



AquaSAFE™ FIRE SAFETY SYSTEM

Uponor
5925 148th Street West

Apple Valley, MN 55124
800-321-4739

Job Name : Church - Two Head Calculation (H.50 & H.54)
Drawing : RESIDENTIAL
Location : 305 COMMERCIAL STREET PORTLAND ME
Remote Area : 1
Contract : 120322-411
Data File : 120322-41 Church.wx2

HYDRAULIC DESIGN INFORMATION SHEET

Name - Church Date - 4/1/2012
Location - PORTLAND ME
Building - RESIDENTIAL System No. - 1
Contractor - ADG BUILDERS Contract No. - 120322-411
Calculated By - DAN HUBBARD SET Drawing No. - F100
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 - 18 Gpm System Type
Listed Pres. at Start Point - 17.52Psi (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 RELIABLE Model RFC43-S2
I Elevation at Highest Outlet - 140 Feet Size 3/8 K-Factor 4.3
G Note: Temperature Rating 155
N

Calculation Gpm Required 35.9984 Psi Required 73.13 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) - 92 Elev.
R Residual (Psi) - 87 Other Well
Flow (Gpm) - 300 Proof Flow Gpm
S Elevation - 100

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

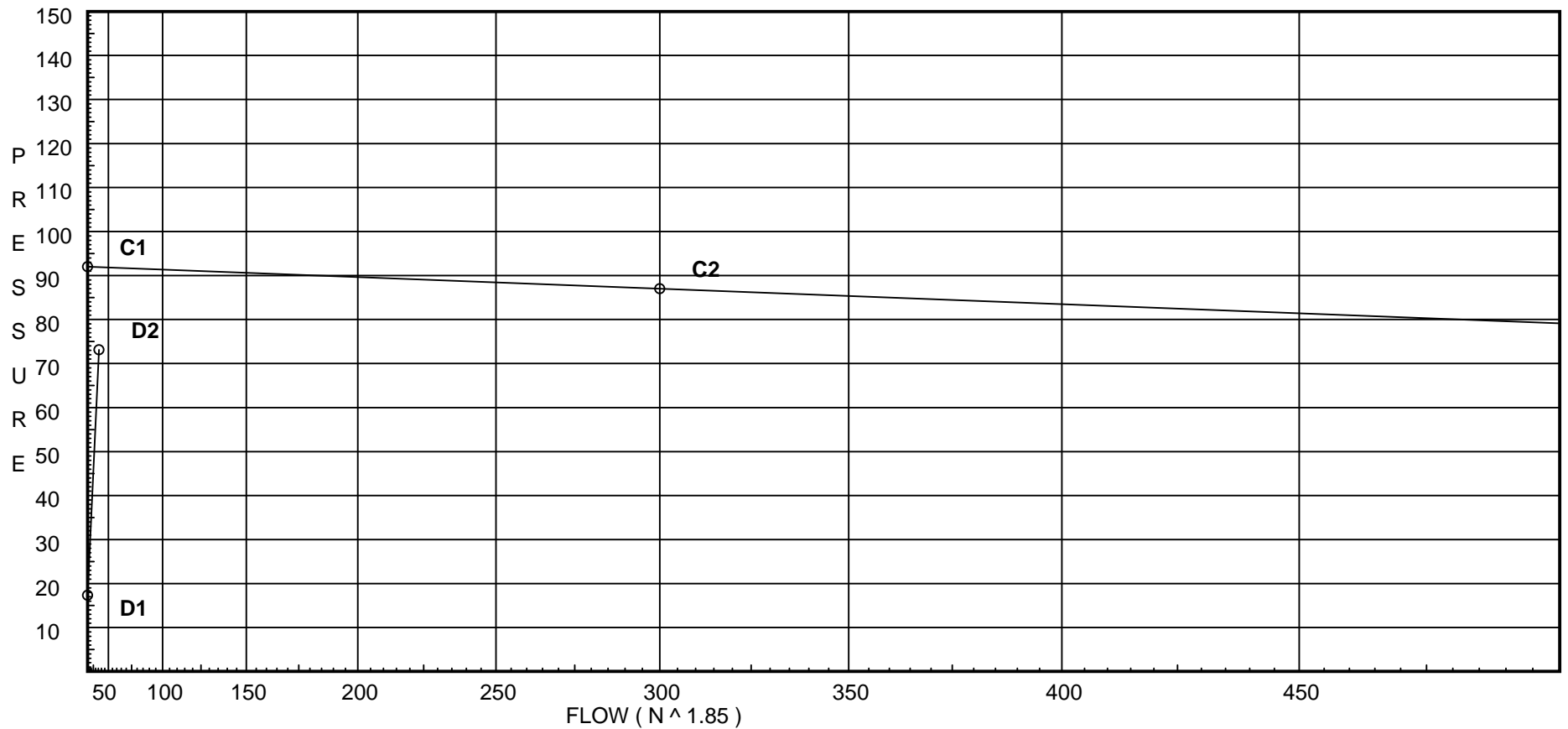
Water Supply Curve (C)

