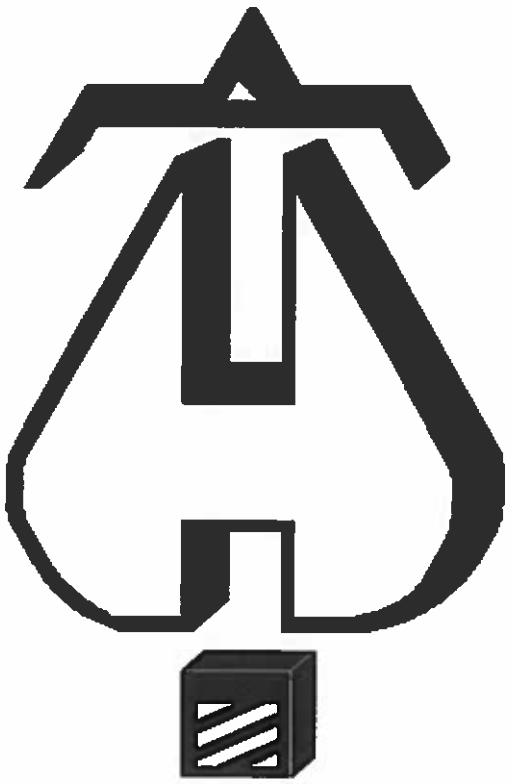


. . . Fire Protection by Computer Design

EASTERN FIRE PROTECTION
170 KITTY HAWK AVE
AUBURN, ME 04210
207-784-1507

| | | |
|---|---|---|
| Job Name | : | BRIGG'S STREET APARTMENTS |
| Drawing | : | 1 OF 1 |
| Location | : | PORTLAND, MAINE |
| Remote Area | : | 1 |
| Contract | : | AU-5364-15 |
| Data File | : | AU-5364-15 B.S.A. BASEMENT WORKSHOP CALC. CPVC.WXF |

***HYDRAULIC CALCULATIONS***
***for***

***Project name:*** BRIGG'S STREET APARTMENTS
***Location:*** PORTLAND, MAINE
***Drawing no:*** 1 OF 1
***Date:*** 5/16/16

***Design***

***Remote area number:*** 1
***Remote area location:*** BASEMENT WORKSHOP
***Occupancy classification:*** OHI
***Density:*** .15 - Gpm/SqFt
***Area of application:*** 378 - SqFt
***Coverage per sprinkler:*** 125 - SqFt
***Type of sprinklers calculated:*** RELIABLE F1FR56 WHITE RECESSED PENDENT
***No. of sprinklers calculated:*** 4
***In-rack demand:*** - GPM
***Hose streams:*** 0 - GPM
***Total water required (including hose streams):*** 78.136 - GPM @ 52.035 - Psi
***Type of system:*** WET
***Volume of dry or preaction system:*** - Gal

