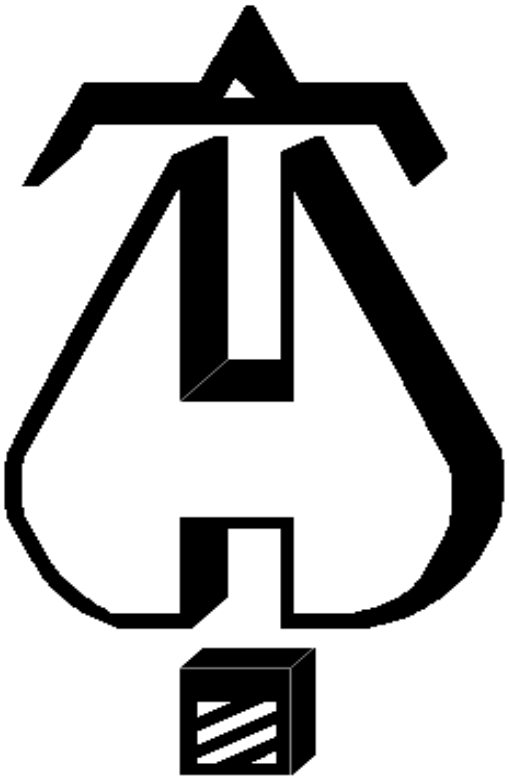

. . . Fire Protection by Computer Design

Dean and Allyn Inc
116 Lewiston Road
Your Street Address 2
Gray ME, 04039
(207)657-5646

Job Name	:	Portland Jetport Repipe '13 ZONE 1
Building	:	Parking Garage
Location	:	Portland Maine
System	:	Zone 3
Contract	:	C131180
Data File	:	PJPREPIPEzone3.WXF

HYDRAULIC CALCULATIONS
for

Project name: Portland Jetport Repipe '13
Location: Portland Maine
Drawing no: Parking Garage
Date: 12/31/2013

Design

Remote area number: Zone 3
Remote area location:
Occupancy classification:
Density: .15 - Gpm/SqFt
Area of application: 1950 - SqFt
Coverage per sprinkler: 120 - SqFt
Type of sprinklers calculated: Reliable F1FR56
No. of sprinklers calculated: 17
In-rack demand: - GPM
Hose streams: 0 - GPM
Total water required (including hose streams): 356.884 - GPM @ 55.5515 - Psi
Type of system: Dry
Volume of dry or preaction system: - Gal

Water supply information

Date:
Location:
Source:

Name of contractor: Dean and Allyn Inc
Address: 116 Lewiston Road Gray, ME 04039
Phone number: (207)657-564
Name of designer: Scott Cote
Authority having jurisdiction: Porltand Fire Department
Notes: (Include peaking information or gridded systems here.)

Fitting Legend

Abbrev.	Name	½	¾	1	1¼	1½	2	2½	3	3½	4	5	6	8	10	12	14	16	18	20	24
B	NFPA 13 Butterfly Valve	0	0	0	0	0	6	7	10	0	12	9	10	12	19	21	0	0	0	0	0
Dvc	Dry Vic 756	0	0	0	0	3	9	8	17	0	21	0	22	50	0	0	0	0	0	0	0
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
F	NFPA 13 45' Elbow	1	1	1	1	2	2	3	3	3	4	5	7	9	11	13	17	19	21	24	28
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
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
Ziu	Wilkins 975	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

Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
300	13.0	5.6	10.46	na	18.11	0.15	22	7.0
301	11.667	5.6	12.4	na	19.72	0.15	84	7.0
302	11.667	5.6	12.92	na	20.13	0.15	84	7.0
303	11.542	5.6	14.12	na	21.04	0.15	84	7.0
304	11.417	5.6	16.19	na	22.53	0.15	84	7.0
300A	11.667		13.22	na				
301A	11.667		13.26	na				
302A	11.542		13.87	na				
303A	11.417		15.13	na				
304A	11.417		17.29	na				
306	13.0	5.6	10.19	na	17.88	0.15	22	7.0
306A	11.667		12.91	na				
307	11.667	5.6	12.94	na	20.14	0.15	84	7.0
308	11.542	5.6	13.55	na	20.61	0.15	84	7.0
309	11.417	5.6	14.84	na	21.58	0.15	84	7.0
310	11.417	5.6	17.06	na	23.13	0.15	84	7.0
311	13.0	5.6	10.33	na	18.0	0.15	120	10.32
311A	11.667		13.07	na				
312	11.667	5.6	13.11	na	20.27	0.15	126	11.391
313	11.542	5.6	13.72	na	20.75	0.15	126	11.391
314	11.417	5.6	15.04	na	21.71	0.15	126	11.391
315	11.417	5.6	17.28	na	23.28	0.15	126	11.391
316	11.417	5.6	24.23	na	27.57	0.15	126	11.391
317	11.417	5.6	24.54	na	27.74	0.15	126	11.391
69	10.167		26.72	na				
68	10.167		26.79	na				
67	10.167		27.12	na				
66	10.167		27.97	na				
66A	9.75		28.29	na				
65	9.75		31.11	na				
64	9.708		33.7	na				
63	10.167		38.23	na				
62	10.167		40.59	na				
TR	21.458		36.86	na				
BR	17.458		40.04	na				
BASE	16.417		51.6	na				
HOSE	13.417		53.02	na				
TEST	13.417		53.3	na				

