

**City of Portland, Maine – Building or Use Permit Application** 389 Congress Street, 04101, Tel: (207) 874-8703, Fax: 874-8716

|   |                              |   |  |  |   |
|---|------------------------------|---|--|--|---|
| Location of Construction:<br><b>318-326 Cumberland Ave/Freble</b>   |                              | Owner:<br><b>August Corp</b>  |  | Phone:   | Permit No: <b>980154</b>  |
| Owner Address:  |                              | Lessee/Buyer's Name:<br><b>Portland Public Market</b>   |  | Phone:   | Business Name:  |
| Contractor Name:<br><b>Sprinkler Systems, Inc.</b>  |                              | Address:<br><b>P.O. Box 1285 Lewiston, ME</b>   |  | Phone:<br><b>04240 782-0104</b>  | <div style="border: 2px solid black; padding: 5px; text-align: center;"> <b>PERMIT ISSUED</b><br/> <b>FEB 26 1998</b><br/> <b>CITY OF PORTLAND</b> </div> |
| Past Use:<br><b>Public Market</b>   | Proposed Use:<br><b>Same</b> | <b>COST OF WORK:</b><br>\$ <b>30,000.00</b>   |  | <b>PERMIT FEE:</b><br>\$ <b>170.00</b>   |   |
| Proposed Project Description:<br><br><b>Install Sprinkler System</b>  |                              | <b>FIRE DEPT.</b> <input checked="" type="checkbox"/> Approved<br><input type="checkbox"/> Denied |  | <b>INSPECTION:</b><br>Use Group: Type:   |   |
|   |                              | Signature: <i>[Signature]</i>   |  | Signature: <i>[Signature]</i>  |   |
| <b>PEDESTRIAN ACTIVITIES DISTRICT (P.A.D.)</b><br>Action: <input type="checkbox"/> Approved<br><input type="checkbox"/> Approved with Conditions<br><input type="checkbox"/> Denied |                              | Signature: _____ Date: _____  |  | Zoning Approval: <i>[Signature]</i> <b>2/23/98</b><br><b>Special Zone or Reviews:</b><br><input type="checkbox"/> Shoreland<br><input type="checkbox"/> Wetland<br><input type="checkbox"/> Flood Zone<br><input type="checkbox"/> Subdivision<br><input type="checkbox"/> Site Plan maj <input type="checkbox"/> minor <input type="checkbox"/> mm <input type="checkbox"/> |   |
| Permit Taken By: <b>Mary Gresik</b>   |                              | Date Applied For: <b>20 February 1998</b>   |  |  |   |

1. This permit application does not preclude the Applicant(s) from meeting applicable State and Federal rules.
2. Building permits do not include plumbing, septic or electrical work.
3. Building permits are void if work is not started within six (6) months of the date of issuance. False information may invalidate a building permit and stop all work.

PERMIT ISSUED WITH REQUIREMENTS

**CERTIFICATION**

I hereby certify that I am the owner of record of the named property, or that the proposed work is authorized by the owner of record and that I have been authorized by the owner to make this application as his authorized agent and I agree to conform to all applicable laws of this jurisdiction. In addition, if a permit for work described in the application is issued, I certify that the code official's authorized representative shall have the authority to enter all areas covered by such permit at any reasonable hour to enforce the provisions of the code(s) applicable to such permit

*[Signature]* **20 February 1998**  
 SIGNATURE OF APPLICANT **Marc Kannegiesser** ADDRESS: \_\_\_\_\_ DATE: \_\_\_\_\_ PHONE: \_\_\_\_\_

RESPONSIBLE PERSON IN CHARGE OF WORK, TITLE \_\_\_\_\_ PHONE: \_\_\_\_\_

**Zoning Appeal**

Variance  
 Miscellaneous  
 Conditional Use  
 Interpretation  
 Approved  
 Denied

**Historic Preservation**

Not in District or Landmark  
 Does Not Require Review  
 Requires Review

**Action:**

Approved  
 Approved with Conditions  
 Denied

Date: *2/23/98*

CEO DISTRICT PH

PORTLAND FIRE DEPARTMENT

Review Date: 2/23/94 Contractor: Sprinkler System Inc

Address: Cumberland Avenue CBU: \_\_\_\_\_

Please note marked Conditions of Approval

- \* The boiler or furnace shall be protected by enclosing with one hour fire rated construction including fire doors and ceiling or by providing automatic extinguishment and smoke protected enclosure. Sprinkler piping serving not more than six sprinklers may be connected to a domestic water supply system having a capacity sufficient to provide a 0.15 gpm per sq ft of floor throughout the entire area. An indicating shut-off valve shall be installed in an accessible location between the sprinkler and the connection to the domestic water supply. Minimum pipe size shall be 3/4" copper or 1" steel. Maximum coverage area of a residential sprinkler is 144 sq ft per sprinkler.
- \* All required fire alarm systems shall have the capacity of zone disconnect via switches or key pad program provided the method is approved by the Fire Prevention Bureau.
- \* All remote annunciators shall have a visible trouble indicator along with the fire alarm zone indicators.
- \* Any master box connected to the municipal fire alarm system shall have a supervised municipal disconnect switch.
- \* All master box locations shall be approved by the Fire Dept. Director of Communications.
- \* A master box shall be located so that the center of the box is five feet above finished floor.
- \* All master box locations are required to have a Knox box.
- \* A fire alarm acceptance report shall be submitted to the Portland Fire Department.
- \* All underground tank removal(s) and/or installation(s) shall be done in accordance with the Department of Environmental Protection and Regulation (Chapter 691).
- \* No cutting of tanks on site. Cutting of tanks to be done at an approved disposal site.
- \* The fire dispatcher must be notified at least 48 hrs in advance of removal or transportation of tanks.
- \* All above ground L/P tanks shall be located in accordance with NFPA 58 standards.
- \* Any tank located near the path of vehicle movement shall be protected.
- \* All piping shall be protected from possible mechanical damage and vandalism.
- \* A 4" storz fire department connection is required.
- \* Any renovation of sprinkler system over 20 heads must have State Fire Marshall approval.
- \* A sprinkler performance test shall be submitted to the P.F.D. after completion of work.
- \* State Fire Marshall approval is required for this project.

