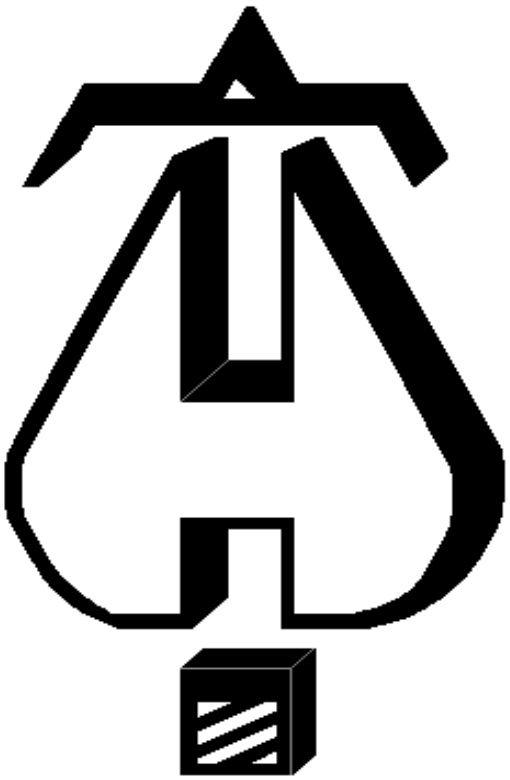

. . . Fire Protection by Computer Design

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

Job Name : JEWISH MUSEUM BASEMENT
Building : MUSEUM
Location : 267 CONGRESS STREET PORTLAND MAINE
System : ONE
Contract : C141184
Data File : JEWISHMUSEUMBASEMENT.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 - 7'
Occupancy - MUSEUM BASEMENT

SYSTEM DESIGN

(X) NFPA 13 ( ) Lt. Haz. Ord.Haz.Gp. (X) 1 ( ) 2 ( ) 3 ( ) Ex.Haz.
( ) NFPA 231 ( ) NFPA 231C ( ) Figure Curve
Other
Specific Ruling Made By Date

Area of Sprinkler Operation	- 1500	System Type	Sprinkler/Nozzle
Density	- .15	(X) Wet	Make RELIABLE
Area Per Sprinkler	- 126	( ) Dry	Model F1FR
Elevation at Highest Outlet	- 6	( ) Deluge	Size 1/2"
Hose Allowance - Inside	- 0	( ) Preaction	K-Factor 5.6
Rack Sprinkler Allowance	- 0	( ) Other	Temp.Rat.155
Hose Allowance - Outside	- 250		

Note CUSHION 12.6 PSI

Calculation Summary: Flow Required - 745.5 Press Required - 65.3 CITY
C-Factor Used: 120 Overhead 140 Underground

WATER SUPPLY

Water Flow Test:
Date of Test - 9-13-2011
Time of Test -
Static Press - 80
Residual Press - 75
Flow - 1162
Elevation - 0

Pump Data:
Rated Cap.-
@ Press -
Elev. -

Tank or Reservoir:
Cap. -
Elev.-

Well
Proof Flow

Location - CUMBERLAND AVE

Source of Information - PWD

STORAGE

Commodity Class Location
Storage Ht. Area Aisle W.
Storage Method: Solid Piled % Palletized % Rack

( ) Single Row	( ) Conven. Pallet	( ) Auto. Storage	( ) Encap.	
( ) Double Row	( ) Slave Pallet	( ) Solid Shelf	( ) Non	
( ) Mult. Row		( ) Open Shelf		

Flue Spacing Clearance:Storage to Ceiling
Longitudinal Transverse

Horizontal Barriers Provided:

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/UL	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes ******
101	19.77	1.049		0.0	3.600	12.467		K Factor = 5.60
to		120		0.0	0.0	0.0		
150	19.77	0.1275		0.0	3.600	0.459		Vel = 7.34
	0.0							
	19.77					12.926		K Factor = 5.50
102	18.90	1.049	1T	5.0	8.100	11.391		K Factor = 5.60
to		120		0.0	5.000	0.0		
150	18.9	0.1172		0.0	13.100	1.535		Vel = 7.02
	0.0							
	18.90					12.926		K Factor = 5.26
103	59.61	1.38		0.0	7.000	13.984		K Factor = 5.60
to		120		0.0	0.0	0.0		
104	59.61	0.2581		0.0	7.000	1.807		Vel = 12.79
104	22.26	1.61	1E	4.0	9.200	15.791		K Factor = 5.60
to		120	1T	8.0	12.000	0.0		
105	81.87	0.2191		0.0	21.200	4.645		Vel = 12.90
105	25.31	1.61		0.0	9.000	20.436		K Factor = 5.60
to		120		0.0	0.0	0.0		
106	107.18	0.3607		0.0	9.000	3.246		Vel = 16.89
106	27.25	1.61	1T	8.0	3.800	23.682		K Factor = 5.60
to		120		0.0	8.000	0.0		
151	134.43	0.5485		0.0	11.800	6.472		Vel = 21.19
	0.0							
	134.43					30.154		K Factor = 24.48
107	29.20	1.049	1E	2.0	9.300	27.192		K Factor = 5.60
to		120		0.0	2.000	0.0		
151	29.2	0.2621		0.0	11.300	2.962		Vel = 10.84
	0.0							
	29.20					30.154		K Factor = 5.32
108	198.71	2.067	1E	5.0	12.100	39.228		K Factor = 5.60
to		120		0.0	5.000	0.0		
152	198.71	0.3347		0.0	17.100	5.723		Vel = 19.00
	0.0							
	198.71					44.951		K Factor = 29.64
109	19.39	1.049		0.0	7.300	11.991		K Factor = 5.60
to		120		0.0	0.0	0.0		
110	19.39	0.1229		0.0	7.300	0.897		Vel = 7.20
110	20.11	1.049		0.0	7.300	12.888		K Factor = 5.60
to		120		0.0	0.0	0.0		
111	39.5	0.4582		0.0	7.300	3.345		Vel = 14.66
111	22.56	1.049		0.0	1.600	16.233		K Factor = 5.60
to		120		0.0	0.0	0.0		
153	62.06	1.0569		0.0	1.600	1.691		Vel = 23.04

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							
	62.06					17.924		K Factor = 14.66
112	22.68	1.049	1T	5.0	4.300	16.398		K Factor = 5.60
to		120		0.0	5.000	0.0		
153	22.68	0.1641		0.0	9.300	1.526		Vel = 8.42
	0.0							
	22.68					17.924		K Factor = 5.36
113	110.87	1.61		0.0	8.500	21.783		K Factor = 5.60
to		120		0.0	0.0	0.0		
114	110.87	0.3840		0.0	8.500	3.264		Vel = 17.47
114	28.03	1.61		0.0	8.500	25.047		K Factor = 5.60
to		120		0.0	0.0	0.0		
115	138.9	0.5826		0.0	8.500	4.952		Vel = 21.89
115	30.67	1.61	1T	8.0	9.000	29.999		K Factor = 5.60
to		120		0.0	8.000	0.0		
155	169.57	0.8428		0.0	17.000	14.327		Vel = 26.72
	0.0							
	169.57					44.326		K Factor = 25.47
116	19.81	1.049		0.0	9.300	12.513		K Factor = 5.60
to		120		0.0	0.0	0.0		
117	19.81	0.1278		0.0	9.300	1.189		Vel = 7.35
117	20.73	1.049		0.0	9.300	13.702		K Factor = 5.60
to		120		0.0	0.0	0.0		
118	40.54	0.4809		0.0	9.300	4.472		Vel = 15.05
118	23.87	1.049		0.0	9.300	18.174		K Factor = 5.60
to		120		0.0	0.0	0.0		
119	64.41	1.1326		0.0	9.300	10.533		Vel = 23.91
119	30.01	1.38		0.0	9.300	28.707		K Factor = 5.60
to		120		0.0	0.0	0.0		
120	94.42	0.6044		0.0	9.300	5.621		Vel = 20.25
120	32.81	1.61	1T	8.0	11.800	34.328		K Factor = 5.60
to		120		0.0	8.000	0.0		
154	127.23	0.4953		0.0	19.800	9.807		Vel = 20.05
154	0.0	3.26		0.0	12.000	44.135		
to		120		0.0	0.0	0.0		
155	127.23	0.0159		0.0	12.000	0.191		Vel = 4.89
	0.0							
	127.23					44.326		K Factor = 19.11
150	38.67	1.049		0.0	2.400	12.926		
to		120		0.0	0.0	0.0		
103	38.67	0.4408		0.0	2.400	1.058		Vel = 14.36