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City Water Supply:
C1 - Static Pressure : 92
C2 - Residual Pressure: 87
C2 - Residual Flow : 300

Demand:
D1 - Elevation : 17.324
D2 - System Flow : 35.9984
D2 - System Pressure : 73.133
Hose (Adj City) : _____
Hose (Demand) : _____
D3 - System Demand : 35.9984
Safety Margin : 18.768



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
Ucp	Aquapex Coupling	1	2	2	1.63	2.88	1.63	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Uel	Aquapex 90 Elbow	3	5	6	9.8	12.06	12.28	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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

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	92.0	87	300.0	91.901	36.0	73.133

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.50	140.0	4.3	17.52	18.0	
T.92	140.0		21.43		
T.90	140.0		24.94		
T.81	128.0		31.19		
T.68	118.0		36.44		
T.60	108.0		41.82		
H.2	108.0		43.11		
H.10	108.0		44.07		
T.64	108.0		44.29		
T.65	108.0		45.87		
S.1	104.0		54.91		
MTR	100.0		61.44		
STR	100.0		73.13		
H.54	140.0	4.3	17.52	18.0	
T.97	140.0		21.43		
T.99	140.0		24.82		
T.88	128.0		31.18		
T.80	118.0		36.41		
T.67	108.0		43.06		
H.55	140.0		21.43		
H.51	140.0		21.43		
T100	140.0		25.44		
H.58	140.0		25.72		
T.98	140.0		26.09		
T.87	128.0		32.36		
T.76	118.0		37.23		
T.62	108.0		41.93		
T.63	108.0		41.99		
H.9	108.0		42.27		
H.11	108.0		43.0		
H.14	108.0		43.67		
H.15	108.0		43.84		
T.89	140.0		25.44		
H.48	140.0		25.82		
T.91	140.0		26.1		
T.83	128.0		32.37		
T.70	118.0		37.28		
H.59	140.0		25.44		
H.57	140.0		25.44		
T.96	140.0		25.44		
T.95	140.0		25.44		
H.53	140.0		25.44		

Flow Summary - NFPA 2007

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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>
H.49	140.0		25.44		
H.56	140.0		26.09		
T.94	140.0		26.09		
T.93	140.0		26.09		
H.52	140.0		26.09		
T.86	128.0		32.37		
H.44	128.0		32.37		
H.41	128.0		32.37		
T.82	128.0		32.37		
H.45	128.0		32.37		
H.47	128.0		32.37		
H.43	128.0		32.37		
H.40	128.0		32.37		
H.38	128.0		32.37		
T.77	118.0		37.45		
H.33	118.0		37.49		
T.78	118.0		37.56		
T.79	118.0		37.57		
H.32	118.0		37.7		
T.75	118.0		37.75		
T.69	118.0		37.41		
H.22	118.0		37.44		
H.25	118.0		37.51		
H.24	118.0		37.54		
H.21	118.0		37.59		
H.29	118.0		37.68		
H.27	118.0		37.42		
H.28	118.0		37.43		
H.6	108.0		41.82		
H.8	108.0		41.83		
H.5	108.0		41.84		
T.61	108.0		41.86		
T.72	118.0		37.54		
T.84	128.0		33.21		
H.42	128.0		33.21		
T.85	128.0		33.21		
T.73	118.0		37.54		
T.66	108.0		41.88		
H.13	108.0		41.89		
H.4	108.0		41.86		
H.3	108.0		41.86		
H.1	108.0		41.87		
H.7	108.0		41.87		
H.12	108.0		41.87		
H.16	108.0		41.88		
H.19	108.0		41.88		
H.18	108.0		41.88		
H.17	108.0		41.88		
T.71	118.0		37.54		
H.20	118.0		37.54		
H.23	118.0		37.54		

NODE ANALYSIS (cont.)

