



**... 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 : PAYSON STREET CHILD CARE  
Building : ONE  
Location : 1340 RIVERSIDE STREET PORTLAND MAINE  
System : ONE  
Contract : TBD  
Data File : PAYSON CHILD CARE3.WXF

HYDRAULIC DESIGN INFORMATION SHEET

Name - PAYSON STREET CHILD CARE Date - 8-9-08  
 Location - 1340 RIVERSIDE STREET PORTLAND MAINE  
 Building - ONE System No. - ONE  
 Contractor - DEAN AND ALLYN, INC. Contract No. - TBD  
 Calculated By - H KING Drawing No. - 1 OF 1  
 Construction: (X) Combustible ( ) Non-Combustible Ceiling Height 8'  
 OCCUPANCY - CHILD CARE FAC.

S Type of Calculation: ( )NFPA 13 Residential ( )NFPA 13R (X)NFPA 13D  
 Y Number of Sprinklers Flowing: ( )1 ( )2 ( )4 (X)3  
 S ( )Other  
 T ( )Specific Ruling Made by Date  
 E  
 M Listed Flow at Start Point - 22 Gpm System Type  
 Listed Pres. at Start Point - 14.4 Psi (X) Wet ( ) Dry  
 D MAXIMUM LISTED SPACING 16 x 18 ( ) Deluge ( ) PreAction  
 E Domestic Flow Added - 0 Gpm Sprinkler or Nozzle  
 S Additional Flow Added - 0 Gpm Make VIKING Model FREEDOM  
 I Elevation at Highest Outlet - 16' Feet Size 1/2" K-Factor 5.8  
 G Note:CUSHION 5.51 PSI Temperature Rating 155  
 N

Calculation Gpm Required 49.0 Psi Required 44.68 At Test  
 Summary C-Factor Used: Overhead 120 Underground 120

W Water Flow Test: Pump Data: Tank or Reservoir:  
 A Date of Test - Rated Cap. Cap.  
 T Time of Test - @ Psi Elev.  
 E Static (Psi) - 55 Elev.  
 R Residual (Psi) - 50 Other Well  
 Flow (Gpm) - 50 Proof Flow Gpm  
 S Elevation - 0

P Location:  
 P  
 L Source of Information:  
 Y

# Fittings Used Summary

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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 | 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  |
| S       | Generic Swing Check Valve | 4   | 5   | 5 | 7     | 9     | 11 | 14    | 16 | 19    | 22 | 27 | 32 | 45 | 55 | 65 | 76 | 87 | 98 | 109 | 130 |
| 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 |

## Units Summary

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

# Pressure / Flow Summary - STANDARD

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| Node No. | Elevation | K-Fact | Pt Actual | Pn | Flow Actual | Density | Area | Press Req. |
|----------|-----------|--------|-----------|----|-------------|---------|------|------------|
| 5A       | 24.0      | 4.9    | 12.0      | na | 16.97       | 0.06    | 256  | 12.0       |
| 7        | 16.0      | 4.2    | 9.99      | na | 13.28       | 0.08    | 144  | 8.2        |
| 8        | 16.0      | 4.2    | 10.66     | na | 13.71       | 0.08    | 144  | 8.2        |
| 9        | 16.0      | 5.8    | 14.4      | na | 22.01       | 0.07    | 288  | 14.4       |
| 20       | 16.0      |        | 17.0      | na |             |         |      |            |
| 13       | 16.0      |        | 23.29     | na |             |         |      |            |
| 14       | 8.0       |        | 31.6      | na |             |         |      |            |
| TR       | 8.0       |        | 36.36     | na |             |         |      |            |
| FF       | 0.0       |        | 43.78     | na |             |         |      |            |
| PMP      | 0.0       |        | 44.68     | na |             |         |      |            |

