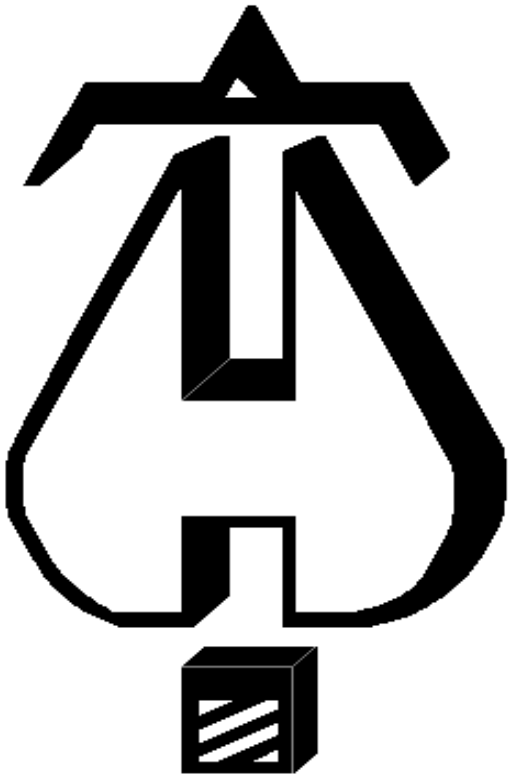


. . . Fire Protection by Computer Design

ACCENDO FIRE PROTECTION LLC
38 ADDITON RD
GREENE, MAINE 04236
207-946-6182

Job Name	:	502 DEERING CENTER MERCANTILE
Drawing	:	1 OF 1
Location	:	PORTLAND, MAINE
Remote Area	:	1
Contract	:	17-1010
Data File	:	17-1019 205 DEERING MERCANTILE.WXF

HYDRAULIC CALCULATIONS
for

Project name: 502 DEERING CENTER MERCANTILE
Location: PORTLAND, MAINE
Drawing no: 1 OF 1
Date: 6/20/17

Design

Remote area number: 1
Remote area location: REAR COMMERCIAL
Occupancy classification: OH II
Density: .2 - Gpm/SqFt
Area of application: 1059 - SqFt
Coverage per sprinkler: 120 - SqFt
Type of sprinklers calculated: 1/2" 5.6K RECESSED PENDENTS
No. of sprinklers calculated: 12
In-rack demand: - GPM
Hose streams: 250 - GPM
Total water required (including hose streams): 573.91 - GPM @ 55.6825 - Psi
Type of system: WET
Volume of dry or preaction system: - Gal

