 10.77	

Final Calculations : Hazen-Williams

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LTX Hangar 2 - Area #1

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Equiv Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	*****	Notes	*****
B8 to B9	36 36		-39.38 439.29	4 4.26		11.000 11.000	120 0.0429	29.806 0.0 0.472		Vel = 9.89	
B9 to CB	36 24.67		-40.60 398.69	4 4.26	2E 26.334	18.620 26.334 44.954	120 0.0359	30.278 4.907 1.612		Vel = 8.97	
CB to B10	24.67 24.670		0.0 398.69	4 4.26		2.580 2.580	120 0.0360	36.797 0.0 0.093		Vel = 8.97	
B10 to B11	24.670 24.670		-38.94 359.75	4 4.26		13.820 13.820	120 0.0296	36.890 0.0 0.409		Vel = 8.10	
B11 to B12	24.670 24.670		-39.68 320.07	4 4.26		9.660 9.660	120 0.0239	37.299 0.0 0.231		Vel = 7.20	
B12 to B13	24.670 24.670		-41.77 278.3	4 4.26	2E 26.334	21.590 26.334 47.924	120 0.0184	37.530 0.0 0.884		Vel = 6.26	
B13 to B14	24.670 24.670		-43.00 235.3	4 4.26		4.190 4.190	120 0.0134	38.414 0.0 0.056		Vel = 5.30	
B14 to B15	24.670 24.670		-45.44 189.86	4 4.26		13.360 13.360	120 0.0091	38.470 0.0 0.122		Vel = 4.27	
B15 to B16	24.670 24.670		-47.54 142.32	4 4.26		10.280 10.280	120 0.0054	38.592 0.0 0.055		Vel = 3.20	
B16 to B17	24.670 24.670		-47.51 94.81	4 4.26		7.350 7.350	120 0.0024	38.647 0.0 0.018		Vel = 2.13	
B17 to B18	24.670 24.67		-47.38 47.43	4 4.26		6.630 6.630	120 0.0008	38.665 0.0 0.005		Vel = 1.07	
B18			0.0 47.43					38.670		K Factor = 7.63	
A1 to A2	36 36		108.79 108.79	4 4.26		2.750 2.750	120 0.0033	37.735 0.0 0.009		Vel = 2.45	
A2 to A3	36 36		99.24 208.03	4 4.26		11.000 11.000	120 0.0107	37.744 0.0 0.118		Vel = 4.68	
A3 to A4	36 36		99.21 307.24	4 4.26		10.330 10.330	120 0.0222	37.862 0.0 0.229		Vel = 6.92	
A4 to A5	36 36		99.90 407.14	4 4.26		11.000 11.000	120 0.0373	38.091 0.0 0.410		Vel = 9.16	
A5 to A6	36 36		100.53 507.67	4 4.26		10.330 10.330	120 0.0561	38.501 0.0 0.579		Vel = 11.43	

Final Calculations : Hazen-Williams

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LTX Hangar 2 - Area #1

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Equiv Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	*****	Notes	*****
A6 to A7	36 36		101.41 609.08	4 4.26		11.000 11.000	120 0.0785	39.080 0.0 0.864		Vel = 13.71	
A7 to A8	36 36		49.90 658.98	4 4.26		10.330 10.330	120 0.0908	39.944 0.0 0.938		Vel = 14.83	
A8 to A9	36 36		39.38 698.36	4 4.26		11.000 11.000	120 0.1012	40.882 0.0 1.113		Vel = 15.72	
A9 to A10	36 36		40.60 738.96	4 4.26		10.330 10.330	120 0.1123	41.995 0.0 1.160		Vel = 16.63	
A10 to A11	36 36		38.94 777.9	4 4.26		11.000 11.000	120 0.1235	43.155 0.0 1.359		Vel = 17.51	
A11 to A12	36 36		39.68 817.58	4 4.26		10.330 10.330	120 0.1353	44.514 0.0 1.398		Vel = 18.40	
A12 to A13	36 36		41.77 859.35	4 4.26		11.000 11.000	120 0.1485	45.912 0.0 1.634		Vel = 19.34	
A13 to A14	36 36		43.00 902.35	4 4.26		10.330 10.330	120 0.1624	47.546 0.0 1.678		Vel = 20.31	
A14 to AX	36 36		45.44 947.79	6 6.357	T 37.72	2.250 37.720 39.970	120 0.0253	49.224 0.0 1.013		Vel = 9.58	
AX			0.0 947.79					50.237		K Factor = 133.72	
A18 to A17	36 36		47.43 47.43	4 4.26		5.980 5.980	120 0.0007	49.845 0.0 0.004		Vel = 1.07	
A17 to A16	36 36		47.38 94.81	4 4.26		8.000 8.000	120 0.0026	49.849 0.0 0.021		Vel = 2.13	
A16 to A15	36 36		47.51 142.32	4 4.26		9.080 9.080	120 0.0053	49.870 0.0 0.048		Vel = 3.20	
A15 to AX	36 36		47.54 189.86	4 4.26	T 26.334	8.750 26.334 35.084	120 0.0091	49.918 0.0 0.319		Vel = 4.27	
AX			0.0 189.86					50.237		K Factor = 26.79	
AX to TOR	36 36		1137.65 1137.65	6 6.357	E 17.603	16.690 17.603 34.293	120 0.0355	50.237 0.0 1.218		Vel = 11.50	
TOR to UG	36 1		0.0 1137.65	6 6.357	E 17.603 B 12.573	35.000 30.176 65.176	120 0.0355	51.455 15.158 2.315		Vel = 11.50	

Final Calculations : Hazen-Williams

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LTX Hangar 2 - Area #1

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Equiv Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	*****	Notes	*****
UG to HOSE	1 0		0.0 1137.65	8 8.27	E 2F G T	28.468 28.468 6.326 55.354	130.000 118.616 248.616	140 6.433 1.844		* * Fixed Loss = 6 Vel = 6.79	
HOSE to TEST	0 0	H500	500.00 1637.65	12 12.34		350.000 350.000	140 0.0021	77.205 0.0 0.725		Vel = 4.39	
TEST			0.0 1637.65					77.930		K Factor = 185.51	

AutoPeaking Summary

LTX Hangar 2 - Area #1

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Auto Peaking Summary - List of Pipes for Area Calculated

Left Side			Right Side		
From	To	Length	From	To	Length
H109	A2	91.150	B2	H101	34.440
H118	A3	91.150	B3	H110	31.440
H127	A4	91.150	B4	H119	31.440
H136	A5	91.150	B5	H128	31.440
H145	A6	91.150	B6	H137	31.440
H147	A7	161.150	B7	H146	31.440
H109	A2	61.150	B2	H101	64.440
H118	A3	61.150	B3	H110	61.440
H127	A4	61.150	B4	H119	61.440
H136	A5	61.150	B5	H128	61.440
H145	A6	61.150	B6	H137	61.440
H147	A7	131.150	B7	H146	61.440

Flow Required		Safety Margin	Pressure Differential
Area Calculated	1637.650	9.733	-0.627
Right	10.000	9.320	-0.214
Right	20.000	9.111	-0.005
Right	30.000	9.106	0.000

AutoPeaking Summary

Right	40.000		1631.156	9.288	-0.182
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Typical Distance Between Heads = 10.000

Split Point Used in Worst Area Peaked = H105

Split Point Used in Area Calculated = H105

Job Name : Lee's Summit Municipal Airport - LTX Hangar 2

Address : 2751 NE Douglas St. - Lee's Summit, MO 64064

Date : 11/6/2024

Sprinkler Contractor : Aegis Fire Protection, LLC

Area Info : Area #2 - Storage Bays

Area Design : Per NFPA-13, 2016

System Type : Wet System

Design Criteria :

Density: **0.20** gpm/sq. ft. Operating Area: **1500** sq. ft.

