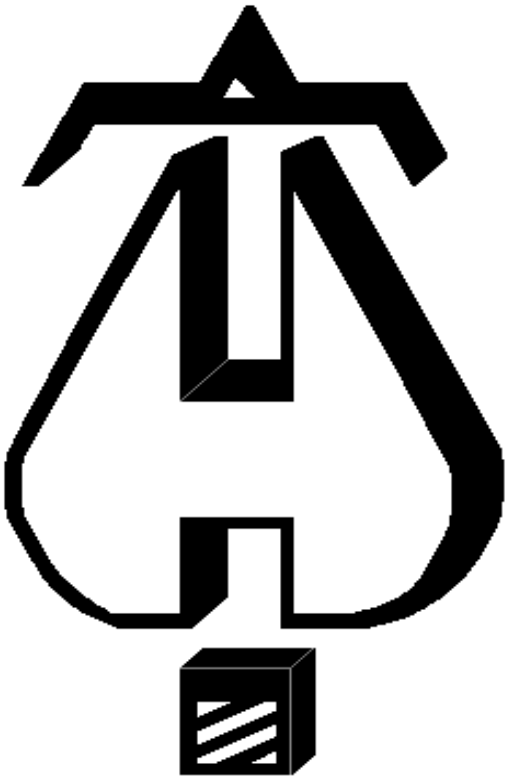


. . . Fire Protection by Computer Design

HIGH TECH FIRE PROTECTION
84 HACKETT MILLS ROAD
P.O. BOX 156
POLAND, ME 04274
207-998-2551

Job Name	:	Gervais Home 2nd floor calc
Drawing	:	
Location	:	
Remote Area	:	
Contract	:	
Data File	:	2ND FLOOR PEND CALC.WXF

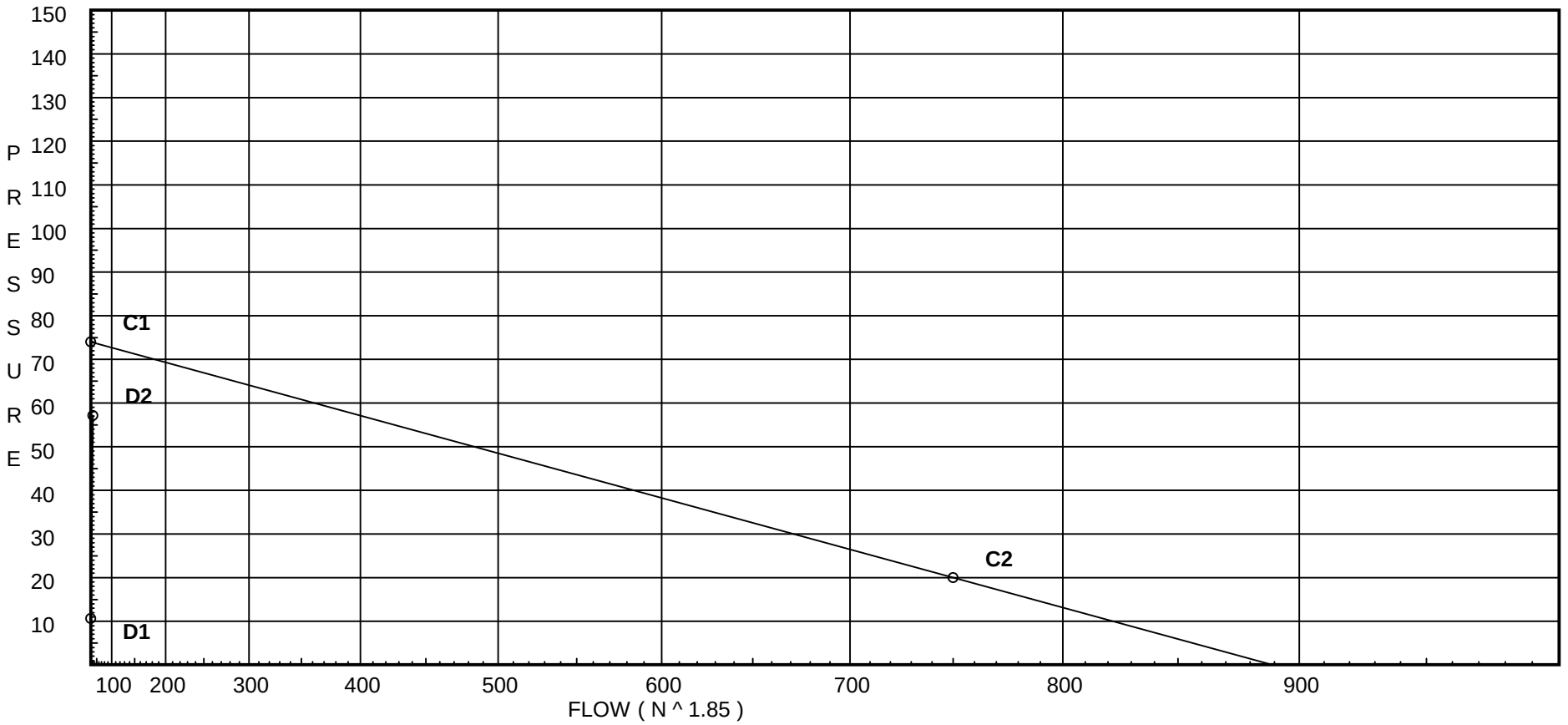
Water Supply Curve (C)

HIGH TECH FIRE PROTECTION
Gervais Home 2nd floor calc

Date 3/14/17

City Water Supply:
- C1 - Static Pressure : 74
- C2 - Residual Pressure: 20
- C2 - Residual Flow : 750

