



AquaSAFE™ FIRE SAFETY SYSTEM

Uponor
5925 148th Street West

Apple Valley, MN 55124
800-321-4739

Job Name : 10 HOWARD STREET - One Head Calculation (H.31)
Drawing : RESIDENTIAL
Location : PORTLAND ME 04101
Remote Area : 1
Contract : 13359F
Data File : 13359F REV 1 10 Howard St.wx1

HYDRAULIC DESIGN INFORMATION SHEET

Name - 10 HOWARD STREET Date - 4/22/13
Location - PORTLAND ME 04101
Building - RESIDENTIAL System No. - 1
Contractor - FORTIN SERVICES Contract No. - 13359F
Calculated By - BRENT KOTULA SET IV 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: (X)1 ()2 ()4 ()
S ()Other
T ()Specific Ruling Made by Date
E
M Listed Flow at Start Point - 18 Gpm System Type
Listed Pres. at Start Point - 13.5 Psi (X) Wet () Dry
D MAXIMUM LISTED SPACING 18 x 18 () Deluge () PreAction
E Domestic Flow Added - 0 Gpm Sprinkler or Nozzle
S Additional Flow Added - Gpm Make SENJU SPRINKLER Model RC-RES
I Elevation at Highest Outlet - 123 Feet Size 7/16 K-Factor 4.9
G Note: Temperature Rating 162
N

Calculation Gpm Required 18 Psi Required 45.52 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 - 4/15/13 Rated Cap. Cap.
T Time of Test - AM @ Psi Elev.
E Static (Psi) - 85 Elev.
R Residual (Psi) - 80 Other Well
Flow (Gpm) - 300 Proof Flow Gpm
S Elevation - 99

P Location: STREET
P
L Source of Information: CONTRACTOR
Y

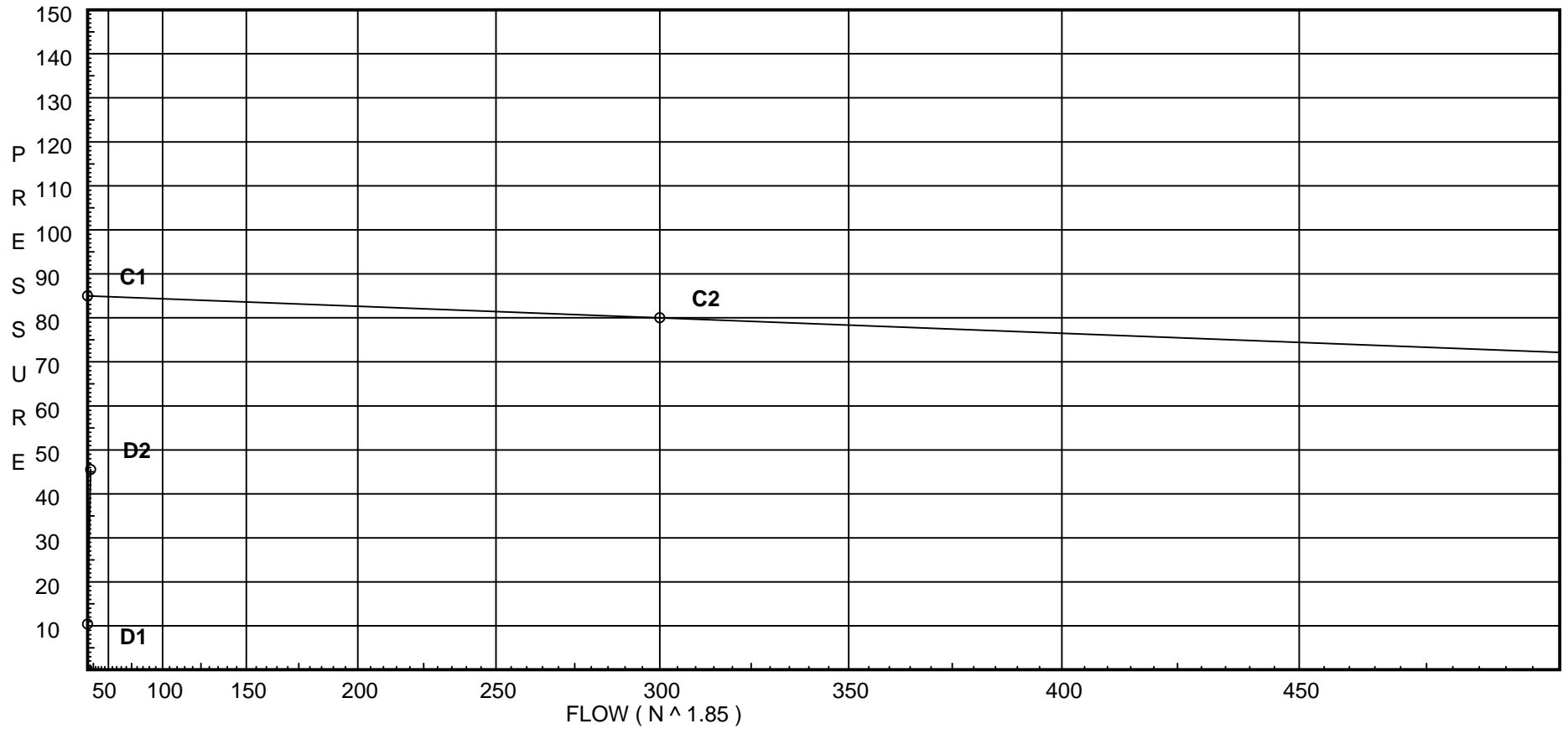
Water Supply Curve (C)

