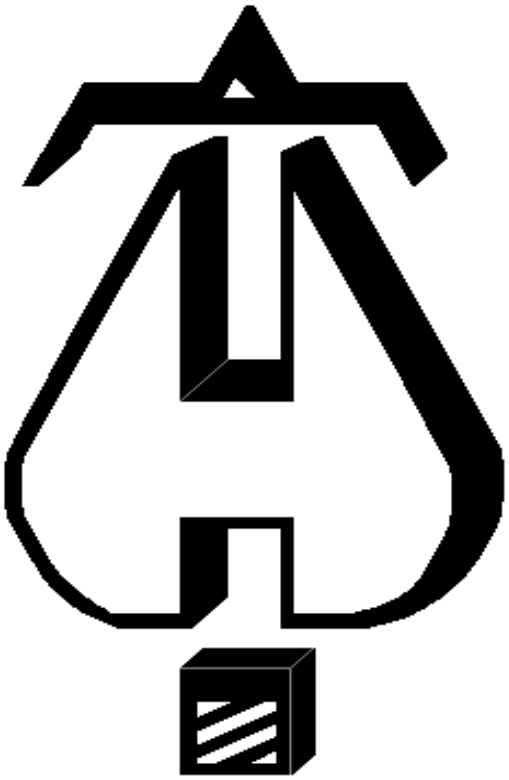


. . . Fire Protection by Computer Design

HIGH TECH FIRE PROTECTION
PO. BOX 156
MINOT, ME 04258-0258
207-998-2551

Job Name : Teen Sheter Stand Pipe Calc
Building : TEEN SHELTER
Location : 38 PREBLE ST
System : HOSE VALVES
Contract : 042712-1
Data File : HOSE VALVE CALC.WXF

HYDRAULIC DESIGN INFORMATION SHEET

Name - TEEN SHELTER Date - 8-9-12
Location - 38 PREBLE ST
Building - TEEN SHELTER System No. - HOSE VALVES
Contractor - HIGH TECH FIRE PROTECTION Contract No. - 042712-1
Calculated By - TIM FORITN Drawing No. - FP-01/FP-02
Occupancy - LIGHT HAZARD

SYSTEM DESIGN

(X)NFPA 14 Number of Standpipes ( )1 (X)2 ( )3 ( )4 ( )
( )Other
( )Specific Ruling Made by Date

Flow at Top Most Outlet	- 250	Gpm	System Type
Pres. at Top Most Outlet	- 21.7	Psi	(X) Wet ( ) Dry
Flow For Ea. Additional Standpipe	- 250	Gpm	
Total Additional Flow	- 450	Gpm	
Elevation at Highest Outlet	- 37.5	Feet	

Hose Valve Connection ( )1 1/2" (X)2 1/2"
Class Service (X)I ( )II ( )III
Note:CITY OF PORTLAND PUMPER TRUCK INFO: 1250 GPM AT 150 PSI

Calculation Summary — Gpm Required 750; Psi Required 21.7; At Test; C-Factor Used: Overhead 120; Underground

WATER SUPPLY

Water Flow Test:		Pump Data:	Tank or Reservoir:
Date of Test	-		Cap.
Time of Test	-	Rated Cap.	Elev.
Static (Psi)	- 200	@ Psi	
Residual (Psi)	- 150	Elev.	Well
Flow (Gpm)	- 1250		Proof Flow Gpm
Elevation	- 3.5		

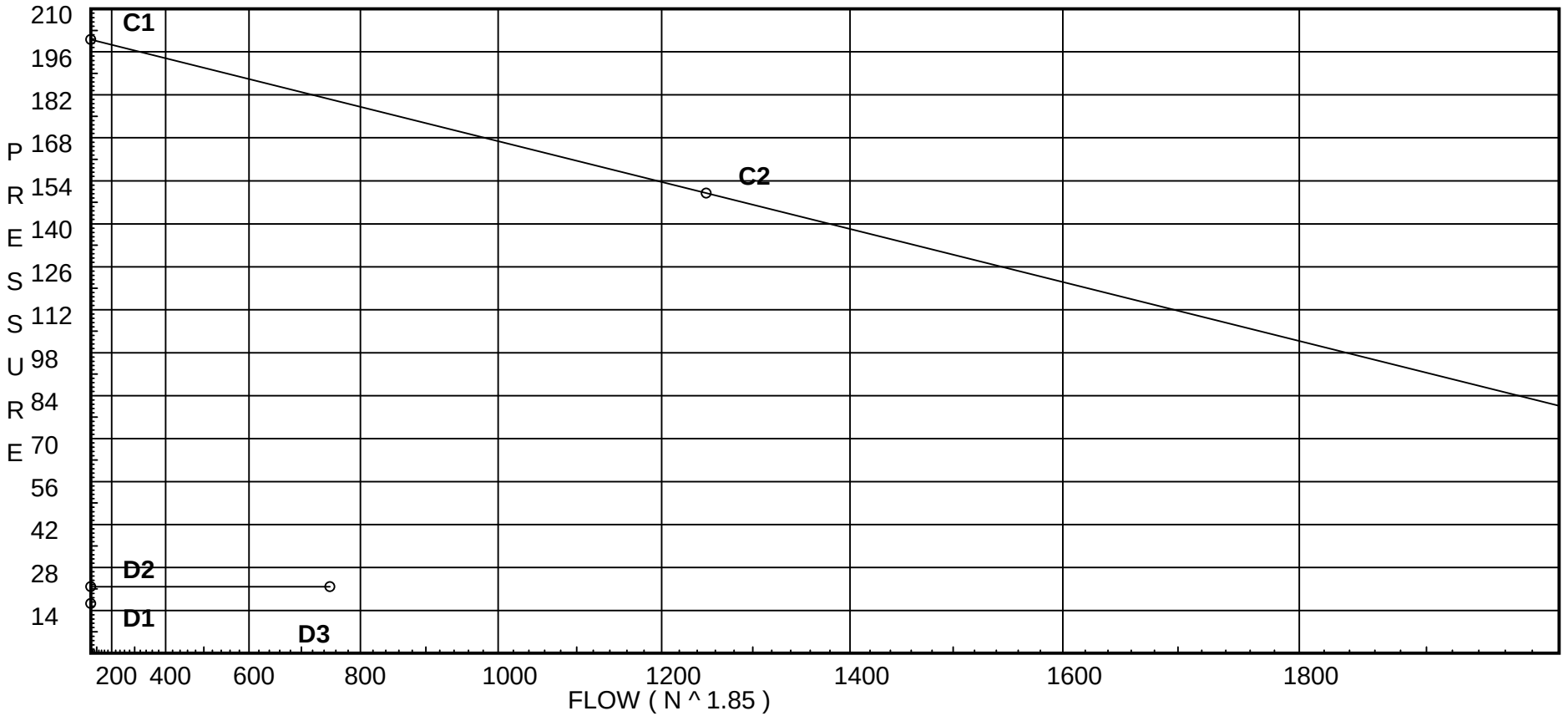
Location: PUMPER TRUCK HOOKED UP TO FIRE DEPARTMENT CONNECTION

