

Uponor

AQUASAFE® Fire Safety System

Uponor
5925 148th Street West

Apple Valley, MN 55124
800-321-4739

Job Name : 25A SUMAC - Two Head Calculation (H.18 & H.12)
Drawing : RESIDENTIAL
Location : 25A SUMAC PORTLAND ME
Remote Area : 1
Contract : 120228-41N
Data File : 120228-41N 25A Sumac.wx2

HYDRAULIC DESIGN INFORMATION SHEET

Name - 25A SUMAC Date - 3/05/12
Location - PORTLAND ME
Building - RESIDENTIAL System No. - 1
Contractor - SPB PLG & HTG Contract No. - 120228-41N
Calculated By - DEVON HUYNH Drawing No. - 1
Construction: (X) Combustible () Non-Combustible Ceiling Height VARIES
OCCUPANCY - RESIDENTIAL

S Type of Calculation: ()NFPA 13 Residential ()NFPA 13R (X)NFPA 13D
Y Number of Sprinklers Flowing: ()1 (X)2 ()4 ()
S ()Other
T ()Specific Ruling Made by Date
E
M Listed Flow at Start Point - 13 Gpm System Type
Listed Pres. at Start Point - 9.14 Psi (X) Wet () Dry
D MAXIMUM LISTED SPACING 16 x 16 () Deluge () PreAction
E Domestic Flow Added - 0 Gpm Sprinkler or Nozzle
S Additional Flow Added - Gpm Make RELIABE-ASSEMBLIES Model AFC43
I Elevation at Highest Outlet - 128 Feet Size 3/8 K-Factor 4.3
G Note: Temperature Rating 155
N

Calculation Gpm Required 26.411 Psi Required 75.53 At Ref Pt STR
Summary C-Factor Used: Overhead 150 Underground 150

W Water Flow Test: Pump Data: Tank or Reservoir:
A Date of Test - x Rated Cap. Cap.
T Time of Test - x @ Psi Elev.
E Static (Psi) - 80 Elev.
R Residual (Psi) - 75 Other Well
Flow (Gpm) - 300 Proof Flow Gpm
S Elevation - 100

