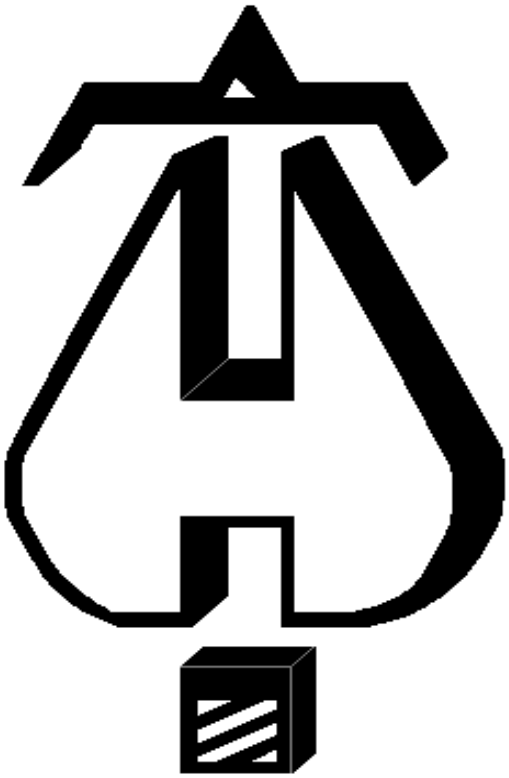


. . . Fire Protection by Computer Design

FREEDOM FIRE PROTECTION INC.
209 QUAKER RIDGE ROAD
CASCO, MAINE 04015
207-627-4109

Job Name : CPORT CREDIT UNION
Building : 285 FOREST AVENUE
Location : PORTLAND, MAINE 04101
System : #1 AREA #1
Contract :
Data File : CPORT CREDIT UNION HC.WXF

Hydraulic Design Information Sheet

Name - CPORT CREDIT UNION Date - 2/22/12
Location - PORTLAND, MAINE 04101
Building - 285 FOREST AVENUE System No. - #1 AREA #1
Contractor - Contract No. -
Calculated By - MIKE NOBLIT Drawing No. - FP-2
Construction: (X) Combustible ( ) Non-Combustible Ceiling Height - 9'-0"
Occupancy - CREDIT UNION

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 - AREA	System Type	Sprinkler/Nozzle
Density - .10	(X) Wet	Make TYCO
Area Per Sprinkler - 130	( ) Dry	Model TY-FRB
Elevation at Highest Outlet - 23'-10"	( ) Deluge	Size 1/2"
Hose Allowance - Inside -	( ) Preaction	K-Factor 5.6
Rack Sprinkler Allowance -	( ) Other	Temp.Rat.155
Hose Allowance - Outside - 100		

Note

Calculation Summary: Flow Required - 408.977 Press Required - 82.365 At Test
C-Factor Used: 120 Overhead 140 Underground

