



Reviewed for Code Compliance
Inspections Division
Approved with Conditions

Date: 12/27/16

... Fire Protection by Computer Design

High Tech Fire Protection
84 Hackett Mills Rd
PO Box 156
Poland, ME, 04274
207-998-2551

Job Name : BAYSIDE BOWL
Building : 1
Location : 58 Alder Street
System : 3
Contract : 033116-2
Data File : Ordinary Calc.WXF

HYDRAULI



Project name: BAYSIDE BOWL
Location: 58 Alder Street
Drawing no: 1
Date: 10-7-16

Design

Remote area number: 3
Remote area location: First Floor Kitchen /
Occupancy classification: Ordinary Group
Density: .15 - Gpm/SqFt
Area of application: 1015 - SqFt
Coverage per sprinkler: 130 - SqFt
Type of sprinklers calculated: QR Uprights
No. of sprinklers calculated: 14
In-rack demand: - GPM
Hose streams: 250 - GPM
Total water required (including hose stream):
Type of system: NFPA 13 Wet
Volume of dry or preaction system: - Gal

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Water supply information

Date: 10-28-2014
Location: Corner of Kennebec St and Preble St
Source: Portland Water District

Name of contractor: High Tech Fire Protection
Address: 84 Hackett Mills Rd / PO Box 156 / Poland, ME, 04274
Phone number: 207-998-2551
Name of designer: Ed Pennell
Authority having jurisdiction: Portland Fire Department
Notes: (Include peaking information or gridded systems here.)

Water Supply Curve (C)

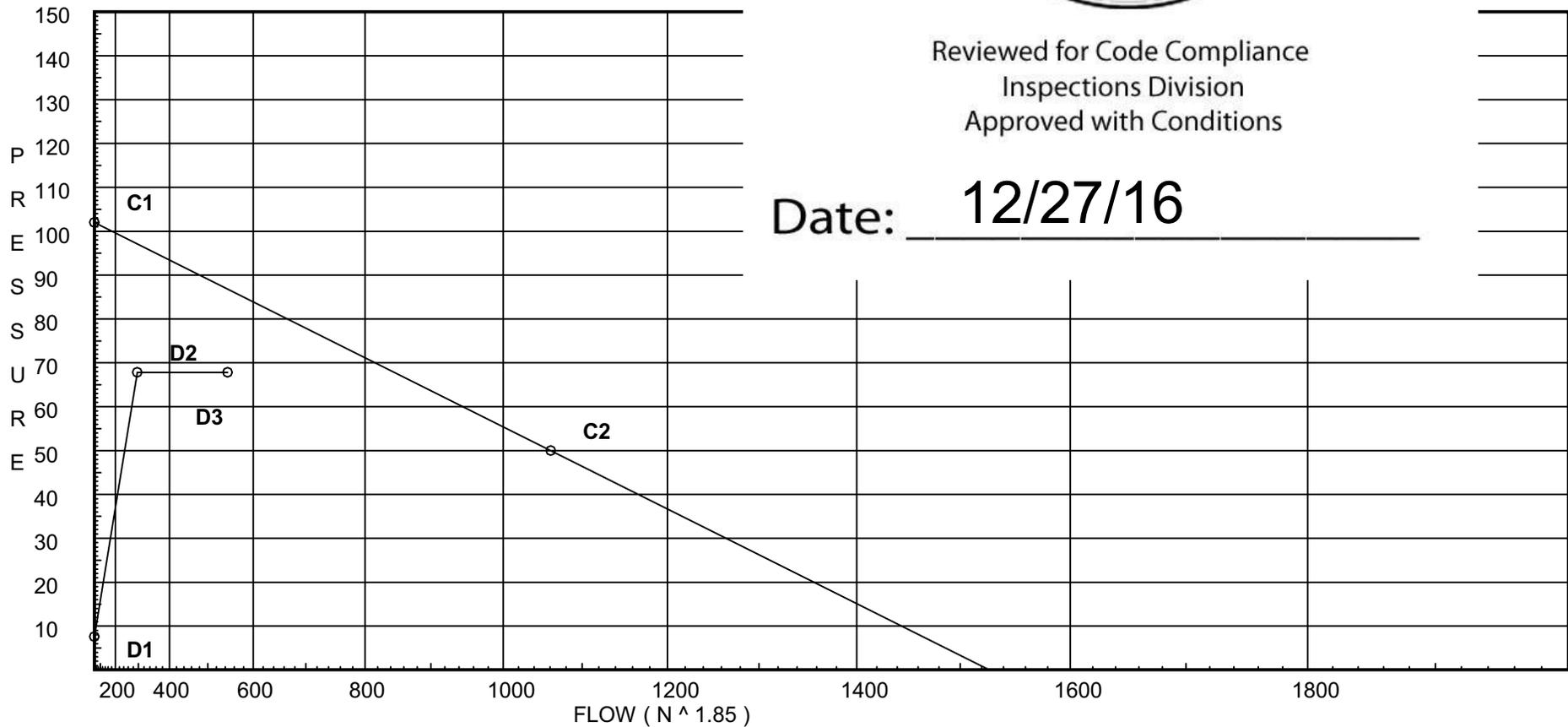
High Tech Fire Protection
BAYSIDE BOWL



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City Water Supply:
C1 - Static Pressure : 102
C2 - Residual Pressure: 50
C2 - Residual Flow : 1061