Max. Area Per Sprinkler: **130** Total Sprinklers Operating: **15** Sprinkler K Factor: **5.6**

Outside Hose Allowance: **250**

Calculation Summary :

GPM Required : 576.84	PSI Required : 75.58	@ Base of Riser
GPM Required : 826.84	PSI Required : 82.75	@ Connection to City Main

Area Safety Margin: **14.4** PSI **15** %

Notes : **Includes Column Sprinkler Flow for Columns In Remote Area.**

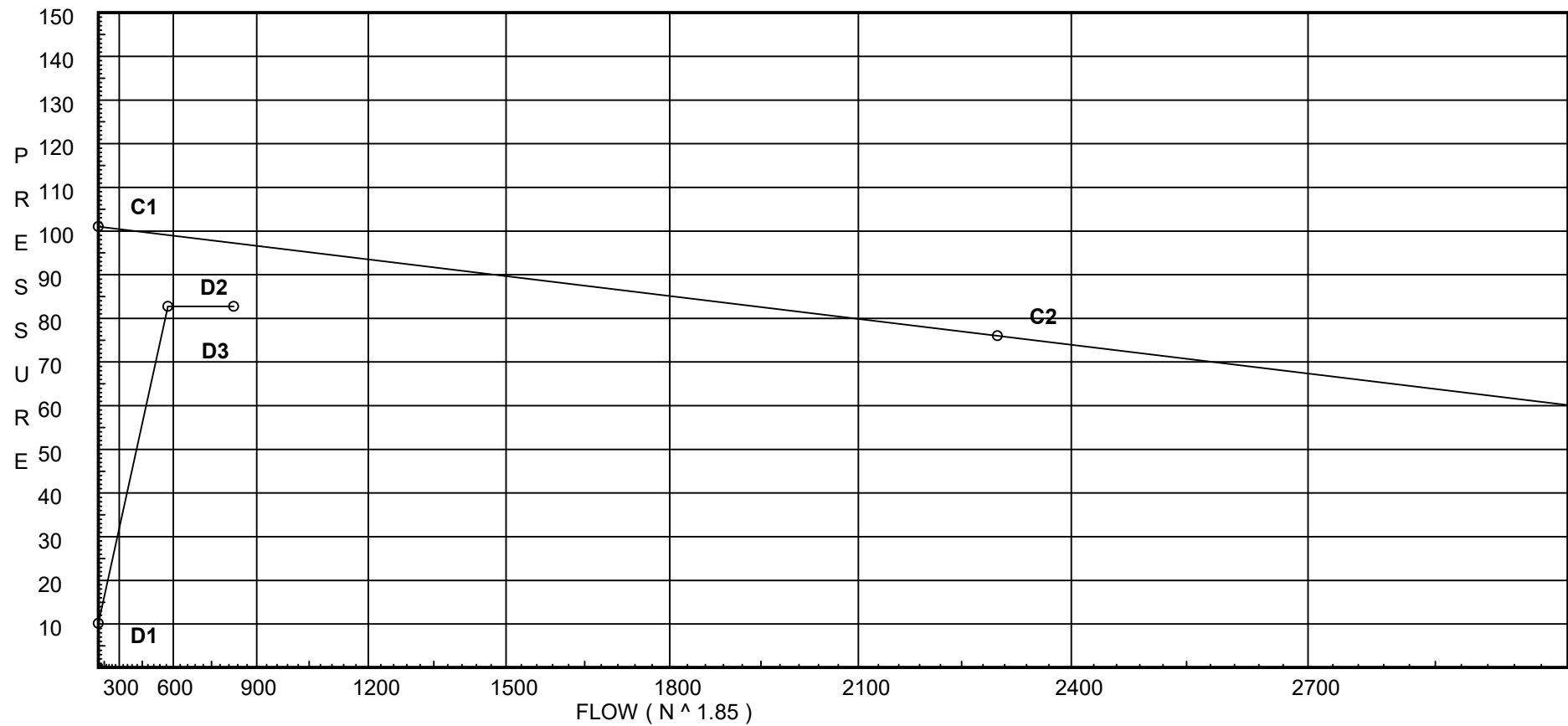
Water Supply Curve

LTX Hangar 2 - Area #2

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City Water Supply:
C1 - Static Pressure : 101
C2 - Residual Pressure: 76
C2 - Residual Flow : 2300

Demand:
D1 - Elevation : 10.126
D2 - System Flow : 576.835
D2 - System Pressure : 82.752
Hose (Demand) : 250
D3 - System Demand : 826.835
Safety Margin : 14.481



Fittings Used Summary

LTX Hangar 2 - Area #2

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
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
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

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.

LTX Hangar 2 - Area #2

SUPPLY ANALYSIS

Node at Source	Static Pressure	Residual Pressure	Flow	Available Pressure	Total Demand	Required Pressure
TEST	101.0	76	2300.0	97.233	826.84	82.752

NODE ANALYSIS

Node Tag	Elevation	Node Type	Pressure at Node	Discharge at Node	Notes	
HC1	10.0	4.2	20.39	18.96	0.25	50
HC2	20.0	4.2	16.43	17.02	0.25	50
CX1	10.0		21.04			
CX2	20.0		16.96			
CCA	24.4		16.41			
H201	23.38	5.6	17.01	23.1	0.2	115
H202	23.19	5.6	18.94	24.37	0.2	120
H203	22.98	5.6	22.91	26.81	0.2	120
H204	22.77	5.6	29.5	30.42	0.2	120
H205	23.38	5.6	26.32	28.73	0.2	120
H206	23.19	5.6	26.89	29.04	0.2	120
H207	22.98	5.6	28.95	30.13	0.2	120
H208	22.77	5.6	33.31	32.32	0.2	120
CCB	24.4		15.61	37.167		
H209	23.38	5.6	16.87	23.0	0.2	115
H210	23.19	5.6	18.86	24.32	0.2	120
H211	22.98	5.6	22.92	26.81	0.2	120
H212	22.77	5.6	29.63	30.48	0.2	120
H213	23.19	5.6	33.96	32.63	0.2	120
H214	22.98	5.6	34.73	33.0	0.2	120
H215	22.77	5.6	37.32	34.21	0.2	120
AA1	20.5		45.23	37.167		
AA2	20.5		45.24			
AA3	20.5		45.33			
AA4	20.5		45.42	37.167		
AA5	20.5		45.57			
AA6	20.5		46.12			
AA7	20.5		47.91			
AA8	36.0		48.72			
A1	36.0		49.74			
A2	36.0		49.93			
A3	36.0		50.71			
A4	36.0		51.45			
A5	36.0		52.23			
A6	36.0		52.96			
A7	36.0		53.74			
A8	36.0		54.48			
A9	36.0		55.26			
A10	36.0		55.99			
A11	36.0		56.77			
A12	36.0		57.51			
A13	36.0		58.29			

LTX Hangar 2 - Area #2

NODE ANALYSIS (cont.)