***Water supply information***

***Date:*** 7/7/2015
***Location:*** PORTLAND, MAINE
***Source:*** PORTLAND WATER DISTRICT

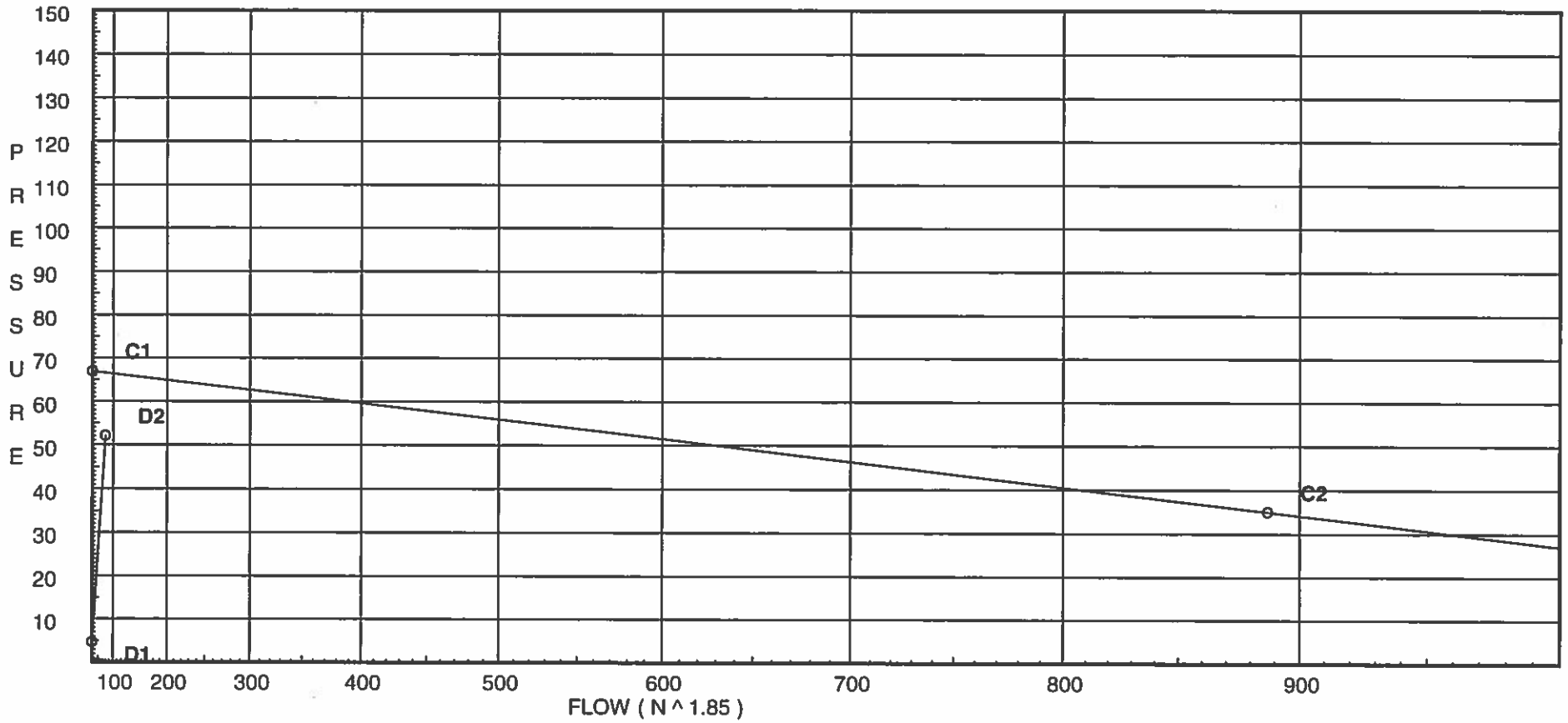
***Name of contractor:*** EASTERN FIRE PROTECTION
***Address:*** 170 KITTY HAWK AVE / / AUBURN, ME 04210
***Phone number:*** 207-784-1507
***Name of designer:*** ERIC MELANSON
***Authority having jurisdiction:*** STATE FIRE MARSHAL
***Notes: (Include peaking information or gridded systems here.)***

EASTERN FIRE PROTECTION
BRIGG'S STREET APARTMENTS



City Water Supply:
C1 - Static Pressure : 67
C2 - Residual Pressure: 35
C2 - Residual Flow : 887

Demand:
D1 - Elevation : 4.690
D2 - System Flow : 78.136
D2 - System Pressure : 52.035
Hose ( Demand ) :
D3 - System Demand : 78.136
Safety Margin : 14.607



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 |
| 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 |
| N * | CPVC 90'Ell Harvel-Spears | | 7 | 7 | 8 | 9 | 11 | 12 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| O * | CPVC Tee - Branch | 3 | 3 | 5 | 6 | 8 | 10 | 12 | 15 | 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 |
| 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 |

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.

## SUPPLY ANALYSIS

| Node at Source | Static Pressure | Residual Pressure | Flow | Available Pressure | Total Demand | Required Pressure |
|---|---|---|---|---|---|---|
| TEST | 67.0 | 35 | 887.0 | 66.643 | 78.14 | 52.035 |

## NODE ANALYSIS

| Node Tag | Elevation | Node Type | Pressure at Node | Discharge at Node | Notes |
|---|---|---|---|---|---|
| HEAD1 | 0.0 | 5.6 | 11.21 | 18.75 | |
| HEAD2 | 0.0 | 5.6 | 11.21 | 18.75 | |
| 1 | 106.83 | 5.51 | 11.57 | 18.75 | K=K @ LIN2 |
| 2 | 106.83 | 5.51 | 12.24 | 19.28 | K=K @ LIN2 |
| 3 | 107.749 | | 13.07 | | |
| 4 | 106.83 | 5.51 | 12.59 | 19.56 | K=K @ LIN2 |
| 5 | 106.83 | 5.51 | 13.9 | 20.55 | K=K @ LIN2 |
| 6 | 107.749 | | 14.86 | | |
| 21 | 107.749 | | 24.01 | | |
| 22 | 107.749 | | 28.21 | | |
| TOR | 105.0 | | 34.04 | | |
| BFP | 101.0 | | 39.01 | | |
| BASE | 98.0 | | 46.3 | | |
| TEST | 96.0 | | 52.04 | | |

