



Hydraulic Calculations by HydraCALC

4-28-2025

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 #1_Club Area.WXF

Water Supply Curve

RANGER FIRE, INC.
HOME 2 SUITES

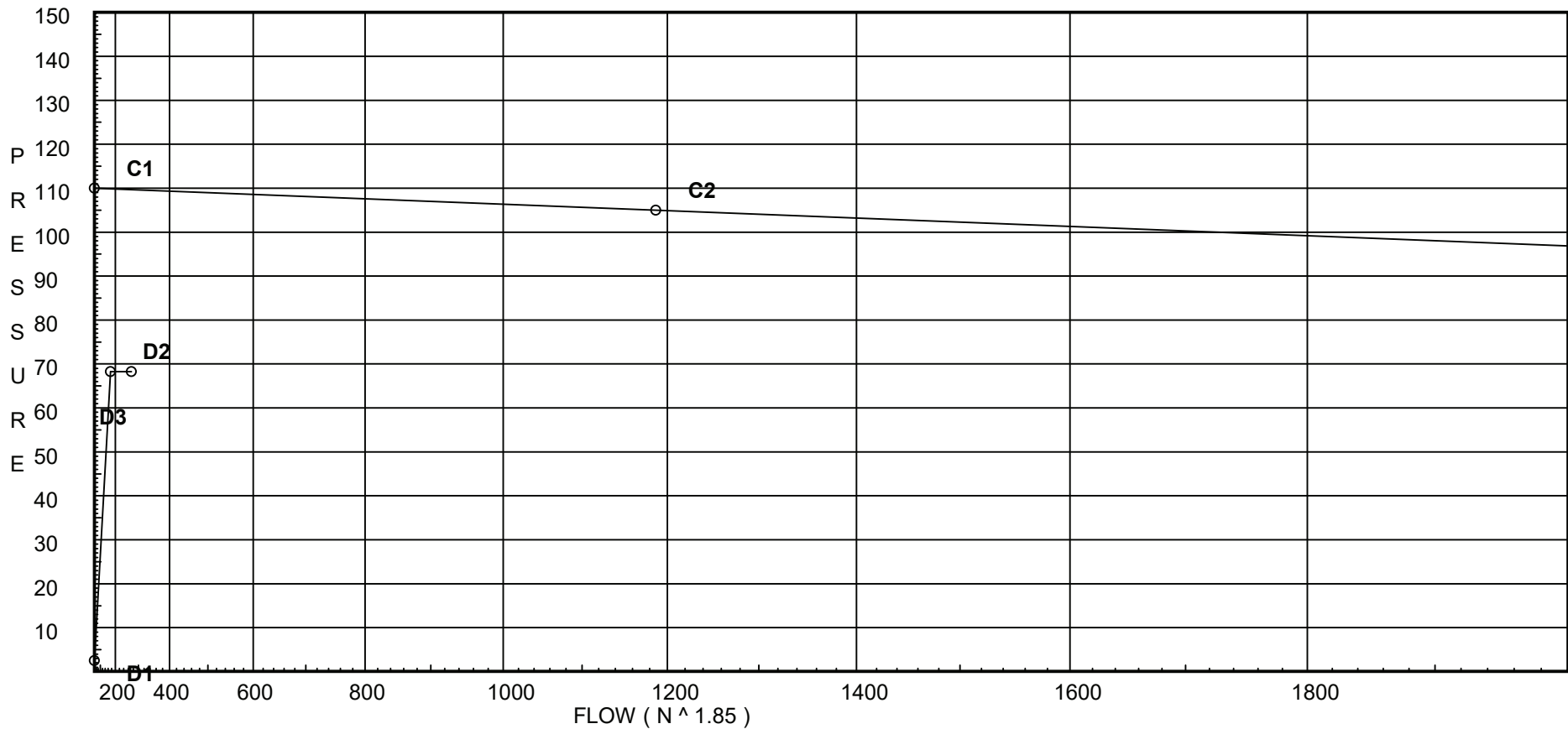
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City Water Supply:

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 : 68.262
Hose (Demand) : 100
D3 - System Demand : 273.464
Safety Margin : 41.407



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	68.262

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		51.15			
TW1	9.5		55.19			
BW1	4.0		60.03			
BOS	4.0		60.08			
FLG	1.0		64.87			
CHG	-5.0		67.5			
UG1	-5.0		71.58			
DOM	-5.0		71.59			
UG2	-5.0		71.62			

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		71.69		
UG4	-5.0		71.67		
UG5	-5.0		71.63		
UG6	-5.0		71.62		
UG7	-5.0		71.61		
UG3X	-5.0		71.69		
CTY	3.0		68.26	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.
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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		42.917 42.917	120 0.2115	42.074 0.0 9.078		Vel = 15.23	
115A to TW1	9.500 9.500		0.0 173.46	2 2.157	E 6.153	12.917 6.153 19.070	120 0.2115	51.152 0.0 4.034		Vel = 15.23	
TW1			0.0 173.46					55.186		K Factor = 23.35	
TW1 to BW1	9.500 4		173.46 173.46	2 2.157	E 6.153	5.500 6.153 11.653	120 0.2114	55.186 2.382 2.464		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	60.032 0.0 0.043		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	60.075 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	64.872 2.599 0.031		Vel = 1.87	
CHG			0.0 173.46						67.502		K Factor = 21.11	
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	67.502 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	71.585 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	71.591 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	71.618 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	71.690 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	71.665 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	71.629 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	71.619 0.0 -0.009		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	71.610 0.0 -0.025		Vel = 0.44	
UG1			0.0 -63.95						71.585		K Factor = -7.56	
UG3 to UG3X	-5 -5		173.46 173.46	6 5.86			2.500 2.500	150 0.0008	71.690 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	71.692 -3.465 0.035		Vel = 1.87	
CTY			100.00 273.46						68.262		Qa = 100.00 K Factor = 33.10	

