life safety

SINGLE SOURCE SOLUTION

FIRE ALARM•SPRINKLER•SECURITY

OVERHEAD FIRE SPRINKLER SYSTEM HYDRAULIC CALCULATIONS

PROJECT: ENZIAN THEATER
1300 S. ORLANDO AVE.
MAITLAND, FL

FROM: A.I.T. LIFE SAFETY
4617 PARKBREEZE COURT
ORLANDO, FL 32808

DATE: MARCH 4, 2015

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4617 Parkbreeze Court, Orlando, Florida 32808 EF0001116 / Fire Sprinkler Lic. #2011-28000-120-10

. . . Fire Protection by Computer Design

AIT LIFE SAFETY
4617 PARKBREEZE COURT
ORLANDO, FL 32808
407-816-9101

Job Name	:	Enzian Theater-Design Area #1
Building	:	NEW THEATER ADDITION
Location	:	1300 S. ORLANDO AVE.
System	:	DA #1
Contract	:	TBA
Data File	:	DA #1.WXF

Hydraulic Design Information Sheet

Name - ENZIAN THEATER
Date - 3-3-15
Location - 1300 S. ORLANDO AVE.
Building - NEW THEATER ADDITION
System No. - DA #1
Contractor - AIT LIFE SAFETY
Contract No. - TBA
Calculated By - SEAN LOCKYER
Drawing No. - FP-2 OF 2
Construction: (X) Combustible ( ) Non-Combustible
Ceiling Height - VARIES
Occupancy - DESIGN AREA #1-THEATER ADDITION (LIGHT HAZARD)

SYSTEM

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

DESIGN

Area of Sprinkler Operation	- 1500	System Type	Sprinkler/Nozzle
Density	- .10	(X) Wet	Make RELIABLE
Area Per Sprinkler	- 225 MAX	( ) Dry	Model F1FR
Elevation at Highest Outlet	- 23'-0"	( ) Deluge	Size 1/2"
Hose Allowance - Inside	- 0	( ) Preaction	K-Factor 4.2K
Rack Sprinkler Allowance	- 0	( ) Other	Temp.Rat.155
Hose Allowance - Outside	- 100		

Note

Calculation Summary: Flow Required - 376.51 Press Required - 44.750 @ TEST
C-Factor Used: 120 Overhead 150 Underground

WATER SUPPLY

Water Flow Test:
Date of Test - 1-29-14
Time of Test - 8:00 AM
Static Press - 60 PSI
Residual Press - 48 PSI
Flow - 1130 GPM
Elevation - 2'-6"

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

Tank or Reservoir:
Cap. -
Elev.-

Well
Proof Flow

Location - 17-92 & MAGNOLIA ROAD

Source of Information - AIT LIFE SAFETY AND THE CITY OF MAITLAND

COMMODITY STORAGE

Commodity
Storage Ht.
Storage Method: Solid Piled % Palletized % Rack

Class Area
Location Aisle W.

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

RACK

Flue Spacing
Longitudinal

Clearance:Storage to Ceiling
Transverse

Horizontal Barriers Provided:

Water Supply Curve (C)

AIT LIFE SAFETY
Enzian Theater-Design Area #1

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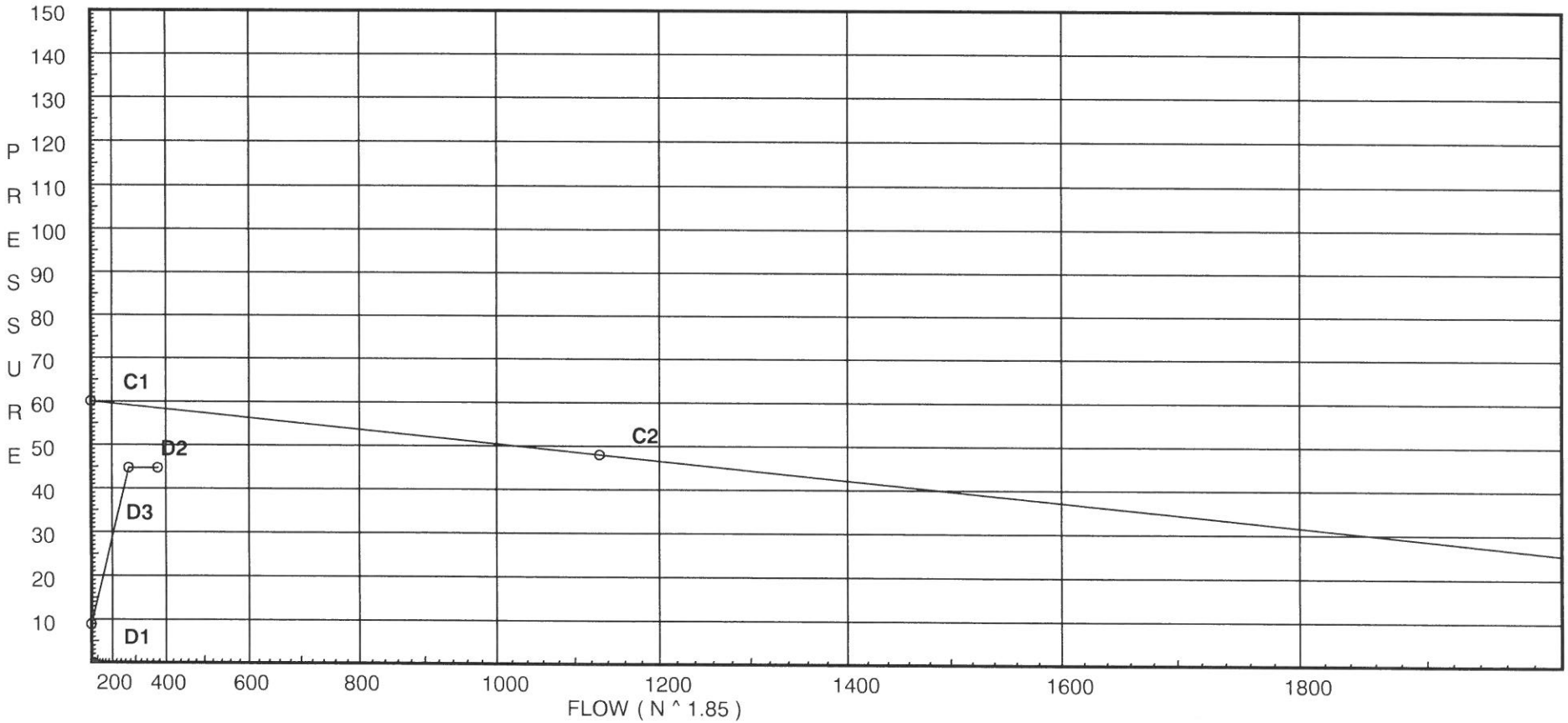
Date 3-3-15

City Water Supply:
- C1 - Static Pressure : 60
- C2 - Residual Pressure: 48
- C2 - Residual Flow : 1130

Demand:

D1 - Elevation	:	8.879
D2 - System Flow	:	276.507
D2 - System Pressure	:	44.750
Hose (Demand)	:	100
D3 - System Demand	:	376.507
Safety Margin	:	13.679



Fittings Used Summary

AIT LIFE SAFETY
Enzian Theater-Design Area #1

Fitting Legend

Abbrev.	Name	½	¾	1	1¼	1½	2	2½	3	3½	4	5	6	8	10	12	14	16	18	20	24
Fsp	Flow Switch Potter VSR	Fitting generates a Fixed Loss Based on Flow																			
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
I	90' Grvd-Vic Elbow #10	0	0	2	3	4	3.5	6	5	8	7	8.5	10	13	17	20	23	25	33	36	40
J	90'Tee-Branch Grv Vic #20	0	0	4.5	6	8	8.5	10.8	13	17	16	21	25	33	41	50	65	78	88	98	120
L	NFPA 13 Long Turn Elbow	0.5	1	2	2	2	3	4	5	5	6	8	9	13	16	18	24	27	30	34	40
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

Units Summary

Diameter Units	Inches
Length Units	Feet
Flow Units	US Gallons per Minute
Pressure Units	Pounds per Square Inch

Note: Fitting Legend provides equivalent pipe lengths for fittings types of various diameters. Equivalent lengths shown are standard for actual diameters of Sched 40 pipe and CFactors of 120 except as noted with *. The fittings marked with a * show equivalent lengths values supplied by manufacturers based on specific pipe diameters and CFactors and they require no adjustment. All values for fittings not marked with a * will be adjusted in the calculation for CFactors of other than 120 and diameters other than Sched 40 per NFPA.

