

DISPLAY THIS CARD ON PRINCIPAL FRONTAGE OF WORK



CITY OF PORTLAND BUILDING PERMIT

This is to certify that INTERNATIONALCORP BROWNE

Located At 254 COMMERCIAL ST

Job ID: 2011-04-754-FAFS

CBL: 041 - - A - 017 - 001 - - - -

has permission to install a Supervised, automatic sprinkler system provided that the person or persons, firm or corporation accepting this permit shall comply with all of the provisions of the Statues of Maine and of the Ordinances of the City of Portland regulating the construction, maintenance and use of the buildings and structures, and of the application on file in the department.

Notification of inspection and written permission procured before this building or part thereof is lathed or otherwise closed-in. 48 HOUR NOTICE IS REQUIRED.

A final inspection must be completed by owner before this building or part thereof is occupied. If a certificate of occupancy is required, it must be

Brawley (58)
Fire Prevention Officer

Code Enforcement Officer / Plan Reviewer

THIS CARD MUST BE POSTED ON THE STREET SIDE OF THE PROPERTY.
PENALTY FOR REMOVING THIS CAR

SCANNED

City of Portland, Maine - Building or Use Permit Application

389 Congress Street, 04101 Tel: (207) 874-8703, FAX: (207) 8716

Job No: 2011-04-754-FAFS	Date Applied: 4/6/2011	CBL: 041 - - A - 017 - 001 - - - - -	
Location of Construction: 254 COMMERCIAL	Owner Name: Waterfront Maine	Owner Address: 14 Maine Street, Brunswick ME 04011	Phone:
Business Name:	Contractor Name: Eastern Fire Protection Co., Inc,	Contractor Address: P.O Box 1390 AUBURN ME 04211	Phone: (207) 784-1507
Lessee/Buyer's Name:	Phone:	Permit Type: FIRE SYS WB - Fire Suppression Water Based	Zone: WCZ
Past Use: Commercial	Proposed Use: Commercial 1 st floor & professional offices above	Cost of Work: 100000.00	CEO District:
		Fire Dept: <input checked="" type="checkbox"/> Approved w/ conditions <input type="checkbox"/> Denied <input type="checkbox"/> N/A	Inspection: Use Group: Type:
		Signature: <i>Bjau Wolff</i> (58)	Signature:
Proposed Project Description: 254 Commercial Street - Water Based Fire Suppression System		Pedestrian Activities District (P.A.D.)	
Permit Taken By: GG	Zoning Approval		

Special Zone or Reviews	Zoning Appeal	Historic Preservation
<input type="checkbox"/> Shoreland	<input type="checkbox"/> Variance	<input checked="" type="checkbox"/> Not in Dist or Landmark
<input type="checkbox"/> Wetlands	<input type="checkbox"/> Miscellaneous	<input type="checkbox"/> Does not Require Review
<input type="checkbox"/> Flood Zone	<input type="checkbox"/> Conditional Use	<input type="checkbox"/> Requires Review
<input type="checkbox"/> Subdivision	<input type="checkbox"/> Interpretation	<input type="checkbox"/> Approved
<input type="checkbox"/> Site Plan	<input type="checkbox"/> Approved	<input type="checkbox"/> Approved w/Conditions
<input type="checkbox"/> Maj <input type="checkbox"/> Min <input type="checkbox"/> MM	<input type="checkbox"/> Denied	<input type="checkbox"/> Denied
Date: 4/12/11 OK <i>ABU</i>	Date:	Date: <i>ABU</i>

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 provision of the code(s) applicable to such permit.

SIGNATURE OF APPLICANT	ADDRESS	DATE	PHONE
------------------------	---------	------	-------

RESPONSIBLE PERSON IN CHARGE OF WORK, TITLE	DATE	PHON
---	------	------

BUILDING PERMIT INSPECTION PROCEDURES

Please call 874-8703 or 874-8693 (ONLY)

or email: buildinginspections@portlandmaine.gov

With the issuance of this permit, the owner, builder or their designee is required to provide adequate notice to the city of Portland Inspections Services for the following inspections. Appointments must be requested 48 to 72 hours in advance of the required inspection. The inspection date will need to be confirmed by this office.

- **Please read the conditions of approval that is attached to this permit!! Contact this office if you have any questions.**
- **Permits expire in 6 months. If the project is not started or ceases for 6 months.**
- **If the inspection requirements are not followed as stated below additional fees may be incurred due to the issuance of a "Stop Work Order" and subsequent release to continue.**

The project cannot move to the next phase prior to the required inspection and approval to continue, REGARDLESS OF THE NOTICE OF CIRCUMSTANCES.

IF THE PERMIT REQUIRES A CERTIFICATE OF OCCUPANCY, IT MUST BE PAID FOR AND ISSUED TO THE OWNER OR DESIGNEE BEFORE THE SPACE MAY BE OCCUPIED.



PORTLAND MAINE

Strengthening a Remarkable City, Building a Community for Life • www.portlandmaine.gov

Director of Planning and Urban Development
Penny St. Louis

Job ID: 2011-04-754-FAFS

Located At: 254 COMMERCIAL

CBL: 041 - - A - 017 - 001 - - - - -

ST

Conditions of Approval:

Fire

The sprinkler system shall be installed in accordance with NFPA 13 and supervised by the fire alarm system.

Sprinkler protection shall be maintained. Where the system is to be shut down for maintenance or repair, the system shall be checked at the end of each day to insure the system has been placed back in service.

Fire department connection type and location shall be approved in writing by fire prevention bureau. The Fire Department will require Knox locking caps on all Fire Department Connections on the exterior of the building.

System acceptance and commissioning must be coordinated with alarm and suppression system contractors and the Fire Department. Call 874-8703 to schedule.

Installation of a sprinkler or fire alarm system requires a Knox Box to be installed per city ordinance.

The Standpipe system shall be installed in accordance with NFPA 14. The hose connections and FDC shall be labeled "manual wet standpipe". A signed compliance letter will be required.

Private fire mains and fire hydrants shall be maintained, tested and painted in accordance with NFPA 25 and City Code Chapter 10, Art IV.

Over Watfront Maine
 14 Maibe St.
 Brunswick ME 04011

254 Commercial St.

Job Summary Report
Job ID: 2011-04-754-FAFS

Report generated on Apr 11, 2011 2:33:42 PM

Page 1

Job Type: Fire Alarm / Suppression **Job Description:** 258 Commercial Street **Job Year:** 2011
Building Job Status Code: Initiate Plan Review **Pin Value:** 1072 **Tenant Name:**
Job Application Date: **Public Building Flag:** N **Tenant Number:**
Estimated Value: 100,000 **Square Footage:**
Related Parties: INTERNATIONAL BROWNE *Property Owner*
 MAINE WATERFRONT *Property Owner*
 Eastern Fire Protection Co.,Inc - Eastern Fire Protection *SPRINKLER CONTRACTOR*
 Co.,Inc Eastern Fire Protection Co.,Inc

Job Charges

Fee Code Description	Charge Amount	Permit Charge Adjustment	Net Charge Amount	Payment Date	Receipt Number	Payment Amount	Payment Adjustment Amount	Net Payment Amount	Outstanding Balance
Job Valuation Fees	\$1,020.00		\$1,020.00						\$1,020.00

