

... Fire Protection by Computer Design

Viega LLC
1800 Southwood Drive

Nashua NH 03063
(603) 882-7171

Job Name : THE WALLACE RESIDENCE
Building : SINGLE FAMILY RESIDENCE – NFPA 13D_2010
Location : HEADS #20 & #17
System : “ALL”
Contract : June 8, 2012
Data File : FPTK1204-004 ME REV-2 (TWO HEAD CALCULATION)

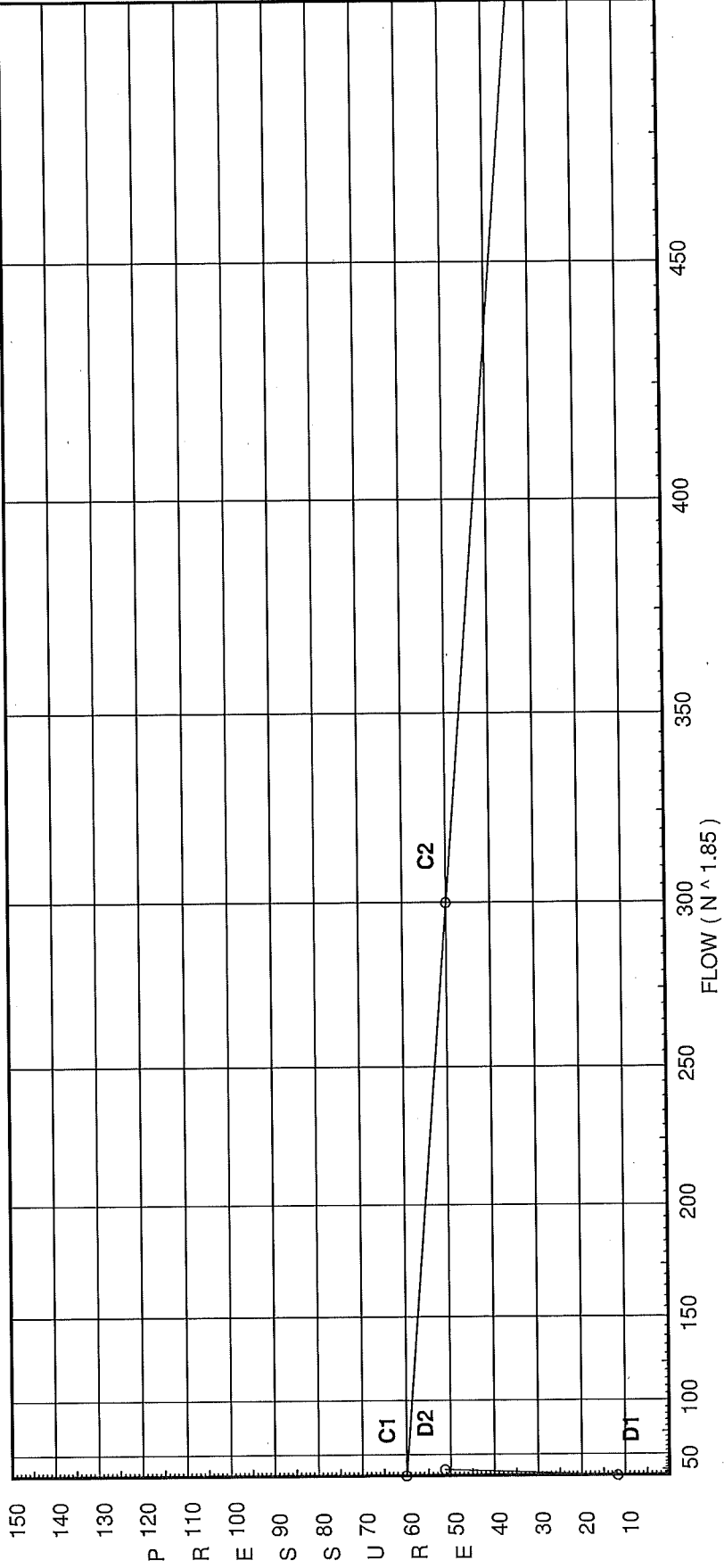
Water Supply Curve (C)