Pressure / Flow Summary - STANDARD

AIT LIFE SAFETY
Enzian Theater-Design Area #1

Date 3-3-15

Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
1	23.0	4.2	7.05	na	11.16	0.1	60	7.0
2	23.0	4.2	7.05	na	11.16	0.1	60	7.0
3	23.0	4.2	7.0	na	11.11	0.1	60	7.0
4	23.0	4.2	7.0	na	11.11	0.1	60	7.0
5	23.0	4.2	7.05	na	11.15	0.1	60	7.0
6	23.0	4.2	7.05	na	11.15	0.1	60	7.0
7	23.0	4.2	7.13	na	11.22	0.1	60	7.0
8	23.0	4.2	7.13	na	11.22	0.1	60	7.0
9	23.0	4.2	7.29	na	11.34	0.1	60	7.0
10	23.0	4.2	7.29	na	11.34	0.1	60	7.0
11	23.0	4.2	7.53	na	11.52	0.1	60	7.0
12	23.0	4.2	7.53	na	11.52	0.1	60	7.0
13	23.0	4.2	7.84	na	11.76	0.1	60	7.0
14	23.0	4.2	7.84	na	11.76	0.1	60	7.0
15	23.0	4.2	8.3	na	12.1	0.1	60	7.0
16	23.0	4.2	8.3	na	12.1	0.1	60	7.0
17	23.0	4.2	8.85	na	12.49	0.1	60	7.0
18	23.0	4.2	8.85	na	12.49	0.1	60	7.0
19	23.0	4.2	7.08	na	11.17	0.1	60	7.0
20	23.0	4.2	7.29	na	11.34	0.1	60	7.0
21	23.0	4.2	8.02	na	11.89	0.1	60	7.0
22	23.0	4.2	7.08	na	11.17	0.1	60	7.0
23	23.0	4.2	7.29	na	11.34	0.1	60	7.0
24	23.0	4.2	8.02	na	11.89	0.1	60	7.0
A1	23.0		7.07	na				
A2	23.0		7.08	na				
A3	23.0		7.13	na				
A4	23.0		7.22	na				
A5	23.0		7.37	na				
A6	23.0		7.62	na				
A7	23.0		7.93	na				
A8	23.0		8.39	na				
B1	23.0		7.07	na				
B2	23.0		7.08	na				
B3	23.0		7.13	na				
B4	23.0		7.22	na				
B5	23.0		7.37	na				
B6	23.0		7.62	na				
B7	23.0		7.93	na				
B8	23.0		8.39	na				
A9	23.0		8.95	na				
B9	23.0		8.95	na				
A10	23.0		10.5	na				
B10	23.0		10.5	na				
C1	23.0		11.09	na				
C2	23.0		14.35	na				
C3	23.0		16.0	na				
C4	23.0		15.02	na				
C5	23.0		16.37	na				
C6	23.0		16.75	na				
C7	13.0		21.44	na				
C8	13.0		22.41	na				
C9	13.0		23.67	na				
C10	13.0		25.77	na				
TR	13.0		26.53	na				
BR	1.0		34.94	na				
UG1	-2.5		41.58	na				
TEST	2.5		44.75	na	100.0			

The maximum velocity is 12.15 and it occurs in the pipe between nodes B9 and B10

Final Calculations - Hazen-Williams

AIT LIFE SAFETY
Enzian Theater-Design Area #1

Date 3-3-15

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	-0.03	2.157		0.0	12.000	7.055		K Factor = 4.20
to		120.0		0.0	0.0	0.0		
2	-0.03	0.0		0.0	12.000	0.0		Vel = 0
2	11.16	2.157	1l	4.307	8.580	7.055		K Factor = 4.20
to		120.0		0.0	4.307	0.0		
B1	11.13	0.0013		0.0	12.887	0.017		Vel = 0.98
	0.0							
	11.13					7.072		K Factor = 4.19
3	0.01	1.682		0.0	12.000	7.000		K Factor = 4.20
to		120.0		0.0	0.0	0.0		
4	0.01	0.0		0.0	12.000	0.0		Vel = 0
4	11.11	1.682	1T	9.9	8.580	7.000		K Factor = 4.20
to		120.0		0.0	9.900	0.0		
B2	11.12	0.0044		0.0	18.480	0.081		Vel = 1.61
	0.0							
	11.12					7.081		K Factor = 4.18
5	0.01	1.682		0.0	12.000	7.050		K Factor = 4.20
to		120.0		0.0	0.0	0.0		
6	0.01	0.0		0.0	12.000	0.0		Vel = 0
6	11.15	1.682	1T	9.9	8.580	7.050		K Factor = 4.20
to		120.0		0.0	9.900	0.0		
B3	11.16	0.0044		0.0	18.480	0.082		Vel = 1.61
	0.0							
	11.16					7.132		K Factor = 4.18
7	0.01	1.682		0.0	12.000	7.135		K Factor = 4.20
to		120.0		0.0	0.0	0.0		
8	0.01	0.0		0.0	12.000	0.0		Vel = 0
8	11.21	1.682	1T	9.9	8.580	7.135		K Factor = 4.20
to		120.0		0.0	9.900	0.0		
B4	11.22	0.0044		0.0	18.480	0.082		Vel = 1.62
	0.0							
	11.22					7.217		K Factor = 4.18
9	0.0	1.682		0.0	12.000	7.287		K Factor = 4.20
to		120.0		0.0	0.0	0.0		
10	0.0	0.0		0.0	12.000	0.0		Vel = 0
10	11.34	1.682	1T	9.9	8.580	7.287		K Factor = 4.20
to		120.0		0.0	9.900	0.0		
B5	11.34	0.0046		0.0	18.480	0.085		Vel = 1.64
	0.0							
	11.34					7.372		K Factor = 4.18
11	0.01	1.682		0.0	12.000	7.529		K Factor = 4.20
to		120.0		0.0	0.0	0.0		
12	0.01	0.0		0.0	12.000	0.0		Vel = 0
12	11.52	1.682	1T	9.9	8.580	7.529		K Factor = 4.20
to		120.0		0.0	9.900	0.0		
B6	11.53	0.0047		0.0	18.480	0.087		Vel = 1.66
	0.0							
	11.53					7.616		K Factor = 4.18

Final Calculations - Hazen-Williams

AIT LIFE SAFETY
Enzian Theater-Design Area #1

Date 3-3-15

Hyd. Ref. Point	Qa / Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt / Pe / Pf	Pt / Pv / Pn	******* Notes ******
13	0.01	1.682		0.0	12.000	7.840		K Factor = 4.20
to		120.0		0.0	0.0	0.0		
14	0.01	0.0		0.0	12.000	0.0		Vel = 0
14	11.76	1.682	1T	9.9	8.580	7.840		K Factor = 4.20
to		120.0		0.0	9.900	0.0		
B7	11.77	0.0049		0.0	18.480	0.090		Vel = 1.70
	0.0							
	11.77					7.930		K Factor = 4.18
15	0.02	1.682		0.0	12.000	8.299		K Factor = 4.20
to		120.0		0.0	0.0	0.0		
16	0.02	0.0		0.0	12.000	0.0		Vel = 0
16	12.10	1.682	1T	9.9	8.580	8.299		K Factor = 4.20
to		120.0		0.0	9.900	0.0		
B8	12.12	0.0052		0.0	18.480	0.096		Vel = 1.75
	0.0							
	12.12					8.395		K Factor = 4.18
17	0.04	1.682		0.0	12.000	8.847		K Factor = 4.20
to		120.0		0.0	0.0	0.0		
18	0.04	0.0		0.0	12.000	0.0		Vel = 0.01
18	12.49	1.682	1T	9.9	8.580	8.847		K Factor = 4.20
to		120.0		0.0	9.900	0.0		
B9	12.53	0.0055		0.0	18.480	0.102		Vel = 1.81
	0.0							
	12.53					8.949		K Factor = 4.19
19	22.30	2.157		0.0	0.920	7.077		K Factor = 4.20
to		120.0		0.0	0.0	0.0		
B2	22.3	0.0043		0.0	0.920	0.004		Vel = 1.96
	0.0							
	22.30					7.081		K Factor = 8.38
20	67.14	2.157		0.0	2.330	7.287		K Factor = 4.20
to		120.0		0.0	0.0	0.0		
B5	67.14	0.0365		0.0	2.330	0.085		Vel = 5.89
	0.0							
	67.14					7.372		K Factor = 24.73
21	113.68	2.157		0.0	3.920	8.015		K Factor = 4.20
to		120.0		0.0	0.0	0.0		
B8	113.68	0.0969		0.0	3.920	0.380		Vel = 9.98
	0.0							
	113.68					8.395		K Factor = 39.24
22	22.36	2.157		0.0	0.920	7.078		K Factor = 4.20
to		120.0		0.0	0.0	0.0		
A2	22.36	0.0043		0.0	0.920	0.004		Vel = 1.96
	0.0							
	22.36					7.082		K Factor = 8.40
23	67.15	2.157		0.0	2.330	7.287		K Factor = 4.20
to		120.0		0.0	0.0	0.0		
A5	67.15	0.0365		0.0	2.330	0.085		Vel = 5.90