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City Water Supply:
C1 - Static Pressure : 85
C2 - Residual Pressure: 80
C2 - Residual Flow : 300

Demand:
D1 - Elevation : 10.394
D2 - System Flow : 18.0037
D2 - System Pressure : 45.518
Hose (Adj City) : _____
Hose (Demand) : _____
D3 - System Demand : 18.0037
Safety Margin : 39.454



Fittings Used Summary

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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
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
Utb	Aquapex Tee - Branch	2	17	14	9	12	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Utr	Aquapex Tee - Run	1	2	2	4	2	1	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

Flow Summary - NFPA 2007

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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>
STR	85.0	80	300.0	84.973	18.0	45.518

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>
H.31	123.0	4.9	13.5	18.0	
H.27	123.0		15.76		
T.59	123.0		21.58		
H.19	123.0		22.27		
T.47	123.0		22.66		
T.48	123.0		23.0		
T.53	109.0		29.13		
T.41	99.0		33.63		
T.45	99.0		34.4		
T.46	99.0		34.47		
H.16	99.0		34.85		
H.23	99.0		35.51		
H.34	99.0		36.1		
T.77	99.0		36.45		
H.35	109.0		32.2		
H.32	109.0		32.21		
T.76	99.0		36.63		
T.75	99.0		36.77		
T.74	99.0		36.84		
T.73	99.0		37.57		
T.72	99.0		37.8		
S.1	94.0		41.98		
MTR	99.0		43.95		
STR	99.0		45.52		
H.36	123.0		15.57		
H.30	123.0		15.89		
T.70	123.0		18.12		
H.26	123.0		18.59		
T.68	123.0		22.57		
T.67	109.0		29.19		
T.66	99.0		33.77		
T.69	99.0		35.41		
H.22	99.0		35.67		
T.71	99.0		35.93		
T.58	109.0		28.05		
H.12	109.0		28.63		
T.43	109.0		28.68		
T.44	109.0		28.72		
T.42	109.0		29.09		
H.3	109.0		29.21		
H.4	109.0		29.26		
T.39	109.0		29.35		

NODE ANALYSIS (cont.)