Node Tag	Elevation	Node Type	Pressure at Node	Discharge at Node	Notes
H.30	118.0		37.54		
T.74	118.0		37.54		
H.26	118.0		37.54		
H.31	118.0		37.54		
H.36	118.0		37.54		
H.37	118.0		37.54		
H.34	118.0		37.54		
H.39	128.0		33.21		
H.46	128.0		33.21		
H.35	118.0		37.57		

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.50 to T.92	17.54	0.86 150.0 0.1778	1Utr 1Utb	2.0 6.0 0.0	14.000 8.000 22.000	17.520 0.0 3.912			K Factor = 4.30 Vel = 9.69	
T.92 to T.90	0.36	0.86 150.0 0.1845	1Utb 1Utr	6.0 2.0 0.0	11.000 8.000 19.000	21.432 0.0 3.506			Vel = 9.89	
T.90 to T.81	-7.66	0.86 150.0 0.0657	1Ucp	2.0 0.0 0.0	14.000 2.000 16.000	24.938 5.197 1.051			Vel = 5.66	
T.81 to T.68	0.0	0.86 150.0 0.0656	1Ucp	2.0 0.0 0.0	12.000 2.000 14.000	31.186 4.331 0.919			Vel = 5.66	
T.68 to T.60	0.0	0.86 150.0 0.0656	1Utb	6.0 0.0 0.0	10.000 6.000 16.000	36.436 4.331 1.050			Vel = 5.66	
T.60 to H.2	-1.05	0.86 150.0 0.0537	1Utr	2.0 0.0 0.0	22.000 2.000 24.000	41.817 0.0 1.289			Vel = 5.08	
H.2 to H.10	0.0	0.86 150.0 0.0537	1Utr	2.0 0.0 0.0	16.000 2.000 18.000	43.106 0.0 0.967			Vel = 5.08	
H.10 to T.64	0.0	0.86 150.0 0.0538	1Utr	2.0 0.0 0.0	2.000 2.000 4.000	44.073 0.0 0.215			Vel = 5.08	
T.64 to T.65	9.39	0.86 150.0 0.1978	1Utb	6.0 0.0 0.0	2.000 6.000 8.000	44.288 0.0 1.582			Vel = 10.26	
T.65 to S.1	17.42	0.86 150.0 0.6722	1T 1Utr	2.871 2.0 0.0	6.000 4.871 10.871	45.870 1.732 7.308			Vel = 19.88	
S.1 to MTR	0.0	1.051 150.0 0.2531	2E	6.101 0.0 0.0	1.000 6.101 7.101	54.910 4.732 1.797			* Fixed loss = 3 Vel = 13.31	
MTR to STR	0.0	1.051 150.0 0.2531	1E 1T 1G	3.05 7.626 1.525	34.000 12.201 46.201	61.439 0.0 11.694			Vel = 13.31	
	0.0 36.00					73.133			K Factor = 4.21	
H.50 to H.54	0.46	0.86 150.0 0.0002	1Utr	2.0 0.0 0.0	12.000 2.000 14.000	17.520 0.0 0.003			Vel = 0.25	
H.54 to T.97	18.00	0.86 150.0 0.1953	1Utb	6.0 0.0 0.0	14.000 6.000 20.000	17.523 0.0 3.906			K Factor = 4.30 Vel = 10.20	
T.97 to T.99	-0.36	0.86 150.0 0.1883	1Utb	6.0 0.0 0.0	12.000 6.000 18.000	21.429 0.0 3.390			Vel = 10.00	
T.99 to T.88	-7.96	0.86 150.0 0.0645	1Ucp 1Utr	2.0 2.0 0.0	14.000 4.000 18.000	24.819 5.197 1.161			Vel = 5.60	

