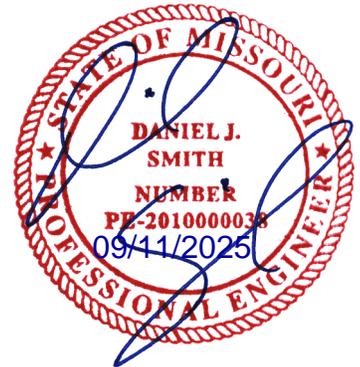


HYDRAULIC CALCULATIONS
for

JOB NAME Lees Summit Hyundai
Location 1231 NW Ward Rd. Lee's Summit, MO. 64086
Drawing # FP2
Contract #
Date 09-05-2025



DESIGN

Remote area # 1
Remote area location Showroom
Occupancy classification Ordinary Hazard Group I
Density 0.15 - Gpm/SqFt
Area of application 1655 - SqFt
Coverage/sprinkler 400 - SqFt
Type of sprinkler calculated QR EC Pendent
Sprinklers calculated 6
In-rack demand n/a - GPM
Hose streams 250 - GPM
Total water required (including hose streams) 623.498 - GPM @ 87.908 - Psi
Type of system Wet
Volume of system (dry or pre-action) n/a - Gal

WATER SUPPLY INFORMATION

Test date 08-27-2024
Location 1231 Nw Ward Road Lee's Summit, MO.
Source of info Fire Department

CONTRACTOR INFO

Phoenix Fire, LLC.
Address 1849 S. 14th ST Kansas City, KS 66103
Phone # 816-838-1996
Name of designer D.J.S.
Authority having jurisdiction

NOTES:

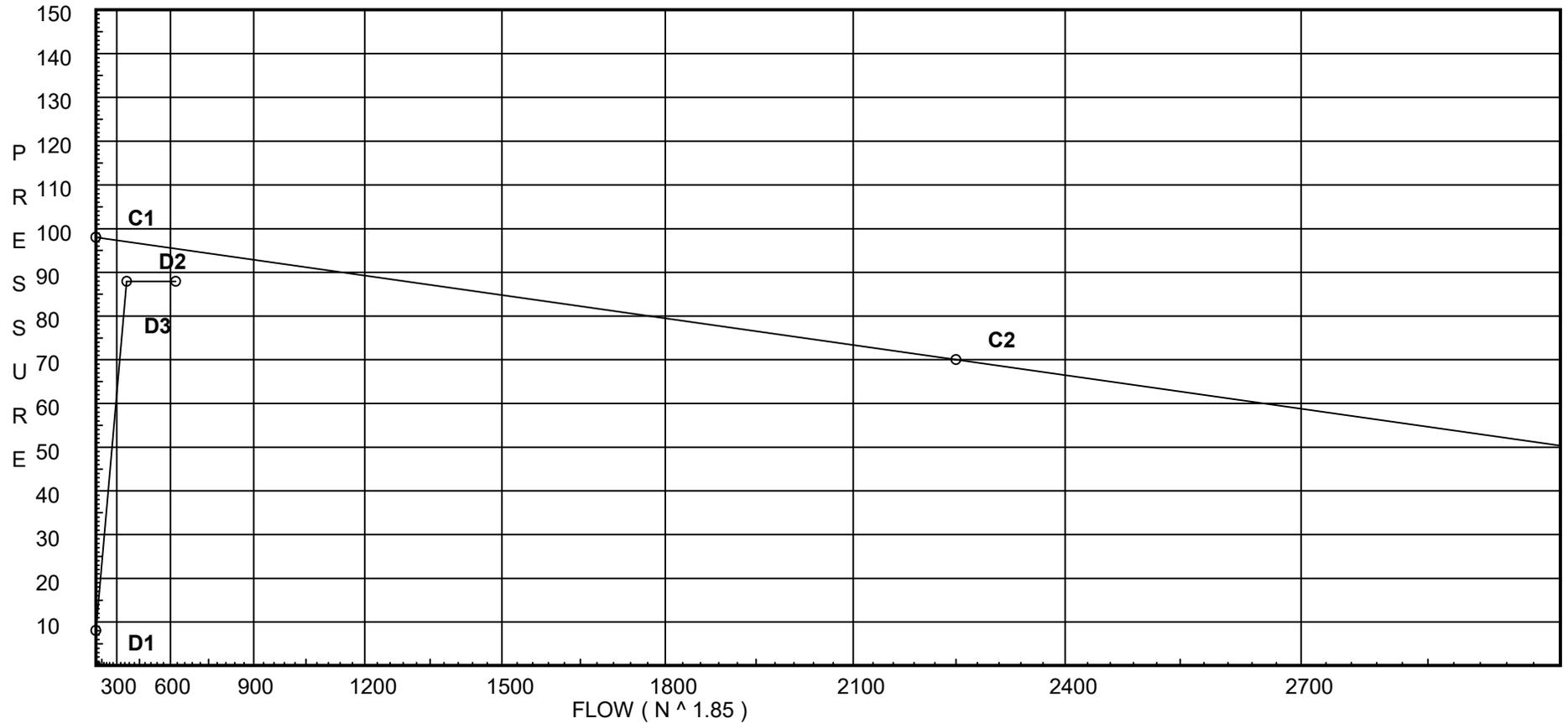
Water Supply Curve

Your Company Name
LATEST Lees Summit Hyundai

Page 2
Date 09-05-2025

City Water Supply:
C1 - Static Pressure : 98
C2 - Residual Pressure: 70
C2 - Residual Flow : 2250

Demand:
D1 - Elevation : 8.086
D2 - System Flow : 373.498
D2 - System Pressure : 87.908
Hose (Demand) : 250
D3 - System Demand : 623.498
Safety Margin : 7.485



Fittings Used Summary

Your Company Name
LATEST Lees Summit Hyundai

Page 3
Date 09-05-2025

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	0	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61
F	NFPA 13 45' Elbow	0	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
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
V	Vic 90' Firelock Ell #001	0	0	0	2.00	2.63	3.5	4.4	5	0	6.88	8.5	10	13	17	20	0	0	0	0	0
X	Vic 90' Firelock Tee #002 Branch	0	0	0	7.5	6.63	8.5	10.9	13	0	16	21	25	33	41	50	0	0	0	0	0
Zac	Ames 2000SS	Fitting generates a Fixed Loss Based on Flow																			

Units Summary

Diameter Units Inches
 Length Units Feet
 Flow Units US Gallons per Minute
 Pressure Units Pounds per Square Inch

Note: Fitting Legend provides equivalent pipe lengths for fittings types of various diameters. Equivalent lengths shown are standard for actual diameters of Sched 40 pipe and CFactors of 120 except as noted with *. The fittings marked with a * show equivalent lengths values supplied by manufacturers based on specific pipe diameters and CFactors and they require no adjustment. All values for fittings not marked with a * will be adjusted in the calculation for CFactors of other than 120 and diameters other than Sched 40 per NFPA.

