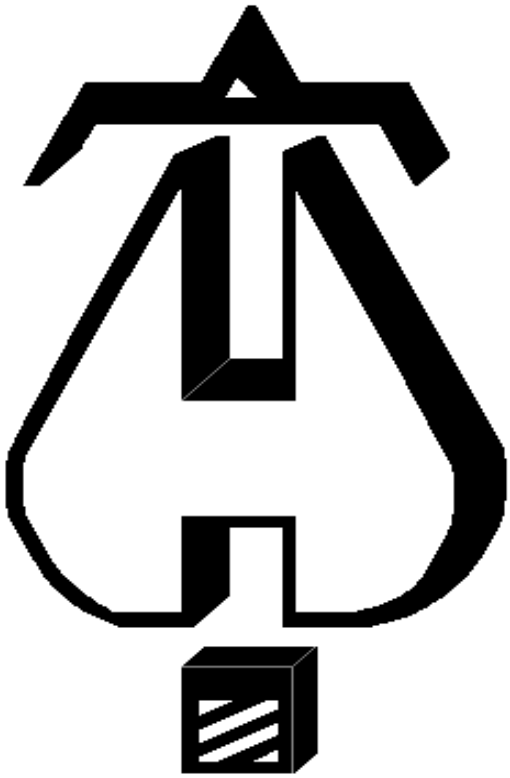


. . . Fire Protection by Computer Design

Residential Fire Protection
64 Daggett Hill Rd.
Greene, ME 04236
(207)946-343

Job Name : 223 CUMBERLAND AVE APT'S
Building : WOOD STRUCTURE
Location : 3RD FLOOR
System : WET
Contract : C16005
Data File : 223 CUMBERLAND AVE APT-3RD FLR.WXF

Hydraulic Design Information Sheet

Name - 223 CUMBERLAND AVE APT'S — Date - 2/29/16
Location - 3RD FLOOR
Building - WOOD STRUCTURE — System No. - WET
Contractor - RESIDENTIAL FIRE PROTECTION — Contract No. - C16005
Calculated By - T. PRAY — Drawing No. - 1 OF 2
Construction: (X) Combustible ( ) Non-Combustible — Ceiling Height - 8'-2.5"
Occupancy - RESIDENTIAL

SYSTEM DESIGN

(X) NFPA 13 (X) Lt. Haz. Ord.Haz.Gp. ( ) 1 ( ) 2 ( ) 3 ( ) Ex.Haz.
( ) NFPA 231 ( ) NFPA 231C ( ) Figure Curve
Other
Specific Ruling — Made By — Date

Area of Sprinkler Operation	- 4 HD'S	System Type	Sprinkler/Nozzle
Density	- .0508	(X) Wet	Make VIKING
Area Per Sprinkler	- 256	( ) Dry	Model VK468
Elevation at Highest Outlet	- 127.75	( ) Deluge	Size 7/16"
Hose Allowance - Inside	-	( ) Preaction	K-Factor 4.9
Rack Sprinkler Allowance	-	( ) Other	Temp.Rat.155
Hose Allowance - Outside	- 100		

Note

Calculation Summary — Flow Required - 160.69 Press Required - 71.07 AT TEST
C-Factor Used: 150 Overhead 140 Underground

WATER SUPPLY

Water Flow Test:		Pump Data:		Tank or Reservoir:
Date of Test	- 6/20/2012			Cap. -
Time of Test	- N/A	Rated Cap.-		Elev.-
Static Press	- 96	@ Press	-	
Residual Press	- 94	Elev.	-	Well
Flow	- 1352			Proof Flow
Elevation	- 99.0'			

Location - TEST HYDRANT LOCATED AT THE CORNER OF CUMBERLAND AVE AND WILMOT ST

Source of Information - PORTLAND WATER DISTRICT

STORAGE

Commodity — Class — Location
Storage Ht. — Area — Aisle W.
Storage Method: Solid Piled % Palletized % Rack

( ) Single Row	( ) Conven. Pallet	( ) Auto. Storage	( ) Encap.	
( ) Double Row	( ) Slave Pallet	( ) Solid Shelf	( ) Non	
( ) Mult. Row		( ) Open Shelf		

Flue Spacing — Clearance:Storage to Ceiling
Longitudinal — Transverse

Horizontal Barriers Provided:

Water Supply Curve (C)