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.88 to T.80	0.0 10.14	0.86 150.0 0.0644	1Ucp	2.0 0.0	12.000 2.000	31.177 4.331				
					14.000	0.902		Vel =	5.60	
T.80 to T.67	0.0 10.14	0.86 150.0 0.0645		0.0 0.0	36.000 0.0	36.410 4.331				
					36.000	2.321		Vel =	5.60	
T.67 to T.65	7.28 17.42	0.86 150.0 0.1755	1Utb 1Utr	6.0 2.0 0.0	8.000 8.000	43.062 0.0				
					16.000	2.808		Vel =	9.62	
	0.0 17.42						45.870	K Factor =	2.57	
T.97 to H.55	0.36 0.36	0.86 150.0 0.0	1Utr	2.0 0.0 0.0	1.000 2.000	21.429 0.0				
					3.000	0.0		Vel =	0.20	
H.55 to H.51	0.0 0.36	0.86 150.0 0.0001	1Utr	2.0 0.0	12.000 2.000	21.429 0.0				
					14.000	0.002		Vel =	0.20	
H.51 to T.92	0.0 0.36	0.86 150.0 0.0003	1Utr	2.0 0.0 0.0	1.000 2.000	21.431 0.0				
					3.000	0.001		Vel =	0.20	
	0.0 0.36						21.432	K Factor =	0.08	
T.99 to T100	7.96 7.96	0.86 150.0 0.0413	1Utr	2.0 0.0	13.000 2.000	24.819 0.0				
					15.000	0.619		Vel =	4.40	
T100 to H.58	-0.02 7.94	0.86 150.0 0.0410	1Utb	6.0 0.0 0.0	1.000 6.000	25.438 0.0				
					7.000	0.287		Vel =	4.39	
H.58 to T.98	0.0 7.94	0.86 150.0 0.0410	1Utr	2.0 0.0	7.000 2.000	25.725 0.0				
					9.000	0.369		Vel =	4.39	
T.98 to T.87	-0.13 7.81	0.86 150.0 0.0398	1Utb	6.0 0.0	21.000 6.000	26.094 5.197				
					27.000	1.074		Vel =	4.31	
T.87 to T.76	-0.21 7.6	0.86 150.0 0.0379	1Utr	2.0 0.0	12.000 2.000	32.365 4.331				
					14.000	0.530		Vel =	4.20	
T.76 to T.62	-3.79 3.81	0.86 150.0 0.0105	1Utb 1Utr	6.0 2.0 0.0	27.000 8.000	37.226 4.331				
					35.000	0.369		Vel =	2.10	
T.62 to T.63	1.05 4.86	0.86 150.0 0.0168	1Utr	2.0 0.0	2.000 2.000	41.926 0.0				
					4.000	0.067		Vel =	2.68	
T.63 to H.9	4.53 9.39	0.86 150.0 0.0560	1Utr	2.0 0.0	3.000 2.000	41.993 0.0				
					5.000	0.280		Vel =	5.19	
H.9 to H.11	0.0 9.39	0.86 150.0 0.0559	1Utr	2.0 0.0	11.000 2.000	42.273 0.0				
					13.000	0.727		Vel =	5.19	