Lt. Gaylen Mc Dougall  
Portland Fire Prevention Bureau

SPRINKLER SYSTEMS INC.  
P.O. Box 1285  
LEWISTON, ME 04243-1285

# Letter of Transmittal

(207) 782-0104 FAX (207) 783-4865

|                              |                   |
|------------------------------|-------------------|
| DATE<br>2/9/98               | JOB NO.<br>7704-1 |
| ATTENTION                    |                   |
| RE<br>Portland Public Market |                   |
|                              |                   |
|                              |                   |
|                              |                   |
|                              |                   |

TO City of Portland  
Code Enforcement

WE ARE SENDING YOU  Attached  Under separate cover via \_\_\_\_\_ the following items:

- Shop drawings     Prints     Plans     Samples     Specifications  
 Copy of letter     Change order     \_\_\_\_\_

| COPIES | DATE | NO. | DESCRIPTION                  |
|--------|------|-----|------------------------------|
| 2      |      | 142 | Shop Drawings                |
| 2      |      | 242 | " "                          |
| 1      |      |     | SALE CALC                    |
| 1      |      |     | check for \$170.00 \$3000.00 |
|        |      |     |                              |
|        |      |     |                              |
|        |      |     |                              |

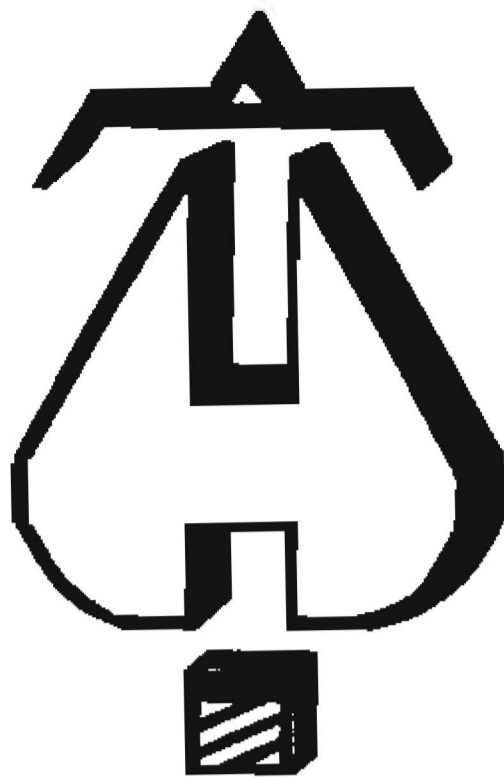
THESE ARE TRANSMITTED as checked below:

- |  |   |   |
|--|---|---|
| <input type="checkbox"/> For approval              | <input type="checkbox"/> Approved as submitted            | <input type="checkbox"/> Resubmit _____ copies for approval   |
| <input type="checkbox"/> For your use              | <input type="checkbox"/> Approved as noted                | <input type="checkbox"/> Submit _____ copies for distribution |
| <input type="checkbox"/> As requested              | <input type="checkbox"/> Returned for corrections         | <input type="checkbox"/> Return _____ corrected prints        |
| <input type="checkbox"/> For review and comment    | <input checked="" type="checkbox"/> <u>Permit</u>         |   |
| <input type="checkbox"/> FOR BIDS DUE _____ 19____ | <input type="checkbox"/> PRINTS RETURNED AFTER LOAN TO US |   |

REMARKS \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

COPY TO File SIGNED: Dayton Saurier

If enclosures are not as noted, kindly notify us at once.



... Fire Protection by Computer Design

SPRINKLER SYSTEMS INC.  
2-4 AVON ST  
P.O. BOX 1285  
LEWISTON ME. ME 04240  
207 782-0000

Job Name : PORTLAND PUBLIC MARKET AREA 1  
Building : NEW  
Location : CUMBERLAND AVE. PORTLAND ME.  
System : 1 WET  
Contract : 97047  
Data File : PORTPM01.WXF

Hydraulic Design Information Sheet

Name - PORTLAND PUBLIC MARKET AREA 1 Date - 1/6/98  
 Location - CUMBERLAND AVE. PORTLAND ME.  
 Building - NEW System No. - 1 WET  
 Contractor - SPRINKLER SYSTEMS INC. Contract No. - 97047  
 Calculated By - CDS Drawing No. - 1-2 OF 2  
 Construction: ( ) Combustible (X) Non-Combustible Ceiling Height - VARIES  
 Occupancy - RETAIL STORES

S (X) NFPA 13 ( ) Lt. Haz. Ord. Haz. Gp. ( ) 1 (X) 2 ( ) 3 ( ) Ex. Haz.  
 Y ( ) NFPA 231 ( ) NFPA 231C ( ) Figure Curve

S Other

T Specific Ruling Made By Date

E  
 M Area of Sprinkler Operation - 1950 System Type Sprinkler/Nozzle  
 Density - 0.2 (X) Wet Make RELIABLE  
 D Area Per Sprinkler - 130 ( ) Dry Model F1FR  
 E Elevation at Highest Outlet - 99 ( ) Deluge Size 17/32" X 3/4"  
 S Hose Allowance - Inside - 0 ( ) Preaction K-Factor 8.2  
 I Rack Sprinkler Allowance - 0 ( ) Other Temp. Sat. 200 DEG.  
 G Hose Allowance - Outside - 250

N  
 Note

Calculation Flow Required - 665.10 Press Required - 74.675 AT BASE  
 Summary C-Factor Used: 120 Overhead 140 Underground

W Water Flow Test: Pump Data: Tank or Reservoir:  
 A Date of Test - 10/31/97 Cap. -  
 T Time of Test - AM Rated Cap. - Elev. -  
 E Static Press - 92 @ Press -  
 R Residual Press - 88 Elev. - Well  
 Flow - 1340 Proof Flow  
 S Elevation - 15.25' BFF

U  
 P Location - 6" MAIN ON SITE  
 P  
 L Source of Information - PORTLAND WATER DISTRICT  
 Y

C Commodity Class Location  
 O Storage Rt. Area Aisle W.  
 M Storage Method: Solid Pallet % Palletized % Rack  
 M  
 ( ) Single Row ( ) Conven. Pallet ( ) Auto. Storage ( ) Encap.  
 S R ( ) Double Row ( ) Slave Pallet ( ) Solid Shelf ( ) Non  
 T A ( ) Mult. Row ( ) Open Shelf

