



Hydraulic Calculations by HydraCALC

RANGER FIRE, INC.
1000 S. MAIN ST
SUITE 150
GRAPEVINE, TX 76051
817-410-9070

10-6-2025



Job Name : HOME 2 SUITES
Drawing :
Location : 1ST FLOOR
Remote Area :
Contract :
Data File : Remote #1_Club Area.WXF

Water Supply Curve

RANGER FIRE, INC.
HOME 2 SUITES

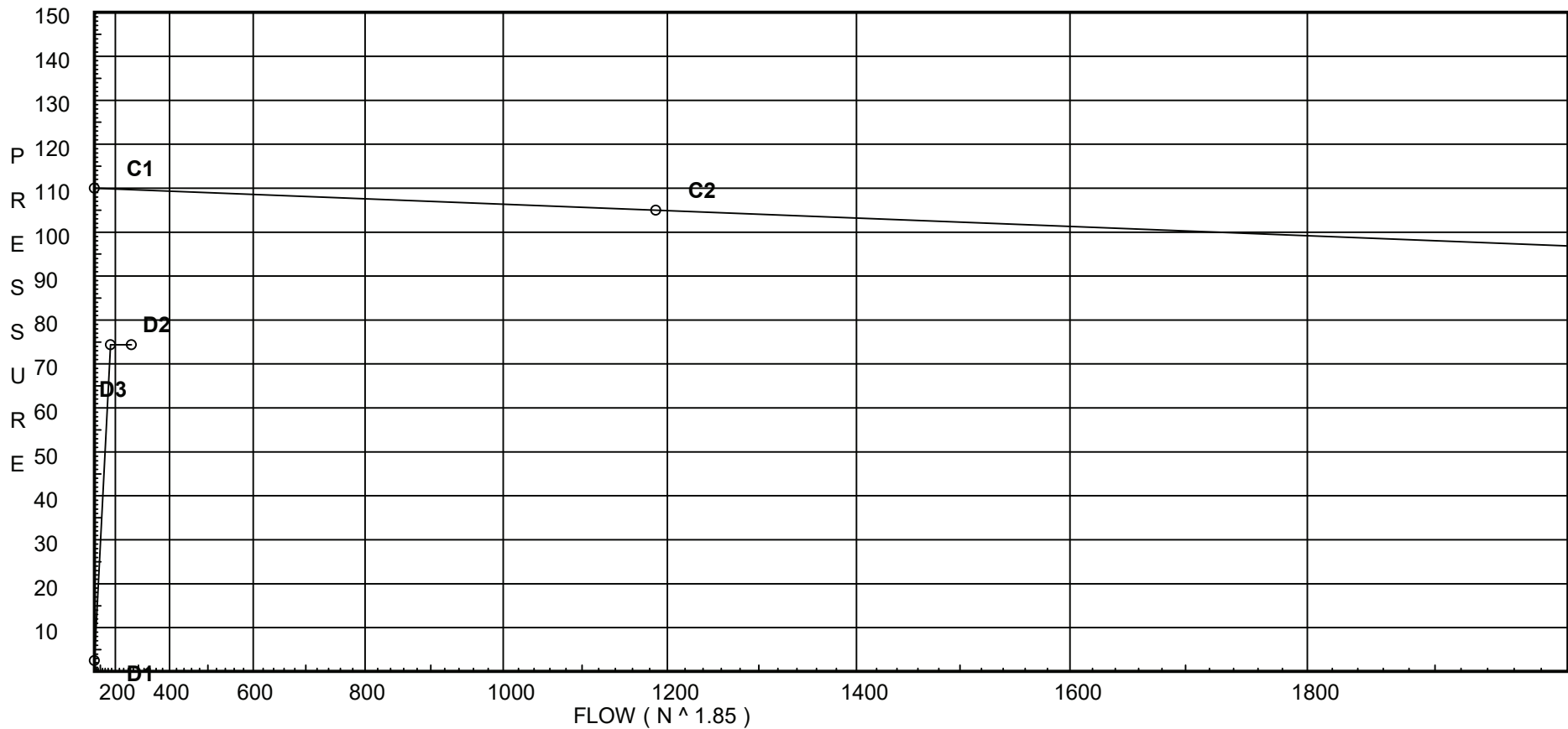
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City Water Supply:

C1 - Static Pressure : 110
C2 - Residual Pressure: 105
C2 - Residual Flow : 1187

Demand:

D1 - Elevation : 2.490
D2 - System Flow : 173.464
D2 - System Pressure : 74.356
Hose (Demand) : 100
D3 - System Demand : 273.464
Safety Margin : 35.314



Fittings Used Summary

RANGER FIRE, INC.
HOME 2 SUITES

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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
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
Zwh	Watts 757DCDA Horiz	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

RANGER FIRE, INC.
HOME 2 SUITES

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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>
CTY	110.0	105	1187.0	109.669	273.46	74.356

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>	
A1	8.75	5.6	17.65	23.53	0.1	104
A2	8.75	5.6	16.76	22.93	0.1	108
A3	8.75	5.6	10.47	18.12	0.1	127
A4	8.75	5.6	11.25	18.79	0.1	125
A5	8.75	5.6	14.31	21.18	0.1	144
A6	8.75	5.6	16.27	22.59	0.1	186
A7	8.75	5.6	14.88	21.6	0.1	216
A8	8.75	5.6	19.51	24.74	0.1	173
L1	7.917		20.98			
L2	7.917		19.72			
L3	7.917		40.7			
L4	7.917		41.86			
L5	7.917		41.86			
L6	7.917		39.44			
L7	7.917		41.86			
A4T	9.5		11.6			
L5T	9.5		41.17			
100	9.5		41.17			
101	9.5		40.01			
102	9.5		38.75			
103	9.5		36.02			
104	9.5		24.88			
105	9.5		20.3			
106	9.5		19.36			
107	9.5		19.03			
108	9.5		17.91			
109	9.5		17.59			
110	9.5		17.59			
111	9.5		17.6			
112	9.5		18.05			
113	9.5		22.22			
114	9.5		29.42			
115	9.5		42.07			
115A	9.5		55.5			
TW1	9.5		61.28			
BW1	4.0		66.13			
BOS	4.0		66.17			
FLG	1.0		70.97			
CHG	-5.0		73.59			
UG1	-5.0		77.68			
DOM	-5.0		77.68			
UG2	-5.0		77.71			

Flow Summary - NFPA

RANGER FIRE, INC.
HOME 2 SUITES

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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>
UG3	-5.0		77.78		
UG4	-5.0		77.76		
UG5	-5.0		77.72		
UG6	-5.0		77.71		
UG7	-5.0		77.7		
UG3X	-5.0		77.79		
CTY	3.0		74.36	100.0	

Final Calculations : Hazen-Williams

RANGER FIRE, INC.
HOME 2 SUITES

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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	*****
A1 to 106	8.750 9.500	5.60	23.53 23.53	1 1.049	2E T	4.0 5.0	2.583 9.000 11.583	120 0.1757	17.652 -0.325 2.035		Vel = 8.73	
106			0.0 23.53						19.362		K Factor = 5.35	
A2 to 108	8.750 9.500	5.60	22.93 22.93	1 1.049	E T	2.0 5.0	1.750 7.000 8.750	120 0.1675	16.765 -0.325 1.466		Vel = 8.51	
108			0.0 22.93						17.906		K Factor = 5.42	
A3 to A4T	8.750 9.500	5.60	18.12 18.12	1 1.049	E	2.0	11.417 2.000 13.417	120 0.1084	10.466 -0.325 1.455		Vel = 6.73	
A4T			0.0 18.12						11.596		K Factor = 5.32	
A4 to A4T	8.750 9.500	5.60	18.79 18.79	1 1.049	T	5.0	0.750 5.000 5.750	120 0.1160	11.254 -0.325 0.667		Vel = 6.98	
A4T			0.0 18.79						11.596		K Factor = 5.52	
A5 to 110	8.750 9.500	5.60	21.18 21.18	1 1.049	2E T	4.0 5.0	15.917 9.000 24.917	120 0.1447	14.307 -0.325 3.606		Vel = 7.86	
110			0.0 21.18						17.588		K Factor = 5.05	
A6 to 111	8.750 9.500	5.60	22.59 22.59	1 1.049	E T	2.0 5.0	3.167 7.000 10.167	120 0.1630	16.267 -0.325 1.657		Vel = 8.39	
111			0.0 22.59						17.599		K Factor = 5.38	
A7 to 112	8.750 9.500	5.60	21.60 21.6	1 1.049	2E T	4.0 5.0	14.333 9.000 23.333	120 0.1500	14.878 -0.325 3.501		Vel = 8.02	
112			0.0 21.60						18.054		K Factor = 5.08	
A8 to 113	8.750 9.500	5.60	24.74 24.74	1 1.049	E T	2.0 5.0	8.750 7.000 15.750	120 0.1928	19.511 -0.325 3.036		Vel = 9.18	
113			0.0 24.74						22.222		K Factor = 5.25	
L1 to 105	7.917 9.500		0.0 0.0	1 1.049	E T	2.0 5.0	20.833 7.000 27.833	120 0	20.981 -0.686 0.0		Vel = 0	
105			0.0 0.0						20.295		K Factor = 0	
L2 to 107	7.917 9.500		0.0 0.0	1 1.049	E T	2.0 5.0	20.833 7.000 27.833	120 0	19.720 -0.686 0.001		Vel = 0	

Final Calculations : Hazen-Williams

RANGER FIRE, INC.
HOME 2 SUITES

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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	*****
107			0.0 0.0					19.035		K Factor = 0	
L3 to 101	7.917 9.500		0.0 0.0	1 1.049	2E T 4.0 5.0	24.250 9.000 33.250	120 0	40.698 -0.686 0.0		Vel = 0	
101			0.0 0.0					40.012		K Factor = 0	
L4 to L5T	7.917 9.500		0.0 0.0	1 1.049	E 2.0	13.583 2.000 15.583	120 0	41.860 -0.686 0.0		Vel = 0	
L5T			0.0 0.0					41.174		K Factor = 0	
L5 to L5T	7.917 9.500		0.0 0.0	1 1.049	T 5.0	1.583 5.000 6.583	120 0	41.860 -0.686 0.0		Vel = 0	
L5T			0.0 0.0					41.174		K Factor = 0	
L6 to 102	7.917 9.500		0.0 0.0	1 1.049	2E T 4.0 5.0	10.333 9.000 19.333	120 0	39.438 -0.686 0.0		Vel = 0	
102			0.0 0.0					38.752		K Factor = 0	
L7 to 100	7.917 9.500		0.0 0.0	1 1.049	E 2.0	5.083 2.000 7.083	120 0	41.860 -0.686 0.0		Vel = 0	
100			0.0 0.0					41.174		K Factor = 0	
A4T to 109	9.500 9.500		36.90 36.9	1 1.049	T 5.0	9.833 5.000 14.833	120 0.4042	11.596 0.0 5.995		Vel = 13.70	
109			0.0 36.90					17.591		K Factor = 8.80	
L5T to 100	9.500 9.500		0.0 0.0	1 1.049	T 5.0	8.500 5.000 13.500	120 0	41.174 0.0 0.0		Vel = 0	
100			0.0 0.0					41.174		K Factor = 0	
100 to 101	9.500 9.500		-86.58 -86.58	1.5 1.682		5.917 5.917	120 -0.1964	41.174 0.0 -1.162		Vel = 12.50	
101 to 102	9.500 9.500		0.0 -86.58	1.5 1.682		6.417 6.417	120 -0.1964	40.012 0.0 -1.260		Vel = 12.50	
102 to 103	9.500 9.500		0.0 -86.58	1.5 1.682		13.917 13.917	120 -0.1964	38.752 0.0 -2.733		Vel = 12.50	
103 to 104	9.500 9.500		0.0 -86.58	1.5 1.682	E 4.95	51.750 4.950 56.700	120 -0.1964	36.019 0.0 -11.135		Vel = 12.50	

