



... Fire Protection by Computer Design

DEAN AND ALLYN, INC.
116 LEWISTON ROAD
GRAY MAINE 04039
207 657 5646

Job Name : JEWISH MUSEUM CHAPEL
Building : MUSEUM
Location : 267 CONGRESS STREET PORTLAND MAINE
System : ONE
Contract : C141184
Data File : JEWISHMUSEUMCHAPEL.WXF

Hydraulic Design Information Sheet

Name - MAINE JEWISH MUSEUM Date - 2-2-14
 Location - 267 CONGRESS STREET PORTLAND MAINE
 Building - MUSEUM System No. - ONE
 Contractor - DEAN AND ALLYN, INC. Contract No. - C141184
 Calculated By - H. KING Drawing No. - 1 OF 1
 Construction: (X) Combustible () Non-Combustible Ceiling Height - VARIES
 Occupancy - MUSEUM CHAPEL

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

S Other

T Specific Ruling

Made By

Date

M	Area of Sprinkler Operation - 1500	System Type	Sprinkler/Nozzle
	Density - .10	(X) Wet	Make RELIABLE
D	Area Per Sprinkler - 225	() Dry	Model F1FR
E	Elevation at Highest Outlet - 43	() Deluge	Size 1/2"
S	Hose Allowance - Inside - 0	() Preaction	K-Factor 5.6
I	Rack Sprinkler Allowance - 0	() Other	Temp.Rat.155
G	Hose Allowance - Outside - 100		

N Note CUSHION 10.6PSI

Calculation Flow Required - 291.4 Press Required - 69.0 CITY
 Summary C-Factor Used: 120 Overhead 140 Underground

W	Water Flow Test:	Pump Data:	Tank or Reservoir:
A	Date of Test - 9-13-2011	Rated Cap.-	Cap. -
T	Time of Test -	@ Press -	Elev.-
E	Static Press - 80	Elev. -	
R	Residual Press - 75		Well
	Flow - 1162		Proof Flow
S	Elevation - 0		

U Location - CUMBERLAND AVE

P Source of Information - PWD

C	Commodity	Class	Location
O	Storage Ht.	Area	Aisle W.
M	Storage Method:	%	Palletized % Rack
M	() 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:

Final Calculations - Standard

DEAN AND ALLYN, INC.
 JEWISH MUSEUM CHAPEL

Page 2
 Date 2-2-14

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/UL	Fitting or Eqv. Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	***** Notes *****
16A to 16	22.50 22.5	1.049 120 0.1619	1E 2.0 1T 5.0 0.0	2.000 7.000 9.000	16.143 0.0 1.457		K Factor = 5.60 Vel = 8.35
	0.0 22.50					17.600	K Factor = 5.36
16 to 17	22.50 22.5	1.049 120 0.1618	0.0 0.0 0.0	14.500 0.0 14.500	17.600 0.0 2.346		K Factor @ node 16 Vel = 8.35
17 to 62B	23.95 46.45	1.38 120 0.1627	1T 6.0 0.0 0.0	6.100 6.000 12.100	19.946 -0.433 1.969		K Factor @ node 16 Vel = 9.96
	0.0 46.45					21.482	K Factor = 10.02
18 to 62B	23.68 23.68	1.049 120 0.1779	1T 5.0 0.0 0.0	8.600 5.000 13.600	19.496 -0.433 2.419		K Factor @ node 16 Vel = 8.79
	0.0 23.68					21.482	K Factor = 5.11
19 to 20	22.58 22.58	1.049 120 0.1629	0.0 0.0 0.0	14.500 0.0 14.500	17.730 0.0 2.362		K Factor @ node 16 Vel = 8.38
20 to 63B	24.04 46.62	1.38 120 0.1639	1T 6.0 0.0 0.0	6.100 6.000 12.100	20.092 -0.433 1.983		K Factor @ node 16 Vel = 10.00
	0.0 46.62					21.642	K Factor = 10.02
21 to 63B	23.77 23.77	1.049 120 0.1791	1T 5.0 0.0 0.0	8.600 5.000 13.600	19.639 -0.433 2.436		K Factor @ node 16 Vel = 8.82
	0.0 23.77					21.642	K Factor = 5.11
22 to 23	0.0 0.0	1.049 120 0.0	0.0 0.0 0.0	14.500 0.0 14.500	42.147 -18.623 0.0		Vel = 0
23 to 64B	26.01 26.01	1.38 120 0.0556	1T 6.0 0.0 0.0	6.100 6.000 12.100	23.524 -0.433 0.673		K Factor @ node 16 Vel = 5.58
	0.0 26.01					23.764	K Factor = 5.34
24 to 64B	24.89 24.89	1.049 120 0.1951	1T 5.0 0.0 0.0	8.600 5.000 13.600	21.544 -0.433 2.653		K Factor @ node 16 Vel = 9.24

