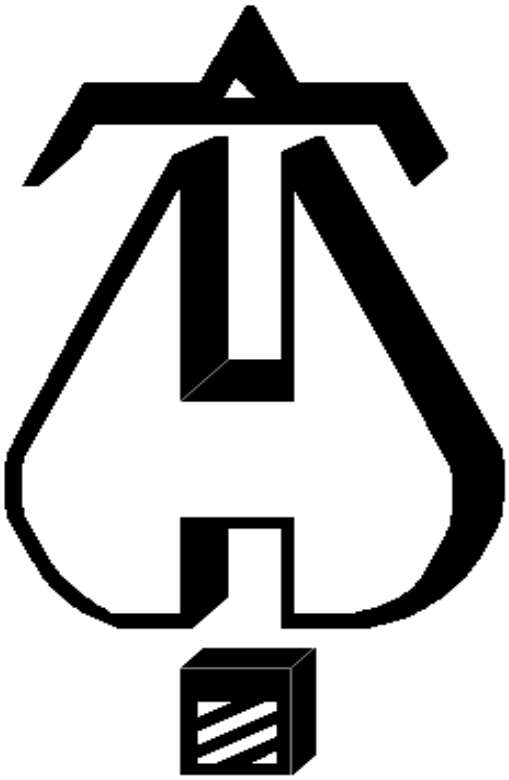

. . . Fire Protection by Computer Design

DEAN & ALLYN, INC.
32 LEWISTON ROAD BUILDING 1C
P.O. BOX 709
GRAY, ME 04039
207-657-5646

Job Name : 129 MORNING STREET
Building : 129 Morning Street
Location : 2CND FLOOR - Portland, Maine
System : WX4
Contract : C770
Data File : CALC.WX4

Hydraulic Design Information Sheet

Name - 129 Morning Street Date - 4/7/08
Location - 2CND FLOOR - Portland, Maine
Building - 129 Morning Street System No. - WX4
Contractor - Dean & Allyn, Inc Contract No. - C770
Calculated By - James R White Drawing No. - 1 OF 1
Construction: (X) Combustible ( ) Non-Combustible Ceiling Height - 8'-0"
Occupancy - RESIDENTIAL APARTMENTS

SYSTEM DESIGN

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

Area of Sprinkler Operation - 4 HEADS	System Type	Sprinkler/Nozzle
Density - .05	(X) Wet	Make TYCO
Area Per Sprinkler - 140	( ) Dry	Model TY2596
Elevation at Highest Outlet - 26'-5"	( ) Deluge	Size 1/2"
Hose Allowance - Inside - 0	( ) Preaction	K-Factor 4.2
Rack Sprinkler Allowance - 0	( ) Other	Temp.Rat.155 DEGRE
Hose Allowance - Outside - 0		

Note SAFETY MARGIN = 7.23 LBS PSI

DESIGN

Calculation Summary: Flow Required - 56.38 Press Required - 64.75
C-Factor Used: 150 Overhead 150 Underground

WATER SUPPLY

Water Flow Test:	Pump Data:	Tank or Reservoir:
Date of Test - 9/26/06		Cap. -
Time of Test -	Rated Cap.-	Elev.-
Static Press - 72	@ Press -	
Residual Press - 68	Elev. -	Well
Flow - 903		Proof Flow
Elevation - 6		

Location - HYDRANT # 413

Source of Information - PORTLAND WATER DISTRICT

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:

Fittings Used Summary

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
Fsp	Flow Switch Potter VSR	Fitting generates a Fixed Loss Based on Flow																			
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
Zaa	Ames 2000B	Fitting generates a Fixed Loss Based on Flow																			

Units Summary

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

Pressure / Flow Summary - STANDARD

Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
D301	26.5	4.2	15.27	na	16.41	0.05	256	14.5
D302	26.5	4.2	9.6	na	13.01	0.05	75	9.6
D303	26.5	4.2	9.69	na	13.07	0.05	75	9.6
D304	26.5	4.2	10.92	na	13.88	0.05	75	9.6
62	27.0		10.87	na				
61	27.0		15.28	na				
51	27.0		9.53	na				
52	27.0		9.8	na				
53	27.0		11.35	na				
54	27.0		15.47	na				
55	27.0		17.8	na				
56	27.0		28.86	na				
57	6.5		40.43	na				
58	6.5		41.48	na				
59	6.5		42.36	na				
60	6.5		46.41	na				
16	6.5		47.09	na				
17	6.5		48.67	na				
18	6.5		48.96	na				
TOR	6.5		52.1	na				
BOR	6.5		58.32	na				
19	6.5		58.55	na				
TEST	6.0		64.75	na				