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

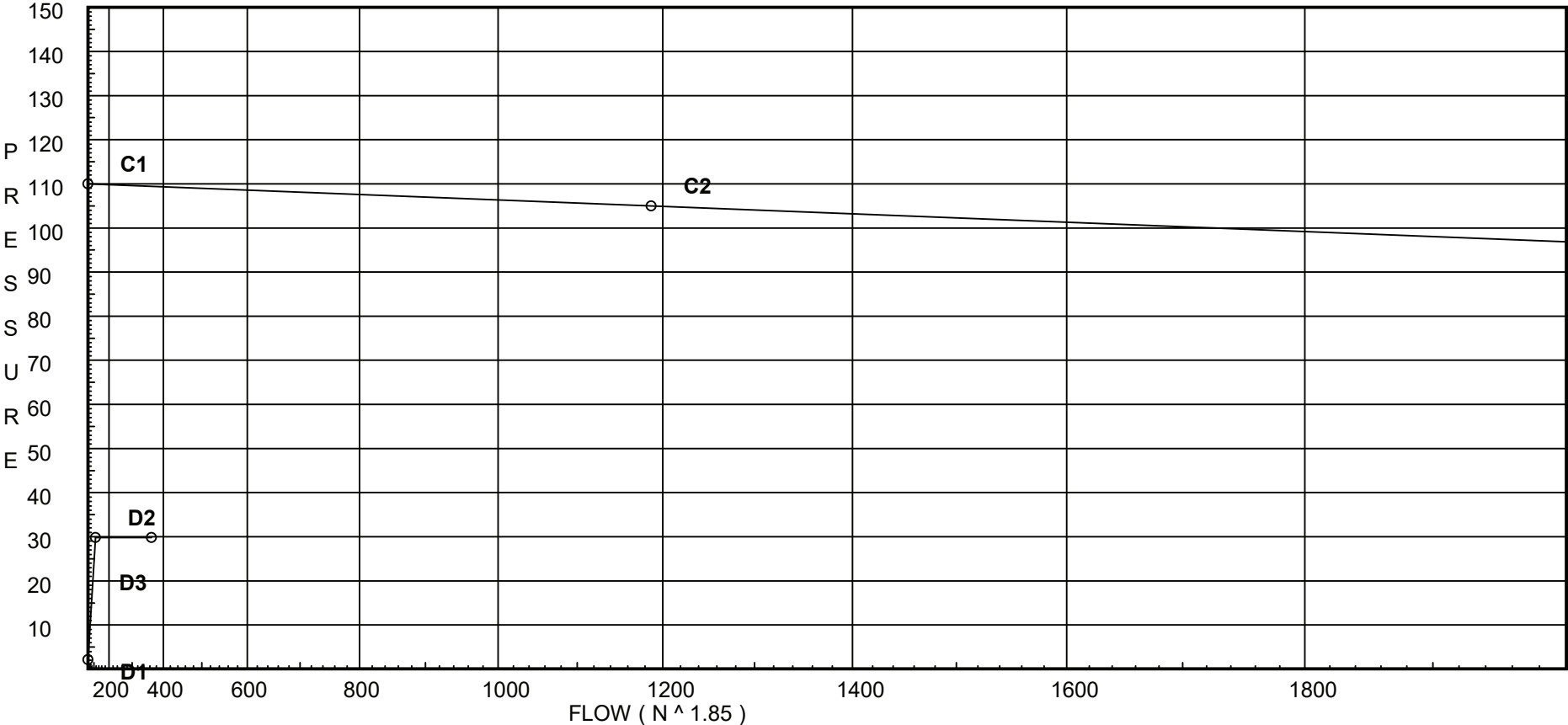
Water Supply Curve

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 : 29.818
Hose (Demand) : 250
D3 - System Demand : 365.094
Safety Margin : 79.618



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	29.818

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		16.59			
TW1	9.5		18.48			
BW1	4.0		22.02			
BOS	4.0		22.04			
FLG	1.0		24.97			
CHG	-5.0		27.59			
UG1	-5.0		33.22			
DOM	-5.0		33.22			
UG2	-5.0		33.23			

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		33.26		
UG4	-5.0		33.25		
UG5	-5.0		33.24		
UG6	-5.0		33.23		
UG7	-5.0		33.23		
UG3X	-5.0		33.27		
CTY	3.0		29.82	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 4.0 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 2.0 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 2.0	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 4.0 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 2.0 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 4.0 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 2.0 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 2.0 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 2.0 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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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		42.917 42.917	120 0.0990	12.343 0.0 4.250		Vel = 10.10	
115A to TW1	9.500 9.500		0.0 115.09	2 2.157	E 6.153	12.917 6.153 19.070	120 0.0990	16.593 0.0 1.888		Vel = 10.10	
TW1			0.0 115.09					18.481		K Factor = 26.77	
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	18.481 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	22.017 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 0.0991	22.037 1.299 1.638		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 0.0004	24.974 2.599 0.014		Vel = 1.24	
CHG			0.0 115.09						27.587		K Factor = 21.91	
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	27.587 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 0.0001	33.216 0.0 0.003		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	33.219 0.0 0.012		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	33.231 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	33.265 0.0 -0.011		Vel = 0.29	
UG4 to UG5	-5 -5		0.0 -42.43	8 7.68	7F 2E T	78.943 45.11 43.857	633.833 167.910 801.743	150 0	33.254 0.0 -0.018		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	33.236 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 66.446	1047.167 182.727 1229.894	150 0	33.232 0.0 -0.004		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	33.228 0.0 -0.012		Vel = 0.29	
UG1			0.0 -42.43						33.216		K Factor = -7.36	
UG3 to UG3X	-5 -5		115.09 115.09	6 5.86			2.500 2.500	150 0.0004	33.265 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 0.0005	33.266 -3.465 0.017		Vel = 1.24	
CTY			250.00 365.09						29.818		Qa = 250.00 K Factor = 66.86	

Final Calculations : Hazen-Williams

RANGER FIRE, INC.
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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

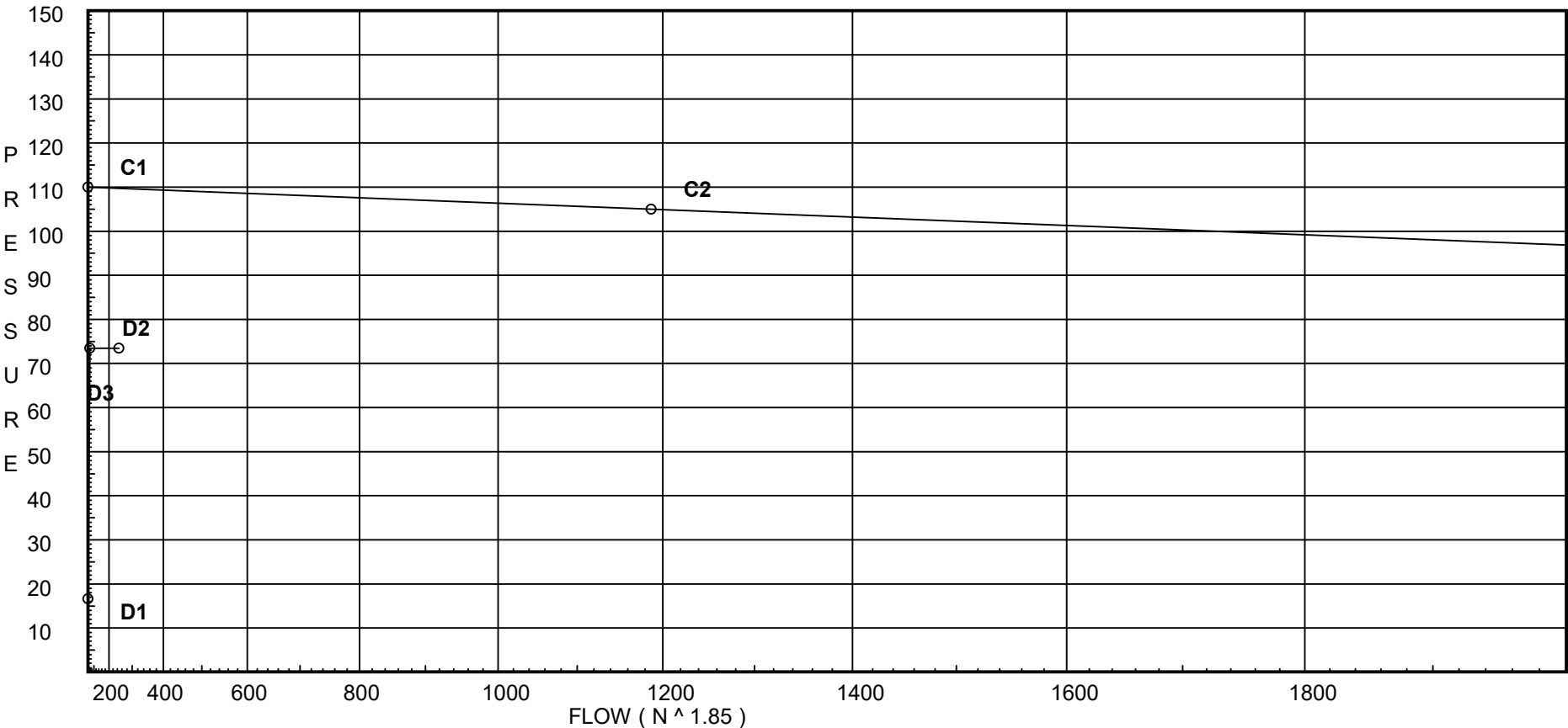
Job Name : HOME 2 SUITES
Drawing :
Location : 4TH FLOOR
Remote Area :
Contract :
Data File : Remote #3_Unit.WXF

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 : 54.988
D2 - System Pressure : 73.468
Hose (Demand) : 192
D3 - System Demand : 246.988
Safety Margin : 36.258



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
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	109.726	246.99	73.468

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	4.4	17.79	18.56	0.05	196
R2	41.33	4.4	18.0	18.67	0.05	256
R3	41.33	4.4	16.3	17.76	0.05	256
R4	40.583		30.81			
R5	41.33		29.94			
R6	41.33		29.94			
C1	41.667		28.42			
C2	41.667		42.71			
C3	41.667		44.87			
C4	41.667		32.27			
R1B	21.75		29.38			
R2B	21.75		30.09			
R3B	21.75		28.07			
R4B	21.75		38.97			
R5B	21.75		38.42			
R6B	21.75		38.42			
C1B	21.75		37.04			
C2B	21.75		51.33			
C3B	21.75		53.5			
C4B	21.75		40.89			
200	21.75		53.5			
201	21.75		51.33			
201X	21.75		33.56			
201Y	21.75		33.01			
201Z	21.75		33.01			
202	21.75		37.04			
203	21.75		38.42			
204	21.75		38.97			
205	21.75		40.89			
206	21.75		46.64			
207	21.75		49.7			
208	21.75		56.79			
208A	21.75		57.24			
208B	9.5		63.05			
TW2	9.5		63.64			
BW2	4.0		66.69			
BW1	4.0		66.69			
BOS	4.0		66.7			
FLG	1.0		68.41			
CHG	-5.0		71.02			
UG1	-5.0		76.67			
DOM	-5.0		76.67	192.0		

