

. . . Fire Protection by Computer Design

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

Job Name : THOMAS STREET APARTMENTS
Building : WOOD STRUCTURE
Location : 3RD FLOOR- RESIDENTIAL SIDEWALLS
System : WET
Contract : C16021
Data File : THOMAS ST APT- 3RD FLR RES SIDEWALLS.WXF

Hydraulic Design Information Sheet

Name - 32 THOMAS STREET APARTMENTS Date - 8/23/16
 Location - 3RD FLOOR- RESIDENTIAL SIDEWALLS
 Building - WOOD STRUCTURE System No. - WET
 Contractor - RESIDENTIAL FIRE PROTECTION Contract No. - C16021
 Calculated By - T. PRAY Drawing No. - 1 OF 2
 Construction: (X) Combustible () Non-Combustible Ceiling Height - 10.54'
 Occupancy - APARTMENT

S (X) NFPA 13 (X) Lt. Haz. Ord.Haz.Gp. () 1 () 2 () 3 () Ex.Haz.
 Y () NFPA 231 () NFPA 231C () Figure Curve

S Other RESIDENTIAL DESIGN

T Specific Ruling Made By Date

M	Area of Sprinkler Operation	- 4 HEADS	System Type	Sprinkler/Nozzle
	Density	- .0508	(X) Wet	Make VIKING
D	Area Per Sprinkler	- 256	() Dry	Model VK486
E	Elevation at Highest Outlet	- 133.63	() Deluge	Size 7/16
S	Hose Allowance - Inside	-	() Preaction	K-Factor
I	Rack Sprinkler Allowance	-	() Other	Temp.Rat.155
G	Hose Allowance - Outside	- 100		

N Note

Calculation Flow Required - 155.69 Press Required - 49.56 AT TEST
 Summary C-Factor Used: 120 Overhead 140 Underground

W	Water Flow Test:	Pump Data:	Tank or Reservoir:
A	Date of Test - 8/22/16		Cap. -
T	Time of Test - 11:30PM	Rated Cap.-	Elev.-
E	Static Press - 51	@ Press -	
R	Residual Press - 49	Elev. -	Well
S	Flow - 903		Proof Flow
U	Elevation - 100		

P Location - HYDRANTS ARE LOCATED ON THOMAS STREET, SEE PLOT PLAN

L Source of Information - PORTLAND WATER DISTRICT

C	Commodity	Class	Location
O	Storage Ht.	Area	Aisle W.
M	Storage Method:	%	Palletized % Rack
	() Single Row	() Conven. Pallet	() Auto. Storage () Encap.
S	() Double Row	() Slave Pallet	() Solid Shelf () Non
T	() Mult. Row		() Open Shelf

R K Flue Spacing Clearance:Storage to Ceiling
 A Longitudinal Transverse

E Horizontal Barriers Provided:

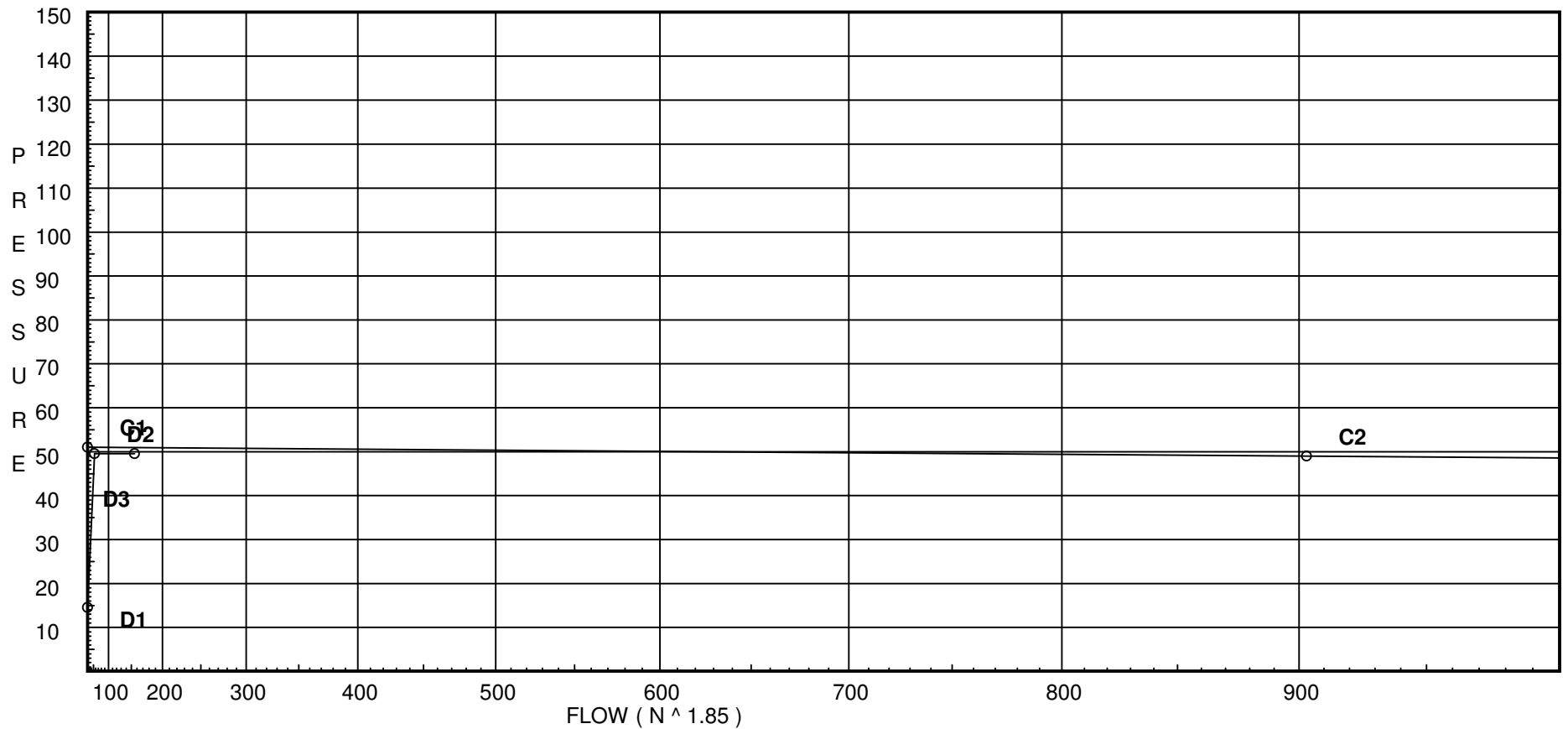
Water Supply Curve (C)

Residential Fire Protection
THOMAS STREET APARTMENTS

Page 2
Date 8/23/2016

City Water Supply:
C1 - Static Pressure : 51
C2 - Residual Pressure: 49
C2 - Residual Flow : 903

Demand:
D1 - Elevation : 14.565
D2 - System Flow : 55.691
D2 - System Pressure : 49.560
Hose (Adj City) : _____
Hose (Demand) : 100
D3 - System Demand : 155.691
Safety Margin : 1.362



Fittings Used Summary

Residential Fire Protection
THOMAS STREET APARTMENTS

Page 3
Date 8/23/2016

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	Generic Butterfly Valve	0	0	0	0	0	0	7	10	0	12	9	10	12	19	21	0	0	0	0	0
E	90' Standard Elbow	2	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61
F	45' Elbow	1	1	1	1	2	2	3	3	3	4	5	7	9	11	13	17	19	21	24	28
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
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
L	Long Turn Elbow	1	1	2	2	2	3	4	5	5	6	8	9	13	16	18	24	27	30	34	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

Pressure / Flow Summary - STANDARD

Residential Fire Protection
THOMAS STREET APARTMENTS

Page 4
Date 8/23/2016

Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
110	133.63	4	10.6	na	13.02	0.0508	256	10.6
111	133.63	4	10.64	na	13.05	0.0508	256	10.6
156	133.63		11.01	na				
112	133.63	4.9	11.14	na	16.35	0.0508	256	7.0
113	133.63	4	11.0	na	13.27	0.0508	256	10.6
157	133.63		11.39	na				
158	133.63		12.48	na				
159	122.21		23.91	na				
160	110.0		33.23	na				
161	110.0		34.29	na				
126	111.63		34.18	na				
127	111.63		34.56	na				
162	110.67		35.88	na				
163	110.67		36.44	na				
164	110.67		36.54	na				
155	110.67		36.91	na				
TOR	97.88		43.13	na				
HDR	97.88		43.46	na				
BFP	97.88		43.46	na				
6UG	97.88		50.46	na				
TEST	100.0		49.56	na	100.0			