Final Calculations : Hazen-Williams

RANGER FIRE, INC.
HOME 2 SUITES

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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	*****
104 to 105	9.500 9.500		0.0 -86.58	1.5 1.682	E 4.95	18.417 4.950 23.367	120 -0.1964	24.884 0.0 -4.589		Vel = 12.50	
105 to 106	9.500 9.500		0.0 -86.58	1.5 1.682		4.750 4.750	120 -0.1964	20.295 0.0 -0.933		Vel = 12.50	
106 to 107	9.500 9.500		23.53 -63.05	1.5 1.682		3.000 3.000	120 -0.1090	19.362 0.0 -0.327		Vel = 9.10	
107 to 108	9.500 9.500		0.0 -63.05	1.5 1.682		10.333 10.333	120 -0.1093	19.035 0.0 -1.129		Vel = 9.10	
108 to 109	9.500 9.500		22.93 -40.12	1.5 1.682		6.667 6.667	120 -0.0472	17.906 0.0 -0.315		Vel = 5.79	
109 to 110	9.500 9.500		36.90 -3.22	1.5 1.682		4.833 4.833	120 -0.0006	17.591 0.0 -0.003		Vel = 0.46	
110 to 111	9.500 9.500		21.18 17.96	1.5 1.682		1.000 1.000	120 0.0110	17.588 0.0 0.011		Vel = 2.59	
111 to 112	9.500 9.500		22.59 40.55	1.5 1.682		9.417 9.417	120 0.0483	17.599 0.0 0.455		Vel = 5.86	
112 to 113	9.500 9.500		21.60 62.15	1.5 1.682	E 4.95	34.250 4.950 39.200	120 0.1063	18.054 0.0 4.168		Vel = 8.97	
113 to 114	9.500 9.500		24.73 86.88	1.5 1.682		36.417 36.417	120 0.1977	22.222 0.0 7.199		Vel = 12.54	
114 to 115	9.500 9.500		0.0 86.88	1.5 1.682	E T 4.95 9.9	49.167 14.850 64.017	120 0.1977	29.421 0.0 12.653		Vel = 12.54	
115 to 100	9.500 9.500		-173.46 -86.58	1.5 1.682		4.583 4.583	120 -0.1964	42.074 0.0 -0.900		Vel = 12.50	
100			0.0 -86.58					41.174		K Factor = -13.49	
115 to 115A	9.500 9.500		173.46 173.46	2 2.157	2E 6.153	12.307 12.307 63.474	120 0.2115	42.074 0.0 13.426		Vel = 15.23	
115A to TW1	9.500 9.500		0.0 173.46	2 2.157	E 6.153	21.167 6.153 27.320	120 0.2115	55.500 0.0 5.779		Vel = 15.23	
TW1			0.0 173.46					61.279		K Factor = 22.16	
TW1 to BW1	9.500 4		173.46 173.46	2 2.157	E 6.153	5.500 6.153 11.653	120 0.2115	61.279 2.382 2.465		Vel = 15.23	

Final Calculations : Hazen-Williams

RANGER FIRE, INC.
HOME 2 SUITES

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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	*****
BW1 to BOS	4 4		0.0 173.46	6 6.357	T	37.72	1.333 37.720 39.053	120 0.0011	66.126 0.0 0.042		Vel = 1.75	
BOS to FLG	4 1		0.0 173.46	2 2.157	S	13.537	3.000 13.537 16.537	120 0.2115	66.168 1.299 3.498		Vel = 15.23	
FLG to CHG	1 -5		0.0 173.46	6 6.16	E	20.084	12.000 20.084 32.084	140 0.0010	70.965 2.599 0.031		Vel = 1.87	
CHG			0.0 173.46						73.595		K Factor = 20.22	
CHG to UG1	-5 -5		173.46 173.46	6 5.86	G T Zwh	3.834 38.342 0.0	38.500 42.176 80.676	150 0.0011	73.595 3.996 0.087		** Fixed Loss = 3.996 Vel = 2.06	
UG1 to DOM	-5 -5		-63.94 109.52	8 7.68	T	43.857	5.000 43.857 48.857	150 0.0001	77.678 0.0 0.006		Vel = 0.76	
DOM to UG2	-5 -5		0.0 109.52	8 7.68	T	43.857	172.250 43.857 216.107	150 0.0001	77.684 0.0 0.027		Vel = 0.76	
UG2 to UG3	-5 -5		0.0 109.52	8 7.68	E 4F	22.555 45.11	515.833 67.665 583.498	150 0.0001	77.711 0.0 0.072		Vel = 0.76	
UG3 to UG4	-5 -5		-173.47 -63.95	8 7.68	T	43.857	487.167 43.857 531.024	150 0	77.783 0.0 -0.025		Vel = 0.44	
UG4 to UG5	-5 -5		0.0 -63.95	8 7.68	7F 2E T	78.943 45.11 43.857	633.833 167.910 801.743	150 0	77.758 0.0 -0.036		Vel = 0.44	
UG5 to UG6	-5 -5		0.0 -63.95	12 11.2	2F E	28.793 29.901	1266.500 58.695 1325.195	150 0	77.722 0.0 -0.010		Vel = 0.21	
UG6 to UG7	-5 -5		0.0 -63.95	12 11.2	E 6F T	29.901 86.38 66.446	1047.167 182.727 1229.894	150 0	77.712 0.0 -0.008		Vel = 0.21	
UG7 to UG1	-5 -5		0.0 -63.95	8 7.68	2F	22.555	533.667 22.555 556.222	150 0	77.704 0.0 -0.026		Vel = 0.44	
UG1			0.0 -63.95						77.678		K Factor = -7.26	
UG3 to UG3X	-5 -5		173.46 173.46	6 5.86			2.500 2.500	150 0.0008	77.783 0.0 0.002		Vel = 2.06	
UG3X to CTY	-5 3		0.0 173.46	6 6.16	E G	20.084 4.304	12.000 24.388 36.388	140 0.0010	77.785 -3.465 0.036		Vel = 1.87	
CTY			100.00 273.46						74.356		Qa = 100.00 K Factor = 31.71	

Final Calculations : Hazen-Williams

RANGER FIRE, INC.
HOME 2 SUITES

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Node1	Elev1	K	Qa	Nom	Fitting or	Pipe	CFact	Pt			
to						Ftngs		Pe			
Node2	Elev2	Fact	Qt	Act	Equiv	Len	Pf/Ft	Pf		Notes	



Hydraulic Calculations by HydraCALC

RANGER FIRE, INC.
1000 S. MAIN ST
SUITE 150
GRAPEVINE, TX 76051
817-410-9070

Job Name : HOME 2 SUITES
Drawing :
Location : 1ST FLOOR
Remote Area :
Contract :
Data File : Remote #2_Laundry.WXF

Water Supply Curve

RANGER FIRE, INC.
HOME 2 SUITES

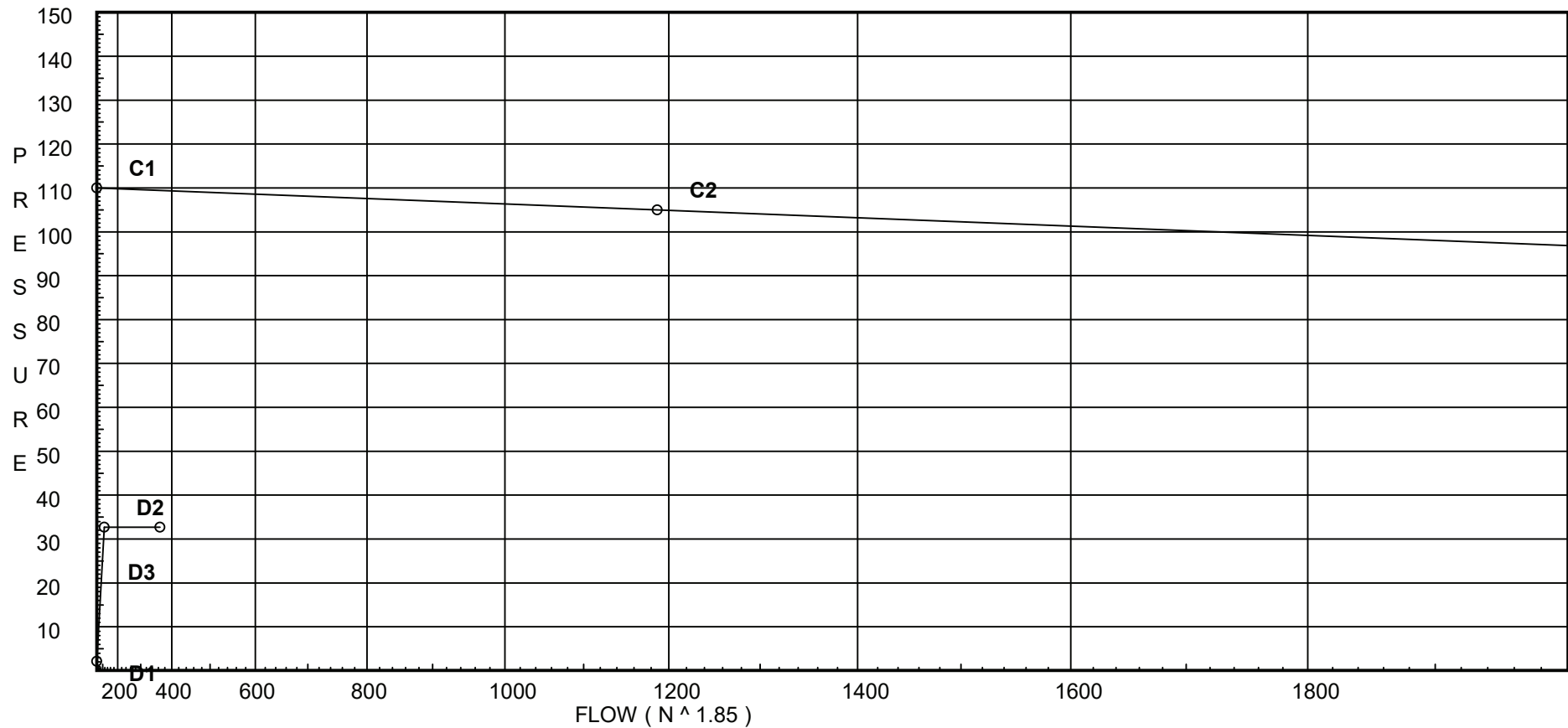
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City Water Supply:

C1 - Static Pressure : 110
C2 - Residual Pressure: 105
C2 - Residual Flow : 1187

Demand:

D1 - Elevation : 2.130
D2 - System Flow : 115.094
D2 - System Pressure : 32.670
Hose (Demand) : 250
D3 - System Demand : 365.094
Safety Margin : 76.765



Fittings Used Summary

RANGER FIRE, INC.
HOME 2 SUITES

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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
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
Zwh	Watts 757DCDA Horiz	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

RANGER FIRE, INC.
HOME 2 SUITES

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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>
CTY	110.0	105	1187.0	109.435	365.09	32.67

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>	
A1	8.75		10.5			
A2	8.75		10.63			
A3	8.75		10.72			
A4	8.75		10.72			
A5	8.75		10.78			
A6	8.75		10.79			
A7	8.75		10.91			
A8	8.75		11.4			
L1	7.917	5.6	8.4	16.23	0.15	96
L2	7.917	5.6	8.4	16.23	0.15	96
L3	7.917	5.6	8.58	16.41	0.15	96
L4	7.917	5.6	7.0	14.82	0.15	96
L5	7.917	5.6	7.63	15.47	0.15	96
L6	7.917	5.6	9.49	17.25	0.15	96
L7	7.917	5.6	11.14	18.69	0.15	96
A4T	9.5		10.39			
L5T	9.5		7.48			
100	9.5		11.26			
101	9.5		10.9			
102	9.5		10.72			
103	9.5		10.64			
104	9.5		10.31			
105	9.5		10.18			
106	9.5		10.18			
107	9.5		10.18			
108	9.5		10.31			
109	9.5		10.39			
110	9.5		10.45			
111	9.5		10.47			
112	9.5		10.59			
113	9.5		11.08			
114	9.5		11.54			
115	9.5		12.34			
115A	9.5		18.63			
TW1	9.5		21.33			
BW1	4.0		24.87			
BOS	4.0		24.89			
FLG	1.0		27.83			
CHG	-5.0		30.44			
UG1	-5.0		36.07			
DOM	-5.0		36.07			
UG2	-5.0		36.08			

Flow Summary - NFPA

RANGER FIRE, INC.
HOME 2 SUITES

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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>
UG3	-5.0		36.12		
UG4	-5.0		36.11		
UG5	-5.0		36.09		
UG6	-5.0		36.08		
UG7	-5.0		36.08		
UG3X	-5.0		36.12		
CTY	3.0		32.67	250.0	