Node Tag	Elevation	Node Type	Pressure at Node	Discharge at Node	Notes
A14	36.0		59.02		
AX	36.0		59.42		
TOR	36.0		59.77		
UG	1.0		75.59		
HOSE	0.0		82.55	250.0	
TEST	0.0		82.75		

Final Calculations : Hazen-Williams

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LTX Hangar 2 - Area #2

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Equiv Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	*****	Notes	*****
HC1 to CX1	10 10	4.20	18.96 18.96	1 1.049	T 5.0	0.500 5.000 5.500	120 0.1180	20.389 0.0 0.649		Vel = 7.04	
CX1			0.0 18.96					21.038		K Factor = 4.13	
HC2 to CX2	20 20	4.20	17.02 17.02	1 1.049	T 5.0	0.500 5.000 5.500	120 0.0965	16.426 0.0 0.531		Vel = 6.32	
CX2			0.0 17.02					16.957		K Factor = 4.13	
CX1 to CX2	10 20		18.96 18.96	1.25 1.442		10.000 10.000	120 0.0250	21.038 -4.331 0.250		Vel = 3.72	
CX2 to CCA	20 24.400		17.03 35.99	1.25 1.442	T 7.432	9.100 7.432 16.532	120 0.0820	16.957 -1.906 1.355		Vel = 7.07	
CCA to H201	24.400 23.38		0.0 35.99	1.25 1.442		2.000 2.000	120 0.0815	16.406 0.442 0.163		Vel = 7.07	
H201			0.0 35.99					17.011		K Factor = 8.73	
H201 to H202	23.38 23.19	5.60	59.08 59.08	1.25 1.442		9.000 9.000	120 0.2050	17.011 0.082 1.845		Vel = 11.61	
H202 to H203	23.19 22.98	5.60	24.37 83.45	1.25 1.442		10.000 10.000	120 0.3883	18.938 0.091 3.883		Vel = 16.39	
H203 to H204	22.98 22.77	5.60	26.81 110.26	1.25 1.442		10.000 10.000	120 0.6501	22.912 0.091 6.501		Vel = 21.66	
H204 to AA2	22.77 20.5	5.60	30.42 140.68	1.25 1.442	E T 7.432	3.310 11.148 14.458	120 1.0203	29.504 0.983 14.751		Vel = 27.64	
AA2			0.0 140.68					45.238		K Factor = 20.92	
H205 to H206	23.38 23.19	5.60	28.73 28.73	1.25 1.442		9.000 9.000	120 0.0541	26.322 0.082 0.487		Vel = 5.64	
H206 to H207	23.19 22.98	5.60	29.04 57.77	1.25 1.442		10.000 10.000	120 0.1966	26.891 0.091 1.966		Vel = 11.35	
H207 to H208	22.98 22.77	5.60	30.13 87.9	1.25 1.442		10.000 10.000	120 0.4274	28.948 0.091 4.274		Vel = 17.27	
H208 to AA3	22.77 20.5	5.60	32.32 120.22	1.25 1.442	E T 7.432	3.310 11.148 14.458	120 0.7629	33.313 0.983 11.030		Vel = 23.62	
			0.0								

Final Calculations : Hazen-Williams

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LTX Hangar 2 - Area #2

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Equiv	Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	*****	Notes	*****
AA3			120.22						45.326		K Factor = 17.86	
CCB to H209	24.400 + 23.38	37.17	37.16	1.25	T	7.432	2.000 7.432 9.432	120	15.607 0.442 0.820			Vel = 7.30
H209			0.0 37.16						16.869		K Factor = 9.05	
H209 to H210	23.38 23.19	5.60	60.16	1.25			9.000	120	16.869 0.082 1.907			Vel = 11.82
H210 to H211	23.19 22.98	5.60	24.32	1.25			10.000	120	18.858 0.091 3.972			Vel = 16.60
H211 to H212	22.98 22.77	5.60	26.81	1.25			10.000	120	22.921 0.091 6.613			Vel = 21.86
H212 to AA5	22.77 20.5	5.60	30.48	1.25	E T	3.716 7.432	3.310 11.148 14.458	120	29.625 0.983 14.964			Vel = 27.85
AA5			0.0 141.77						45.572		K Factor = 21.00	
H213 to H214	23.19 22.98	5.60	32.63	1.25			10.000	120	33.960 0.091 0.683			Vel = 6.41
H214 to H215	22.98 22.77	5.60	33.01	1.25			10.000	120	34.734 0.091 2.491			Vel = 12.90
H215 to AA6	22.77 20.5	5.60	34.21	1.25	E T	3.716 7.432	3.310 11.148 14.458	120	37.316 0.983 7.823			Vel = 19.62
AA6			0.0 99.85						46.122		K Factor = 14.70	
AA1 to AA2	20.5 + 20.5	37.17	37.16	4			11.000	120	45.233 0.0 0.005			Vel = 0.84
AA2 to AA3	20.5 20.5		140.68	4			11.000	120	45.238 0.0 0.088			Vel = 4.00
AA3 to AA4	20.5 20.5		120.22	4			4.530	120	45.326 0.0 0.095			Vel = 6.71
AA4 to AA5	20.5 + 20.5	37.17	37.16	4			5.800	120	45.421 0.0 0.151			Vel = 7.55
AA5 to AA6	20.5 20.5		335.22	4.26			5.800	0.0260	0.550			Vel = 10.74
AA6 to AA7	20.5 20.5		141.77	4			11.000	120	45.572 0.0 1.786			Vel = 12.98
AA6 to AA7	20.5 20.5		476.99	4.26			11.000	0.0500	0.550			
AA6 to AA7	20.5 20.5		99.85	4			25.160	120	46.122 0.0 1.786			Vel = 12.98

Final Calculations : Hazen-Williams

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LTX Hangar 2 - Area #2

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Equiv Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	*****	Notes	*****
AA7 to AA8	20.5 36		0.0 576.84	4 4.26	3E 39.501	66.520 39.501 106.021	120 0.0710	47.908 -6.713 7.530		Vel = 12.98	
AA8 to A1	36 36		0.0 576.84	4 4.26	E 13.167	1.080 13.167 14.247	120 0.0710	48.725 0.0 1.012		Vel = 12.98	
A1			0.0 576.84					49.737		K Factor = 81.79	
A1 to A2	36 36		576.84	4 4.26		2.750 2.750	120 0.0709	49.737 0.0 0.195		Vel = 12.98	
A2 to A3	36 36		0.0 576.84	4 4.26		11.000 11.000	120 0.0710	49.932 0.0 0.781		Vel = 12.98	
A3 to A4	36 36		0.0 576.84	4 4.26		10.330 10.330	120 0.0711	50.713 0.0 0.734		Vel = 12.98	
A4 to A5	36 36		0.0 576.84	4 4.26		11.000 11.000	120 0.0710	51.447 0.0 0.781		Vel = 12.98	
A5 to A6	36 36		0.0 576.84	4 4.26		10.330 10.330	120 0.0711	52.228 0.0 0.734		Vel = 12.98	
A6 to A7	36 36		0.0 576.84	4 4.26		11.000 11.000	120 0.0710	52.962 0.0 0.781		Vel = 12.98	
A7 to A8	36 36		0.0 576.84	4 4.26		10.330 10.330	120 0.0710	53.743 0.0 0.733		Vel = 12.98	
A8 to A9	36 36		0.0 576.84	4 4.26		11.000 11.000	120 0.0711	54.476 0.0 0.782		Vel = 12.98	
A9 to A10	36 36		0.0 576.84	4 4.26		10.330 10.330	120 0.0710	55.258 0.0 0.733		Vel = 12.98	
A10 to A11	36 36		0.0 576.84	4 4.26		11.000 11.000	120 0.0710	55.991 0.0 0.781		Vel = 12.98	
A11 to A12	36 36		0.0 576.84	4 4.26		10.330 10.330	120 0.0711	56.772 0.0 0.734		Vel = 12.98	
A12 to A13	36 36		0.0 576.84	4 4.26		11.000 11.000	120 0.0710	57.506 0.0 0.781		Vel = 12.98	
A13 to A14	36 36		0.0 576.84	4 4.26		10.330 10.330	120 0.0711	58.287 0.0 0.734		Vel = 12.98	
A14 to AX	36 36		0.0 576.84	6 6.357	T 37.72	2.250 37.720 39.970	120 0.0101	59.021 0.0 0.404		Vel = 5.83	