The maximum velocity is 9.1 and it occurs in the pipe between nodes 112 and 157

Final Calculations - Hazen-Williams

Residential Fire Protection
THOMAS STREET APARTMENTS

Page 5
Date 8/23/2016

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
110 to 156	13.02 13.02	1.049 120 0.0589	2E	4.0 0.0 0.0	3.000 4.000 7.000	10.600 0.0 0.412			K Factor = 4.00 Vel = 4.83	
	0.0 13.02						11.012		K Factor = 3.92	
111 to 156	13.05 13.05	1.049 120 0.0591	1T	5.0 0.0 0.0	1.330 5.000 6.330	10.638 0.0 0.374			K Factor = 4.00 Vel = 4.84	
156 to 112	13.02 26.07	1.38 120 0.0560		0.0 0.0 0.0	2.250 0.0 2.250	11.012 0.0 0.126			Vel = 5.59	
112 to 157	16.35 42.42	1.38 120 0.1372		0.0 0.0 0.0	1.830 0.0 1.830	11.138 0.0 0.251			K Factor = 4.90 Vel = 9.10	
	0.0 42.42						11.389		K Factor = 12.57	
113 to 157	13.27 13.27	1.049 120 0.0608	1T	5.0 0.0 0.0	1.330 5.000 6.330	11.004 0.0 0.385			K Factor = 4.00 Vel = 4.93	
157 to 158	42.42 55.69	1.61 120 0.1075	1T	8.0 0.0 0.0	2.170 8.000 10.170	11.389 0.0 1.093			Vel = 8.78	
158 to 159	0.0 55.69	1.61 120 0.1074	3T 2E	24.0 8.0 0.0	28.350 32.000 60.350	12.482 4.946 6.483			Vel = 8.78	
159 to 160	0.0 55.69	1.61 120 0.1074	2E 1T	8.0 8.0 0.0	21.500 16.000 37.500	23.911 5.288 4.029			Vel = 8.78	
160 to 161	0.0 55.69	1.61 120 0.1075	1T	8.0 0.0 0.0	1.920 8.000 9.920	33.228 0.0 1.066			Vel = 8.78	
161 to 126	0.0 55.69	2.067 120 0.0318	1E	5.0 0.0 0.0	13.710 5.000 18.710	34.294 -0.706 0.595			Vel = 5.32	
126 to 127	0.0 55.69	2.067 120 0.0318		0.0 0.0 0.0	12.000 0.0 12.000	34.183 0.0 0.382			Vel = 5.32	
127 to 162	0.0 55.69	2.067 120 0.0318	2E 1T	10.0 10.0 0.0	8.170 20.000 28.170	34.565 0.416 0.896			Vel = 5.32	
162 to 163	0.0 55.69	2.067 120 0.0318	1T	10.0 0.0 0.0	7.580 10.000 17.580	35.877 0.0 0.559			Vel = 5.32	
163 to 164	0.0 55.69	2.635 120 0.0097	1I	8.237 0.0 0.0	2.330 8.237 10.567	36.436 0.0 0.103			Vel = 3.28	
164 to 155	0.0 55.69	2.635 120 0.0098	2I 1J	16.474 14.827 0.0	6.500 31.301 37.801	36.539 0.0 0.369			Vel = 3.28	

Final Calculations - Standard

Residential Fire Protection
THOMAS STREET APARTMENTS

Page 6
Date 8/23/2016

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv. Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
155 to TOR	0.0 55.69	2.635 120 0.0098	5I 41.186 0.0	28.590 41.186 69.776	36.908 5.539 0.681		Vel = 3.28		
TOR to HDR	0.0 55.69	2.635 120 0.0097	1F 4.119 1B 9.61 1T 16.474	4.000 30.203 34.203	43.128 0.0 0.333		Vel = 3.28		
HDR to BFP	0.0 55.69	4.26 120 0.0020	0.0 0.0 0.0	0.500 0.0 0.500	43.461 0.0 0.001		Vel = 1.25		
BFP to 6UG	0.0 55.69	4.26 120 0.0010	0.0 0.0 0.0	3.000 0.0 3.000	43.462 7.000 0.003		* Fixed loss = 7 Vel = 1.25		
6UG to TEST	0.0 55.69	6.16 140 0.0001	1L 12.911 1G 4.304 1T 43.037	60.000 60.252 120.252	50.465 -0.918 0.013		Vel = 0.60		
	100.00 155.69				49.560		Qa = 100.00 K Factor = 22.12		