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>
UG2	-5.0		76.72		
UG3	-5.0		76.86		
UG4	-5.0		76.82		
UG5	-5.0		76.75		
UG6	-5.0		76.73		
UG7	-5.0		76.71		
UG3X	-5.0		76.87		
CTY	3.0		73.47		

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 21.750	4.40	18.56 18.56	0.75 0.874			18.833 18.833	150 0.1823	17.788 8.157 3.434		Vel = 9.93	
R1B			0.0 18.56						29.379		K Factor = 3.42	
R2 to R2B	41.330 21.750	4.40	18.67 18.67	0.75 0.874			19.583 19.583	150 0.1843	17.998 8.480 3.610		Vel = 9.98	
R2B			0.0 18.67						30.088		K Factor = 3.40	
R3 to R3B	41.330 21.750	4.40	17.76 17.76	0.75 0.874			19.583 19.583	150 0.1682	16.300 8.480 3.294		Vel = 9.50	
R3B			0.0 17.76						28.074		K Factor = 3.35	
R4 to R4B	40.583 21.750		0.0 0.0	0.75 0.874			18.833 18.833	150 0	30.813 8.157 0.0		Vel = 0	
R4B			0.0 0.0						38.970		K Factor = 0	
R5 to R5B	41.330 21.750		0.0 0.0	0.75 0.874			19.583 19.583	150 0	29.940 8.480 0.0		Vel = 0	
R5B			0.0 0.0						38.420		K Factor = 0	
R6 to R6B	41.330 21.750		0.0 0.0	0.75 0.874			19.583 19.583	150 0	29.940 8.480 0.0		Vel = 0	
R6B			0.0 0.0						38.420		K Factor = 0	
C1 to C1B	41.667 21.750		0.0 0.0	0.75 0.874	2N O	8.0 3.0	32.583 11.000 43.583	150 0	28.416 8.626 0.0		Vel = 0	
C1B			0.0 0.0						37.042		K Factor = 0	
C2 to C2B	41.667 21.750		0.0 0.0	0.75 0.874	2N O	8.0 3.0	32.000 11.000 43.000	150 0	42.707 8.626 0.0		Vel = 0	
C2B			0.0 0.0						51.333		K Factor = 0	
C3 to C3B	41.667 21.750		0.0 0.0	0.75 0.874	2N O	8.0 3.0	35.917 11.000 46.917	150 0	44.875 8.626 0.0		Vel = 0	
C3B			0.0 0.0						53.501		K Factor = 0	
C4 to C4B	41.667 21.750		0.0 0.0	0.75 0.874	2N O	8.0 3.0	35.250 11.000 46.250	150 0	32.265 8.626 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						40.891		K Factor = 0	
R1B to 201X	21.750 21.750		18.56 18.56	0.75 0.874	2N O	8.0 3.0	11.917 11.000 22.917	150 0.1824	29.379 0.0 4.179		Vel = 9.93	
201X			0.0 18.56						33.558		K Factor = 3.20	
R2B to 201Y	21.750 21.750		18.67 18.67	0.75 0.874	2N O	8.0 3.0	4.833 11.000 15.833	150 0.1844	30.088 0.0 2.919		Vel = 9.98	
201Y			0.0 18.67						33.007		K Factor = 3.25	
R3B to 201Z	21.750 21.750		17.76 17.76	0.75 0.874	2N O	8.0 3.0	18.333 11.000 29.333	150 0.1682	28.074 0.0 4.935		Vel = 9.50	
201Z			0.0 17.76						33.009		K Factor = 3.09	
R4B to 204	21.750 21.750		0.0 0.0	0.75 0.874	O	3.0	7.917 3.000 10.917	150 0	38.970 0.0 0.0		Vel = 0	
204			0.0 0.0						38.970		K Factor = 0	
R5B to 203	21.750 21.750		0.0 0.0	0.75 0.874	N O	4.0 3.0	1.083 7.000 8.083	150 0	38.420 0.0 0.0		Vel = 0	
203			0.0 0.0						38.420		K Factor = 0	
R6B to 203	21.750 21.750		0.0 0.0	0.75 0.874	N	4.0	10.000 4.000 14.000	150 0	38.420 0.0 0.0		Vel = 0	
203			0.0 0.0						38.420		K Factor = 0	
C1B to 202	21.750 21.750		0.0 0.0	0.75 0.874	O	3.0	7.917 3.000 10.917	150 0	37.042 0.0 0.0		Vel = 0	
202			0.0 0.0						37.042		K Factor = 0	
C2B to 201	21.750 21.750		0.0 0.0	0.75 0.874	O	3.0	7.917 3.000 10.917	150 0	51.333 0.0 0.0		Vel = 0	
201			0.0 0.0						51.333		K Factor = 0	
C3B to 200	21.750 21.750		0.0 0.0	0.75 0.874	O	3.0	7.917 3.000 10.917	150 0	53.501 0.0 0.0		Vel = 0	
200			0.0 0.0						53.501		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	*****
C4B to 205	21.750 21.750		0.0 0.0	0.75 0.874	O	3.0	7.917 3.000 10.917	150 0	40.891 0.0 0.0		Vel = 0	
205			0.0 0.0						40.891		K Factor = 0	
200 to 201	21.750 21.750		-33.78 -33.78	1 1.101			12.083 12.083	150 -0.1794	53.501 0.0 -2.168		Vel = 11.38	
201 to 201X	21.750 21.750		0.0 -33.78	1 1.101	N	5.0	94.083 5.000 99.083	150 -0.1794	51.333 0.0 -17.775		Vel = 11.38	
201X to 201Y	21.750 21.750		18.56 -15.22	1 1.101	N	5.0	8.417 5.000 13.417	150 -0.0411	33.558 0.0 -0.551		Vel = 5.13	
201Y to 201Z	21.750 21.750		18.67 3.45	1 1.101			0.500 0.500	150 0.0040	33.007 0.0 0.002		Vel = 1.16	
201Z to 202	21.750 21.750		17.76 21.21	1 1.101			53.167 53.167	150 0.0759	33.009 0.0 4.033		Vel = 7.15	
202 to 203	21.750 21.750		0.0 21.21	1 1.101			18.167 18.167	150 0.0759	37.042 0.0 1.378		Vel = 7.15	
203 to 204	21.750 21.750		0.0 21.21	1 1.101			7.250 7.250	150 0.0759	38.420 0.0 0.550		Vel = 7.15	
204 to 205	21.750 21.750		0.0 21.21	1 1.101			25.333 25.333	150 0.0758	38.970 0.0 1.921		Vel = 7.15	
205 to 206	21.750 21.750		0.0 21.21	1 1.101			75.833 75.833	150 0.0759	40.891 0.0 5.753		Vel = 7.15	
206 to 207	21.750 21.750		0.0 21.21	1 1.101	N	5.0	35.250 5.000 40.250	150 0.0759	46.644 0.0 3.053		Vel = 7.15	
207 to 208	21.750 21.750		0.0 21.21	1 1.101	N O	5.0 5.0	83.500 10.000 93.500	150 0.0759	49.697 0.0 7.093		Vel = 7.15	
208 to 200	21.750 21.750		-54.99 -33.78	1 1.101			18.333 18.333	150 -0.1794	56.790 0.0 -3.289		Vel = 11.38	
200			0.0 -33.78						53.501		K Factor = -4.62	
208 to 208A	21.750 21.750		54.99 54.99	2 2.003	N	9.0	9.583 9.000 18.583	150 0.0239	56.790 0.0 0.445		Vel = 5.60	
208A to 208B	21.750 9.500		0.0 54.99	2 2.003	N	9.0	12.250 9.000 21.250	150 0.0240	57.235 5.305 0.510		Vel = 5.60	