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							
	38.67					13.984		K Factor = 10.34
151	163.64	1.61	1E	4.0	7.500	30.154		
to		120		0.0	4.000	0.0		
108	163.64	0.7890		0.0	11.500	9.074		Vel = 25.79
	0.0							
	163.64					39.228		K Factor = 26.13
152	198.71	3.26	1T	20.159	10.900	44.951		
to		120		0.0	20.159	0.0		
61	198.71	0.0364		0.0	31.059	1.130		Vel = 7.64
	0.0							
	198.71					46.081		K Factor = 29.27
153	84.73	1.38		0.0	7.800	17.924		
to		120		0.0	0.0	0.0		
113	84.73	0.4947		0.0	7.800	3.859		Vel = 18.17
	0.0							
	84.73					21.783		K Factor = 18.15
155	296.80	3.26	1T	20.159	2.800	44.326		
to		120		0.0	20.159	0.0		
61	296.8	0.0764		0.0	22.959	1.755		Vel = 11.41
61	198.71	3.26	1E	9.408	4.800	46.081		
to		120		0.0	9.408	0.0		
TR	495.51	0.1973		0.0	14.208	2.803		Vel = 19.05
TR	0.0	3.26	1E	9.408	6.000	48.884		
to		120	1Z	9.408	18.815	7.599		* Fixed loss = 5.000
FF	495.51	0.1973		0.0	24.815	4.896		Vel = 19.05
FF	0.0	6.16	1G	3.236	400.000	61.379		
to		120	1T	32.359	35.595	0.0		
CTY	495.51	0.0089		0.0	435.595	3.876		Vel = 5.33
	250.00							Qa = 250.00
	745.51					65.255		K Factor = 92.29

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

Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
101	6.0	5.6	12.47	na	19.77	.15	126	7.0
102	6.0	5.6	11.39	na	18.9	.15	126	7.0
103	6.0	5.6	13.98	na	20.94	.15	126	7.0
104	6.0	5.6	15.79	na	22.25	.15	126	7.0
105	6.0	5.6	20.44	na	25.32	.15	126	7.0
106	6.0	5.6	23.68	na	27.25	.15	126	7.0
107	6.0	5.6	27.19	na	29.2	.15	126	7.0
108	6.0	5.6	39.23	na	35.07	.15	126	7.0
109	6.0	5.6	11.99	na	19.39	.15	126	7.0
110	6.0	5.6	12.89	na	20.1	.15	126	7.0
111	6.0	5.6	16.23	na	22.56	.15	126	7.0
112	6.0	5.6	16.4	na	22.68	.15	126	7.0
113	6.0	5.6	21.78	na	26.14	.15	126	7.0
114	6.0	5.6	25.05	na	28.03	.15	126	7.0
115	6.0	5.6	30.0	na	30.67	.15	126	7.0
116	6.0	5.6	12.51	na	19.81	.15	126	7.0
117	6.0	5.6	13.7	na	20.73	.15	126	7.0
118	6.0	5.6	18.17	na	23.87	.15	126	7.0
119	6.0	5.6	28.71	na	30.0	.15	126	7.0
120	6.0	5.6	34.33	na	32.81	.15	126	7.0
154	6.0		44.13	na				
150	6.0		12.93	na				
151	6.0		30.15	na				
152	6.0		44.95	na				
153	6.0		17.92	na				
155	6.0		44.33	na				
61	6.0		46.08	na				
TR	6.0		48.88	na				
FF	0.0		61.38	na				
CTY	0.0		65.25	na	250.0			

The maximum velocity is 26.72 and it occurs in the pipe between nodes 115 and 155

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