Final Calculations - Hazen-Williams

AIT LIFE SAFETY
Enzian Theater-Design Area #1

Date 3-3-15

Hyd. Ref. Point	Qa / Qt	Dia. "C" / Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt / Pe / Pf	Pt / Pv / Pn	******* Notes ******
	0.0							
	67.15					7.372		K Factor = 24.73
24	113.64	2.157		0.0	3.920	8.016		K Factor = 4.20
to		120.0		0.0	0.0	0.0		
A8	113.64	0.0967		0.0	3.920	0.379		Vel = 9.98
	0.0							
	113.64					8.395		K Factor = 39.22
1	11.18	2.157	1I	4.307	8.750	7.055		
to		120.0		0.0	4.307	0.0		
A1	11.18	0.0013		0.0	13.057	0.017		Vel = 0.98
	0.0							
	11.18					7.072		K Factor = 4.20
3	11.10	1.682	1T	9.9	8.750	7.000		
to		120.0		0.0	9.900	0.0		
A2	11.1	0.0044		0.0	18.650	0.082		Vel = 1.60
	0.0							
	11.10					7.082		K Factor = 4.17
5	11.14	1.682	1T	9.9	8.750	7.050		
to		120.0		0.0	9.900	0.0		
A3	11.14	0.0044		0.0	18.650	0.082		Vel = 1.61
	0.0							
	11.14					7.132		K Factor = 4.17
7	11.21	1.682	1T	9.9	8.750	7.135		
to		120.0		0.0	9.900	0.0		
A4	11.21	0.0045		0.0	18.650	0.083		Vel = 1.62
	0.0							
	11.21					7.218		K Factor = 4.17
9	11.33	1.682	1T	9.9	8.750	7.287		
to		120.0		0.0	9.900	0.0		
A5	11.33	0.0046		0.0	18.650	0.085		Vel = 1.64
	0.0							
	11.33					7.372		K Factor = 4.17
11	11.52	1.682	1T	9.9	8.750	7.529		
to		120.0		0.0	9.900	0.0		
A6	11.52	0.0047		0.0	18.650	0.087		Vel = 1.66
	0.0							
	11.52					7.616		K Factor = 4.17
13	11.75	1.682	1T	9.9	8.750	7.840		
to		120.0		0.0	9.900	0.0		
A7	11.75	0.0049		0.0	18.650	0.091		Vel = 1.70
	0.0							
	11.75					7.931		K Factor = 4.17
15	12.08	1.682	1T	9.9	8.750	8.299		
to		120.0		0.0	9.900	0.0		
A8	12.08	0.0051		0.0	18.650	0.096		Vel = 1.74
	0.0							
	12.08					8.395		K Factor = 4.17

Final Calculations - Hazen-Williams

AIT LIFE SAFETY
Enzian Theater-Design Area #1

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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 ******
17	12.45	1.682	1T	9.9	8.750	8.847		
to		120.0		0.0	9.900	0.0		
A9	12.45	0.0055		0.0	18.650	0.102		Vel = 1.80
	0.0							
	12.45					8.949		K Factor = 4.16
A1	11.18	2.157		0.0	4.080	7.072		
to		120.0		0.0	0.0	0.0		
22	11.18	0.0015		0.0	4.080	0.006		Vel = 0.98
	0.0							
	11.18					7.078		K Factor = 4.20
A2	33.46	2.157		0.0	5.000	7.082		
to		120.0		0.0	0.0	0.0		
A3	33.46	0.0100		0.0	5.000	0.050		Vel = 2.94
A3	11.14	2.157		0.0	5.000	7.132		
to		120.0		0.0	0.0	0.0		
A4	44.6	0.0172		0.0	5.000	0.086		Vel = 3.92
A4	11.21	2.157		0.0	2.670	7.218		
to		120.0		0.0	0.0	0.0		
23	55.81	0.0258		0.0	2.670	0.069		Vel = 4.90
	0.0							
	55.81					7.287		K Factor = 20.67
A5	78.49	2.157		0.0	5.000	7.372		
to		120.0		0.0	0.0	0.0		
A6	78.49	0.0488		0.0	5.000	0.244		Vel = 6.89
A6	11.51	2.157		0.0	5.000	7.616		
to		120.0		0.0	0.0	0.0		
A7	90.0	0.0630		0.0	5.000	0.315		Vel = 7.90
A7	11.75	2.157		0.0	1.080	7.931		
to		120.0		0.0	0.0	0.0		
24	101.75	0.0787		0.0	1.080	0.085		Vel = 8.93
	0.0							
	101.75					8.016		K Factor = 35.94
A8	125.72	2.157		0.0	4.750	8.395		
to		120.0		0.0	0.0	0.0		
A9	125.72	0.1166		0.0	4.750	0.554		Vel = 11.04
	0.0							
	125.72					8.949		K Factor = 42.03
B1	11.13	2.157		0.0	4.080	7.072		
to		120.0		0.0	0.0	0.0		
19	11.13	0.0012		0.0	4.080	0.005		Vel = 0.98
	0.0							
	11.13					7.077		K Factor = 4.18
B2	33.42	2.157		0.0	5.000	7.081		
to		120.0		0.0	0.0	0.0		
B3	33.42	0.0102		0.0	5.000	0.051		Vel = 2.93
B3	11.16	2.157		0.0	5.000	7.132		
to		120.0		0.0	0.0	0.0		
B4	44.58	0.0170		0.0	5.000	0.085		Vel = 3.91

Final Calculations - Hazen-Williams

AIT LIFE SAFETY
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Date 3-3-15

Hyd. Ref. Point	Qa / Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes ******
B4	11.23	2.157		0.0	2.670	7.217		
to		120.0		0.0	0.0	0.0		
20	55.81	0.0262		0.0	2.670	0.070		Vel = 4.90
	0.0							
	55.81					7.287		K Factor = 20.67
B5	78.49	2.157		0.0	5.000	7.372		
to		120.0		0.0	0.0	0.0		
B6	78.49	0.0488		0.0	5.000	0.244		Vel = 6.89
B6	11.53	2.157		0.0	5.000	7.616		
to		120.0		0.0	0.0	0.0		
B7	90.02	0.0628		0.0	5.000	0.314		Vel = 7.90
B7	11.77	2.157		0.0	1.080	7.930		
to		120.0		0.0	0.0	0.0		
21	101.79	0.0787		0.0	1.080	0.085		Vel = 8.94
	0.0							
	101.79					8.015		K Factor = 35.95
B8	125.80	2.157		0.0	4.750	8.395		
to		120.0		0.0	0.0	0.0		
B9	125.8	0.1166		0.0	4.750	0.554		Vel = 11.05
	0.0							
	125.80					8.949		K Factor = 42.05
A9	138.18	2.157	1I	4.307	6.830	8.949		
to		120.0		0.0	4.307	0.0		
A10	138.18	0.1388		0.0	11.137	1.546		Vel = 12.13
	0.0							
	138.18					10.495		K Factor = 42.65
B9	138.33	2.157	1I	4.307	6.830	8.949		
to		120.0		0.0	4.307	0.0		
B10	138.33	0.1392		0.0	11.137	1.550		Vel = 12.15
	0.0							
	138.33					10.499		K Factor = 42.69
A10	138.18	3.26	1J	17.471	14.790	10.495		
to		120.0		0.0	17.471	0.0		
C1	138.18	0.0186		0.0	32.261	0.600		Vel = 5.31
	0.0							
	138.18					11.095		K Factor = 41.48
B10	138.33	3.26	1J	17.471	14.540	10.499		
to		120.0		0.0	17.471	0.0		
C1	138.33	0.0186		0.0	32.011	0.596		Vel = 5.32
C1	138.18	3.26	2I	13.44	15.000	11.095		
to		120.0	1T	20.159	33.599	0.0		
C2	276.51	0.0671		0.0	48.599	3.259		Vel = 10.63
C2	-130.96	3.26	1T	20.159	60.420	14.354		
to		120.0		0.0	20.159	0.0		
C3	145.55	0.0205		0.0	80.579	1.648		Vel = 5.59
	0.0							
	145.55					16.002		K Factor = 36.39

Final Calculations - Hazen-Williams

AIT LIFE SAFETY
Enzian Theater-Design Area #1

Date 3-3-15

Hyd. Ref. Point	Qa / Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes ******
C2	130.96	3.26	1T	20.159	19.210	14.354		
to		120.0		0.0	20.159	0.0		
C4	130.96	0.0168		0.0	39.369	0.662		Vel = 5.03
	0.0							
	130.96					15.016		K Factor = 33.80
C3	145.55	3.26	1T	20.159	16.620	16.002		
to		120.0		0.0	20.159	0.0		
C6	145.55	0.0204		0.0	36.779	0.752		Vel = 5.59
	0.0							
	145.55					16.754		K Factor = 35.56
C4	130.96	3.26	1T	20.159	60.420	15.016		
to		120.0		0.0	20.159	0.0		
C5	130.96	0.0168		0.0	80.579	1.356		Vel = 5.03
C5	0.0	3.26	1T	20.159	2.580	16.372		
to		120.0		0.0	20.159	0.0		
C6	130.96	0.0168		0.0	22.739	0.382		Vel = 5.03
C6	145.55	4.26	1I	9.217	10.000	16.754		
to		120.0		0.0	9.217	4.331		
C7	276.51	0.0183		0.0	19.217	0.351		Vel = 6.22
C7	0.0	4.26	1I	9.217	23.160	21.436		
to		120.0	1J	21.067	30.284	0.0		
C8	276.51	0.0182		0.0	53.444	0.974		Vel = 6.22
C8	0.0	4.26	1I	9.217	60.000	22.410		
to		120.0		0.0	9.217	0.0		
C9	276.51	0.0182		0.0	69.217	1.261		Vel = 6.22
C9	0.0	4.26	1I	9.217	106.000	23.671		
to		120.0		0.0	9.217	0.0		
C10	276.51	0.0182		0.0	115.217	2.099		Vel = 6.22
C10	0.0	4.26	1I	9.217	32.250	25.770		
to		120.0		0.0	9.217	0.0		
TR	276.51	0.0182		0.0	41.467	0.756		Vel = 6.22
TR	0.0	4.26	1Fsp	0.0	12.000	26.526		
to		120.0		0.0	0.0	8.197		* Fixed loss = 3
BR	276.51	0.0182		0.0	12.000	0.219		Vel = 6.22
BR	0.0	4.07	2L	19.119	321.000	34.942		
to		150.0		0.0	19.119	1.516		
UG1	276.51	0.0151		0.0	340.119	5.121		Vel = 6.82
UG1	0.0	4.07	1G	3.186	50.000	41.579		
to		150.0	2T	63.728	105.152	0.834		* Fixed loss = 3
TEST	276.51	0.0151	4L	38.237	155.152	2.337		Vel = 6.82
	100.00							Qa = 100.00
	376.51					44.750		K Factor = 56.28