The maximum velocity is 16.39 and it occurs in the pipe between nodes 315 and 67

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes ******
300	18.11	1.049	3E	6.0	9.208	10.459		K Factor = 5.60
to		120.0	1T	5.0	11.000	0.577		
300A	18.11	0.1083		0.0	20.208	2.189		Vel = 6.72
	0.0							
	18.11					13.225		K Factor = 4.98
301	19.72	1.049	1T	5.0	1.750	12.404		K Factor = 5.60
to		120.0		0.0	5.000	0.0		
301A	19.72	0.1268		0.0	6.750	0.856		Vel = 7.32
	0.0							
	19.72					13.260		K Factor = 5.42
302	20.13	1.049	1T	5.0	1.750	12.923		K Factor = 5.60
to		120.0		0.0	5.000	0.054		
302A	20.13	0.1317		0.0	6.750	0.889		Vel = 7.47
	0.0							
	20.13					13.866		K Factor = 5.41
303	21.04	1.049	1T	5.0	1.750	14.116		K Factor = 5.60
to		120.0		0.0	5.000	0.054		
303A	21.04	0.1430		0.0	6.750	0.965		Vel = 7.81
	0.0							
	21.04					15.135		K Factor = 5.41
304	22.53	1.049	1T	5.0	1.750	16.193		K Factor = 5.60
to		120.0		0.0	5.000	0.0		
304A	22.53	0.1624		0.0	6.750	1.096		Vel = 8.36
	0.0							
	22.53					17.289		K Factor = 5.42
300A	18.11	1.61		0.0	2.625	13.225		
to		120.0		0.0	0.0	0.0		
301A	18.11	0.0133		0.0	2.625	0.035		Vel = 2.85
301A	19.72	1.61		0.0	10.500	13.260		
to		120.0		0.0	0.0	0.054		
302A	37.83	0.0526		0.0	10.500	0.552		Vel = 5.96
302A	20.13	1.61		0.0	10.500	13.866		
to		120.0		0.0	0.0	0.054		
303A	57.96	0.1157		0.0	10.500	1.215		Vel = 9.13
303A	21.04	1.61		0.0	10.500	15.135		
to		120.0		0.0	0.0	0.0		
304A	79.0	0.2051		0.0	10.500	2.154		Vel = 12.45
304A	22.54	1.61	1E	4.0	15.250	17.289		
to		120.0	1T	8.0	12.000	0.541		
69	101.54	0.3263		0.0	27.250	8.893		Vel = 16.00
	0.0							
	101.54					26.723		K Factor = 19.64
306	17.88	1.049	3E	6.0	9.208	10.191		K Factor = 5.60
to		120.0	1T	5.0	11.000	0.577		
306A	17.88	0.1058		0.0	20.208	2.137		Vel = 6.64
306A	0.0	1.61		0.0	2.583	12.905		
to		120.0		0.0	0.0	0.0		
307	17.88	0.0132		0.0	2.583	0.034		Vel = 2.82