P Location: x
P
L Source of Information: CITY SUPPLY
Y

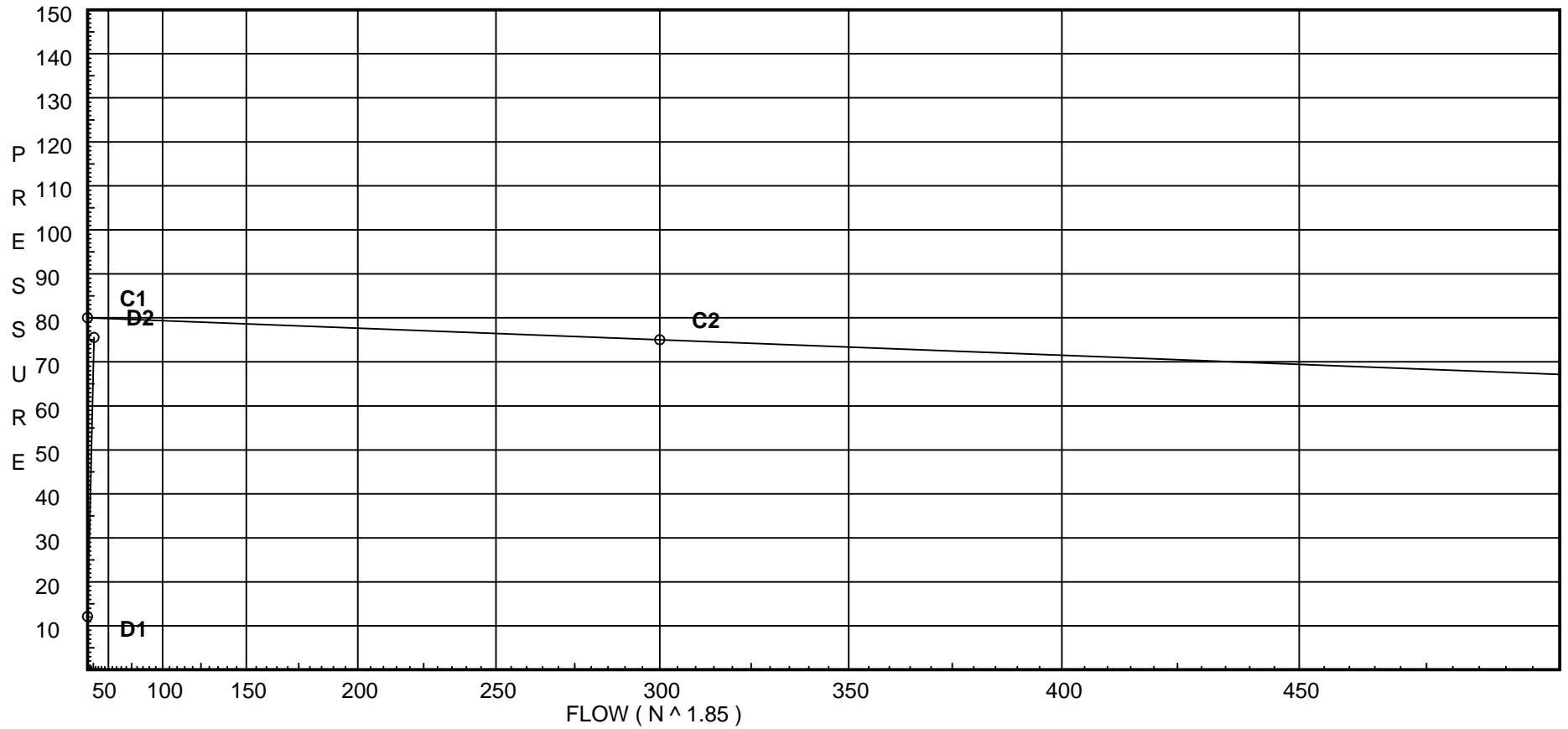
Water Supply Curve (C)

Uponor
25A SUMAC - Two Head Calculation (H.18 & H.12)

Page 2
Date 3/5/2012

City Water Supply:
C1 - Static Pressure : 80
C2 - Residual Pressure: 75
C2 - Residual Flow : 300

Demand:
D1 - Elevation : 12.127
D2 - System Flow : 26.411
D2 - System Pressure : 75.534
Hose (Adj City) : _____
Hose (Demand) : _____
D3 - System Demand : 26.411
Safety Margin : 4.411



Fittings Used Summary

Uponsor
25A SUMAC - Two Head Calculation (H.18 & H.12)

Page 3
Date 3/5/2012

Fitting Legend

Abbrev.	Name	½	¾	1	1¼	1½	2	2½	3	3½	4	5	6	8	10	12	14	16	18	20	24
E	90' Standard Elbow	2	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61
G	Generic Gate Valve	1	1	1	1	1	1	1	1	1	2	2	3	4	5	6	7	8	10	11	13
R	CPVC Coupling Tee - Run	1	1	1	1	1	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0
T	90' Flow thru Tee	3	4	5	6	8	10	12	15	17	20	25	30	35	50	60	71	81	91	101	121
U	UnAdjusted Fitting	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Utb	Aquapex Tee - Branch	2	6	6	9.08	12.88	13.22	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Utr	Aquapex Tee - Run	1	2	2	1.64	2.39	2.39	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Units Summary

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

SUPPLY ANALYSIS

Node at Source	Static Pressure	Residual Pressure	Flow	Available Pressure	Total Demand	Required Pressure
STR	80.0	75	300.0	79.944	26.41	75.534