Flow Summary - NFPA

Your Company Name
LATEST Lees Summit Hyundai

Page 4
Date 09-05-2025

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	98.0	70	2250.0	95.393	623.5	87.908

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>
DP01	14.0	11.2	28.7	60.0	0.15 400
EQ01	18.67		33.3		
DP02	18.0	11.2	28.7	60.0	0.15 400
EQ02	18.67		31.06		
1	18.67	10.4	34.25	60.85	K=K @ EQ01
2	18.67		37.28		
3	18.67		39.23		
4	18.67		43.79		
5	18.67		61.88		
6	18.67		62.06		
7	9.67		69.7		
8	9.67		70.24		
9	9.67		70.93		
TOR	9.67		72.88		
BOR	0.0		77.68		
UG	0.0		78.77	250.0	
HOSE	0.0		80.45		
BFP	0.0		85.43		
TEST	0.0		87.91		
10	18.67	10.4	33.3	60.0	K=K @ EQ01
11	18.67	10.77	37.31	65.76	K=K @ EQ02
12	18.67	10.4	34.35	60.94	K=K @ EQ01
13	18.67		37.39		
14	18.67		39.35		
15	18.67		43.91		
16	18.67	10.4	33.4	60.09	K=K @ EQ01
17	18.67	10.77	37.42	65.86	K=K @ EQ02
18	9.67		70.01		
19	16.82		67.12		
20	16.82		67.15		
21	16.82		67.19		
22	16.82		67.22		
23	16.82		67.24		
24	16.82		67.25		
25	16.82		67.26		
26	16.82		67.27		
27	16.82		67.27		
28	16.82		67.27		
29	16.82		67.27		
30	18.99		66.36		
31	20.35		65.97		
32	17.93		67.04		

Flow Summary - NFPA

Your Company Name
LATEST Lees Summit Hyundai

Page 5
Date 09-05-2025

NODE ANALYSIS (cont.)

<i>Node Tag</i>	<i>Elevation</i>	<i>Node Type</i>	<i>Pressure at Node</i>	<i>Discharge at Node</i>	<i>Notes</i>
33	17.93		67.04		
34	17.93		67.04		
35	17.93		67.05		
36	17.93		67.06		
37	17.93		67.07		
38	17.93		67.08		
39	17.93		67.1		
40	17.93		67.12		
41	17.93		67.16		
42	17.93		67.2		
43	18.98		66.24		
44	20.35		66.09		
45	18.98		66.26		
46	20.35		66.07		
47	18.98		66.3		
48	20.35		66.03		
49	18.98		66.32		
50	20.35		66.01		
51	18.98		66.33		
52	20.35		66.0		
53	18.98		66.34		
54	20.35		65.99		
55	18.98		66.35		
56	20.35		65.98		
57	18.99		66.35		
58	20.35		65.97		
59	18.99		66.36		
60	20.35		65.97		
61	18.99		66.36		
62	20.35		65.97		

Final Calculations : Hazen-Williams

Your Company Name
LATEST Lees Summit Hyundai

Page 6
Date 09-05-2025

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 to EQ01	14 18.67	11.20	60.00 60.0	1 1.049	E	2.0	4.670 2.000 6.670	120	28.700 -2.023 6.626		Vel = 22.27	
EQ01			0.0 60.00						33.303		K Factor = 10.40	
DP02 to EQ02	18 18.67	11.20	60.00 60.0	1 1.049	E	2.0	0.670 2.000 2.670	120	28.700 -0.290 2.652		Vel = 22.27	
EQ02			0.0 60.00						31.062		K Factor = 10.77	
1 to 2	18.67 18.67	10.4	60.85 60.85	1 1.049	E	2.0	0.970 2.000 2.970	120	34.250 0.0 3.028		K = K @ EQ01 Vel = 22.59	
2 to 3	18.67 18.67		0.0 60.85	1.5 1.682			19.110 19.110	120	37.278 0.0 1.954		Vel = 8.79	
3 to 4	18.67 18.67		60.00 120.85	1.5 1.682			12.510 12.510	120	39.232 0.0 4.553		Vel = 17.45	
4 to 5	18.67 18.67		65.76 186.61	1.5 1.682	T	9.9	12.360 9.900 22.260	120	43.785 0.0 18.099		Vel = 26.94	
5 to 6	18.67 18.67		0.0 186.61	4 4.26			20.000 20.000	120	61.884 0.0 0.176		Vel = 4.20	
6 to 7	18.67 9.67		186.89 373.5	4 4.26	3V X	27.177 21.067	69.860 48.244 118.104	120	62.060 3.898 3.743		Vel = 8.41	
7 to 8	9.67 9.67		-70.28 303.22	4 4.26			25.130 25.130	120	69.701 0.0 0.543		Vel = 6.83	
8 to 9	9.67 9.670		0.0 303.22	4 4.26	X	21.067	10.660 21.067 31.727	120	70.244 0.0 0.686		Vel = 6.83	
9 to TOR	9.670 9.670		70.28 373.5	4 4.26	X 2V	21.067 18.118	22.360 39.185 61.545	120	70.930 0.0 1.949		Vel = 8.41	
TOR to BOR	9.670 0		0.0 373.5	4 4.26	B	15.8	3.580 15.800 19.380	120	72.879 4.188 0.616		Vel = 8.41	
BOR to UG	0 0		0.0 373.5	4 4.26	S	28.968	5.083 28.968 34.051	120	77.683 0.0 1.082		Vel = 8.41	
UG to HOSE	0 0	H250	250.00 623.5	6 6.16	2F	20.084	145.000 20.084 165.084	140	78.765 0.0 1.690		Vel = 6.71	
HOSE to BFP	0 0		0.0 623.5	6 6.16	F Zac	10.042 0.0	170.000 10.042 180.042	140	80.455 3.131 1.842		** Fixed Loss = 3.131 Vel = 6.71	