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	*****
208B to TW2	9.500 9.500		0.0 54.99	2 2.003	2N	18.0	6.417 18.000 24.417	150 0.0240	63.050 0.0 0.585		Vel = 5.60	
TW2 to BW2	9.500 4		0.0 54.99	2 2.157	Ball E T	2.769 6.153 12.307	5.500 21.229 26.729	120 0.0253	63.635 2.382 0.675		Vel = 4.83	
BW2 to BW1	4 4		0.0 54.99	6 6.357			1.333 1.333	120 0.0008	66.692 0.0 0.001		Vel = 0.56	
BW1 to BOS	4 4		0.0 54.99	6 6.357	T	37.72	1.333 37.720 39.053	120 0.0001	66.693 0.0 0.005		Vel = 0.56	
BOS to FLG	4 1		0.0 54.99	2 2.157	S	13.537	3.000 13.537 16.537	120 0.0253	66.698 1.299 0.418		Vel = 4.83	
FLG to CHG	1 -5		0.0 54.99	6 6.16	E	20.084	12.000 20.084 32.084	140 0.0001	68.415 2.599 0.003		Vel = 0.59	
CHG			0.0 54.99						71.017		K Factor = 6.53	
CHG to UG1	-5 -5		54.99 54.99	6 5.86	G T Zwh	3.834 38.342 0.0	38.500 42.176 80.676	150 0.0001	71.017 5.640 0.010		* * Fixed Loss = 5.64 Vel = 0.65	
UG1 to DOM	-5 -5		-89.11 -34.12	8 7.68	T	43.857	5.000 43.857 48.857	150 0	76.667 0.0 -0.001		Vel = 0.24	
DOM to UG2	-5 -5	H192	192.00 157.88	8 7.68	T	43.857	172.250 43.857 216.107	150 0.0002	76.666 0.0 0.053		Vel = 1.09	
UG2 to UG3	-5 -5		0.0 157.88	8 7.68	E 4F	22.555 45.11	515.833 67.665 583.498	150 0.0002	76.719 0.0 0.141		Vel = 1.09	
UG3 to UG4	-5 -5		-246.98 -89.1	8 7.68	T	43.857	487.167 43.857 531.024	150 -0.0001	76.860 0.0 -0.044		Vel = 0.62	
UG4 to UG5	-5 -5		0.0 -89.1	8 7.68	7F 2E T	78.943 45.11 43.857	633.833 167.910 801.743	150 -0.0001	76.816 0.0 -0.068		Vel = 0.62	
UG5 to UG6	-5 -5		0.0 -89.1	12 11.2	2F E	28.793 29.901	1266.500 58.695 1325.195	150 0	76.748 0.0 -0.018		Vel = 0.29	
UG6 to UG7	-5 -5		0.0 -89.1	12 11.2	E 6F T	29.901 86.38 66.446	1047.167 182.727 1229.894	150 0	76.730 0.0 -0.016		Vel = 0.29	
UG7 to UG1	-5 -5		0.0 -89.1	8 7.68	2F	22.555	533.667 22.555 556.222	150 -0.0001	76.714 0.0 -0.047		Vel = 0.62	
			0.0									

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	*****
UG1			-89.10						76.667		K Factor = -10.18	
UG3	-5		246.99	6			2.500	150	76.860			
to UG3X	-5		246.99	5.86			2.500	0.0020	0.005		Vel = 2.94	
UG3X	-5		0.0	6	E	20.084	12.000	140	76.865			
to CTY	3		246.99	6.16	G	4.304	24.388		-3.465			
							36.388	0.0019	0.068		Vel = 2.66	
CTY			0.0									
			246.99						73.468		K Factor = 28.82	



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

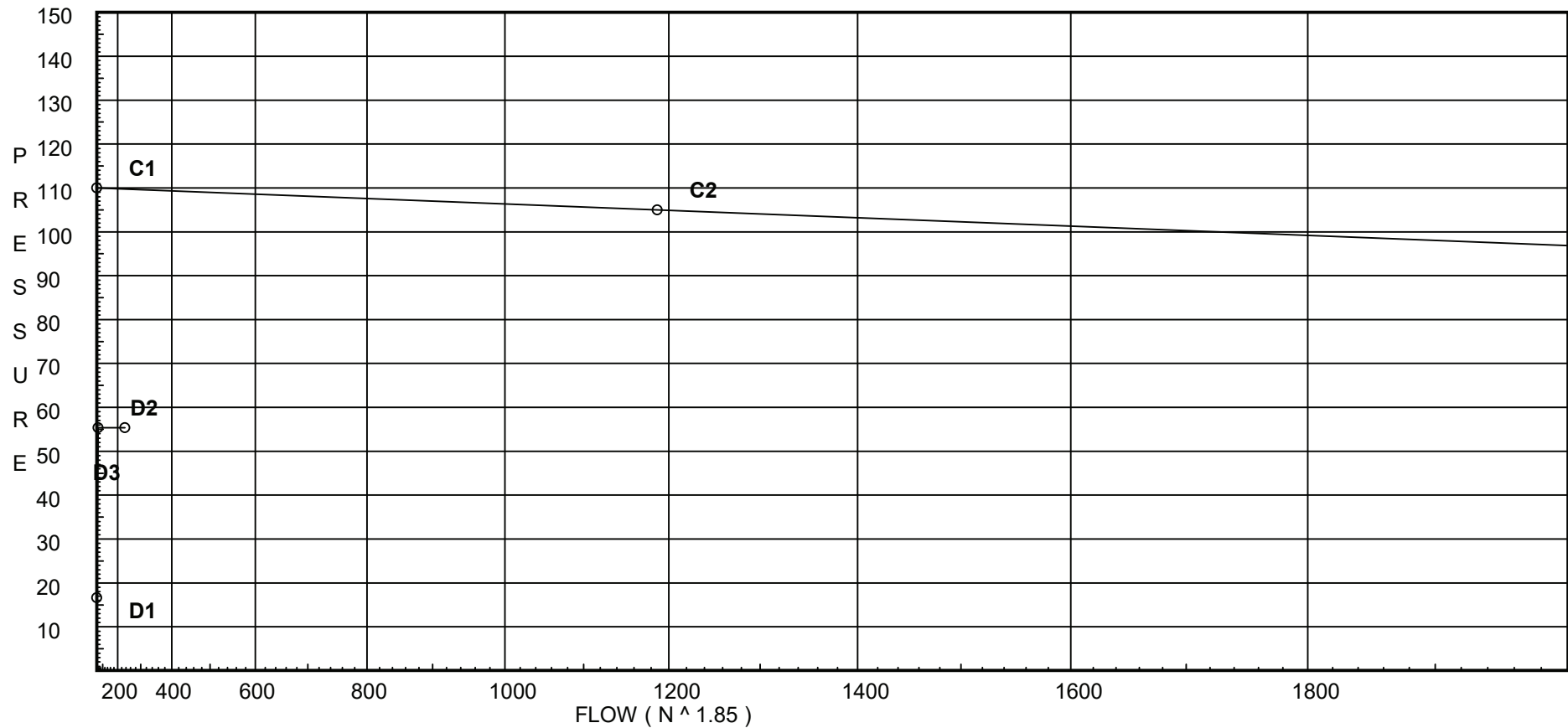
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City Water Supply:

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

Demand:

D1 - Elevation : 16.601
D2 - System Flow : 42.923
D2 - System Pressure : 55.357
Hose (Demand) : 192
D3 - System Demand : 234.923
Safety Margin : 54.393



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
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	109.75	234.92	55.357