.579
5.705
7.802
0
5.705
3.999



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Fittings Used Summary

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Fitting Legend		1/2	3/4	1	1 1/4	1 1/2	2
Abbrev.	Name						
E	NFPA 13 90' Standard Elbow	1	2	2	3	4	5
Fsp	Flow Switch Potter VSR	Fitting generates a Fixed Loss Based on Flow					
G	NFPA 13 Gate Valve	0	0	0	0	0	1
T	NFPA 13 90' Flow thru Tee	3	4	5	6	8	10
V	90' Ell Firelock #001	0	0	0	0	3.5	3.5
X	90'Tee-BranchFirelock002	0	0	0	0	8	8.5

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 vario
Equivalent lengths shown are standard for actual diameters of Sched 40 pipe
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.



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20 24

50 61

11 13

101 121

0 0

0 0

Pressure / Flow Summary - STANDARD

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Node No.	Elevation	K-Fact	Pt Actual
DP1	1.0	5.6	12.13
O1	17.5	5.6	12.13
O2	17.5	5.6	13.02
O3	16.8		14.12
O4	16.8		16.76
P*	0.0		19.7
O5	17.5	5.6	12.17
O6	17.5	5.6	13.07
O7	16.8		14.17
O8	16.8		16.82
O9	17.5	5.6	12.32
O10	17.5	5.6	13.23
O11	16.8		14.34
O12	16.8		17.02
O13	17.5	5.6	12.78
O14	17.5	5.6	13.51
O15	16.8		14.64
O16	16.8		17.39
O17	17.5	5.6	16.31
O18	16.8		17.1
O19	16.8		18.03
O20	17.5	5.6	17.18
O21	16.8		18.0
O22	16.8		18.97
O23	17.5	K = K @ EQ01	15.83
O24	17.5	K = K @ EQ01	16.21
O25	16.8		19.85
O27	17.5	K = K @ EQ01	17.38
O28	17.5	K = K @ EQ01	17.79
O29	16.8		21.73
O31	17.4		25.19
O32	17.4		26.61
W19	17.4		51.61
W20	6.6		56.46
W21	6.6		56.53
TOR	1.0		59.0
BOR	-1.0		66.87
UG1	-1.0		67.1
UG2	-1.0		67.86
UG3	-1.0		68.16
TEST	0.0		67.8



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na	
na	21.79
na	22.05
na	
na	22.83
na	23.1
na	
na	250.0

The maximum velocity is 17.4 and it occurs in the pipe between nodes O29 and O31

Final Calculations - Hazen-Williams

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Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.				
DP1	19.50	1.049						
to		120.0						
EQ01	19.5	0.1250						
	0.0							
	19.50							
O1	19.50	1.049	1T	5.0				
to		120.0						
O3	19.5	0.1242						
	0.0							
	19.50							
O2	20.21	1.049	1T	5.0				
to		120.0						
O3	20.21	0.1327						
	0.0							
	19.50							
O3	19.50	1.049	1T	5.0				
to		120.0						
O4	39.71	0.4628						
	0.0				12.000	16.755		
O4	0.0	2.635			0.0	0.0		
to		120.0						
O8	39.71	0.0052			12.000	0.063	Vel = 2.34	
	0.0							
	39.71					16.818	K Factor = 9.68	
O5	19.54	1.049	1T	5.0	8.600	12.172	K Factor = 5.60	
to		120.0			5.000	0.303		
O7	19.54	0.1246			13.600	1.695	Vel = 7.25	
	0.0							
	19.54					14.170	K Factor = 5.19	
O6	20.24	1.049	1T	5.0	1.000	13.069	K Factor = 5.60	
to		120.0			5.000	0.303		
O7	20.24	0.1330			6.000	0.798	Vel = 7.51	
	0.0							
	19.54							
O7	19.54	1.049	1T	5.0	0.700	14.170		
to		120.0			5.000	0.0		
O8	39.78	0.4646			5.700	2.648	Vel = 14.77	
	0.0							
	39.71							
O8	39.71	2.635			10.700	16.818		
to		120.0			0.0	0.0		
O12	79.49	0.0188			10.700	0.201	Vel = 4.68	
	0.0							
	79.49					17.019	K Factor = 19.27	
O9	19.66	1.049	1T	5.0	8.600	12.324	K Factor = 5.60	
to		120.0			5.000	0.303		
O11	19.66	0.1261			13.600	1.715	Vel = 7.30	
	0.0							
	19.66					14.342	K Factor = 5.19	
O10	20.37	1.049	1T	5.0	1.000	13.231	K Factor = 5.60	
to		120.0			5.000	0.303		
O11	20.37	0.1347			6.000	0.808	Vel = 7.56	
	0.0							
	19.66							
O11	19.66	1.049	1T	5.0	0.700	14.342		
to		120.0			5.000	0.0		
O12	40.03	0.4696			5.700	2.677	Vel = 14.86	