Final Calculations : Hazen-Williams

Your Company Name
LATEST Lees Summit Hyundai

Page 7
Date 09-05-2025

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	*****
BFP to TEST	0 0		0.0 623.5	6 6.16	T G E	43.037 4.304 20.084	175.000 67.425 242.425	140 0.0102	85.428 0.0 2.480		Vel = 6.71	
TEST			0.0 623.50						87.908		K Factor = 66.50	
10 to 3	18.67 18.67	10.4	60.00 60.0	1 1.049	T E	5.0	0.970 5.000 5.970	120 0.9931	33.303 0.0 5.929		K = K @ EQ01 Vel = 22.27	
3			0.0 60.00						39.232		K Factor = 9.58	
11 to 4	18.67 18.67	10.77	65.76 65.76	1 1.049	T E	5.0	0.500 5.000 5.500	120 1.1767	37.313 0.0 6.472		K = K @ EQ02 Vel = 24.41	
4			0.0 65.76						43.785		K Factor = 9.94	
12 to 13	18.67 18.67	10.4	60.94 60.94	1 1.049	E E	2.0	0.970 2.000 2.970	120 1.0222	34.351 0.0 3.036		K = K @ EQ01 Vel = 22.62	
13 to 14	18.67 18.67		0.0 60.94	1.5 1.682			19.110 19.110	120 0.1026	37.387 0.0 1.960		Vel = 8.80	
14 to 15	18.67 18.67		60.09 121.03	1.5 1.682			12.510 12.510	120 0.3649	39.347 0.0 4.565		Vel = 17.48	
15 to 6	18.67 18.67		65.86 186.89	1.5 1.682	T E	9.9	12.360 9.900 22.260	120 0.8153	43.912 0.0 18.148		Vel = 26.99	
6			0.0 186.89						62.060		K Factor = 23.72	
16 to 14	18.67 18.67	10.4	60.09 60.09	1 1.049	T E	5.0	0.970 5.000 5.970	120 0.9960	33.401 0.0 5.946		K = K @ EQ01 Vel = 22.31	
14			0.0 60.09						39.347		K Factor = 9.58	
17 to 15	18.67 18.67	10.77	65.86 65.86	1 1.049	T E	5.0	0.500 5.000 5.500	120 1.1800	37.422 0.0 6.490		K = K @ EQ02 Vel = 24.45	
15			0.0 65.86						43.912		K Factor = 9.94	
7 to 18	9.67 9.67		70.28 70.28	3 3.26	X E	17.471	40.100 17.471 57.571	120 0.0053	69.701 0.0 0.307		Vel = 2.70	
18 to 19	9.67 16.82		0.0 70.28	3 3.26	2V E	13.44	25.320 13.440 38.760	120 0.0053	70.008 -3.097 0.206		Vel = 2.70	
19 to 20	16.82 16.82		-8.47 61.81	3 3.26			8.020 8.020	120 0.0042	67.117 0.0 0.034		Vel = 2.38	

Final Calculations : Hazen-Williams

Your Company Name
LATEST Lees Summit Hyundai

Page 8
Date 09-05-2025

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	*****
20 to 21	16.82 16.82		-7.89 53.92	3 3.26			13.500 13.500	120 0.0033	67.151 0.0 0.044		Vel = 2.07	
21 to 22	16.82 16.82		-7.11 46.81	3 3.26			9.450 9.450	120 0.0024	67.195 0.0 0.023		Vel = 1.80	
22 to 23	16.82 16.82		-6.64 40.17	3 3.26			9.250 9.250	120 0.0019	67.218 0.0 0.018		Vel = 1.54	
23 to 24	16.82 16.82		-6.28 33.89	3 3.26			8.420 8.420	120 0.0014	67.236 0.0 0.012		Vel = 1.30	
24 to 25	16.82 16.82		-6.04 27.85	3 3.26			10.960 10.960	120 0.0009	67.248 0.0 0.010		Vel = 1.07	
25 to 26	16.82 16.82		-5.80 22.05	3 3.26			13.500 13.500	120 0.0006	67.258 0.0 0.008		Vel = 0.85	
26 to 27	16.82 16.82		-5.61 16.44	3 3.26			11.540 11.540	120 0.0004	67.266 0.0 0.005		Vel = 0.63	
27 to 28	16.82 16.82		-5.52 10.92	3 3.26			11.250 11.250	120 0.0002	67.271 0.0 0.002		Vel = 0.42	
28 to 29	16.82 16.82		-5.46 5.46	3 3.26			11.250 11.250	120 0	67.273 0.0 0.0		Vel = 0.21	
29 to 30	16.82 18.99		0.0 5.46	1.25 1.442	T	7.432	2.170 7.432 9.602	120 0.0025	67.273 -0.940 0.024		Vel = 1.07	
30 to 31	18.99 20.35		0.0 5.46	1.25 1.442	2T	14.864	65.250 14.864 80.114	120 0.0025	66.357 -0.589 0.200		Vel = 1.07	
31 to 32	20.35 17.93		0.0 5.46	1.25 1.442	T	7.432	2.420 7.432 9.852	120 0.0025	65.968 1.048 0.025		Vel = 1.07	
32 to 33	17.93 17.93		0.0 5.46	3 3.26			11.250 11.250	120 0.0001	67.041 0.0 0.001		Vel = 0.21	
33 to 34	17.93 17.93		5.46 10.92	3 3.26			11.250 11.250	120 0.0002	67.042 0.0 0.002		Vel = 0.42	
34 to 35	17.93 17.93		5.52 16.44	3 3.26			11.540 11.540	120 0.0003	67.044 0.0 0.004		Vel = 0.63	
35 to 36	17.93 17.93		5.61 22.05	3 3.26			13.500 13.500	120 0.0006	67.048 0.0 0.008		Vel = 0.85	