Node Tag	Elevation	Node Type	Pressure at Node	Discharge at Node	Notes
H.13	109.0		29.99		
H.14	109.0		30.12		
T.51	109.0		30.22		
T.54	109.0		30.43		
H.17	109.0		30.58		
T.57	109.0		30.82		
T.61	109.0		30.97		
T.65	109.0		31.07		
T.64	109.0		31.13		
T.63	109.0		31.59		
H.21	109.0		28.59		
T.62	109.0		29.24		
H.20	123.0		22.78		
H.18	123.0		22.86		
T.50	123.0		22.96		
H.9	123.0		22.99		
H.10	123.0		23.0		
T.37	123.0		23.12		
T.38	109.0		29.3		
H.7	109.0		28.7		
H.11	123.0		22.7		
H.1	123.0		22.82		
H.2	123.0		22.93		
T.49	123.0		22.98		
T.40	99.0		33.63		
H.15	99.0		33.7		
H.6	99.0		33.63		
H.5	99.0		33.63		
H.8	99.0		34.43		
H.28	109.0		31.1		
H.24	109.0		31.33		
H.25	109.0		31.36		
H.33	99.0		36.51		
H.29	99.0		36.81		

Final Calculations - Hazen-Williams

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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.31 to H.27	9.41	0.671 150.0	1Utr	2.0 0.0	10.000 2.000	13.500 0.0			K Factor = 4.90	
H.27 to T.59	9.41	0.1879		0.0	12.000	2.255			Vel = 8.54	
H.27 to T.59	0.0	0.671 150.0	1Utb 1Utr	17.0 2.0	12.000 19.000	15.755 0.0				
T.59 to H.19	9.41	0.1880		0.0	31.000	5.827			Vel = 8.54	
T.59 to H.19	-5.93	0.671 150.0	1Utb	17.0 0.0	6.000 17.000	21.582 0.0				
H.19 to T.47	3.48	0.0298		0.0	23.000	0.686			Vel = 3.16	
H.19 to T.47	0.0	0.671 150.0	1Utr	2.0 0.0	11.000 2.000	22.268 0.0				
T.47 to T.48	3.48	0.0298		0.0	13.000	0.388			Vel = 3.16	
T.47 to T.48	-1.68	0.671 150.0	2Utb	34.0 0.0	5.000 34.000	22.656 0.0				
T.48 to T.53	1.8	0.0088		0.0	39.000	0.342			Vel = 1.63	
T.48 to T.53	0.48	0.862 150.0		0.0 0.0	16.000 0.0	22.998 6.063				
T.53 to T.41	2.28	0.0041		0.0	16.000	0.065			Vel = 1.25	
T.53 to T.41	1.52	0.862 150.0	1Utr	2.0 0.0	15.000 2.000	29.126 4.331				
T.41 to T.45	3.8	0.0104		0.0	17.000	0.177			Vel = 2.09	
T.41 to T.45	-0.02	0.671 150.0	1Utr 1Utb	2.0 17.0	3.000 19.000	33.634 0.0				
T.45 to T.46	3.78	0.0347		0.0	22.000	0.764			Vel = 3.43	
T.45 to T.46	-0.73	0.671 150.0	1Utr	2.0 0.0	1.000 2.000	34.398 0.0				
T.46 to H.16	3.05	0.0233		0.0	3.000	0.070			Vel = 2.77	
T.46 to H.16	0.73	0.671 150.0	1Utr	2.0 0.0	9.000 2.000	34.468 0.0				
H.16 to H.23	3.78	0.0347		0.0	11.000	0.382			Vel = 3.43	
H.16 to H.23	0.0	0.671 150.0	1Utr	2.0 0.0	17.000 2.000	34.850 0.0				
H.23 to H.34	3.78	0.0347		0.0	19.000	0.659			Vel = 3.43	
H.23 to H.34	0.0	0.671 150.0	1Utr	2.0 0.0	15.000 2.000	35.509 0.0				
H.34 to T.77	3.78	0.0348		0.0	17.000	0.591			Vel = 3.43	
H.34 to T.77	0.0	0.671 150.0	1Utr	2.0 0.0	8.000 2.000	36.100 0.0				
T.77 to H.35	3.78	0.0347		0.0	10.000	0.347			Vel = 3.43	
T.77 to H.35	-2.87	0.671 150.0	1Utb	17.0 0.0	17.000 17.000	36.447 -4.331				
H.35 to H.32	0.91	0.0025		0.0	34.000	0.085			Vel = 0.83	
H.35 to H.32	0.0	0.671 150.0	1Utr	2.0 0.0	3.000 2.000	32.201 0.0				
H.32 to T.76	0.91	0.0024		0.0	5.000	0.012			Vel = 0.83	
H.32 to T.76	0.0	0.671 150.0	1Utb 1Utr	17.0 2.0	17.000 19.000	32.213 4.331				
T.76	0.91	0.0025		0.0	36.000	0.090			Vel = 0.83	