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		21.11			
R2	41.33		19.69			
R3	41.33		19.65			
R4	40.583	4.4	10.82	14.47	0.05	196
R5	41.33	4.4	10.71	14.4	0.05	196
R6	41.33	4.4	10.2	14.05	0.05	196
C1	41.667		15.19			
C2	41.667		28.68			
C3	41.667		29.66			
C4	41.667		15.65			
R1B	21.75		29.26			
R2B	21.75		28.17			
R3B	21.75		28.13			
R4B	21.75		21.15			
R5B	21.75		21.42			
R6B	21.75		20.82			
C1B	21.75		23.82			
C2B	21.75		37.31			
C3B	21.75		38.29			
C4B	21.75		24.28			
200	21.75		38.29			
201	21.75		37.31			
201X	21.75		29.26			
201Y	21.75		28.17			
201Z	21.75		28.13			
202	21.75		23.82			
203	21.75		22.34			
204	21.75		22.4			
205	21.75		24.28			
206	21.75		29.88			
207	21.75		32.86			
208	21.75		39.77			
208A	21.75		40.06			
208B	9.5		45.68			
TW2	9.5		46.05			
BW2	4.0		48.86			
BW1	4.0		48.86			
BOS	4.0		48.87			
FLG	1.0		50.43			
CHG	-5.0		53.03			
UG1	-5.0		58.58			
DOM	-5.0		58.58	192.0		

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>
UG2	-5.0		58.63		
UG3	-5.0		58.76		
UG4	-5.0		58.72		
UG5	-5.0		58.65		
UG6	-5.0		58.64		
UG7	-5.0		58.62		
UG3X	-5.0		58.76		
CTY	3.0		55.36		

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 21.750		0.0 0.0	0.75 0.874			18.833 18.833	150 -0.0001	21.106 8.157 -0.001		Vel = 0	
R1B			0.0 0.0						29.262		K Factor = 0	
R2 to R2B	41.330 21.750		0.0 0.0	0.75 0.874			19.583 19.583	150 0	19.693 8.480 0.0		Vel = 0	
R2B			0.0 0.0						28.173		K Factor = 0	
R3 to R3B	41.330 21.750		0.0 0.0	0.75 0.874			19.583 19.583	150 0	19.652 8.480 0.0		Vel = 0	
R3B			0.0 0.0						28.132		K Factor = 0	
R4 to R4B	40.583 21.750	4.40	14.47 14.47	0.75 0.874			18.833 18.833	150 0.1151	10.820 8.157 2.168		Vel = 7.74	
R4B			0.0 14.47						21.145		K Factor = 3.15	
R5 to R5B	41.330 21.750	4.40	14.40 14.4	0.75 0.874			19.583 19.583	150 0.1140	10.707 8.480 2.233		Vel = 7.70	
R5B			0.0 14.40						21.420		K Factor = 3.11	
R6 to R6B	41.330 21.750	4.40	14.05 14.05	0.75 0.874			19.583 19.583	150 0.1090	10.200 8.480 2.135		Vel = 7.51	
R6B			0.0 14.05						20.815		K Factor = 3.08	
C1 to C1B	41.667 21.750		0.0 0.0	0.75 0.874	2N O	8.0 3.0	32.583 11.000 43.583	150 0	15.190 8.626 0.0		Vel = 0	
C1B			0.0 0.0						23.816		K Factor = 0	
C2 to C2B	41.667 21.750		0.0 0.0	0.75 0.874	2N O	8.0 3.0	32.000 11.000 43.000	150 0	28.679 8.626 0.0		Vel = 0	
C2B			0.0 0.0						37.305		K Factor = 0	
C3 to C3B	41.667 21.750		0.0 0.0	0.75 0.874	2N O	8.0 3.0	35.917 11.000 46.917	150 0	29.660 8.626 0.0		Vel = 0	
C3B			0.0 0.0						38.286		K Factor = 0	
C4 to C4B	41.667 21.750		0.0 0.0	0.75 0.874	2N O	8.0 3.0	35.250 11.000 46.250	150 0	15.650 8.626 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						24.276		K Factor = 0	
R1B to 201X	21.750 21.750		0.0 0.0	0.75 0.874	2N O	8.0 3.0	11.917 11.000 22.917	150 0	29.262 0.0 0.0		Vel = 0	
201X			0.0 0.0						29.262		K Factor = 0	
R2B to 201Y	21.750 21.750		0.0 0.0	0.75 0.874	2N O	8.0 3.0	4.833 11.000 15.833	150 0	28.173 0.0 0.0		Vel = 0	
201Y			0.0 0.0						28.173		K Factor = 0	
R3B to 201Z	21.750 21.750		0.0 0.0	0.75 0.874	2N O	8.0 3.0	18.333 11.000 29.333	150 0	28.132 0.0 0.0		Vel = 0	
201Z			0.0 0.0						28.132		K Factor = 0	
R4B to 204	21.750 21.750		14.47 14.47	0.75 0.874	O	3.0	7.917 3.000 10.917	150	21.145 0.0 1.257		Vel = 7.74	
204			0.0 14.47						22.402		K Factor = 3.06	
R5B to 203	21.750 21.750		14.40 14.4	0.75 0.874	N O	4.0 3.0	1.083 7.000 8.083	150	21.420 0.0 0.922		Vel = 7.70	
203			0.0 14.40						22.342		K Factor = 3.05	
R6B to 203	21.750 21.750		14.05 14.05	0.75 0.874	N	4.0	10.000 4.000 14.000	150	20.815 0.0 1.527		Vel = 7.51	
203			0.0 14.05						22.342		K Factor = 2.97	
C1B to 202	21.750 21.750		0.0 0.0	0.75 0.874	O	3.0	7.917 3.000 10.917	150 0	23.816 0.0 0.0		Vel = 0	
202			0.0 0.0						23.816		K Factor = 0	
C2B to 201	21.750 21.750		0.0 0.0	0.75 0.874	O	3.0	7.917 3.000 10.917	150 0	37.305 0.0 0.0		Vel = 0	
201			0.0 0.0						37.305		K Factor = 0	
C3B to 200	21.750 21.750		0.0 0.0	0.75 0.874	O	3.0	7.917 3.000 10.917	150 0	38.286 0.0 0.0		Vel = 0	
200			0.0 0.0						38.286		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	*****
C4B to 205	21.750 21.750		0.0 0.0	0.75 0.874	O	3.0	7.917 3.000 10.917	150 0	24.276 0.0 0.0			
205			0.0 0.0						24.276		K Factor = 0	
200 to 201	21.750 21.750		-22.00 -22.0	1 1.101			12.083 12.083	150 -0.0812	38.286 0.0 -0.981			Vel = 7.41
201 to 201X	21.750 21.750		0.0 -22.0	1 1.101	N	5.0	94.083 5.000 99.083	150 -0.0812	37.305 0.0 -8.043			Vel = 7.41
201X to 201Y	21.750 21.750		0.0 -22.0	1 1.101	N	5.0	8.417 5.000 13.417	150 -0.0812	29.262 0.0 -1.089			Vel = 7.41
201Y to 201Z	21.750 21.750		0.0 -22.0	1 1.101			0.500 0.500	150 -0.0820	28.173 0.0 -0.041			Vel = 7.41
201Z to 202	21.750 21.750		0.0 -22.0	1 1.101			53.167 53.167	150 -0.0812	28.132 0.0 -4.316			Vel = 7.41
202 to 203	21.750 21.750		0.0 -22.0	1 1.101			18.167 18.167	150 -0.0811	23.816 0.0 -1.474			Vel = 7.41
203 to 204	21.750 21.750		28.45 6.45	1 1.101			7.250 7.250	150 0.0083	22.342 0.0 0.060			Vel = 2.17
204 to 205	21.750 21.750		14.47 20.92	1 1.101			25.333 25.333	150 0.0740	22.402 0.0 1.874			Vel = 7.05
205 to 206	21.750 21.750		0.0 20.92	1 1.101			75.833 75.833	150 0.0740	24.276 0.0 5.608			Vel = 7.05
206 to 207	21.750 21.750		0.0 20.92	1 1.101	N	5.0	35.250 5.000 40.250	150 0.0739	29.884 0.0 2.976			Vel = 7.05
207 to 208	21.750 21.750		0.0 20.92	1 1.101	N O	5.0 5.0	83.500 10.000 93.500	150 0.0739	32.860 0.0 6.914			Vel = 7.05
208 to 200	21.750 21.750		-42.92 -22.0	1 1.101			18.333 18.333	150 -0.0812	39.774 0.0 -1.488			Vel = 7.41
200			0.0 -22.00						38.286		K Factor = -3.56	
208 to 208A	21.750 21.750		42.92 42.92	2 2.003	N	9.0	9.583 9.000 18.583	150 0.0152	39.774 0.0 0.282			Vel = 4.37
208A to 208B	21.750 9.500		0.0 42.92	2 2.003	N	9.0	12.250 9.000 21.250	150 0.0152	40.056 5.305 0.323			Vel = 4.37