WATER SUPPLY

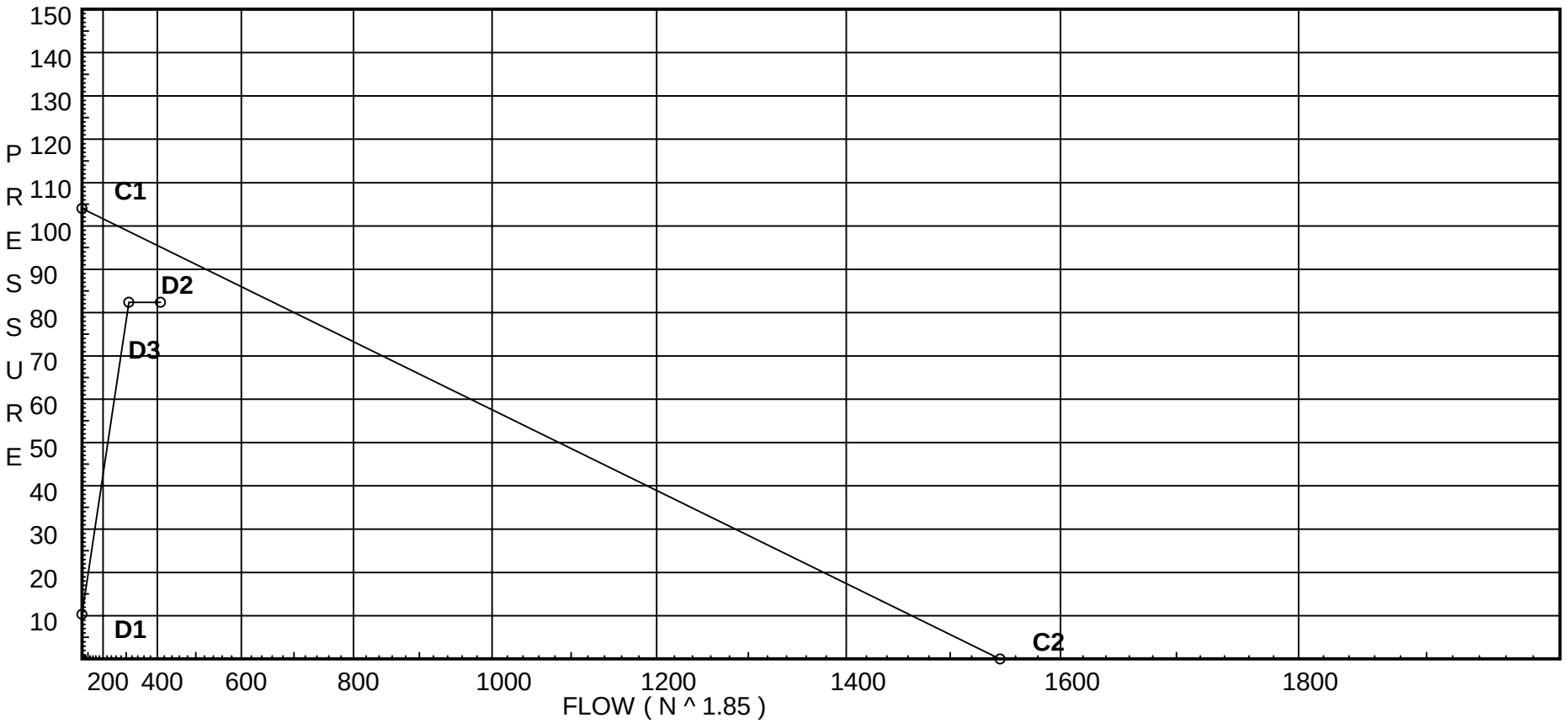
Water Flow Test:	Pump Data:	Tank or Reservoir:
Date of Test - 8/5/11		Cap. -
Time of Test -	Rated Cap.-	Elev.-
Static Press - 104	@ Press -	
Residual Press - 0	Elev. -	Well
Flow - 1546		Proof Flow
Elevation -		

Location -

Source of Information - PORTLAND WATER DISTRICT

City Water Supply:
C1 - Static Pressure : 104
C2 - Residual Pressure: 0
C2 - Residual Flow : 1546

Demand:
D1 - Elevation : 10.321
D2 - System Flow : 308.977
D2 - System Pressure : 82.365
Hose (Adj City) :
Hose (Demand) : 100
D3 - System Demand : 408.977
Safety Margin : 12.750



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
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
Zac	Ames 2000SS	Fitting generates a Fixed Loss Based on Flow																			

Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
102	19.166	5.6	15.55	na	22.08	0.1	130	7.0
101	19.166	5.6	16.95	na	23.06	0.1	130	7.0
34	19.166		18.76	na				
104	19.166	5.6	15.78	na	22.25	0.1	130	7.0
103	19.166	5.6	17.21	na	23.23	0.1	130	7.0
33	19.166		19.04	na				
32	19.166		23.5	na				
31	19.166		26.31	na				
30	18.33		28.81	na				
105	23.83	5.6	18.15	na	23.86	0.1	130	7.0
106	23.83	5.6	10.36	na	18.02	0.1	130	7.0
107	23.83	5.6	7.87	na	15.71	0.1	130	7.0
108	23.83	5.6	7.47	na	15.3	0.1	130	7.0
17	23.83		8.34	na				
16	23.83		10.98	na				
15	23.83		19.18	na				
14	23.83		20.53	na				
109	23.83	5.6	17.85	na	23.66	0.1	130	7.0
110	23.83	5.6	11.97	na	19.38	0.1	130	7.0
111	23.83	5.6	9.05	na	16.85	0.1	130	7.0
112	23.83	5.6	9.1	na	16.89	0.1	130	7.0
20	23.83		9.57	na				
19	23.83		12.71	na				
18	23.83		18.92	na				
113	23.83	5.6	13.89	na	20.87	0.1	130	7.0
114	23.83	5.6	10.04	na	17.75	0.1	130	7.0
115	23.83	5.6	7.42	na	15.25	0.1	130	7.0
116	23.83	5.6	7.0	na	14.82	0.1	130	7.0
13	23.83		7.87	na				
12	23.83		10.63	na				
11	23.83		14.87	na				
10	23.83		17.39	na				
9	23.83		20.77	na				
8	23.83		24.36	na				
7	23.83		26.89	na				
6	18.33		31.5	na				
5	11.33		42.63	na				
4	11.33		51.51	na				
3	11.33		65.19	na				
2	11.33		69.79	na				
1	0.0		81.06	na				
TEST	0.0		82.37	na	100.0			