Location ID: 6220

Location Details			
Alternate Id	Parcel Number	Census Tract	GIS X GIS Y GIS Z
W09130	041 A 017 001	M	-70.253728 43.653624
Location Type	Subdivision Code	Subdivision Sub Code	Related Persons
1			254 COMMERCIAL STREET WEST

Location Use Code	Variance Code	Use Zone Code	Fire Zone Code	Inside Outside Code	District Code	General Location Code	Inspection Area Code	Jurisdiction Code
WAREHOUSE & STORAGE		WATERFRONT			DISTRICT 2			CENTRAL BUSINESS DISTRICT

Structure Details

Structure: Heating System

Occupancy Type Code:

Structure Type Code	Structure Status Type	Square Footage	Estimated Value	Address
Office & Professional Buildings	0			254 COMMERCIAL STREET WEST

Longitude	Latitude	GIS X	GIS Y	GIS Z	GIS Reference	User Defined Property	Value
						Alarms Commercial	0
						Alarms Commercial	1

- Sending electronic permit
Final submittal Kelly #237-
795-6314 +237



Water-Based Fire Suppression System Permit

If you or the property owner owes real estate or property taxes or user charges on any property within the city, payment arrangements must be made before permits of any kind are accepted.

whole sale

Installation address: 258 COMMERCIAL ST CBL: 041 A 015 001

Exact location: (within structure) INTERIOR ROOFTOP

Type of occupancy(s) (NFPA & ICC): LEGIT HAZARDOUS (CORRECT) ONEWAY HAZARDOUS (CORRECT)

Building owner: MUNISC CORP.

Managing Supervisor (RMS): WILLIAM FLYNN License No: 368

Supervisor phone: 784-1507 E-mail: FLYNN@CITYOFPORTLAND.ME

Installing contractor: BASTON FIRE PROTECTION License No: 101

Contractor phone: 784-1507 E-mail: FLYNN@CITYOFPORTLAND.ME

The suppression work to be done will be: New: Renovation: Addition to existing system:

This is an amendment to an existing permit: Yes: NO Permit no: _____

NFPA Standard this system is designed to: 13 Edition: 2010

*Non-NFPA systems are not approved for use within the City of Portland.

Download a new copy of this document from www.portlandmaine.gov/fire for every submittal. Attach all working documents and complete approved submittals as may be required by the State Fire Marshal's Office on electronic PDF's in addition to full sized plans.

Contractor shall verify location and type of all FDCs shall be approved in writing by the Fire Prevention Bureau.

COST OF WORK: \$ 100000.00
 PERMIT FEE: \$ 1030.00
 (\$10 PER \$1,000 + \$30 FOR THE FIRST \$1,000)

RECEIVED

APR - 6 2011

Dept. of Building Inspections
City of Portland Maine

Submit all information to the Building Inspections Department, 389 Congress Street, Room 315, Portland, Maine 04101.

Prior to acceptance of any fire protection system, a complete commissioning and acceptance test must be coordinated with all fire system contractors and the Fire Department, and proper documentation of such test(s) provided.

All installation(s) must comply with NFPA and the Fire Department Technical Standard(s).

Applicant signature: [Signature] Date: 4/5/11



EASTERN FIRE PROTECTION

P.O. Box 1390
Kittyhawk Ave.
Auburn, ME 04210

PH # (207) 784-1507
FAX # (207) 782-0566

LETTER OF TRANSMITTAL

DATE	4/5/11	JOB NO.	4660
ATTENTION			
RE: MORNELL WIDANF			
GATEAU RUCLEMB			

TO PORTLAND COOP IMPROVEMENT
389 CONGRESS ST. ROOM 315
PORTLAND, MAINE 04101

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

- Shop drawings Descriptive data Hydraulic calculations
 Copy of letter Literature _____

QUANTITY	DRAWING NO.	DATE	DESCRIPTION	STATUS
2	30P3	02/01/11	SPRINKLER SHOP DWG	C/O
2	20P3	03/08/11	SPRINKLER SHOP DWG	C/O
2	10P3	04/01/11	SPRINKLER SHOP DWG	}
2			BSMT. HYD. CALC.	
2			FRONT PLAN HYD. CALC.	
2			SECOND FLOOR HYD. CALC.	
2			TREND PLAN HYD. CALC.	
2			FOURTH FLOOR HYD. CALC.	
2			FIFTH FLOOR HYD. CALC.	
1			ROOFED APP. + CHECKS.	

- Status code A. Approved D. Corrected & resubmitted
B. Approved as noted E. For your files
C. Submitted for approval F. Refer to remarks

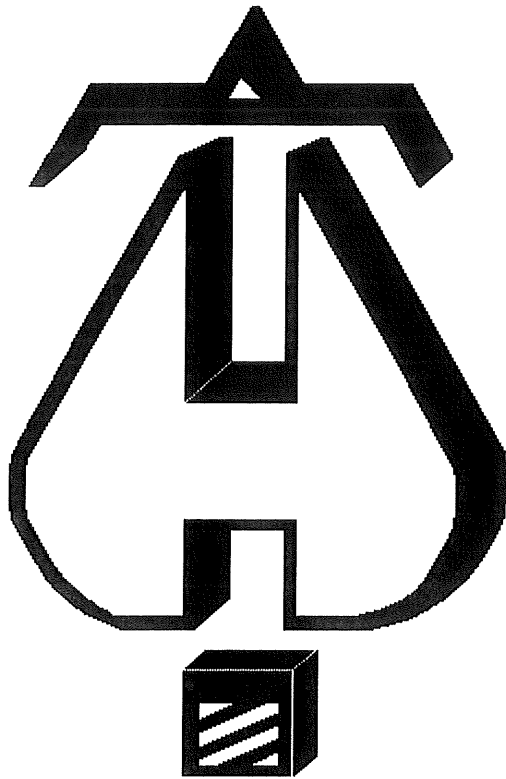
Please return 1 copies each indicating your approval and/or comments.

REMARKS _____

COPY TO _____

SIGNED [Signature] [Signature]

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



... Fire Protection by Computer Design

EASTERN FIRE PROTECTION
170 KITTYHAWK AVE.
P.O. BOX 1390
AUBURN, MAINE 04211-1390
800-274-1507

Job Name : 258 COMMERCIAL ST BSMT FLR UPR
Drawing : EXISTING WOOD CONSTRUCTION
Location : 258 COMMERCIAL ST PORTLAND, MAINE
Remote Area : 1 OF 2
Contract : AU-4660-10
Data File : 1-4660.BSMT.wx2

Hydraulic Design Information Sheet

Name - MERRILL'S WHARF BSMT FLR UPR Date - 04/01/11
Location - 258 COMMERCIAL ST PORTLAND, MAINE
Building - EXISTING WOOD CONSTRUCTION System No. - 1 OF 2
Contractor - EASTERN FIRE PROTECTION CO., INC Contract No. - AU-4660-10
Calculated By - WILLIAM FLYNT Drawing No. - 1 OF 3
Construction: (X) Combustible () Non-Combustible Ceiling Height - VARIES
Occupancy - BSMT FLR EXPOSED UPRIGHTS .15/1024 SQ FT

S (X) NFPA 13 (X) Lt. Haz. Ord.Haz.Gp. () 1 () 2 () 3 () Ex.Haz.
Y () NFPA 231 () NFPA 231C (X) Figure 11.2.3.1.1 Curve OH I