NODE ANALYSIS

Node Tag	Elevation	Node Type	Pressure at Node	Discharge at Node	Notes
H.12	128.0	4.3	9.73	13.41	
H.18	128.0	4.3	9.14	13.0	
H.2	128.0		19.77		
H.3	128.0		19.37		
H.4	128.0		19.61		
H.9	118.0		27.51		
M.22	128.0		20.11		
H.1	128.0		19.4		
T.23	128.0		17.82		
H.7	128.0		18.66		
M.25	108.0		36.41		
H.5	108.0		34.8		
H.8	118.0		27.38		
H.6	108.0		34.65		
H.10	128.0		16.16		
H.13	108.0		34.5		
T.24	108.0		36.5		
M.27	118.0		27.84		
T.26	118.0		27.85		
H.17	118.0		26.48		
H.11	128.0		16.19		
T.30	128.0		14.54		
H.15	118.0		27.81		
H.14	118.0		27.98		
T.28	118.0		27.58		
H.20	108.0		34.96		
H.16	128.0		12.81		
T.29	128.0		14.5		
H.19	108.0		34.71		
T.33	118.0		28.0		
T.31	118.0		26.91		
T.32	118.0		26.26		
H.21	118.0		26.06		
T.34	118.0		21.24		
S.1	104.0		40.83		
MTR	100.0		53.34		
STR	100.0		75.53		

Final Calculations - Hazen-Williams

Uponor
25A SUMAC - Two Head Calculation (H.18 & H.12)

Page 5
Date 3/5/2012

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv. Ln.	Pipe Ftg's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
H.12 to M.22	4.90 4.9	0.475 150.0 0.3021	1T 1.219 21U 21.0	12.000 22.369 34.369	9.727 0.0 10.384		K Factor = 4.30 Vel = 8.87		
	0.0 4.90					20.111	K Factor = 1.09		
H.18 to M.22	4.34 4.34	0.475 150.0 0.2418	1T 1.219 21U 21.0	23.000 22.369 45.369	9.140 0.0 10.971		K Factor = 4.30 Vel = 7.86		
	0.0 4.34					20.111	K Factor = 0.97		
H.2 to H.1	-0.57 -0.57	0.475 150.0 -0.0057	42U 42.0 0.0	22.000 42.300 64.300	19.771 0.0 -0.367		Vel = 1.03		
	0.0 -0.57					19.404	K Factor = -0.13		
H.3 to H.1	0.17 0.17	0.475 150.0 0.0006	42U 42.0 0.0	10.000 42.300 52.300	19.374 0.0 0.030		Vel = 0.31		
	0.0 0.17					19.404	K Factor = 0.04		
H.4 to H.1	-0.48 -0.48	0.475 150.0 -0.0041	42U 42.0 0.0	8.000 42.300 50.300	19.608 0.0 -0.204		Vel = 0.87		
	0.0 -0.48					19.404	K Factor = -0.11		
H.9 to H.4	-2.05 -2.05	0.475 150.0 -0.0602	42U 42.0 0.0	17.000 42.300 59.300	27.509 -4.331 -3.570		Vel = 3.71		
H.4 to H.3	1.56 -0.49	0.475 150.0 -0.0043	42U 42.0 0.0	12.000 42.300 54.300	19.608 0.0 -0.234		Vel = 0.89		
	0.0 -0.49					19.374	K Factor = -0.11		
M.22 to H.3	-1.23 -1.23	0.475 150.0 -0.0235	1T 1.219 21U 21.0	9.000 22.369 31.369	20.111 0.0 -0.737		Vel = 2.23		
	0.0 -1.23					19.374	K Factor = -0.28		
H.1 to H.7	-0.88 -0.88	0.475 150.0 -0.0127	42U 42.0 0.0	16.000 42.300 58.300	19.404 0.0 -0.740		Vel = 1.59		
	0.0 -0.88					18.664	K Factor = -0.20		
T.23 to H.2	1.99 1.99	0.475 150.0 0.0571	1R 1.0 21U 21.0 1Utr 1.0	11.000 23.150 34.150	17.821 0.0 1.950		Vel = 3.60		
	0.0 1.99					19.771	K Factor = 0.45		