The maximum velocity is 27.13 and it occurs in the pipe between nodes 6 and 5

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes ******
102	22.08	1.049		0.0	9.000	15.548		K Factor = 5.60
to		120		0.0	0.0	0.0		
101	22.08	0.1562		0.0	9.000	1.406		Vel = 8.20
101	23.06	1.049	1E	2.0	1.083	16.954		K Factor = 5.60
to		120		0.0	2.000	0.0		
34	45.14	0.5868		0.0	3.083	1.809		Vel = 16.76
34	0.0	1.049	1T	5.0	3.083	18.763		
to		120		0.0	5.000	0.0		
32	45.14	0.5867		0.0	8.083	4.742		Vel = 16.76
	0.0							
	45.14					23.505		K Factor = 9.31
104	22.25	1.049		0.0	9.000	15.783		K Factor = 5.60
to		120		0.0	0.0	0.0		
103	22.25	0.1584		0.0	9.000	1.426		Vel = 8.26
103	23.23	1.049	1E	2.0	1.083	17.209		K Factor = 5.60
to		120		0.0	2.000	0.0		
33	45.48	0.5949		0.0	3.083	1.834		Vel = 16.88
33	0.0	1.049		0.0	7.500	19.043		
to		120		0.0	0.0	0.0		
32	45.48	0.5949		0.0	7.500	4.462		Vel = 16.88
32	45.14	1.38	1E	3.0	2.000	23.505		
to		120		0.0	3.000	0.0		
31	90.62	0.5602		0.0	5.000	2.801		Vel = 19.44
31	0.0	1.38	1E	3.0	0.830	26.306		
to		120		0.0	3.000	0.362		
30	90.62	0.5601		0.0	3.830	2.145		Vel = 19.44
30	0.0	1.61	1T	8.0	2.166	28.813		
to		120		0.0	8.000	0.0		
6	90.62	0.2644		0.0	10.166	2.688		Vel = 14.28
	0.0							
	90.62					31.501		K Factor = 16.15
105	23.86	1.049	1T	5.0	0.750	18.147		K Factor = 5.60
to		120		0.0	5.000	0.0		
15	23.86	0.1803		0.0	5.750	1.037		Vel = 8.86
	0.0							
	23.86					19.184		K Factor = 5.45
106	18.02	1.049	1T	5.0	0.750	10.360		K Factor = 5.60
to		120		0.0	5.000	0.0		
16	18.02	0.1073		0.0	5.750	0.617		Vel = 6.69
	0.0							
	18.02					10.977		K Factor = 5.44

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes ******
107	15.71	1.049	1T	5.0	0.583	7.874		K Factor = 5.60
to		120		0.0	5.000	0.0		
17	15.71	0.0833		0.0	5.583	0.465		Vel = 5.83
	0.0							
	15.71					8.339		K Factor = 5.44
108	15.30	1.049		0.0	11.000	7.467		K Factor = 5.60
to		120		0.0	0.0	0.0		
17	15.3	0.0793		0.0	11.000	0.872		Vel = 5.68
17	15.72	1.049		0.0	9.000	8.339		
to		120		0.0	0.0	0.0		
16	31.02	0.2931		0.0	9.000	2.638		Vel = 11.52
16	18.02	1.049		0.0	12.000	10.977		
to		120		0.0	0.0	0.0		
15	49.04	0.6839		0.0	12.000	8.207		Vel = 18.20
15	23.86	1.38	1E	3.0	0.583	19.184		
to		120		0.0	3.000	0.0		
14	72.9	0.3745		0.0	3.583	1.342		Vel = 15.64
14	0.0	1.38	1T	6.0	4.250	20.526		
to		120		0.0	6.000	0.0		
8	72.9	0.3745		0.0	10.250	3.839		Vel = 15.64
	0.0							
	72.90					24.365		K Factor = 14.77
109	23.66	1.049	1T	5.0	1.000	17.852		K Factor = 5.60
to		120		0.0	5.000	0.0		
18	23.66	0.1777		0.0	6.000	1.066		Vel = 8.78
	0.0							
	23.66					18.918		K Factor = 5.44
110	19.38	1.049	1T	5.0	1.000	11.974		K Factor = 5.60
to		120		0.0	5.000	0.0		
19	19.38	0.1228		0.0	6.000	0.737		Vel = 7.19
	0.0							
	19.38					12.711		K Factor = 5.44
111	16.85	1.049	1T	5.0	0.500	9.051		K Factor = 5.60
to		120		0.0	5.000	0.0		
20	16.85	0.0947		0.0	5.500	0.521		Vel = 6.26
	0.0							
	16.85					9.572		K Factor = 5.45
112	16.89	1.049		0.0	5.000	9.097		K Factor = 5.60
to		120		0.0	0.0	0.0		
20	16.89	0.0950		0.0	5.000	0.475		Vel = 6.27
20	16.85	1.049		0.0	9.166	9.572		
to		120		0.0	0.0	0.0		
19	33.74	0.3425		0.0	9.166	3.139		Vel = 12.53