S Other

T Specific Ruling Made By Date

E
M Area of Sprinkler Operation - 1024 System Type Sprinkler/Nozzle
Density - .15 (X) Wet Make TYCO
D Area Per Sprinkler - 130 () Dry Model TY-FRB
E Elevation at Highest Outlet - 12'-0" () Deluge Size 1/2"
S Hose Allowance - Inside - () Preaction K-Factor 5.6
I Rack Sprinkler Allowance - () Other Temp.Rat.155
G Hose Allowance - Outside - 250

N Note REMOTE AREA REDUCED PER NFPA 13 (2010) SECTION 11.2.3.2.3.1

Calculation Flow Required - 485 Press Required - 71 AT TEST POINT
Summary C-Factor Used: 120 Overhead 100 Underground

W Water Flow Test: Pump Data: Tank or Reservoir:
A Date of Test - 03/28/11 Cap. -
T Time of Test - 2:30 PM Rated Cap.- Elev.-
E Static Press - 110 @ Press -
R Residual Press - 78 Elev. - Well
Flow - 1380 Proof Flow
S Elevation - 10'-0"

U Location - OFF 8" IN PRIVATE YARD MAIN OFF EXISTING HYDRANT

P
L Source of Information -
Y EASTERN FIRE PROTECTION CO.

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
A Longitudinal Transverse

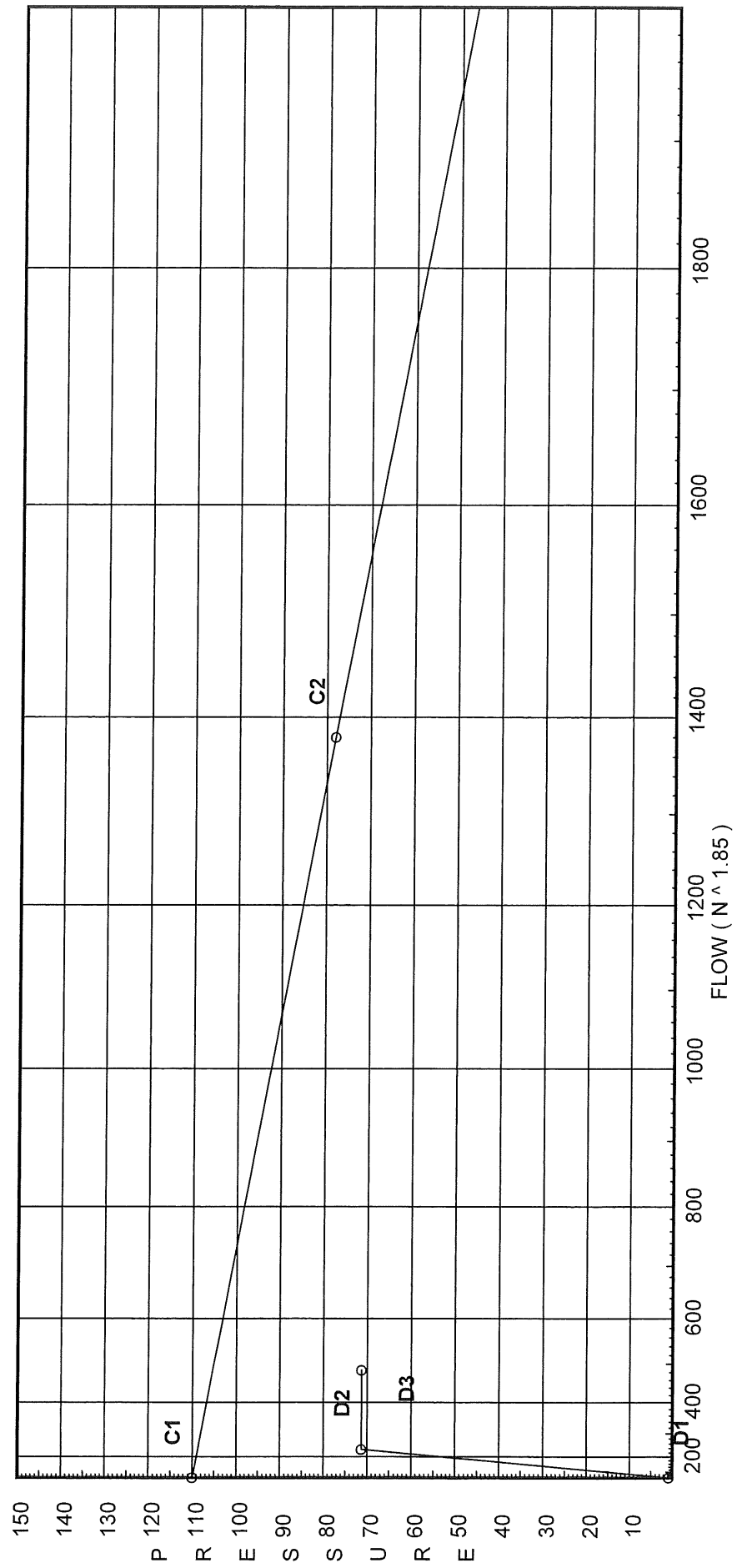
G
E Horizontal Barriers Provided:

City Water Supply:

C1 - Static Pressure : 110
C2 - Residual Pressure: 78
C2 - Residual Flow : 1380

Demand:

D1 - Elevation : 0.866
D2 - System Flow : 235.245
D2 - System Pressure : 71.325
Hose (Demand) : 250
D3 - System Demand : 485.245
Safety Margin : 34.046



Fittings Used Summary

EASTERN FIRE PROTECTION
258 COMMERCIAL ST BSMT FLR UPR

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
B	0	0	0	0	0	6	7	10	0	12	9	10	12	19	21	0	0	0	0	0
Fsp	Fitting generates a Fixed Loss Based on Flow																			
G	0	0	0	0	0	1	1	1	1	2	2	3	4	5	6	7	8	10	11	13
L	0.5	1	2	2	2	3	4	5	5	6	8	9	13	16	18	24	27	30	34	40
S	4	5	5	7	9	11	14	16	19	22	27	32	45	55	65	76	87	98	109	130
T	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.

Flow Summary - NFPA 2007

EASTERN FIRE PROTECTION
258 COMMERCIAL ST BSMT FLR UPR

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Date 040111

SUPPLY ANALYSIS

<i>Node at Source</i>	<i>Static Pressure</i>	<i>Residual Pressure</i>	<i>Flow</i>	<i>Available Pressure</i>	<i>Total Demand</i>	<i>Required Pressure</i>
TEST	110.0	78	1380.0	105.372	485.24	71.325

NODE ANALYSIS

<i>Node Tag</i>	<i>Elevation</i>	<i>Node Type</i>	<i>Pressure at Node</i>	<i>Discharge at Node</i>	<i>Notes</i>
75	12.0	5.6	31.79	31.57	
73	12.0	5.6	30.75	31.05	
69	12.0	5.6	20.42	25.31	
70	12.0	5.6	22.07	26.31	
71	12.0	5.6	28.2	29.74	
72	12.0		33.86		
61	12.0	5.6	12.13	19.5	
62	12.0	5.6	13.14	20.3	
63	12.0	5.6	16.93	23.04	
64	12.0	5.6	25.76	28.42	
65	12.0		32.76		
66	12.0		39.26		
67	12.0		39.46		
68	12.0		49.97		
HDR1	8.0		66.2		
FLG	7.0		72.34		
TEST	10.0		71.33	250.0	