Final Calculations : Hazen-Williams

Your Company Name
LATEST Lees Summit Hyundai

Page 9
Date 09-05-2025

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	*****
36 to 37	17.93 17.93		5.80 27.85	3 3.26			10.960 10.960	120 0.0010	67.056 0.0 0.011			Vel = 1.07
37 to 38	17.93 17.93		6.04 33.89	3 3.26			8.420 8.420	120 0.0013	67.067 0.0 0.011			Vel = 1.30
38 to 39	17.93 17.93		6.28 40.17	3 3.26			9.250 9.250	120 0.0019	67.078 0.0 0.018			Vel = 1.54
39 to 40	17.93 17.93		6.64 46.81	3 3.26			9.450 9.450	120 0.0024	67.096 0.0 0.023			Vel = 1.80
40 to 41	17.93 17.93		7.11 53.92	3 3.26			13.500 13.500	120 0.0033	67.119 0.0 0.044			Vel = 2.07
41 to 42	17.93 17.93		7.89 61.81	3 3.26			8.020 8.020	120 0.0042	67.163 0.0 0.034			Vel = 2.38
42 to 9	17.93 9.670		8.47 70.28	3 3.26	2V	13.44	15.790 13.440 29.230	120 0.0053	67.197 3.577 0.156			Vel = 2.70
9			0.0 70.28						70.930			K Factor = 8.34
19 to 43	16.82 18.98		8.47 8.47	1.25 1.442	T	7.432	2.170 7.432 9.602	120 0.0056	67.117 -0.935 0.054			Vel = 1.66
43 to 44	18.98 20.35		0.0 8.47	1.25 1.442	2T	14.864	65.230 14.864 80.094	120 0.0056	66.236 -0.593 0.451			Vel = 1.66
44 to 42	20.35 17.93		0.0 8.47	1.25 1.442	T	7.432	2.420 7.432 9.852	120 0.0056	66.094 1.048 0.055			Vel = 1.66
42			0.0 8.47						67.197			K Factor = 1.03
20 to 45	16.82 18.98		7.90 7.9	1.25 1.442	T	7.432	2.170 7.432 9.602	120 0.0049	67.151 -0.935 0.047			Vel = 1.55
45 to 46	18.98 20.35		0.0 7.9	1.25 1.442	2T	14.864	65.260 14.864 80.124	120 0.0049	66.263 -0.593 0.396			Vel = 1.55
46 to 41	20.35 17.93		0.0 7.9	1.25 1.442	T	7.432	2.420 7.432 9.852	120 0.0050	66.066 1.048 0.049			Vel = 1.55
41			0.0 7.90						67.163			K Factor = 0.96
21 to 47	16.82 18.98		7.10 7.1	1.25 1.442	T	7.432	2.170 7.432 9.602	120 0.0040	67.195 -0.935 0.038			Vel = 1.39

Final Calculations : Hazen-Williams

Your Company Name
LATEST Lees Summit Hyundai

Page 10
Date 09-05-2025

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	*****
47 to 48	18.98 20.35		0.0 7.1	1.25 1.442	2T	14.864	65.260 14.864 80.124	120 0.0041	66.298 -0.593 0.326		Vel = 1.39	
48 to 40	20.35 17.93		0.0 7.1	1.25 1.442	T	7.432	2.420 7.432 9.852	120 0.0041	66.031 1.048 0.040		Vel = 1.39	
40			0.0 7.10						67.119		K Factor = 0.87	
22 to 49	16.82 18.98		6.64 6.64	1.25 1.442	T	7.432	2.170 7.432 9.602	120 0.0036	67.218 -0.935 0.035		Vel = 1.30	
49 to 50	18.98 20.35		0.0 6.64	1.25 1.442	2T	14.864	65.250 14.864 80.114	120 0.0036	66.318 -0.593 0.287		Vel = 1.30	
50 to 39	20.35 17.93		0.0 6.64	1.25 1.442	T	7.432	2.420 7.432 9.852	120 0.0037	66.012 1.048 0.036		Vel = 1.30	
39			0.0 6.64						67.096		K Factor = 0.81	
23 to 51	16.82 18.98		6.28 6.28	1.25 1.442	T	7.432	2.170 7.432 9.602	120 0.0032	67.236 -0.935 0.031		Vel = 1.23	
51 to 52	18.98 20.35		0.0 6.28	1.25 1.442	2T	14.864	65.250 14.864 80.114	120 0.0032	66.332 -0.593 0.259		Vel = 1.23	
52 to 38	20.35 17.93		0.0 6.28	1.25 1.442	T	7.432	2.420 7.432 9.852	120 0.0032	65.998 1.048 0.032		Vel = 1.23	
38			0.0 6.28						67.078		K Factor = 0.77	
24 to 53	16.82 18.98		6.04 6.04	1.25 1.442	T	7.432	2.170 7.432 9.602	120 0.0029	67.248 -0.935 0.028		Vel = 1.19	
53 to 54	18.98 20.35		0.0 6.04	1.25 1.442	2T	14.864	65.250 14.864 80.114	120 0.0030	66.341 -0.593 0.241		Vel = 1.19	
54 to 37	20.35 17.93		0.0 6.04	1.25 1.442	T	7.432	2.420 7.432 9.852	120 0.0030	65.989 1.048 0.030		Vel = 1.19	
37			0.0 6.04						67.067		K Factor = 0.74	
25 to 55	16.82 18.98		5.80 5.8	1.25 1.442	T	7.432	2.170 7.432 9.602	120 0.0028	67.258 -0.935 0.027		Vel = 1.14	
55 to 56	18.98 20.35		0.0 5.8	1.25 1.442	2T	14.864	65.240 14.864 80.104	120 0.0028	66.350 -0.593 0.223		Vel = 1.14	

Final Calculations : Hazen-Williams

Your Company Name
LATEST Lees Summit Hyundai

Page 11
Date 09-05-2025

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	*****
56 to 36	20.35 17.93		0.0 5.8	1.25 1.442	T	7.432	2.420 7.432 9.852	120	65.980 1.048 0.028		Vel = 1.14	
36			0.0 5.80						67.056		K Factor = 0.71	
26 to 57	16.82 18.99		5.61 5.61	1.25 1.442	T	7.432	2.170 7.432 9.602	120	67.266 -0.940 0.026		Vel = 1.10	
57 to 58	18.99 20.35		0.0 5.61	1.25 1.442	2T	14.864	65.240 14.864 80.104	120	66.352 -0.589 0.211		Vel = 1.10	
58 to 35	20.35 17.93		0.0 5.61	1.25 1.442	T	7.432	2.420 7.432 9.852	120	65.974 1.048 0.026		Vel = 1.10	
35			0.0 5.61						67.048		K Factor = 0.69	
27 to 59	16.82 18.99		5.51 5.51	1.25 1.442	T	7.432	2.170 7.432 9.602	120	67.271 -0.940 0.024		Vel = 1.08	
59 to 60	18.99 20.35		0.0 5.51	1.25 1.442	2T	14.864	65.240 14.864 80.104	120	66.355 -0.589 0.204		Vel = 1.08	
60 to 34	20.35 17.93		0.0 5.51	1.25 1.442	T	7.432	2.420 7.432 9.852	120	65.970 1.048 0.026		Vel = 1.08	
34			0.0 5.51						67.044		K Factor = 0.67	
28 to 61	16.82 18.99		5.47 5.47	1.25 1.442	T	7.432	2.170 7.432 9.602	120	67.273 -0.940 0.024		Vel = 1.07	
61 to 62	18.99 20.35		0.0 5.47	1.25 1.442	2T	14.864	65.240 14.864 80.104	120	66.357 -0.589 0.201		Vel = 1.07	
62 to 33	20.35 17.93		0.0 5.47	1.25 1.442	T	7.432	2.420 7.432 9.852	120	65.969 1.048 0.025		Vel = 1.07	
33			0.0 5.47						67.042		K Factor = 0.67	