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.11 to H.14	0.0 9.39	0.86 150.0 0.0560	1Utr	2.0 0.0	10.000 2.000	43.000 0.0			Vel = 5.19	
H.14 to H.15	0.0 9.39	0.86 150.0 0.0560		0.0 0.0	3.000 0.0	43.672 0.0			Vel = 5.19	
H.15 to T.64	0.0 9.39	0.86 150.0 0.0560	1Utr	2.0 0.0	6.000 2.000	43.840 0.0			Vel = 5.19	
	0.0 9.39						44.288		K Factor = 1.41	
T.90 to T.89	7.66 7.66	0.86 150.0 0.0385	1Utr	2.0 0.0	11.000 2.000	24.938 0.0			Vel = 4.23	
T.89 to H.48	0.03 7.69	0.86 150.0 0.0386	1Utr 1Utb	2.0 6.0	2.000 8.000	25.438 0.0			Vel = 4.25	
H.48 to T.91	0.0 7.69	0.86 150.0 0.0387	1Utr	2.0 0.0	5.000 2.000	25.824 0.0			Vel = 4.25	
T.91 to T.83	0.13 7.82	0.86 150.0 0.0399	1Utb	6.0 0.0	21.000 6.000	26.095 5.197			Vel = 4.32	
T.83 to T.70	0.20 8.02	0.86 150.0 0.0418	1Utr	2.0 0.0	12.000 2.000	32.368 4.331			Vel = 4.43	
T.70 to T.63	-3.49 4.53	0.86 150.0 0.0145	1Utb 1Utr	6.0 2.0	18.000 8.000	37.284 4.331			Vel = 2.50	
	0.0 4.53						41.993		K Factor = 0.70	
T100 to H.59	0.02 0.02	0.86 150.0 0.0		0.0 0.0	17.000 0.0	25.438 0.0			Vel = 0.01	
H.59 to H.57	0.0 0.02	0.86 150.0 0.0	1Utr	2.0 0.0	10.000 2.000	25.438 0.0			Vel = 0.01	
H.57 to T.96	0.0 0.02	0.86 150.0 0.0	1Utr 1Uel	2.0 6.0	9.000 8.000	25.438 0.0			Vel = 0.01	
T.96 to T.95	0.0 0.02	0.86 150.0 0.0	1Uel	6.0 0.0	1.000 6.000	25.438 0.0			Vel = 0.01	
T.95 to H.53	0.0 0.02	0.86 150.0 0.0		0.0 0.0	3.000 0.0	25.438 0.0			Vel = 0.01	
H.53 to H.49	0.0 0.02	0.86 150.0 0.0	1Utr	2.0 0.0	12.000 2.000	25.438 0.0			Vel = 0.01	

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.49 to T.89	0.0 0.02	0.86 150.0 0.0	1Utr	2.0 0.0 0.0	18.000 2.000 20.000	25.438 0.0 0.0				Vel = 0.01
	0.0 0.02					25.438				K Factor = 0
T.98 to H.56	0.13	0.86 150.0 0.0	1Utr	2.0 0.0 0.0	3.000 2.000 5.000	26.094 0.0 0.0				Vel = 0.07
H.56 to T.94	0.0 0.13	0.86 150.0 0.0	1Utr 1Uel	2.0 6.0 0.0	9.000 8.000 17.000	26.094 0.0 0.0				Vel = 0.07
T.94 to T.93	0.0 0.13	0.86 150.0 0.0	1Uel	6.0 0.0 0.0	1.000 6.000 7.000	26.094 0.0 0.0				Vel = 0.07
T.93 to H.52	0.0 0.13	0.86 150.0 0.0		0.0 0.0 0.0	3.000 0.0 3.000	26.094 0.0 0.0				Vel = 0.07
H.52 to T.91	0.0 0.13	0.86 150.0 0.0001	1Utr	2.0 0.0 0.0	8.000 2.000 10.000	26.094 0.0 0.001				Vel = 0.07
	0.0 0.13					26.095				K Factor = 0.03
T.87 to T.86	0.21	0.86 150.0 0.0001	2Utb	12.0 0.0 0.0	7.000 12.000 19.000	32.365 0.0 0.001				Vel = 0.12
T.86 to H.44	-0.08 0.13	0.86 150.0 0.0	1Utr	2.0 0.0 0.0	5.000 2.000 7.000	32.366 0.0 0.0				Vel = 0.07
H.44 to H.41	0.0 0.13	0.86 150.0 0.0001	1Utr	2.0 0.0 0.0	12.000 2.000 14.000	32.366 0.0 0.001				Vel = 0.07
H.41 to T.82	0.0 0.13	0.86 150.0 0.0	1Utr	2.0 0.0 0.0	4.000 2.000 6.000	32.367 0.0 0.0				Vel = 0.07
T.82 to T.83	0.08 0.21	0.86 150.0 0.0001	2Utb	12.0 0.0 0.0	7.000 12.000 19.000	32.367 0.0 0.001				Vel = 0.12
	0.0 0.21					32.368				K Factor = 0.04
T.86 to H.45	0.08	0.86 150.0 0.0	1Utr	2.0 0.0 0.0	1.000 2.000 3.000	32.366 0.0 0.0				Vel = 0.04
H.45 to H.47	0.0 0.08	0.86 150.0 0.0		0.0 0.0 0.0	17.000 0.0 17.000	32.366 0.0 0.0				Vel = 0.04
H.47 to H.43	0.0 0.08	0.86 150.0 0.0	1Utr	2.0 0.0 0.0	15.000 2.000 17.000	32.366 0.0 0.0				Vel = 0.04