Final Calculations - Hazen-Williams - 2007

EASTERN FIRE PROTECTION
258 COMMERCIAL ST BSMT FLR UPR

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Date 040111

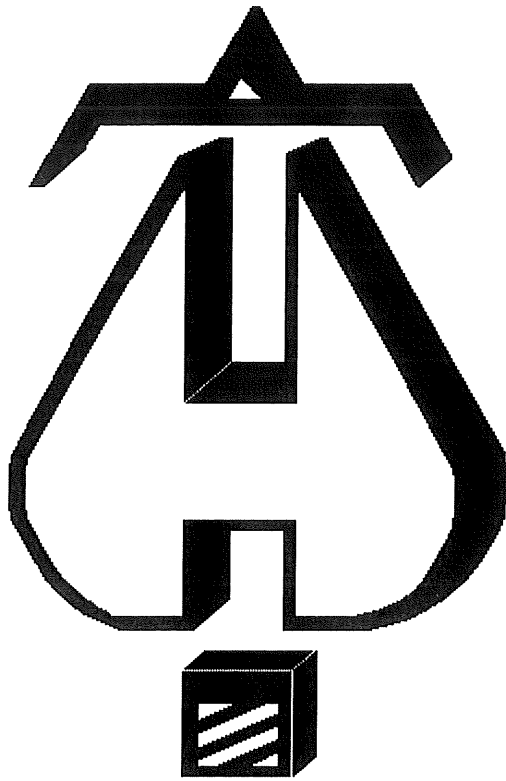
Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqv.	Ln.	Pipe Ftng's Total	CFact Pf/Ft	Pt Pe Pf	*****	Notes	*****
75 to 72	12.00 12.00	5.60	31.57 31.57	1 1.049	1T	5.0 0.0 0.0	1.830 5.000 6.830	120 0.3028	31.790 0.0 2.068		Vel = 11.72	
72			0.0 31.57						33.858		K Factor = 5.43	
73 to 65	12.00 12.00	5.60	31.05 31.05	1 1.049	1T	5.0 0.0 0.0	1.830 5.000 6.830	120 0.2937	30.752 0.0 2.006		Vel = 11.53	
65			0.0 31.05						32.758		K Factor = 5.43	
69 to 70	12.00 12.00	5.60	25.31 25.31	1 1.049		0.0 0.0 0.0	8.160 0.0 8.160	120 0.2011	20.425 0.0 1.641		Vel = 9.40	
70 to 71	12.00 12.00	5.60	26.30 51.61	1 1.049		0.0 0.0 0.0	8.160 0.0 8.160	120 0.7518	22.066 0.0 6.135		Vel = 19.16	
71 to 72	12.00 12.00	5.60	29.74 81.35	1.25 1.38	1T	6.0 0.0 0.0	6.330 6.000 12.330	120 0.4588	28.201 0.0 5.657		Vel = 17.45	
72 to 67	12.00 12		31.58 112.93	1.25 1.38	1T	6.0 0.0 0.0	0.660 6.000 6.660	120 0.8416	33.858 0.0 5.605		Vel = 24.22	
67			0.0 112.93						39.463		K Factor = 17.98	
61 to 62	12.00 12.00	5.60	19.50 19.5	1 1.049		0.0 0.0 0.0	8.160 0.0 8.160	120 0.1243	12.125 0.0 1.014		Vel = 7.24	
62 to 63	12.00 12.00	5.60	20.30 39.8	1 1.049		0.0 0.0 0.0	8.160 0.0 8.160	120 0.4647	13.139 0.0 3.792		Vel = 14.77	
63 to 64	12.00 12.00	5.60	23.04 62.84	1 1.049		0.0 0.0 0.0	8.160 0.0 8.160	120 1.0820	16.931 0.0 8.829		Vel = 23.33	
64 to 65	12.00 12.00	5.60	28.42 91.26	1.25 1.38	1T	6.0 0.0 0.0	6.330 6.000 12.330	120 0.5676	25.760 0.0 6.998		Vel = 19.58	
65 to 66	12.00 12.00		31.06 122.32	1.25 1.38	1T	6.0 0.0 0.0	0.660 6.000 6.660	120 0.9757	32.758 0.0 6.498		Vel = 26.24	
66 to 67	12.00 12		0.0 122.32	3 3.26		0.0 0.0 0.0	14.000 0.0 14.000	120 0.0148	39.256 0.0 0.207		Vel = 4.70	
67 to 68	12 12.00		112.92 235.24	3 3.26	7L 1T	47.038 20.159 0.0	144.000 67.197 211.197	120 0.0497	39.463 0.0 10.503		Vel = 9.04	
68 to HDR1	12.00 8		0.0 235.24	3 3.26	3L 1T 1Fsp	20.159 20.159 0.0	156.000 75.261 231.261	120 0.0497	49.966 4.732 11.500		* Fixed loss = 3 Vel = 9.04	

Final Calculations - Hazen-Williams - 2007

EASTERN FIRE PROTECTION
258 COMMERCIAL ST BSMT FLR UPR

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Date 040111

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	*****
					1S	21.503						
					1B	13.44						
HDR1 to FLG	8 7		0.0 235.24	3 3.26	5L	33.599	7.500 6.720	120	66.198 5.433		* Fixed loss = 5	
FLG to TEST	7 10		0.0 235.24	6 6.16	3L 1G 1T	20.785 2.309 23.094	45.000 46.189 91.189	100	72.338 -1.299 0.286	0.0497	Vel = 9.04	
TEST			250.00 485.24								Vel = 2.53	
									71.325		Qa = 250.00 K Factor = 57.46	



... Fire Protection by Computer Design

EASTERN FIRE PROTECTION
170 KITTYHAWK AVE.
P.O. BOX 1390
AUBURN, MAINE 04211-1390
800-274-1507

Job Name : 258 COMMERCIAL ST 1ST FLR PEND
Drawing : EXISTING WOOD CONSTRUCTION
Location : 258 COMMERCIAL ST PORTLAND, MAINE
Remote Area : 2 OF 2
Contract : AU-4660-10
Data File : 1-4660.11.wx2

Hydraulic Design Information Sheet

Name - MERRILL'S WHARF FIRST FLR PEND Date - 04/01/11
 Location - 258 COMMERCIAL ST PORTLAND, MAINE
 Building - EXISTING WOOD CONSTRUCTION System No. - 2 OF 2
 Contractor - EASTERN FIRE PROTECTION CO., INC Contract No. - AU-4660-10
 Calculated By - WILLIAM FLYNT Drawing No. - 1 OF 3
 Construction: (X) Combustible () Non-Combustible Ceiling Height - VARIES
 Occupancy - FIRST FLR EXPOSED PENDENTS .1/1120 SQ FT

S (X) NFPA 13 (X) Lt. Haz. Ord.Haz.Gp. () 1 () 2 () 3 () Ex.Haz.
 Y () NFPA 231 () NFPA 231C (X) Figure 11.2.3.1.1 Curve LIGHT

S Other

T Specific Ruling Made By Date

M	Area of Sprinkler Operation - 1120	System Type	Sprinkler/Nozzle
	Density - .1	(X) Wet	Make TYCO
D	Area Per Sprinkler - 130	() Dry	Model TY-FRB
E	Elevation at Highest Outlet - 27'-4"	() Deluge	Size 1/2"
S	Hose Allowance - Inside -	() Preaction	K-Factor 5.6
I	Rack Sprinkler Allowance -	() Other	Temp.Rat.155
G	Hose Allowance - Outside - 100		

Note REMOTE AREA REDUCED PER NFPA 13 (2010) SECTION 11.2.3.2.3.1

Calculation Summary	Flow Required - 366 C-Factor Used: 120	Press Required - 70 Overhead 100	AT TEST POINT Underground
---------------------	---	-------------------------------------	------------------------------

W	Water Flow Test:	Pump Data:	Tank or Reservoir:
A	Date of Test - 03/28/11		Cap. -
T	Time of Test - 2:30 PM	Rated Cap.-	Elev.-
E	Static Press - 110	@ Press -	
R	Residual Press - 78	Elev. -	Well
	Flow - 1380		Proof Flow
S	Elevation - 10'-0"		

U Location - OFF 8" IN PRIVATE YARD MAIN OFF EXISTING HYDRANT

P Source of Information -
 Y EASTERN FIRE PROTECTION CO.