HYDRAULIC CALCULATIONS
for

JOB NAME Lees Summit Hyundai
Location 1231 NW Ward Rd. Lee's Summit, MO. 64086
Drawing # FP2
Contract #
Date 09-05-2025

DESIGN

Remote area # 2
Remote area location Shop
Occupancy classification Ordinary Hazard Group II
Density 0.20 - Gpm/SqFt
Area of application 1593 - SqFt
Coverage/sprinkler 130 - SqFt
Type of sprinkler calculated QR Upright
Sprinklers calculated 13
In-rack demand n/a - GPM
Hose streams 250 - GPM
Total water required (including hose streams) 597.920 - GPM @ 53.109 - Psi
Type of system Wet
Volume of system (dry or pre-action) n/a - Gal

WATER SUPPLY INFORMATION

Test date 08-27-2024
Location 1231 Nw Ward Road Lee's Summit, MO.
Source of info Fire Department

CONTRACTOR INFO Phoenix Fire, LLC.
Address 1849 S. 14th ST Kansas City, KS 66103
Phone # 816-838-1996
Name of designer D.J.S.
Authority having jurisdiction
NOTES:

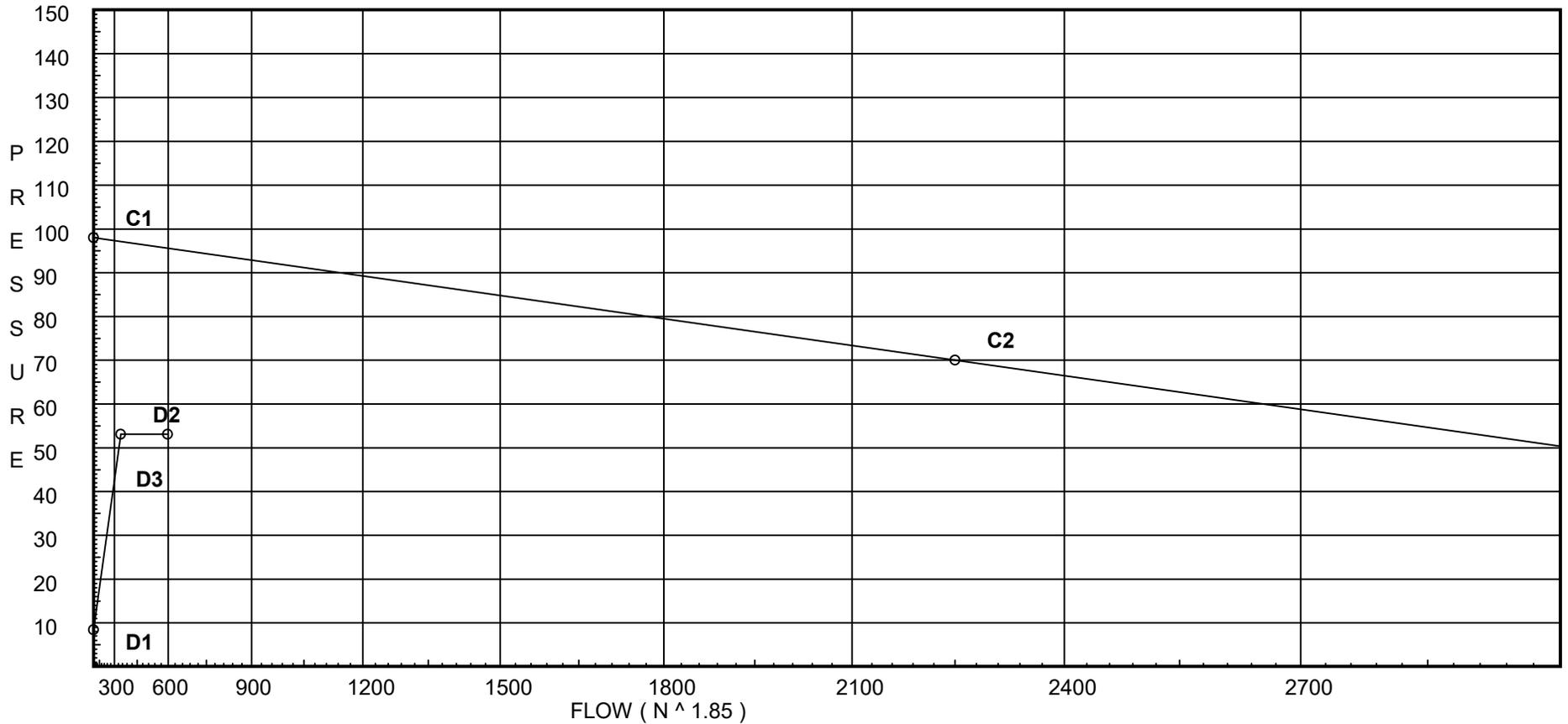
Water Supply Curve

Your Company Name
Lees Summit Hyundai

Page 2
Date 09-05-2025

City Water Supply:
C1 - Static Pressure : 98
C2 - Residual Pressure: 70
C2 - Residual Flow : 2250

Demand:
D1 - Elevation : 8.437
D2 - System Flow : 347.92
D2 - System Pressure : 53.109
Hose (Demand) : 250
D3 - System Demand : 597.92
Safety Margin : 42.479



Fittings Used Summary

Your Company Name
Lees Summit Hyundai

Page 3
Date 09-05-2025

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	0	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61
F	NFPA 13 45' Elbow	0	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
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
V	Vic 90' Firelock Ell #001	0	0	0	2.00	2.63	3.5	4.4	5	0	6.88	8.5	10	13	17	20	0	0	0	0	0
X	Vic 90' Firelock Tee #002 Branch	0	0	0	7.5	6.63	8.5	10.9	13	0	16	21	25	33	41	50	0	0	0	0	0
Zac	Ames 2000SS	Fitting generates a Fixed Loss Based on Flow																			

Units Summary

Diameter Units Inches
 Length Units Feet
 Flow Units US Gallons per Minute
 Pressure Units Pounds per Square Inch

Note: Fitting Legend provides equivalent pipe lengths for fittings types of various diameters. Equivalent lengths shown are standard for actual diameters of Sched 40 pipe and CFactors of 120 except as noted with *. The fittings marked with a * show equivalent lengths values supplied by manufacturers based on specific pipe diameters and CFactors and they require no adjustment. All values for fittings not marked with a * will be adjusted in the calculation for CFactors of other than 120 and diameters other than Sched 40 per NFPA.