. . . Fire Protection by Computer Design

AIT LIFE SAFETY
4617 PARKBREEZE COURT
ORLANDO, FL 32808
407-816-9101

Job Name	:	Enzian Theater-Design Area #2
Building	:	THEATER ADDITION/RENOVATION
Location	:	1300 S. ORLANDO AVE.
System	:	DA #2
Contract	:	TBA
Data File	:	DA #2.WXF

Hydraulic Design Information Sheet

Name - ENZIAN THEATER
Date - 3-3-15
Location - 1300 S. ORLANDO AVE.
Building - THEATER ADDITION/RENOVATION
System No. - DA #2
Contractor - AIT LIFE SAFETY
Contract No. - TBA
Calculated By - SEAN LOCKYER
Drawing No. - FP-2 OF 2
Construction: (X) Combustible ( ) Non-Combustible
Ceiling Height - VARIES
Occupancy - DESIGN AREA #2-EXISTING THEATER (LIGHT HAZARD)

SYSTEM

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

DESIGN

Area of Sprinkler Operation	- 1500	System Type	Sprinkler/Nozzle
Density	- .10	(X) Wet	Make RELIABLE
Area Per Sprinkler	- 324 MAX	( ) Dry	Model ECLH
Elevation at Highest Outlet	- 23'-0"	( ) Deluge	Size 3/4"
Hose Allowance - Inside	- 0	( ) Preaction	K-Factor 11.2K
Rack Sprinkler Allowance	- 0	( ) Other	Temp.Rat.155
Hose Allowance - Outside	- 100		

Note

Calculation Summary: Flow Required - 448.46 Press Required - 46.117 @ TEST
C-Factor Used: 120 Overhead 150 Underground

WATER SUPPLY

Water Flow Test:		Pump Data:		Tank or Reservoir:
Date of Test	- 1-29-14			Cap. -
Time of Test	- 8:00 AM	Rated Cap.-		Elev.-
Static Press	- 60 PSI	@ Press	-	
Residual Press	- 48 PSI	Elev.	-	Well
Flow	- 1130 GPM			Proof Flow
Elevation	- 2'-6"			

Location - 17-92 & MAGNOLIA ROAD

Source of Information - AIT LIFE SAFETY AND THE CITY OF MAITLAND

COMMODITY STORAGE

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

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:

Water Supply Curve (C)

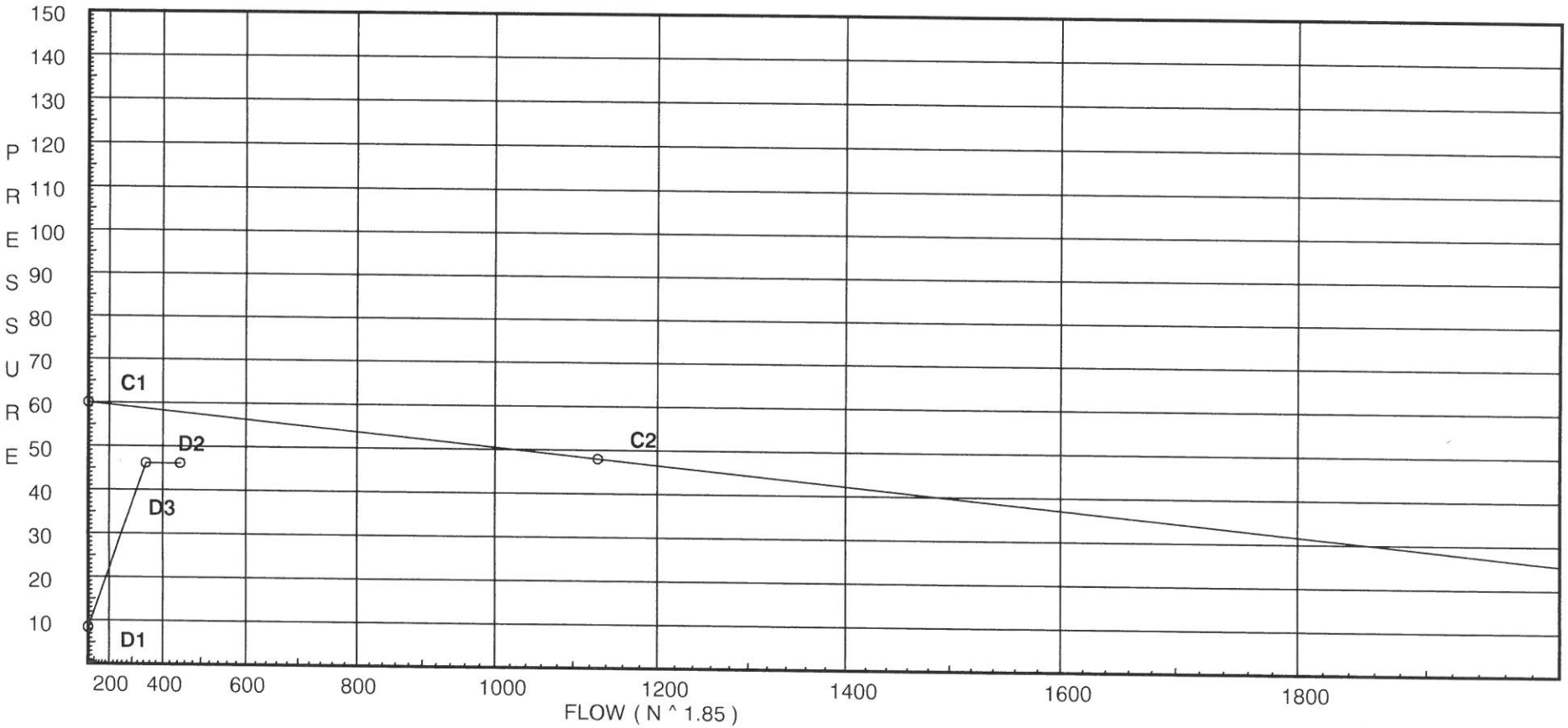
AIT LIFE SAFETY
Enzian Theater-Design Area #2

Date 3-3-15

City Water Supply:
- C1 - Static Pressure : 60
- C2 - Residual Pressure: 48
- C2 - Residual Flow : 1130

Demand:

D1 - Elevation	:	8.445
D2 - System Flow	:	348.457
D2 - System Pressure	:	46.117
Hose (Demand)	:	100
D3 - System Demand	:	448.457
Safety Margin	:	11.712



Fittings Used Summary

AIT LIFE SAFETY
Enzian Theater-Design Area #2

Fitting Legend

Abbrev.	Name	½	¾	1	1¼	1½	2	2½	3	3½	4	5	6	8	10	12	14	16	18	20	24
Fsp	Flow Switch Potter VSR	Fitting generates a Fixed Loss Based on Flow																			
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
I	90' Grvd-Vic Elbow #10	0	0	2	3	4	3.5	6	5	8	7	8.5	10	13	17	20	23	25	33	36	40
L	NFPA 13 Long Turn Elbow	0.5	1	2	2	2	3	4	5	5	6	8	9	13	16	18	24	27	30	34	40
O *	CPVC Tee - Branch	3	3	5	6	8	10	12	15	0	0	0	0	0	0	0	0	0	0	0	0
R *	CPVC Coupling Tee - Run	1	1	1	1	1	1	2	2	0	0	0	0	0	0	0	0	0	0	0	0
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

Units Summary

Diameter Units	Inches
Length Units	Feet
Flow Units	US Gallons per Minute
Pressure Units	Pounds per Square Inch

Note: Fitting Legend provides equivalent pipe lengths for fittings types of various diameters. Equivalent lengths shown are standard for actual diameters of Sched 40 pipe and CFactors of 120 except as noted with *. The fittings marked with a * show equivalent lengths values supplied by manufacturers based on specific pipe diameters and CFactors and they require no adjustment. All values for fittings not marked with a * will be adjusted in the calculation for CFactors of other than 120 and diameters other than Sched 40 per NFPA.

