

Hydraulic Design Information Sheet

Name - PACKEDGE MEZZININE Date - 9-18-17
 Location - 352 PRESUMPSCOT STREET PORTLAND ME
 Building - UNDER MEZZININE System No. - 1 OF 1
 Contractor - OWNER Contract No. - D17043
 Calculated By - SJC Drawing No. - 1 OF 1
 Construction: () Combustible (X) Non-Combustible Ceiling Height - 12'-0"
 Occupancy - INDUSTRIAL

S (X) NFPA 13 () Lt. Haz. Ord.Haz.Gp. () 1 (X) 2 () 3 () Ex.Haz.
 Y () NFPA 231 () NFPA 231C () Figure Curve

S Other

T Specific Ruling Made By Date

M	Area of Sprinkler Operation - 1038	System Type	Sprinkler/Nozzle
	Density - .2	(X) Wet	Make VIKING
D	Area Per Sprinkler - 112	() Dry	Model VK300
E	Elevation at Highest Outlet -	() Deluge	Size 1/2"
S	Hose Allowance - Inside -	() Preaction	K-Factor 5.6
I	Rack Sprinkler Allowance -	() Other	Temp.Rat.155
G	Hose Allowance - Outside -		

N Note SAFETY MARGIN: 9.89 PSI

Calculation Flow Required - 120 Press Required - 140
 Summary C-Factor Used: 120 Overhead 120 Underground

W	Water Flow Test:	Pump Data:	Tank or Reservoir:
A	Date of Test - 2-16-17		Cap. -
T	Time of Test -	Rated Cap.-	Elev.-
E	Static Press - 98	@ Press -	
R	Residual Press - 85	Elev. -	Well
S	Flow - 490		Proof Flow
U	Elevation - 0		

P Location - AT THE RISER

L Source of Information - MAIN DRAIN TEST

C	Commodity	Class	Location
O	Storage Ht.	Area	Aisle W.
M	Storage Method:	%	Palletized % Rack
	() Single Row	() Conven. Pallet	() Auto. Storage () Encap.
S	() Double Row	() Slave Pallet	() Solid Shelf () Non
T	() Mult. Row		() Open Shelf

R K Flue Spacing Clearance:Storage to Ceiling
 A Longitudinal Transverse

E Horizontal Barriers Provided:

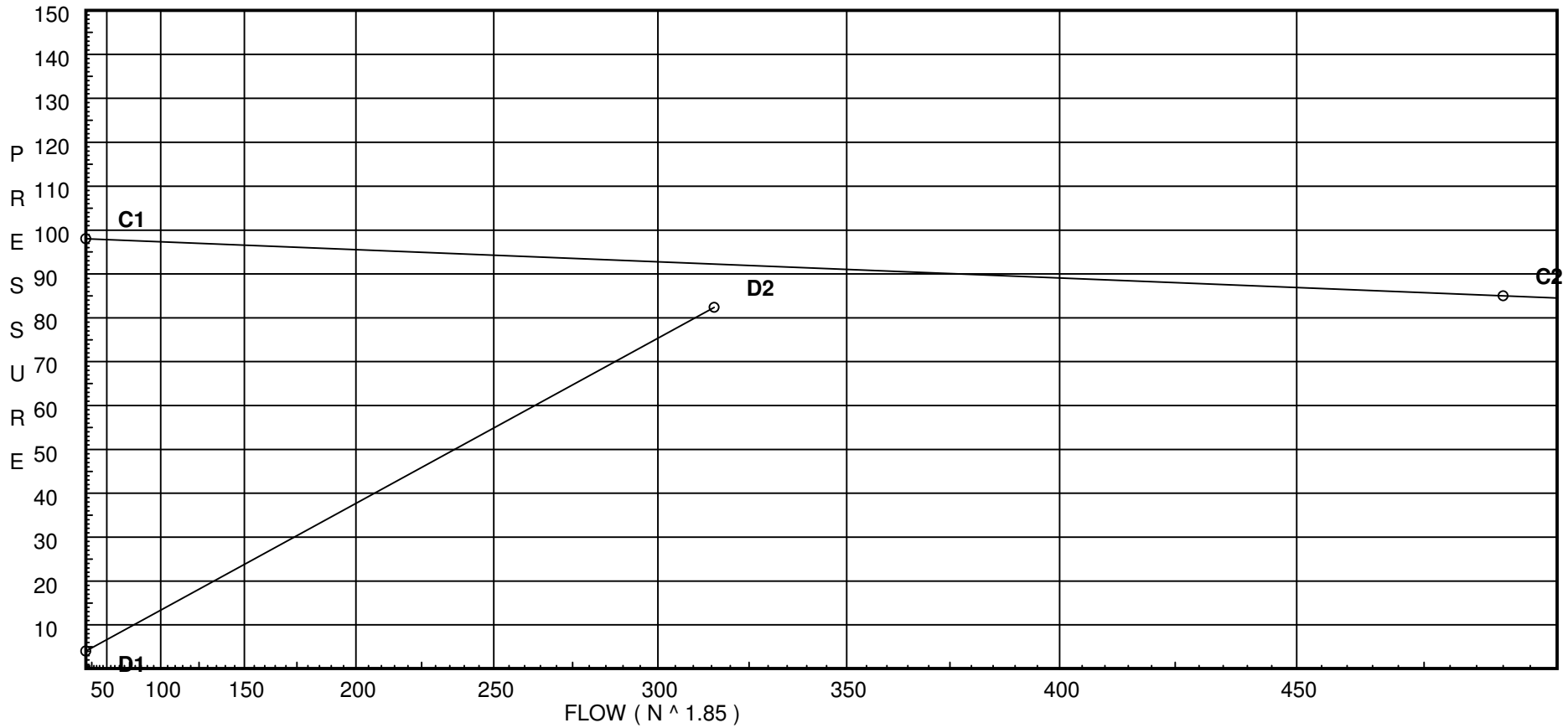
Water Supply Curve (C)

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City Water Supply:
C1 - Static Pressure : 98
C2 - Residual Pressure: 85
C2 - Residual Flow : 490

Demand:
D1 - Elevation : 4.006
D2 - System Flow : 315.677
D2 - System Pressure : 82.350
Hose (Adj City) : _____
Hose (Demand) : _____
D3 - System Demand : 315.677
Safety Margin : 9.886



Fittings Used Summary

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Fitting Legend

Abbrev.	Name	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	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
Z	Generic Flow Switch	2	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61
Zac	Ames 2000SS	Fitting generates a Fixed Loss Based on Flow																			

Pressure / Flow Summary - STANDARD

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Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
1	10.25	5.6	16.0	na	22.4	0.2	112	7.0
2	10.25	5.6	16.53	na	22.77	0.2	112	7.0
3	10.25	5.6	26.16	na	28.64	0.2	112	7.0
4	10.25	5.6	26.61	na	28.89	0.2	112	7.0
22	10.25		30.46	na				
5	10.25	5.6	22.78	na	26.73	0.2	112	7.0
6	10.25	5.6	25.0	na	28.0	0.2	112	7.0
7	10.25	5.6	23.24	na	27.0	0.2	112	7.0
8	10.25	5.6	26.42	na	28.78	0.2	112	7.0
9	10.25	5.6	38.57	na	34.78	0.2	112	7.0
10	10.25	5.6	31.24	na	31.3	0.2	112	7.0
11	10.25	5.6	42.25	na	36.4	0.2	112	7.0
20	10.25		17.73	na				
21	10.25		26.53	na				
23	10.25		35.05	na				
30	10.25		59.55	na				
31	10.25		59.74	na				
TR	1.0		79.49	na				
BR	1.0		82.35	na				