Flow Summary - NFPA

Your Company Name
Lees Summit Hyundai

Page 4
Date 09-05-2025

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	98.0	70	2250.0	95.588	597.92	53.109

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>	
65	19.21		21.77			
66	19.0	5.6	22.39	26.5	0.2	130
30	18.99		23.88			
29	16.82		28.44			
28	16.82		28.52			
27	16.82		28.81			
26	16.82		29.32			
25	16.82		29.85			
24	16.82		30.24			
23	16.82		30.52			
22	16.82		30.79			
21	16.82		31.05			
20	16.82		31.37			
19	16.82		31.54			
18	9.67		35.36			
7	9.67		36.43			
8	9.67		36.55			
9	9.67		36.74			
TOR	9.67		38.83			
BOR	0.0		43.56			
UG	0.0		44.51	250.0		
HOSE	0.0		46.07			
BFP	0.0		50.81			
TEST	0.0		53.11			
70	19.75		22.1			
31	20.35		27.17			
32	17.93		29.67			
33	17.93		29.71			
34	17.93		29.82			
35	17.93		30.0			
36	17.93		30.26			
37	17.93		30.5			
38	17.93		30.71			
39	17.93		30.96			
40	17.93		31.24			
41	17.93		31.69			
42	17.93		31.98			
72	19.24	5.6	21.67	26.07	0.2	130
73	19.48	5.6	21.56	26.0	0.2	130
74	19.72	5.6	21.88	26.19	0.2	130
75	18.79	5.6	23.16	26.95	0.2	130
76	18.79	5.6	23.22	26.98	0.2	130

Flow Summary - NFPA

Your Company Name
Lees Summit Hyundai

Page 5
Date 09-05-2025

NODE ANALYSIS (cont.)

<i>Node Tag</i>	<i>Elevation</i>	<i>Node Type</i>	<i>Pressure at Node</i>	<i>Discharge at Node</i>	<i>Notes</i>	
61	18.99		23.95			
77	19.0	5.6	22.44	26.53	0.2	130
78	19.24	5.6	21.72	26.1	0.2	130
79	19.48	5.6	21.6	26.03	0.2	130
80	19.72	5.6	21.92	26.22	0.2	130
62	20.35		27.2			
81	18.79	5.6	24.45	27.69	0.2	130
82	18.79		25.32			
59	18.99		26.09			
83	19.0	5.6	25.65	28.36	0.2	130
84	19.24	5.6	25.55	28.3	0.2	130
60	20.35		28.25			
57	18.99		28.49			
58	20.35		28.84			
55	18.98		29.0			
56	20.35		29.13			
53	18.98		29.38			
54	20.35		29.38			
51	18.98		29.65			
52	20.35		29.59			
49	18.98		29.92			
50	20.35		29.85			
47	18.98		30.18			
48	20.35		30.13			
45	18.98		30.51			
46	20.35		30.56			
43	18.98		30.7			
44	20.35		30.84			

Final Calculations : Hazen-Williams

Your Company Name
Lees Summit Hyundai

Page 6
Date 09-05-2025

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	*****
65 to 66	19.21 19		28.66	1.25			9.790	120	21.769 0.091			
66 to 30	19 18.99	5.60	26.50	1.25	T	7.432	0.840 7.432 8.272	120	22.386 0.004 1.494		Vel = 5.63	
30 to 29	18.99 16.82		55.16	1.442			2.170 7.432 9.602	120	23.884 0.940 3.618		Vel = 10.84	
29 to 28	16.82 16.82		0.0	3			11.250	120	28.442 0.0			
28 to 27	16.82 16.82		82.11	3.26			11.250	120	0.0070 28.521 0.0		Vel = 3.16	
27 to 26	16.82 16.82		164.42	3.26			11.250	120	0.0257 0.289		Vel = 6.32	
26 to 25	16.82 16.82		55.99	3			11.540	120	28.810 0.0			
25 to 24	16.82 16.82		220.41	3.26			11.540	0.0440	0.508		Vel = 8.47	
24 to 23	16.82 16.82		-12.58	3			13.500	120	29.318 0.0			
23 to 22	16.82 16.82		207.83	3.26			13.500	0.0396	0.534		Vel = 7.99	
22 to 21	16.82 16.82		-10.87	3			10.960	120	29.852 0.0			
21 to 20	16.82 16.82		196.96	3.26			10.960	0.0358	0.392		Vel = 7.57	
20 to 19	16.82 16.82		-9.82	3			8.420	120	30.244 0.0			
19 to 18	16.82 9.67		187.14	3.26			8.420	0.0327	0.275		Vel = 7.19	
18 to 7	9.67 9.67		-9.32	3			9.250	120	30.519 0.0			
7 to 8	9.67 9.67		177.82	3.26			9.250	0.0296	0.274		Vel = 6.83	
8 to 7	9.67 9.67		-9.16	3			9.450	120	30.793 0.0			
7 to 18	9.67 9.67		168.66	3.26			9.450	0.0269	0.254		Vel = 6.48	
18 to 7	9.67 9.67		-9.38	3			13.500	120	31.047 0.0			
7 to 19	9.67 16.82		159.28	3.26			13.500	0.0241	0.326		Vel = 6.12	
19 to 18	16.82 9.67		-10.25	3			8.020	120	31.373 0.0			
18 to 7	9.67 9.67		149.03	3.26			8.020	0.0213	0.171		Vel = 5.73	
7 to 18	9.67 9.67		-11.07	3	2V	13.44	25.320 13.440 38.760	120	31.544 3.097 0.718			
18 to 7	9.67 9.67		137.96	3.26			40.100 17.471 57.571	120	35.359 0.0 1.067		Vel = 5.30	
7 to 8	9.67 9.67		0.0	4	X	17.471	25.130	120	36.426 0.0			
8 to 7	9.67 9.67		137.96	4.26			25.130	0.0050	0.126		Vel = 3.11	