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 Eqiv	Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	*****	Notes	*****
208B to TW2	9.500 9.500		0.0 42.92	2 2.003	2N	18.0	6.417 18.000 24.417	150 0.0152	45.684 0.0 0.370		Vel = 4.37	
TW2 to BW2	9.500 4		0.0 42.92	2 2.157	Ball E T	2.769 6.153 12.307	5.500 21.229 26.729	120 0.0160	46.054 2.382 0.427		Vel = 3.77	
BW2 to BW1	4 4		0.0 42.92	6 6.357			1.333 1.333	120 0	48.863 0.0 0.0		Vel = 0.43	
BW1 to BOS	4 4		0.0 42.92	6 6.357	T	37.72	1.333 37.720 39.053	120 0.0001	48.863 0.0 0.003		Vel = 0.43	
BOS to FLG	4 1		0.0 42.92	2 2.157	S	13.537	3.000 13.537 16.537	120 0.0160	48.866 1.299 0.265		Vel = 3.77	
FLG to CHG	1 -5		0.0 42.92	6 6.16	E	20.084	12.000 20.084 32.084	140 0	50.430 2.599 0.001		Vel = 0.46	
CHG			0.0 42.92						53.030		K Factor = 5.89	
CHG to UG1	-5 -5		42.92 42.92	6 5.86	G T Zwh	3.834 38.342 0.0	38.500 42.176 80.676	150 0.0001	53.030 5.543 0.007		* * Fixed Loss = 5.543 Vel = 0.51	
UG1 to DOM	-5 -5		-84.68 -41.76	8 7.68	T	43.857	5.000 43.857 48.857	150 0	58.580 0.0 -0.001		Vel = 0.29	
DOM to UG2	-5 -5	H192	192.00 150.24	8 7.68	T	43.857	172.250 43.857 216.107	150 0.0002	58.579 0.0 0.048		Vel = 1.04	
UG2 to UG3	-5 -5		0.0 150.24	8 7.68	E 4F	22.555 45.11	515.833 67.665 583.498	150 0.0002	58.627 0.0 0.129		Vel = 1.04	
UG3 to UG4	-5 -5		-234.93 -84.69	8 7.68	T	43.857	487.167 43.857 531.024	150 -0.0001	58.756 0.0 -0.040		Vel = 0.59	
UG4 to UG5	-5 -5		0.0 -84.69	8 7.68	7F 2E T	78.943 45.11 43.857	633.833 167.910 801.743	150 -0.0001	58.716 0.0 -0.062		Vel = 0.59	
UG5 to UG6	-5 -5		0.0 -84.69	12 11.2	2F E	28.793 29.901	1266.500 58.695 1325.195	150 0	58.654 0.0 -0.016		Vel = 0.28	
UG6 to UG7	-5 -5		0.0 -84.69	12 11.2	E 6F T	29.901 86.38 66.446	1047.167 182.727 1229.894	150 0	58.638 0.0 -0.015		Vel = 0.28	
UG7 to UG1	-5 -5		0.0 -84.69	8 7.68	2F	22.555	533.667 22.555 556.222	150 -0.0001	58.623 0.0 -0.043		Vel = 0.59	
			0.0									

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	*****
UG1			-84.69						58.580		K Factor = -11.07	
UG3	-5		234.92	6			2.500	150	58.756			
to UG3X	-5		234.92	5.86			2.500	0.0020	0.005		Vel = 2.79	
UG3X	-5		0.0	6	E	20.084	12.000	140	58.761			
to CTY	3		234.92	6.16	G	4.304	24.388		-3.465			
							36.388	0.0017	0.061		Vel = 2.53	
CTY			0.0									
			234.92						55.357		K Factor = 31.57	



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

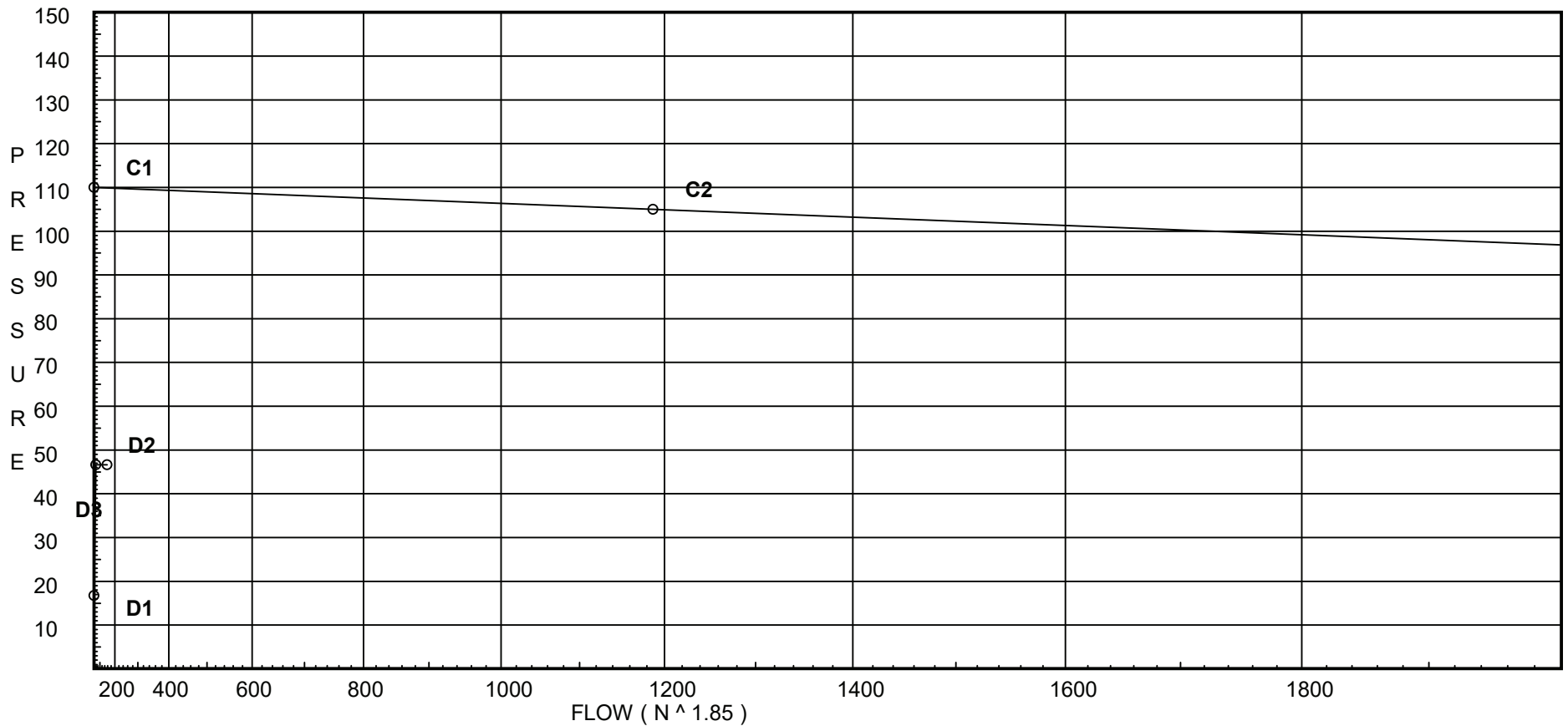
Page 1
Date

City Water Supply:

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

Demand:

D1 - Elevation : 16.747
D2 - System Flow : 56.02
D2 - System Pressure : 46.609
Hose (Demand) : 100
D3 - System Demand : 156.02
Safety Margin : 63.274



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
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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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	109.883	156.02	46.609