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O12 to O16	79.49 119.52	2.635 120.0 0.0401		0.0 0.0 0.0			
O13 to O15	20.02 20.02	1.097 120.0 0.1049	1T	6.217 0.0 0.0			
O14 to O15	20.59 20.59	1.049 120.0 0.1373	1T	5.0 0.0 0.0			
O15 to O16	20.02 40.61	1.049 120.0 0.4825	1T	5.0 0.0 0.0	5.700 2.750		Vel = 15.08
O16 to O19	119.52 160.13	2.635 120.0 0.0688		0.0 0.0 0.0	9.300 0.0 9.300	17.392 0.0 0.640	Vel = 9.42
O17 to O18	22.61 22.61	1.049 120.0 0.1633	1E	2.0 0.0 0.0	1.000 2.000 3.000	16.308 0.303 0.490	K Factor = 37.71 K Factor = 5.60
O18 to O19	0.0 22.61	1.049 120.0 0.1633	1T	5.0 0.0 0.0	0.700 5.000 5.700	17.101 0.0 0.931	Vel = 8.39
O19 to O22	160.13 182.74	2.635 120.0 0.0879		0.0 0.0 0.0	10.700 0.0 10.700	18.032 0.0 0.940	Vel = 8.39 Vel = 10.75
O20 to O21	23.21 23.21	1.049 120.0 0.1713	1E	2.0 0.0 0.0	1.000 2.000 3.000	17.178 0.303 0.514	K Factor = 41.95 K Factor = 5.60
O21 to O22	0.0 23.21	1.049 120.0 0.1714	1T	5.0 0.0 0.0	0.700 5.000 5.700	17.995 0.0 0.977	Vel = 8.62
O22 to O25	182.74 205.95	2.635 120.0 0.1096		0.0 0.0 0.0	8.000 0.0 8.000	18.972 0.0 0.877	Vel = 8.62 Vel = 12.12
O23 to O24	21.79 21.79	1.049 120.0 0.1524		0.0 0.0 0.0	2.500 0.0 2.500	15.831 0.0 0.381	K Factor = 46.23 K Factor @ node EQ01
O24 to O25	22.04 43.83	1.049 120.0 0.5557	1T	5.0 0.0 0.0	1.000 5.000 6.000	16.212 0.303 3.334	Vel = 8.09 K Factor @ node EQ01 Vel = 16.27

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Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.				
O25	205.95	2.635						0.0
to		120.0						0.0
O29	249.78	0.1567						0.0
	0.0							249.78
O27	22.82	1.049						0.0
to		120.0						0.0
O28	22.82	0.1664						0.0
O28	23.10	1.049	1T	5.0				0.0
to		120.0						0.0
O29	45.92	0.6057						0.0
O29	249.78	2.635	1V	5.903				0.0
to		120.0						0.0
O31	295.7	0.2140						0.0
O31	0.0	2.635	1V	5.903				0.0
to		120.0			5.903	0.0		0.0
O32	295.7	0.2141			6.603	1.414		Vel = 17.40
O32	0.0	2.635	1T	16.474	85.500	26.608		
to		120.0	1X	14.827	31.301	0.0		
W19	295.7	0.2141			116.801	25.002		Vel = 17.40
W19	0.0	6.357	2V	25.147	33.300	51.610		
to		120.0			0.0	25.147		4.677
W20	295.7	0.0029			58.447	0.172		Vel = 2.99
W20	0.0	6.357	1V	12.573	11.800	56.459		
to		120.0			0.0	12.573		0.0
W21	295.7	0.0030			24.373	0.072		Vel = 2.99
W21	0.0	6.357	1V	12.573	1.000	56.531		
to		120.0			0.0	12.573		2.425
TOR	295.7	0.0029			13.573	0.040		Vel = 2.99
TOR	0.0	6.357	1Fsp	0.0	3.000	58.996		
to		120.0			0.0	0.0		7.866
BOR	295.7	0.0030			3.000	0.009		* Fixed loss = 7 Vel = 2.99
BOR	0.0	6.16	1E	20.084	22.000	66.871		
to		140.0	1G	4.304	67.425	0.0		
UG1	295.7	0.0026	1T	43.037	89.425	0.230		Vel = 3.18
UG1	0.0	6.16	1T	43.037	250.000	67.101		
to		140.0			0.0	43.037		0.0
UG2	295.7	0.0026			293.037	0.755		Vel = 3.18
UG2	0.0	6.16	1T	43.037	75.000	67.856		
to		140.0			0.0	43.037		0.0
UG3	295.7	0.0026			118.037	0.304		Vel = 3.18
UG3	0.0	6.16	1E	20.084	5.000	68.160		
to		140.0	1G	4.304	24.388	-0.433		
TEST	295.7	0.0026			29.388	0.075		Vel = 3.18
	250.00							Qa = 250.00
	545.70					67.802		K Factor = 66.27