Reviewed for Code Compliance
Inspections Division
Approved with Conditions

Date: 04/21/16

. . . Fire Protection by Computer Design

Eastern Fire Protection
170 Kitty Hawk Ave.
P.O. Box 1390
Auburn, Maine, 04211
207-784-1507

Job Name	:	MARGINAL WAY #5378 BUILDING A
Drawing	:	1 OF 1
Location	:	KENNEBEC ST., PORTLAND, MAINE
Remote Area	:	BUILDING A
Contract	:	5378
Data File	:	MARGINAL WAY #5378 BUILDING A.WXF

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HYDRAULIC CALCULATIONS
for

Project name: MARGINAL WAY #5378 BUILDING A
Location: KENNEBEC ST., PORTLAND, MAINE
Drawing no: 1 OF 1
Date: 10/29/15

Design

Remote area number: BUILDING A
Remote area location: TENANT SPACE 5, BUILDING A
Occupancy classification: ORDINARY HAZARD II
Density: .2 - Gpm/SqFt
Area of application: 1086 - SqFt
Coverage per sprinkler: 117 - SqFt
Type of sprinklers calculated: RELIABLE F1FR 3/4" K=8.0
No. of sprinklers calculated: 10
In-rack demand: - GPM
Hose streams: 250 - GPM
Total water required (including hose streams): 501.198 - GPM @ 56.56 - Psi
Type of system: WET
Volume of dry or preaction system: NA - Gal

Water supply information

Date: 09/13/2011
Location: HYDRANT LOCATED ON KENNEBEC STREET
Source: PORTLAND WATER DISTRICT

Name of contractor: Eastern Fire Protection
Address: 170 Kitty Hawk Ave. / P.O. Box 1390 / Auburn, Maine, 04211
Phone number: 207-784-1507
Name of designer: WAF
Authority having jurisdiction: STATE FIRE MARSHAL
Notes: (Include peaking information or gridded systems here.)
REMOTE AREA REDUCED PER NFPA 13 (2007)SECTION 11.2.3.2.3.1

Water Supply Curve C

Eastern Fire Protection
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City Water Supply:
C1 - Static Pressure : 106
C2 - Residual Pressure: 80
C2 - Residual Flow : 978

Demand:
D1 - Ele
D2 - Sy
D2 - Sy
Hose (
D3 - Sy
Safety Margin : 41.890

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Fittings Used Summary

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Fitting Legend

Abbrev.	Name	½	¾	1	1¼	1½	2	2½	3	3½	4	5	6	8	10	1	4
G	NFPA 13 Gate Valve	0	0	0	0	0	1	1	1	1	2	2	3	4	5	6	3
I	90' Grvd-Vic Elbow #10	0	0	2	3	4	3.5	6	5	8	7	8.5	10	13	17	2	0
L	NFPA 13 Long Turn Elbow	0.5	1	2	2	2	3	4	5	5	6	8	9	13	16	1	0
T	NFPA 13 90' Flow thru Tee	3	4	5	6	8	10	12	15	17	20	25	30	35	50	6	21
Zcb	Colt C200 Vert Butt	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.

Flow Summary - NFPA 2007

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SUPPLY ANALYSIS

Node at Source	Static Pressure	Residual Pressure	Flow	Available Pressure	Total Demand
TEST	106.0	80	978.0	98.451	501.2

NODE ANALYSIS

Node Tag	Elevation	Node Type	Pressure at Node	Discharge at Node	Notes
S1	0.0	8	8.56	23.4	
100	128.66	7.59	9.51	23.4	K=K @ D1
101	128.66	7.59	9.68	23.6	K=K @ D1
102	128.66	7.59	10.22	24.25	K=K @ D1
103	128.66	7.59	11.36	25.57	K=K @ D1
104	128.66	7.59	13.71	28.09	K=K @ D1
105	128.66	7.59	9.72	23.66	K=K @ D1
106	128.66	7.59	9.89	23.86	K=K @ D1
107	128.66	7.59	10.44	24.52	K=K @ D1
108	128.66	7.59	11.61	25.85	K=K @ D1
109	128.66	7.59	14.0	28.39	K=K @ D1
A	126.91		30.86		
B	126.91		31.39		
TOR	126.91		40.23		
BASE	113.33		54.56		
TEST	110.0		56.56	250.0	