Final Calculations : Hazen-Williams

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LTX Hangar 2 - Area #2

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Equiv Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	*****	Notes	*****
AX			0.0 576.84					59.425		K Factor = 74.83	
AX to TOR	36 36		576.84	6 6.357	E 17.603	16.690 17.603	120	59.425 0.0			
TOR to UG	36 1		576.84	6.357	E 17.603 B 12.573	35.000 30.176	120	59.772 15.158		Vel = 5.83	
UG to HOSE	1 0		576.84	6.357	E 2F 28.468 G 6.326 T 55.354	130.000 118.616	140	75.589 6.433		* * Fixed Loss = 6	
HOSE to TEST	0 0	H250	250.00	12		350.000	140	82.547 0.0		Vel = 3.45	
TEST			0.0 826.84					82.752		K Factor = 90.89	

Job Name : Lee's Summit Municipal Airport - LTX Hangar 2

Address : 2751 NE Douglas St. - Lee's Summit, MO 64064

Date : 11/6/2024

Sprinkler Contractor : Aegis Fire Protection, LLC

Area Info : Area #3 - Office Area

Area Design : Per NFPA-13, 2016

System Type : Wet System

Design Criteria :

Density: **0.10** gpm/sq. ft. Operating Area: **1050** sq. ft.

Max. Area Per Sprinkler: **225** Total Sprinklers Operating: **9** Sprinkler K Factor: **5.6**

Outside Hose Allowance: **100**

Calculation Summary :

GPM Required : 275.16	PSI Required : 60.50	@ Base of Riser
GPM Required : 375.16	PSI Required : 67.11	@ Connection to City Main

Area Safety Margin: **33.0** PSI **33** %

Notes : **Includes Column Sprinkler Flow for Columns In Remote Area.**

Water Supply Curve

LTX Hangar 2 - Area #3

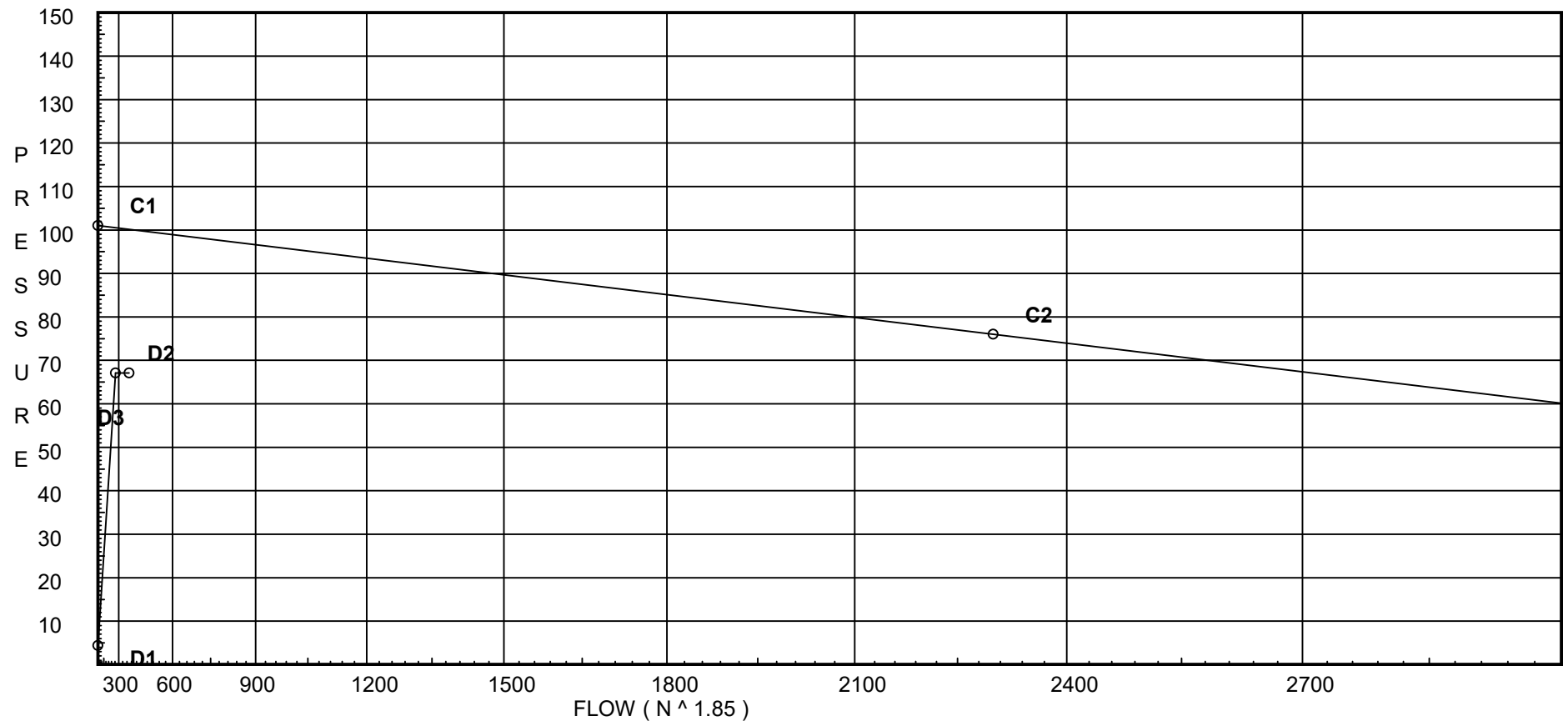
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City Water Supply:

C1 - Static Pressure : 101
C2 - Residual Pressure: 76
C2 - Residual Flow : 2300

Demand:

D1 - Elevation : 4.396
D2 - System Flow : 275.158
D2 - System Pressure : 67.115
Hose (Demand) : 100
D3 - System Demand : 375.158
Safety Margin : 33.012



Fittings Used Summary

LTX Hangar 2 - Area #3

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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
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
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

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.

LTX Hangar 2 - Area #3

SUPPLY ANALYSIS

Node at Source	Static Pressure	Residual Pressure	Flow	Available Pressure	Total Demand	Required Pressure
TEST	101.0	76	2300.0	100.127	375.16	67.115

NODE ANALYSIS

Node Tag	Elevation	Node Type	Pressure at Node	Discharge at Node	Notes	
HA1	10.0	4.2	15.32	16.44	0.25	50
AX1	10.67		15.53			
AAA	10.67		15.79	16.44		
H301	10.15	5.6	12.76	20.0	0.1	200
H302	10.15	5.6	14.24	21.13	0.1	200
301	10.67		16.17			
302	10.67		18.05			
3HB	10.67		20.13	16.44		
AAB	10.67		19.99	16.44		
H303	10.0	5.6	16.26	22.58	0.1	200
H304	10.0	5.6	17.08	23.15	0.1	200
303	10.67		20.54			
304	10.67		21.57			
H305	12.5	5.6	17.77	23.61	0.1	200
305	13.0		22.5			
H306	10.15	5.6	18.0	23.76	0.1	200
H307	10.15	5.6	18.43	24.04	0.1	200
306	10.67		22.79			
307	10.67		23.32			
H308	10.15	5.6	18.32	23.97	0.1	200
308	13.0		22.18			
H309	12.25	5.6	23.52	27.16	0.15	130
C1	10.67		24.19			
C2	10.67		24.22			
C3	10.67		24.51			
C4	10.67		24.82			
C5	10.67		24.94			
C6	10.67		25.37			
C7	10.67		40.96			
C8	10.67		45.2			
C9	24.67		43.3			
B1	36.0		42.86			
B2	36.0		42.86			
B3	36.0		42.86			
B4	36.0		42.86			
B5	36.0		42.84			
B6	36.0		42.83			
B7	36.0		42.81			
B8	36.0		42.78			
B9	36.0		42.74			
CB	24.67		47.44			
B10	24.67		47.45			

LTX Hangar 2 - Area #3

NODE ANALYSIS (cont.)