Final Calculations - Hazen-Williams

Uponor
25A SUMAC - Two Head Calculation (H.18 & H.12)

Page 6
Date 3/5/2012

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
M.22 to H.2	-0.71	0.475 150.0	1T 21U	1.219 21.0	18.000 22.369	20.111 0.0				
	-0.71	-0.0084		0.0	40.369	-0.340		Vel =	1.29	
H.2 to H.8	2.57	0.475 150.0	42U	42.0 0.0	23.000 42.300	19.771 4.331				
	1.86	0.0502		0.0	65.300	3.279		Vel =	3.37	
	0.0 1.86					27.381		K Factor =	0.36	
H.3 to H.11	-1.89	0.475 150.0	42U	42.0 0.0	19.000 42.300	19.374 0.0				
	-1.89	-0.0519		0.0	61.300	-3.182		Vel =	3.42	
	0.0 -1.89					16.192		K Factor =	-0.47	
H.7 to H.4	1.08	0.475 150.0	42U	42.0 0.0	9.000 42.300	18.664 0.0				
	1.08	0.0184		0.0	51.300	0.944		Vel =	1.96	
	0.0 1.08					19.608		K Factor =	0.24	
M.22 to T.26	16.00	0.862 150.0	1Utb	6.0 0.0	17.000 6.000	20.111 4.331				
	16.0	0.1483		0.0	23.000	3.410		Vel =	8.80	
	0.0 16.00					27.852		K Factor =	3.03	
M.22 to H.7	-1.84	0.475 150.0	1T 21U	1.219 21.0	7.000 22.369	20.111 0.0				
	-1.84	-0.0493		0.0	29.369	-1.447		Vel =	3.33	
	0.0 -1.84					18.664		K Factor =	-0.43	
M.25 to H.5	-1.79	0.475 150.0	1T 21U	1.219 21.0	12.000 22.369	36.412 0.0				
	-1.79	-0.0468		0.0	34.369	-1.610		Vel =	3.24	
	0.0 -1.79					34.802		K Factor =	-0.30	
H.9 to H.6	1.70	0.475 150.0	42U	42.0 0.0	24.000 42.300	27.509 4.331				
	1.7	0.0424		0.0	66.300	2.814		Vel =	3.08	
	0.0 1.70					34.654		K Factor =	0.29	
H.8 to H.9	0.35	0.475 150.0	42U	42.0 0.0	14.000 42.300	27.381 0.0				
	0.35	0.0023		0.0	56.300	0.128		Vel =	0.63	
	0.0 0.35					27.509		K Factor =	0.07	
H.6 to H.13	-0.34	0.475 150.0	42U	42.0 0.0	28.000 42.300	34.654 0.0				
	-0.34	-0.0022		0.0	70.300	-0.152		Vel =	0.62	
	0.0 -0.34					34.502		K Factor =	-0.06	

Final Calculations - Hazen-Williams

Uponor
25A SUMAC - Two Head Calculation (H.18 & H.12)

