Inspections Division
Date: 03/22/16

. . . 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

Inspections Division
Date: 03/22/16

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

SYSTEM DESIGN

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

Flow at Top Most Outlet	- 250	Gpm
Pres. at Top Most Outlet	- 100	Psi
Flow For Ea. Additional Standpipe	- 250	Gpm
Total Additional Flow	- 750	Gpm
Elevation at Highest Outlet	- 66.5	Feet

System Type (X) Wet ( ) Dry

Hose Valve Connection (X)1 1/2" (X)2 1/2"
Class Service ( )I (X)II ( )III
Note:DESIGN REQUIRES A 165 PSI @ 1000 GPM FIRE DEPT ASSIST AT THE FDC

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

WATER SUPPLY

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

Location: FIRE DPET CONNECTION

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

Water Supply Curve C

HAMPSHIRE FIRE PROTECTION
PARK DANFORTH - STANDPIPES

Date 2·

Inspections Division
Date: 03/22/16

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

HAMPSHIRE FIRE PROTECTION
PARK DANFORTH - STANDPIPES

Inspections Division
Date: 03/22/16

Fitting Legend

Abbrev.	Name	½	¾	1	1¼	1½	2	2½	3	3½	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

HAMPSHIRE FIRE PROTECTION
PARK DANFORTH - STANDPIPES

Date 2-12-

Inspections Division
Date: 03/22/16

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

HAMPSHIRE FIRE PROTECTION
PARK DANFORTH - STANDPIPES

Date 2-12-

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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