

... Fire Protection by Computer Design

Master Craft Plumbing
887 Brentwood Dr.
Daytona beach, FL 32117
386-252-7047

Job Name : DME - Residential Dwelling Calc #1
Building :
Location :
System :
Contract :
Data File : DME - Calc #1 - 13R Residential Dwelling.WXF

CURTIS ENGINEERING SERVICE, LLC - CA#31561
JAMES M. CURTIS, P.E. - PE#37912
29775 BAYHEAD ROAD
DADE CITY, FLORIDA 33523
ENGINEER OF RECORD

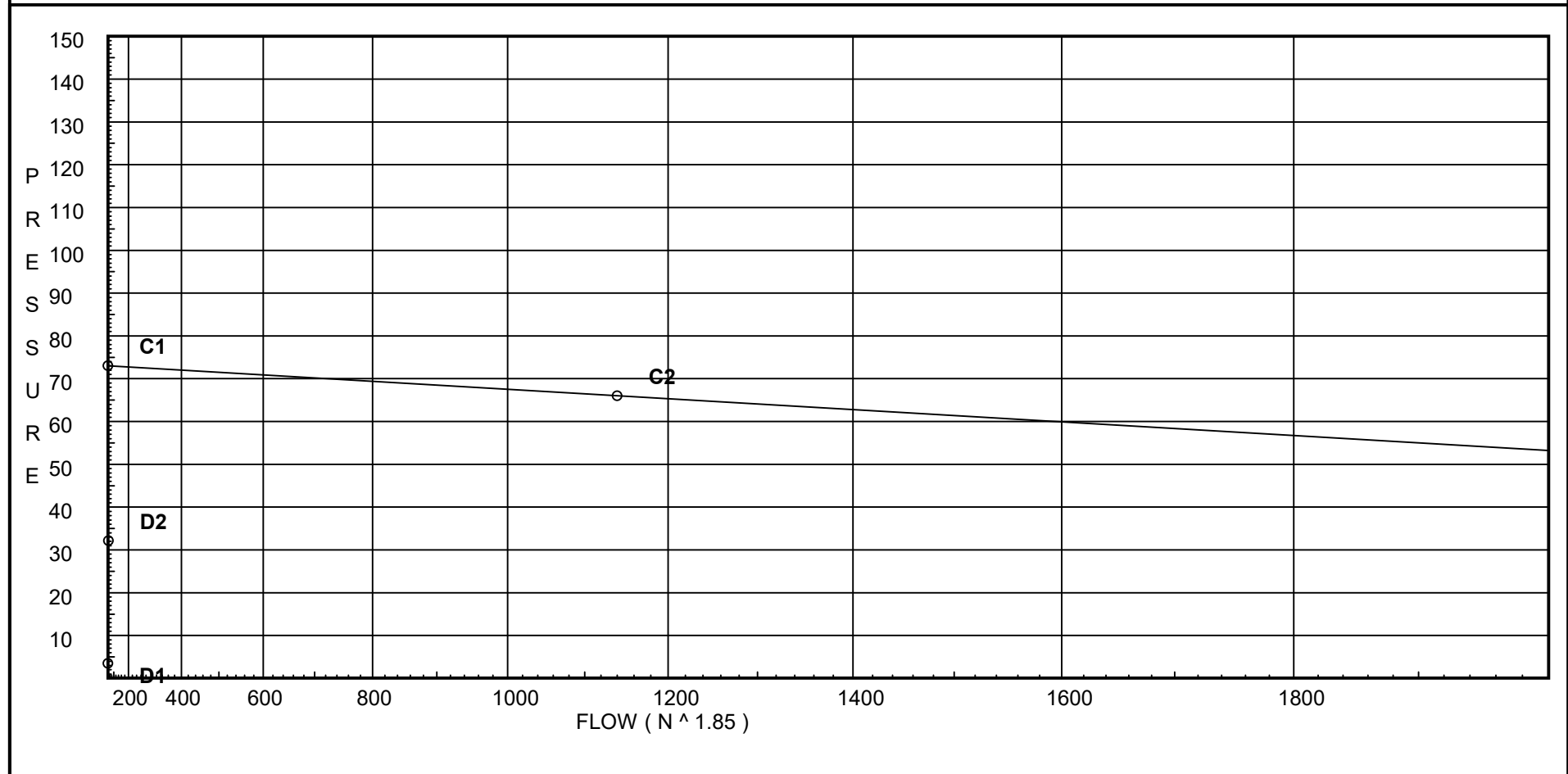
Water Supply Curve C

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City Water Supply:
C1 - Static Pressure : 73
C2 - Residual Pressure: 66
C2 - Residual Flow : 1140