Final Calculations : Hazen-Williams

RANGER FIRE, INC.
HOME 2 SUITES

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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	*****
A1 to 106	8.750 9.500		0.0 0.0	1 1.049	2E T 5.0	2.583 9.000 11.583	120 0	10.503 -0.325 0.0		Vel = 0	
106			0.0 0.0					10.178		K Factor = 0	
A2 to 108	8.750 9.500		0.0 0.0	1 1.049	E T 5.0	1.750 7.000 8.750	120 0	10.634 -0.325 0.0		Vel = 0	
108			0.0 0.0					10.309		K Factor = 0	
A3 to A4T	8.750 9.500		0.0 0.0	1 1.049	E T 5.0	11.417 2.000 13.417	120 0	10.718 -0.325 0.0		Vel = 0	
A4T			0.0 0.0					10.393		K Factor = 0	
A4 to A4T	8.750 9.500		0.0 0.0	1 1.049	T 5.0	0.750 5.000 5.750	120 0	10.718 -0.325 0.0		Vel = 0	
A4T			0.0 0.0					10.393		K Factor = 0	
A5 to 110	8.750 9.500		0.0 0.0	1 1.049	2E T 5.0	15.917 9.000 24.917	120 0	10.779 -0.325 0.0		Vel = 0	
110			0.0 0.0					10.454		K Factor = 0	
A6 to 111	8.750 9.500		0.0 0.0	1 1.049	E T 5.0	3.167 7.000 10.167	120 0	10.792 -0.325 0.0		Vel = 0	
111			0.0 0.0					10.467		K Factor = 0	
A7 to 112	8.750 9.500		0.0 0.0	1 1.049	2E T 5.0	14.333 9.000 23.333	120 0	10.910 -0.325 0.0		Vel = 0	
112			0.0 0.0					10.585		K Factor = 0	
A8 to 113	8.750 9.500		0.0 0.0	1 1.049	E T 5.0	8.750 7.000 15.750	120 0.0001	11.403 -0.325 0.001		Vel = 0	
113			0.0 0.0					11.079		K Factor = 0	
L1 to 105	7.917 9.500	5.60	16.23 16.23	1 1.049	E T 5.0	20.833 7.000 27.833	120 0.0885	8.400 -0.686 2.462		Vel = 6.03	
105			0.0 16.23					10.176		K Factor = 5.09	
L2 to 107	7.917 9.500	5.60	16.23 16.23	1 1.049	E T 5.0	20.833 7.000 27.833	120 0.0885	8.403 -0.686 2.462		Vel = 6.03	

Final Calculations : Hazen-Williams

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HOME 2 SUITES

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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	*****
107			0.0 16.23						10.179		K Factor = 5.09	
L3 to 101	7.917 9.500	5.60	16.41 16.41	1 1.049	2E T	4.0 5.0	24.250 9.000 33.250	120 0.0902	8.582 -0.686 3.000		Vel = 6.09	
101			0.0 16.41						10.896		K Factor = 4.97	
L4 to L5T	7.917 9.500	5.60	14.82 14.82	1 1.049	E	2.0	13.583 2.000 15.583	120 0.0747	7.000 -0.686 1.164		Vel = 5.50	
L5T			0.0 14.82						7.478		K Factor = 5.42	
L5 to L5T	7.917 9.500	5.60	15.47 15.47	1 1.049	T	5.0	1.583 5.000 6.583	120 0.0810	7.631 -0.686 0.533		Vel = 5.74	
L5T			0.0 15.47						7.478		K Factor = 5.66	
L6 to 102	7.917 9.500	5.60	17.25 17.25	1 1.049	2E T	4.0 5.0	10.333 9.000 19.333	120 0.0990	9.489 -0.686 1.914		Vel = 6.40	
102			0.0 17.25						10.717		K Factor = 5.27	
L7 to 100	7.917 9.500	5.60	18.69 18.69	1 1.049	E	2.0	5.083 2.000 7.083	120 0.1149	11.136 -0.686 0.814		Vel = 6.94	
100			0.0 18.69						11.264		K Factor = 5.57	
A4T to 109	9.500 9.500		0.0 0.0	1 1.049	T	5.0	9.833 5.000 14.833	120 0	10.393 0.0 0.0		Vel = 0	
109			0.0 0.0						10.393		K Factor = 0	
L5T to 100	9.500 9.500		30.29 30.29	1 1.049	T	5.0	8.500 5.000 13.500	120 0.2804	7.478 0.0 3.786		Vel = 11.24	
100			0.0 30.29						11.264		K Factor = 9.03	
100 to 101	9.500 9.500		-46.51 -46.51	1.5 1.682			5.917 5.917	120 -0.0622	11.264 0.0 -0.368		Vel = 6.72	
101 to 102	9.500 9.500		16.40 -30.11	1.5 1.682			6.417 6.417	120 -0.0279	10.896 0.0 -0.179		Vel = 4.35	
102 to 103	9.500 9.500		17.25 -12.86	1.5 1.682			13.917 13.917	120 -0.0057	10.717 0.0 -0.080		Vel = 1.86	
103 to 104	9.500 9.500		0.0 -12.86	1.5 1.682	E	4.95	51.750 4.950 56.700	120 -0.0058	10.637 0.0 -0.327		Vel = 1.86	

Final Calculations : Hazen-Williams

RANGER FIRE, INC.
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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	*****
104 to 105	9.500 9.500		0.0 -12.86	1.5 1.682	E 4.95	18.417 4.950 23.367	120 -0.0057	10.310 0.0 -0.134		Vel = 1.86	
105 to 106	9.500 9.500		16.23 3.37	1.5 1.682		4.750 4.750	120 0.0004	10.176 0.0 0.002		Vel = 0.49	
106 to 107	9.500 9.500		0.0 3.37	1.5 1.682		3.000 3.000	120 0.0003	10.178 0.0 0.001		Vel = 0.49	
107 to 108	9.500 9.500		16.24 19.61	1.5 1.682		10.333 10.333	120 0.0126	10.179 0.0 0.130		Vel = 2.83	
108 to 109	9.500 9.500		0.0 19.61	1.5 1.682		6.667 6.667	120 0.0126	10.309 0.0 0.084		Vel = 2.83	
109 to 110	9.500 9.500		0.0 19.61	1.5 1.682		4.833 4.833	120 0.0126	10.393 0.0 0.061		Vel = 2.83	
110 to 111	9.500 9.500		0.0 19.61	1.5 1.682		1.000 1.000	120 0.0130	10.454 0.0 0.013		Vel = 2.83	
111 to 112	9.500 9.500		0.0 19.61	1.5 1.682		9.417 9.417	120 0.0125	10.467 0.0 0.118		Vel = 2.83	
112 to 113	9.500 9.500		0.0 19.61	1.5 1.682	E 4.95	34.250 4.950 39.200	120 0.0126	10.585 0.0 0.494		Vel = 2.83	
113 to 114	9.500 9.500		0.0 19.61	1.5 1.682		36.417 36.417	120 0.0126	11.079 0.0 0.458		Vel = 2.83	
114 to 115	9.500 9.500		0.0 19.61	1.5 1.682	E T 4.95 9.9	49.167 14.850 64.017	120 0.0126	11.537 0.0 0.806		Vel = 2.83	
115 to 100	9.500 9.500		-115.10 -95.49	1.5 1.682		4.583 4.583	120 -0.2354	12.343 0.0 -1.079		Vel = 13.79	
100			0.0 -95.49					11.264		K Factor = -28.45	
115 to 115A	9.500 9.500		115.09 115.09	2 2.157	2E 12.307	51.167 12.307 63.474	120 0.0990	12.343 0.0 6.285		Vel = 10.10	
115A to TW1	9.500 9.500		0.0 115.09	2 2.157	E 6.153	21.167 6.153 27.320	120 0.0990	18.628 0.0 2.706		Vel = 10.10	
TW1			0.0 115.09					21.334		K Factor = 24.92	
TW1 to BW1	9.500 4		115.09 115.09	2 2.157	E 6.153	5.500 6.153 11.653	120 0.0990	21.334 2.382 1.154		Vel = 10.10	

Final Calculations : Hazen-Williams

RANGER FIRE, INC.
HOME 2 SUITES

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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	*****
BW1 to BOS	4 4		0.0 115.09	6 6.357	T	37.72	1.333 37.720 39.053	120 0.0005	24.870 0.0 0.020		Vel = 1.16	
BOS to FLG	4 1		0.0 115.09	2 2.157	S	13.537	3.000 13.537 16.537	120 0.0990	24.890 1.299 1.637		Vel = 10.10	
FLG to CHG	1 -5		0.0 115.09	6 6.16	E	20.084	12.000 20.084 32.084	140 0.0005	27.826 2.599 0.015		Vel = 1.24	
CHG			0.0 115.09						30.440		K Factor = 20.86	
CHG to UG1	-5 -5		115.09 115.09	6 5.86	G T Zwh	3.834 38.342 0.0	38.500 42.176 80.676	150 0.0005	30.440 5.588 0.041		** Fixed Loss = 5.588 Vel = 1.37	
UG1 to DOM	-5 -5		-42.42 72.67	8 7.68	T	43.857	5.000 43.857 48.857	150 0	36.069 0.0 0.002		Vel = 0.50	
DOM to UG2	-5 -5		0.0 72.67	8 7.68	T	43.857	172.250 43.857 216.107	150 0.0001	36.071 0.0 0.013		Vel = 0.50	
UG2 to UG3	-5 -5		0.0 72.67	8 7.68	E 4F	22.555 45.11	515.833 67.665 583.498	150 0.0001	36.084 0.0 0.034		Vel = 0.50	
UG3 to UG4	-5 -5		-115.10 -42.43	8 7.68	T	43.857	487.167 43.857 531.024	150 0	36.118 0.0 -0.012		Vel = 0.29	
UG4 to UG5	-5 -5		0.0 -42.43	8 7.68	7F 2E T	78.943 45.11	633.833 167.910 801.743	150 0	36.106 0.0 -0.017		Vel = 0.29	
UG5 to UG6	-5 -5		0.0 -42.43	12 11.2	2F E	28.793 29.901	1266.500 58.695 1325.195	150 0	36.089 0.0 -0.004		Vel = 0.14	
UG6 to UG7	-5 -5		0.0 -42.43	12 11.2	E 6F T	29.901 86.38	1047.167 182.727 1229.894	150 0	36.085 0.0 -0.005		Vel = 0.14	
UG7 to UG1	-5 -5		0.0 -42.43	8 7.68	2F	22.555	533.667 22.555 556.222	150 0	36.080 0.0 -0.011		Vel = 0.29	
UG1			0.0 -42.43						36.069		K Factor = -7.06	
UG3 to UG3X	-5 -5		115.09 115.09	6 5.86			2.500 2.500	150 0.0004	36.118 0.0 0.001		Vel = 1.37	
UG3X to CTY	-5 3		0.0 115.09	6 6.16	E G	20.084 4.304	12.000 24.388 36.388	140 0.0004	36.119 -3.465 0.016		Vel = 1.24	
CTY			250.00 365.09						32.670		Qa = 250.00 K Factor = 63.87	

Final Calculations : Hazen-Williams

RANGER FIRE, INC.
HOME 2 SUITES

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Node1	Elev1	K	Qa	Nom	Fitting or	Pipe	CFact	Pt			
to						Ftngs		Pe			
Node2	Elev2	Fact	Qt	Act	Equiv	Len	Pf/Ft	Pf		Notes	