Final Calculations - Hazen-Williams

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Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftg's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
T.76 to T.75	2.87 3.78	0.671 150.0 0.0348	1Utr	2.0 0.0	2.000 2.000 4.000	36.634 0.0 0.139				Vel = 3.43
T.75 to T.74	-0.74 3.04	0.671 150.0 0.0233	1Utr	2.0 0.0	1.000 2.000 3.000	36.773 0.0 0.070				Vel = 2.76
T.74 to T.73	0.74 3.78	0.671 150.0 0.0347	1Utr 1Utb	2.0 17.0 0.0	2.000 19.000 21.000	36.843 0.0 0.729				Vel = 3.43
T.73 to T.72	5.85 9.63	0.862 150.0 0.0580	1Utr	2.0 0.0	2.000 2.000 4.000	37.572 0.0 0.232				Vel = 5.29
T.72 to S.1	8.37 18.0	0.862 150.0 0.1843	1T	7.528 0.0	8.000 2.904 10.904	37.804 2.166 2.010				Vel = 9.90
S.1 to MTR	0.0 18.0	1.049 150.0 0.0709	2E	6.044 0.0	10.000 6.044 16.044	41.980 0.834 1.138				* Fixed loss = 3 Vel = 6.68
MTR to STR	0.0 18.0	1.049 150.0 0.0709	1E 1T 1G	3.022 7.555 1.511	10.000 12.089 22.089	43.952 0.0 1.566				Vel = 6.68
	0.0 18.00					45.518				K Factor = 2.67
H.31 to H.36	8.60 8.6	0.671 150.0 0.1592	1Utr	2.0 0.0	11.000 2.000 13.000	13.500 0.0 2.069				Vel = 7.80
H.36 to H.30	0.0 8.6	0.671 150.0 0.1590		0.0 0.0	2.000 0.0 2.000	15.569 0.0 0.318				Vel = 7.80
H.30 to T.70	0.0 8.6	0.671 150.0 0.1592	1Utr	2.0 0.0	12.000 2.000 14.000	15.887 0.0 2.229				Vel = 7.80
T.70 to H.26	0.0 8.6	0.671 150.0 0.1590	1Utr	2.0 0.0	1.000 2.000 3.000	18.116 0.0 0.477				Vel = 7.80
H.26 to T.68	0.0 8.6	0.671 150.0 0.1592	1Utb 1Utr	17.0 2.0	6.000 19.000 25.000	18.593 0.0 3.979				Vel = 7.80
T.68 to T.67	-1.73 6.87	0.862 150.0 0.0311		0.0 0.0	18.000 0.0 18.000	22.572 6.063 0.559				Vel = 3.78
T.67 to T.66	-1.86 5.01	0.862 150.0 0.0174	1Utr	2.0 0.0	12.000 2.000 14.000	29.194 4.331 0.243				Vel = 2.75
T.66 to T.69	0.85 5.86	0.671 150.0 0.0782	1Utr 1Utb	2.0 17.0	2.000 19.000 21.000	33.768 0.0 1.642				Vel = 5.32
T.69 to H.22	-1.61 4.25	0.671 150.0 0.0433	1Utr	2.0 0.0	4.000 2.000 6.000	35.410 0.0 0.260				Vel = 3.86