Final Calculations - Standard

DEAN AND ALLYN, INC.
 JEWISH MUSEUM CHAPEL

Page 3
 Date 2-2-14

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/UL	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
	0.0 24.89					23.764			K Factor =	5.11
62B to 62	70.13	1.38 120	1T	6.0 0.0	0.800 6.000	21.482 0.0				
	70.13	0.3485		0.0	6.800	2.370			Vel =	15.04
	0.0 70.13					23.852			K Factor =	14.36
63B to 63	70.39	1.38 120	1T	6.0 0.0	0.800 6.000	21.642 0.0				
	70.39	0.3510		0.0	6.800	2.387			Vel =	15.10
	0.0 70.39					24.029			K Factor =	14.36
64B to 64	50.91	1.38 120	1T	6.0 0.0	0.800 6.000	23.764 0.0				
	50.91	0.1928		0.0	6.800	1.311			Vel =	10.92
	0.0 50.91					25.075			K Factor =	10.17
62 to 63	70.13	2.635 120		0.0 0.0	11.800 0.0	23.852 0.0				
	70.13	0.0150		0.0	11.800	0.177			Vel =	4.13
63 to 64	70.40	2.469 120		0.0 0.0	14.100 0.0	24.029 0.0				
	140.53	0.0742		0.0	14.100	1.046			Vel =	9.42
64 to 53	50.90	2.469 120	1T	12.0 0.0	21.500 12.000	25.075 -0.433				
	191.43	0.1315		0.0	33.500	4.404			Vel =	12.83
53 to 55	0.0	2.635 120	1E	8.237 0.0	18.000 8.237	29.046 6.930				
	191.43	0.0957		0.0	26.237	2.512			Vel =	11.26
55 to 56	0.0	2.635 120	1E 1T	8.237 16.474	7.300 24.711	38.488 0.0				
	191.43	0.0957		0.0	32.011	3.065			Vel =	11.26
56 to 57	0.0	2.635 120	1T 1E	16.474 8.237	16.300 24.711	41.553 0.0				
	191.43	0.0958		0.0	41.011	3.928			Vel =	11.26
57 to 58	0.0	3.26 120		0.0 0.0	10.000 0.0	45.481 5.197				
	191.43	0.0340		0.0	10.000	0.340			Vel =	7.36
58 to 59	0.0	3.26 120	1E	9.408 0.0	10.800 9.408	51.018 4.764				
	191.43	0.0339		0.0	20.208	0.686			Vel =	7.36

Final Calculations - Standard

DEAN AND ALLYN, INC.
 JEWISH MUSEUM CHAPEL

Page 4
 Date 2-2-14

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/UL	Fitting or Eqv. Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
59 to 60	0.0 191.43	3.26 120 0.0340	2E 11.408 1T 20.159 0.0	12.500 38.975 51.475	56.468 0.0 1.748		Vel = 7.36		
60 to 61	0.0 191.43	3.26 120 0.0340	1E 9.408 1T 20.159 0.0	22.000 29.567 51.567	58.216 0.0 1.752		Vel = 7.36		
61 to TR	0.0 191.43	3.26 120 0.0339	1E 9.408 0.0 0.0	4.800 9.408 14.208	59.968 0.0 0.482		Vel = 7.36		
TR to FF	0.0 191.43	4.26 120 0.0092	1E 13.167 1Z 13.167 0.0	6.000 26.334 32.334	60.450 7.599 0.298		* Fixed loss = 5.000 Vel = 4.31		
FF to CTY	0.0 191.43	6.16 120 0.0015	1G 3.236 1T 32.359 0.0	400.000 35.595 435.595	68.347 0.0 0.667		Vel = 2.06		
	100.00 291.43				69.014		Qa = 100.00 K Factor = 35.08		

Fittings Used Summary

DEAN AND ALLYN, INC.
JEWISH MUSEUM CHAPEL

Page 5
Date 2-2-14

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	90' Standard Elbow	2	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61
G	Generic Gate Valve	0	0	1	1	1	1	1	1	1	2	2	3	4	5	6	7	8	10	11	13
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

Pressure / Flow Summary - STANDARD

DEAN AND ALLYN, INC.
 JEWISH MUSEUM CHAPEL

Page 6
 Date 2-2-14

Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
16A	43.0	5.6	16.14	na	22.5	.10	225	7.0
16	43.0	K = K @ 16	17.6	na	22.5			
17	43.0	K = K @ 16	19.95	na	23.95			
18	43.0	K = K @ 16	19.5	na	23.68			
19	43.0	K = K @ 16	17.73	na	22.58			
20	43.0	K = K @ 16	20.09	na	24.04			
21	43.0	K = K @ 16	19.64	na	23.77			
22	0.0		42.15	na				
23	43.0	K = K @ 16	23.52	na	26.01			
24	43.0	K = K @ 16	21.54	na	24.89			
62B	44.0		21.48	na				
63B	44.0		21.64	na				
64B	44.0		23.76	na				
62	44.0		23.85	na				
63	44.0		24.03	na				
64	44.0		25.08	na				
53	45.0		29.05	na				
55	29.0		38.49	na				
56	29.0		41.55	na				
57	29.0		45.48	na				
58	17.0		51.02	na				
59	6.0		56.47	na				
60	6.0		58.22	na				
61	6.0		59.97	na				
TR	6.0		60.45	na				
FF	0.0		68.35	na				
CTY	0.0		69.01	na	100.0			

The maximum velocity is 15.1 and it occurs in the pipe between nodes 63B and 63

Water Supply Curve (C)

DEAN AND ALLYN, INC.
JEWISH MUSEUM CHAPEL

Page 7
Date 2-2-14

City Water Supply:
C1 - Static Pressure : 80
C2 - Residual Pressure: 75
C2 - Residual Flow : 1162