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.43 to H.40	0.0 0.08	0.86 150.0	1Utr	2.0 0.0	17.000 2.000	32.366 0.0				
					19.000	0.001		Vel =	0.04	
H.40 to H.38	0.0 0.08	0.86 150.0	1Utr	2.0 0.0	13.000 2.000	32.367 0.0				
					15.000	0.0		Vel =	0.04	
H.38 to T.82	0.0 0.08	0.86 150.0	1Utr	2.0 0.0	5.000 2.000	32.367 0.0				
					7.000	0.0		Vel =	0.04	
	0.0 0.08					32.367		K Factor =	0.01	
T.76 to T.77	3.79 3.79	0.86 150.0	2Utb	12.0 0.0	9.000 12.000	37.226 0.0				
					21.000	0.220		Vel =	2.09	
T.77 to H.33	1.02 4.81	0.86 150.0	1Utr	2.0 0.0	1.000 2.000	37.446 0.0				
					3.000	0.048		Vel =	2.66	
H.33 to T.78	0.0 4.81	0.86 150.0	1Utr	2.0 0.0	2.000 2.000	37.494 0.0				
					4.000	0.065		Vel =	2.66	
T.78 to T.79	-0.34 4.47	0.86 150.0		0.0 0.0	1.000 0.0	37.559 0.0				
					1.000	0.014		Vel =	2.47	
T.79 to H.32	0.34 4.81	0.86 150.0	1Utr	2.0 0.0	6.000 2.000	37.573 0.0				
					8.000	0.130		Vel =	2.66	
H.32 to T.75	0.0 4.81	0.86 150.0	1Utr	2.0 0.0	1.000 2.000	37.703 0.0				
					3.000	0.049		Vel =	2.66	
T.75 to T.67	2.47 7.28	0.86 150.0	2Utb	12.0 0.0	16.000 12.000	37.752 4.331				
					28.000	0.979		Vel =	4.02	
	0.0 7.28					43.062		K Factor =	1.11	
T.70 to T.69	3.49 3.49	0.86 150.0	2Utb	12.0 0.0	2.000 12.000	37.284 0.0				
					14.000	0.126		Vel =	1.93	
T.69 to H.22	-1.01 2.48	0.86 150.0	1Utr	2.0 0.0	4.000 2.000	37.410 0.0				
					6.000	0.028		Vel =	1.37	
H.22 to H.25	0.0 2.48	0.86 150.0		0.0 0.0	14.000 0.0	37.438 0.0				
					14.000	0.067		Vel =	1.37	
H.25 to H.24	0.0 2.48	0.86 150.0	1Utr	2.0 0.0	6.000 2.000	37.505 0.0				
					8.000	0.038		Vel =	1.37	
H.24 to H.21	0.0 2.48	0.86 150.0	1Utr	2.0 0.0	8.000 2.000	37.543 0.0				
					10.000	0.047		Vel =	1.37	