The maximum velocity is 19 and it occurs in the pipe between nodes 54 and 55

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes ******
D301	16.41	1.101	1E	3.825	1.000	15.274		K Factor = 4.20
to		150		0.0	3.825	-0.217		
61	16.41	0.0473		0.0	4.825	0.228		Vel = 5.53
	0.0							
	16.41					15.285		K Factor = 4.20
D302	13.01	1.101	1E	3.825	1.000	9.600		K Factor = 4.20
to		150		0.0	3.825	-0.217		
51	13.01	0.0309		0.0	4.825	0.149		Vel = 4.38
	0.0							
	13.01					9.532		K Factor = 4.21
D303	13.07	1.101	1T	9.563	1.000	9.688		K Factor = 4.20
to		150		0.0	9.562	-0.217		
52	13.07	0.0311		0.0	10.562	0.328		Vel = 4.40
	0.0							
	13.07					9.799		K Factor = 4.18
D304	13.88	1.101	1E	3.825	1.000	10.918		K Factor = 4.20
to		150		0.0	3.825	-0.217		
62	13.88	0.0346		0.0	4.825	0.167		Vel = 4.68
	0.0							
	13.88					10.868		K Factor = 4.21
62	13.88	1.101	1T	9.563	4.330	10.868		
to		150		0.0	9.562	0.0		
53	13.88	0.0346		0.0	13.892	0.481		Vel = 4.68
	0.0							
	13.88					11.349		K Factor = 4.12
61	16.41	1.101		0.0	3.830	15.285		
to		150		0.0	0.0	0.0		
54	16.41	0.0473		0.0	3.830	0.181		Vel = 5.53
	0.0							
	16.41					15.466		K Factor = 4.17
51	13.01	1.101		0.0	8.700	9.532		
to		150		0.0	0.0	0.0		
52	13.01	0.0307		0.0	8.700	0.267		Vel = 4.38
52	13.08	1.101	1T	9.563	4.370	9.799		
to		150		0.0	9.562	0.0		
53	26.09	0.1113		0.0	13.932	1.550		Vel = 8.79
53	13.87	1.101	1T	9.563	7.250	11.349		
to		150		0.0	9.562	0.0		
54	39.96	0.2449		0.0	16.812	4.117		Vel = 13.47
54	16.42	1.101		0.0	5.040	15.466		
to		150		0.0	0.0	0.0		
55	56.38	0.4627		0.0	5.040	2.332		Vel = 19.00
55	0.0	1.101	1E	3.825	20.080	17.798		
to		150		0.0	3.825	0.0		
56	56.38	0.4628		0.0	23.905	11.064		Vel = 19.00
56	0.0	1.38	1E	3.0	2.540	28.862		
to		120	1T	6.0	9.000	8.879		
57	56.38	0.2328		0.0	11.540	2.686		Vel = 12.09

Final Calculations - Hazen-Williams

DEAN & ALLYN, INC.
129 MORNING STREET

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes ******
57	0.0	1.38	1E	3.0	1.540	40.427		
to		120		0.0	3.000	0.0		
58	56.38	0.2328		0.0	4.540	1.057		Vel = 12.09
58	0.0	1.38	1E	3.0	0.750	41.484		
to		120		0.0	3.000	0.0		
59	56.38	0.2328		0.0	3.750	0.873		Vel = 12.09
59	0.0	1.38	1E	3.0	8.410	42.357		
to		120	1T	6.0	9.000	0.0		
60	56.38	0.2328		0.0	17.410	4.053		Vel = 12.09
60	0.0	1.682		0.0	7.660	46.410		
to		120		0.0	0.0	0.0		
16	56.38	0.0888		0.0	7.660	0.680		Vel = 8.14
16	0.0	2.067	2E	10.0	38.660	47.090		
to		120		0.0	10.000	0.0		
17	56.38	0.0326		0.0	48.660	1.584		Vel = 5.39
17	0.0	2.067	1E	5.0	3.910	48.674		
to		120		0.0	5.000	0.0		
18	56.38	0.0325		0.0	8.910	0.290		Vel = 5.39
18	0.0	2.067	1Fsp	0.0	4.042	48.964		
to		120		0.0	0.0	3.000		* Fixed loss = 3
TOR	56.38	0.0327		0.0	4.042	0.132		Vel = 5.39
TOR	0.0	2.067	1E	5.0	10.500	52.096		
to		120	1Zaa	0.0	5.000	5.724		* Fixed loss = 5.724
BOR	56.38	0.0325		0.0	15.500	0.504		Vel = 5.39
BOR	0.0	2.067	1E	5.0	2.000	58.324		
to		120		0.0	5.000	0.0		
19	56.38	0.0326		0.0	7.000	0.228		Vel = 5.39
19	0.0	1.985		0.0	227.870	58.552		
to		150		0.0	0.0	0.217		
TEST	56.38	0.0262		0.0	227.870	5.977		Vel = 5.85
	0.0							
	56.38					64.746		K Factor = 7.01

Water Supply Curve (C)

DEAN & ALLYN, INC.
129 MORNING STREET

Page 6
Date 031608

City Water Supply:
- C1 - Static Pressure : 72
- C2 - Residual Pressure: 68
- C2 - Residual Flow : 903

Demand:

D1 - Elevation	:	8.879
D2 - System Flow	:	56.3778
D2 - System Pressure	:	64.746
Hose (Adj City)	:	_____
Hose (Demand)	:	_____
D3 - System Demand	:	56.3778
Safety Margin	:	7.231