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City Water Supply:
 C1 - Static Pressure : 60
 C2 - Residual Pressure: 50
 C2 - Residual Flow : 300

Demand:

D1 - Elevation : 11.694
 D2 - System Flow : 26.065
 D2 - System Pressure : 51.281
 Hose (Demand) : 26.065
 D3 - System Demand : 8.611
 Safety Margin : 8.611



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
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
Vrt* PEX Press Tee - Flun	2.2	1.9	2.3	4.8	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vtb* PEX Press Tee - Branch	10.4	8.9	11	13	16	0	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

<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>
TANK	60.0	50	300.0	59.891	26.07	51.281

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.20	127.0	4.9	7.04	13.0	
T.43	118.0		20.98		
T.42	118.0		22.33		
T.38	118.0		22.61		
H.6	118.0		23.21		
T.32	118.0		23.54		
T.34	118.0		23.67		
T.33	118.0		30.52		
T.26	109.0		36.66		
T.25	109.0		36.69		
H.1	109.0		36.95		
T.24	109.0		37.02		
T.23	109.0		37.09		
T.36	109.0		37.54		
T.37	109.0		37.7		
H.12	109.0		37.93		
T.49	109.0		38.12		
T.50	109.0		38.31		
S.1	104.0		41.03		
T.51	109.0		37.85		
T.52	109.0		37.23		
H.13	109.0		36.9		
T.39	109.0		36.7		
T.30	109.0		36.68		
T.31	109.0		36.68		
T.28	109.0		36.67		
T.27	109.0		36.66		
H.2	109.0		36.66		
H.17	127.0	4.9	7.11	13.06	
T.45	118.0		21.68		
T.48	118.0		22.69		
T.47	118.0		30.5		
H.14	118.0		21.14		
T.44	118.0		21.77		
T.35	118.0		23.09		
H.18	118.0		22.55		
T.46	118.0		30.51		
H.16	118.0		30.51		
T.41	118.0		30.51		
H.7	118.0		30.52		
BV	100.0		50.44		
TANK	100.0		51.28		

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>
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Final Calculations - Hazen-Williams

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Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Fting's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
H.20 to T.43	11.34	0.671 150.0	1Vrt 1Vtb	1.9 8.9 0.0	27.000 10.800 37.800	7.040 3.898 10.046			K Factor = 4.90 Vel = 10.29	
T.43 to T.42	-4.75 6.59	0.671 150.0	1Vtb 1Vrt	8.9 1.9 0.0	3.000 10.800 13.800	20.984 0.0 1.344			Vel = 5.98	
T.42 to T.38	-2.14 4.45	0.671 150.0	1Vrt	1.9 0.0 0.0	4.000 1.900 5.900	22.328 0.0 0.278			Vel = 4.04	
T.38 to H.6	0.0 4.45	0.671 150.0	1Vrt	1.9 0.0 0.0	11.000 1.900 12.900	22.606 0.0 0.606			Vel = 4.04	
H.6 to T.32	0.0 4.45	0.671 150.0	1Vrt	1.9 0.0 0.0	5.000 1.900 6.900	23.212 0.0 0.325			Vel = 4.04	
T.32 to T.34	0.0 4.45	0.671 150.0	1Vrt	1.9 0.0 0.0	1.000 1.900 2.900	23.537 0.0 0.137			Vel = 4.04	
T.34 to T.33	8.29 12.74	0.671 150.0	2Vtb	17.8 0.0 0.0	3.000 17.800 20.800	23.674 0.0 6.848			Vel = 11.56	
T.33 to T.26	0.35 13.09	0.863 150.0	1Vtb	11.0 0.0 0.0	11.000 11.000 22.000	30.522 3.898 2.237			Vel = 7.18	
T.26 to T.25	-2.16 10.93	0.995 150.0		0.0 0.0 0.0	1.000 0.0 1.000	36.657 0.0 0.036			Vel = 4.51	
T.25 to H.1	0.0 10.93	0.995 150.0		0.0 0.0 0.0	7.000 0.0 7.000	36.693 0.0 0.255			Vel = 4.51	
H.1 to T.24	0.0 10.93	0.995 150.0		0.0 0.0 0.0	2.000 0.0 2.000	36.948 0.0 0.073			Vel = 4.51	
T.24 to T.23	0.0 10.93	0.995 150.0		0.0 0.0 0.0	2.000 0.0 2.000	37.021 0.0 0.073			Vel = 4.51	
T.23 to T.36	0.0 10.93	0.995 150.0	1E	2.336 0.0 0.0	10.000 2.336 12.336	37.094 0.0 0.450			Vel = 4.51	
T.36 to T.37	0.0 10.93	0.995 150.0	1E	2.336 0.0 0.0	2.000 2.336 4.336	37.544 0.0 0.158			Vel = 4.51	
T.37 to H.12	0.0 10.93	0.995 150.0	1E	2.336 0.0 0.0	4.000 2.336 6.336	37.702 0.0 0.231			Vel = 4.51	
H.12 to T.49	0.0 10.93	0.995 150.0		0.0 0.0 0.0	5.000 0.0 5.000	37.933 0.0 0.182			Vel = 4.51	