Pressure / Flow Summary - STANDARD

AIT LIFE SAFETY
Enzian Theater-Design Area #2

Date 3-3-15

Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
25	23.0	11.2	10.97	na	37.1	0.1	324	8.7
26A	22.0	11.2	9.17	na	33.92	0.1	324	8.7
27A	22.0	11.2	8.78	na	33.18	0.1	324	8.7
28A	22.0	11.2	8.7	na	33.04	0.1	324	8.7
29A	22.0	11.2	10.12	na	35.62	0.1	324	8.7
30A	22.0	11.2	9.68	na	34.85	0.1	324	8.7
31A	22.0	11.2	9.6	na	34.7	0.1	324	8.7
32A	22.0	11.2	10.29	na	35.92	0.1	324	8.7
33A	22.0	11.2	9.85	na	35.14	0.1	324	8.7
34A	22.0	11.2	9.76	na	34.99	0.1	324	8.7
28	23.0		9.3	na				
27	23.0		9.38	na				
26	23.0		9.82	na				
31	23.0		10.3	na				
30	23.0		10.39	na				
29	23.0		10.87	na				
34	23.0		10.48	na				
33	23.0		10.57	na				
32	23.0		11.06	na				
D1	23.0		13.73	na				
D2	23.0		13.81	na				
D3	23.0		14.05	na				
D4	23.0		15.44	na				
D7	23.0		17.67	na				
C10	13.0		22.63	na				
TR	13.0		23.79	na				
BR	1.0		32.33	na				
UG1	-2.5		41.7	na				
TEST	2.5		46.12	na	100.0			

The maximum velocity is 12.1 and it occurs in the pipe between nodes 32A and 32

Final Calculations - Hazen-Williams

AIT LIFE SAFETY
Enzian Theater-Design Area #2

Date 3-3-15

Hyd. Ref. Point	Qa / Qt	Dia. "C" / Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt / Pe / Pf	Pt / Pv / Pn	******* Notes ******
25	137.23	2.157	1T	12.307	7.830	10.972		K Factor = 11.20
to		120.0		0.0	12.307	0.0		
D1	137.23	0.1371		0.0	20.137	2.761		Vel = 12.05
	0.0							
	137.23					13.733		K Factor = 37.03
26A	33.92	1.101	1O	5.0	1.000	9.172		K Factor = 11.20
to		150.0		0.0	5.000	-0.433		
26	33.92	0.1807		0.0	6.000	1.084		Vel = 11.43
	0.0							
	33.92					9.823		K Factor = 10.82
27A	33.18	1.101	1O	5.0	1.000	8.776		K Factor = 11.20
to		150.0		0.0	5.000	-0.433		
27	33.18	0.1735		0.0	6.000	1.041		Vel = 11.18
	0.0							
	33.18					9.384		K Factor = 10.83
28A	33.04	1.101	1O	5.0	1.000	8.700		K Factor = 11.20
to		150.0		0.0	5.000	-0.433		
28	33.04	0.1722		0.0	6.000	1.033		Vel = 11.13
	0.0							
	33.04					9.300		K Factor = 10.83
29A	35.62	1.101	1O	5.0	1.000	10.116		K Factor = 11.20
to		150.0		0.0	5.000	-0.433		
29	35.62	0.1978		0.0	6.000	1.187		Vel = 12.00
	0.0							
	35.62					10.870		K Factor = 10.80
30A	34.85	1.101	1O	5.0	1.000	9.681		K Factor = 11.20
to		150.0		0.0	5.000	-0.433		
30	34.85	0.1902		0.0	6.000	1.141		Vel = 11.74
	0.0							
	34.85					10.389		K Factor = 10.81
31A	34.70	1.101	1O	5.0	1.000	9.598		K Factor = 11.20
to		150.0		0.0	5.000	-0.433		
31	34.7	0.1887		0.0	6.000	1.132		Vel = 11.69
	0.0							
	34.70					10.297		K Factor = 10.81
32A	35.92	1.101	1O	5.0	1.000	10.286		K Factor = 11.20
to		150.0		0.0	5.000	-0.433		
32	35.92	0.2012		0.0	6.000	1.207		Vel = 12.10
	0.0							
	35.92					11.060		K Factor = 10.80
33A	35.14	1.101	1O	5.0	1.000	9.846		K Factor = 11.20
to		150.0		0.0	5.000	-0.433		
33	35.14	0.1930		0.0	6.000	1.158		Vel = 11.84
	0.0							
	35.14					10.571		K Factor = 10.81
34A	34.99	1.101	1O	5.0	1.000	9.761		K Factor = 11.20
to		150.0		0.0	5.000	-0.433		
34	34.99	0.1915		0.0	6.000	1.149		Vel = 11.79

Final Calculations - Hazen-Williams

AIT LIFE SAFETY
Enzian Theater-Design Area #2

Date 3-3-15

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes ******
	0.0							
	34.99					10.477		K Factor = 10.81
28	33.04	2.003	1R	1.0	8.000	9.300		
to		150.0		0.0	1.000	0.0		
27	33.04	0.0093		0.0	9.000	0.084		Vel = 3.36
27	33.17	2.003	1R	1.0	12.000	9.384		
to		150.0		0.0	1.000	0.0		
26	66.21	0.0338		0.0	13.000	0.439		Vel = 6.74
26	33.92	2.157		0.0	15.000	9.823		
to		120.0		0.0	0.0	0.0		
25	100.13	0.0766		0.0	15.000	1.149		Vel = 8.79
	0.0							
	100.13					10.972		K Factor = 30.23
31	34.70	2.003	1R	1.0	8.000	10.297		
to		150.0		0.0	1.000	0.0		
30	34.7	0.0102		0.0	9.000	0.092		Vel = 3.53
30	34.85	2.003	1R	1.0	12.000	10.389		
to		150.0		0.0	1.000	0.0		
29	69.55	0.0370		0.0	13.000	0.481		Vel = 7.08
29	35.62	2.157	1T	12.307	22.830	10.870		
to		120.0		0.0	12.307	0.0		
D2	105.17	0.0838		0.0	35.137	2.945		Vel = 9.23
	0.0							
	105.17					13.815		K Factor = 28.30
34	34.99	2.003	1R	1.0	8.000	10.477		
to		150.0		0.0	1.000	0.0		
33	34.99	0.0104		0.0	9.000	0.094		Vel = 3.56
33	35.15	2.003	1R	1.0	12.000	10.571		
to		150.0		0.0	1.000	0.0		
32	70.14	0.0376		0.0	13.000	0.489		Vel = 7.14
32	35.92	2.157	1T	12.307	22.830	11.060		
to		120.0		0.0	12.307	0.0		
D3	106.06	0.0851		0.0	35.137	2.990		Vel = 9.31
	0.0							
	106.06					14.050		K Factor = 28.30
D1	137.23	4.26		0.0	16.500	13.733		
to		120.0		0.0	0.0	0.0		
D2	137.23	0.0050		0.0	16.500	0.082		Vel = 3.09
D2	105.17	4.26		0.0	16.500	13.815		
to		120.0		0.0	0.0	0.0		
D3	242.4	0.0142		0.0	16.500	0.235		Vel = 5.46
D3	106.06	4.26	1T	26.334	23.420	14.050		
to		120.0		0.0	26.334	0.0		
D4	348.46	0.0280		0.0	49.754	1.391		Vel = 7.84
D4	0.0	4.26	1T	26.334	53.500	15.441		
to		120.0		0.0	26.334	0.0		
D7	348.46	0.0280		0.0	79.834	2.232		Vel = 7.84

Final Calculations - Hazen-Williams

AIT LIFE SAFETY
Enzian Theater-Design Area #2

Date 3-3-15

Hyd. Ref. Point	Qa / Qt	Dia. "C" / Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt / Pe / Pf	Pt / Pv / Pn	******* Notes ******
D7	0.0	4.26	1I	9.217	13.330	17.673		
to		120.0		0.0	9.217	4.331		
C10	348.46	0.0279		0.0	22.547	0.630		Vel = 7.84
C10	0.0	4.26	1I	9.217	32.250	22.634		
to		120.0		0.0	9.217	0.0		
TR	348.46	0.0279		0.0	41.467	1.159		Vel = 7.84
TR	0.0	4.26	1Fsp	0.0	12.000	23.793		
to		120.0		0.0	0.0	8.197		* Fixed loss = 3
BR	348.46	0.0280		0.0	12.000	0.336		Vel = 7.84
BR	0.0	4.07	2L	19.119	321.000	32.326		
to		150.0		0.0	19.119	1.516		
UG1	348.46	0.0231		0.0	340.119	7.856		Vel = 8.59
UG1	0.0	4.07	1G	3.186	50.000	41.698		
to		150.0	2T	63.728	105.152	0.834		* Fixed loss = 3
TEST	348.46	0.0231	4L	38.237	155.152	3.585		Vel = 8.59
	100.00							Qa = 100.00
	448.46					46.117		K Factor = 66.04

. . . Fire Protection by Computer Design

AIT LIFE SAFETY
4617 PARKBREEZE COURT
ORLANDO, FL 32808
407-816-9101

Job Name	:	Enzian Theater-Design Area #3
Building	:	THEATER ADDITION/RENOVATION
Location	:	1300 S. ORLANDO AVE.
System	:	DA #3
Contract	:	TBA
Data File	:	DA #3.WXF

Hydraulic Design Information Sheet

Name - ENZIAN THEATER
Date - 3-3-15
Location - 1300 S. ORLANDO AVE.
Building - THEATER ADDITION/RENOVATION
System No. - DA #3
Contractor - AIT LIFE SAFETY
Contract No. - TBA
Calculated By - SEAN LOCKYER
Drawing No. - FP-2 OF 2
Construction: (X) Combustible ( ) Non-Combustible
Ceiling Height - VARIES
Occupancy - DESIGN AREA #3-KITCHEN (ORDINARY HAZARD)

SYSTEM

(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

DESIGN

Area of Sprinkler Operation	- 900	System Type	Sprinkler/Nozzle
Density	- .15	(X) Wet	Make RELIABLE
Area Per Sprinkler	- 196 MAX	( ) Dry	Model J112
Elevation at Highest Outlet	- 13'-0"	( ) Deluge	Size 3/4"
Hose Allowance - Inside	- 0	( ) Preaction	K-Factor 11.2K
Rack Sprinkler Allowance	- 0	( ) Other	Temp.Rat.155
Hose Allowance - Outside	- 250		

Note DESIGN AREA REDUCED 40% AS ALLOWED BY NFPA #13

Calculation Summary: Flow Required - 537.44 Press Required - 35.183 @ TEST
C-Factor Used: 120 Overhead 150 Underground

WATER SUPPLY

Water Flow Test:
Date of Test - 1-29-14
Time of Test - 8:00 AM
Static Press - 60 PSI
Residual Press - 48 PSI
Flow - 1130 GPM
Elevation - 2'-6"