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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.21 to H.29	0.0 2.48	0.86 150.0	1Utr	2.0 0.0	16.000 2.000	37.590 0.0				
		0.0048		0.0	18.000	0.086		Vel =	1.37	
H.29 to T.75	0.0 2.48	0.86 150.0	1Utr	2.0 0.0	14.000 2.000	37.676 0.0				
		0.0048		0.0	16.000	0.076		Vel =	1.37	
	0.0 2.48					37.752		K Factor =	0.40	
T.69 to H.27	1.02	0.86 150.0	1Utr	2.0 0.0	8.000 2.000	37.410 0.0				
	1.02	0.0009		0.0	10.000	0.009		Vel =	0.56	
H.27 to H.28	0.0	0.86 150.0	1Utr	2.0 0.0	11.000 2.000	37.419 0.0				
	1.02	0.0009		0.0	13.000	0.012		Vel =	0.56	
H.28 to T.77	0.0	0.86 150.0	1Utr	2.0 0.0	14.000 2.000	37.431 0.0				
	1.02	0.0009		0.0	16.000	0.015		Vel =	0.56	
	0.0 1.02					37.446		K Factor =	0.17	
T.60 to H.6	1.05	0.86 150.0	1Utr	2.0 0.0	3.000 2.000	41.817 0.0				
	1.05	0.0010		0.0	5.000	0.005		Vel =	0.58	
H.6 to H.8	0.0	0.86 150.0		0.0 0.0	7.000 0.0	41.822 0.0				
	1.05	0.0010		0.0	7.000	0.007		Vel =	0.58	
H.8 to H.5	0.0	0.86 150.0	1Utr	2.0 0.0	13.000 2.000	41.829 0.0				
	1.05	0.0009		0.0	15.000	0.014		Vel =	0.58	
H.5 to T.61	0.0	0.86 150.0	1Utr	2.0 0.0	14.000 2.000	41.843 0.0				
	1.05	0.0010		0.0	16.000	0.016		Vel =	0.58	
T.61 to T.72	-0.44	0.86 150.0	1Utr	2.0 0.0	27.000 2.000	41.859 -4.331				
	0.61	0.0003		0.0	29.000	0.010		Vel =	0.34	
T.72 to T.84	-0.30	0.86 150.0	1Utb	6.0 0.0	13.000 6.000	37.538 -4.331				
	0.31	0.0001		0.0	19.000	0.002		Vel =	0.17	
T.84 to H.42	-0.11	0.86 150.0	1Utr	2.0 0.0	6.000 2.000	33.209 0.0				
	0.2	0.0001		0.0	8.000	0.001		Vel =	0.11	
H.42 to T.85	0.0	0.86 150.0	1Utr	2.0 0.0	5.000 2.000	33.210 0.0				
	0.2	0.0		0.0	7.000	0.0		Vel =	0.11	
T.85 to T.73	0.11	0.86 150.0	1Utb	6.0 0.0	14.000 6.000	33.210 4.331				
	0.31	0.0001		0.0	20.000	0.002		Vel =	0.17	
T.73 to T.66	0.30	0.86 150.0	1Utb 1Utr	6.0 2.0	21.000 8.000	37.543 4.331				
	0.61	0.0004		0.0	29.000	0.011		Vel =	0.34	