Final Calculations - Hazen-Williams

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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.22 to T.71	0.0 4.25	0.671 150.0 0.0433	1Utr	2.0 0.0 0.0	4.000 2.000 6.000	35.670 0.0 0.260			Vel = 3.86	
T.71 to T.73	1.61 5.86	0.671 150.0 0.0782	1Utb	17.0 0.0 0.0	4.000 17.000 21.000	35.930 0.0 1.642			Vel = 5.32	
	0.0 5.86					37.572			K Factor = 0.96	
T.59 to T.58	5.93 5.93	0.862 150.0 0.0236		0.0 0.0 0.0	17.000 0.0 17.000	21.582 6.063 0.401			Vel = 3.26	
T.58 to H.12	-3.31 2.62	0.671 150.0 0.0177	1Utb	17.0 0.0 0.0	16.000 17.000 33.000	28.046 0.0 0.584			Vel = 2.38	
H.12 to T.43	0.0 2.62	0.671 150.0 0.0177	1Utr	2.0 0.0 0.0	1.000 2.000 3.000	28.630 0.0 0.053			Vel = 2.38	
T.43 to T.44	-0.51 2.11	0.671 150.0 0.0120	1Utr	2.0 0.0 0.0	1.000 2.000 3.000	28.683 0.0 0.036			Vel = 1.91	
T.44 to T.42	0.51 2.62	0.671 150.0 0.0177	1Utr 1Utb	2.0 17.0 0.0	2.000 19.000 21.000	28.719 0.0 0.371			Vel = 2.38	
T.42 to H.3	-1.52 1.1	0.671 150.0 0.0035	1Utb	17.0 0.0 0.0	17.000 17.000 34.000	29.090 0.0 0.120			Vel = 1.00	
H.3 to H.4	0.0 1.1	0.671 150.0 0.0036	1Utr	2.0 0.0 0.0	12.000 2.000 14.000	29.210 0.0 0.050			Vel = 1.00	
H.4 to T.39	0.0 1.1	0.671 150.0 0.0035	1Utb	17.0 0.0 0.0	8.000 17.000 25.000	29.260 0.0 0.088			Vel = 1.00	
T.39 to H.13	2.11 3.21	0.671 150.0 0.0258	1Utb 1Utr	17.0 2.0 0.0	6.000 19.000 25.000	29.348 0.0 0.644			Vel = 2.91	
H.13 to H.14	0.0 3.21	0.671 150.0 0.0258	1Utr	2.0 0.0 0.0	3.000 2.000 5.000	29.992 0.0 0.129			Vel = 2.91	
H.14 to T.51	0.0 3.21	0.671 150.0 0.0258	1Utr	2.0 0.0 0.0	2.000 2.000 4.000	30.121 0.0 0.103			Vel = 2.91	
T.51 to T.54	0.0 3.21	0.671 150.0 0.0258	1Utr	2.0 0.0 0.0	6.000 2.000 8.000	30.224 0.0 0.206			Vel = 2.91	
T.54 to H.17	0.0 3.21	0.671 150.0 0.0258	1Utr	2.0 0.0 0.0	4.000 2.000 6.000	30.430 0.0 0.155			Vel = 2.91	
H.17 to T.57	0.0 3.21	0.671 150.0 0.0257	1Utr	2.0 0.0 0.0	7.000 2.000 9.000	30.585 0.0 0.231			Vel = 2.91	