Page 7
Date 3/5/2012

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftg's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
H.10 to T.23	1.99	0.475 150.0	21U 1R	21.0 1.0	7.000 22.150	16.157 0.0				
	1.99	0.0571		0.0	29.150	1.664		Vel =	3.60	
	0.0									
	1.99					17.821		K Factor =	0.47	
M.22 to H.11	-2.99	0.475 150.0	1T 21U	1.219 21.0	10.000 22.369	20.111 0.0				
	-2.99	-0.1211		0.0	32.369	-3.919		Vel =	5.41	
	0.0									
	-2.99					16.192		K Factor =	-0.74	
M.25 to H.6	-1.82	0.475 150.0	1T 21U	1.219 21.0	14.000 22.369	36.412 0.0				
	-1.82	-0.0483		0.0	36.369	-1.758		Vel =	3.30	
	0.0									
	-1.82					34.654		K Factor =	-0.31	
H.13 to H.5	0.54	0.475 150.0	42U	42.0 0.0	17.000 42.300	34.502 0.0				
	0.54	0.0051		0.0	59.300	0.300		Vel =	0.98	
	0.0									
	0.54					34.802		K Factor =	0.09	
H.7 to H.12	-3.80	0.475 150.0	42U	42.0 0.0	5.000 42.300	18.664 0.0				
	-3.8	-0.1889		0.0	47.300	-8.937		Vel =	6.88	
	0.0									
	-3.80					9.727		K Factor =	-1.22	
H.8 to T.28	0.64	0.475 150.0	21U 1R	21.0 1.0	5.000 23.150	27.381 0.0				
	0.64	0.0070	1Utr	1.0	28.150	0.196		Vel =	1.16	
	0.0									
	0.64					27.577		K Factor =	0.12	
T.24 to S.1	26.41	1.054 150.0	1T	2.44 0.0	16.000 2.440	36.503 1.732				
	26.41	0.1408		0.0	18.440	2.596		Vel =	9.71	
	0.0									
	26.41					40.831		K Factor =	4.13	
H.10 to H.12	-2.79	0.475 150.0	42U	42.0 0.0	18.000 42.300	16.157 0.0				
	-2.79	-0.1066		0.0	60.300	-6.430		Vel =	5.05	
	0.0									
	-2.79					9.727		K Factor =	-0.89	
M.25 to T.24	6.80	0.862 150.0	1Utr	2.0 0.0	1.000 2.000	36.412 0.0				
	6.8	0.0303		0.0	3.000	0.091		Vel =	3.74	
	-26.41	0.862 150.0	1Utb 1Utr	6.0 2.0	12.000 8.000	36.503 -4.331				
	-19.61	-0.2160		0.0	20.000	-4.320		Vel =	10.78	
	0.0									
	-19.61					27.852		K Factor =	-3.72	

Final Calculations - Hazen-Williams

Uponor
25A SUMAC - Two Head Calculation (H.18 & H.12)

Page 8
Date 3/5/2012

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
M.27 to H.8	-0.87 -0.87	0.475 150.0 -0.0123	1T 21U	1.219 21.0 0.0	15.000 22.369 37.369	27.842 0.0 -0.461				
	0.0 -0.87					27.381			Vel = 1.58	
									K Factor = -0.17	
T.26 to M.27	-3.61 -3.61	0.862 150.0 -0.0100		0.0 0.0 0.0	1.000 0.0 1.000	27.852 0.0 -0.010				
	0.0 -3.61					27.842			Vel = 1.98	
									K Factor = -0.68	
H.17 to H.10	-2.76 -2.76	0.475 150.0 -0.1045	42U	42.0 0.0 0.0	15.000 42.300 57.300	26.477 -4.331 -5.989				
	0.0 -2.76					16.157			Vel = 5.00	
									K Factor = -0.69	
H.11 to T.29	-2.04 -2.04	0.475 150.0 -0.0601	21U 1R 1Utr	21.0 1.0 1.0	5.000 23.150 28.150	16.192 0.0 -1.691				
	0.0 -2.04					14.501			Vel = 3.69	
									K Factor = -0.54	
T.30 to H.10	1.96 1.96	0.475 150.0 0.0555	1R 21U 1Utb	1.0 21.0 2.0	5.000 24.150 29.150	14.539 0.0 1.618				
	0.0 1.96					16.157			Vel = 3.55	
									K Factor = 0.49	
H.15 to H.5	1.62 1.62	0.475 150.0 0.0389	42U	42.0 0.0 0.0	26.000 42.300 68.300	27.814 4.331 2.657				
	0.0 1.62					34.802			Vel = 2.93	
									K Factor = 0.27	
H.14 to H.9	-0.70 -0.7	0.475 150.0 -0.0083	42U	42.0 0.0 0.0	14.000 42.300 56.300	27.975 0.0 -0.466				
	0.0 -0.70					27.509			Vel = 1.27	
									K Factor = -0.13	
M.27 to H.14	0.46 0.46	0.475 150.0 0.0038	1T 21U	1.219 21.0 0.0	13.000 22.369 35.369	27.842 0.0 0.133				
	0.0 0.46					27.975			Vel = 0.83	
									K Factor = 0.09	
T.28 to H.15	0.64 0.64	0.475 150.0 0.0069	1R 21U	1.0 21.0 0.0	12.000 22.150 34.150	27.577 0.0 0.237				
	0.0 0.64					27.814			Vel = 1.16	
									K Factor = 0.12	
H.20 to H.5	-0.36 -0.36	0.475 150.0 -0.0025	42U	42.0 0.0 0.0	21.000 42.300 63.300	34.959 0.0 -0.157				
									Vel = 0.65	