Final Calculations : Hazen-Williams

Your Company Name
Lees Summit Hyundai

Page 7
Date 09-05-2025

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	*****
8 to 9	9.67 9.67		0.0 137.96	4 4.26	T 26.334	10.660 26.334 36.994	120 0.0051	36.552 0.0 0.187		Vel = 3.11	
9 to TOR	9.67 9.670		209.96 347.92	4 4.26	T 2E 26.334	22.360 26.334 52.668 75.028	120 0.0279	36.739 0.0 2.091		Vel = 7.83	
TOR to BOR	9.670 0		0.0 347.92	4 4.26	B 15.8	3.580 15.800 19.380	120 0.0279	38.830 4.188 0.540		Vel = 7.83	
BOR to UG	0 0		0.0 347.92	4 4.26	S 28.968	5.083 28.968 34.051	120 0.0279	43.558 0.0 0.949		Vel = 7.83	
UG to HOSE	0 0	H250	250.00 597.92	6 6.16	2F 20.084	145.000 20.084 165.084	140 0.0095	44.507 0.0 1.563		Vel = 6.44	
HOSE to BFP	0 0		0.0 597.92	6 6.16	F Zac 10.042	170.000 0.0 10.042 180.042	140 0.0095	46.070 3.038 1.705		** Fixed Loss = 3.038 Vel = 6.44	
BFP to TEST	0 0		0.0 597.92	6 6.16	T G E 43.037	175.000 4.304 67.425 242.425	140 0.0095	50.813 0.0 2.296		Vel = 6.44	
TEST			0.0 597.92					53.109		K Factor = 82.05	
70 to 31	19.75 20.35		49.60 49.6	1.25 1.442	T 7.432	28.460 7.432 35.892	120 0.1483	22.104 -0.260 5.322		Vel = 9.74	
31 to 32	20.35 17.93		0.0 49.6	1.25 1.442	T 7.432	2.420 7.432 9.852	120 0.1483	27.166 1.048 1.461		Vel = 9.74	
32 to 33	17.93 17.93		0.0 49.6	3 3.26		11.250 11.250	120 0.0028	29.675 0.0 0.031		Vel = 1.91	
33 to 34	17.93 17.93		49.54 99.14	3 3.26		11.250 11.250	120 0.0100	29.706 0.0 0.113		Vel = 3.81	
34 to 35	17.93 17.93		28.37 127.51	3 3.26		11.540 11.540	120 0.0160	29.819 0.0 0.185		Vel = 4.90	
35 to 36	17.93 17.93		12.58 140.09	3 3.26		13.500 13.500	120 0.0190	30.004 0.0 0.257		Vel = 5.38	
36 to 37	17.93 17.93		10.87 150.96	3 3.26		10.960 10.960	120 0.0219	30.261 0.0 0.240		Vel = 5.80	
37 to 38	17.93 17.93		9.82 160.78	3 3.26		8.420 8.420	120 0.0246	30.501 0.0 0.207		Vel = 6.18	
38 to 39	17.93 17.93		9.32 170.1	3 3.26		9.250 9.250	120 0.0274	30.708 0.0 0.253		Vel = 6.54	

Final Calculations : Hazen-Williams

Your Company Name
Lees Summit Hyundai

Page 8
Date 09-05-2025

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	*****
39 to 40	17.93 17.93		9.16 179.26	3 3.26			9.450 9.450	120 0.0301	30.961 0.0 0.284			Vel = 6.89
40 to 41	17.93 17.93		9.38 188.64	3 3.26			13.500 13.500	120 0.0330	31.245 0.0 0.446			Vel = 7.25
41 to 42	17.93 17.93		10.26 198.9	3 3.26			8.020 8.020	120 0.0365	31.691 0.0 0.293			Vel = 7.65
42 to 9	17.93 9.67		11.06 209.96	3 3.26	2V	13.44	15.790 13.440 29.230	120 0.0403	31.984 3.577 1.178			Vel = 8.07
9			0.0 209.96						36.739			K Factor = 34.64
65 to 72	19.21 19.24		-28.66 -28.66	1.25 1.442			1.650 1.650	120 -0.0539	21.769 -0.013 -0.089			Vel = 5.63
72 to 73	19.24 19.48	5.60	26.06 -2.6	1.25 1.442			11.440 11.440	120 -0.0006	21.667 -0.104 -0.007			Vel = 0.51
73 to 74	19.48 19.72	5.60	26.00 23.4	1.25 1.442			11.440 11.440	120 0.0370	21.556 -0.104 0.423			Vel = 4.60
74 to 70	19.72 19.75	5.60	26.20 49.6	1.25 1.442			1.630 1.630	120 0.1485	21.875 -0.013 0.242			Vel = 9.74
70			0.0 49.60						22.104			K Factor = 10.55
75 to 30	18.79 18.99	5.60	26.95 26.95	1.25 1.442	T	7.432	9.480 7.432 16.912	120 0.0480	23.159 -0.087 0.812			Vel = 5.29
30			0.0 26.95						23.884			K Factor = 5.51
76 to 61	18.79 18.99	5.60	26.98 26.98	1.25 1.442	T	7.432	9.480 7.432 16.912	120 0.0481	23.220 -0.087 0.814			Vel = 5.30
61 to 28	18.99 16.82		55.33 82.31	1.25 1.442	T	7.432	2.170 7.432 9.602	120 0.3785	23.947 0.940 3.634			Vel = 16.17
28			0.0 82.31						28.521			K Factor = 15.41
61 to 77	18.99 19		-55.33 -55.33	1.25 1.442	T	7.432	0.840 7.432 8.272	120 -0.1816	23.947 -0.004 -1.502			Vel = 10.87
77 to 78	19 19.24	5.60	26.53 -28.8	1.25 1.442			11.440 11.440	120 -0.0543	22.441 -0.104 -0.621			Vel = 5.66