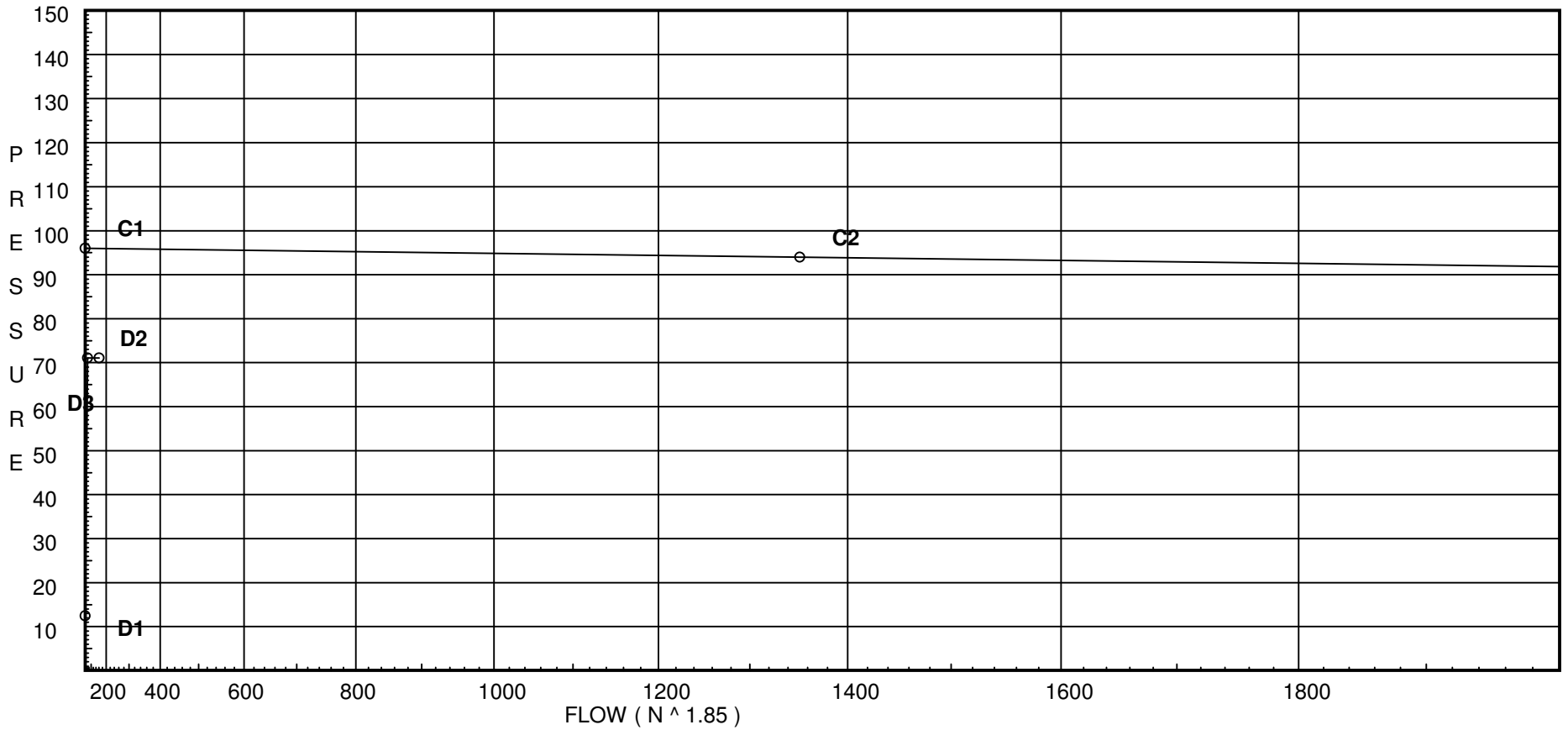
Residential Fire Protection
223 CUMBERLAND AVE APT'S

Date 2/25/16

City Water Supply:
- C1 - Static Pressure : 96
- C2 - Residual Pressure: 94
- C2 - Residual Flow : 1352

Demand:

D1 - Elevation	:	12.452
D2 - System Flow	:	60.693
D2 - System Pressure	:	71.069
Hose (Adj City)	:	_____
Hose (Demand)	:	100
D3 - System Demand	:	160.693
Safety Margin	:	24.892



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
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	0	0	0	0	0	1	1	1	1	2	2	3	4	5	6	7	8	10	11	13
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
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
Z	Generic Flow Switch	2	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61

Pressure / Flow Summary - STANDARD

Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
DO01	0.0	4.9	7.04	na	13.0	0.0508	256	7.0
DO02	0.0	4.9	7.04	na	13.0	0.0508	256	7.0
10	127.75	K = K @ EQ01	7.47	na	13.0			
11	127.75	K = K @ EQ02	8.56	na	13.58			
12	127.75	K = K @ EQ01	11.43	na	16.09			
51	127.75		11.57	na				
52	127.75		12.48	na				
13	127.75	K = K @ EQ01	14.35	na	18.02			
53	126.5		17.3	na				
53A	126.5		18.41	na				
54	126.5		28.34	na				
55	108.0		41.95	na				
56	108.0		45.02	na				
38	97.67		54.66	na				
39	97.67		57.33	na				
40	97.67		60.0	na				
41	97.67		62.67	na				
42	97.67		65.97	na				
43	97.67		65.97	na				
61	97.75		65.93	na				
62	97.75		65.93	na				
TOR	97.75		66.17	na				
BOR	94.29		73.03	na				
TEST	99.0		71.07	na	100.0			