Hydraulic Calculations by HydraCALC

RANGER FIRE, INC.
1000 S. MAIN ST
SUITE 150
GRAPEVINE, TX 76051
817-410-9070

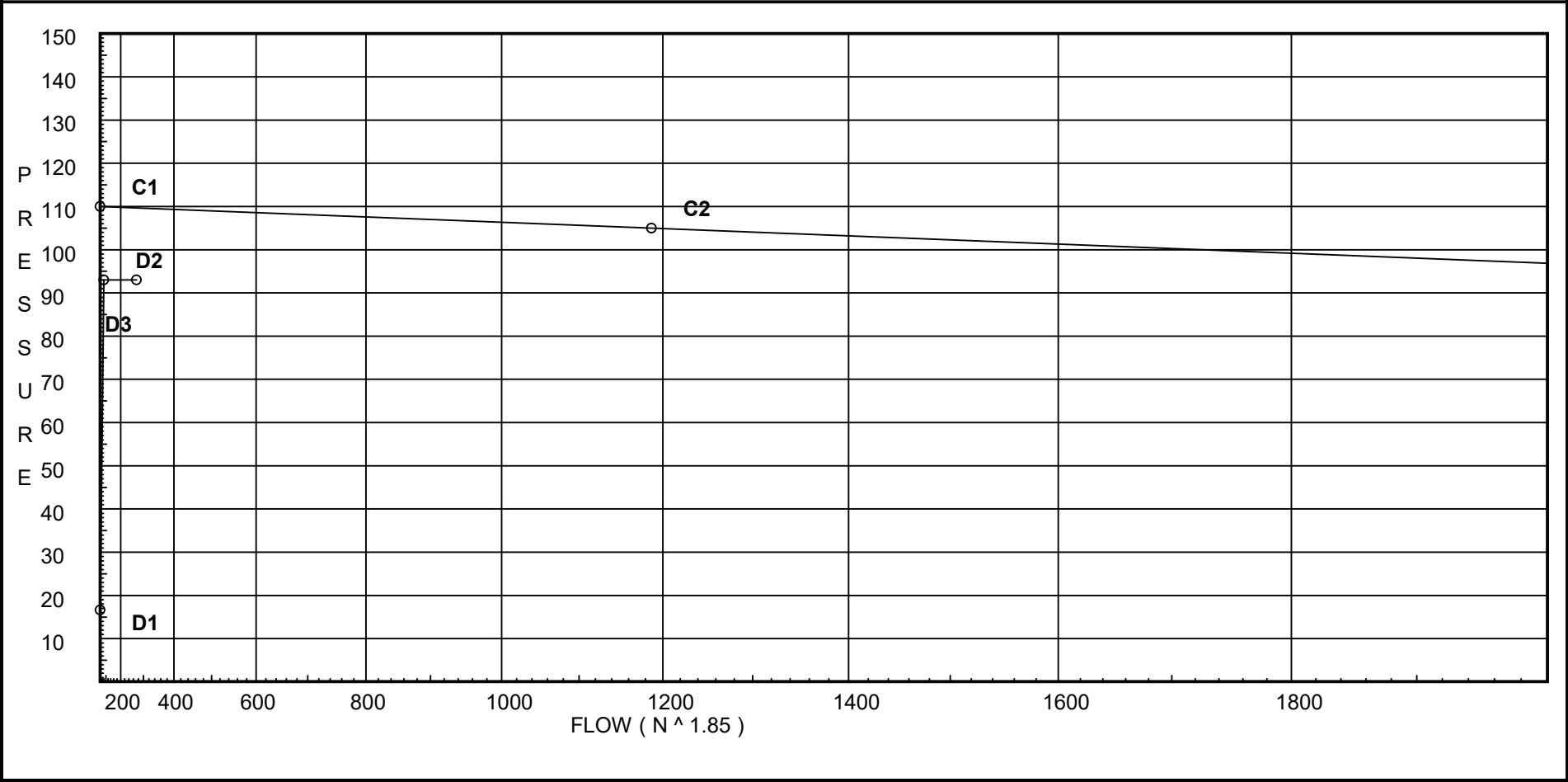
Job Name : HOME 2 SUITES
Drawing :
Location : 4TH FLOOR
Remote Area :
Contract :
Data File : Remote #3_Unit.WXF

Water Supply Curve

RANGER FIRE, INC.
HOME 2 SUITES

City Water Supply:
C1 - Static Pressure : 110
C2 - Residual Pressure: 105
C2 - Residual Flow : 1187

Demand:
D1 - Elevation : 16.601
D2 - System Flow : 80.735
D2 - System Pressure : 93.026
Hose (Demand) : 192
D3 - System Demand : 272.735
Safety Margin : 16.645



Fittings Used Summary

RANGER FIRE, INC.
HOME 2 SUITES

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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
Ball	B Ball Milw BB-SC100			2.25	2	2.5	2.25	10													
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
N *	CPVC 90' Ell	0	4	5	6	7	9	12	13	0	0	0	0	0	0	0	0	0	0	0	0
O *	CPVC Branch Tee	0	3	5	6	8	10	12	15	0	0	0	0	0	0	0	0	0	0	0	0
S	NFPA 13 Swing Check	0	0	5	7	9	11	14	16	19	22	27	32	45	55	65					
T	NFPA 13 90' Flow thru Tee	3	4	5	6	8	10	12	15	17	20	25	30	35	50	60	71	81	91	101	121
Zwh	Watts 757DCDA Horiz	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

RANGER FIRE, INC.
HOME 2 SUITES

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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>
CTY	110.0	105	1187.0	109.671	272.74	93.026

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>	
R1	40.583	5.6	24.62	27.78	0.1	196
R2	41.33	5.6	23.85	27.35	0.1	256
R3	41.33	5.6	20.9	25.6	0.1	256
R4	40.583		43.5			
R5	41.33		42.92			
R6	41.33		42.64			
C1	41.667		45.09			
C2	41.667		42.1			
C3	41.667		43.03			
C4	41.667		43.52			
R1B	33.0		35.15			
R2B	33.0		34.78			
R3B	33.0		30.98			
R4B	33.0		46.78			
R5B	33.0		46.52			
R6B	33.0		46.25			
C1B	33.0		48.85			
C2B	33.0		45.86			
C4B	33.0		47.27			
400	33.0		43.97			
401	33.0		40.7			
402	33.0		40.68			
403	33.0		45.86			
404	33.0		46.25			
405	33.0		46.52			
406	33.0		46.78			
407	33.0		47.27			
408	33.0		48.85			
409	33.0		53.28			
410	33.0		53.96			
BLK4	32.167		72.88			
BLK3	31.167		73.31			
BLK	9.5		82.74			
SP1	9.5		82.89			
SP2	9.5		83.14			
TOS	9.5		83.15			
BOS	4.0		85.55			
FLG	1.0		87.7			
CHG	-5.0		90.3			
UG1	-5.0		96.17			
DOM	-5.0		96.17	192.0		
UG2	-5.0		96.23			

Flow Summary - NFPA

RANGER FIRE, INC.
HOME 2 SUITES

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Date

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>
UG3	-5.0		96.4		
UG4	-5.0		96.35		
UG5	-5.0		96.27		
UG6	-5.0		96.25		
UG7	-5.0		96.23		
UG3X	-5.0		96.41		
CTY	3.0		93.03		

Final Calculations : Hazen-Williams

RANGER FIRE, INC.
HOME 2 SUITES

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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	*****
R1 to R1B	40.583 33	5.60	27.78 27.78	0.75 0.874			18.833 18.833	150 0.3848	24.617 3.284 7.247		Vel = 14.86	
R1B			0.0 27.78						35.148		K Factor = 4.69	
R2 to R2B	41.330 33	5.60	27.35 27.35	0.75 0.874			19.583 19.583	150 0.3737	23.853 3.608 7.319		Vel = 14.63	
R2B			0.0 27.35						34.780		K Factor = 4.64	
R3 to R3B	41.330 33	5.60	25.60 25.6	0.75 0.874			19.583 19.583	150 0.3307	20.898 3.608 6.476		Vel = 13.69	
R3B			0.0 25.60						30.982		K Factor = 4.60	
R4 to R4B	40.583 33		0.0 0.0	0.75 0.874			18.833 18.833	150 0	43.496 3.284 0.0		Vel = 0	
R4B			0.0 0.0						46.780		K Factor = 0	
R5 to R5B	41.330 33		0.0 0.0	0.75 0.874			19.583 19.583	150 0	42.916 3.608 0.0		Vel = 0	
R5B			0.0 0.0						46.524		K Factor = 0	
R6 to R6B	41.330 33		0.0 0.0	0.75 0.874			19.583 19.583	150 0	42.641 3.608 0.0		Vel = 0	
R6B			0.0 0.0						46.249		K Factor = 0	
C1 to C1B	41.667 33		0.0 0.0	0.75 0.874	2N O	8.0 3.0	32.583 11.000 43.583	150 0	45.092 3.754 0.0		Vel = 0	
C1B			0.0 0.0						48.846		K Factor = 0	
C2 to C2B	41.667 33		0.0 0.0	0.75 0.874	2N O	8.0 3.0	32.000 11.000 43.000	150 0	42.104 3.754 0.0		Vel = 0	
C2B			0.0 0.0						45.858		K Factor = 0	
C3 to R4B	41.667 33		0.0 0.0	0.75 0.874	2N O	8.0 3.0	35.917 11.000 46.917	150 0	43.026 3.754 0.0		Vel = 0	
R4B			0.0 0.0						46.780		K Factor = 0	
C4 to C4B	41.667 33		0.0 0.0	0.75 0.874	2N O	8.0 3.0	35.250 11.000 46.250	150 0	43.516 3.754 -0.001		Vel = 0	

Final Calculations : Hazen-Williams

RANGER FIRE, INC.
HOME 2 SUITES

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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	*****
C4B			0.0 0.0						47.269		K Factor = 0	
R1B to 400	33 33		27.78 27.78	0.75 0.874	2N O	8.0 3.0	11.917 11.000 22.917	150 0.3848	35.148 0.0 8.819		Vel = 14.86	
400			0.0 27.78						43.967		K Factor = 4.19	
R2B to 401	33 33		27.35 27.35	0.75 0.874	2N O	8.0 3.0	4.833 11.000 15.833	150 0.3737	34.780 0.0 5.917		Vel = 14.63	
401			0.0 27.35						40.697		K Factor = 4.29	
R3B to 402	33 33		25.60 25.6	0.75 0.874	2N O	8.0 3.0	18.333 11.000 29.333	150 0.3307	30.982 0.0 9.701		Vel = 13.69	
402			0.0 25.60						40.683		K Factor = 4.01	
R4B to 406	33 33		0.0 0.0	0.75 0.874	O	3.0	7.917 3.000 10.917	150 0	46.780 0.0 0.0		Vel = 0	
406			0.0 0.0						46.780		K Factor = 0	
R5B to 405	33 33		0.0 0.0	0.75 0.874	N O	4.0 3.0	1.083 7.000 8.083	150 0	46.524 0.0 0.0		Vel = 0	
405			0.0 0.0						46.524		K Factor = 0	
R6B to 404	33 33		0.0 0.0	0.75 0.874	N	4.0	10.000 4.000 14.000	150 0	46.249 0.0 0.0		Vel = 0	
404			0.0 0.0						46.249		K Factor = 0	
C1B to 408	33 33		0.0 0.0	0.75 0.874	O	3.0	7.917 3.000 10.917	150 0	48.846 0.0 0.0		Vel = 0	
408			0.0 0.0						48.846		K Factor = 0	
C2B to 403	33 33		0.0 0.0	0.75 0.874	O	3.0	7.917 3.000 10.917	150 0	45.858 0.0 0.0		Vel = 0	
403			0.0 0.0						45.858		K Factor = 0	
C4B to 407	33 33		0.0 0.0	0.75 0.874	O	3.0	7.917 3.000 10.917	150 0	47.269 0.0 0.0		Vel = 0	
407			0.0 0.0						47.269		K Factor = 0	

Final Calculations : Hazen-Williams

RANGER FIRE, INC.
HOME 2 SUITES

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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	*****
400 to 401	33 33		-39.86 -39.86	1 1.101	N 5.0	8.417 5.000 13.417	150 -0.2437	43.967 0.0 -3.270		Vel = 13.43	
401 to 402	33 33		27.35 -12.51	1 1.101		0.500 0.500	150 -0.0280	40.697 0.0 -0.014		Vel = 4.22	
402 to 403	33 33		25.60 13.09	1 1.101		166.583 166.583	150 0.0311	40.683 0.0 5.175		Vel = 4.41	
403 to 404	33 33		0.0 13.09	1 1.101		12.583 12.583	150 0.0311	45.858 0.0 0.391		Vel = 4.41	
404 to 405	33 33		0.0 13.09	1 1.101	N 5.0	3.833 5.000 8.833	150 0.0311	46.249 0.0 0.275		Vel = 4.41	
405 to 406	33 33		0.0 13.09	1 1.101		8.250 8.250	150 0.0310	46.524 0.0 0.256		Vel = 4.41	
406 to 407	33 33		0.0 13.09	1 1.101		15.750 15.750	150 0.0310	46.780 0.0 0.489		Vel = 4.41	
407 to 408	33 33		0.0 13.09	1 1.101	N 5.0	45.750 5.000 50.750	150 0.0311	47.269 0.0 1.577		Vel = 4.41	
408 to 409	33 33		0.0 13.09	1 1.101		142.833 142.833	150 0.0311	48.846 0.0 4.437		Vel = 4.41	
409 to 410	33 33		0.0 13.09	1 1.101	N 5.0	11.833 10.000 21.833	150 0.0311	53.283 0.0 0.679		Vel = 4.41	
410 to 400	33 33		-80.73 -67.64	1 1.101		15.417 15.417	150 -0.6483	53.962 0.0 -9.995		Vel = 22.79	
400			0.0 -67.64					43.967		K Factor = -10.20	
410 to BLK4	33 32.167		80.73 80.73	1.25 1.442	3E Ball S T	11.148 2.477 8.671 7.432	21.083 29.728 50.811	120 0.3652	53.962 0.361 18.556		Vel = 15.86
BLK4 to BLK3	32.167 31.167		0.0 80.73	4 4.26		1.000 1.000	120 0.0020	72.879 0.433 0.002		Vel = 1.82	
BLK3 to BLK	31.167 9.500		0.0 80.73	4 4.26		21.667 21.667	120 0.0019	73.314 9.384 0.041		Vel = 1.82	
BLK to SP1	9.500 9.500		0.0 80.73	4 4.26	2E B T	26.334 15.8 26.334	14.417 68.468 82.885	120 0.0019	82.739 0.0 0.155		Vel = 1.82