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	() Double Row	() Slave Pallet	() Solid Shelf () Non
T	() Mult. Row		() Open Shelf

R	Flue Spacing	Clearance:Storage to Ceiling
A	Longitudinal	Transverse

G Horizontal Barriers Provided:

water supply curve (C)

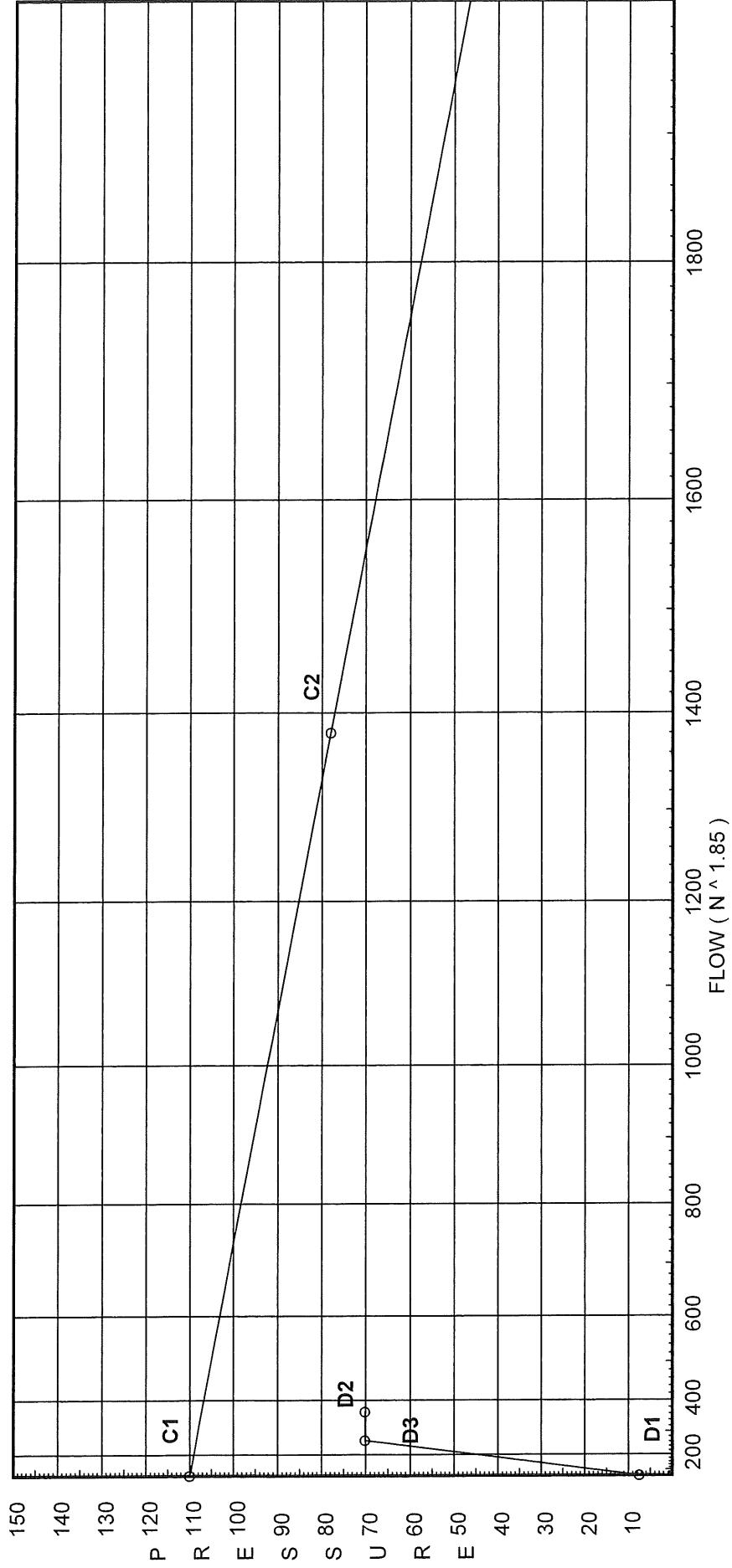
EASTERN FIRE PROTECTION
258 COMMERCIAL ST 1ST FLR PEND

City Water Supply:

C1 - Static Pressure : 110
C2 - Residual Pressure: 78
C2 - Residual Flow : 1380

Demand:

D1 - Elevation : 7.506
D2 - System Flow : 265.643
D2 - System Pressure : 70.165
Hose (Demand) : 100
D3 - System Demand : 365.643
Safety Margin : 37.093



Fittings Used Summary

EASTERN FIRE PROTECTION
258 COMMERCIAL ST 1ST FLR PEND

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Date 040111

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
B	0	0	0	0	0	6	7	10	0	12	9	10	12	19	21	0	0	0	0	0
Fsp	Fitting generates a Fixed Loss Based on Flow																			
G	0	0	0	0	1	1	1	1	1	2	2	3	4	5	6	7	8	10	11	13
L	0.5	1	2	2	3	4	4	5	5	6	8	9	13	16	18	24	27	30	34	40
S	4	5	5	7	9	11	14	16	19	22	27	32	45	55	65	76	87	98	109	130
T	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.