Demand:
D1 - Elevation : 3.465
D2 - System Flow : 26.388
D2 - System Pressure : 32.156
Hose (Demand) : _____
D3 - System Demand : 26.388
Safety Margin : 40.838



Fittings Used Summary

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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	1	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61
Fhc *	1/2 in FlexHead - 4 Ft Long	0	0	24					0	0	0	0	0	0	0	0	0	0	0	0	0
Fsp	Flow Switch Potter VSR	Fitting generates a Fixed Loss Based on Flow																			
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
Zac	Ames 2000SS	Fitting generates a Fixed Loss Based on Flow																			

Unit 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.

Pressure / Flow Summary - STANDARD

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Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
S11	10.0	4.9	7.0	na	12.96	0.05	256	7.0
S12	10.0	4.9	7.51	na	13.42	0.05	256	7.0
11	10.75		8.43	na				
12	10.75		9.05	na				
101	10.75		12.47	na				
21	10.75		12.69	na				
22	10.75		13.52	na				
23	10.75		14.35	na				
24	10.75		15.18	na				
202	10.75		16.54	na				
203	10.75		17.11	na				
204	14.75		15.58	na				
403	14.75		16.29	na				
404	14.75		16.72	na				
405	10.75		18.54	na				
406	10.75		18.9	na				
TOR	10.75		19.1	na				
BOR	2.0		26.09	na				
U1	-4.0		28.69	na				
U2	-4.0		28.69	na				
U3	-4.0		28.69	na				
U4	-4.0		28.7	na				
BF1	2.0		26.1	na				
BF2	2.0		30.15	na				
U5	-4.0		32.75	na				
U6	-4.0		32.75	na				
M1	-4.0		32.75	na				
M2	-4.0		34.75	na				
S	2.0		32.16	na				

The maximum velocity is 9.8 and it occurs in the pipe between nodes 12 and 101

Final Calculations - Hazen-Williams - 2007

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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	*****
*SPRINKLER DROP PENDENTS									
S11	12.96	1.049	Fhc 24.0	1.000	7.000			K Factor = 4.90	
to		120.0	T 5.0	29.000	-0.325				
11	12.96	0.0584	0.0	30.000	1.751			Vel = 4.81	
	0.0								
	12.96				8.426			K Factor = 4.46	
S12	13.42	1.049	Fhc 24.0	1.000	7.506			K Factor = 4.90	
to		120.0	T 5.0	29.000	-0.325				
12	13.42	0.0622	0.0	30.000	1.867			Vel = 4.98	
	0.0								
	13.42				9.048			K Factor = 4.46	
*									
*BRANCH LINE									
11	12.96	1.049		0.0	10.667	8.426			
to		120.0		0.0	0.0	0.0			
12	12.96	0.0583		0.0	10.667	0.622		Vel = 4.81	
12	13.43	1.049	T 5.0	10.750	9.048				
to		120.0	0.0	5.000	0.0				
101	26.39	0.2173	0.0	15.750	3.423			Vel = 9.80	
	0.0								
	26.39				12.471			K Factor = 7.47	
*									
*CROSSMAIN									
101	26.39	1.442		0.0	4.667	12.471			
to		120.0		0.0	0.0	0.0			
21	26.39	0.0461		0.0	4.667	0.215		Vel = 5.18	
21	0.0	1.442		0.0	18.000	12.686			
to		120.0		0.0	0.0	0.0			
22	26.39	0.0462		0.0	18.000	0.831		Vel = 5.18	
22	0.0	1.442		0.0	18.000	13.517			
to		120.0		0.0	0.0	0.0			
23	26.39	0.0461		0.0	18.000	0.830		Vel = 5.18	
23	0.0	1.442		0.0	18.000	14.347			
to		120.0		0.0	0.0	0.0			
24	26.39	0.0462		0.0	18.000	0.831		Vel = 5.18	
24	0.0	1.442	T 7.432	22.000	15.178				
to		120.0	0.0	7.432	0.0				
202	26.39	0.0461	0.0	29.432	1.358			Vel = 5.18	
	0.0								
	26.39				16.536			K Factor = 6.49	
*									
*FEED MAIN									
202	26.39	1.682	E 4.95	21.500	16.536				
to		120.0	0.0	4.950	0.0				
203	26.39	0.0218	0.0	26.450	0.577			Vel = 3.81	
203	0.0	1.682	E 4.95	4.000	17.113				
to		120.0	0.0	4.950	-1.732				
204	26.39	0.0218	0.0	8.950	0.195			Vel = 3.81	