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

Tank or Reservoir:
Cap. -
Elev.-

Well
Proof Flow

Location - 17-92 & MAGNOLIA ROAD

Source of Information - AIT LIFE SAFETY AND THE CITY OF MAITLAND

COMMODITY STORAGE

Commodity
Storage Ht.
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
Longitudinal
Clearance:Storage to Ceiling
Transverse

Horizontal Barriers Provided:

Water Supply Curve (C)

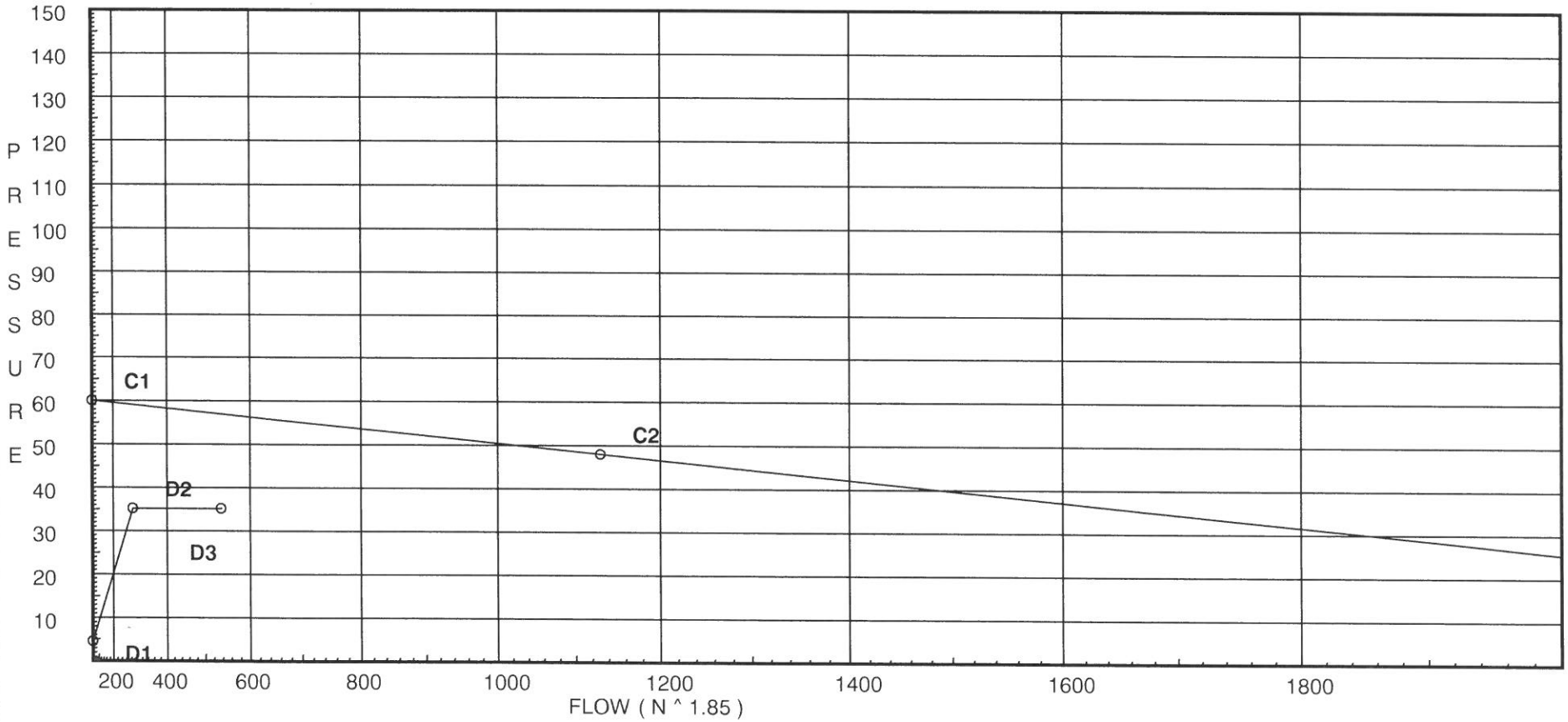
AIT LIFE SAFETY
Enzian Theater-Design Area #3

Date 3-3-15

City Water Supply:
- C1 - Static Pressure : 60
- C2 - Residual Pressure: 48
- C2 - Residual Flow : 1130

Demand:

D1 - Elevation	:	4.548
D2 - System Flow	:	287.438
D2 - System Pressure	:	35.183
Hose (Demand)	:	250
D3 - System Demand	:	537.438
Safety Margin	:	21.782



Fittings Used Summary

AIT LIFE SAFETY
Enzian Theater-Design Area #3

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	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
Fsp	Flow Switch Potter VSR	Fitting generates a Fixed Loss Based on Flow																			
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
I	90' Grvd-Vic Elbow #10	0	0	2	3	4	3.5	6	5	8	7	8.5	10	13	17	20	23	25	33	36	40
L	NFPA 13 Long Turn Elbow	0.5	1	2	2	2	3	4	5	5	6	8	9	13	16	18	24	27	30	34	40
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

Units Summary

Diameter Units	Inches
Length Units	Feet
Flow Units	US Gallons per Minute
Pressure Units	Pounds per Square Inch

Note: Fitting Legend provides equivalent pipe lengths for fittings types of various diameters. Equivalent lengths shown are standard for actual diameters of Sched 40 pipe and CFactors of 120 except as noted with *. The fittings marked with a * show equivalent lengths values supplied by manufacturers based on specific pipe diameters and CFactors and they require no adjustment. All values for fittings not marked with a * will be adjusted in the calculation for CFactors of other than 120 and diameters other than Sched 40 per NFPA.

Pressure / Flow Summary - STANDARD

AIT LIFE SAFETY
Enzian Theater-Design Area #3

Date 3-3-15

Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
35A	13.0	11.2	11.28	na	37.62	0.15	196	7.2
36A	13.0	5.6	13.68	na	20.72	0.15	130	7.0
37A	13.0	11.2	11.3	na	37.64	0.15	196	7.2
38A	13.0	11.2	9.25	na	34.07	0.15	196	7.2
39A	13.0	11.2	9.33	na	34.21	0.15	196	7.2
40A	13.0	11.2	9.64	na	34.78	0.15	196	7.2
41A	13.0	11.2	9.72	na	34.92	0.15	196	7.2
42A	13.0	5.6	12.13	na	19.5	0.15	130	7.0
43A	13.0	11.2	9.2	na	33.98	0.15	196	7.2
35	13.0		13.8	na				
37	13.0		13.81	na				
D5	13.0		14.51	na				
36	13.0		14.52	na				
38	13.0		10.3	na				
39	13.0		10.38	na				
D6	13.0		14.54	na				
40	13.0		14.6	na				
41	13.0		14.72	na				
42	13.0		13.83	na				
43	13.0		13.96	na				
D8	13.0		15.12	na				
D7	13.0		15.13	na				
C10	13.0		15.58	na				
TR	13.0		16.39	na				
BR	1.0		24.82	na				
UG1	-2.5		31.84	na				
TEST	2.5		35.18	na	250.0			

The maximum velocity is 13.97 and it occurs in the pipe between nodes 35A and 35

Final Calculations - Hazen-Williams

AIT LIFE SAFETY
Enzian Theater-Design Area #3

Date 3-3-15

Hyd. Ref. Point	Qa / Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes ******
35A	37.62	1.049	1T	5.0	1.000	11.284		K Factor = 11.20
to		120.0		0.0	5.000	0.0		
35	37.62	0.4188		0.0	6.000	2.513		Vel = 13.97
	0.0							
	37.62					13.797		K Factor = 10.13
36A	20.72	1.049	1T	5.0	1.000	13.685		K Factor = 5.60
to		120.0		0.0	5.000	0.0		
36	20.72	0.1388		0.0	6.000	0.833		Vel = 7.69
	0.0							
	20.72					14.518		K Factor = 5.44
37A	37.64	1.049	1T	5.0	1.000	11.295		K Factor = 11.20
to		120.0		0.0	5.000	0.0		
37	37.64	0.4193		0.0	6.000	2.516		Vel = 13.97
	0.0							
	37.64					13.811		K Factor = 10.13
38A	34.07	1.049	1E	2.0	1.000	9.253		K Factor = 11.20
to		120.0		0.0	2.000	0.0		
38	34.07	0.3483		0.0	3.000	1.045		Vel = 12.65
	0.0							
	34.07					10.298		K Factor = 10.62
39A	34.21	1.049	1E	2.0	1.000	9.331		K Factor = 11.20
to		120.0		0.0	2.000	0.0		
39	34.21	0.3513		0.0	3.000	1.054		Vel = 12.70
	0.0							
	34.21					10.385		K Factor = 10.62
40A	34.78	1.049		0.0	13.700	9.641		K Factor = 11.20
to		120.0		0.0	0.0	0.0		
40	34.78	0.3621		0.0	13.700	4.961		Vel = 12.91
	0.0							
	34.78					14.602		K Factor = 9.10
41A	34.92	1.049		0.0	13.700	9.722		K Factor = 11.20
to		120.0		0.0	0.0	0.0		
41	34.92	0.3649		0.0	13.700	4.999		Vel = 12.96
	0.0							
	34.92					14.721		K Factor = 9.10
42A	19.50	1.049		0.0	13.700	12.125		K Factor = 5.60
to		120.0		0.0	0.0	0.0		
42	19.5	0.1242		0.0	13.700	1.701		Vel = 7.24
	0.0							
	19.50					13.826		K Factor = 5.24
43A	33.98	1.049		0.0	13.700	9.205		K Factor = 11.20
to		120.0		0.0	0.0	0.0		
43	33.98	0.3469		0.0	13.700	4.753		Vel = 12.61
	0.0							
	33.98					13.958		K Factor = 9.10
35	37.62	1.682	1T	9.9	7.170	13.797		
to		120.0		0.0	9.900	0.0		
D5	37.62	0.0420		0.0	17.070	0.717		Vel = 5.43