Node Tag	Elevation	Node Type	Pressure at Node	Discharge at Node	Notes
B11	24.67		47.51		
B12	24.67		47.55		
B13	24.67		47.67		
B14	24.67		47.68		
B15	24.67		47.7		
B16	24.67		47.7		
B17	24.67		47.71		
D1	36.0		43.42		
D2	36.0		43.6		
D3	36.0		43.78		
D4	36.0		43.96		
H101	42.17		40.74		
H102	42.38		40.72		
H103	42.58		40.7		
H104	42.79		40.68		
H105	42.99		40.66		
H106	42.79		40.82		
H107	42.58		40.98		
H108	42.38		41.14		
H109	42.17		41.3		
H110	42.17		40.73		
H111	42.38		40.71		
H112	42.58		40.69		
H113	42.79		40.67		
H114	42.99		40.65		
H115	42.79		40.81		
H116	42.58		40.97		
H117	42.38		41.13		
H118	42.17		41.29		
H119	42.17		40.75		
H120	42.38		40.73		
H121	42.58		40.71		
H122	42.79		40.69		
H123	42.99		40.67		
H124	42.79		40.83		
H125	42.58		40.99		
H126	42.38		41.14		
H127	42.17		41.3		
H128	42.17		40.74		
H129	42.38		40.72		
H130	42.58		40.71		
H131	42.79		40.69		
H132	42.99		40.67		
H133	42.79		40.83		
H134	42.58		40.99		
H135	42.38		41.15		
H136	42.17		41.31		
H137	42.17		40.74		
H138	42.38		40.72		
H139	42.58		40.71		
H140	42.79		40.69		

LTX Hangar 2 - Area #3

NODE ANALYSIS (cont.)

Node Tag	Elevation	Node Type	Pressure at Node	Discharge at Node	Notes
H141	42.99		40.67		
H142	42.79		40.83		
H143	42.58		40.99		
H144	42.38		41.15		
H145	42.17		41.31		
H146	42.17		40.73		
H147	42.38		40.71		
B18	24.67		47.71		
A1	36.0		44.53		
A2	36.0		44.53		
A3	36.0		44.53		
A4	36.0		44.54		
A5	36.0		44.55		
A6	36.0		44.57		
A7	36.0		44.59		
A8	36.0		44.62		
A9	36.0		44.66		
A10	36.0		44.71		
A11	36.0		44.77		
A12	36.0		44.84		
A13	36.0		44.93		
A14	36.0		45.02		
A18	36.0		45.03		
A17	36.0		45.03		
A16	36.0		45.04		
A15	36.0		45.04		
AX	36.0		45.09		
TOR	36.0		45.17		
UG	1.0		60.5		
HOSE	0.0		67.07	100.0	
TEST	0.0		67.11		

Final Calculations : Hazen-Williams

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LTX Hangar 2 - Area #3

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Equiv Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	*****	Notes	*****
HA1 to AX1	10 10.670	4.20	16.44 16.44	1 1.049	T	5.0 5.000 5.500	120 0.0905	15.322 -0.290 0.498		Vel = 6.10	
AX1			0.0 16.44					15.530		K Factor = 4.17	
AX1 to AAA	10.670 10.670		16.44 16.44	1.25 1.442	2E	7.432 5.850 7.432 13.282	120 0.0192	15.530 0.0 0.255		Vel = 3.23	
AAA to 301	10.670 + 10.67	16.44	16.44 32.88	1.25 1.442		5.600 5.600	120 0.0695	15.785 0.0 0.389		Vel = 6.46	
301			0.0 32.88					16.174		K Factor = 8.18	
H301 to 301	10.150 10.67	5.60	20.00 20.0	1 1.049	T	5.0 23.000 5.000 28.000	120 0.1301	12.755 -0.225 3.644		Vel = 7.42	
301			0.0 20.00					16.174		K Factor = 4.97	
H302 to 302	10.150 10.67	5.60	21.13 21.13	1 1.049	T	5.0 23.000 5.000 28.000	120 0.1441	14.239 -0.225 4.034		Vel = 7.84	
302			0.0 21.13					18.048		K Factor = 4.97	
301 to 302	10.67 10.67		52.88 52.88	1.25 1.442		11.230 11.230	120 0.1669	16.174 0.0 1.874		Vel = 10.39	
302 to 3HB	10.67 10.67		21.13 74.01	1.25 1.442		6.680 6.680	120 0.3111	18.048 0.0 2.078		Vel = 14.54	
3HB to C1	10.67 + 10.67	16.44	16.44 90.45	1.25 1.442	T	7.432 1.580 7.432 9.012	120 0.4506	20.126 0.0 4.061		Vel = 17.77	
C1			0.0 90.45					24.187		K Factor = 18.39	
AAB to 303	10.670 + 10.67	16.44	16.44 16.44	1.25 1.442	4E	14.864 13.600 14.864 28.464	120 0.0193	19.988 0.0 0.548		Vel = 3.23	
303			0.0 16.44					20.536		K Factor = 3.63	
H303 to 303	10 10.67	5.60	22.58 22.58	1 1.049	T	5.0 23.000 5.000 28.000	120 0.1629	16.264 -0.290 4.562		Vel = 8.38	
303			0.0 22.58					20.536		K Factor = 4.98	
H304 to 304	10 10.67	5.60	23.15 23.15	1 1.049	T	5.0 23.000 5.000 28.000	120 0.1705	17.085 -0.290 4.774		Vel = 8.59	

Final Calculations : Hazen-Williams

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LTX Hangar 2 - Area #3

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Equiv	Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	*****	Notes	*****
304			0.0 23.15						21.569		K Factor = 4.98	
303 to 304	10.67 10.67		39.02 39.02	1.25 1.442			10.860 10.860	120 0.0951	20.536 0.0 1.033		Vel = 7.67	
304 to C2	10.67 10.67		23.15 62.17	1.25 1.442	T	7.432	4.330 7.432 11.762	120 0.2252	21.569 0.0 2.649		Vel = 12.21	
C2			0.0 62.17						24.218		K Factor = 12.63	
H305 to 305	12.500 13	5.60	23.61 23.61	1 1.049	T	5.0	23.000 5.000 28.000	120 0.1769	17.770 -0.217 4.952		Vel = 8.76	
305			0.0 23.61						22.505		K Factor = 4.98	
305 to C3	13 10.67		23.61 23.61	1.25 1.442	2E T	7.432 7.432	11.570 14.864 26.434	120 0.0376	22.505 1.009 0.993		Vel = 4.64	
C3			0.0 23.61						24.507		K Factor = 4.77	
H306 to 306	10.150 10.67	5.60	23.76 23.76	1 1.049	T	5.0	23.000 5.000 28.000	120 0.1790	18.003 -0.225 5.012		Vel = 8.82	
306			0.0 23.76						22.790		K Factor = 4.98	
H307 to 307	10.150 10.67	5.60	24.04 24.04	1 1.049	T	5.0	23.000 5.000 28.000	120 0.1829	18.427 -0.225 5.120		Vel = 8.92	
307			0.0 24.04						23.322		K Factor = 4.98	
306 to 307	10.67 10.67		23.76 23.76	1.25 1.442			14.000 14.000	120 0.0380	22.790 0.0 0.532		Vel = 4.67	
307 to C4	10.67 10.67		24.04 47.8	1.25 1.442	T	7.432	3.400 7.432 10.832	120 0.1385	23.322 0.0 1.500		Vel = 9.39	
C4			0.0 47.80						24.822		K Factor = 9.59	
H308 to 308	10.150 13	5.60	23.97 23.97	1 1.049	T	5.0	23.000 5.000 28.000	120 0.1819	18.319 -1.234 5.093		Vel = 8.90	
308			0.0 23.97						22.178		K Factor = 5.09	
308 to C5	13 10.67		23.97 23.97	1.25 1.442	4E T	14.864 7.432	23.070 22.296 45.366	120 0.0386	22.178 1.009 1.752		Vel = 4.71	
			0.0									