Final Calculations : Hazen-Williams

RANGER FIRE, INC.
HOME 2 SUITES

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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	*****
SP1 to SP2	9.500 9.500		0.0 80.73	4 4.26	T	26.334 26.334	120 0.0019	82.894 0.0 0.248		Vel = 1.82	
SP2 to TOS	9.500 9.500		0.0 80.73	6 6.357		32.083 32.083	120 0.0003	83.142 0.0 0.009		Vel = 0.82	
TOS to BOS	9.500 4		0.0 80.73	6 6.357	E T	17.603 37.72 55.323	120 0.0003	83.151 2.382 0.016		Vel = 0.82	
BOS to FLG	4 1		0.0 80.73	2 2.157	S	13.537 3.000 13.537	120 0.0514	85.549 1.299 0.850		Vel = 7.09	
FLG to CHG	1 -5		0.0 80.73	6 6.16	E	20.084 12.000 20.084	140 0.0002	87.698 2.599 0.007		Vel = 0.87	
CHG			0.0 80.73					90.304		K Factor = 8.50	
CHG to UG1	-5 -5		80.73	6 5.86	G T Zwh	3.834 38.342 0.0	150 0.0003	90.304 5.846 0.021		* * Fixed Loss = 5.846 Vel = 0.96	
UG1 to DOM	-5 -5		-98.48 -17.75	8 7.68	T	43.857 5.000 43.857	150 0	96.171 0.0 0.0		Vel = 0.12	
DOM to UG2	-5 -5	H192	192.00 174.25	8 7.68	T	43.857 43.857 216.107	150 0.0003	96.171 0.0 0.063		Vel = 1.21	
UG2 to UG3	-5 -5		0.0 174.25	8 7.68	E 4F	22.555 45.11 67.665	150 0.0003	96.234 0.0 0.169		Vel = 1.21	
UG3 to UG4	-5 -5		-272.73 -98.48	8 7.68	T	43.857 487.167 43.857	150 -0.0001	96.403 0.0 -0.053		Vel = 0.68	
UG4 to UG5	-5 -5		0.0 -98.48	8 7.68	7F 2E T	78.943 45.11 43.857	150 -0.0001	96.350 0.0 -0.082		Vel = 0.68	
UG5 to UG6	-5 -5		0.0 -98.48	12 11.2	2F E	28.793 29.901 58.695	150 0	96.268 0.0 -0.021		Vel = 0.32	
UG6 to UG7	-5 -5		0.0 -98.48	12 11.2	E 6F T	29.901 86.38 66.446	150 0	96.247 0.0 -0.020		Vel = 0.32	
UG7 to UG1	-5 -5		0.0 -98.48	8 7.68	2F	22.555 533.667 22.555	150 -0.0001	96.227 0.0 -0.056		Vel = 0.68	
UG1			0.0 -98.48					96.171		K Factor = -10.04	
UG3 to UG3X	-5 -5		272.74 272.74	6 5.86		2.500 2.500	150 0.0028	96.403 0.0 0.007		Vel = 3.24	

Final Calculations : Hazen-Williams

RANGER FIRE, INC.
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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	*****
UG3X to CTY	-5 3		0.0 272.74	6 6.16	E G	20.084 4.304	12.000 24.388 36.388	140 0.0022	96.410 -3.465 0.081		Vel = 2.94	
CTY			0.0 272.74						93.026		K Factor = 28.28	



Hydraulic Calculations by HydraCALC

RANGER FIRE, INC.
1000 S. MAIN ST
SUITE 150
GRAPEVINE, TX 76051
817-410-9070

Job Name : HOME 2 SUITES
Drawing :
Location : 4TH FLOOR
Remote Area :
Contract :
Data File : Remote #4_Unit.WXF

Water Supply Curve

RANGER FIRE, INC.
HOME 2 SUITES

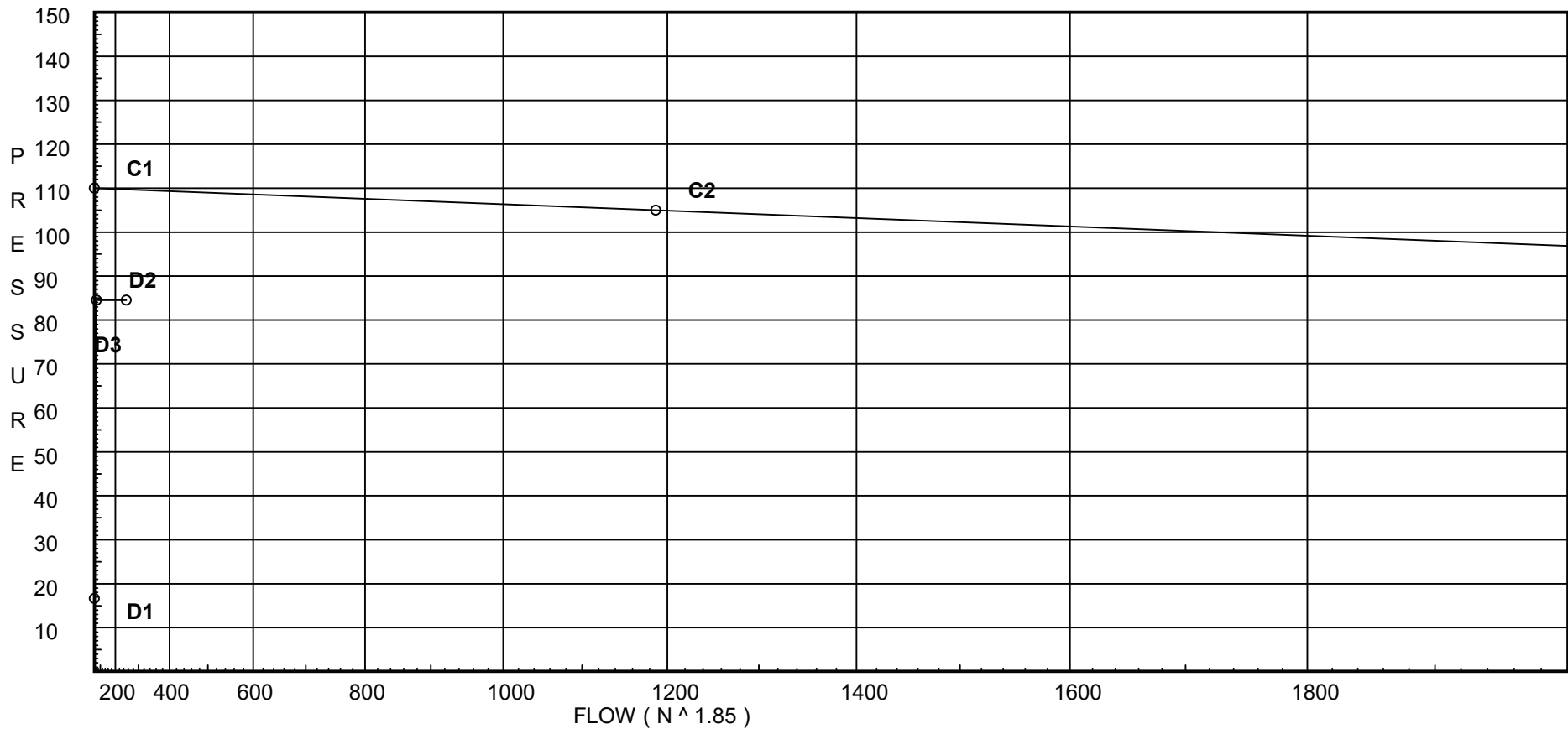
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City Water Supply:

C1 - Static Pressure : 110
C2 - Residual Pressure: 105
C2 - Residual Flow : 1187

Demand:

D1 - Elevation : 16.601
D2 - System Flow : 59.904
D2 - System Pressure : 84.515
Hose (Demand) : 192
D3 - System Demand : 251.904
Safety Margin : 25.201



Fittings Used Summary

RANGER FIRE, INC.
HOME 2 SUITES

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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
Ball	B Ball Milw BB-SC100			2.25	2	2.5	2.25	10													
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
N *	CPVC 90' Ell	0	4	5	6	7	9	12	13	0	0	0	0	0	0	0	0	0	0	0	0
O *	CPVC Branch Tee	0	3	5	6	8	10	12	15	0	0	0	0	0	0	0	0	0	0	0	0
S	NFPA 13 Swing Check	0	0	5	7	9	11	14	16	19	22	27	32	45	55	65					
T	NFPA 13 90' Flow thru Tee	3	4	5	6	8	10	12	15	17	20	25	30	35	50	60	71	81	91	101	121
Zwh	Watts 757DCDA Horiz	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

RANGER FIRE, INC.
HOME 2 SUITES

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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>
CTY	110.0	105	1187.0	109.716	251.9	84.515

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>	
R1	40.583		48.5			
R2	41.33		46.15			
R3	41.33		46.07			
R4	40.583	5.6	12.95	20.15	0.1	196
R5	41.33	5.6	12.95	20.15	0.1	196
R6	41.33	5.6	12.25	19.6	0.1	196
C1	41.667		27.88			
C2	41.667		20.78			
C3	41.667		16.48			
C4	41.667		20.95			
R1B	33.0		51.78			
R2B	33.0		49.75			
R3B	33.0		49.68			
R4B	33.0		20.24			
R5B	33.0		20.71			
R6B	33.0		19.81			
C1B	33.0		31.63			
C2B	33.0		24.53			
C4B	33.0		24.71			
400	33.0		51.78			
401	33.0		49.75			
402	33.0		49.68			
403	33.0		24.53			
404	33.0		22.63			
405	33.0		22.43			
406	33.0		22.56			
407	33.0		24.71			
408	33.0		31.63			
409	33.0		51.13			
410	33.0		54.11			
BLK4	32.167		65.15			
BLK3	31.167		65.59			
BLK	9.5		74.99			
SP1	9.5		75.08			
SP2	9.5		75.23			
TOS	9.5		75.23			
BOS	4.0		77.62			
FLG	1.0		79.41			
CHG	-5.0		82.01			
UG1	-5.0		87.7			
DOM	-5.0		87.7	192.0		
UG2	-5.0		87.76			

Flow Summary - NFPA

RANGER FIRE, INC.
HOME 2 SUITES

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Date

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>
UG3	-5.0		87.9		
UG4	-5.0		87.86		
UG5	-5.0		87.79		
UG6	-5.0		87.77		
UG7	-5.0		87.75		
UG3X	-5.0		87.91		
CTY	3.0		84.52		