Final Calculations - Hazen-Williams

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Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftg's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
T.57	0.0	0.671	1Utr	2.0	4.000	30.816				
to T.61	3.21	150.0 0.0258		0.0	2.000 6.000	0.0 0.155			Vel = 2.91	
T.61	0.0	0.671	1Utr	2.0	2.000	30.971				
to T.65	3.21	150.0 0.0258		0.0	2.000 4.000	0.0 0.103			Vel = 2.91	
T.65	-0.52	0.671	1Utr	2.0	1.000	31.074				
to T.64	2.69	150.0 0.0187		0.0	2.000 3.000	0.0 0.056			Vel = 2.44	
T.64	0.52	0.671	1Utb	17.0	1.000	31.130				
to T.63	3.21	150.0 0.0257		0.0	17.000 18.000	0.0 0.463			Vel = 2.91	
T.63	5.16	0.862	1Utb	17.0	28.000	31.593				
to T.72	8.37	150.0 0.0448		0.0	14.000 42.000	4.331 1.880			Vel = 4.60	
	0.0									
	8.37					37.804			K Factor = 1.36	
T.58	3.30	0.671	1Utb	17.0	1.000	28.046				
to H.21	3.3	150.0 0.0272	1Utr	2.0	19.000 20.000	0.0 0.543			Vel = 2.99	
H.21	0.0	0.671	1Utb	17.0	7.000	28.589				
to T.62	3.3	150.0 0.0272		0.0	17.000 24.000	0.0 0.652			Vel = 2.99	
T.62	1.86	0.671	2Utb	34.0	4.000	29.241				
to T.63	5.16	150.0 0.0619		0.0	34.000 38.000	0.0 2.352			Vel = 4.68	
	0.0									
	5.16					31.593			K Factor = 0.92	
T.68	1.73	0.671	1Utb	17.0	9.000	22.572				
to H.20	1.73	150.0 0.0082		0.0	17.000 26.000	0.0 0.213			Vel = 1.57	
H.20	0.0	0.671	1Utr	2.0	7.000	22.785				
to H.18	1.73	150.0 0.0082		0.0	2.000 9.000	0.0 0.074			Vel = 1.57	
H.18	0.0	0.671	1Utr	2.0	11.000	22.859				
to T.50	1.73	150.0 0.0082		0.0	2.000 13.000	0.0 0.106			Vel = 1.57	
T.50	-0.48	0.671	1Utr	2.0	3.000	22.965				
to H.9	1.25	150.0 0.0044		0.0	2.000 5.000	0.0 0.022			Vel = 1.13	
H.9	0.0	0.671	1Utr	2.0	2.000	22.987				
to H.10	1.25	150.0 0.0045		0.0	2.000 4.000	0.0 0.018			Vel = 1.13	
H.10	0.0	0.671	1Utb	17.0	6.000	23.005				
to T.37	1.25	150.0 0.0045	1Utr	2.0	19.000 25.000	0.0 0.112			Vel = 1.13	
T.37	1.68	0.862	1Utr	2.0	16.000	23.117				
to T.38	2.93	150.0 0.0064		0.0	2.000 18.000	6.063 0.116			Vel = 1.61	

Final Calculations - Hazen-Williams

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Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftg's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
T.38 to T.39	-0.82 2.11	0.862 150.0 0.0035	1Utb	17.0 0.0	1.000 14.000 15.000	29.296 0.0 0.052			Vel = 1.16	
	0.0 2.11					29.348			K Factor = 0.39	
T.43 to H.7	0.51 0.51	0.671 150.0 0.0009	1Utb 1Utr	17.0 2.0 0.0	2.000 19.000 21.000	28.683 0.0 0.018			Vel = 0.46	
H.7 to T.44	0.0 0.51	0.671 150.0 0.0009	1Utb	17.0 0.0	4.000 17.000 21.000	28.701 0.0 0.018			Vel = 0.46	
	0.0 0.51					28.719			K Factor = 0.10	
T.47 to H.11	1.68 1.68	0.671 150.0 0.0078	1Utr	2.0 0.0	4.000 2.000 6.000	22.656 0.0 0.047			Vel = 1.52	
H.11 to H.1	0.0 1.68	0.671 150.0 0.0078	1Utr	2.0 0.0	13.000 2.000 15.000	22.703 0.0 0.117			Vel = 1.52	
H.1 to H.2	0.0 1.68	0.671 150.0 0.0079	1Utr	2.0 0.0	12.000 2.000 14.000	22.820 0.0 0.110			Vel = 1.52	
H.2 to T.37	0.0 1.68	0.671 150.0 0.0078	1Utb	17.0 0.0	7.000 17.000 24.000	22.930 0.0 0.187			Vel = 1.52	
	0.0 1.68					23.117			K Factor = 0.35	
T.50 to T.49	0.48 0.48	0.671 150.0 0.0008	1Utb	17.0 0.0	5.617 17.000 22.617	22.965 0.0 0.017			Vel = 0.44	
T.49 to T.48	0.0 0.48	0.671 150.0 0.0008	1Utr 1Utb	2.0 17.0 0.0	2.000 19.000 21.000	22.982 0.0 0.016			Vel = 0.44	
	0.0 0.48					22.998			K Factor = 0.10	
T.42 to T.53	1.52 1.52	0.862 150.0 0.0019	1Utb	17.0 0.0	5.000 14.000 19.000	29.090 0.0 0.036			Vel = 0.84	
	0.0 1.52					29.126			K Factor = 0.28	
T.67 to T.62	1.86 1.86	0.862 150.0 0.0028	1Utb	17.0 0.0	3.000 14.000 17.000	29.194 0.0 0.047			Vel = 1.02	
	0.0 1.86					29.241			K Factor = 0.34	
T.38 to T.40	0.82 0.82	0.862 150.0 0.0006		0.0 0.0	12.000 0.0 12.000	29.296 4.331 0.007			Vel = 0.45	