EOD

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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	*
S1	0	8.00	23.40	1	T	5.0	0.500	120	8.556	
to						0.0	5.000		0.0	
D1	0		23.4	1.049		0.0	5.500	0.1740	0.957	Vel = 8.69
			0.0							
D1			23.40						9.513	K Factor = 7.59
100	128.660	7.59	23.40	1.5		0.0	9.540	120	9.513	K = K @ D1
to						0.0	0.0		0.0	
101	128.660		23.4	1.682		0.0	9.540	0.0174	0.166	Vel = 3.38
101	128.660	7.59	23.60	1.5		0.0	8.460	120	9.679	K = K @ D1
to						0.0	0.0		0.0	
102	128.660		47.0	1.682		0.0	8.460	0.0635	0.537	Vel = 6.79
102	128.660	7.59	24.25	1.5		0.0	8.370	120	10.216	K = K @ D1
to						0.0	0.0		0.0	
103	128.660		71.25	1.682		0.0	8.370	0.1369	1.146	Vel = 10.29
103	128.660	7.59	25.58	1.5		0.0	9.710	120	11.362	K = K @ D1
to						0.0	0.0		0.0	
104	128.660		96.83	1.682		0.0	9.710	0.2415	2.345	Vel = 13.98
104	128.660	7.59	28.09	1.5	2T	19.799	22.580	120	13.707	K = K @ D1
to						0.0	19.799		0.758	
A	126.910		124.92	1.682		0.0	42.379	0.3869	16.398	Vel = 18.04
			0.0							
A			124.92						30.863	K Factor = 22.49
105	128.660	7.59	23.66	1.5		0.0	9.540	120	9.723	K = K @ D1
to						0.0	0.0		0.0	
106	128.660		23.66	1.682		0.0	9.540	0.0178	0.170	Vel = 3.42
106	128.660	7.59	23.86	1.5		0.0	8.460	120	9.893	K = K @ D1
to						0.0	0.0		0.0	
107	128.660		47.52	1.682		0.0	8.460	0.0648	0.548	Vel = 6.86
107	128.660	7.59	24.52	1.5		0.0	8.370	120	10.441	K = K @ D1
to						0.0	0.0		0.0	
108	128.660		72.04	1.682		0.0	8.370	0.1398	1.170	Vel = 10.40
108	128.660	7.59	25.85	1.5		0.0	9.710	120	11.611	K = K @ D1
to						0.0	0.0		0.0	
109	128.660		97.89	1.682		0.0	9.710	0.2464	2.393	Vel = 14.13
109	128.660	7.59	28.39	1.5	2T	19.799	22.330	120	14.004	K = K @ D1
to						0.0	19.799		0.758	
B	126.910		126.28	1.682		0.0	42.129	0.3948	16.632	Vel = 18.23
			0.0							
B			126.28						31.394	K Factor = 22.54
A	126.910		124.92	2.5		0.0	12.210	120	30.863	
to						0.0	0.0		0.0	
B	126.910		124.92	2.635		0.0	12.210	0.0435	0.531	Vel = 7.35
B	126.910		126.28	2.5	2l	16.474	39.340	120	31.394	
to						0.0	16.474		0.0	
TOR	126.910		251.2	2.635		0.0	55.814	0.1583	8.835	Vel = 14.78

Final Calculations - Hazen-Williams

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TOR	126.910		0.0	2.5	Zcb	0.0	13.580	120	40.229	
to						0.0	0.0		12.177	* * Fixed Loss = 6.295
BASE	113.330		251.2	2.635		0.0	13.580	0.1582	2.149	Vel = 14.78
BASE	113.330		0.0	6	G	4.304	210.000	140	54.555	
to					3L	38.734	86.075		1.442	
TEST	110		251.2	6.16	T	43.037	296.075	0.0019	0.564	Vel = 2.70
			250.00							Qa = 250.00
TEST			501.20						56.561	K Factor = 66.64