Final Calculations - Hazen-Williams - 2007

EASTERN FIRE PROTECTION
258 COMMERCIAL ST 1ST FLR PEND

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Date 040111

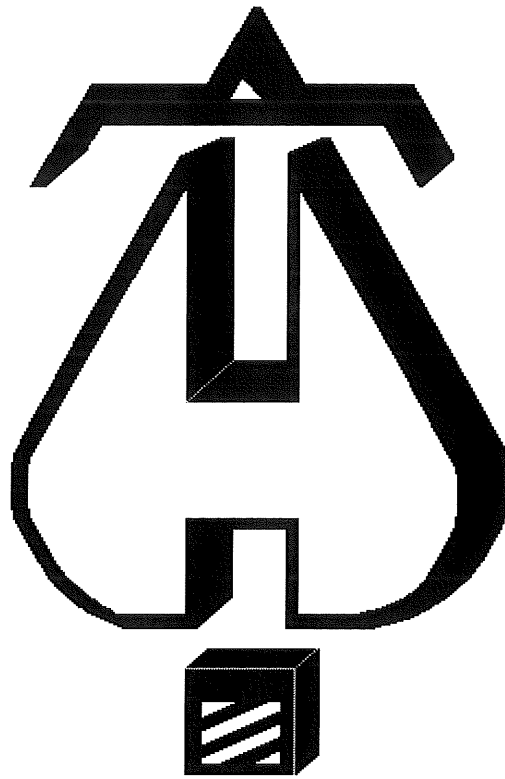
Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqv.	Ln.	Pipe Ftng's Total	CFact Pf/Ft	Pt Pe Pf	*****	Notes	*****
D101 to EQ01	27.33 27.33	5.60	14.82	1	1T	5.0 0.0 0.0	0.500 5.000 5.500	120	7.000 0.0 0.411			Vel = 5.50
EQ01			0.0 14.82						7.411			K Factor = 5.44
94 to 95	27.33 27.33	5.44	14.86	1.5		0.0 0.0 0.0	7.000 0.0 7.000	120	7.452 0.0 0.065			K = K @ EQ01 Vel = 2.34
95 to 96	27.33 27.33	5.44	14.92	1.5		0.0 0.0 0.0	6.950 0.0 6.950	120	7.517 0.0 0.235			K = K @ EQ01 Vel = 4.69
96 to 97	27.33 27.33	5.44	15.15	1.5		0.0 0.0 0.0	9.000 0.0 9.000	120	7.752 0.0 0.650			K = K @ EQ01 Vel = 7.08
97 to 98	27.33 27.33	5.44	15.78	1.5		0.0 0.0 0.0	6.950 0.0 6.950	120	8.402 0.0 0.876			K = K @ EQ01 Vel = 9.57
98 to 99	27.33 27.33	5.44	16.58	1.5		0.0 0.0 0.0	7.000 0.0 7.000	120	9.278 0.0 1.378			K = K @ EQ01 Vel = 12.18
99 to 88	27.33 27.33	5.44	17.76	1.5	2T	16.0 0.0 0.0	3.660 16.000 19.660	120	10.656 0.0 5.679			K = K @ EQ01 Vel = 14.98
88			0.0 95.05						16.335			K Factor = 23.52
90 to 91	27.33 27.33	5.44	18.59	1.5		0.0 0.0 0.0	9.000 0.0 9.000	120	11.663 0.0 0.127			K = K @ EQ01 Vel = 2.93
91 to 92	27.33 27.33	5.44	18.69	1.5		0.0 0.0 0.0	6.950 0.0 6.950	120	11.790 0.0 0.355			K = K @ EQ01 Vel = 5.88
92 to 93	27.33 27.33	5.44	18.96	1.5		0.0 0.0 0.0	7.000 0.0 7.000	120	12.145 0.0 0.766			K = K @ EQ01 Vel = 8.86
93 to 89	27.33 27.33	5.44	19.56	1.5	2T	16.0 0.0 0.0	3.660 16.000 19.660	120	12.911 0.0 3.736			K = K @ EQ01 Vel = 11.95
89			0.0 75.80						16.647			K Factor = 18.58
81 to 82	27.33 27.33	5.44	14.82	1.5		0.0 0.0 0.0	7.000 0.0 7.000	120	7.411 0.0 0.065			K = K @ EQ01 Vel = 2.34
82 to 83	27.33 27.33	5.44	14.88	1.5		0.0 0.0 0.0	6.950 0.0 6.950	120	7.476 0.0 0.233			K = K @ EQ01 Vel = 4.68
83 to 84	27.33 27.33	5.44	15.11	1.5		0.0 0.0 0.0	9.000 0.0 9.000	120	7.709 0.0 0.647			K = K @ EQ01 Vel = 7.06

Final Calculations - Hazen-Williams - 2007

EASTERN FIRE PROTECTION
258 COMMERCIAL ST 1ST FLR PEND

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Date 040111

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 *****
84 to 85	27.33 27.33	5.44	15.73 60.54	1.5 1.61		0.0 0.0	6.950 0.0	120 0.1253	8.356 0.0 0.871	K = K @ EQ01 Vel = 9.54
85 to 86	27.33 27.33	5.44	16.53 77.07	1.5 1.61		0.0 0.0	7.000 7.000	120 0.1960	9.227 0.0 1.372	K = K @ EQ01 Vel = 12.15
86 to 87	27.33 27.33	5.44	17.72 94.79	1.5 1.61	2T	16.0 0.0	3.660 16.000	120	10.599 0.0	K = K @ EQ01
87 to 88	27.33 27.33		0.0 94.79	3 3.26		0.0 0.0	9.330 0.0	120 0.0093	16.248 0.0 0.087	Vel = 14.94 Vel = 3.64
88 to 89	27.33 27.33		95.05 189.84	3 3.26		0.0 0.0	9.330 9.330	120 0.0334	16.335 0.0 0.312	Vel = 7.30
89 to 49.1	27.33 27.330		75.80 265.64	3 3.26	3T 3L 1Fsp 1S 1B	60.478 20.159 0.0 21.503 13.44	35.000 115.580 150.580	120 0.0623	16.647 3.000 9.376	* Fixed loss = 3 Vel = 10.21
49.1 to HDR2	27.330 8		0.0 265.64	3 3.26	10L 3T 1Fsp 1S 1B	67.198 60.478 0.0 21.503 13.44	222.000 162.619 384.619	120 0.0623	29.023 11.372 23.947	* Fixed loss = 3 Vel = 10.21
HDR2 to FLG	8 7		0.0 265.64	3 3.26	5L	33.599 0.0	10.000 6.720	120	64.342 5.433	* Fixed loss = 5 Vel = 10.21
FLG to TEST	7 10	H100	100.00 365.64	6 6.16	3L 1G 1T	20.785 2.309 23.094	45.000 46.189 91.189	100 0.0071	70.816 -1.299 0.648	Vel = 3.94
TEST			0.0 365.64						70.165	K Factor = 43.65



... Fire Protection by Computer Design

EASTERN FIRE PROTECTION
170 KITTYHAWK AVE.
P.O. BOX 1390
AUBURN, MAINE 04211-1390
800-274-1507

Job Name : MERRILLS WHARF 2ND FLR PEND
Drawing : EXISTING WOOD CONSTRUCTION
Location : 258 COMMERCIAL ST PORTLAND, MAINE
Remote Area : 1 OF 1
Contract : AU-4660-10
Data File : 2-4660REWWATER.2.wx1

Hydraulic Design Information Sheet

Name - MERRILL'S WHARF 2ND FLR PEND Date - 03/08/11
 Location - 258 COMMERCIAL ST PORTLAND, MAINE
 Building - EXISTING WOOD CONSTRUCTION System No. - 1 OF 1
 Contractor - EASTERN FIRE PROTECTION CO., INC Contract No. - AU-4660-10
 Calculated By - WILLIAM FLYNT Drawing No. - 2 OF 3
 Construction: (X) Combustible () Non-Combustible Ceiling Height - VARIES
 Occupancy - OFFICE LIGHT HAZARD

S (X) NFPA 13 (X) Lt. Haz. Ord.Haz.Gp. () 1 () 2 () 3 () Ex.Haz.
 Y () NFPA 231 () NFPA 231C (X) Figure 11.2.3.1.1 Curve LIGHT

S Other

T Specific Ruling Made By Date

Specific Ruling	Made By	Date
Area of Sprinkler Operation - 1009	System Type	Sprinkler/Nozzle
Density - .1	(X) Wet	Make TYCO
Area Per Sprinkler - 130	() Dry	Model TY-FRB
Elevation at Highest Outlet - 39'-9"	() Deluge	Size 1/2"
Hose Allowance - Inside -	() Preaction	K-Factor 5.6
Rack Sprinkler Allowance -	() Other	Temp.Rat.155
Hose Allowance - Outside - 100		