Final Calculations - Hazen-Williams

Uponor
25A SUMAC - Two Head Calculation (H.18 & H.12)

Page 9
Date 3/5/2012

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftn'g's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
	0.0 -0.36						34.802		K Factor = -0.06	
H.16 to H.12	-1.93	0.475 150.0	42U	42.0 0.0	15.000 42.300	12.810 0.0				
	-1.93	-0.0538		0.0	57.300	-3.083			Vel = 3.49	
	0.0 -1.93						9.727		K Factor = -0.62	
H.14 to H.13	1.56	0.475 150.0	42U	42.0 0.0	18.000 42.300	27.975 4.331				
	1.56	0.0364		0.0	60.300	2.196			Vel = 2.82	
	0.0 1.56						34.502		K Factor = 0.27	
H.6 to H.19	0.22	0.475 150.0	42U	42.0 0.0	18.000 42.300	34.654 0.0				
	0.22	0.0009		0.0	60.300	0.056			Vel = 0.40	
	0.0 0.22						34.710		K Factor = 0.04	
T.29 to H.16	-2.04	0.475 150.0	1R 21U	1.0 21.0	4.000 24.150	14.501 0.0				
	-2.04	-0.0601	1Utb	2.0	28.150	-1.691			Vel = 3.69	
H.16 to T.30	4.00	0.475 150.0	21U 1R	21.0 1.0	9.000 22.150	12.810 0.0				
	1.96	0.0555		0.0	31.150	1.729			Vel = 3.55	
	0.0 1.96						14.539		K Factor = 0.51	
H.11 to H.18	-2.83	0.475 150.0	42U	42.0 0.0	22.000 42.300	16.192 0.0				
	-2.83	-0.1097		0.0	64.300	-7.052			Vel = 5.12	
	0.0 -2.83						9.140		K Factor = -0.94	
M.25 to H.20	-1.55	0.475 150.0	1T 21U	1.219 21.0	18.000 22.369	36.412 0.0				
	-1.55	-0.0360		0.0	40.369	-1.453			Vel = 2.81	
	0.0 -1.55						34.959		K Factor = -0.26	
H.14 to H.15	-0.40	0.475 150.0	42U	42.0 0.0	12.000 42.300	27.975 0.0				
	-0.4	-0.0030		0.0	54.300	-0.161			Vel = 0.72	
	0.0 -0.40						27.814		K Factor = -0.08	
M.27 to H.17	-1.44	0.475 150.0	1T 21U	1.219 21.0	21.000 22.369	27.842 0.0				
	-1.44	-0.0315		0.0	43.369	-1.365			Vel = 2.61	
	0.0 -1.44						26.477		K Factor = -0.28	
M.25 to H.19	-1.64	0.475 150.0	1T 21U	1.219 21.0	20.000 22.369	36.412 0.0				
	-1.64	-0.0402		0.0	42.369	-1.702			Vel = 2.97	

Final Calculations - Hazen-Williams

Uponor
25A SUMAC - Two Head Calculation (H.18 & H.12)