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		14.1			
R2	41.33		13.51			
R3	41.33		13.5			
R4	40.583		12.8			
R5	41.33		12.46			
R6	41.33		12.46			
C1	41.667	4.9	7.1	13.06	0.1	80
C2	41.667	4.9	9.14	14.82	0.1	80
C3	41.667	4.9	9.6	15.19	0.1	80
C4	41.667	4.9	7.0	12.96	0.1	80
R1B	21.75		22.26			
R2B	21.75		21.99			
R3B	21.75		21.98			
R4B	21.75		20.95			
R5B	21.75		20.94			
R6B	21.75		20.94			
C1B	21.75		19.87			
C2B	21.75		22.94			
C3B	21.75		24.13			
C4B	21.75		19.97			
200	21.75		25.51			
201	21.75		24.25			
201X	21.75		22.26			
201Y	21.75		21.99			
201Z	21.75		21.98			
202	21.75		20.91			
203	21.75		20.94			
204	21.75		20.95			
205	21.75		21.0			
206	21.75		24.28			
207	21.75		26.03			
208	21.75		30.08			
208A	21.75		30.54			
208B	9.5		36.37			
TW2	9.5		36.98			
BW2	4.0		40.06			
BW1	4.0		40.06			
BOS	4.0		40.06			
FLG	1.0		41.79			
CHG	-5.0		44.4			
UG1	-5.0		50.06			
DOM	-5.0		50.06			

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>
UG2	-5.0		50.06		
UG3	-5.0		50.07		
UG4	-5.0		50.07		
UG5	-5.0		50.06		
UG6	-5.0		50.06		
UG7	-5.0		50.06		
UG3X	-5.0		50.07		
CTY	3.0		46.61	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 21.750		0.0 0.0	0.75 0.874			18.833 18.833	150 0	14.102 8.157 0.0		Vel = 0	
R1B			0.0 0.0						22.259		K Factor = 0	
R2 to R2B	41.330 21.750		0.0 0.0	0.75 0.874			19.583 19.583	150 0	13.509 8.480 0.0		Vel = 0	
R2B			0.0 0.0						21.989		K Factor = 0	
R3 to R3B	41.330 21.750		0.0 0.0	0.75 0.874			19.583 19.583	150 0	13.499 8.480 0.0		Vel = 0	
R3B			0.0 0.0						21.979		K Factor = 0	
R4 to R4B	40.583 21.750		0.0 0.0	0.75 0.874			18.833 18.833	150 0	12.796 8.157 0.0		Vel = 0	
R4B			0.0 0.0						20.953		K Factor = 0	
R5 to R5B	41.330 21.750		0.0 0.0	0.75 0.874			19.583 19.583	150 0	12.461 8.480 0.0		Vel = 0	
R5B			0.0 0.0						20.941		K Factor = 0	
R6 to R6B	41.330 21.750		0.0 0.0	0.75 0.874			19.583 19.583	150 0	12.461 8.480 0.0		Vel = 0	
R6B			0.0 0.0						20.941		K Factor = 0	
C1 to C1B	41.667 21.750	4.90	13.06 13.06	0.75 0.874	2N O	8.0 3.0	32.583 11.000 43.583	150 0.0952	7.098 8.626 4.147		Vel = 6.98	
C1B			0.0 13.06						19.871		K Factor = 2.93	
C2 to C2B	41.667 21.750	4.90	14.82 14.82	0.75 0.874	2N O	8.0 3.0	32.000 11.000 43.000	150 0.1202	9.142 8.626 5.170		Vel = 7.93	
C2B			0.0 14.82						22.938		K Factor = 3.09	
C3 to C3B	41.667 21.750	4.90	15.19 15.19	0.75 0.874	2N O	8.0 3.0	35.917 11.000 46.917	150 0.1258	9.604 8.626 5.904		Vel = 8.12	
C3B			0.0 15.19						24.134		K Factor = 3.09	
C4 to C4B	41.667 21.750	4.90	12.96 12.96	0.75 0.874	2N O	8.0 3.0	35.250 11.000 46.250	150 0.0939	7.000 8.626 4.344		Vel = 6.93	

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 12.96						19.970		K Factor = 2.90	
R1B to 201X	21.750 21.750		0.0 0.0	0.75 0.874	2N O	8.0 3.0	11.917 11.000 22.917	150 0	22.259 0.0 0.0		Vel = 0	
201X			0.0 0.0						22.259		K Factor = 0	
R2B to 201Y	21.750 21.750		0.0 0.0	0.75 0.874	2N O	8.0 3.0	4.833 11.000 15.833	150 0	21.989 0.0 0.0		Vel = 0	
201Y			0.0 0.0						21.989		K Factor = 0	
R3B to 201Z	21.750 21.750		0.0 0.0	0.75 0.874	2N O	8.0 3.0	18.333 11.000 29.333	150 0	21.979 0.0 0.0		Vel = 0	
201Z			0.0 0.0						21.979		K Factor = 0	
R4B to 204	21.750 21.750		0.0 0.0	0.75 0.874	O	3.0	7.917 3.000 10.917	150 0	20.953 0.0 0.0		Vel = 0	
204			0.0 0.0						20.953		K Factor = 0	
R5B to 203	21.750 21.750		0.0 0.0	0.75 0.874	N O	4.0 3.0	1.083 7.000 8.083	150 0	20.941 0.0 0.0		Vel = 0	
203			0.0 0.0						20.941		K Factor = 0	
R6B to 203	21.750 21.750		0.0 0.0	0.75 0.874	N	4.0	10.000 4.000 14.000	150 0	20.941 0.0 0.0		Vel = 0	
203			0.0 0.0						20.941		K Factor = 0	
C1B to 202	21.750 21.750		13.06 13.06	0.75 0.874	O	3.0	7.917 3.000 10.917	150 0.0952	19.871 0.0 1.039		Vel = 6.98	
202			0.0 13.06						20.910		K Factor = 2.86	
C2B to 201	21.750 21.750		14.82 14.82	0.75 0.874	O	3.0	7.917 3.000 10.917	150 0.1203	22.938 0.0 1.313		Vel = 7.93	
201			0.0 14.82						24.251		K Factor = 3.01	
C3B to 200	21.750 21.750		15.19 15.19	0.75 0.874	O	3.0	7.917 3.000 10.917	150 0.1259	24.134 0.0 1.374		Vel = 8.12	
200			0.0 15.19						25.508		K Factor = 3.01	

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	*****
C4B to 205	21.750 21.750		12.96 12.96	0.75 0.874	O 3.0	7.917 3.000 10.917	150 0.0940	19.970 0.0 1.026		Vel = 6.93	
205			0.0 12.96					20.996		K Factor = 2.83	
200 to 201	21.750 21.750		-25.16 -25.16	1 1.101		12.083 12.083	150 -0.1040	25.508 0.0 -1.257		Vel = 8.48	
201 to 201X	21.750 21.750		14.81 -10.35	1 1.101	N 5.0	94.083 5.000 99.083	150 -0.0201	24.251 0.0 -1.992		Vel = 3.49	
201X to 201Y	21.750 21.750		0.0 -10.35	1 1.101	N 5.0	8.417 5.000 13.417	150 -0.0201	22.259 0.0 -0.270		Vel = 3.49	
201Y to 201Z	21.750 21.750		0.0 -10.35	1 1.101		0.500 0.500	150 -0.0200	21.989 0.0 -0.010		Vel = 3.49	
201Z to 202	21.750 21.750		0.0 -10.35	1 1.101		53.167 53.167	150 -0.0201	21.979 0.0 -1.069		Vel = 3.49	
202 to 203	21.750 21.750		13.06 2.71	1 1.101		18.167 18.167	150 0.0017	20.910 0.0 0.031		Vel = 0.91	
203 to 204	21.750 21.750		0.0 2.71	1 1.101		7.250 7.250	150 0.0017	20.941 0.0 0.012		Vel = 0.91	
204 to 205	21.750 21.750		0.0 2.71	1 1.101		25.333 25.333	150 0.0017	20.953 0.0 0.043		Vel = 0.91	
205 to 206	21.750 21.750		12.96 15.67	1 1.101		75.833 75.833	150 0.0433	20.996 0.0 3.286		Vel = 5.28	
206 to 207	21.750 21.750		0.0 15.67	1 1.101	N 5.0	35.250 5.000 40.250	150 0.0433	24.282 0.0 1.744		Vel = 5.28	
207 to 208	21.750 21.750		0.0 15.67	1 1.101	N O 5.0 5.0	83.500 10.000 93.500	150 0.0433	26.026 0.0 4.052		Vel = 5.28	
208 to 200	21.750 21.750		-56.02 -40.35	1 1.101		18.333 18.333	150 -0.2493	30.078 0.0 -4.570		Vel = 13.60	
200			0.0 -40.35					25.508		K Factor = -7.99	
208 to 208A	21.750 21.750		56.02 56.02	2 2.003	N 9.0	9.583 9.000 18.583	150 0.0248	30.078 0.0 0.461		Vel = 5.70	
208A to 208B	21.750 9.500		0.0 56.02	2 2.003	N 9.0	12.250 9.000 21.250	150 0.0248	30.539 5.305 0.528		Vel = 5.70	