The maximum velocity is 10.51 and it occurs in the pipe between nodes 9 and 20

# Final Calculations - Hazen-Williams

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| Hyd.<br>Ref.<br>Point | Qa<br>Qt       | Dia.<br>"C"<br>Pf/Ft   | Fitting<br>or<br>Eqv. | Ln.                | Pipe<br>Ftng's<br>Total    | Pt<br>Pe<br>Pf            | Pt<br>Pv<br>Pn | ***** | Notes           | ***** |
|-----------------------|----------------|------------------------|-----------------------|--------------------|----------------------------|---------------------------|----------------|-------|-----------------|-------|
| 5A<br>to<br>5         | 16.97<br>16.97 | 1.049<br>120<br>0.0962 | 1T                    | 5.0<br>0.0<br>0.0  | 1.000<br>5.000<br>6.000    | 12.000<br>10.394<br>0.577 |                |       | K Factor = 4.90 |       |
|                       | 0.0<br>16.97   |                        |                       |                    |                            |                           | 22.971         |       | K Factor = 3.54 |       |
| 7<br>to<br>8          | 13.28<br>13.28 | 1.049<br>120<br>0.0610 |                       | 0.0<br>0.0<br>0.0  | 11.000<br>0.0<br>11.000    | 9.991<br>0.0<br>0.671     |                |       | K Factor = 4.20 |       |
| 8<br>to<br>9          | 13.71<br>26.99 | 1.049<br>120<br>0.2265 | 1E                    | 2.0<br>0.0<br>0.0  | 14.500<br>2.000<br>16.500  | 10.662<br>0.0<br>3.738    |                |       | K Factor = 4.20 |       |
| 9<br>to<br>20         | 22.01<br>49.0  | 1.38<br>120<br>0.1796  | 1T<br>1E              | 6.0<br>3.0<br>0.0  | 5.500<br>9.000<br>14.500   | 14.400<br>0.0<br>2.604    |                |       | K Factor = 5.80 |       |
| 20<br>to<br>13        | 0.0<br>49.0    | 1.38<br>120<br>0.1796  | 2T<br>1E              | 12.0<br>3.0<br>0.0 | 20.000<br>15.000<br>35.000 | 17.004<br>0.0<br>6.286    |                |       | Vel = 10.51     |       |
| 13<br>to<br>14        | 0.0<br>49.0    | 1.38<br>120<br>0.1796  | 3E<br>1T              | 9.0<br>6.0<br>0.0  | 12.000<br>15.000<br>27.000 | 23.290<br>3.465<br>4.849  |                |       | Vel = 10.51     |       |
| 14<br>to<br>TR        | 0.0<br>49.0    | 1.38<br>120<br>0.1796  | 2T                    | 12.0<br>0.0<br>0.0 | 14.500<br>12.000<br>26.500 | 31.604<br>0.0<br>4.759    |                |       | Vel = 10.51     |       |
| TR<br>to<br>FF        | 0.0<br>49.0    | 1.38<br>120<br>0.2079  | 2E<br>1S<br>1Z        | 6.0<br>7.0<br>0.0  | 6.000<br>13.000<br>19.000  | 36.363<br>3.465<br>3.951  |                |       | Vel = 10.51     |       |
| FF<br>to<br>PMP       | 0.0<br>49.0    | 1.38<br>120<br>0.1796  |                       | 0.0<br>0.0<br>0.0  | 5.000<br>0.0<br>5.000      | 43.779<br>0.0<br>0.898    |                |       | Vel = 10.51     |       |
|                       | 0.0<br>49.00   |                        |                       |                    |                            |                           | 44.677         |       | K Factor = 7.33 |       |

# Water Supply Curve (C)

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City Water Supply:  
C1 - Static Pressure : 55  
C2 - Residual Pressure: 50  
C2 - Residual Flow : 50

Demand:  
D1 - Elevation : 6.930  
D2 - System Flow : 48.999  
D2 - System Pressure : 44.677  
Hose ( Adj City ) : \_\_\_\_\_  
Hose ( Demand ) : \_\_\_\_\_  
D3 - System Demand : 48.999  
Safety Margin : 5.507