O C  
 R K Blue Spacing Clearance: Storage to Ceiling  
 Longitudinal Transverse

E Horizontal Barriers Provided:

| Node No. | Elevation | K-Fact | Press Actual | Flow Added | Density Req. | Area | Press Req. |
|----------|-----------|--------|--------------|------------|--------------|------|------------|
| SPG1     | 90        | 8.2    | 21.22        | 37.27      | .2           | 130  | 7          |
| 1        | 90        | 8.2    | 11.14        | 27.37      | .2           | 130  | 7          |
| 2        | 90        | 8.2    | 13.24        | 29.83      | .2           | 130  | 7          |
| 3        | 90        | 8.2    | 15.1         | 31.87      | .2           | 130  | 7          |
| 4        | 90        | 8.2    | 17.4         | 34.2       | .2           | 130  | 7          |
| 5        | 90        | 8.2    | 21.58        | 38.1       | .2           | 130  | 7          |
| 6        | 88.5      |        | 26.93        |            |              |      |            |
| SPG2     | 94        | 8.2    | 18.68        | 35.45      | .2           | 130  | 7          |
| 8        | 94        | 8.2    | 11           | 23.2       | .2           | 130  | 7          |
| 9        | 94        | 8.2    | 12.61        | 29.12      | .2           | 130  | 7          |
| 10       | 94        | 8.2    | 14.06        | 30.78      | .2           | 130  | 7          |
| 11       | 94        | 8.2    | 16.27        | 33.07      | .2           | 130  | 7          |
| 12       | 94        | 8.2    | 20.26        | 36.91      | .2           | 130  | 7          |
| 13       | 94        |        | 25.44        |            |              |      |            |
| SPG3     | 99        | 8.2    | 18.74        | 35.5       | .2           | 130  | 7          |
| SPG4     | 99        | 8.2    | 19.77        | 36.46      | .2           | 130  | 7          |
| 15       | 99        | 8.2    | 10.05        | 26         | .2           | 130  | 7          |
| 16       | 99        | 8.2    | 12.43        | 28.91      | .2           | 130  | 7          |
| 17       | 99        | 8.2    | 14.30        | 31.09      | .2           | 130  | 7          |
| 18       | 99        | 8.2    | 16.1         | 32.9       | .2           | 130  | 7          |
| 19       | 88.5      |        | 30.06        |            |              |      |            |
| 20       | 88.5      |        | 31.44        |            |              |      |            |
| SPG5     | 99        | 8.2    | 25.21        | 41.17      | .2           | 130  | 7          |
| SPG6     | 99        | 8.2    | 25.5         | 41.41      | .2           | 130  | 7          |
| 22       | 88.5      |        | 38.66        |            |              |      |            |
| 23       | 88.5      |        | 39.05        |            |              |      |            |
| 7        | 88.5      |        | 39.67        |            |              |      |            |
| 14       | 88.5      |        | 39.78        |            |              |      |            |
| 21       | 88.5      |        | 40.14        |            |              |      |            |
| 24       | 88.5      |        | 40.96        |            |              |      |            |
| 25       | 88.5      |        | 51.37        |            |              |      |            |
| 26       | 74.5      |        | 59.02        |            |              |      |            |
| 27       | 74.5      |        | 59.78        |            |              |      |            |
| 28       | 74.5      |        | 60.58        |            |              |      |            |
| 29       | 74.5      |        | 63.78        |            |              |      |            |
| 30       | 61        |        | 71.18        |            |              |      |            |
| TOV      | 60        |        | 71.62        |            |              |      |            |
| BASE     | 54.25     |        | 74.68        |            |              |      |            |
| HOSE     | 39        |        | 83.21        | 250        |              |      |            |
| TEST     | 39        |        | 83.3         |            |              |      |            |

The maximum velocity is 17.7 and it occurred in the pipe between nodes 4 and 5

| Hyd.<br>Ref.<br>Point | Qa<br>Qt        | Dia.<br>"C"<br>Pf/UL   | Fitting<br>or<br>Eqv. Ln. | Pipe<br>Ftng's<br>Total             | Pt<br>Pe<br>Pf             | Pt<br>Pv<br>Pn | ***** Notes *****               |
|-----------------------|-----------------|------------------------|---------------------------|-------------------------------------|----------------------------|----------------|---------------------------------|
| SPG1<br>to<br>6       | 37.77<br>37.77  | 1.049<br>120<br>0.4219 | 2T<br>5.000               | 2.000<br>10.000<br>12.000           | 21.221<br>0.650<br>5.063   | 21.221         | K Factor = 8.2<br>Vel = 14.021  |
|                       | 37.77           |                        |                           |                                     | 26.934                     |                | K Factor = 7.28                 |
| 1<br>to<br>2          | 27.37<br>27.37  | 1.049<br>120<br>0.2326 |                           | 9.000<br>9.000                      | 11.143<br>2.093            | 11.143         | K Factor = 8.2<br>Vel = 10.160  |
| 2<br>to<br>3          | 29.84<br>57.21  | 1.452<br>120<br>0.1867 |                           | 10.000<br>10.000                    | 13.236<br>1.867            | 13.236         | K Factor = 8.2<br>Vel = 11.085  |
| 3<br>to<br>4          | 31.86<br>89.07  | 1.687<br>120<br>0.2040 |                           | 11.250<br>11.250                    | 15.103<br>2.295            | 15.103         | K Factor = 8.2<br>Vel = 12.785  |
| 4<br>to<br>5          | 34.21<br>123.28 | 1.687<br>120<br>0.3722 |                           | 11.250<br>11.250                    | 17.398<br>4.187            | 17.398         | K Factor = 8.2<br>Vel = 17.695  |
| 5<br>to<br>6          | 38.09<br>161.37 | 2.154<br>120<br>0.1863 | 2E                        | 6.112<br>13.000<br>12.224<br>25.224 | 21.585<br>0.650<br>4.699   | 21.585         | K Factor = 8.2<br>Vel = 14.208  |
| 6<br>to<br>7          | 37.78<br>199.15 | 2.154<br>120<br>0.2749 | 1E<br>1T                  | 6.112<br>12.224<br>46.336           | 28.000<br>18.336<br>12.739 | 26.934         | Vel = 17.534                    |
|                       | 199.15          |                        |                           |                                     | 39.673                     |                | K Factor = 31.62                |
| SPG2<br>to<br>13      | 35.44<br>35.44  | 1.049<br>120<br>0.3750 | 1E<br>2T                  | 2.000<br>5.000<br>18.000            | 6.000<br>12.000<br>6.750   | 18.685         | K Factor = 8.20<br>Vel = 13.156 |
|                       | 35.44           |                        |                           |                                     | 25.435                     |                | K Factor = 7.03                 |
| 8<br>to<br>9          | 27.20<br>27.20  | 1.049<br>120<br>0.2299 |                           | 7.000<br>7.000                      | 11.005<br>1.609            | 11.005         | K Factor = 8.20<br>Vel = 10.097 |
| 9<br>to<br>10         | 29.12<br>56.32  | 1.452<br>120<br>0.1814 |                           | 8.000<br>8.000                      | 12.614<br>1.451            | 12.614         | K Factor = 8.20<br>Vel = 10.912 |
| 10<br>to<br>11        | 30.76<br>87.08  | 1.687<br>120<br>0.1956 |                           | 11.250<br>11.250                    | 14.065<br>2.201            | 14.065         | K Factor = 8.20<br>Vel = 12.499 |
| 11<br>to<br>12        | 33.07<br>120.15 | 1.687<br>120<br>0.3548 |                           | 11.250<br>11.250                    | 16.266<br>3.992            | 16.266         | K Factor = 8.20<br>Vel = 17.246 |
| 12<br>to<br>13        | 36.91<br>157.06 | 2.154<br>120<br>0.1772 | 2E                        | 6.112<br>17.000<br>12.224<br>29.224 | 20.258<br>0.650<br>5.179   | 20.258         | K Factor = 8.20<br>Vel = 13.028 |