Final Calculations - Hazen-Williams

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Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Fing's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
T.49 to T.50	0.0 10.93	0.995 150.0 0.0365	1E	2.336 0.0	3.000 2.336 5.336	38.115 0.0 0.195			Vel = 4.51	
T.50 to S.1	0.0 10.93	0.995 150.0 0.0364	1T 1E	5.841 2.336 0.0	7.000 8.177 15.177	38.310 2.166 0.552			Vel = 4.51	
S.1 to T.51	-26.06 -15.13	0.995 150.0 -0.0665	1T 1E	5.841 2.336 0.0	7.000 8.177 15.177	41.028 -2.166 -1.009			Vel = 6.24	
T.51 to T.52	0.0 -15.13	0.995 150.0 -0.0665	1E	2.336 0.0	7.000 2.336 9.336	37.853 0.0 -0.621			Vel = 6.24	
T.52 to H.13	0.0 -15.13	0.995 150.0 -0.0664		0.0 0.0	5.000 0.0 5.000	37.232 0.0 -0.332			Vel = 6.24	
H.13 to T.39	0.0 -15.13	0.995 150.0 -0.0667		0.0 0.0	3.000 0.0 3.000	36.900 0.0 -0.200			Vel = 6.24	
T.39 to T.30	12.97 -2.16	0.995 150.0 -0.0018	1E	2.336 0.0	6.000 2.336 8.336	36.700 0.0 -0.015			Vel = 0.89	
T.30 to T.31	0.0 -2.16	0.995 150.0 -0.0017	1E	2.336 0.0	3.000 2.336 5.336	36.685 0.0 -0.009			Vel = 0.89	
T.31 to T.28	0.0 -2.16	0.995 150.0 -0.0020		0.0 0.0	4.000 0.0 4.000	36.676 0.0 -0.008			Vel = 0.89	
T.28 to T.27	0.0 -2.16	0.995 150.0 -0.0018	1E	2.336 0.0	1.000 2.336 3.336	36.668 0.0 -0.006			Vel = 0.89	
T.27 to H.2	0.0 -2.16	0.995 150.0 -0.0010		0.0 0.0	1.000 0.0 1.000	36.662 0.0 -0.001			Vel = 0.89	
H.2 to T.26	0.0 -2.16	0.995 150.0 -0.0020		0.0 0.0	2.000 0.0 2.000	36.661 0.0 -0.004			Vel = 0.89	
	0.0 -2.16					36.657			K Factor = -0.36	
H.20 to H.17	1.66 1.66	0.671 150.0 0.0076		0.0 0.0	9.000 0.0 9.000	7.040 0.0 0.068			Vel = 1.51	
H.17 to T.45	13.06 14.72	0.671 150.0 0.4305	1Vrt 1Vtb	1.9 8.9	14.000 10.800 24.800	7.108 3.898 10.676			K Factor = 4.90 Vel = 13.36	
T.45 to T.48	-3.53 11.19	0.671 150.0 0.2590	1Vrt	1.9 0.0	2.000 1.900 3.900	21.682 0.0 1.010			Vel = 10.15	
T.48 to T.47	2.14 13.33	0.671 150.0 0.3582	2Vtb	17.8 0.0	4.000 17.800 21.800	22.692 0.0 7.809			Vel = 12.09	