Final Calculations - Hazen-Williams

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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	*****
204	0.0	1.682		0.0	32.583	15.576				
to		120.0		0.0	0.0	0.0				
403	26.39	0.0218		0.0	32.583	0.710		Vel =	3.81	
403	0.0	1.682	E	4.95	14.833	16.286				
to		120.0		0.0	4.950	0.0				
404	26.39	0.0218		0.0	19.783	0.431		Vel =	3.81	
404	0.0	1.682		0.0	4.000	16.717				
to		120.0		0.0	0.0	1.732				
405	26.39	0.0220		0.0	4.000	0.088		Vel =	3.81	
405	0.0	2.157	2E	12.307	31.083	18.537				
to		120.0	T	12.307	24.614	0.0				
406	26.39	0.0065		0.0	55.697	0.361		Vel =	2.32	
406	0.0	2.157	E	6.153	13.167	18.898				
to		120.0	T	12.307	18.460	0.0				
TOR	26.39	0.0065		0.0	31.627	0.206		Vel =	2.32	
	0.0									
	26.39					19.104		K Factor =	6.04	
*										
*RISER										
TOR	26.39	2.157	Fsp	0.0	8.750	19.104				
to		120.0	B	7.384	20.921	6.790		* Fixed Loss =	3	
BOR	26.39	0.0065	S	13.537	29.671	0.192		Vel =	2.32	
BOR	0.0	6.16	E	20.084	16.000	26.086				
to		140.0		0.0	20.084	2.599				
U1	26.39	0.0		0.0	36.084	0.001		Vel =	0.28	
U1	0.0	5.86	E	17.893	47.250	28.686				
to		150.0		0.0	17.893	0.0				
U2	26.39	0.0		0.0	65.143	0.002		Vel =	0.31	
U2	0.0	5.86	T	38.342	57.500	28.688				
to		150.0		0.0	38.342	0.0				
U3	26.39	0.0		0.0	95.842	0.003		Vel =	0.31	
U3	0.0	5.86	2E	35.786	137.667	28.691				
to		150.0		0.0	35.786	0.0				
U4	26.39	0.0		0.0	173.453	0.006		Vel =	0.31	
U4	0.0	6.16	E	20.084	6.000	28.697				
to		140.0		0.0	20.084	-2.599				
BF1	26.39	0.0		0.0	26.084	0.001		Vel =	0.28	
BF1	0.0	6.16	E	20.084	5.000	26.099				
to		140.0	Zac	0.0	20.084	4.052		* Fixed Loss =	4.052	
BF2	26.39	0.0		0.0	25.084	0.001		Vel =	0.28	
BF2	0.0	6.16	E	20.084	6.000	30.152				
to		140.0		0.0	20.084	2.599				
U5	26.39	0.0		0.0	26.084	0.0		Vel =	0.28	
U5	0.0	5.86	E	17.893	3.500	32.751				
to		150.0	T	38.342	56.235	0.0				
U6	26.39	0.0		0.0	59.735	0.002		Vel =	0.31	
U6	0.0	5.86		0.0	7.000	32.753				
to		150.0		0.0	0.0	0.0				
M1	26.39	0.0		0.0	7.000	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	*****
M1	0.0	5.86	2G	7.668	3.000	32.753			
to		150.0		0.0	7.668	2.000		* Fixed Loss = 2	
M2	26.39	0.0001		0.0	10.668	0.001		Vel = 0.31	
M2	0.0	7.68	E	22.555	17.500	34.754			
to		150.0	G	5.012	71.424	-2.599			
S	26.39	0.0	T	43.857	88.924	0.001		Vel = 0.18	
	0.0								
	26.39					32.156		K Factor = 4.65	