N Note REMOTE AREA REDUCED PER NFPA 13 (2010) SECTION 11.2.3.2.3.1

Calculation Flow Required - 348 Press Required - 76 AT TEST POINT
 Summary C-Factor Used: 120 Overhead 100 Underground

Water Flow Test:	Pump Data:	Tank or Reservoir:
Date of Test - 03/28/11	Rated Cap.-	Cap. -
Time of Test - 2:30 PM	@ Press -	Elev.-
Static Press - 110	Elev. -	Well
Residual Press - 78		Proof Flow
Flow - 1380		
Elevation - 10'-0"		

U Location - OFF 8" IN PRIVATE YARD MAIN OFF EXISTING HYDRANT

L Source of Information -
 Y EASTERN FIRE PROTECTION

Commodity	Class	Location
Storage Ht.	Area	Aisle W.
Storage Method:	% Palletized	% Rack
() Single Row	() Conven. Pallet	() Auto. Storage
() Double Row	() Slave Pallet	() Solid Shelf
() Mult. Row		() Open Shelf

R K Flue Spacing Clearance:Storage to Ceiling
 A Longitudinal Transverse

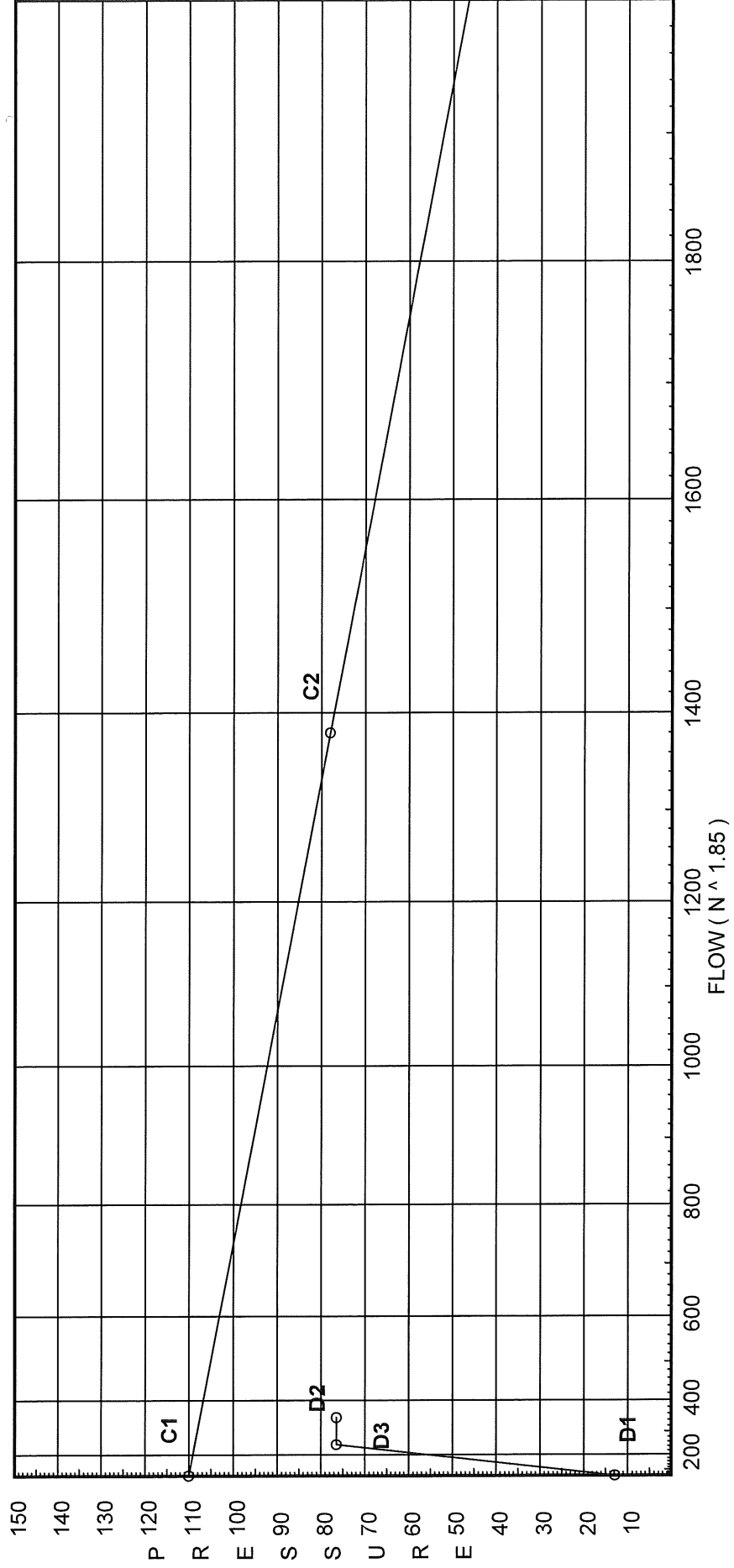
G Horizontal Barriers Provided:

Water Supply Curve (C)

EASTERN FIRE PROTECTION
MERRILLS WHARF 2ND FLR PEND

City Water Supply:
C1 - Static Pressure : 110
C2 - Residual Pressure: 78
C3 - Residual Flow : 1380

Demand:
D1 - Elevation : 12.885
D2 - System Flow : 248.341
D2 - System Pressure : 76.457
Hose (Demand) : 100
D3 - System Demand : 348.341
Safety Margin : 31.036



Fittings Used Summary

EASTERN FIRE PROTECTION
MERRILLS WHARF 2ND FLR PEND

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	
B	0	0	0	0	0	6	7	10	0	12	9	10	12	19	21	0	0	0	0	0	
E	1	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61	
Fsp	Fitting generates a Fixed Loss Based on Flow																				
G	0	0	0	0	0	1	1	1	1	2	2	3	4	5	6	7	8	10	11	13	
L	0.5	1	2	2	2	3	4	5	5	6	8	9	13	16	18	24	27	30	34	40	
S	4	5	5	7	9	11	14	16	19	22	27	32	45	55	65	76	87	98	109	130	
T	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.

Flow Summary - NFPA 2007

EASTERN FIRE PROTECTION
MERRILLS WHARF 2ND FLR PEND

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SUPPLY ANALYSIS

<i>Node at Source</i>	<i>Static Pressure</i>	<i>Residual Pressure</i>	<i>Flow</i>	<i>Available Pressure</i>	<i>Total Demand</i>	<i>Required Pressure</i>
TEST	110.0	78	1380.0	107.493	348.34	76.457

NODE ANALYSIS

<i>Node Tag</i>	<i>Elevation</i>	<i>Node Type</i>	<i>Pressure at Node</i>	<i>Discharge at Node</i>	<i>Notes</i>
35	39.75	5.6	10.14	17.84	
36	39.75	5.6	10.26	17.93	
38	39.75	5.6	10.86	18.46	
37	39.75		11.2		
31	39.75	5.6	11.67	19.13	
32	39.75	5.6	13.1	20.27	
33	39.75	5.6	15.02	21.7	
34	39.75	5.6	18.33	23.97	
24A	39.75	5.6	7.06	14.88	
25A	39.75	5.6	7.89	15.73	
20	39.75	5.6	7.0	14.82	
21	39.75	5.6	7.08	14.9	
22	39.75	5.6	7.25	15.08	
23	39.75	5.6	7.68	15.52	
24	39.75		8.12		
25	39.75		9.06		
26	39.75	5.6	10.44	18.09	
27	39.75		18.88		
28	39.75		19.5		
29-2	39.75		32.53		
HDR2	8.0		71.09		
FLG	7.0		77.44		
TEST	10.0		76.46	100.0	