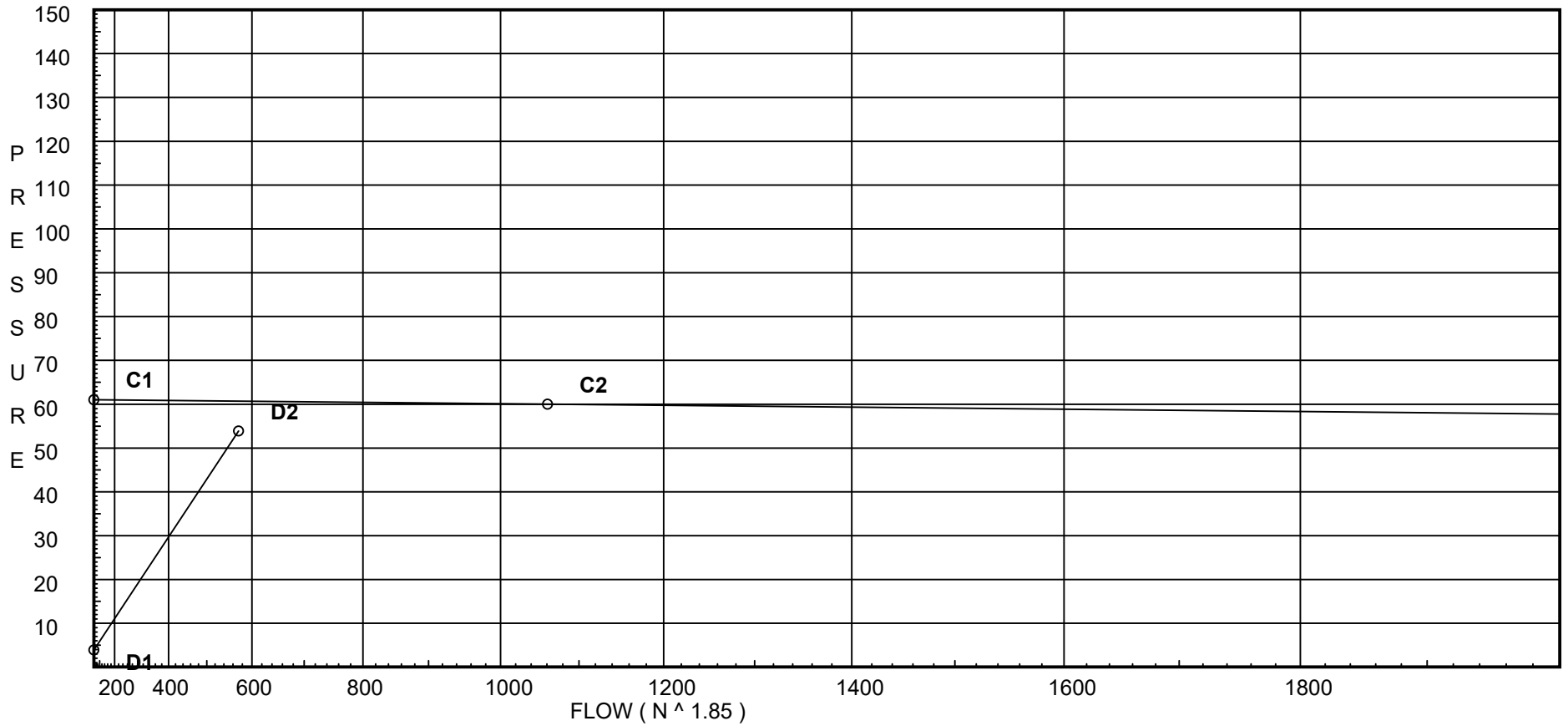
Water supply information

Date: ?
Location: CORNER OF HARTLEY AND STEVENS AVE
Source: PORTLAND WATER DISTRICT

Name of contractor: ACCENDO FIRE PROTECTION LLC
Address: 38 ADDITON RD / / GREENE, MAINE 04236
Phone number: 207-946-6182
Name of designer: JWD
Authority having jurisdiction: SFMO, PORTLAND FIRE
Notes: (Include peaking information or gridded systems here.) HYDRAULICALLY REMOTE AREA
REVISED PER NFPA 13 2016 ED. SEC. 11.2.3.2.3.1

City Water Supply:
C1 - Static Pressure : 61
C2 - Residual Pressure: 60
C2 - Residual Flow : 1061

Demand:
D1 - Elevation : 3.898
D2 - System Flow : 572.149
D2 - System Pressure : 53.894
Hose (Demand) : _____
D3 - System Demand : 572.149
Safety Margin : 6.787



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	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
G	NFPA 13 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
L	NFPA 13 Long Turn Elbow	0.5	1	2	2	2	3	4	5	5	6	8	9	13	16	18	24	27	30	34	40
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
Zca	Colt C200 Horz 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.

Pressure / Flow Summary - STANDARD

Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
DROP	0.0	5.6	18.37	na	24.0	0.2	120	7.0
DR	0.0	5.6	7.0	na	14.82	0.1	120	7.0
D1	0.0	5.6	7.0	na	14.82	0.1	120	7.0
1	109.0	K = K @ LINE	37.91	na	25.53			
2	109.0	K = K @ LINE	38.16	na	25.61			
3	109.0	K = K @ LINE	35.29	na	24.63			
4	109.0	K = K @ LINE	35.52	na	24.71			
5	109.0	K = K @ LINE	36.36	na	25.0			
6	109.0	K = K @ LINE	33.5	na	24.0			
7	109.0	K = K @ LINE	33.72	na	24.08			
8	109.0	K = K @ LINE	34.25	na	24.27			
9	109.0	K = K @ LN	34.95	na	31.7			
10A	109.0	K = K @ L1	34.72	na	32.48			
15	109.0	5.6	37.23	na	34.17	0.15	120	7.0
10	109.0		37.89	na				
11	109.0		37.91	na				
12	109.0		38.06	na				
13	109.0		39.01	na				
14	109.0		39.08	na				
16	109.0	K = K @ LINE	39.2	na	25.96			
17	108.0		39.66	na				
18	108.0		40.3	na				
TOR	108.0		40.93	na				
BFP	108.0		41.11	na				
BASE	101.0		50.19	na				
TEST	100.0		53.89	na				