Final Calculations - Hazen-Williams

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Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftg's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
T.40 to H.15	0.02 0.84	0.671 150.0 0.0022	1Utb 1Utr	17.0 2.0 0.0	12.000 19.000 31.000	33.634 0.0 0.067			Vel = 0.76	
H.15 to T.66	0.0 0.84	0.671 150.0 0.0022	1Utb	17.0 0.0 0.0	14.000 17.000 31.000	33.701 0.0 0.067			Vel = 0.76	
	0.0 0.84					33.768			K Factor = 0.14	
T.41 to H.6	0.02 0.02	0.671 150.0 0.0	1Utb	17.0 0.0 0.0	14.000 17.000 31.000	33.634 0.0 0.0			Vel = 0.02	
H.6 to H.5	0.0 0.02	0.671 150.0 0.0	1Utr	2.0 0.0 0.0	10.000 2.000 12.000	33.634 0.0 0.0			Vel = 0.02	
H.5 to T.40	0.0 0.02	0.671 150.0 0.0	1Utb	17.0 0.0 0.0	6.000 17.000 23.000	33.634 0.0 0.0			Vel = 0.02	
	0.0 0.02					33.634			K Factor = 0	
T.45 to H.8	0.72 0.72	0.671 150.0 0.0016	1Utb	17.0 0.0 0.0	4.000 17.000 21.000	34.398 0.0 0.034			Vel = 0.65	
H.8 to T.46	0.0 0.72	0.671 150.0 0.0016	1Utb 1Utr	17.0 2.0 0.0	3.000 19.000 22.000	34.432 0.0 0.036			Vel = 0.65	
	0.0 0.72					34.468			K Factor = 0.12	
T.65 to H.28	0.52 0.52	0.671 150.0 0.0009	1Utb	17.0 0.0 0.0	13.000 17.000 30.000	31.074 0.0 0.027			Vel = 0.47	
H.28 to T.64	0.0 0.52	0.671 150.0 0.0009	1Utb 1Utr	17.0 2.0 0.0	13.000 19.000 32.000	31.101 0.0 0.029			Vel = 0.47	
	0.0 0.52					31.130			K Factor = 0.09	
T.69 to H.24	1.60 1.6	0.671 150.0 0.0071	1Utb 1Utr	17.0 2.0 0.0	16.000 19.000 35.000	35.410 -4.331 0.249			Vel = 1.45	
H.24 to H.25	0.0 1.6	0.671 150.0 0.0072	1Utr	2.0 0.0 0.0	2.000 2.000 4.000	31.328 0.0 0.029			Vel = 1.45	
H.25 to T.71	0.0 1.6	0.671 150.0 0.0071	1Utb	17.0 0.0 0.0	17.000 17.000 34.000	31.357 4.331 0.242			Vel = 1.45	
	0.0 1.60					35.930			K Factor = 0.27	
T.77 to H.33	2.86 2.86	0.671 150.0 0.0207		0.0 0.0 0.0	3.000 0.0 3.000	36.447 0.0 0.062			Vel = 2.59	

Final Calculations - Hazen-Williams

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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.33 to T.76	0.0 2.86	0.671 150.0 0.0208	1Utr 2.0 0.0 0.0	4.000 2.000 6.000	36.509 0.0 0.125		Vel = 2.59		
	0.0 2.86				36.634		K Factor = 0.47		
T.75 to H.29	0.74	0.671 150.0 0.0017	1Utb 17.0 0.0 0.0	3.000 17.000 20.000	36.773 0.0 0.034		Vel = 0.67		
H.29 to T.74	0.0 0.74	0.671 150.0 0.0017	1Utb 17.0 1Utr 2.0 0.0	2.000 19.000 21.000	36.807 0.0 0.036		Vel = 0.67		
	0.0 0.74				36.843		K Factor = 0.12		