Final Calculations - Hazen-Williams

AIT LIFE SAFETY
Enzian Theater-Design Area #3

Date 3-3-15

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes ******
	0.0							
	37.62					14.514		K Factor = 9.87
37	37.64	1.682	1T	9.9	6.830	13.811		
to		120.0		0.0	9.900	0.0		
D5	37.64	0.0420		0.0	16.730	0.703		Vel = 5.43
D5	37.62	4.26		0.0	2.080	14.514		
to		120.0		0.0	0.0	0.0		
36	75.26	0.0019		0.0	2.080	0.004		Vel = 1.69
36	20.72	4.26		0.0	8.960	14.518		
to		120.0		0.0	0.0	0.0		
D6	95.98	0.0026		0.0	8.960	0.023		Vel = 2.16
	0.0							
	95.98					14.541		K Factor = 25.17
38	34.07	1.049	1T	5.0	7.170	10.298		
to		120.0		0.0	5.000	0.0		
D6	34.07	0.3486		0.0	12.170	4.243		Vel = 12.65
	0.0							
	34.07					14.541		K Factor = 8.93
39	34.21	1.049	1T	5.0	6.830	10.385		
to		120.0		0.0	5.000	0.0		
D6	34.21	0.3513		0.0	11.830	4.156		Vel = 12.70
D6	130.05	4.26		0.0	8.750	14.541		
to		120.0		0.0	0.0	0.0		
40	164.26	0.0070		0.0	8.750	0.061		Vel = 3.70
40	34.78	4.26		0.0	12.000	14.602		
to		120.0		0.0	0.0	0.0		
41	199.04	0.0099		0.0	12.000	0.119		Vel = 4.48
41	34.92	4.26	1T	26.334	4.580	14.721		
to		120.0		0.0	26.334	0.0		
D7	233.96	0.0134		0.0	30.914	0.413		Vel = 5.27
	0.0							
	233.96					15.134		K Factor = 60.14
42	19.50	1.682		0.0	10.540	13.826		
to		120.0		0.0	0.0	0.0		
43	19.5	0.0125		0.0	10.540	0.132		Vel = 2.82
43	33.98	1.682	1T	9.9	4.580	13.958		
to		120.0		0.0	9.900	0.0		
D8	53.48	0.0805		0.0	14.480	1.166		Vel = 7.72
D8	0.0	4.26		0.0	11.670	15.124		
to		120.0		0.0	0.0	0.0		
D7	53.48	0.0009		0.0	11.670	0.010		Vel = 1.20
D7	233.96	4.26	1I	9.217	13.330	15.134		
to		120.0		0.0	9.217	0.0		
C10	287.44	0.0196		0.0	22.547	0.442		Vel = 6.47
C10	0.0	4.26	1I	9.217	32.250	15.576		
to		120.0		0.0	9.217	0.0		
TR	287.44	0.0196		0.0	41.467	0.812		Vel = 6.47

Final Calculations - Hazen-Williams

AIT LIFE SAFETY
Enzian Theater-Design Area #3

Date 3-3-15

Hyd. Ref. Point	Qa / Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes ******
TR	0.0	4.26	1Fsp	0.0	12.000	16.388		
to		120.0		0.0	0.0	8.197		* Fixed loss = 3
BR	287.44	0.0196		0.0	12.000	0.235		Vel = 6.47
BR	0.0	4.07	2L	19.119	321.000	24.820		
to		150.0		0.0	19.119	1.516		
UG1	287.44	0.0162		0.0	340.119	5.502		Vel = 7.09
UG1	0.0	4.07	1G	3.186	50.000	31.838		
to		150.0	2T	63.728	105.152	0.834		* Fixed loss = 3
TEST	287.44	0.0162	4L	38.237	155.152	2.511		Vel = 7.09
	250.00							Qa = 250.00
	537.44					35.183		K Factor = 90.61

. . . Fire Protection by Computer Design

AIT LIFE SAFETY
4617 PARKBREEZE COURT
ORLANDO, FL 32808
407-816-9101

Job Name	:	Enzian Theater-Design Area #4
Building	:	NEW THEATER ADDITION
Location	:	1300 S. ORLANDO AVE.
System	:	DA #4
Contract	:	TBA
Data File	:	DA #4.WXF

Hydraulic Design Information Sheet

Name - ENZIAN THEATER
Date - 3-3-15
Location - 1300 S. ORLANDO AVE.
Building - NEW THEATER ADDITION
System No. - DA #4
Contractor - AIT LIFE SAFETY
Contract No. - TBA
Calculated By - SEAN LOCKYER
Drawing No. - FP-2 OF 2
Construction: (X) Combustible ( ) Non-Combustible
Ceiling Height - VARIES
Occupancy - DESIGN AREA #4-THEATER ADDITION-LOBBY (LIGHT HAZARD PROOF CALC)

SYSTEM DESIGN

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

Area of Sprinkler Operation - 900	System Type	Sprinkler/Nozzle
Density - .10	(X) Wet	Make RELIABLE
Area Per Sprinkler - 225 MAX	( ) Dry	Model F1FR
Elevation at Highest Outlet - 13'-0"	( ) Deluge	Size 1/2"
Hose Allowance - Inside - 0	( ) Preaction	K-Factor 5.6K
Rack Sprinkler Allowance - 0	( ) Other	Temp.Rat.155
Hose Allowance - Outside - 100		

Note DESIGN AREA REDUCED 40% AS ALLOWED BY NFPA 13

Calculation Summary: Flow Required - 309.26 Press Required - 47.484 @ TEST
C-Factor Used: 120 Overhead 150 Underground

WATER SUPPLY

Water Flow Test:
Date of Test - 1-29-14
Time of Test - 8:00 AM
Static Press - 60 PSI
Residual Press - 48 PSI
Flow - 1130 GPM
Elevation - 2'-6"

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

Tank or Reservoir:
Cap. -
Elev.-

Well
Proof Flow

Location - 17-92 & MAGNOLIA ROAD

Source of Information - AIT LIFE SAFETY AND THE CITY OF MAITLAND

COMMODITY STORAGE

Commodity
Storage Ht.
Storage Method: Solid Piled % Palletized % Rack

Class Area
Location Aisle W.

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

RACK

Flue Spacing
Longitudinal
Transverse

Clearance:Storage to Ceiling

Horizontal Barriers Provided:

Water Supply Curve (C)

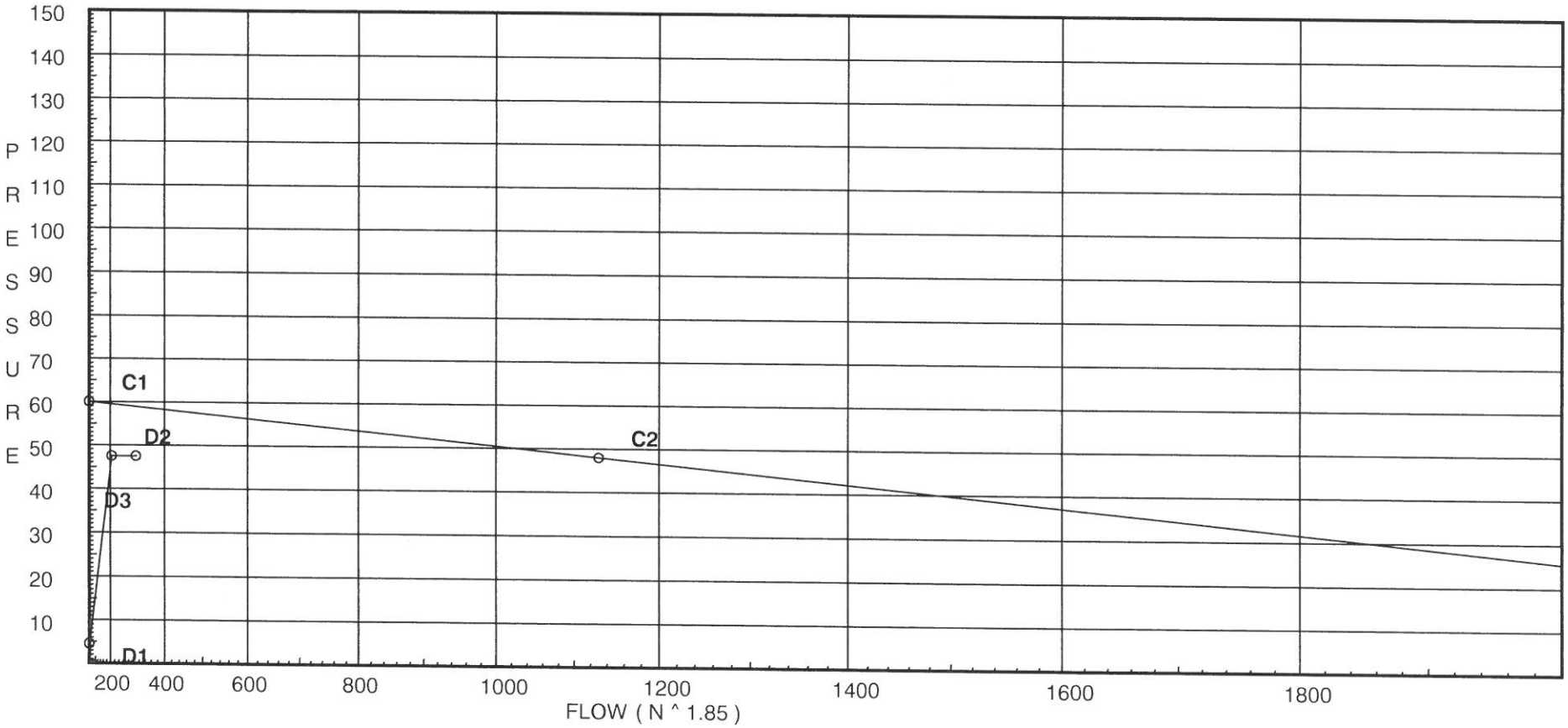
AIT LIFE SAFETY
Enzian Theater-Design Area #4