Demand:
- D1 - Elevation : 10.611
- D2 - System Flow : 28.462
- D2 - System Pressure : 57.133
- Hose (Demand) : _____
- D3 - System Demand : 28.462
- Safety Margin : 16.740



Fittings Used Summary

Fitting Legend

Abbrev.	Name	½	¾	1	1¼	1½	2	2½	3	3½	4	5	6	8	10	12	14	16	18	20	24
Bvt	Ball Vic 728 Thrd	0	0	0.5	1	1.7	0.5	0	0	0	0	0	0	0	0	0	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
Fsp	Flow Switch Potter VSR	Fitting generates a Fixed Loss Based on Flow																			
G	NFPA 13 Gate Valve	0	0	0	0	1	1	1	1	1	2	2	3	4	5	6	7	8	10	11	13
N *	CPVC 90'Ell Harvel-Spears		7	7	8	9	11	12	13	0	0	0	0	0	0	0	0	0	0	0	0
O *	CPVC Tee - Branch	3	3	5	6	8	10	12	15	0	0	0	0	0	0	0	0	0	0	0	0
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
Zik	Wilkins 950XL	Fitting generates a Fixed Loss Based on Flow																			

Units 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

Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
DP1	-1.0	4.9	8.2	na	14.03	0.05	256	8.2
DP2	-1.0	4.9	8.2	na	14.03	0.05	256	8.2
20	26.5	K = K @ EQ01	8.03	na	14.03			
21	26.5	K = K @ EQ02	8.42	na	14.43			
22	26.5		9.34	na				
23	16.5		15.63	na				
24	16.0		20.03	na				
25	8.5		25.23	na				
26	8.0		28.33	na				
27	8.0		29.31	na				
TOR	8.0		34.27	na				
FLW	3.0		40.44	na				
BOR	1.0		48.89	na				
WTM	1.0		53.07	na				
H1	1.0		57.56	na				
H2	1.0		57.56	na				
TEST	2.0		57.13	na				

The maximum velocity is 11.74 and it occurs in the pipe between nodes BOR and WTM

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes ******
DP1	14.03	1.101	1N	7.0	0.500	8.200		K Factor = 4.90
to		150.0		0.0	7.000	-0.433		
EQ01	14.03	0.0353		0.0	7.500	0.265		Vel = 4.73
	0.0							
	14.03					8.032		K Factor = 4.95
DP2	14.03	1.101	1O	5.0	0.500	8.200		K Factor = 4.90
to		150.0		0.0	5.000	-0.433		
EQ02	14.03	0.0353		0.0	5.500	0.194		Vel = 4.73
	0.0							
	14.03					7.961		K Factor = 4.97
20	14.03	1.101		0.0	11.000	8.032		K Factor @ node EQ01
to		150.0		0.0	0.0	0.0		
21	14.03	0.0353		0.0	11.000	0.388		Vel = 4.73
21	14.43	1.101	1O	5.0	2.000	8.420		K Factor @ node EQ02
to		150.0		0.0	5.000	0.0		
22	28.46	0.1307		0.0	7.000	0.915		Vel = 9.59
22	0.0	1.101	1O	5.0	10.000	9.335		
to		150.0		0.0	5.000	4.331		
23	28.46	0.1307		0.0	15.000	1.960		Vel = 9.59
23	0.0	1.101	1N	7.0	25.000	15.626		
to		150.0		0.0	7.000	0.217		
24	28.46	0.1307		0.0	32.000	4.182		Vel = 9.59
24	0.0	1.101	1O	5.0	10.000	20.025		
to		150.0		0.0	5.000	3.248		
25	28.46	0.1307		0.0	15.000	1.961		Vel = 9.59
25	0.0	1.101	1N	7.0	15.000	25.234		
to		150.0		0.0	7.000	0.217		
26	28.46	0.1307		0.0	22.000	2.875		Vel = 9.59
26	0.0	1.101	1N	7.0	0.500	28.326		
to		150.0		0.0	7.000	0.0		
27	28.46	0.1307		0.0	7.500	0.980		Vel = 9.59
27	0.0	1.101	1N	7.0	31.000	29.306		
to		150.0		0.0	7.000	0.0		
TOR	28.46	0.1307		0.0	38.000	4.966		Vel = 9.59
TOR	0.0	1.049	1Fsp	0.0	4.000	34.272		
to		120.0		0.0	0.0	5.166		* Fixed loss = 3
FLW	28.46	0.2500		0.0	4.000	1.000		Vel = 10.57
FLW	0.0	1.049	1Zik	0.0	1.000	40.438		
to		120.0	1T	5.0	5.000	6.952		* Fixed loss = 6.086
BOR	28.46	0.2498		0.0	6.000	1.499		Vel = 10.57
BOR	0.0	0.995	2Bvt	1.168	2.000	48.889		
to		150.0		0.0	1.168	3.500		* Fixed loss = 3.5
WTM	28.46	0.2140		0.0	3.168	0.678		Vel = 11.74
WTM	0.0	1.917	1G	1.047	500.000	53.067		
to		150.0	1T	10.47	11.517	0.0		
H1	28.46	0.0088		0.0	511.517	4.490		Vel = 3.16
H1	0.0	8.27	1T	41.62	650.000	57.557		
to		120.0		0.0	41.620	0.0		
H2	28.46	0.0		0.0	691.620	0.007		Vel = 0.17

Final Calculations - Hazen-Williams

HIGH TECH FIRE PROTECTION
Gervais Home 2nd floor calc

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*******	Notes	******
H2	0.0	6.28	1G	2.537	10.000	57.564				
to		100.0	1E	11.839	14.376	-0.433				
TEST	28.46	0.0001		0.0	24.376	0.002		Vel = 0.29		
	0.0									
	28.46					57.133		K Factor = 3.77		