Final Calculations : Hazen-Williams

RANGER FIRE, INC.
HOME 2 SUITES

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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	*****
R1 to R1B	40.583 33		0.0 0.0	0.75 0.874			18.833 18.833	150 0	48.496 3.284 0.0		Vel = 0	
R1B			0.0 0.0						51.780		K Factor = 0	
R2 to R2B	41.330 33		0.0 0.0	0.75 0.874			19.583 19.583	150 -0.0001	46.147 3.608 -0.001		Vel = 0	
R2B			0.0 0.0						49.754		K Factor = 0	
R3 to R3B	41.330 33		0.0 0.0	0.75 0.874			19.583 19.583	150 0	46.071 3.608 0.0		Vel = 0	
R3B			0.0 0.0						49.679		K Factor = 0	
R4 to R4B	40.583 33	5.60	20.15 20.15	0.75 0.874			18.833 18.833	150 0.2125	12.952 3.284 4.002		Vel = 10.78	
R4B			0.0 20.15						20.238		K Factor = 4.48	
R5 to R5B	41.330 33	5.60	20.15 20.15	0.75 0.874			19.583 19.583	150 0.2124	12.946 3.608 4.159		Vel = 10.78	
R5B			0.0 20.15						20.713		K Factor = 4.43	
R6 to R6B	41.330 33	5.60	19.60 19.6	0.75 0.874			19.583 19.583	150 0.2018	12.250 3.608 3.951		Vel = 10.48	
R6B			0.0 19.60						19.809		K Factor = 4.40	
C1 to C1B	41.667 33		0.0 0.0	0.75 0.874	2N O	8.0 3.0	32.583 11.000 43.583	150 0	27.880 3.754 -0.001		Vel = 0	
C1B			0.0 0.0						31.633		K Factor = 0	
C2 to C2B	41.667 33		0.0 0.0	0.75 0.874	2N O	8.0 3.0	32.000 11.000 43.000	150 0	20.780 3.754 0.0		Vel = 0	
C2B			0.0 0.0						24.534		K Factor = 0	
C3 to R4B	41.667 33		0.0 0.0	0.75 0.874	2N O	8.0 3.0	35.917 11.000 46.917	150 0	16.484 3.754 0.0		Vel = 0	
R4B			0.0 0.0						20.238		K Factor = 0	
C4 to C4B	41.667 33		0.0 0.0	0.75 0.874	2N O	8.0 3.0	35.250 11.000 46.250	150 0	20.953 3.754 0.0		Vel = 0	

Final Calculations : Hazen-Williams

RANGER FIRE, INC.
HOME 2 SUITES

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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	*****
C4B			0.0 0.0						24.707		K Factor = 0	
R1B to 400	33 33		0.0 0.0	0.75 0.874	2N O	8.0 3.0	11.917 11.000 22.917	150 0	51.780 0.0 0.0		Vel = 0	
400			0.0 0.0						51.780		K Factor = 0	
R2B to 401	33 33		0.0 0.0	0.75 0.874	2N O	8.0 3.0	4.833 11.000 15.833	150 0	49.754 0.0 0.0		Vel = 0	
401			0.0 0.0						49.754		K Factor = 0	
R3B to 402	33 33		0.0 0.0	0.75 0.874	2N O	8.0 3.0	18.333 11.000 29.333	150 0	49.679 0.0 0.0		Vel = 0	
402			0.0 0.0						49.679		K Factor = 0	
R4B to 406	33 33		20.15 20.15	0.75 0.874	O	3.0	7.917 3.000 10.917	150 0.2124	20.238 0.0 2.319		Vel = 10.78	
406			0.0 20.15						22.557		K Factor = 4.24	
R5B to 405	33 33		20.15 20.15	0.75 0.874	N O	4.0 3.0	1.083 7.000 8.083	150 0.2124	20.713 0.0 1.717		Vel = 10.78	
405			0.0 20.15						22.430		K Factor = 4.25	
R6B to 404	33 33		19.60 19.6	0.75 0.874	N	4.0	10.000 4.000 14.000	150 0.2018	19.809 0.0 2.825		Vel = 10.48	
404			0.0 19.60						22.634		K Factor = 4.12	
C1B to 408	33 33		0.0 0.0	0.75 0.874	O	3.0	7.917 3.000 10.917	150 0	31.633 0.0 0.0		Vel = 0	
408			0.0 0.0						31.633		K Factor = 0	
C2B to 403	33 33		0.0 0.0	0.75 0.874	O	3.0	7.917 3.000 10.917	150 0	24.534 0.0 0.0		Vel = 0	
403			0.0 0.0						24.534		K Factor = 0	
C4B to 407	33 33		0.0 0.0	0.75 0.874	O	3.0	7.917 3.000 10.917	150 0	24.707 0.0 0.0		Vel = 0	
407			0.0 0.0						24.707		K Factor = 0	

Final Calculations : Hazen-Williams

RANGER FIRE, INC.
HOME 2 SUITES

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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	*****
400 to 401	33 33		-30.77	1	N 5.0	8.417 5.000 13.417	150 -0.1510	51.780 0.0 -2.026		Vel = 10.37	
401 to 402	33 33		0.0	1		0.500	150	49.754 0.0		Vel = 10.37	
402 to 403	33 33		-30.77	1.101		0.500	-0.1500	-0.075		Vel = 10.37	
402 to 403	33 33		0.0	1		166.583	150	49.679 0.0		Vel = 10.37	
403 to 404	33 33		-30.77	1.101		166.583	-0.1509	-25.145		Vel = 10.37	
403 to 404	33 33		0.0	1		12.583	150	24.534 0.0		Vel = 10.37	
404 to 405	33 33		-30.77	1.101		12.583	-0.1510	-1.900		Vel = 10.37	
404 to 405	33 33		19.60	1	N 5.0	3.833 5.000 8.833	150 -0.0231	22.634 0.0 -0.204		Vel = 3.76	
405 to 406	33 33		-11.17	1.101		8.250	150	22.430 0.0		Vel = 3.03	
405 to 406	33 33		20.15	1		8.250	0.0154	0.127		Vel = 3.03	
406 to 407	33 33		8.98	1.101		8.250	150	22.557 0.0		Vel = 9.82	
406 to 407	33 33		20.16	1		15.750	150	22.557 0.0		Vel = 9.82	
407 to 408	33 33		29.14	1.101		15.750	0.1365	2.150		Vel = 9.82	
407 to 408	33 33		0.0	1	N 5.0	45.750 5.000 50.750	150	24.707 0.0		Vel = 9.82	
408 to 409	33 33		29.14	1.101		50.750	0.1365	6.926		Vel = 9.82	
408 to 409	33 33		0.0	1		142.833	150	31.633 0.0		Vel = 9.82	
409 to 410	33 33		29.14	1.101		142.833	0.1365	19.494		Vel = 9.82	
409 to 410	33 33		0.0	1	N O 5.0 5.0	11.833 10.000 21.833	150	51.127 0.0		Vel = 9.82	
410 to 400	33 33		29.14	1.101		21.833	0.1365	2.980		Vel = 9.82	
410 to 400	33 33		-59.91	1		15.417	150	54.107 0.0		Vel = 10.37	
400 to 400	33 33		-30.77	1.101		15.417	-0.1509	-2.327		Vel = 10.37	
400 to 400			0.0 -30.77					51.780		K Factor = -4.28	
410 to BLK4	33 32.167		59.90	1.25	3E Ball S T 11.148 2.477 8.671 7.432	21.083 29.728 50.811	120	54.107 0.361 10.684		Vel = 11.77	
BLK4 to BLK3	32.167 31.167		59.9	1.442		1.000	120	65.152 0.433		Vel = 1.35	
BLK4 to BLK3	32.167 31.167		0.0	4		1.000	0.0010	0.001		Vel = 1.35	
BLK3 to BLK	31.167 9.500		59.9	4.26		21.667	120	65.586 9.384		Vel = 1.35	
BLK3 to BLK	31.167 9.500		0.0	4		21.667	0.0011	0.023		Vel = 1.35	
BLK to SP1	9.500 9.500		59.9	4.26	2E B T 26.334 15.8 26.334	14.417 68.468 82.885	120	74.993 0.0		Vel = 1.35	
BLK to SP1	9.500 9.500		59.9	4.26		82.885	0.0011	0.089		Vel = 1.35	

Final Calculations : Hazen-Williams

RANGER FIRE, INC.
HOME 2 SUITES

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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	*****
SP1 to SP2	9.500 9.500		0.0 59.9	4 4.26	T	26.334 106.583 26.334 132.917	120 0.0011	75.082 0.0 0.143		Vel = 1.35	
SP2 to TOS	9.500 9.500		0.0 59.9	6 6.357		32.083 32.083	120 0.0002	75.225 0.0 0.005		Vel = 0.61	
TOS to BOS	9.500 4		0.0 59.9	6 6.357	E T	17.603 37.72 5.500 55.323 60.823	120 0.0002	75.230 2.382 0.010		Vel = 0.61	
BOS to FLG	4 1		0.0 59.9	2 2.157	S	13.537 3.000 13.537 16.537	120 0.0296	77.622 1.299 0.489		Vel = 5.26	
FLG to CHG	1 -5		0.0 59.9	6 6.16	E	20.084 12.000 20.084 32.084	140 0.0001	79.410 2.599 0.004		Vel = 0.64	
CHG			0.0 59.90					82.013		K Factor = 6.61	
CHG to UG1	-5 -5		59.90 59.9	6 5.86	G T Zwh	3.834 38.342 0.0 80.676	150 0.0002	82.013 5.679 0.013		** Fixed Loss = 5.679 Vel = 0.71	
UG1 to DOM	-5 -5		-90.89 -30.99	8 7.68	T	43.857 5.000 43.857 48.857	150 0	87.705 0.0 -0.001		Vel = 0.21	
DOM to UG2	-5 -5	H192	191.99 161.0	8 7.68	T	43.857 172.250 43.857 216.107	150 0.0002	87.704 0.0 0.054		Vel = 1.12	
UG2 to UG3	-5 -5		0.0 161.0	8 7.68	E 4F	22.555 45.11 515.833 67.665 583.498	150 0.0003	87.758 0.0 0.147		Vel = 1.12	
UG3 to UG4	-5 -5		-251.90 -90.9	8 7.68	T	43.857 487.167 43.857 531.024	150 -0.0001	87.905 0.0 -0.046		Vel = 0.63	
UG4 to UG5	-5 -5		0.0 -90.9	8 7.68	7F 2E T	78.943 45.11 43.857 801.743	150 -0.0001	87.859 0.0 -0.070		Vel = 0.63	
UG5 to UG6	-5 -5		0.0 -90.9	12 11.2	2F E	28.793 29.901 1266.500 58.695 1325.195	150 0	87.789 0.0 -0.019		Vel = 0.30	
UG6 to UG7	-5 -5		0.0 -90.9	12 11.2	E 6F T	29.901 86.38 1047.167 182.727 1229.894	150 0	87.770 0.0 -0.017		Vel = 0.30	
UG7 to UG1	-5 -5		0.0 -90.9	8 7.68	2F	22.555 533.667 22.555 556.222	150 -0.0001	87.753 0.0 -0.048		Vel = 0.63	
UG1			0.0 -90.90					87.705		K Factor = -9.71	
UG3 to UG3X	-5 -5		251.90 251.9	6 5.86		2.500 2.500	150 0.0020	87.905 0.0 0.005		Vel = 3.00	

Final Calculations : Hazen-Williams

RANGER FIRE, INC.
HOME 2 SUITES

Page 9
Date

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	*****
UG3X to CTY	-5 3		0.0 251.9	6 6.16	E G	20.084 4.304	12.000 24.388 36.388	140 0.0019	87.910 -3.465 0.070		Vel = 2.71	
CTY			0.0 251.90						84.515		K Factor = 27.40	



Hydraulic Calculations by HydraCALC

RANGER FIRE, INC.
1000 S. MAIN ST
SUITE 150
GRAPEVINE, TX 76051
817-410-9070

Job Name : HOME 2 SUITES
Drawing :
Location : 4TH FLOOR
Remote Area :
Contract :
Data File : Remote #5_Corridor.WXF

