

. . . Fire Protection by Computer Design

HAMPSHIRE FIRE PROTECTION
8 N. WENTWORTH AVE.
LONDONDERRY, NH 03053
603-432-8221

Job Name : PARK DANFORTH - STANDPIPES
Building : 2016 ADDITION
Location : PORTLAND ME
System : STP
Contract : 4734CME
Data File : PDSTP.wxf

HYDRAULIC DESIGN INFORMATION SHEET

Name - PARK DANFORTH - STANDPIPES Date - 2-12-16
 Location - PORTLAND ME
 Building - 2016 ADDITION System No. - STP
 Contractor - PC CONSTRUCTION Contract No. - 4734CME
 Calculated By - BENOIT Drawing No. - ALL
 Occupancy - NURSING HOME

S (X)NFPA 14 Number of Standpipes ()1 ()2 ()3 (X)4 ()

Y ()Other

S ()Specific Ruling Made by Date

T

E	Flow at Top Most Outlet	- 250	Gpm	System Type
M	Pres. at Top Most Outlet	- 100	Psi	(X) Wet () Dry
	Flow For Ea. Additional Standpipe	- 250	Gpm	
D	Total Additional Flow	- 750	Gpm	
E	Elevation at Highest Outlet	- 66.5	Feet	
S	Hose Valve Connection	(X)1 1/2" (X)2 1/2"		
I	Class Service	()I (X)II ()III		
G	Note:DESIGN REQUIRES A 165 PSI @ 1000 GPM FIRE DEPT ASSIST AT THE FDC			

N

Calculation	Gpm Required 1000	Psi Required 153.0	At FDC
Summary	C-Factor Used:	Overhead 120	Underground 120

W	Water Flow Test:	Pump Data:	Tank or Reservoir:
A	Date of Test - NA		Cap.
T	Time of Test - NA	Rated Cap.	Elev.
E	Static (Psi) - 165	@ Psi	
R	Residual (Psi) - 165	Elev.	Well
	Flow (Gpm) - 1000		Proof Flow Gpm
S	Elevation - 0		