| Hyd. Ref. Point | Qa Qt           | Dia. "C" Pf/UL         | Fitting or Eqv. Ln. | Pipe Ftng's Total         | Pt Pe Pf                   | Pt Pv Pn                  | ***** Notes *****                             |
|-----------------|-----------------|------------------------|---------------------|---------------------------|----------------------------|---------------------------|---|
| 13 to 14        | 35.44<br>192.50 | 2.154<br>120<br>0.2582 | 1E<br>1T            | 6.112<br>12.224<br>46.336 | 28.000<br>18.336<br>11.964 | 25.436<br>2.382<br>11.964 | 25.436<br><br>Vel = 16.948                    |
|                 | 192.50          |                        |                     |                           |                            | 39.782                    | K Factor = 30.52                              |
| SPG3 to 19      | 35.50<br>35.50  | 1.049<br>120<br>0.3762 | 1E<br>1T            | 2.000<br>5.000<br>18.000  | 11.000<br>7.000<br>18.000  | 18.744<br>4.548<br>6.771  | 18.744<br><br>K Factor = 8.20<br>Vel = 13.179 |
|                 | 35.50           |                        |                     |                           |                            | 30.063                    | K Factor = 6.47                               |
| SPG4 to 20      | 36.46<br>36.46  | 1.049<br>120<br>0.3952 | 1E<br>1T            | 2.000<br>5.000<br>18.000  | 11.000<br>7.000<br>18.000  | 19.774<br>4.548<br>7.114  | 19.774<br><br>K Factor = 8.20<br>Vel = 13.535 |
|                 | 36.46           |                        |                     |                           |                            | 31.436                    | K Factor = 6.50                               |
| 15 to 16        | 26.00<br>26.00  | 1.049<br>120<br>0.2115 |                     |                           | 11.250<br>11.250           | 10.054<br>2.379           | 10.054<br><br>K Factor = 8.20<br>Vel = 9.652  |
| 16 to 17        | 28.91<br>54.91  | 1.452<br>120<br>0.1731 |                     |                           | 11.250<br>11.250           | 12.432<br>1.947           | 12.432<br><br>K Factor = 8.20<br>Vel = 10.639 |
| 17 to 18        | 31.10<br>86.01  | 1.687<br>120<br>0.1912 |                     |                           | 9.000<br>9.000             | 14.379<br>1.721           | 14.379<br><br>K Factor = 8.20<br>Vel = 12.345 |
| 18 to 19        | 32.90<br>118.91 | 1.687<br>120<br>0.3481 | 2E                  | 5.022<br>10.044<br>27.044 | 17.000<br>10.044<br>9.415  | 16.100<br>4.548<br>9.415  | 16.100<br><br>K Factor = 8.20<br>Vel = 17.068 |
| 19 to 20        | 35.50<br>154.41 | 2.154<br>120<br>0.1718 |                     |                           | 8.000<br>8.000             | 30.063<br>1.374           | 30.063<br><br>Vel = 13.595                    |
| 20 to 21        | 36.46<br>190.87 | 2.154<br>120<br>0.2542 | 1E<br>1T            | 6.112<br>12.224<br>34.336 | 16.000<br>18.336<br>8.727  | 31.437<br>31.437<br>8.727 | 31.437<br><br>Vel = 16.805                    |
|                 | 190.87          |                        |                     |                           |                            | 40.164                    | K Factor = 30.12                              |
| SPG5 to 22      | 41.17<br>41.17  | 1.049<br>120<br>0.4948 | 1E<br>1T            | 2.000<br>5.000<br>18.000  | 11.000<br>7.000<br>18.000  | 25.208<br>4.548<br>8.907  | 25.208<br><br>K Factor = 8.20<br>Vel = 15.283 |
|                 | 41.17           |                        |                     |                           |                            | 38.663                    | K Factor = 6.62                               |
| SPG6 to 23      | 41.41<br>41.41  | 1.049<br>120<br>0.5002 | 1E<br>1T            | 2.000<br>5.000<br>18.000  | 11.000<br>7.000<br>18.000  | 25.503<br>4.548<br>9.003  | 25.503<br><br>K Factor = 8.20<br>Vel = 15.372 |