The maximum velocity is 29.74 and it occurs in the pipe between nodes 23 and 11

Final Calculations - Hazen-Williams

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Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
1 to 20	22.40 22.4	1.049 120 0.1605	1T	5.0 0.0 0.0	5.750 5.000 10.750	16.000 0.0 1.725			K Factor = 5.60 Vel = 8.32	
	0.0 22.40						17.725		K Factor = 5.32	
2 to 20	22.77 22.77	1.049 120 0.1654	1T	5.0 0.0 0.0	2.250 5.000 7.250	16.526 0.0 1.199			K Factor = 5.60 Vel = 8.45	
	0.0 22.77						17.725		K Factor = 5.41	
3 to 21	28.64 28.64	1.049 120 0.2527		0.0 0.0 0.0	1.500 0.0 1.500	26.156 0.0 0.379			K Factor = 5.60 Vel = 10.63	
	0.0 28.64						26.535		K Factor = 5.56	
4 to 22	28.89 28.89	1.049 120 0.2569	1T	5.0 0.0 0.0	10.000 5.000 15.000	26.609 0.0 3.853			K Factor = 5.60 Vel = 10.72	
22 to 10	73.80 102.69	1.61 120 0.3335		0.0 0.0 0.0	2.330 0.0 2.330	30.462 0.0 0.777			Vel = 16.18	
	0.0 102.69						31.239		K Factor = 18.37	
5 to 6	26.73 26.73	1.049 120 0.2225		0.0 0.0 0.0	10.000 0.0 10.000	22.776 0.0 2.225			K Factor = 5.60 Vel = 9.92	
6 to 23	28.00 54.73	1.049 120 0.8378	1T	5.0 0.0 0.0	7.000 5.000 12.000	25.001 0.0 10.054			K Factor = 5.60 Vel = 20.32	
	0.0 54.73						35.055		K Factor = 9.24	
7 to 8	27.00 27.0	1.049 120 0.2267		0.0 0.0 0.0	14.000 0.0 14.000	23.244 0.0 3.174			K Factor = 5.60 Vel = 10.02	
8 to 9	28.78 55.78	1.049 120 0.8680		0.0 0.0 0.0	14.000 0.0 14.000	26.418 0.0 12.152			K Factor = 5.60 Vel = 20.71	
9 to 30	34.78 90.56	1.38 120 0.5595	1T	6.0 0.0 0.0	31.500 6.000 37.500	38.570 0.0 20.980			K Factor = 5.60 Vel = 19.43	
	0.0 90.56						59.550		K Factor = 11.74	
10 to 23	133.99 133.99	1.61 120 0.5451		0.0 0.0 0.0	7.000 0.0 7.000	31.239 0.0 3.816			K Factor = 5.60 Vel = 21.12	
	0.0 133.99						35.055		K Factor = 22.63	

Final Calculations - Standard

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Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
11	225.12	2.067	1T	10.0	31.500	42.246			K Factor = 5.60	
to		120		0.0	10.000	0.0				
31	225.12	0.4216		0.0	41.500	17.496			Vel = 21.52	
	0.0									
	225.12					59.742			K Factor = 29.13	
20	45.17	1.049	1T	5.0	10.000	17.725				
to		120		0.0	5.000	0.0				
21	45.17	0.5873		0.0	15.000	8.810			Vel = 16.77	
21	28.64	1.38		0.0	10.250	26.535				
to		120		0.0	0.0	0.0				
22	73.81	0.3831		0.0	10.250	3.927			Vel = 15.83	
	0.0									
	73.81					30.462			K Factor = 13.37	
23	188.72	1.61		0.0	7.000	35.055				
to		120		0.0	0.0	0.0				
11	188.72	1.0273		0.0	7.000	7.191			Vel = 29.74	
	0.0									
	188.72					42.246			K Factor = 29.04	
30	90.56	2.635		0.0	8.000	59.550				
to		120		0.0	0.0	0.0				
31	90.56	0.0240		0.0	8.000	0.192			Vel = 5.33	
31	225.12	2.635	2T	32.948	24.000	59.742				
to		120	1E	8.237	41.185	4.006				
TR	315.68	0.2416		0.0	65.185	15.747			Vel = 18.57	
TR	0.0	6.357	1Z	17.603	8.750	79.495				
to		120	1Zac	0.0	17.603	2.768			* Fixed loss = 2.768	
BR	315.68	0.0033		0.0	26.353	0.087			Vel = 3.19	
	0.0									
	315.68					82.350			K Factor = 34.79	