



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)

Residential Fire Protection
PACKEDGE MEZZININE

Page
Date

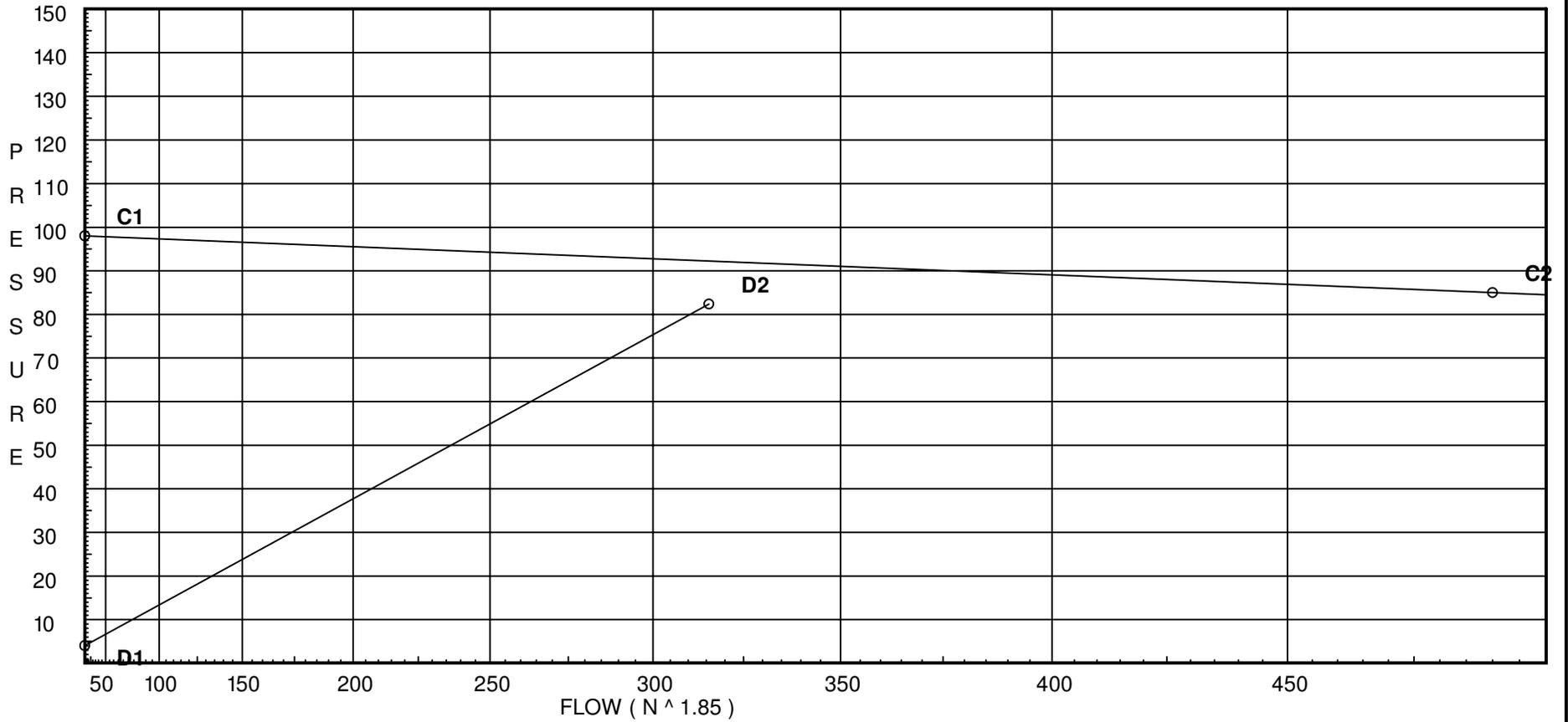


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Inspectors Division
Approved with Conditions

Date: 01/26/18

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

Residential Fire Protection
PACKEDGE MEZZININE

Page
Date



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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			
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

Residential Fire Protection
PACKEDGE MEZZININE

Page 4
Date 9-



Reviewed for Code Compliance
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Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	
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

Residential Fire Protection
PACKEDGE MEZZININE

Page 5
Date 9-



Reviewed for Code Compliance
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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	***** Not	Date: 01/26/18
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

Residential Fire Protection
PACKEDGE MEZZININE

Page 6
Date 9-



Reviewed for Code Compliance
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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	***** Not	Date: 01/26/18
11 to 31	225.12 225.12	2.067 120 0.4216	1T 10.0 0.0 0.0	31.500 10.000 41.500	42.246 0.0 17.496		K Factor = 5.60 Vel = 21.52	
	0.0 225.12				59.742		K Factor = 29.13	
20 to 21	45.17 45.17	1.049 120 0.5873	1T 5.0 0.0 0.0	10.000 5.000 15.000	17.725 0.0 8.810		Vel = 16.77	
21 to 22	28.64 73.81	1.38 120 0.3831	0.0 0.0 0.0	10.250 0.0 10.250	26.535 0.0 3.927		Vel = 15.83	
	0.0 73.81				30.462		K Factor = 13.37	
23 to 11	188.72 188.72	1.61 120 1.0273	0.0 0.0 0.0	7.000 0.0 7.000	35.055 0.0 7.191		Vel = 29.74	
	0.0 188.72				42.246		K Factor = 29.04	
30 to 31	90.56 90.56	2.635 120 0.0240	0.0 0.0 0.0	8.000 0.0 8.000	59.550 0.0 0.192		Vel = 5.33	
31 to TR	225.12 315.68	2.635 120 0.2416	2T 32.948 1E 8.237 0.0	24.000 41.185 65.185	59.742 4.006 15.747		Vel = 18.57	
TR to BR	0.0 315.68	6.357 120 0.0033	1Z 17.603 1Zac 0.0 0.0	8.750 17.603 26.353	79.495 2.768 0.087		* Fixed loss = 2.768 Vel = 3.19	
	0.0 315.68				82.350		K Factor = 34.79	