Final Calculations : Hazen-Williams

Your Company Name
Lees Summit Hyundai

Page 9
Date 09-05-2025

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	*****
78 to 79	19.24 19.48	5.60	26.10 -2.7	1.25 1.442			11.440 11.440	120 -0.0006	21.716 -0.104 -0.007		Vel = 0.53	
79 to 80	19.48 19.72	5.60	26.03 23.33	1.25 1.442			11.440 11.440	120 0.0367	21.605 -0.104 0.420		Vel = 4.58	
80 to 62	19.72 20.35	5.60	26.22 49.55	1.25 1.442	T	7.432	30.080 7.432 37.512	120 0.1480	21.921 -0.273 5.552		Vel = 9.73	
62 to 33	20.35 17.93		0.0 49.55	1.25 1.442	T	7.432	2.420 7.432 9.852	120 0.1480	27.200 1.048 1.458		Vel = 9.73	
33			0.0 49.55						29.706		K Factor = 9.09	
81 to 82	18.79 18.79	5.60	27.69 27.69	1 1.097	E	2.487	2.050 2.487 4.537	120 0.1911	24.455 0.0 0.867		Vel = 9.40	
82 to 59	18.79 18.99		0.0 27.69	1.25 1.442	T	7.432	9.480 7.432 16.912	120 0.0504	25.322 -0.087 0.853		Vel = 5.44	
59 to 27	18.99 16.82		28.30 55.99	1.25 1.442	T	7.432	2.170 7.432 9.602	120 0.1856	26.088 0.940 1.782		Vel = 11.00	
27			0.0 55.99						28.810		K Factor = 10.43	
59 to 83	18.99 19		-28.29 -28.29	1.25 1.442	T	7.432	0.840 7.432 8.272	120 -0.0525	26.088 -0.004 -0.434		Vel = 5.56	
83 to 84	19 19.24	5.60	28.36 0.07	1.25 1.442			11.440 11.440	120 0	25.650 -0.104 0.0		Vel = 0.01	
84 to 60	19.24 20.35	5.60	28.30 28.37	1.25 1.442	T	7.432	52.960 7.432 60.392	120 0.0528	25.546 -0.481 3.186		Vel = 5.57	
60 to 34	20.35 17.93		0.0 28.37	1.25 1.442	T	7.432	2.420 7.432 9.852	120 0.0528	28.251 1.048 0.520		Vel = 5.57	
34			0.0 28.37						29.819		K Factor = 5.20	
26 to 57	16.82 18.99		12.58 12.58	1.25 1.442	T	7.432	2.170 7.432 9.602	120 0.0118	29.318 -0.940 0.113		Vel = 2.47	
57 to 58	18.99 20.35		0.0 12.58	1.25 1.442	2T	14.864	65.240 14.864 80.104	120 0.0117	28.491 -0.589 0.938		Vel = 2.47	
58 to 35	20.35 17.93		0.0 12.58	1.25 1.442	T	7.432	2.420 7.432 9.852	120 0.0118	28.840 1.048 0.116		Vel = 2.47	

Final Calculations : Hazen-Williams

Your Company Name
Lees Summit Hyundai

Page 10
Date 09-05-2025

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 12.58						30.004		K Factor = 2.30	
25 to 55	16.82 18.98		10.87	1.25	T	7.432	2.170 7.432 9.602	120	29.852 -0.935 0.085		Vel = 2.14	
55 to 56	18.98 20.35		0.0	1.25	2T	14.864	65.240 14.864 80.104	120	29.002 -0.593 0.716		Vel = 2.14	
56 to 36	20.35 17.93		10.87	1.442			2.420 7.432 9.852	120	29.125 1.048 0.088		Vel = 2.14	
			0.0 10.87						30.261		K Factor = 1.98	
24 to 53	16.82 18.98		9.82	1.25	T	7.432	2.170 7.432 9.602	120	30.244 -0.935 0.071		Vel = 1.93	
53 to 54	18.98 20.35		0.0	1.25	2T	14.864	65.250 14.864 80.114	120	29.380 -0.593 0.593		Vel = 1.93	
54 to 37	20.35 17.93		9.82	1.442			2.420 7.432 9.852	120	29.380 1.048 0.073		Vel = 1.93	
			0.0 9.82						30.501		K Factor = 1.78	
23 to 51	16.82 18.98		9.32	1.25	T	7.432	2.170 7.432 9.602	120	30.519 -0.935 0.064		Vel = 1.83	
51 to 52	18.98 20.35		0.0	1.25	2T	14.864	65.250 14.864 80.114	120	29.648 -0.593 0.539		Vel = 1.83	
52 to 38	20.35 17.93		9.32	1.442			2.420 7.432 9.852	120	29.594 1.048 0.066		Vel = 1.83	
			0.0 9.32						30.708		K Factor = 1.68	
22 to 49	16.82 18.98		9.16	1.25	T	7.432	2.170 7.432 9.602	120	30.793 -0.935 0.062		Vel = 1.80	
49 to 50	18.98 20.35		0.0	1.25	2T	14.864	65.250 14.864 80.114	120	29.920 -0.593 0.521		Vel = 1.80	
50 to 39	20.35 17.93		9.16	1.442			2.420 7.432 9.852	120	29.848 1.048 0.065		Vel = 1.80	
			0.0 9.16						30.961		K Factor = 1.65	
21 to 47	16.82 18.98		9.39	1.25	T	7.432	2.170 7.432 9.602	120	31.047 -0.935 0.065		Vel = 1.84	

Final Calculations : Hazen-Williams

Your Company Name
Lees Summit Hyundai

Page 11
Date 09-05-2025

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	*****
47 to 48	18.98 20.35		0.0 9.39	1.25 1.442	2T	14.864	65.260 14.864 80.124	120 0.0068	30.177 -0.593 0.546		Vel = 1.84	
48 to 40	20.35 17.93		0.0 9.39	1.25 1.442	T	7.432	2.420 7.432 9.852	120 0.0068	30.130 1.048 0.067		Vel = 1.84	
40			0.0 9.39						31.245		K Factor = 1.68	
20 to 45	16.82 18.98		10.25 10.25	1.25 1.442	T	7.432	2.170 7.432 9.602	120 0.0080	31.373 -0.935 0.077		Vel = 2.01	
45 to 46	18.98 20.35		0.0 10.25	1.25 1.442	2T	14.864	65.260 14.864 80.124	120 0.0080	30.515 -0.593 0.642		Vel = 2.01	
46 to 41	20.35 17.93		0.0 10.25	1.25 1.442	T	7.432	2.420 7.432 9.852	120 0.0080	30.564 1.048 0.079		Vel = 2.01	
41			0.0 10.25						31.691		K Factor = 1.82	
19 to 43	16.82 18.98		11.06 11.06	1.25 1.442	T	7.432	2.170 7.432 9.602	120 0.0093	31.544 -0.935 0.089		Vel = 2.17	
43 to 44	18.98 20.35		0.0 11.06	1.25 1.442	2T	14.864	65.230 14.864 80.094	120 0.0092	30.698 -0.593 0.739		Vel = 2.17	
44 to 42	20.35 17.93		0.0 11.06	1.25 1.442	T	7.432	2.420 7.432 9.852	120 0.0093	30.844 1.048 0.092		Vel = 2.17	
42			0.0 11.06						31.984		K Factor = 1.96	