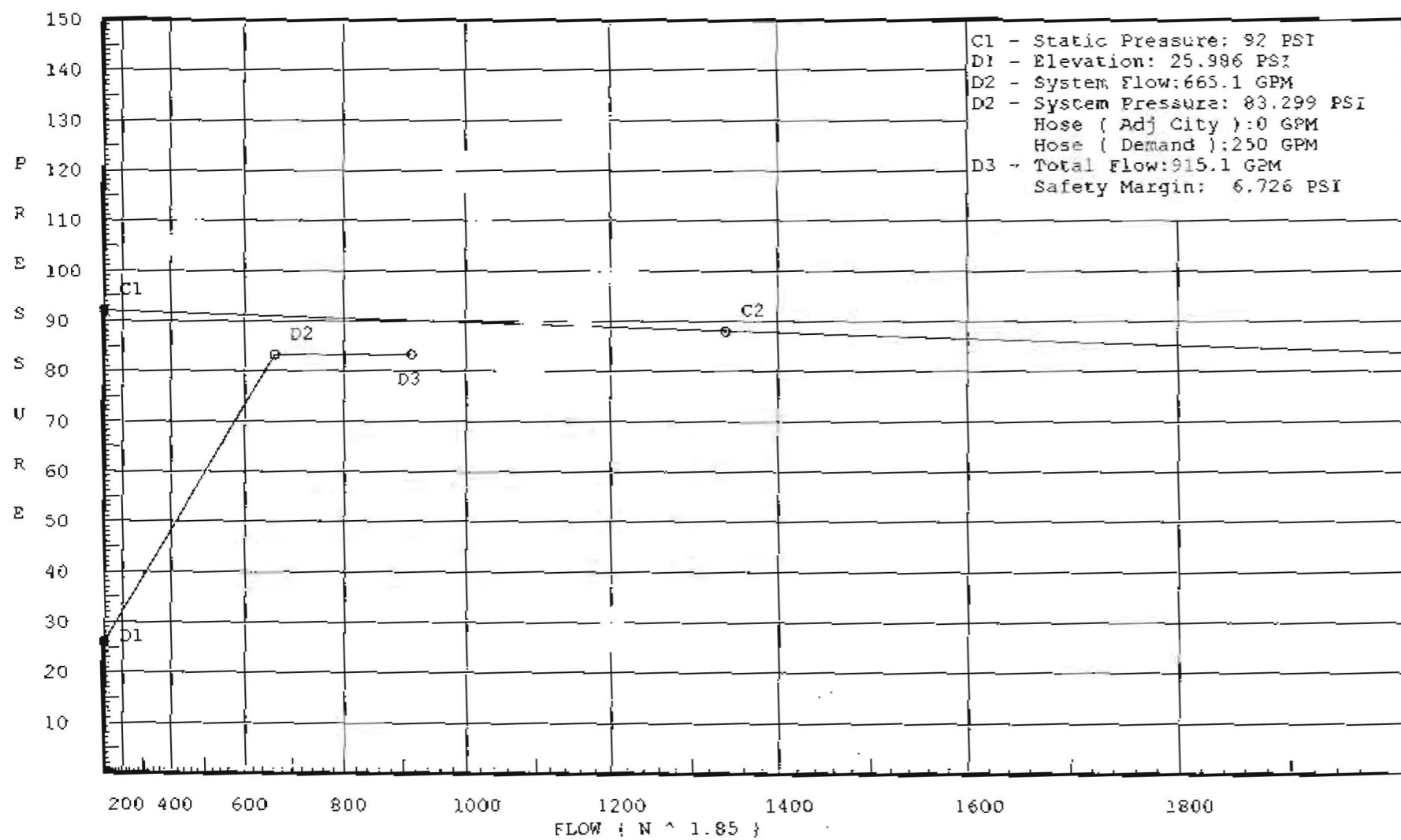


| Hyd. Ref. Point | Qa Qt  | Dia. "C" Pf/UL | Fitting or Eqv. Ln. | Pipe Ftng's Total | Pt Pe Pf       | Pt Pv Pn      | ***** Notes ***** |
|-----------------|--------|----------------|---------------------|-------------------|----------------|---------------|-------------------|
|                 | 41.41  |                |                     |                   | 39.054         |               | K Factor = 6.63   |
| 22 to 23        | 41.17  | 1.687 120      |                     | 8.000             | 38.662         | 38.662        | Vel = 5.909       |
| 23 to 24        | 41.41  | 2.154 120      | 1E 1T               | 6.112 12.224      | 17.000 18.336  | 39.053 39.053 | Vel = 7.271       |
|                 | 82.58  | 0.0539         |                     | 35.336            | 1.906          |               |                   |
|                 | 82.58  |                |                     |                   | 40.959         |               | K Factor = 12.90  |
| 7 to 14         | 199.15 | 4.26 120       |                     | 11.000            | 39.673         | 39.673        | Vel = 4.483       |
| 14 to 21        | 192.50 | 4.26 120       |                     | 11.000            | 39.782         | 39.782        | Vel = 8.816       |
| 21 to 24        | 190.87 | 4.26 120       |                     | 11.000            | 40.164         | 40.164        | Vel = 13.112      |
| 24 to 25        | 82.58  | 4.26 120       | 2E 1T               | 13.167 26.334     | 60.000 52.668  | 40.959 40.959 | Vel = 14.971      |
| 25 to 26        | 665.10 | 0.0924         |                     | 112.668           | 10.413         |               |                   |
| 26 to 27        |        | 6.357 120      | 3E 1T               | 17.603 37.720     | 30.000 90.528  | 51.372 6.063  | Vel = 6.723       |
| 27 to 28        | 665.10 | 0.0132         |                     | 120.528           | 1.586          |               |                   |
| 28 to 29        |        | 6.357 120      | 1F 1T               | 8.801 37.720      | 14.000 46.521  | 59.784 59.784 | Vel = 6.723       |
| 29 to 30        | 665.10 | 0.0132         |                     | 60.521            | 0.796          |               |                   |
| 30 to TOV       |        | 6.357 120      | 2E 1T               | 17.603 37.720     | 170.000 72.925 | 60.581 60.581 | Vel = 6.723       |
| TOV to BASE     | 665.10 | 0.0132         |                     | 242.925           | 3.196          |               |                   |
| BASE to HOSE    |        | 6.357 120      | 1E 2T               | 17.603 37.720     | 25.000 93.043  | 63.777 5.847  | Vel = 6.723       |
|                 | 665.10 | 0.0132         |                     | 118.043           | 1.553          |               |                   |
|                 |        | 6.357 120      |                     | 1.000             | 71.177         | 71.177        |                   |
|                 | 665.10 | 0.0130         |                     | 1.000             | 0.433          |               | Vel = 6.723       |
|                 |        | 6.357 120      | 1A 1G               | 33.948 3.772      | 5.000 37.720   | 71.623 2.490  |                   |
|                 | 665.10 | 0.0132         |                     | 42.720            | 0.562          |               | Vel = 6.723       |
|                 |        | 6.16 140       | 1G 1T               | 4.304 43.037      | 100.000 67.425 | 74.675 6.605  |                   |
|                 | 665.10 | 0.0115         | 2E                  | 20.084            | 167.425        | 1.931         | Vel = 7.160       |

| Hyd.<br>Ref.<br>Point | Qa<br>Qt | Dia.<br>"C"<br>Pf/UL | Fitting<br>or<br>Eqv. Lr. | Pipe<br>Ftng's<br>Total | Pt<br>Fe<br>Pf | Pt<br>Pv<br>Pn | ***** Notes ***** |
|-----------------------|----------|----------------------|---------------------------|-------------------------|----------------|----------------|-------------------|
| HOSE<br>to<br>TEST    | 250.00   | 16.41<br>140         |                           | 500.000                 | 83.211         | 83.211         | Qa = 250.0        |
|                       | 915.10   | 0.0002               |                           | 500.000                 | 0.088          |                | Vel = 1.388       |
|                       | 915.10   |                      |                           |                         | 83.299         |                | K Factor = 100.26 |