Final Calculations : Hazen-Williams

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LTX Hangar 2 - Area #3

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Equiv	Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	*****	Notes	*****
C5			23.97						24.939		K Factor = 4.80	
H309 to C6	12.25 10.67	5.60	27.16	1.25	E T	3.716 7.432	12.730 11.148	120	23.524 0.684			
			27.16	1.442			23.878	0.0487	1.162		Vel = 5.34	
C6			0.0 27.16						25.370		K Factor = 5.39	
C1 to C2	10.67 10.67		90.45	2.5			1.300	120	24.187 0.0			
			90.45	2.635			1.300	0.0238	0.031		Vel = 5.32	
C2 to C3	10.67 10.67		62.17	2.5			4.580	120	24.218 0.0			
			152.62	2.635			4.580	0.0631	0.289		Vel = 8.98	
C3 to C4	10.67 10.67		23.61	2.5			3.840	120	24.507 0.0			
			176.23	2.635			3.840	0.0820	0.315		Vel = 10.37	
C4 to C5	10.67 10.67		47.80	2.5			0.910	120	24.822 0.0			
			224.03	2.635			0.910	0.1286	0.117		Vel = 13.18	
C5 to C6	10.67 10.67		23.97	2.5			2.790	120	24.939 0.0			
			248.0	2.635			2.790	0.1545	0.431		Vel = 14.59	
C6 to C7	10.67 10.67		27.16	2.5	2E	16.474	66.720 16.474	120	25.370 0.0			
			275.16	2.635			83.194	0.1874	15.587		Vel = 16.19	
C7 to C8	10.67 10.67		0.0	2.5	T	16.474	6.170 16.474	120	40.957 0.0			
			275.16	2.635			22.644	0.1874	4.243		Vel = 16.19	
C8 to C9	10.67 24.670		0.0	2.5	E	8.237	14.000 8.237	120	45.200 -6.063			
			275.16	2.635			22.237	0.1873	4.166		Vel = 16.19	
C9 to CB	24.670 24.67		0.0	2.5	T	16.474	5.600 16.474	120	43.303 0.0			
			275.16	2.635			22.074	0.1874	4.136		Vel = 16.19	
CB			0.0 275.16						47.439		K Factor = 39.95	
B1 to B2	36 36		-14.44	4			3.130	120	42.864 0.0			
			-14.44	4.26			3.130	0	0.0		Vel = 0.33	
B2 to B3	36 36		-14.20	4			11.000	120	42.864 0.0			
			-28.64	4.26			11.000	-0.0003	-0.003		Vel = 0.64	
B3 to B4	36 36		-14.34	4			10.330	120	42.861 0.0			
			-42.98	4.26			10.330	-0.0006	-0.006		Vel = 0.97	
B4 to B5	36 36		-14.23	4			11.000	120	42.855 0.0			
			-57.21	4.26			11.000	-0.0010	-0.011		Vel = 1.29	
B5 to B6	36 36		-14.32	4			10.330	120	42.844 0.0			
			-71.53	4.26			10.330	-0.0015	-0.015		Vel = 1.61	

Final Calculations : Hazen-Williams

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LTX Hangar 2 - Area #3

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Equiv	Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	*****	Notes	*****
B6 to B7	36 36		-14.47 -86.0	4 4.26			11.000 11.000	120 -0.0021	42.829 0.0 -0.023		Vel = 1.94	
B7 to B8	36 36		-14.68 -100.68	4 4.26			10.330 10.330	120 -0.0028	42.806 0.0 -0.029		Vel = 2.27	
B8 to B9	36 36		-14.93 -115.61	4 4.26			11.000 11.000	120 -0.0036	42.777 0.0 -0.040		Vel = 2.60	
B9 to CB	36 24.67		-15.27 -130.88	4 4.26	2E	26.334	18.620 26.334 44.954	120 -0.0046	42.737 4.907 -0.205		Vel = 2.95	
CB to B10	24.67 24.67		275.15 144.27	4 4.26			2.580 2.580	120 0.0054	47.439 0.0 0.014		Vel = 3.25	
B10 to B11	24.67 24.67		-16.01 128.26	4 4.26			13.820 13.820	120 0.0044	47.453 0.0 0.061		Vel = 2.89	
B11 to B12	24.67 24.67		-15.62 112.64	4 4.26			9.660 9.660	120 0.0034	47.514 0.0 0.033		Vel = 2.54	
B12 to B13	24.67 24.67		-15.79 96.85	4 4.26	2E	26.334	21.590 26.334 47.924	120 0.0026	47.547 0.0 0.125		Vel = 2.18	
B13 to B14	24.67 24.67		-15.64 81.21	4 4.26			4.190 4.190	120 0.0019	47.672 0.0 0.008		Vel = 1.83	
B14 to B15	24.67 24.67		-15.93 65.28	4 4.26			13.360 13.360	120 0.0013	47.680 0.0 0.017		Vel = 1.47	
B15 to B16	24.67 24.67		-16.35 48.93	4 4.26			10.280 10.280	120 0.0008	47.697 0.0 0.008		Vel = 1.10	
B16 to B17	24.67 24.67		-16.33 32.6	4 4.26			7.350 7.350	120 0.0003	47.705 0.0 0.002		Vel = 0.73	
B17 to B18	24.670 24.67		-16.29 16.31	4 4.26			6.630 6.630	120 0.0002	47.707 0.0 0.001		Vel = 0.37	
B18			0.0 16.31						47.708		K Factor = 2.36	
B1 to D1	36 36		14.44 14.44	1.5 1.682	T 2E	9.9 9.9	57.500 19.800 77.300	120 0.0072	42.864 0.0 0.553		Vel = 2.08	
D1 to D2	36 36		0.0 14.44	1.5 1.682			25.330 25.330	120 0.0071	43.417 0.0 0.181		Vel = 2.08	
D2 to D3	36 36		0.0 14.44	1.5 1.682			25.330 25.330	120 0.0071	43.598 0.0 0.180		Vel = 2.08	

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LTX Hangar 2 - Area #3

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	*****
D3 to D4	36 36		0.0 14.44	1.5 1.682			25.330 25.330	120 0.0071	43.778 0.0 0.181		Vel = 2.08	
D4 to A1	36 36		0.0 14.44	1.5 1.682	2E T	9.9 9.9	60.150 19.800 79.950	120 0.0071	43.959 0.0 0.571		Vel = 2.08	
A1			0.0 14.44						44.530		K Factor = 2.16	
B2 to H101	36 42.17		14.21 14.21	1.5 1.682	E T	4.95 9.9	64.440 14.850 79.290	120 0.0069	42.864 -2.672 0.550		Vel = 2.05	
H101 to H102	42.17 42.38		0.0 14.21	1.5 1.682			10.000 10.000	120 0.0069	40.742 -0.091 0.069		Vel = 2.05	
H102 to H103	42.38 42.58		0.0 14.21	1.5 1.682			10.000 10.000	120 0.0070	40.720 -0.087 0.070		Vel = 2.05	
H103 to H104	42.58 42.79		0.0 14.21	1.5 1.682			10.000 10.000	120 0.0070	40.703 -0.091 0.070		Vel = 2.05	
H104 to H105	42.79 42.99		0.0 14.21	1.5 1.682			10.000 10.000	120 0.0069	40.682 -0.087 0.069		Vel = 2.05	
H105 to H106	42.99 42.79		0.0 14.21	1.5 1.682			10.000 10.000	120 0.0069	40.664 0.087 0.069		Vel = 2.05	
H106 to H107	42.79 42.58		0.0 14.21	1.5 1.682			10.000 10.000	120 0.0069	40.820 0.091 0.069		Vel = 2.05	
H107 to H108	42.58 42.38		0.0 14.21	1.5 1.682			10.000 10.000	120 0.0069	40.980 0.087 0.069		Vel = 2.05	
H108 to H109	42.38 42.17		0.0 14.21	1.5 1.682			10.000 10.000	120 0.0070	41.136 0.091 0.070		Vel = 2.05	
H109 to A2	42.17 36		0.0 14.21	1.5 1.682	2T	19.799	61.150 19.799 80.949	120 0.0069	41.297 2.672 0.561		Vel = 2.05	
A2			0.0 14.21						44.530		K Factor = 2.13	
B3 to H110	36 42.17		14.33 14.33	1.5 1.682	E T	4.95 9.9	61.440 14.850 76.290	120 0.0071	42.861 -2.672 0.538		Vel = 2.07	
H110 to H111	42.17 42.38		0.0 14.33	1.5 1.682			10.000 10.000	120 0.0070	40.727 -0.091 0.070		Vel = 2.07	
H111 to H112	42.38 42.58		0.0 14.33	1.5 1.682			10.000 10.000	120 0.0071	40.706 -0.087 0.071		Vel = 2.07	