EASTERN FIRE PROTECTION
BRIGG'S STREET APARTMENTS



| Node1 / to / Node2 | Elev1 / Elev2 | K / Fact | Qa / Qt | Nom / Act | Fitting or Eqv. | Ln. | Pipe Ftng's Total | CFact / Pf/Ft | Pt / Pe / Pf | ******* Notes ****** |
|---|---|---|---|---|---|---|---|---|---|---|
| HEAD1 | 0 | 5.60 | 18.75 | 1 | O | 5.0 | 1.001 | 120 | 11.210 | |
| to | | | | | | 0.0 | 5.000 | | 0.0 | |
| LIN1 | 0 | | 18.75 | 1.049 | | 0.0 | 6.001 | 0.1156 | 0.694 | Vel = 6.96 |
| | | | 0.0 | | | | | | | |
| LIN1 | | | 18.75 | | | | | | 11.904 | K Factor = 5.43 |
| HEAD2 | 0 | 5.60 | 18.75 | 1 | O | 5.0 | 1.001 | 150 | 11.210 | |
| to | | | | | | 0.0 | 5.000 | | 0.0 | |
| LIN2 | 0 | | 18.75 | 1.101 | | 0.0 | 6.001 | 0.0605 | 0.363 | Vel = 6.32 |
| | | | 0.0 | | | | | | | |
| LIN2 | | | 18.75 | | | | | | 11.573 | K Factor = 5.51 |
| 1 | 106.830 | 5.51 | 18.75 | 1 | | 0.0 | 11.000 | 150 | 11.573 | K = K @ LIN2 |
| to | | | | | | 0.0 | 0.0 | | 0.0 | |
| 2 | 106.830 | | 18.75 | 1.101 | | 0.0 | 11.000 | 0.0604 | 0.664 | Vel = 6.32 |
| 2 | 106.830 | 5.51 | 19.28 | 1 | O | 5.0 | 0.500 | 150 | 12.237 | K = K @ LIN2 |
| to | | | | | | 0.0 | 5.000 | | -0.398 | |
| 3 | 107.749 | | 38.03 | 1.101 | | 0.0 | 5.500 | 0.2235 | 1.229 | Vel = 12.82 |
| 3 | 107.749 | | 0.0 | 1 | | 0.0 | 8.000 | 150 | 13.068 | |
| to | | | | | | 0.0 | 0.0 | | 0.0 | |
| 6 | 107.749 | | 38.03 | 1.101 | | 0.0 | 8.000 | 0.2234 | 1.787 | Vel = 12.82 |
| | | | 0.0 | | | | | | | |
| 6 | | | 38.03 | | | | | | 14.855 | K Factor = 9.87 |
| 4 | 106.830 | 5.51 | 19.56 | 1 | N | 7.0 | 13.000 | 150 | 12.592 | K = K @ LIN2 |
| to | | | | | | 0.0 | 7.000 | | 0.0 | |
| 5 | 106.830 | | 19.56 | 1.101 | | 0.0 | 20.000 | 0.0653 | 1.306 | Vel = 6.59 |
| 5 | 106.830 | 5.51 | 20.54 | 1 | O | 5.0 | 0.500 | 150 | 13.898 | K = K @ LIN2 |
| to | | | | | | 0.0 | 5.000 | | -0.398 | |
| 6 | 107.749 | | 40.1 | 1.101 | | 0.0 | 5.500 | 0.2464 | 1.355 | Vel = 13.51 |
| 6 | 107.749 | | 38.04 | 1.25 | | 0.0 | 34.120 | 150 | 14.855 | |
| to | | | | | | 0.0 | 0.0 | | 0.0 | |
| 21 | 107.749 | | 78.14 | 1.394 | | 0.0 | 34.120 | 0.2683 | 9.154 | Vel = 16.43 |
| 21 | 107.749 | | 0.0 | 1.5 | 2N | 18.0 | 12.460 | 150 | 24.009 | |
| to | | | | | | 0.0 | 18.000 | | 0.0 | |
| 22 | 107.749 | | 78.14 | 1.598 | | 0.0 | 30.460 | 0.1380 | 4.202 | Vel = 12.50 |
| 22 | 107.749 | | 0.0 | 1.5 | 3E | 12.0 | 11.080 | 120 | 28.211 | |
| to | | | | | | 0.0 | 12.000 | | 1.191 | |
| TOR | 105 | | 78.14 | 1.61 | | 0.0 | 23.080 | 0.2010 | 4.638 | Vel = 12.31 |
| TOR | 105 | | 0.0 | 2 | Fsp | 0.0 | 4.000 | 120 | 34.040 | |
| to | | | | | | 0.0 | 0.0 | | 4.732 | * * Fixed Loss = 3 |
| BFP | 101 | | 78.14 | 2.067 | | 0.0 | 4.000 | 0.0598 | 0.239 | Vel = 7.47 |
| BFP | 101 | | 0.0 | 2 | Zaa | 0.0 | 3.000 | 120 | 39.011 | |
| to | | | | | | 0.0 | 0.0 | | 7.111 | * * Fixed Loss = 5.812 |
| BASE | 98 | | 78.14 | 2.067 | | 0.0 | 3.000 | 0.0597 | 0.179 | Vel = 7.47 |
| BASE | 98 | | 0.0 | 2 | 2L | 3.705 | 40.000 | 150 | 46.301 | |
| to | | | | | T | 6.174 | 10.497 | | 0.866 | |
| TEST | 96 | | 78.14 | 1.72 | G | 0.617 | 50.497 | 0.0964 | 4.868 | Vel = 10.79 |
| | | | 0.0 | | | | | | | |
| TEST | | | 78.14 | | | | | | 52.035 | K Factor = 10.83 |