

... Fire Protection by Computer Design

EASTERN FIRE PROTECTION
170 KITTY HAWK AVE
AUBURN, ME 04210
207-784-1507

Job Name : BRIGG'S STREET APARTMENTS
Drawing : WOOD FRAMED
Location : PORTLAND, MAINE
Remote Area : 1
Contract : AU-5364-15
Data File : AU-5364-15 B.S.A. 3RD FLOOR CALC..W XF

HYDRAULIC DESIGN INFORMATION SHEET

Name - BRIGG'S STREET APARTMENTS Date - 5/16/16
Location - PORTLAND, MAINE
Building - WOOD FRAMED System No. - 1
Contractor - EASTERN FIRE PROTECTION Contract No. - AU-5364-15
Calculated By - EWM Drawing No. - 1 OF 1
Construction: (X) Combustible () Non-Combustible Ceiling Height 8'-10"
OCCUPANCY - RESIDENTIAL

S Type of Calculation: ()NFPA 13 Residential (X)NFPA 13R ()NFPA 13D
Y Number of Sprinklers Flowing: ()1 ()2 (X)4 ()
S ()Other
T ()Specific Ruling Made by Date
E
M Listed Flow at Start Point - 16 Gpm System Type
Listed Pres. at Start Point - 13.3 Psi (X) Wet () Dry
D MAXIMUM LISTED SPACING 16 x 16 () Deluge () PreAction
E Domestic Flow Added - Gpm Sprinkler or Nozzle
S Additional Flow Added - Gpm Make RELIABLE Model F1RES44
I Elevation at Highest Outlet - 136.22Feet Size 1/2" K-Factor 4.4
G Note: Temperature Rating 175
N

Calculation Gpm Required 68.452 Psi Required 60.824 At Test
Summary C-Factor Used: Overhead 150 Underground 150

W Water Flow Test: Pump Data: Tank or Reservoir:
A Date of Test - 7/7/2015 Rated Cap. Cap.
T Time of Test - 11:30 @ Psi Elev.
E Static (Psi) - 67 Elev.
R Residual (Psi) - 35 Other Well
Flow (Gpm) - 887 Proof Flow Gpm
S Elevation - 96
P Location: PORTLAND, MAINE
P
L Source of Information: PORTLAND WATER DISTRICT
Y

water Supply Curve C

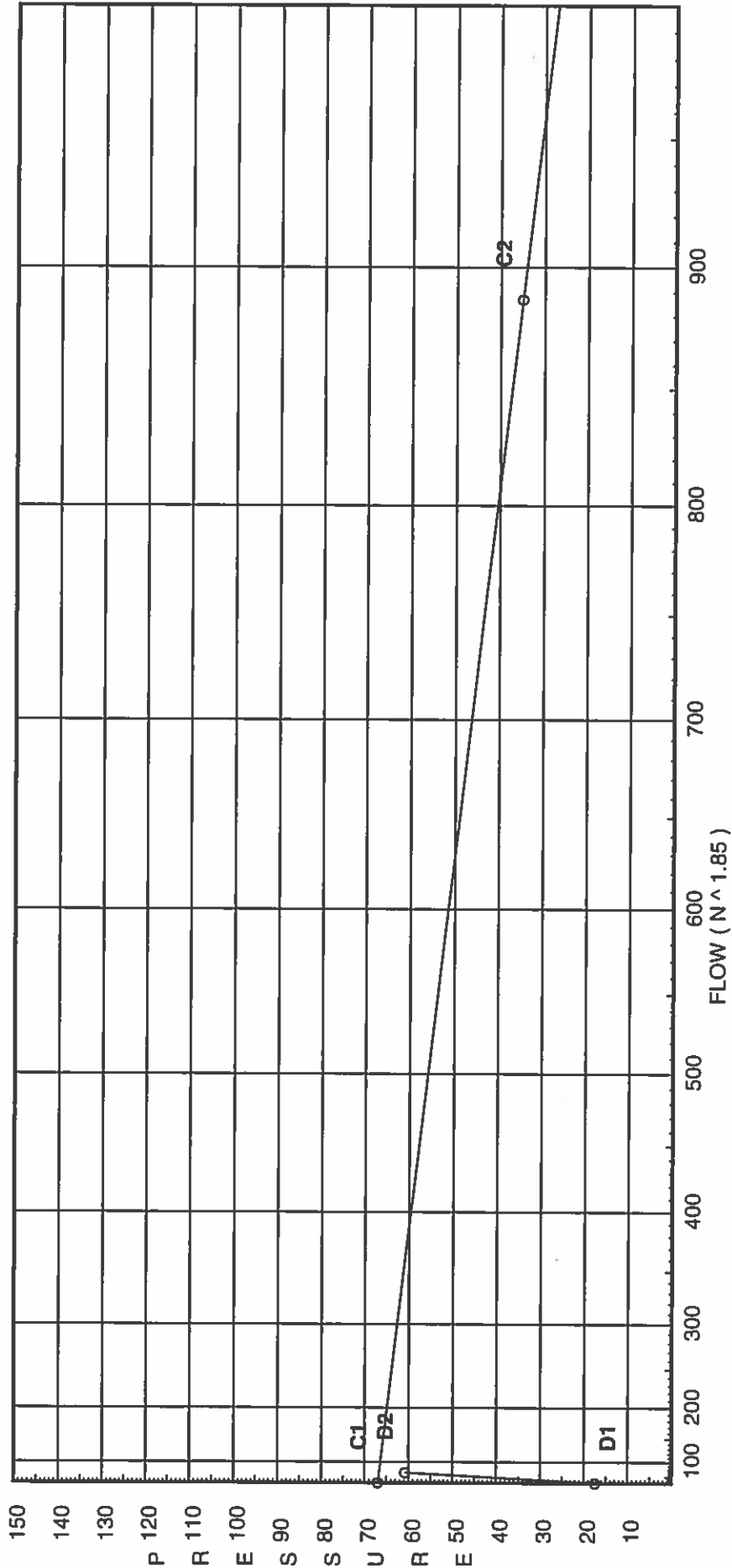
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BRIGGS STREET APARTMENTS