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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.66 to H.13	0.44 1.05	0.86 150.0	1Utr	2.0 0.0 0.0	6.000 2.000 8.000	41.885 0.0 0.007			Vel = 0.58	
H.13 to T.62	0.0 1.05	0.86 150.0	1Utr	2.0 0.0 0.0	33.000 2.000 35.000	41.892 0.0 0.034			Vel = 0.58	
	0.0 1.05					41.926			K Factor = 0.16	
T.61 to H.4	0.44 0.44	0.86 150.0	1Utb	6.0 0.0 0.0	2.000 6.000 8.000	41.859 0.0 0.002			Vel = 0.24	
H.4 to H.3	0.0 0.44	0.86 150.0	1Utr	2.0 0.0 0.0	13.000 2.000 15.000	41.861 0.0 0.002			Vel = 0.24	
H.3 to H.1	0.0 0.44	0.86 150.0	1Utr	2.0 0.0 0.0	10.000 2.000 12.000	41.863 0.0 0.003			Vel = 0.24	
H.1 to H.7	0.0 0.44	0.86 150.0	1Utr	2.0 0.0 0.0	17.000 2.000 19.000	41.866 0.0 0.003			Vel = 0.24	
H.7 to H.12	0.0 0.44	0.86 150.0	1Utr	2.0 0.0 0.0	12.000 2.000 14.000	41.869 0.0 0.003			Vel = 0.24	
H.12 to H.16	0.0 0.44	0.86 150.0	1Utr	2.0 0.0 0.0	11.000 2.000 13.000	41.872 0.0 0.003			Vel = 0.24	
H.16 to H.19	0.0 0.44	0.86 150.0	1Utr	2.0 0.0 0.0	14.000 2.000 16.000	41.875 0.0 0.003			Vel = 0.24	
H.19 to H.18	0.0 0.44	0.86 150.0		0.0 0.0 0.0	7.000 0.0 7.000	41.878 0.0 0.001			Vel = 0.24	
H.18 to H.17	0.0 0.44	0.86 150.0	1Utr	2.0 0.0 0.0	15.000 2.000 17.000	41.879 0.0 0.003			Vel = 0.24	
H.17 to T.66	0.0 0.44	0.86 150.0	1Utr	2.0 0.0 0.0	10.000 2.000 12.000	41.882 0.0 0.003			Vel = 0.24	
	0.0 0.44					41.885			K Factor = 0.07	
T.72 to T.71	0.30 0.3	0.86 150.0	2Utb	12.0 0.0 0.0	1.000 12.000 13.000	37.538 0.0 0.002			Vel = 0.17	
T.71 to H.20	-0.14 0.16	0.86 150.0	1Utr	2.0 0.0 0.0	19.000 2.000 21.000	37.540 0.0 0.0			Vel = 0.09	
H.20 to H.23	0.0 0.16	0.86 150.0	1Utr	2.0 0.0 0.0	15.000 2.000 17.000	37.540 0.0 0.001			Vel = 0.09	

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Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftnng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
H.23 to H.30	0.0 0.16	0.86 150.0	1Utr	2.0 0.0	15.000 2.000	37.541 0.0				Vel = 0.09
H.30 to T.74	0.0 0.16	0.86 150.0	1Utr	2.0 0.0	5.000 2.000	37.541 0.0				Vel = 0.09
T.74 to T.73	0.14 0.3	0.86 150.0	2Utb	12.0 0.0	4.000 12.000	37.542 0.0				Vel = 0.17
	0.0 0.30					37.543				K Factor = 0.05
T.71 to H.26	0.14 0.14	0.86 150.0	1Utr	2.0 0.0	7.000 2.000	37.540 0.0				Vel = 0.08
H.26 to H.31	0.0 0.14	0.86 150.0	1Utr	2.0 0.0	15.000 2.000	37.540 0.0				Vel = 0.08
H.31 to H.36	0.0 0.14	0.86 150.0	1Utr	2.0 0.0	17.000 2.000	37.540 0.0				Vel = 0.08
H.36 to H.37	0.0 0.14	0.86 150.0		0.0 0.0	10.000 0.0	37.541 0.0				Vel = 0.08
H.37 to H.34	0.0 0.14	0.86 150.0	1Utr	2.0 0.0	11.000 2.000	37.541 0.0				Vel = 0.08
H.34 to T.74	0.0 0.14	0.86 150.0	1Utr	2.0 0.0	9.000 2.000	37.541 0.0				Vel = 0.08
	0.0 0.14					37.542				K Factor = 0.02
T.84 to H.39	0.11 0.11	0.86 150.0	1Utr	2.0 0.0	11.000 2.000	33.209 0.0				Vel = 0.06
H.39 to H.46	0.0 0.11	0.86 150.0	1Utr	2.0 0.0	26.000 2.000	33.210 0.0				Vel = 0.06
H.46 to T.85	0.0 0.11	0.86 150.0		0.0 0.0	9.000 0.0	33.210 0.0				Vel = 0.06
	0.0 0.11					33.210				K Factor = 0.02
T.78 to H.35	0.34 0.34	0.67 150.0	1Utr 1Utb	2.0 6.0	11.000 8.000	37.559 0.0				Vel = 0.31
H.35 to T.79	0.0 0.34	0.67 150.0	1Utb	6.0 0.0	10.000 6.000	37.567 0.0				Vel = 0.31

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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	*****
	0.0 0.34				37.573			K Factor = 0.06	