City Water Supply:  
C1 - Static Pressure: 92 PSI  
C2 - Residual Pressure: 88 PSI  
C2 - Residual Flow: 1340 GPM

Pump Data:



Hydraulic Design Information Sheet

Name - PORTLAND PUBLIC MARKET AREA 2 Date - 1/6/98  
 Location - CUMBERLAND AVE. PORTLAND ME.  
 Building - NEW System No. - 1 WET  
 Contractor - SPRINKLER SYSTEMS INC. Contract No. - 97047  
 Calculated By - CDS Drawing No. - 1-2 OF 2  
 Construction: ( ) Combustible (X) Non-Combustible Ceiling Height - VARIES  
 Occupancy - RETAIL STORES

S (X) NFPA 13 ( ) Lt. Haz. Ord.Haz.Gp. ( ) 1 (X) 2 ( ) 3 ( ) Ex.Haz.  
 Y ( ) NFPA 231 ( ) NFPA 231C ( ) Figure Curve

S Other

T Specific Ruling Made By Date

E  
 M Area of Sprinkler Operation - 1950 System Type Sprinkler/Nozzle  
 Density - 0.2 (X) Wet Make RELIABLE  
 D Area Per Sprinkler - 130 ( ) Dry Model F1FR  
 E Elevation at Highest Outlet - 99 ( ) Deluge Size 17/32' X 3/4"  
 S Hose Allowance - Inside - 0 ( ) Preaction K-Factor 8.2  
 I Rack Sprinkler Allowance - 0 ( ) Other Temp.Rat.200 DEG.  
 G Hose Allowance - Outside - 250  
 N

Note

Calculation Flow Required - 732.14 Press Required - 66.972 AT BASE  
 Summary C-Factor Used: 120 Overhead 140 Underground

W Water Flow Test: Pump Data: Tank or Reservoir:  
 A Date of Test - 10/31/97 Cap. -  
 T Time of Test - AM Rated Cap.- Elev.-  
 E Static Press - 92 @ Press -  
 R Residual Press - 88 Elev. - Well  
 Flow - 1340 Proof Flow  
 S Elevation - 15.25'BFF

U  
 P Location - 6" MAIN ON SITE  
 P  
 L Source of Information - PORTLAND WATER DISTRICT  
 Y

C Commodity Class Location  
 O Storage Ht. Area Aisle W.  
 M Storage Method: Solid Piled % Palletized % Rack  
 M  
 ( ) Single Row ( ) Conven. Pallet ( ) Auto. Storage ( ) Encap.  
 S R ( ) Double Row ( ) Slave Pallet ( ) Solid Shelf ( ) Non  
 T A ( ) Mult. Row ( ) Open Shelf

O C  
 R K Flue Spacing Clearance:Storage to Ceiling  
 Longitudinal Transverse

E Horizontal Barriers Provided:

Computer Programs by Hydratec Inc. Route 111 Windham N.H. 03087

| Node No. | Elevation | K-Fact | Press Actual | Flow Added | Density Req. | Area | Press Req. |
|----------|-----------|--------|--------------|------------|--------------|------|------------|
| 51       | 90        | 8.2    | 11.82        | 28.14      | .2           | 130  | 7          |
| 51A      | 90        |        | 12.4         |            |              |      |            |
| 52       | 90        | 8.2    | 12.83        | 29.37      | .2           | 130  | 7          |
| 53       | 90        | 8.2    | 13.08        | 29.66      | .2           | 130  | 7          |
| 54       | 90        | 8.2    | 13.5         | 30.13      | .2           | 130  | 7          |
| 55       | 90        | 8.2    | 14.43        | 31.15      | .2           | 130  | 7          |
| 55A      | 90        |        | 14.59        |            |              |      |            |
| 56       | 90        | 8.2    | 15.87        | 32.46      | .2           | 130  | 7          |
| 57       | 90        | 8.2    | 17.94        | 34.73      | .2           | 130  | 7          |
| 58T      | 90        |        | 23.44        |            |              |      |            |
| 59       | 94        | 8.2    | 20.92        | 37.51      | .2           | 130  | 7          |
| 60       | 94        | 8.2    | 18.05        | 26         | .2           | 130  | 7          |
| 61       | 94        | 8.2    | 11.53        | 27.85      | .2           | 130  | 7          |
| 62       | 94        | 8.2    | 12.54        | 29.03      | .2           | 130  | 7          |
| 63       | 94        | 8.2    | 14.14        | 30.84      | .2           | 130  | 7          |
| 64       | 94        | 8.2    | 16.71        | 33.52      | .2           | 130  | 7          |
| 65       | 94        | 8.2    | 18.12        | 34.91      | .2           | 130  | 7          |
| 66T      | 94        |        | 22.14        |            |              |      |            |
| 75       | 99        | 8.2    | 14.04        | 30.72      | .2           | 130  | 7          |
| 76       | 99        | 8.2    | 17.29        | 34.08      | .2           | 130  | 7          |
| 69       | 99        | 8.2    | 10.45        | 26.51      | .2           | 130  | 7          |
| 70       | 99        | 8.2    | 11.77        | 28.13      | .2           | 130  | 7          |
| 71       | 99        | 8.2    | 13.14        | 29.73      | .2           | 130  | 7          |
| 72       | 99        | 8.2    | 14.8         | 31.55      | .2           | 130  | 7          |
| 73       | 99        | 8.2    | 17.79        | 34.59      | .2           | 130  | 7          |
| 74T      | 99        |        | 20.61        |            |              |      |            |
| 80       | 99        | 8.2    | 24.24        | 40.38      | .2           | 130  | 7          |
| 78       | 99        | 8.2    | 24.85        | 40.9       | .2           | 130  | 7          |
| 79T      | 99        |        | 25.61        |            |              |      |            |
| 59       | 89        |        | 28.1         |            |              |      |            |
| 68       | 93        |        | 26.93        |            |              |      |            |
| 77       | 98        |        | 25.25        |            |              |      |            |
| 81       | 98        |        | 26.74        |            |              |      |            |
| 25       | 88.5      |        | 42.02        |            |              |      |            |
| 26       | 74.5      |        | 49.98        |            |              |      |            |
| 27       | 74.5      |        | 30.89        |            |              |      |            |
| 28       | 74.5      |        | 51.84        |            |              |      |            |
| 29       | 74.5      |        | 55.66        |            |              |      |            |
| 30       | 61        |        | 63.36        |            |              |      |            |
| TOV      | 80        |        | 63.81        |            |              |      |            |
| BASE     | 54.25     |        | 66.97        |            |              |      |            |
| HOSE     | 39        |        | 75.88        | 250        |              |      |            |
| TEST     | 39        |        | 75.98        |            |              |      |            |