City Water Supply:

C1 - Static Pressure : 67
C2 - Residual Pressure: 35
C2 - Residual Flow : 887

Demand:

D1 - Elevation : 17.419
D2 - System Flow : 68.452
D2 - System Pressure : 60.824
Hose (Demand) :
D3 - System Demand : 68.452
Safety Margin : 5.896



Fittings Used Summary

EASTERN FIRE PROTECTION
BRIGG'S STREET APARTMENTS

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
E NFPA 13 90' Standard Elbow	1	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61
Fsp Flow Switch Potter VSR	Fitting generates a Fixed Loss Based on Flow																			
G NFPA 13 Gate Valve	0	0	0	0	1	1	1	1	1	2	2	3	4	5	6	7	8	10	11	13
L NFPA 13 Long Turn Elbow	0.5	1	2	2	3	4	5	5	5	6	8	9	13	16	18	24	27	30	34	40
N* CPVC 90'El Harvel-Spears	3	3	5	6	8	10	12	13	0	0	0	0	0	0	0	0	0	0	0	0
O* CPVC Tee - Branch	3	4	5	6	8	10	12	15	0	0	0	0	0	0	0	0	0	0	0	0
T NFPA 13 90' Flow thru Tee	3	4	5	6	8	10	12	15	17	20	25	30	35	50	60	71	81	91	101	121
Zaa Ames 2000B	Fitting generates a Fixed Loss Based on Flow																			

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.

SUPPLY ANALYSIS

<i>Node at Source</i>	<i>Static Pressure</i>	<i>Residual Pressure</i>	<i>Flow</i>	<i>Available Pressure</i>	<i>Total Demand</i>	<i>Required Pressure</i>
TEST	67.0	35	887.0	66.72	68.45	60.824

NODE ANALYSIS

<i>Node Tag</i>	<i>Elevation</i>	<i>Node Type</i>	<i>Pressure at Node</i>	<i>Discharge at Node</i>	<i>Notes</i>
HEAD	0.0	5.6	5.39	13.0	
12	136.22	4.4	13.5	16.17	
13	127.59		18.3		
14	136.22	4.4	13.3	16.05	
15	127.59		18.59		
16	136.22	4.4	15.35	17.24	
17	127.59		20.54		
18	136.22	4.4	18.64	19.0	
19	127.59		22.98		
20	107.75		34.68		
21	107.75		35.9		
22	107.75		39.19		
TOR	105.0		44.02		
BFP	101.0		48.94		
BASE	98.0		56.15		
TEST	96.0		60.82		