Source of Information: CITY OF PORTLAND

City Water Supply:
- C1 - Static Pressure : 200
- C2 - Residual Pressure: 150
- C2 - Residual Flow : 1250

Demand:

D1 - Elevation	:	16.241
D2 - System Flow	:	
D2 - System Pressure	:	21.744
Hose (Adj City)	:	
Hose (Demand)	:	750
D3 - System Demand	:	750
Safety Margin	:	158.823



Fitting Legend

Abbrev. Name	½	¾	1	1¼	1½	2	2½	3	3½	4	5	6	8	10	12	14	16	18	20	24

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.

Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
HV1	37.5		0.0	na	250.0			
HV2	25.5		5.38	na	250.0			
S	37.5		0.11	na				
S1	25.5		5.49	na				
S2	12.5		11.77	na				
S3	9.0		13.94	na				
S4	9.0		14.02	na				
S5	9.0		16.06	na				
HV3	37.5		4.55	na	250.0			
R3	37.5		4.63	na				
R2	25.5		9.88	na				
R1	12.5		15.69	na				
S6	3.5		19.71	na				
TEST	0.0		21.74	na				

The maximum velocity is 16.88 and it occurs in the pipe between nodes S6 and TEST

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv. Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes ******
HV1	250.00	2.469	0.0	0.500	0.0		Qa = 250
to		120.0	0.0	0.0	0.0		
S	250.0	0.2160	0.0	0.500	0.108		Vel = 16.75
	0.0						
	250.00				0.108		K Factor = 760.73
HV2	250.00	2.469	0.0	0.500	5.379		Qa = 250
to		120.0	0.0	0.0	0.0		
S1	250.0	0.2140	0.0	0.500	0.107		Vel = 16.75
	0.0						
	250.00				5.486		K Factor = 106.74
S	250.00	4.26	0.0	12.000	0.108		
to		120.0	0.0	0.0	5.197		
S1	250.0	0.0151	0.0	12.000	0.181		Vel = 5.63
S1	250.00	4.26	0.0	12.000	5.486		
to		120.0	0.0	0.0	5.630		
S2	500.0	0.0546	0.0	12.000	0.655		Vel = 11.25
S2	0.0	4.26	0.0	12.000	11.771		
to		120.0	0.0	0.0	1.516		
S3	500.0	0.0545	0.0	12.000	0.654		Vel = 11.25
S3	0.0	4.26	0.0	1.500	13.941		
to		120.0	0.0	0.0	0.0		
S4	500.0	0.0547	0.0	1.500	0.082		Vel = 11.25
S4	0.0	4.26	0.0	37.300	14.023		
to		120.0	0.0	0.0	0.0		
S5	500.0	0.0545	0.0	37.300	2.033		Vel = 11.25
S5	0.0	4.26	0.0	23.300	16.056		
to		120.0	0.0	0.0	2.382		
S6	500.0	0.0545	0.0	23.300	1.270		Vel = 11.25
	0.0						
	500.00				19.708		K Factor = 112.63
HV3	250.00	2.635	0.0	0.500	4.549		Qa = 250
to		120.0	0.0	0.0	0.0		
R3	250.0	0.1580	0.0	0.500	0.079		Vel = 14.71
R3	0.0	4.26	0.0	3.500	4.628		
to		120.0	0.0	0.0	5.197		
R2	250.0	0.0151	0.0	3.500	0.053		Vel = 5.63
R2	0.0	4.26	0.0	12.000	9.878		
to		120.0	0.0	0.0	5.630		
R1	250.0	0.0152	0.0	12.000	0.182		Vel = 5.63
R1	0.0	4.26	0.0	8.000	15.690		
to		120.0	0.0	0.0	3.898		
S6	250.0	0.0150	0.0	8.000	0.120		Vel = 5.63

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						
	250.00				19.708		K Factor = 56.31
S6	750.00	4.26	0.0	4.500	19.708		
to		120.0	0.0	0.0	1.516		
TEST	750.0	0.1156	0.0	4.500	0.520		Vel = 16.88
	0.0						
	750.00				21.744		K Factor = 160.84