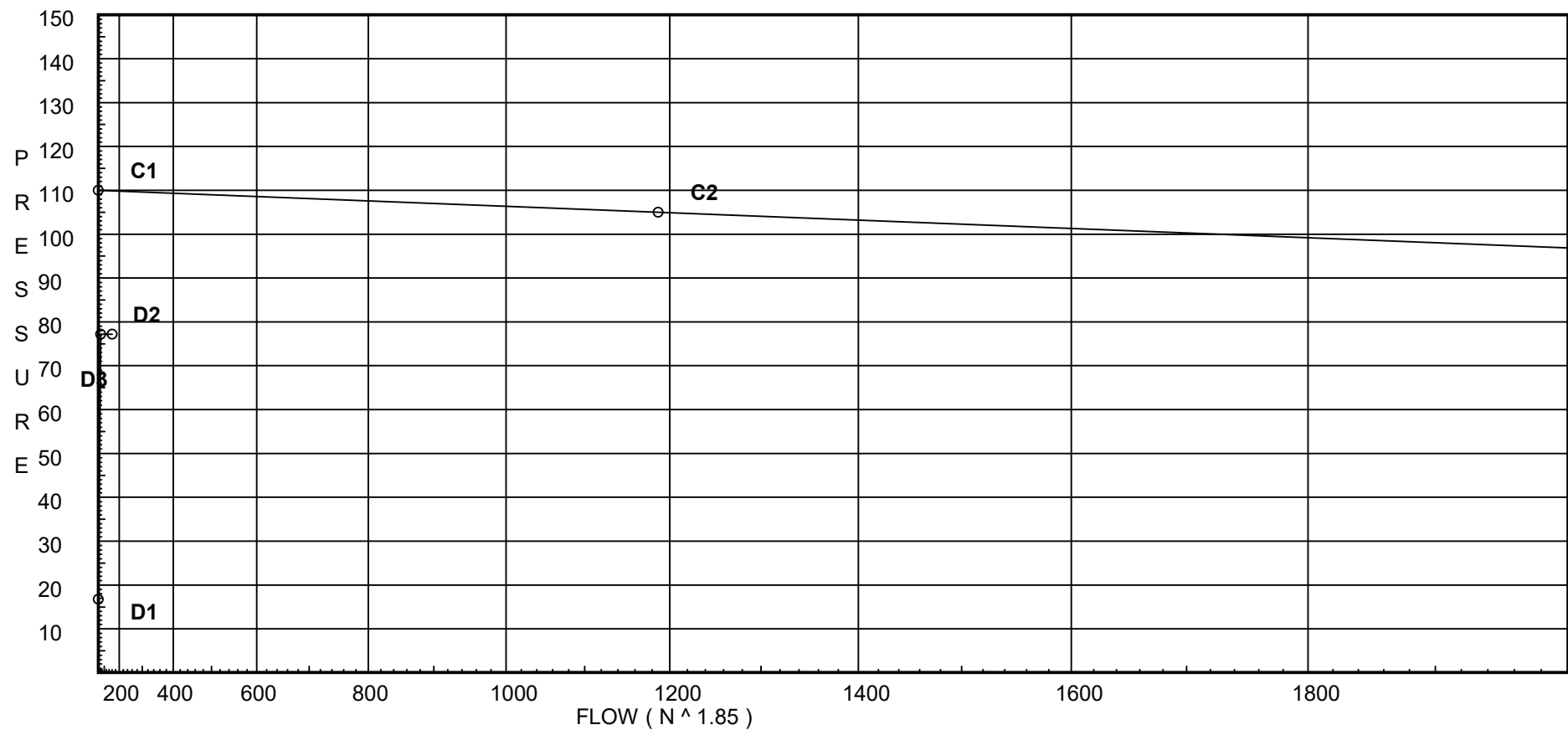
Water Supply Curve

RANGER FIRE, INC.
HOME 2 SUITES

Page 1
Date

City Water Supply:
C1 - Static Pressure : 110
C2 - Residual Pressure: 105
C2 - Residual Flow : 1187

Demand:
D1 - Elevation : 16.747
D2 - System Flow : 61.564
D2 - System Pressure : 77.203
Hose (Demand) : 100
D3 - System Demand : 161.564
Safety Margin : 32.672



Fittings Used Summary

RANGER FIRE, INC.
HOME 2 SUITES

Page 2
Date

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
Ball	B Ball Milw BB-SC100			2.25	2	2.5	2.25	10													
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
N *	CPVC 90' Ell	0	4	5	6	7	9	12	13	0	0	0	0	0	0	0	0	0	0	0	0
O *	CPVC Branch Tee	0	3	5	6	8	10	12	15	0	0	0	0	0	0	0	0	0	0	0	0
S	NFPA 13 Swing Check	0	0	5	7	9	11	14	16	19	22	27	32	45	55	65					
T	NFPA 13 90' Flow thru Tee	3	4	5	6	8	10	12	15	17	20	25	30	35	50	60	71	81	91	101	121
Zwh	Watts 757DCDA Horiz	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

RANGER FIRE, INC.
HOME 2 SUITES

Page 3
Date

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>
CTY	110.0	105	1187.0	109.875	161.56	77.203

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>	
R1	40.583		40.98			
R2	41.33		38.76			
R3	41.33		38.69			
R4	40.583		13.11			
R5	41.33		14.39			
R6	41.33		14.7			
C1	41.667	5.6	8.4	16.23	0.1	84
C2	41.667	5.6	7.82	15.66	0.1	84
C3	41.667	5.6	7.0	14.82	0.1	84
C4	41.667	5.6	7.04	14.86	0.1	84
R1B	33.0		44.26			
R2B	33.0		42.37			
R3B	33.0		42.3			
R4B	33.0		16.4			
R5B	33.0		18.0			
R6B	33.0		18.31			
C1B	33.0		18.35			
C2B	33.0		17.3			
C4B	33.0		16.39			
400	33.0		44.26			
401	33.0		42.37			
402	33.0		42.3			
403	33.0		18.76			
404	33.0		18.31			
405	33.0		18.0			
406	33.0		17.71			
407	33.0		17.71			
408	33.0		19.9			
409	33.0		42.92			
410	33.0		46.44			
BLK4	32.167		58.04			
BLK3	31.167		58.47			
BLK	9.5		67.88			
SP1	9.5		67.98			
SP2	9.5		68.13			
TOS	9.5		68.13			
BOS	4.0		70.52			
FLG	1.0		72.34			
CHG	-5.0		74.94			
UG1	-5.0		80.65			
DOM	-5.0		80.65			
UG2	-5.0		80.65			

Flow Summary - NFPA

RANGER FIRE, INC.
HOME 2 SUITES

Page 4
Date

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>
UG3	-5.0		80.66		
UG4	-5.0		80.66		
UG5	-5.0		80.65		
UG6	-5.0		80.65		
UG7	-5.0		80.65		
UG3X	-5.0		80.66		
CTY	3.0		77.2	100.0	

Final Calculations : Hazen-Williams

RANGER FIRE, INC.
HOME 2 SUITES

Page 5
Date

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	*****
R1 to R1B	40.583 33		0.0 0.0	0.75 0.874			18.833 18.833	150 0	40.978 3.284 0.0		Vel = 0	
R1B			0.0						44.262		K Factor = 0	
R2 to R2B	41.330 33		0.0 0.0	0.75 0.874			19.583 19.583	150 -0.0001	38.759 3.608 -0.001		Vel = 0	
R2B			0.0						42.366		K Factor = 0	
R3 to R3B	41.330 33		0.0 0.0	0.75 0.874			19.583 19.583	150 0	38.688 3.608 0.0		Vel = 0	
R3B			0.0						42.296		K Factor = 0	
R4 to R4B	40.583 33		0.0 0.0	0.75 0.874			18.833 18.833	150 0	13.111 3.284 0.0		Vel = 0	
R4B			0.0						16.395		K Factor = 0	
R5 to R5B	41.330 33		0.0 0.0	0.75 0.874			19.583 19.583	150 -0.0001	14.392 3.608 -0.001		Vel = 0	
R5B			0.0						17.999		K Factor = 0	
R6 to R6B	41.330 33		0.0 0.0	0.75 0.874			19.583 19.583	150 -0.0001	14.704 3.608 -0.001		Vel = 0	
R6B			0.0						18.311		K Factor = 0	
C1 to C1B	41.667 33	5.60	16.23 16.23	0.75 0.874	2N O	8.0 3.0	32.583 11.000 43.583	150 0.1423	8.396 3.754 6.201		Vel = 8.68	
C1B			0.0						18.351		K Factor = 3.79	
C2 to C2B	41.667 33	5.60	15.66 15.66	0.75 0.874	2N O	8.0 3.0	32.000 11.000 43.000	150 0.1332	7.819 3.754 5.728		Vel = 8.37	
C2B			0.0						17.301		K Factor = 3.76	
C3 to R4B	41.667 33	5.60	14.82 14.82	0.75 0.874	2N O	8.0 3.0	35.917 11.000 46.917	150 0.1202	7.000 3.754 5.641		Vel = 7.93	
R4B			0.0						16.395		K Factor = 3.66	
C4 to C4B	41.667 33	5.60	14.86 14.86	0.75 0.874	2N O	8.0 3.0	35.250 11.000 46.250	150 0.1209	7.043 3.754 5.593		Vel = 7.95	

Final Calculations : Hazen-Williams

RANGER FIRE, INC.
HOME 2 SUITES

Page 6
Date

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	*****
C4B			0.0 14.86						16.390		K Factor = 3.67	
R1B to 400	33 33		0.0 0.0	0.75 0.874	2N O	8.0 3.0	11.917 11.000 22.917	150 0	44.262 0.0 0.0		Vel = 0	
400			0.0 0.0						44.262		K Factor = 0	
R2B to 401	33 33		0.0 0.0	0.75 0.874	2N O	8.0 3.0	4.833 11.000 15.833	150 0	42.366 0.0 0.0		Vel = 0	
401			0.0 0.0						42.366		K Factor = 0	
R3B to 402	33 33		0.0 0.0	0.75 0.874	2N O	8.0 3.0	18.333 11.000 29.333	150 0	42.296 0.0 0.0		Vel = 0	
402			0.0 0.0						42.296		K Factor = 0	
R4B to 406	33 33		14.82 14.82	0.75 0.874	O	3.0	7.917 3.000 10.917	150 0.1203	16.395 0.0 1.313		Vel = 7.93	
406			0.0 14.82						17.708		K Factor = 3.52	
R5B to 405	33 33		0.0 0.0	0.75 0.874	N O	4.0 3.0	1.083 7.000 8.083	150 0	17.999 0.0 0.0		Vel = 0	
405			0.0 0.0						17.999		K Factor = 0	
R6B to 404	33 33		0.0 0.0	0.75 0.874	N	4.0	10.000 4.000 14.000	150 0	18.311 0.0 0.0		Vel = 0	
404			0.0 0.0						18.311		K Factor = 0	
C1B to 408	33 33		16.23 16.23	0.75 0.874	O	3.0	7.917 3.000 10.917	150 0.1423	18.351 0.0 1.553		Vel = 8.68	
408			0.0 16.23						19.904		K Factor = 3.64	
C2B to 403	33 33		15.66 15.66	0.75 0.874	O	3.0	7.917 3.000 10.917	150 0.1333	17.301 0.0 1.455		Vel = 8.37	
403			0.0 15.66						18.756		K Factor = 3.62	
C4B to 407	33 33		14.86 14.86	0.75 0.874	O	3.0	7.917 3.000 10.917	150 0.1210	16.390 0.0 1.321		Vel = 7.95	
407			0.0 14.86						17.711		K Factor = 3.53	

Final Calculations : Hazen-Williams

RANGER FIRE, INC.
HOME 2 SUITES

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Date

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	*****
400 to 401	33 33		-29.69 -29.69	1 1.101	N 5.0	8.417 5.000 13.417	150 -0.1413	44.262 0.0 -1.896		Vel = 10.01	
401 to 402	33 33		0.0 -29.69	1 1.101		0.500 0.500	150 -0.1400	42.366 0.0 -0.070		Vel = 10.01	
402 to 403	33 33		0.0 -29.69	1 1.101		166.583 166.583	150 -0.1413	42.296 0.0 -23.540		Vel = 10.01	
403 to 404	33 33		15.66 -14.03	1 1.101		12.583 12.583	150 -0.0354	18.756 0.0 -0.445		Vel = 4.73	
404 to 405	33 33		0.0 -14.03	1 1.101	N 5.0	3.833 5.000 8.833	150 -0.0353	18.311 0.0 -0.312		Vel = 4.73	
405 to 406	33 33		0.0 -14.03	1 1.101		8.250 8.250	150 -0.0353	17.999 0.0 -0.291		Vel = 4.73	
406 to 407	33 33		14.82 0.79	1 1.101		15.750 15.750	150 0.0002	17.708 0.0 0.003		Vel = 0.27	
407 to 408	33 33		14.86 15.65	1 1.101	N 5.0	45.750 5.000 50.750	150 0.0432	17.711 0.0 2.193		Vel = 5.27	
408 to 409	33 33		16.23 31.88	1 1.101		142.833 142.833	150 0.1612	19.904 0.0 23.018		Vel = 10.74	
409 to 410	33 33		0.0 31.88	1 1.101	N O 5.0	11.833 10.000 21.833	150 0.1612	42.922 0.0 3.519		Vel = 10.74	
410 to 400	33 33		-61.57 -29.69	1 1.101		15.417 15.417	150 -0.1413	46.441 0.0 -2.179		Vel = 10.01	
400			0.0 -29.69					44.262		K Factor = -4.46	
410 to BLK4	33 32.167		61.56 61.56	1.25 1.442	3E Ball S T 11.148 2.477 8.671 7.432	21.083 29.728 50.811	120 0.2212	46.441 0.361 11.238		Vel = 12.09	
BLK4 to BLK3	32.167 31.167		0.0 61.56	4 4.26		1.000 1.000	120 0.0010	58.040 0.433 0.001		Vel = 1.39	
BLK3 to BLK	31.167 9.500		0.0 61.56	4 4.26		21.667 21.667	120 0.0012	58.474 9.384 0.025		Vel = 1.39	
BLK to SP1	9.500 9.500		0.0 61.56	4 4.26	2E B T 26.334 15.8 26.334	14.417 68.468 82.885	120 0.0011	67.883 0.0 0.094		Vel = 1.39	