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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	*****
T.47 to T.39	-0.35 12.98	0.863 150.0 0.1000	1Vtb	11.0 0.0 0.0	12.000 11.000 23.000	30.501 3.898 2.301			Vel = 7.12	
	0.0 12.98					36.700			K Factor = 2.14	
T.43 to H.14	4.75 4.75	0.671 150.0 0.0531	1Vrt	1.9 0.0 0.0	1.000 1.900 2.900	20.984 0.0 0.154			Vel = 4.31	
H.14 to T.44	0.0 4.75	0.671 150.0 0.0532	1Vtb	8.9 0.0 0.0	3.000 8.900 11.900	21.138 0.0 0.633			Vel = 4.31	
T.44 to T.35	3.54 8.29	0.671 150.0 0.1487	1Vrt	1.9 0.0 0.0	7.000 1.900 8.900	21.771 0.0 1.323			Vel = 7.52	
T.35 to T.34	0.0 8.29	0.671 150.0 0.1487	1Vrt	1.9 0.0 0.0	2.000 1.900 3.900	23.094 0.0 0.580			Vel = 7.52	
	0.0 8.29					23.674			K Factor = 1.70	
T.45 to T.44	3.53 3.53	0.671 150.0 0.0307	1Vrt	1.9 0.0 0.0	1.000 1.900 2.900	21.682 0.0 0.089			Vel = 3.20	
	0.0 3.53					21.771			K Factor = 0.76	
T.42 to H.18	2.14 2.14	0.671 150.0 0.0122	1Vrt	1.9 0.0 0.0	16.000 1.900 17.900	22.328 0.0 0.218			Vel = 1.94	
H.18 to T.48	0.0 2.14	0.671 150.0 0.0122		0.0 0.0 0.0	12.000 0.0 12.000	22.546 0.0 0.146			Vel = 1.94	
	0.0 2.14					22.692			K Factor = 0.45	
T.47 to T.46	0.36 0.36	0.671 150.0 0.0004	1Vtb	8.9 0.0 0.0	5.215 8.900 14.115	30.501 0.0 0.006			Vel = 0.33	
T.46 to H.16	0.0 0.36	0.671 150.0 0.0005	1Vrt	1.9 0.0 0.0	4.000 1.900 5.900	30.507 0.0 0.003			Vel = 0.33	
H.16 to T.41	0.0 0.36	0.671 150.0 0.0003	1Vrt	1.9 0.0 0.0	1.000 1.900 2.900	30.510 0.0 0.001			Vel = 0.33	
T.41 to H.7	0.0 0.36	0.671 150.0 0.0005	1Vrt	1.9 0.0 0.0	8.000 1.900 9.900	30.511 0.0 0.005			Vel = 0.33	
H.7 to T.33	0.0 0.36	0.671 150.0 0.0004	1Vrt 1Vtb	1.9 8.9 0.0	3.000 10.800 13.800	30.516 0.0 0.006			Vel = 0.33	

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	*****
	0.0 0.36					30.522			K Factor = 0.07	
S.1 to BV	26.06 26.06	1.265 150.0 0.0565	2E 3T 1G	5.935 17.804 0.989	5.000 24.728 29.728	41.028 7.732 1.680			* Fixed loss = 6 Vel = 6.65	
BV to TANK	0.0 26.06	1.265 150.0 0.0565	1E 1T 1G	2.967 5.935 0.989	5.000 9.891 14.891	50.440 0.0 0.841			Vel = 6.65	
	0.0 26.06					51.281			K Factor = 3.64	