The maximum velocity is 20.45 and it occurs in the pipe between nodes 53A and 54

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes ******
DO01	13.00	0.874	1E	4.026	0.500	7.044		K Factor = 4.90
to		150		0.0	4.026	0.0		
EQ01	13.0	0.0946		0.0	4.526	0.428		Vel = 6.95
	0.0							
	13.00					7.472		K Factor = 4.76
DO02	13.00	0.874	1T	8.053	0.500	7.044		K Factor = 4.90
to		150		0.0	8.052	0.0		
EQ02	13.0	0.0945		0.0	8.552	0.808		Vel = 6.95
	0.0							
	13.00					7.852		K Factor = 4.64
10	13.00	0.874	1E	4.026	7.500	7.472		K Factor @ node EQ01
to		150		0.0	4.026	0.0		
11	13.0	0.0944		0.0	11.526	1.088		Vel = 6.95
11	13.58	0.874	1T	8.053	3.000	8.560		K Factor @ node EQ02
to		150		0.0	8.052	0.0		
52	26.58	0.3547		0.0	11.052	3.920		Vel = 14.21
	0.0							
	26.58					12.480		K Factor = 7.52
12	16.09	0.874		0.0	1.000	11.435		K Factor @ node EQ01
to		150		0.0	0.0	0.0		
51	16.09	0.1400		0.0	1.000	0.140		Vel = 8.60
51	0.0	0.874		0.0	6.460	11.575		
to		150		0.0	0.0	0.0		
52	16.09	0.1401		0.0	6.460	0.905		Vel = 8.60
52	26.58	1.101	2E	7.65	7.840	12.480		
to		150		0.0	7.650	0.541		
53	42.67	0.2764		0.0	15.490	4.282		Vel = 14.38
	0.0							
	42.67					17.303		K Factor = 10.26
13	18.02	0.874	1E	4.026	8.300	14.347		K Factor @ node EQ01
to		150	1T	8.053	12.078	0.541		
53A	18.02	0.1728		0.0	20.378	3.521		Vel = 9.64
	0.0							
	18.02					18.409		K Factor = 4.20
53	42.67	1.101		0.0	4.000	17.303		
to		150		0.0	0.0	0.0		
53A	42.67	0.2765		0.0	4.000	1.106		Vel = 14.38
53A	18.02	1.101	1T	9.563	5.340	18.409		
to		150	1E	3.825	13.387	0.0		
54	60.69	0.5305		0.0	18.727	9.935		Vel = 20.45
54	0.0	1.394	3E	14.285	19.000	28.344		
to		150		0.0	14.285	8.012		
55	60.69	0.1681		0.0	33.285	5.596		Vel = 12.76
55	0.0	1.394	2E	9.523	8.740	41.952		
to		150		0.0	9.523	0.0		
56	60.69	0.1681		0.0	18.263	3.070		Vel = 12.76
56	0.0	1.38	2E	6.0	13.370	45.022		
to		120		0.0	6.000	4.474		
38	60.69	0.2669		0.0	19.370	5.169		Vel = 13.02

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes ******
38	0.0	1.38		0.0	10.000	54.665		
to		120		0.0	0.0	0.0		
39	60.69	0.2668		0.0	10.000	2.668		Vel = 13.02
39	0.0	1.38		0.0	10.000	57.333		
to		120		0.0	0.0	0.0		
40	60.69	0.2669		0.0	10.000	2.669		Vel = 13.02
40	0.0	1.38		0.0	10.000	60.002		
to		120		0.0	0.0	0.0		
41	60.69	0.2668		0.0	10.000	2.668		Vel = 13.02
41	0.0	1.61	1E	4.0	14.170	62.670		
to		120	1T	8.0	12.000	-0.035		
62	60.69	0.1260		0.0	26.170	3.297		Vel = 9.56
	0.0							
	60.69					65.932		K Factor = 7.47
42	0.0	1.38		0.0	10.000	65.966		
to		120		0.0	0.0	0.0		
43	0.0	0.0		0.0	10.000	0.0		Vel = 0
43	0.0	1.61	1E	4.0	14.330	65.966		
to		120	1T	8.0	12.000	-0.035		
61	0.0	0.0		0.0	26.330	0.001		Vel = 0
61	0.0	2.635		0.0	1.080	65.932		
to		120		0.0	0.0	0.0		
62	0.0	0.0		0.0	1.080	0.0		Vel = 0
62	60.69	2.635	1T	16.474	4.460	65.932		
to		120		0.0	16.474	0.0		
TOR	60.69	0.0114		0.0	20.934	0.239		Vel = 3.57
TOR	0.0	2.635	2I	16.474	7.000	66.171		
to		120	1Z	8.237	24.711	6.499		* Fixed loss = 5
BOR	60.69	0.0114		0.0	31.711	0.362		Vel = 3.57
BOR	0.0	4.1	1E	14.534	30.000	73.032		
to		140	1G	2.907	46.508	-2.040		
TEST	60.69	0.0010	1T	29.067	76.508	0.077		Vel = 1.47
	100.00							Qa = 100.00
	160.69					71.069		K Factor = 19.06