Page 10
Date 3/5/2012

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
	0.0 -1.64					34.710			K Factor = -0.28	
H.20 to H.13	-0.69	0.475 150.0	42U	42.0 0.0	15.000 42.300	34.959 0.0				
	-0.69	-0.0080		0.0	57.300	-0.457			Vel = 1.25	
	0.0 -0.69					34.502			K Factor = -0.12	
H.15 to T.31	-1.38	0.475 150.0	21U 1R	21.0 1.0	8.000 23.150	27.814 0.0				
	-1.38	-0.0291	1Utr	1.0	31.150	-0.905			Vel = 2.50	
	0.0 -1.38					26.909			K Factor = -0.27	
M.27 to H.21	-1.75	0.475 150.0	1T 21U	1.219 21.0	17.000 22.369	27.842 0.0				
	-1.75	-0.0452		0.0	39.369	-1.781			Vel = 3.17	
	0.0 -1.75					26.061			K Factor = -0.34	
H.16 to H.18	-2.08	0.475 150.0	42U	42.0 0.0	17.000 42.300	12.810 0.0				
	-2.08	-0.0619		0.0	59.300	-3.670			Vel = 3.77	
	0.0 -2.08					9.140			K Factor = -0.69	
H.19 to H.20	0.50	0.475 150.0	42U	42.0 0.0	14.000 42.300	34.710 0.0				
	0.5	0.0044		0.0	56.300	0.249			Vel = 0.91	
	0.0 0.50					34.959			K Factor = 0.08	
T.33 to H.17	-1.93	0.475 150.0	1R 21U	1.0 21.0	5.000 23.150	27.996 0.0				
	-1.93	-0.0540	1Utr	1.0	28.150	-1.519			Vel = 3.49	
	0.0 -1.93					26.477			K Factor = -0.38	
H.18 to T.34	3.75	0.475 150.0	21U 1R	21.0 1.0	19.000 23.150	9.140 4.331				
	3.75	0.1843	1Utr	1.0	42.150	7.770			Vel = 6.79	
	0.0 3.75					21.241			K Factor = 0.81	
T.31 to H.21	-1.38	0.475 150.0	1R 21U	1.0 21.0	7.000 22.150	26.909 0.0				
	-1.38	-0.0291		0.0	29.150	-0.848			Vel = 2.50	
	0.0 -1.38					26.061			K Factor = -0.27	
T.32 to H.17	0.61	0.475 150.0	1R 21U	1.0 21.0	10.000 23.150	26.263 0.0				
	0.61	0.0065	1Utr	1.0	33.150	0.214			Vel = 1.10	
	0.0 0.61					26.477			K Factor = 0.12	

Final Calculations - Hazen-Williams

Uponor
25A SUMAC - Two Head Calculation (H.18 & H.12)

Page 11
Date 3/5/2012

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv. Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
H.21 to T.32	0.61 0.61	0.475 150.0 0.0065	21U 21.0 1R 1.0	9.000 22.150 31.150	26.061 0.0 0.202		Vel = 1.10		
	0.0 0.61				26.263		K Factor = 0.12		
T.34 to H.21	3.75 3.75	0.475 150.0 0.1843	1R 1.0 21U 21.0	4.000 22.150 26.150	21.241 0.0 4.820		Vel = 6.79		
	0.0 3.75				26.061		K Factor = 0.73		
H.19 to T.33	-1.93 -1.93	0.475 150.0 -0.0540	21U 21.0 1R 1.0 1Utb 2.0	20.000 24.150 44.150	34.710 -4.331 -2.383		Vel = 3.49		
	0.0 -1.93				27.996		K Factor = -0.36		
S.1 to MTR	26.41 26.41	0.785 150.0 0.5911	2E 4.773	5.000 0.0 4.773 9.773	40.831 6.732 5.777		* Fixed loss = 5 Vel = 17.51		
MTR to STR	0.0 26.41	0.911 150.0 0.2863	1E 1.521 1T 3.801 1G 0.76	40.000 6.082 46.082	53.340 9.000 13.194		* Fixed loss = 9 Vel = 13.00		
	0.0 26.41				75.534		K Factor = 3.04		