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes ******
19	19.38	1.049		0.0	7.830	12.711		
to		120		0.0	0.0	0.0		
18	53.12	0.7927		0.0	7.830	6.207		Vel = 19.72
18	23.66	1.38		0.0	4.500	18.918		
to		120		0.0	0.0	0.0		
9	76.78	0.4122		0.0	4.500	1.855		Vel = 16.47
	0.0							
	76.78					20.773		K Factor = 16.85
113	20.87	1.049	1T	5.0	2.000	13.889		K Factor = 5.60
to		120		0.0	5.000	0.0		
11	20.87	0.1407		0.0	7.000	0.985		Vel = 7.75
	0.0							
	20.87					14.874		K Factor = 5.41
114	17.75	1.049	1T	5.0	0.660	10.042		K Factor = 5.60
to		120		0.0	5.000	0.0		
12	17.75	0.1042		0.0	5.660	0.590		Vel = 6.59
	0.0							
	17.75					10.632		K Factor = 5.44
115	15.25	1.049	1T	5.0	0.660	7.419		K Factor = 5.60
to		120		0.0	5.000	0.0		
13	15.25	0.0788		0.0	5.660	0.446		Vel = 5.66
	0.0							
	15.25					7.865		K Factor = 5.44
116	14.82	1.049		0.0	11.583	7.000		K Factor = 5.60
to		120		0.0	0.0	0.0		
13	14.82	0.0747		0.0	11.583	0.865		Vel = 5.50
13	15.25	1.049		0.0	10.000	7.865		
to		120		0.0	0.0	0.0		
12	30.07	0.2767		0.0	10.000	2.767		Vel = 11.16
12	17.75	1.049		0.0	6.500	10.632		
to		120		0.0	0.0	0.0		
11	47.82	0.6526		0.0	6.500	4.242		Vel = 17.75
11	20.87	1.38	1E	3.0	4.500	14.874		
to		120		0.0	3.000	0.0		
10	68.69	0.3355		0.0	7.500	2.516		Vel = 14.73
10	0.0	1.38	1T	6.0	4.083	17.390		
to		120		0.0	6.000	0.0		
9	68.69	0.3355		0.0	10.083	3.383		Vel = 14.73
9	76.77	1.61		0.0	5.660	20.773		
to		120		0.0	0.0	0.0		
8	145.46	0.6346		0.0	5.660	3.592		Vel = 22.92

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes ******
8	72.90	2.067	1E	5.0	1.330	24.365		
to		120		0.0	5.000	0.0		
7	218.36	0.3984		0.0	6.330	2.522		Vel = 20.88
7	0.0	2.067		0.0	5.600	26.887		
to		120		0.0	0.0	2.382		
6	218.36	0.3986		0.0	5.600	2.232		Vel = 20.88
6	90.62	2.157	1E	6.153	7.000	31.501		
to		120		0.0	6.153	3.032		
5	308.98	0.6154		0.0	13.153	8.094		Vel = 27.13
5	0.0	2.157	1T	12.307	2.125	42.627		
to		120		0.0	12.307	0.0		
4	308.98	0.6154		0.0	14.432	8.881		Vel = 27.13
4	0.0	2.157	1E	6.153	16.083	51.508		
to		120		0.0	6.153	0.0		
3	308.98	0.6154		0.0	22.236	13.685		Vel = 27.13
3	0.0	2.635		0.0	26.330	65.193		
to		140		0.0	0.0	0.0		
2	308.98	0.1746		0.0	26.330	4.596		Vel = 18.18
2	0.0	2.469	1Zac	0.0	10.330	69.789		
to		140		0.0	0.0	8.792		* Fixed loss = 3.885
1	308.98	0.2397		0.0	10.330	2.476		Vel = 20.71
1	0.0	4.1	1E	14.534	50.000	81.057		
to		140		0.0	14.534	0.0		
TEST	308.98	0.0203		0.0	64.534	1.308		Vel = 7.51
	100.00							Qa = 100.00
	408.98					82.365		K Factor = 45.06