Final Calculations - Hazen-Williams - 2007

EASTERN FIRE PROTECTION
BRIGG'S STREET APARTMENTS

Page 5
Date 5/16/16

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqv. Ln.	Pipe Ftng's Total	CFact Pf/Ft	Pt Pe Pf	*****	Notes	*****
HEAD to LINE	0 0	5.60	13.00 13.0	1	T 0.0	5.0 5.000	120	5.389 0.0			
			0.0	1.049	0.0	6.000	0.0587	0.352	Vel =	4.83	
LINE			13.00					5.741	K Factor =	5.43	
12 to 13	136.220 127.590	4.40	16.17 16.17	1	N O	7.0 5.0	11.045 12.000	150	13.504 3.738		
			0.0	1.101	0.0	23.045	0.0459	1.057	Vel =	5.45	
13 to 15	127.590 127.590		0.0 16.17	1		0.0 0.0	6.290 6.290	150	18.299 0.0		
			0.0	1.101	0.0	6.290	0.0459	0.289	Vel =	5.45	
15			16.17					18.588	K Factor =	3.75	
14 to 15	136.220 127.590	4.40	16.05 16.05	1	2N O	14.0 5.0	15.250 19.000	150	13.300 3.738		
			0.0	1.101	0.0	34.250	0.0453	1.550	Vel =	5.41	
15 to 17	127.590 127.590		16.17 32.22	1.25	N O	8.0 6.0	23.500 14.000	150	18.588 0.0		
			0.0	1.394	0.0	37.500	0.0521	1.953	Vel =	6.77	
17			32.22					20.541	K Factor =	7.11	
16 to 17	136.220 127.590	4.40	17.24 17.24	1	N O	7.0 5.0	16.090 12.000	150	15.352 3.738		
			0.0	1.101	0.0	28.090	0.0517	1.451	Vel =	5.81	
17 to 19	127.590 127.590		32.22 49.46	1.25	2O	12.0 0.0	9.165 12.000	150	20.541 0.0		
			0.0	1.394	0.0	21.165	0.1151	2.437	Vel =	10.40	
19			49.46					22.978	K Factor =	10.32	
18 to 19	136.220 127.590	4.40	19.00 19.0	1		0.0 0.0	9.670 0.0	150	18.642 3.738		
			0.0	1.101	0.0	9.670	0.0618	0.598	Vel =	6.40	
19 to 20	127.590 107.750		49.45 68.45	1.5	N	9.0 0.0	19.840 9.000	150	22.978 8.593		
			0.0	1.598	0.0	28.840	0.1080	3.114	Vel =	10.95	
20 to 21	107.750 107.750		0.0 68.45	1.5	O	8.0 0.0	3.290 8.000	150	34.685 0.0		
			0.0	1.598	0.0	11.290	0.1080	1.219	Vel =	10.95	
21 to 22	107.750 107.750		0.0 68.45	1.5	2N	18.0 0.0	12.460 18.000	150	35.904 0.0		
			0.0	1.598	0.0	30.460	0.1080	3.290	Vel =	10.95	
22 to TOR	107.750 105		0.0 68.45	1.5	3E	12.0 0.0	11.080 12.000	120	39.194 1.191		
			0.0	1.61	0.0	23.080	0.1574	3.632	Vel =	10.79	
TOR to BFP	105 101		0.0 68.45	2	Fsp	0.0 0.0	4.000 0.0	120	44.017 4.732	** Fixed Loss = 3	
			0.0	2.067	0.0	4.000	0.0468	0.187	Vel =	6.54	
BFP to BASE	101 98		0.0 68.45	2	Zaa	0.0 0.0	3.000 0.0	120	48.936 7.071	** Fixed Loss = 5.772	
			0.0	2.067	0.0	3.000	0.0467	0.140	Vel =	6.54	

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EASTERN FIRE PROTECTION
BRIGG'S STREET APARTMENTS

Page 6
Date 5/16/16

Node1	Elev1	K	Qa	Nom	Fitting or	Pipe	CFact	Pt			
to	Elev2	Fact	Qt	Act	Eqv.	Ln.	Pf/Ft	Pe	*****	Notes	*****
Node2								Pf			
BASE	98		0.0	2	2L	3.705	40.000	150	56.147		
to					T	6.174	10.497		0.866		
TEST	96		68.45	1.72	G	0.617	50.497	0.0755	3.811	Vel = 9.45	
			0.0								
TEST			68.45						60.824	K Factor = 8.78	