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes ******
307	20.14	1.61		0.0	10.500	12.939		K Factor = 5.60
to		120.0		0.0	0.0	0.054		
308	38.02	0.0530		0.0	10.500	0.557		Vel = 5.99
308	20.61	1.61		0.0	10.500	13.550		K Factor = 5.60
to		120.0		0.0	0.0	0.054		
309	58.63	0.1182		0.0	10.500	1.241		Vel = 9.24
309	21.58	1.61		0.0	10.500	14.845		K Factor = 5.60
to		120.0		0.0	0.0	0.0		
310	80.21	0.2110		0.0	10.500	2.215		Vel = 12.64
310	23.13	1.61	1E	4.0	15.250	17.060		K Factor = 5.60
to		120.0	1T	8.0	12.000	0.541		
68	103.34	0.3371		0.0	27.250	9.187		Vel = 16.29
	0.0							
	103.34					26.788		K Factor = 19.97
311	18.00	1.049	3E	6.0	9.208	10.332		K Factor = 5.60
to		120.0	1T	5.0	11.000	0.577		
311A	18.0	0.1071		0.0	20.208	2.164		Vel = 6.68
311A	0.0	1.61		0.0	2.583	13.073		
to		120.0		0.0	0.0	0.0		
312	18.0	0.0132		0.0	2.583	0.034		Vel = 2.84
312	20.27	1.61		0.0	10.500	13.107		K Factor = 5.60
to		120.0		0.0	0.0	0.054		
313	38.27	0.0537		0.0	10.500	0.564		Vel = 6.03
313	20.75	1.61		0.0	10.500	13.725		K Factor = 5.60
to		120.0		0.0	0.0	0.054		
314	59.02	0.1196		0.0	10.500	1.256		Vel = 9.30
314	21.71	1.61		0.0	10.500	15.035		K Factor = 5.60
to		120.0		0.0	0.0	0.0		
315	80.73	0.2135		0.0	10.500	2.242		Vel = 12.72
315	23.28	1.61	1E	4.0	15.250	17.277		K Factor = 5.60
to		120.0	1T	8.0	12.000	0.541		
67	104.01	0.3412		0.0	27.250	9.298		Vel = 16.39
	0.0							
	104.01					27.116		K Factor = 19.97
316	27.57	1.61		0.0	10.500	24.235		K Factor = 5.60
to		120.0		0.0	0.0	0.0		
317	27.57	0.0292		0.0	10.500	0.307		Vel = 4.34
317	27.74	1.61	1E	4.0	15.250	24.542		K Factor = 5.60
to		120.0	1T	8.0	12.000	0.541		
66	55.31	0.1061		0.0	27.250	2.891		Vel = 8.72
	0.0							
	55.31					27.974		K Factor = 10.46
69	101.54	4.26	1E	13.167	9.750	26.723		
to		120.0		0.0	13.167	0.0		
68	101.54	0.0028		0.0	22.917	0.065		Vel = 2.29
68	103.34	4.26	1T	26.334	5.000	26.788		
to		120.0		0.0	26.334	0.0		
67	204.88	0.0105		0.0	31.334	0.328		Vel = 4.61

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*******	Notes	******
67	104.01	4.26	1T	26.334	12.000	27.116				
to		120.0		0.0	26.334	0.0				
66	308.89	0.0224		0.0	38.334	0.858		Vel = 6.95		
66	55.31	4.26		0.0	4.542	27.974				
to		120.0		0.0	0.0	0.181				
66A	364.2	0.0302		0.0	4.542	0.137		Vel = 8.20		
66A	0.0	4.26	1F	5.267	87.792	28.292				
to		120.0		0.0	5.267	0.0				
65	364.2	0.0303		0.0	93.059	2.823		Vel = 8.20		
65	0.0	4.26	1F	5.267	79.333	31.115				
to		120.0		0.0	5.267	0.018				
64	364.2	0.0303		0.0	84.600	2.566		Vel = 8.20		
64	0.0	4.26	4E	52.668	103.292	33.699				
to		120.0		0.0	52.668	-0.199				
63	364.2	0.0303		0.0	155.960	4.731		Vel = 8.20		
63	0.0	4.26	2E	26.334	51.500	38.231				
to		120.0		0.0	26.334	0.0				
62	364.2	0.0303		0.0	77.834	2.361		Vel = 8.20		
62	0.0	4.26	2E	26.334	12.000	40.592				
to		120.0		0.0	26.334	-4.890				
TR	364.2	0.0303		0.0	38.334	1.163		Vel = 8.20		
TR	0.0	4.26	1Dvc	27.651	4.000	36.865				
to		120.0	1B	15.8	43.451	1.732				
BR	364.2	0.0303		0.0	47.451	1.439		Vel = 8.20		
BR	0.0	8.249	1Ziu	0.0	7.000	40.036				
to		120.0		0.0	0.0	11.550		* Fixed loss = 11.1		
BASE	364.2	0.0013		0.0	7.000	0.009		Vel = 2.19		
BASE	0.0	8.27	3E	85.404	50.000	51.595				
to		140.0	1G	6.326	91.730	1.299				
HOSE	364.2	0.0009		0.0	141.730	0.128		Vel = 2.18		
HOSE	0.0	12.34	6F	121.897	2000.000	53.022				
to		140.0	1E	42.195	164.092	0.0				
TEST	364.2	0.0001		0.0	2164.092	0.278		Vel = 0.98		
	0.0									
	364.20					53.300		K Factor = 49.89		

City Water Supply:
- C1 - Static Pressure : 86
- C2 - Residual Pressure: 73
- C2 - Residual Flow : 2781

Demand:

D1 - Elevation	:	-0.181
D2 - System Flow	:	364.202
D2 - System Pressure	:	53.300
Hose (Adj City)	:	_____
Hose (Demand)	:	_____
D3 - System Demand	:	364.202
Safety Margin	:	32.397