The maximum velocity is 15.02 and it occurs in the pipe between nodes 9 and 10

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 ******
DROP	0	5.60	24.00	1	T	5.0	78.000	120	18.367	
to						0.0	5.000		0.0	
LINE	0		24.0	1.049		0.0	83.000	0.1823	15.134	Vel = 8.91
			0.0							
LINE			24.00						33.501	K Factor = 4.15
DR	0	5.60	14.82	1	E	2.0	1.500	120	7.000	
to					T	5.0	7.000		0.0	
LN	0		14.82	1.049		0.0	8.500	0.0747	0.635	Vel = 5.50
			0.0							
LN			14.82						7.635	K Factor = 5.36
D1	0	5.60	14.82	1	E	2.0	1.000	120	7.000	
to						0.0	2.000		0.0	
L1	0		14.82	1.049		0.0	3.000	0.0747	0.224	Vel = 5.50
			0.0							
L1			14.82						7.224	K Factor = 5.51
1	109	4.15	25.53	1.5		0.0	12.000	120	37.912	K = K @ LINE
to						0.0	0.0		0.0	
2	109		25.53	1.682		0.0	12.000	0.0205	0.246	Vel = 3.69
2	109	4.15	25.62	1.5	T	9.9	1.625	120	38.158	K = K @ LINE
to						0.0	9.900		0.0	
13	109		51.15	1.682		0.0	11.525	0.0742	0.855	Vel = 7.39
			0.0							
13			51.15						39.013	K Factor = 8.19
3	109	4.15	24.63	1.5		0.0	12.000	120	35.294	K = K @ LINE
to						0.0	0.0		0.0	
4	109		24.63	1.682		0.0	12.000	0.0192	0.230	Vel = 3.56
4	109	4.15	24.72	1.5		0.0	12.000	120	35.524	K = K @ LINE
to						0.0	0.0		0.0	
5	109		49.35	1.682		0.0	12.000	0.0694	0.833	Vel = 7.13
5	109	4.15	25.00	1.5	T	9.9	1.625	120	36.357	K = K @ LINE
to						0.0	9.900		0.0	
12	109		74.35	1.682		0.0	11.525	0.1482	1.708	Vel = 10.74
			0.0							
12			74.35						38.065	K Factor = 12.05
6	109	4.15	24.00	1.5		0.0	12.000	120	33.501	K = K @ LINE
to						0.0	0.0		0.0	
7	109		24.0	1.682		0.0	12.000	0.0183	0.220	Vel = 3.47
7	109	4.15	24.08	1.5		0.0	8.000	120	33.721	K = K @ LINE
to						0.0	0.0		0.0	
8	109		48.08	1.682		0.0	8.000	0.0661	0.529	Vel = 6.94
8	109	4.15	24.27	1.5		0.0	5.000	120	34.250	K = K @ LINE
to						0.0	0.0		0.0	
9	109		72.35	1.682		0.0	5.000	0.1408	0.704	Vel = 10.45
9	109	5.36	31.70	1.5	T	9.9	0.750	120	34.954	K = K @ LN
to						0.0	9.900		0.0	
10	109		104.05	1.682		0.0	10.650	0.2759	2.938	Vel = 15.02
			0.0							
10			104.05						37.892	K Factor = 16.90

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 ******
10A	109	5.51	32.48	1	T	5.0	5.000	120	34.715	K = K @ L1
to						0.0	5.000		0.0	
11	109		32.48	1.049		0.0	10.000	0.3191	3.191	Vel = 12.06
			0.0							
11			32.48						37.906	K Factor = 5.28
15	109	5.60	34.17	1	T	5.0	2.540	120	37.228	
to						0.0	5.000		0.433	
18	108		34.17	1.049		0.0	7.540	0.3505	2.643	Vel = 12.68
			0.0							
18			34.17						40.304	K Factor = 5.38
10	109		104.05	3		0.0	1.290	120	37.892	
to						0.0	0.0		0.0	
11	109		104.05	3.26		0.0	1.290	0.0109	0.014	Vel = 4.00
11	109		32.48	3		0.0	8.710	120	37.906	
to						0.0	0.0		0.0	
12	109		136.53	3.26		0.0	8.710	0.0183	0.159	Vel = 5.25
12	109		74.35	3	T	20.159	4.830	120	38.065	
to						0.0	20.159		0.0	
14	109		210.88	3.26		0.0	24.989	0.0406	1.015	Vel = 8.11
			0.0							
14			210.88						39.080	K Factor = 33.73
13	109		51.15	3	T	20.159	2.500	120	39.013	
to						0.0	20.159		0.0	
14	109		51.15	3.26		0.0	22.659	0.0030	0.067	Vel = 1.97
14	109		210.87	4		0.0	7.040	120	39.080	
to						0.0	0.0		0.0	
16	109		262.02	4.26		0.0	7.040	0.0165	0.116	Vel = 5.90
16	109	4.15	25.96	4		0.0	1.500	120	39.196	K = K @ LINE
to						0.0	0.0		0.433	
17	108		287.98	4.26		0.0	1.500	0.0200	0.030	Vel = 6.48
17	108		0.0	4	T	26.334	6.500	120	39.659	
to						0.0	26.334		0.0	
18	108		287.98	4.26		0.0	32.834	0.0196	0.645	Vel = 6.48
18	108		34.17	4	2I	18.434	7.500	120	40.304	
to						0.0	18.434		0.0	
TOR	108		322.15	4.26		0.0	25.934	0.0241	0.626	Vel = 7.25
TOR	108		0.0	4		0.0	7.500	120	40.930	
to						0.0	0.0		0.0	
BFP	108		322.15	4.26		0.0	7.500	0.0243	0.182	Vel = 7.25
BFP	108		0.0	4	Zca	0.0	2.000	120	41.112	
to						0.0	0.0		9.029	* * Fixed Loss = 5.997
BASE	101		322.15	4.26		0.0	2.000	0.0240	0.048	Vel = 7.25
BASE	101		0.0	4	2L	17.44	100.000	140	50.189	
to					T	29.067	49.414		0.433	
TEST	100		322.15	4.1	G	2.907	149.414	0.0219	3.272	Vel = 7.83
			0.0							
TEST			322.15						53.894	K Factor = 43.88