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Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Equiv Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	*****	Notes	*****
H112 to H113	42.58 42.79		0.0 14.33	1.5 1.682		10.000	120 0.0071	40.690 -0.091 0.071		Vel = 2.07	
H113 to H114	42.79 42.99		0.0 14.33	1.5 1.682		10.000	120 0.0071	40.670 -0.087 0.071		Vel = 2.07	
H114 to H115	42.99 42.79		0.0 14.33	1.5 1.682		10.000	120 0.0070	40.654 0.087 0.070		Vel = 2.07	
H115 to H116	42.79 42.58		0.0 14.33	1.5 1.682		10.000	120 0.0070	40.811 0.091 0.070		Vel = 2.07	
H116 to H117	42.58 42.38		0.0 14.33	1.5 1.682		10.000	120 0.0070	40.972 0.087 0.070		Vel = 2.07	
H117 to H118	42.38 42.17		0.0 14.33	1.5 1.682		10.000	120 0.0071	41.129 0.091 0.071		Vel = 2.07	
H118 to A3	42.17 36		0.0 14.33	1.5 1.682	2T 19.799	61.150 19.799 80.949	120 0.0071	41.291 2.672 0.571		Vel = 2.07	
A3			0.0 14.33					44.534		K Factor = 2.15	
B4 to H119	36 42.170		14.23	1.5 1.682	2T 19.799	61.440 19.799 81.239	120 0.0070	42.855 -2.672 0.565		Vel = 2.05	
H119 to H120	42.170 42.380		0.0 14.23	1.5 1.682		10.000	120 0.0070	40.748 -0.091 0.070		Vel = 2.05	
H120 to H121	42.380 42.580		0.0 14.23	1.5 1.682		10.000	120 0.0070	40.727 -0.087 0.070		Vel = 2.05	
H121 to H122	42.580 42.790		0.0 14.23	1.5 1.682		10.000	120 0.0069	40.710 -0.091 0.069		Vel = 2.05	
H122 to H123	42.790 42.99		0.0 14.23	1.5 1.682		10.000	120 0.0070	40.688 -0.087 0.070		Vel = 2.05	
H123 to H124	42.99 42.79		0.0 14.23	1.5 1.682		10.000	120 0.0069	40.671 0.087 0.069		Vel = 2.05	
H124 to H125	42.79 42.58		0.0 14.23	1.5 1.682		10.000	120 0.0070	40.827 0.091 0.070		Vel = 2.05	
H125 to H126	42.58 42.38		0.0 14.23	1.5 1.682		10.000	120 0.0069	40.988 0.087 0.069		Vel = 2.05	
H126 to H127	42.38 42.17		0.0 14.23	1.5 1.682		10.000	120 0.0069	41.144 0.091 0.069		Vel = 2.05	

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Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Equiv Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	*****	Notes	*****
H127 to A4	42.17 36		0.0 14.23	1.5 1.682	2T 19.799	61.150 19.799 80.949	120 0.0070	41.304 2.672 0.564	Vel = 2.05		
A4			0.0 14.23					44.540	K Factor = 2.13		
B5 to H128	36 42.17		14.33 14.33	1.5 1.682	2T 19.799	61.440 19.799 81.239	120 0.0070	42.844 -2.672 0.572	Vel = 2.07		
H128 to H129	42.17 42.38		0.0 14.33	1.5 1.682		10.000 10.000	120 0.0071	40.744 -0.091 0.071	Vel = 2.07		
H129 to H130	42.38 42.58		0.0 14.33	1.5 1.682		10.000 10.000	120 0.0071	40.724 -0.087 0.071	Vel = 2.07		
H130 to H131	42.58 42.79		0.0 14.33	1.5 1.682		10.000 10.000	120 0.0070	40.708 -0.091 0.070	Vel = 2.07		
H131 to H132	42.79 42.99		0.0 14.33	1.5 1.682		10.000 10.000	120 0.0071	40.687 -0.087 0.071	Vel = 2.07		
H132 to H133	42.99 42.79		0.0 14.33	1.5 1.682		10.000 10.000	120 0.0070	40.671 0.087 0.070	Vel = 2.07		
H133 to H134	42.79 42.58		0.0 14.33	1.5 1.682		10.000 10.000	120 0.0071	40.828 0.091 0.071	Vel = 2.07		
H134 to H135	42.58 42.38		0.0 14.33	1.5 1.682		10.000 10.000	120 0.0069	40.990 0.087 0.069	Vel = 2.07		
H135 to H136	42.38 42.17		0.0 14.33	1.5 1.682		10.000 10.000	120 0.0071	41.146 0.091 0.071	Vel = 2.07		
H136 to A5	42.17 36		0.0 14.33	1.5 1.682	2T 19.799	61.150 19.799 80.949	120 0.0070	41.308 2.672 0.570	Vel = 2.07		
A5			0.0 14.33					44.550	K Factor = 2.15		
B6 to H137	36 42.17		14.47 14.47	1.5 1.682	2T 19.799	61.440 19.799 81.239	120 0.0072	42.829 -2.672 0.582	Vel = 2.09		
H137 to H138	42.17 42.38		0.0 14.47	1.5 1.682		10.000 10.000	120 0.0072	40.739 -0.091 0.072	Vel = 2.09		
H138 to H139	42.38 42.58		0.0 14.47	1.5 1.682		10.000 10.000	120 0.0072	40.720 -0.087 0.072	Vel = 2.09		
H139 to H140	42.58 42.79		0.0 14.47	1.5 1.682		10.000 10.000	120 0.0072	40.705 -0.091 0.072	Vel = 2.09		