U

P Location: FIRE DPET CONNECTION

P

L Source of Information: FIRE DEPT. PUMPER ASSIST OF 165 PSI @ 1000 GPM

Y

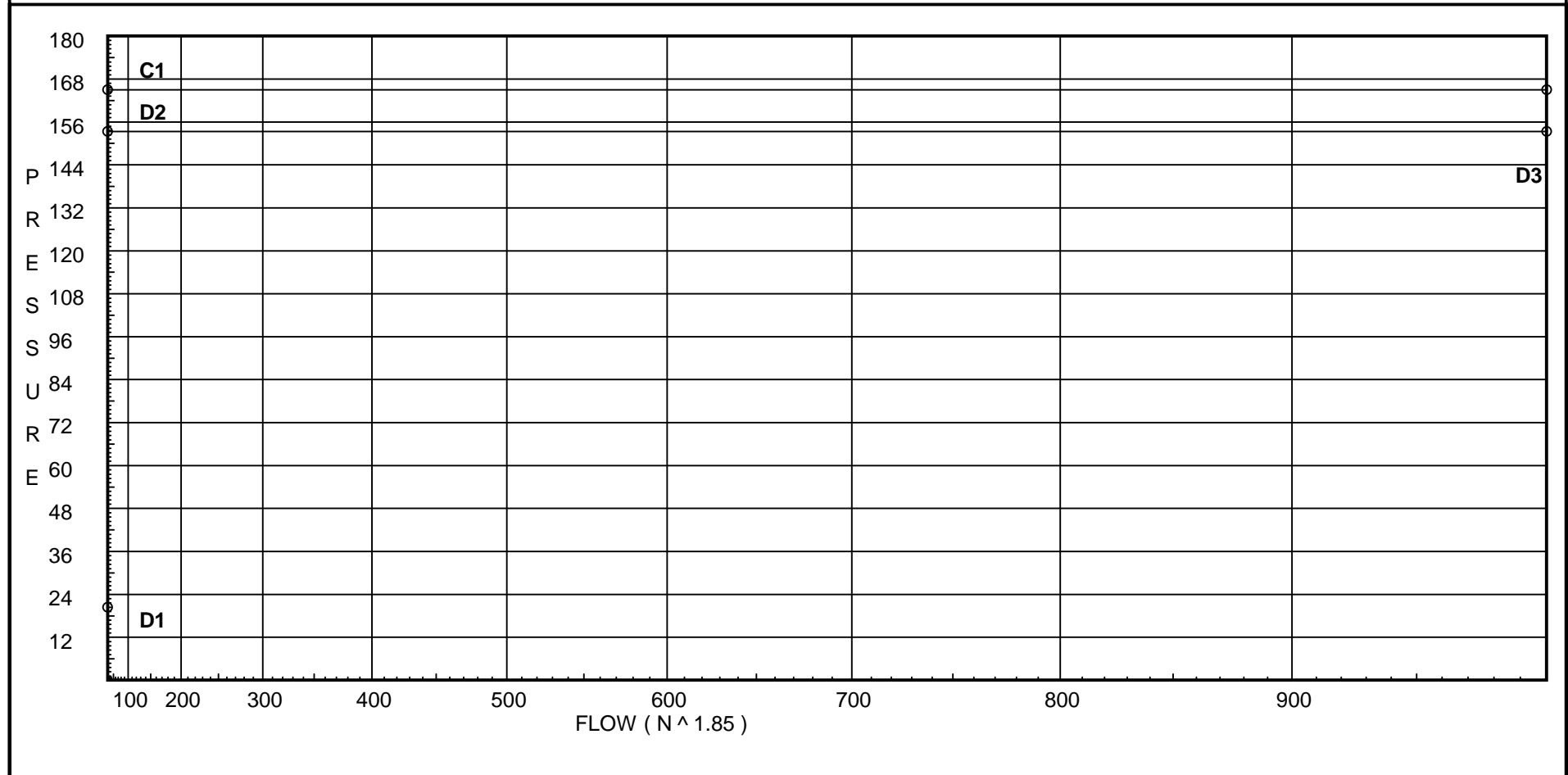
Water Supply Curve C

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City Water Supply:
C1 - Static Pressure : 165
C2 - Residual Pressure: 165
C2 - Residual Flow : 1000

Demand:
D1 - Elevation : 20.356
D2 - System Flow : _____
D2 - System Pressure : 153.303
Hose (Demand) : 1000
D3 - System Demand : 1000
Safety Margin : 11.697



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	2.25	2	2.5	6	7	10	0	12	9	10	12	19	21	0	0	0	0	0
I	90' Grvd-Vic Elbow #10	0	0	2	3	4	3.5	6	5	8	7	8.5	10	13	17	20	23	25	33	36	40
J	90'Tee-Branch Grv Vic #20	0	0	4.5	6	8	8.5	10.8	13	17	16	21	25	33	41	50	65	78	88	98	120
S	NFPA 13 Swing Check	0	0	5	7	9	11	14	16	19	22	27	32	45	55	65					

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

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Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
S1	58.0		100.0	na	250.0			
S2	57.0		100.45	na	250.0			
SA	17.0		121.59	na				
SB	17.0		133.28	na				
SE	9.0		141.86	na				
S3	57.0		114.58	na	250.0			
S4	66.5		122.6	na	250.0			
SC	17.0		145.96	na				
SD	17.0		146.94	na				
FDC	11.0		153.3	na				

The maximum velocity is 16.88 and it occurs in the pipe between nodes SB and SE

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	*****
S1	250.00	4.26		0.0	1.000	100.000			Qa = 250	
to		120.0		0.0	0.0	0.433				
S2	250.0	0.0150		0.0	1.000	0.015			Vel = 5.63	
S2	250.00	4.26	I	9.217	45.000	100.448			Qa = 250	
to		120.0	B	15.8	25.017	17.324				
SA	500.0	0.0545		0.0	70.017	3.817			Vel = 11.25	
SA	0.0	4.26	2I	18.434	175.000	121.589				
to		120.0	J	21.067	39.501	0.0				
SB	500.0	0.0545		0.0	214.501	11.694			Vel = 11.25	
SB	250.00	4.26	I	9.217	14.000	133.283				
to		120.0	J	21.067	30.284	3.465				
SE	750.0	0.1154		0.0	44.284	5.111			Vel = 16.88	
SE	0.0	4.26	J	21.067	15.000	141.859				
to		120.0		0.0	21.067	3.898				
SF	750.0	0.1154		0.0	36.067	4.163			Vel = 16.88	
	0.0									
	750.00					149.920			K Factor = 61.25	
S3	250.00	4.26	I	9.217	45.000	114.582			Qa = 250	
to		120.0	J	21.067	46.084	17.324				
SB	250.0	0.0151	B	15.8	91.084	1.377			Vel = 5.63	
	0.0									
	250.00					133.283			K Factor = 21.65	
S4	250.00	4.26	I	9.217	60.000	122.600			Qa = 250	
to		120.0	2J	42.135	67.152	21.438				
SC	250.0	0.0151	B	15.8	127.152	1.923			Vel = 5.63	
SC	0.0	4.26	J	21.067	44.000	145.961				
to		120.0		0.0	21.067	0.0				
SD	250.0	0.0151		0.0	65.067	0.984			Vel = 5.63	
SD	-1000.00	6.357	8I	100.587	135.000	146.945				
to		120.0	J	31.433	132.020	7.363				
SF	-750.0	-0.0164		0.0	267.020	-4.388			Vel = 7.58	
	0.0									
	-750.00					149.920			K Factor = -61.25	
SD	1000.00	6.357	3I	37.72	25.000	146.945				
to		120.0	J	31.433	109.388	2.599				
FDC	1000.0	0.0280	S	40.235	134.388	3.759			Vel = 10.11	
	0.0									
	1000.00					153.303			K Factor = 80.77	