Final Calculations : Hazen-Williams

RANGER FIRE, INC.
HOME 2 SUITES

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Date

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	*****
SP1 to SP2	9.500 9.500		0.0 61.56	4 4.26	T	26.334 106.583 26.334 132.917	120 0.0011	67.977 0.0 0.150		Vel = 1.39	
SP2 to TOS	9.500 9.500		0.0 61.56	6 6.357		32.083 32.083	120 0.0002	68.127 0.0 0.005		Vel = 0.62	
TOS to BOS	9.500 4		0.0 61.56	6 6.357	E T	17.603 37.72 5.500 55.323 60.823	120 0.0002	68.132 2.382 0.010		Vel = 0.62	
BOS to FLG	4 1		0.0 61.56	2 2.157	S	13.537 3.000 13.537 16.537	120 0.0311	70.524 1.299 0.515		Vel = 5.40	
FLG to CHG	1 -5		0.0 61.56	6 6.16	E	20.084 12.000 20.084 32.084	140 0.0001	72.338 2.599 0.004		Vel = 0.66	
CHG			0.0 61.56					74.941		K Factor = 7.11	
CHG to UG1	-5 -5		61.56	6 5.86	G T Zwh	3.834 38.342 0.0 80.676	150 0.0001	74.941 5.693 0.012		** Fixed Loss = 5.693 Vel = 0.73	
UG1 to DOM	-5 -5		-22.69 38.87	8 7.68	T	43.857 5.000 43.857 48.857	150 0	80.646 0.0 0.001		Vel = 0.27	
DOM to UG2	-5 -5		0.0 38.87	8 7.68	T	43.857 172.250 43.857 216.107	150 0	80.647 0.0 0.004		Vel = 0.27	
UG2 to UG3	-5 -5		0.0 38.87	8 7.68	E 4F	22.555 45.11 515.833 67.665 583.498	150 0	80.651 0.0 0.011		Vel = 0.27	
UG3 to UG4	-5 -5		-61.56 -22.69	8 7.68	T	43.857 487.167 43.857 531.024	150 0	80.662 0.0 -0.004		Vel = 0.16	
UG4 to UG5	-5 -5		0.0 -22.69	8 7.68	7F 2E T	78.943 45.11 43.857 801.743	150 0	80.658 0.0 -0.005		Vel = 0.16	
UG5 to UG6	-5 -5		0.0 -22.69	12 11.2	2F E	28.793 29.901 1266.500 58.695 1325.195	150 0	80.653 0.0 -0.001		Vel = 0.07	
UG6 to UG7	-5 -5		0.0 -22.69	12 11.2	E 6F T	29.901 86.38 1047.167 182.727 1229.894	150 0	80.652 0.0 -0.002		Vel = 0.07	
UG7 to UG1	-5 -5		0.0 -22.69	8 7.68	2F	22.555 533.667 22.555 556.222	150 0	80.650 0.0 -0.004		Vel = 0.16	
UG1			0.0 -22.69					80.646		K Factor = -2.53	
UG3 to UG3X	-5 -5		61.56	6 5.86		2.500 2.500	150 0	80.662 0.0 0.0		Vel = 0.73	

Final Calculations : Hazen-Williams

RANGER FIRE, INC.
HOME 2 SUITES

Page 9
Date

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	*****
UG3X to CTY	-5 3		0.0 61.56	6 6.16	E G	20.084 4.304	12.000 24.388	140 0.0002	80.662 -3.465	Vel = 0.66	
CTY			100.00 161.56					77.203		Qa = 100.00 K Factor = 18.39	



Hydraulic Calculations by HydraCALC

RANGER FIRE, INC.
1000 S. MAIN ST
SUITE 150
GRAPEVINE, TX 76051
817-410-9070

Job Name : HOME 2 SUITES
Drawing :
Location : STAIRWELL 1 & 2
Remote Area :
Contract :
Data File : Wet Standpipe.WXF

Water Supply Curve

RANGER FIRE, INC.
HOME 2 SUITES

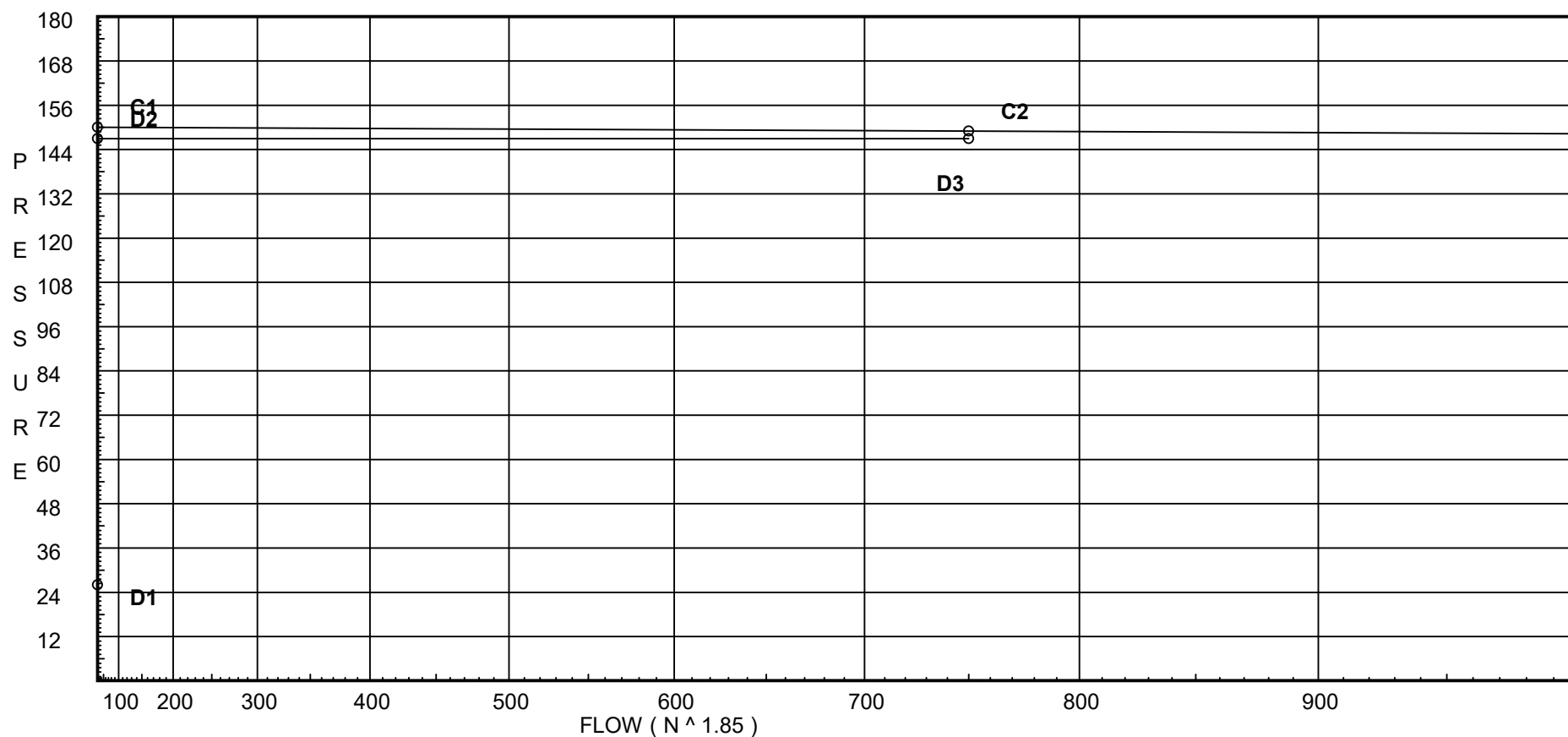
Page 1
Date

City Water Supply:

C1 - Static Pressure : 150
C2 - Residual Pressure: 149
C2 - Residual Flow : 750

Demand:

D1 - Elevation : 26.058
D2 - System Flow :
D2 - System Pressure : 146.971
Hose (Demand) : 750
D3 - System Demand : 750
Safety Margin : 2.029



Fittings Used Summary

RANGER FIRE, INC.
HOME 2 SUITES

Page 2
Date

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
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

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

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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>
FDC	150.0	149	750.0	149.0	750.0	146.971

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>
HV1	60.167		100.0	250.0	
HV2	59.167		100.45	250.0	
H1	60.167		102.74		
H2	59.167		103.19		
D2	51.333		108.16		
HV3	45.5		117.26	250.0	
H3	45.5		119.95		
SP1	9.5		137.34		
SP2	9.5		139.35		
TOS	9.5		139.88		
BOS	4.0		143.26		
BW1	4.0		143.9		
BW2	4.0		144.54		
FDC	0.0		146.97		

Final Calculations : Hazen-Williams

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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	*****
HV1 to H1	60.167 60.167	H250	250.00 250.0	2.5 2.469	T	8.564	0.500 8.564 9.064	100 0.3019	100.000 0.0 2.736		Vel = 16.75	
H1			0.0 250.00						102.736		K Factor = 24.66	
HV2 to H2	59.167 59.167	H250	250.00 250.0	2.5 2.469	T	8.564	0.500 8.564 9.064	100 0.3019	100.454 0.0 2.736		Vel = 16.75	
H2			0.0 250.00						103.190		K Factor = 24.61	
H1 to H2	60.167 59.167		250.00 250.0	4 4.26			1.000 1.000	100 0.0210	102.736 0.433 0.021		Vel = 5.63	
H2 to D2	59.167 51.333		250.00 500.0	4 4.26	E G	9.397 1.879	9.417 11.276 20.693	100 0.0764	103.190 3.393 1.581		Vel = 11.25	
D2 to SP3	51.333 0		0.0 500.0	4 4.26	2E B T	26.334 15.8 26.334	52.917 68.468 121.385	120 0.0545	108.164 22.232 6.617		Vel = 11.25	
SP3			0.0 500.00						137.013		K Factor = 42.72	
HV3 to H3	45.500 45.500	H250	250.00 250.0	2.5 2.469	T	12.0	0.500 12.000 12.500	120 0.2154	117.258 0.0 2.692		Vel = 16.75	
H3 to SP1	45.500 9.500		0.0 250.0	4 4.26	2E B T	26.334 15.8 26.334	50.417 68.468 118.885	120 0.0151	119.950 15.592 1.798		Vel = 5.63	
SP1			0.0 250.00						137.340		K Factor = 21.33	
SP1 to SP2	9.500 9.500		250.00 250.0	4 4.26	T	26.334	106.583 26.334 132.917	120 0.0151	137.340 0.0 2.010		Vel = 5.63	
SP2 to SP3	9.500 0		-750.00 -500.0	4 4.26	E	13.167	105.167 13.167 118.334	120 -0.0545	139.350 4.114 -6.451		Vel = 11.25	
SP3			0.0 -500.00						137.013		K Factor = -42.72	
SP2 to TOS	9.500 9.500		750.00 750.0	6 6.357			32.083 32.083	120 0.0164	139.350 0.0 0.527		Vel = 7.58	
TOS to BOS	9.500 4		0.0 750.0	6 6.357	E T	17.603 37.72	5.500 55.323 60.823	120 0.0164	139.877 2.382 1.000		Vel = 7.58	
BOS to BW1	4 4		0.0 750.0	6 6.357	T	37.72	1.333 37.720 39.053	120 0.0164	143.259 0.0 0.641		Vel = 7.58	
BW1 to BW2	4 4		0.0 750.0	6 6.357	T	37.72	1.333 37.720 39.053	120 0.0164	143.900 0.0 0.642		Vel = 7.58	

Final Calculations : Hazen-Williams

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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	*****
BW2 to FDC	4 0		0.0 750.0	6 6.357	S	40.235 40.235 42.402	120 0.0164	144.542 1.732 0.697		Vel = 7.58	
FDC			0.0 750.00					146.971		K Factor = 61.87	