The maximum velocity is 19.34 and it occurs in the pipe between nodes 66T and 68.

| Hyd. Ref. Point | Qa Qt  | Dia. "C" Pf/UL      | Fitting or Eqv. Ln. | Pipe Ftg's Total | Pt Pe Pf        | Pt Pv Pn | ***** Notes *****               |
|-----------------|--------|---------------------|---------------------|------------------|-----------------|----------|---------------------------------|
| 51 to 51A       | 28.19  | 1.049 120<br>0.2455 |                     | 4.000            | 11.820          | 11.820   | K Factor = 8.20<br>Vel = 10.465 |
| 51A to 52       | 28.19  | 2.154 120<br>0.0075 |                     | 4.000            | 12.802          | 12.802   | Vel = 2.482                     |
| 52 to 53        | 29.38  | 2.154 120<br>0.0277 |                     | 9.000            | 12.832          | 12.832   | K Factor = 8.20<br>Vel = 5.069  |
| 53 to 54        | 29.65  | 2.154 120<br>0.0597 |                     | 7.000            | 13.081          | 13.081   | K Factor = 8.20<br>Vel = 7.679  |
| 54 to 55        | 30.13  | 2.154 120<br>0.1033 |                     | 9.000            | 13.499          | 13.499   | K Factor = 8.20<br>Vel = 10.332 |
| 55 to 55A       | 31.15  | 2.154 120<br>0.1600 |                     | 1.000            | 14.429          | 14.429   | K Factor = 8.20<br>Vel = 13.074 |
| 55A to 56       | 148.50 | 2.154 120<br>0.1598 |                     | 8.000            | 14.589          | 14.589   | Vel = 13.074                    |
| 56 to 57        | 32.66  | 2.154 120<br>0.2308 |                     | 9.000            | 15.867          | 15.867   | K Factor = 8.20<br>Vel = 15.950 |
| 57 to 58T       | 34.74  | 2.154 120<br>0.3193 | 1T 12.224           | 5.000<br>12.224  | 17.943          | 17.943   | K Factor = 8.20<br>Vel = 19.009 |
| 58T to 59       | 215.90 | 2.154 120<br>0.3193 | 1T 12.224           | 1.000<br>12.224  | 23.442<br>0.433 | 23.442   | Vel = 19.009                    |
|                 | 215.90 |                     |                     |                  | 28.097          |          | K Factor = 40.73                |
| 67 to 68T       | 37.51  | 1.452 120<br>0.0855 | 1T 7.686            | 6.500<br>7.686   | 20.923          | 20.923   | K Factor = 8.20<br>Vel = 7.268  |
|                 | 37.51  |                     |                     |                  | 22.136          |          | K Factor = 7.97                 |
| 60 to 61        | 26.00  | 1.049 120<br>0.2114 |                     | 7.000            | 10.054          | 10.054   | K Factor = 8.20<br>Vel = 9.652  |
| 61 to 62        | 27.85  | 1.452 120<br>0.1670 |                     | 6.000            | 11.534          | 11.534   | K Factor = 8.20<br>Vel = 10.434 |
| 62 to 63        | 29.03  | 1.687 120<br>0.1786 |                     | 9.000            | 12.535          | 12.535   | K Factor = 8.20<br>Vel = 11.896 |

| Hyd. Ref. Point | Qa Qt           | Dia. "C" Pf/UL         | Fitting or Eqv. Ln. | Pipe Ftng's Total         | Pt Pe Pf        | Pt Pv Pn | ***** Notes *****               |
|-----------------|-----------------|------------------------|---------------------|---------------------------|-----------------|----------|---------------------------------|
| 63 to 64        | 30.84<br>113.72 | 1.687<br>120<br>0.3205 |                     | 8.000                     | 14.142          | 14.142   | K Factor = 8.20<br>Vel = 16.323 |
| 64 to 65        | 33.51<br>147.23 | 2.154<br>120<br>0.1572 |                     | 9.000                     | 16.706          | 16.706   | K Factor = 8.20<br>Vel = 12.963 |
| 65 to 66T       | 34.91<br>182.14 | 2.154<br>120<br>0.2330 | 1T 12.224           | 5.000<br>12.224<br>17.224 | 18.121          | 18.121   | K Factor = 8.20<br>Vel = 16.036 |
| 66T to 68       | 37.51<br>219.65 | 2.154<br>120<br>0.3296 | 1T 12.224           | 1.000<br>12.224<br>13.224 | 22.136<br>0.433 | 22.136   | Vel = 19.339                    |
|                 |                 |                        |                     |                           | 219.65          | 26.927   | K Factor = 42.33                |
| 75 to 76        | 30.72<br>30.72  | 1.049<br>120<br>0.2879 |                     | 11.250                    | 14.038          | 14.038   | K Factor = 8.20<br>Vel = 11.404 |
| 76 to 74T       | 34.09<br>64.81  | 1.452<br>120<br>0.2352 | 1T 7.686            | 6.500<br>7.686<br>14.186  | 17.278          | 17.278   | K Factor = 8.20<br>Vel = 12.557 |
|                 |                 |                        |                     |                           | 64.81           | 20.614   | K Factor = 14.27                |
| 69 to 70        | 26.51<br>26.51  | 1.049<br>120<br>0.2192 |                     | 6.000                     | 10.455          | 10.455   | K Factor = 8.20<br>Vel = 9.841  |
| 70 to 71        | 28.14<br>54.65  | 1.452<br>120<br>0.1715 |                     | 8.000                     | 11.770          | 11.770   | K Factor = 8.20<br>Vel = 10.589 |
| 71 to 72        | 29.72<br>84.37  | 1.687<br>120<br>0.1846 |                     | 9.000                     | 13.143          | 13.143   | K Factor = 8.20<br>Vel = 12.110 |
| 72 to 73        | 31.55<br>115.92 | 1.687<br>120<br>0.3321 |                     | 9.000                     | 14.804          | 14.804   | K Factor = 8.20<br>Vel = 16.639 |
| 73 to 74T       | 34.59<br>150.51 | 2.154<br>120<br>0.1638 | 1T 12.224           | 5.000<br>12.224<br>17.224 | 17.793          | 17.793   | K Factor = 8.20<br>Vel = 13.251 |
| 74T to 77       | 64.81<br>215.32 | 2.154<br>120<br>0.3177 | 1T 12.224           | 1.000<br>12.224<br>13.224 | 20.614<br>0.433 | 20.614   | Vel = 18.958                    |
|                 |                 |                        |                     |                           | 215.32          | 25.248   | K Factor = 42.85                |
| 80 to 79T       | 40.38<br>40.38  | 1.452<br>120<br>0.0980 | 1T 7.686            | 6.250<br>7.686<br>13.936  | 24.245          | 24.245   | K Factor = 8.20<br>Vel = 7.824  |