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LTX Hangar 2 - Area #3

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Equiv	Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	*****	Notes	*****
H140 to H141	42.79 42.99		0.0 14.47	1.5 1.682			10.000 10.000	120 0.0072	40.686 -0.087 0.072		Vel = 2.09	
H141 to H142	42.99 42.79		0.0 14.47	1.5 1.682			10.000 10.000	120 0.0071	40.671 0.087 0.071		Vel = 2.09	
H142 to H143	42.79 42.58		0.0 14.47	1.5 1.682			10.000 10.000	120 0.0072	40.829 0.091 0.072		Vel = 2.09	
H143 to H144	42.58 42.38		0.0 14.47	1.5 1.682			10.000 10.000	120 0.0071	40.992 0.087 0.071		Vel = 2.09	
H144 to H145	42.38 42.17		0.0 14.47	1.5 1.682			10.000 10.000	120 0.0072	41.150 0.091 0.072		Vel = 2.09	
H145 to A6	42.17 36		0.0 14.47	1.5 1.682	2T	19.799	61.150 19.799 80.949	120 0.0072	41.313 2.672 0.581		Vel = 2.09	
A6			0.0 14.47						44.566		K Factor = 2.17	
B7 to H146	36 42.17		14.67 14.67	1.5 1.682	2T	19.799	61.440 19.799 81.239	120 0.0074	42.806 -2.672 0.598		Vel = 2.12	
H146 to H147	42.17 42.38		0.0 14.67	1.5 1.682			10.000 10.000	120 0.0073	40.732 -0.091 0.073		Vel = 2.12	
H147 to A7	42.38 36		0.0 14.67	1.5 1.682	2T	19.799	131.150 19.799 150.949	120 0.0074	40.714 2.763 1.112		Vel = 2.12	
A7			0.0 14.67						44.589		K Factor = 2.20	
B8 to A8	36 36		14.93 14.93	1.5 1.682	4T	39.599	202.590 39.599 242.189	120 0.0076	42.777 0.0 1.841		Vel = 2.16	
A8			0.0 14.93						44.618		K Factor = 2.24	
B9 to A9	36 36		15.28 15.28	1.5 1.682	4T	39.599	202.590 39.599 242.189	120 0.0079	42.737 0.0 1.921		Vel = 2.21	
A9			0.0 15.28						44.658		K Factor = 2.29	
B10 to A10	24.670 36		16.02 16.02	1.5 1.682	3T 3E	29.699 14.849	204.950 44.548 249.498	120 0.0087	47.453 -4.907 2.159		Vel = 2.31	
A10			0.0 16.02						44.705		K Factor = 2.40	
B11 to A11	24.670 36		15.62 15.62	1.5 1.682	3T 3E	29.699 14.849	216.840 44.548 261.388	120 0.0083	47.514 -4.907 2.160		Vel = 2.26	

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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	*****
A11			0.0 15.62						44.767		K Factor = 2.33	
B12 to A12	24.670 36		15.79 15.79	1.5 1.682	3T 3E	29.699 14.849	216.180 44.548	120 0.0084	47.547 -4.907 2.198			Vel = 2.28
A12			0.0 15.79						44.838		K Factor = 2.36	
B13 to A13	24.670 36		15.64 15.64	1.5 1.682	3T 5E	29.699 24.749	206.440 54.448	120 0.0083	47.672 -4.907 2.162			Vel = 2.26
A13			0.0 15.64						44.927		K Factor = 2.33	
B14 to A14	24.670 36		15.93 15.93	1.5 1.682	3T 5E	29.699 24.749	208.380 54.448	120 0.0086	47.680 -4.907 2.251			Vel = 2.30
A14			0.0 15.93						45.024		K Factor = 2.37	
B15 to A15	24.670 36		16.35 16.35	1.5 1.682	3T 3E	29.699 14.849	205.990 44.548	120 0.0090	47.697 -4.907 2.252			Vel = 2.36
A15			0.0 16.35						45.042		K Factor = 2.44	
B16 to A16	24.670 36		16.33 16.33	1.5 1.682	3T 3E	29.699 14.849	204.770 44.548	120 0.0090	47.705 -4.907 2.238			Vel = 2.36
A16			0.0 16.33						45.036		K Factor = 2.43	
B17 to A17	24.670 36		16.29 16.29	1.5 1.682	3T 3E	29.699 14.849	205.420 44.548	120 0.0089	47.707 -4.907 2.233			Vel = 2.35
A17			0.0 16.29						45.033		K Factor = 2.43	
B18 to A18	24.67 36		16.31 16.31	1.5 1.682	3T 3E	29.699 14.849	204.780 44.548	120 0.0089	47.708 -4.907 2.231			Vel = 2.36
A18			0.0 16.31						45.032		K Factor = 2.43	
A1 to A2	36 36		14.44 14.44	4 4.26			2.750 2.750	120 0	44.530 0.0 0.0			Vel = 0.33
A2 to A3	36 36		14.20 28.64	4 4.26			11.000 11.000	120 0.0004	44.530 0.0 0.004			Vel = 0.64
A3 to A4	36 36		14.34 42.98	4 4.26			10.330 10.330	120 0.0006	44.534 0.0 0.006			Vel = 0.97
A4 to A5	36 36		14.23 57.21	4 4.26			11.000 11.000	120 0.0009	44.540 0.0 0.010			Vel = 1.29

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Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Equiv Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	*****	Notes	*****
A5 to A6	36 36		14.32 71.53	4 4.26		10.330 10.330	120 0.0015	44.550 0.0 0.016		Vel = 1.61	
A6 to A7	36 36		14.47 86.0	4 4.26		11.000 11.000	120 0.0021	44.566 0.0 0.023		Vel = 1.94	
A7 to A8	36 36		14.68 100.68	4 4.26		10.330 10.330	120 0.0028	44.589 0.0 0.029		Vel = 2.27	
A8 to A9	36 36		14.93 115.61	4 4.26		11.000 11.000	120 0.0036	44.618 0.0 0.040		Vel = 2.60	
A9 to A10	36 36		15.27 130.88	4 4.26		10.330 10.330	120 0.0045	44.658 0.0 0.047		Vel = 2.95	
A10 to A11	36 36		16.02 146.9	4 4.26		11.000 11.000	120 0.0056	44.705 0.0 0.062		Vel = 3.31	
A11 to A12	36 36		15.62 162.52	4 4.26		10.330 10.330	120 0.0069	44.767 0.0 0.071		Vel = 3.66	
A12 to A13	36 36		15.79 178.31	4 4.26		11.000 11.000	120 0.0081	44.838 0.0 0.089		Vel = 4.01	
A13 to A14	36 36		15.64 193.95	4 4.26		10.330 10.330	120 0.0094	44.927 0.0 0.097		Vel = 4.37	
A14 to AX	36 36		15.93 209.88	6 6.357	T 37.72	2.250 37.720 39.970	120 0.0016	45.024 0.0 0.063		Vel = 2.12	
AX			0.0 209.88					45.087		K Factor = 31.26	
A18 to A17	36 36		16.31 16.31	4 4.26		5.980 5.980	120 0.0002	45.032 0.0 0.001		Vel = 0.37	
A17 to A16	36 36		16.29 32.6	4 4.26		8.000 8.000	120 0.0004	45.033 0.0 0.003		Vel = 0.73	
A16 to A15	36 36		16.33 48.93	4 4.26		9.080 9.080	120 0.0007	45.036 0.0 0.006		Vel = 1.10	
A15 to AX	36 36		16.35 65.28	4 4.26	T 26.334	8.750 26.334 35.084	120 0.0013	45.042 0.0 0.045		Vel = 1.47	
AX			0.0 65.28					45.087		K Factor = 9.72	
AX to TOR	36 36		275.16 275.16	6 6.357	E 17.603	16.690 17.603 34.293	120 0.0026	45.087 0.0 0.088		Vel = 2.78	

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Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Equiv Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	*****	Notes	*****
TOR to UG	36 1		0.0 275.16	6 6.357	E B	17.603 12.573	35.000 30.176	120 15.158			
UG to HOSE	1 0		0.0 275.16	8 8.27	E 2F G T	28.468 28.468 6.326 55.354	130.000 118.616 248.616	140 60.501 6.433 0.133	Vel = 2.78	** Fixed Loss = 6	Vel = 1.64
HOSE to TEST	0 0	H100	100.00 375.16	12 12.34		350.000 350.000	140 0.0001	67.067 0.0 0.048		Vel = 1.01	
TEST			0.0 375.16					67.115		K Factor = 45.79	