Date 3-3-15

City Water Supply:
- C1 - Static Pressure : 60
- C2 - Residual Pressure: 48
- C2 - Residual Flow : 1130

Demand:

D1 - Elevation	:	4.548
D2 - System Flow	:	209.255
D2 - System Pressure	:	47.484
Hose (Demand)	:	100
D3 - System Demand	:	309.255
Safety Margin	:	11.424



Fittings Used Summary

AIT LIFE SAFETY
Enzian Theater-Design Area #4

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	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
Fsp	Flow Switch Potter VSR	Fitting generates a Fixed Loss Based on Flow																			
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
I	90' Grvd-Vic Elbow #10	0	0	2	3	4	3.5	6	5	8	7	8.5	10	13	17	20	23	25	33	36	40
L	NFPA 13 Long Turn Elbow	0.5	1	2	2	2	3	4	5	5	6	8	9	13	16	18	24	27	30	34	40
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

Units Summary

Diameter Units	Inches
Length Units	Feet
Flow Units	US Gallons per Minute
Pressure Units	Pounds per Square Inch

Note: Fitting Legend provides equivalent pipe lengths for fittings types of various diameters. Equivalent lengths shown are standard for actual diameters of Sched 40 pipe and CFactors of 120 except as noted with *. The fittings marked with a * show equivalent lengths values supplied by manufacturers based on specific pipe diameters and CFactors and they require no adjustment. All values for fittings not marked with a * will be adjusted in the calculation for CFactors of other than 120 and diameters other than Sched 40 per NFPA.

Pressure / Flow Summary - STANDARD

AIT LIFE SAFETY
Enzian Theater-Design Area #4

Date 3-3-15

Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
44	13.0	5.6	12.83	na	20.06	0.1	167	7.0
45	13.0	5.6	12.93	na	20.13	0.1	164	7.0
46	13.0	5.6	13.46	na	20.55	0.1	164	7.0
47	13.0	5.6	15.96	na	22.37	0.1	164	7.0
48	13.0	5.6	16.14	na	22.5	0.1	225	7.0
49	13.0	5.6	18.36	na	23.99	0.1	218	7.0
50A	13.0	5.6	23.75	na	27.29	0.1	218	7.0
51	13.0	5.6	24.33	na	27.62	0.1	218	7.0
52A	13.0	5.6	19.51	na	24.73	0.1	126	7.0
E1	13.0		16.29	na				
52	13.0		22.15	na				
E3	13.0		24.92	na				
E2	13.0		24.92	na				
50	13.0		24.06	na				
E4	13.0		25.42	na				
C8	13.0		29.89	na				
C9	13.0		30.65	na				
C10	13.0		31.9	na				
TR	13.0		32.35	na				
BR	1.0		40.68	na				
UG1	-2.5		45.25	na				
TEST	2.5		47.48	na	100.0			

The maximum velocity is 18.71 and it occurs in the pipe between nodes 49 and E2

Final Calculations - Hazen-Williams

AIT LIFE SAFETY
Enzian Theater-Design Area #4

Date 3-3-15

Hyd. Ref. Point	Qa / Qt	Dia. "C" / Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt / Pe / Pf	Pt / Pv / Pn	******* Notes ******
44	20.06	1.682		0.0	7.000	12.835		K Factor = 5.60
to		120.0		0.0	0.0	0.0		
45	20.06	0.0131		0.0	7.000	0.092		Vel = 2.90
45	20.14	1.682		0.0	11.290	12.927		K Factor = 5.60
to		120.0		0.0	0.0	0.0		
46	40.2	0.0475		0.0	11.290	0.536		Vel = 5.80
46	20.54	1.682	1I	4.95	12.870	13.463		K Factor = 5.60
to		120.0	1T	9.9	14.850	0.0		
E1	60.74	0.1019		0.0	27.720	2.826		Vel = 8.77
	0.0							
	60.74					16.289		K Factor = 15.05
47	22.37	1.682		0.0	11.290	15.962		K Factor = 5.60
to		120.0		0.0	0.0	0.0		
48	22.37	0.0160		0.0	11.290	0.181		Vel = 3.23
48	22.50	1.682		0.0	2.500	16.143		K Factor = 5.60
to		120.0		0.0	0.0	0.0		
E1	44.87	0.0584		0.0	2.500	0.146		Vel = 6.48
	0.0							
	44.87					16.289		K Factor = 11.12
49	129.61	1.682	1I	4.95	1.000	18.357		K Factor = 5.60
to		120.0	1T	9.9	14.850	0.0		
E2	129.61	0.4142		0.0	15.850	6.565		Vel = 18.71
	0.0							
	129.61					24.922		K Factor = 25.96
50A	27.29	1.682	2E	9.9	3.500	23.748		K Factor = 5.60
to		120.0		0.0	9.900	0.0		
50	27.29	0.0232		0.0	13.400	0.311		Vel = 3.94
	0.0							
	27.29					24.059		K Factor = 5.56
51	54.91	1.682	1T	9.9	3.000	24.330		K Factor = 5.60
to		120.0		0.0	9.900	0.0		
E4	54.91	0.0846		0.0	12.900	1.091		Vel = 7.93
	0.0							
	54.91					25.421		K Factor = 10.89
52A	24.73	1.049		0.0	13.700	19.507		K Factor = 5.60
to		120.0		0.0	0.0	0.0		
52	24.73	0.1928		0.0	13.700	2.641		Vel = 9.18
	0.0							
	24.73					22.148		K Factor = 5.25
E1	105.62	1.682		0.0	7.290	16.289		
to		120.0		0.0	0.0	0.0		
49	105.62	0.2837		0.0	7.290	2.068		Vel = 15.25
	0.0							
	105.62					18.357		K Factor = 24.65
52	24.73	1.049	1T	5.0	9.370	22.148		
to		120.0		0.0	5.000	0.0		
E3	24.73	0.1928		0.0	14.370	2.770		Vel = 9.18

Final Calculations - Hazen-Williams

AIT LIFE SAFETY
Enzian Theater-Design Area #4

Date 3-3-15

Hyd. Ref. Point	Qa / Qt	Dia. "C" / Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt / Pe / Pf	Pt / Pv / Pn	******* Notes ******
E3	0.0	2.635		0.0	2.170	24.918		
to		120.0		0.0	0.0	0.0		
E2	24.73	0.0018		0.0	2.170	0.004		Vel = 1.45
E2	129.61	2.635		0.0	7.750	24.922		
to		120.0		0.0	0.0	0.0		
E4	154.34	0.0644		0.0	7.750	0.499		Vel = 9.08
	0.0							
	154.34					25.421		K Factor = 30.61
50	27.29	1.682		0.0	11.670	24.059		
to		120.0		0.0	0.0	0.0		
51	27.29	0.0232		0.0	11.670	0.271		Vel = 3.94
	0.0							
	27.29					24.330		K Factor = 5.53
E4	209.26	2.635		0.0	39.620	25.421		
to		120.0		0.0	0.0	0.0		
C8	209.26	0.1129		0.0	39.620	4.473		Vel = 12.31
C8	0.0	4.26	1l	9.217	60.000	29.894		
to		120.0		0.0	9.217	0.0		
C9	209.26	0.0109		0.0	69.217	0.753		Vel = 4.71
C9	0.0	4.26	1l	9.217	106.000	30.647		
to		120.0		0.0	9.217	0.0		
C10	209.26	0.0109		0.0	115.217	1.254		Vel = 4.71
C10	0.0	4.26	1l	9.217	32.250	31.901		
to		120.0		0.0	9.217	0.0		
TR	209.26	0.0109		0.0	41.467	0.451		Vel = 4.71
TR	0.0	4.26	1Fsp	0.0	12.000	32.352		
to		120.0		0.0	0.0	8.197		* Fixed loss = 3
BR	209.26	0.0109		0.0	12.000	0.131		Vel = 4.71
BR	0.0	4.07	2L	19.119	321.000	40.680		
to		150.0		0.0	19.119	1.516		
UG1	209.26	0.0090		0.0	340.119	3.058		Vel = 5.16
UG1	0.0	4.07	1G	3.186	50.000	45.254		
to		150.0	2T	63.728	105.152	0.834		* Fixed loss = 3
TEST	209.26	0.0090	4L	38.237	155.152	1.396		Vel = 5.16
	100.00							Qa = 100.00
	309.26					47.484		K Factor = 44.88