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 Eqiv	Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	*****	Notes	*****
208B to TW2	9.500 9.500		0.0 56.02	2 2.003	2N	18.0	6.417 18.000 24.417	150 0.0248	36.372 0.0 0.605		Vel = 5.70	
TW2 to BW2	9.500 4		0.0 56.02	2 2.157	Ball E T	2.769 6.153 12.307	5.500 21.229 26.729	120 0.0262	36.977 2.382 0.699		Vel = 4.92	
BW2 to BW1	4 4		0.0 56.02	6 6.357			1.333 1.333	120 0	40.058 0.0 0.0		Vel = 0.57	
BW1 to BOS	4 4		0.0 56.02	6 6.357	T	37.72	1.333 37.720 39.053	120 0.0001	40.058 0.0 0.005		Vel = 0.57	
BOS to FLG	4 1		0.0 56.02	2 2.157	S	13.537	3.000 13.537 16.537	120 0.0262	40.063 1.299 0.433		Vel = 4.92	
FLG to CHG	1 -5		0.0 56.02	6 6.16	E	20.084	12.000 20.084 32.084	140 0.0001	41.795 2.599 0.003		Vel = 0.60	
CHG			0.0 56.02						44.397		K Factor = 8.41	
CHG to UG1	-5 -5		56.02 56.02	6 5.86	G T Zwh	3.834 38.342 0.0	38.500 42.176 80.676	150 0.0001	44.397 5.648 0.011		* * Fixed Loss = 5.648 Vel = 0.67	
UG1 to DOM	-5 -5		-20.65 35.37	8 7.68	T	43.857	5.000 43.857 48.857	150 0	50.056 0.0 0.001		Vel = 0.24	
DOM to UG2	-5 -5		0.0 35.37	8 7.68	T	43.857	172.250 43.857 216.107	150 0	50.057 0.0 0.003		Vel = 0.24	
UG2 to UG3	-5 -5		0.0 35.37	8 7.68	E 4F	22.555 45.11	515.833 67.665 583.498	150 0	50.060 0.0 0.009		Vel = 0.24	
UG3 to UG4	-5 -5		-56.02 -20.65	8 7.68	T	43.857	487.167 43.857 531.024	150 0	50.069 0.0 -0.003		Vel = 0.14	
UG4 to UG5	-5 -5		0.0 -20.65	8 7.68	7F 2E T	78.943 45.11 43.857	633.833 167.910 801.743	150 0	50.066 0.0 -0.004		Vel = 0.14	
UG5 to UG6	-5 -5		0.0 -20.65	12 11.2	2F E	28.793 29.901	1266.500 58.695 1325.195	150 0	50.062 0.0 -0.002		Vel = 0.07	
UG6 to UG7	-5 -5		0.0 -20.65	12 11.2	E 6F T	29.901 86.38 66.446	1047.167 182.727 1229.894	150 0	50.060 0.0 -0.001		Vel = 0.07	
UG7 to UG1	-5 -5		0.0 -20.65	8 7.68	2F	22.555	533.667 22.555 556.222	150 0	50.059 0.0 -0.003		Vel = 0.14	
			0.0									

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 Equiv	Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	*****	Notes	*****
UG1			-20.65						50.056		K Factor = -2.92	
UG3	-5		56.02	6			2.500	150	50.069			
to									0.0			
UG3X	-5		56.02	5.86			2.500	0	0.0		Vel = 0.67	
UG3X	-5		0.0	6	E	20.084	12.000	140	50.069			
to					G	4.304	24.388		-3.465			
CTY	3		56.02	6.16			36.388	0.0001	0.005		Vel = 0.60	
			100.00								Qa = 100.00	
CTY			156.02						46.609		K Factor = 22.85	



Hydraulic Calculations by HydraCALC

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

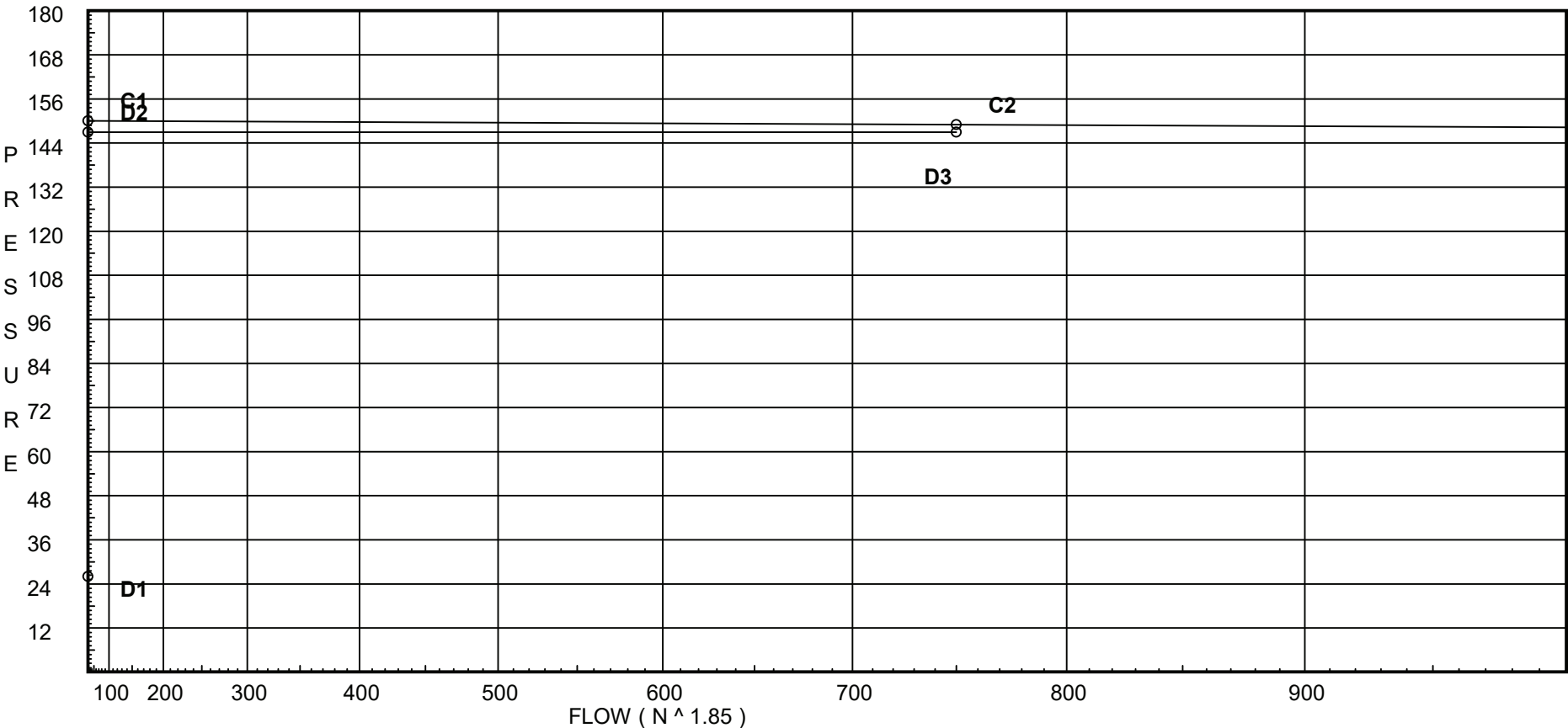
Job Name : HOME 2 SUITES
Drawing :
Location : STAIRWELL 1 & 2
Remote Area :
Contract :
Data File : Wet Standpipe.WXF

Water Supply Curve

RANGER FIRE, INC.
HOME 2 SUITES

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.
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Fitting Legend

Abbrev.	Name	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	5	6	8	10	12	14	16	18	20	24
B	NFPA 13 Butterfly Valve	0	0	0	0	0	6	7	10	0	12	9	10	12	19	21	0	0	0	0	0
E	NFPA 13 90' Standard Elbow	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 Equiv 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	