| Hyd. Ref. Point | Qa Qt  | Dia. "C" Pf/UL | Fitting or Egv. Ln. | Pipe Ftng's Total | Pt Pe Pf | Pt Pv Pn | ***** Notes ***** |
|-----------------|--------|----------------|---------------------|-------------------|----------|----------|-------------------|
|                 | 40.38  |                |                     |                   |          | 25.611   | K Factor = 7.98   |
| 78 to 79T       | 40.90  | 1.687 120      | 1T 10.044           | 5.000 10.044      | 24.883   | 24.883   | K Factor = 8.20   |
| 79T             | 40.90  | 0.0483         |                     | 15.044            | 0.727    |          | Vel = 5.871       |
| 79T to 81       | 40.38  | 2.154 120      | 1T 12.224           | 1.000 12.224      | 25.610   | 25.610   |                   |
| 81              | 81.28  | 0.0524         |                     | 13.224            | 0.693    |          | Vel = 7.156       |
|                 | 81.28  |                |                     |                   |          | 26.736   | K Factor = 15.72  |
| 59 to 68        | 215.90 | 4.26 120       | 2F 5.267            | 12.000 13.167     | 28.096   | 28.096   |                   |
| 68              | 215.90 | 0.0115         |                     | 48.868            | -1.732   |          | Vel = 4.860       |
| 68 to 77        | 219.64 | 4.26 120       |                     | 11.500            | 26.927   | 26.927   |                   |
| 77              | 435.54 | 0.0423         |                     | 11.500            | -2.166   |          | Vel = 9.804       |
| 77 to 81        | 215.32 | 4.26 120       | 1F 5.267            | 11.500 5.267      | 25.247   | 25.247   |                   |
| 81              | 650.86 | 0.0888         |                     | 16.767            | 0.486    |          | Vel = 14.651      |
| 81 to 25        | 81.28  | 4.26 120       | 2F 5.267            | 38.000 13.167     | 26.736   | 26.736   |                   |
| 25              | 732.14 | 0.1104         |                     | 101.202           | 4.114    |          | Vel = 16.480      |
| 25 to 26        |        | 6.357 120      | 3E 17.603           | 30.000 37.720     | 42.022   | 42.022   |                   |
| 26              | 732.14 | 0.0157         |                     | 120.528           | 6.063    |          | Vel = 7.401       |
| 26 to 27        |        | 6.357 120      |                     | 58.000            | 49.980   | 49.980   |                   |
| 27              | 732.14 | 0.0157         |                     | 58.000            | 0.911    |          | Vel = 7.401       |
| 27 to 28        |        | 6.357 120      | 1F 8.801            | 14.000 37.720     | 50.891   | 50.891   |                   |
| 28              | 732.14 | 0.0157         |                     | 60.521            | 0.951    |          | Vel = 7.401       |
| 28 to 29        |        | 6.357 120      | 2E 17.603           | 170.000 37.720    | 51.842   | 51.842   |                   |
| 29              | 732.14 | 0.0257         |                     | 242.925           | 3.818    |          | Vel = 7.401       |
| 29 to 30        |        | 6.357 120      | 1E 17.603           | 25.000 37.720     | 55.660   | 55.660   |                   |
| 30              | 732.14 | 0.0157         |                     | 118.043           | 5.847    |          | Vel = 7.401       |
| 30 to TOV       |        | 6.357 120      |                     | 1.000             | 63.362   | 63.362   |                   |
| TOV             | 732.14 | 0.0160         |                     | 1.000             | 0.133    |          | Vel = 7.401       |
| TOV to BASE     |        | 6.357 120      | 1A 33.948           | 5.000 37.720      | 63.811   | 63.811   |                   |
| BASE            | 732.14 | 0.0157         |                     | 42.720            | 2.490    |          | Vel = 7.401       |
| BASE to NOSE    |        | 6.16 140       | 1G 4.304            | 100.000 43.037    | 66.972   | 66.972   |                   |
| NOSE            | 732.14 | 0.0138         |                     | 167.425           | 6.605    |          | Vel = 7.982       |



| Hyd.<br>Ref.<br>Point | Qa<br>Qt         | Dia.<br>"C"<br>Pf/UL   | Fitting<br>or<br>Eqv. Ln. | Pipe<br>Ftng's<br>Total | Pt<br>Pe<br>Pf  | Pt<br>Pv<br>Pn | ***** Notes *****         |
|-----------------------|------------------|------------------------|---------------------------|-------------------------|-----------------|----------------|---------------------------|
| HOSE<br>to<br>TEST    | 250.00<br>982.14 | 16.41<br>140<br>0.0002 |                           | 500.000<br>500.000      | 75.883<br>0.100 | 75.883         | Qa = 250.0<br>Vel = 1.490 |
|                       | 982.14           |                        |                           |                         | 75.983          |                | K Factor = 112.67         |

City Water Supply:  
C1 - Static Pressure: 92 PSI  
C2 - Residual Pressure: 88 PSI  
C2 - Residual Flow: 1340 GPM

Pump Data:

C1 - Static Pressure: 92 PSI  
D1 - Elevation: 23.821 PSI  
D2 - System Flow: 732.14 GPM  
D2 - System Pressure: 75.983 PSI  
Hose ( Adj City ): 0 GPM  
Hose ( Demand ): 250 GPM  
D3 - Total Flow: 982.14 GPM  
Safety Margin: 13.765 PSI