Final Calculations - Hazen-Williams - 2007

EASTERN FIRE PROTECTION
MERRILLS WHARF 2ND FLR PEND

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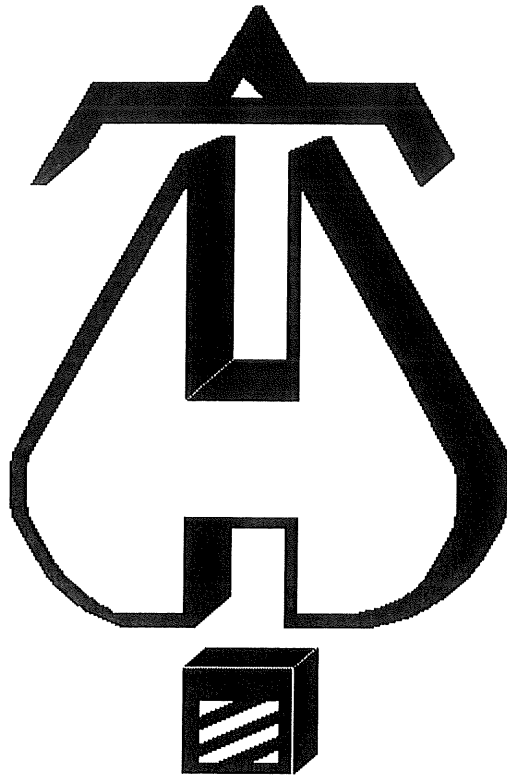
Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqv.	Ln.	Pipe Ftng's Total	CFact Pf/Ft	Pt Pe Pf	*****	Notes	*****
35 to 36	39.75 39.75	5.60	17.84	1.5		0.0	8.500	120	10.145			
						0.0	0.0		0.0			
			17.84	1.61		0.0	8.500	0.0131	0.111	Vel =	2.81	
36 to 37	39.75 39.750	5.60	17.93	1.5	2L 1T	4.0 8.0	7.830 12.000	120	10.256			
						0.0	19.830	0.0474	0.939	Vel =	5.64	
			0.0									
37			35.77						11.195	K Factor =	10.69	
38 to 37	39.750 39.750	5.60	18.46	1.5	2L 1T	4.0 8.0	11.830 12.000	120	10.863			
						0.0	23.830	0.0139	0.332	Vel =	2.91	
			18.46	1.61		0.0						
37 to 31	39.750 39.75		35.77	1.5	1L	2.0 0.0	2.670 2.000	120	11.195			
						0.0	4.670	0.1024	0.478	Vel =	8.55	
			54.23	1.61		0.0						
31 to 32	39.75 39.75	5.60	19.13	1.5		0.0	8.000	120	11.673			
						0.0	0.0		0.0			
			73.36	1.61		0.0	8.000	0.1788	1.430	Vel =	11.56	
32 to 33	39.75 39.75	5.60	20.27	1.5		0.0	6.830	120	13.103			
						0.0	0.0		0.0			
			93.63	1.61		0.0	6.830	0.2810	1.919	Vel =	14.76	
33 to 34	39.75 39.75	5.60	21.71	1.5		0.0	8.000	120	15.022			
						0.0	0.0		0.0			
			115.34	1.61		0.0	8.000	0.4131	3.305	Vel =	18.18	
34 to 28	39.75 39.75	5.60	23.97	1.5		0.0	2.000	120	18.327			
						0.0	0.0		0.0			
			139.31	1.61		0.0	2.000	0.5855	1.171	Vel =	21.95	
			0.0									
28			139.31						19.498	K Factor =	31.55	
24A to 24	39.750 39.75	5.60	14.88	1	2E 1T	4.0 5.0	5.000 9.000	120	7.064			
						0.0	14.000	0.0753	1.054	Vel =	5.52	
			14.88	1.049		0.0						
			0.0									
24			14.88						8.118	K Factor =	5.22	
25A to 25	39.750 39.75	5.60	15.73	1	2E 1T	4.0 5.0	5.000 9.000	120	7.893			
						0.0	14.000	0.0835	1.169	Vel =	5.84	
			15.73	1.049		0.0						
			0.0									
25			15.73						9.062	K Factor =	5.23	
20 to 21	39.75 39.75	5.60	14.82	1.5		0.0	9.000	120	7.000			
						0.0	0.0		0.0			
			14.82	1.61		0.0	9.000	0.0092	0.083	Vel =	2.34	
21 to 22	39.75 39.75	5.60	14.90	1.5		0.0	5.000	120	7.083			
						0.0	0.0		0.0			
			29.72	1.61		0.0	5.000	0.0338	0.169	Vel =	4.68	
22 to 23	39.75 39.75	5.60	15.08	1.5		0.0	6.000	120	7.252			
						0.0	0.0		0.0			
			44.8	1.61		0.0	6.000	0.0718	0.431	Vel =	7.06	
23 to 24	39.75 39.75	5.60	15.52	1.5		0.0	3.500	120	7.683			
						0.0	0.0		0.0			
			60.32	1.61		0.0	3.500	0.1243	0.435	Vel =	9.51	

Final Calculations - Hazen-Williams - 2007

EASTERN FIRE PROTECTION
MERRILLS WHARF 2ND FLR PEND

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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 *****
24 to 25	39.75 39.75		14.89 75.21	1.5 1.61		0.0 0.0	5.040 0.0	120 0.1873	8.118 0.0 0.944	Vel = 11.85
25 to 26	39.75 39.75		15.73 90.94	1.5 1.61		0.0 0.0	5.170 0.0	120 0.2662	9.062 0.0 1.376	Vel = 14.33
26 to 27	39.75 39.750	5.60	18.09 109.03	1.5 1.61	2T	16.0 0.0	6.670 16.000	120 0.3723	10.438 0.0 8.440	Vel = 17.18
27 to 28	39.750 39.75		0.0 109.03	3 3.26	2T	40.319 0.0	11.420 40.319	120 0.0120	18.878 0.0 0.620	Vel = 4.19
28 to 29-2	39.75 39.750		139.31 248.34	3 3.26	3T 3L 1Fsp 1S 1B	60.478 20.159 0.0 21.503 13.44	67.000 115.580 182.580	120 0.0550	19.498 3.000 10.037	* Fixed loss = 3 Vel = 9.55
29-2 to HDR2	39.750 8		0.0 248.34	3 3.26	10L 3T 1Fsp 1S 1B	67.198 60.478 0.0 21.503 13.44	234.000 162.619 396.619	120 0.0550	32.535 16.751 21.802	* Fixed loss = 3 Vel = 9.55
HDR2 to FLG	8 7		0.0 248.34	3 3.26	5L	33.599 0.0	10.000 6.720	120 0.0550	71.088 5.433 0.919	* Fixed loss = 5 Vel = 9.55
FLG to TEST	7 10		0.0 248.34	6 6.16	3L 1G 1T	20.785 2.309 23.094	45.000 46.189 91.189	100 0.0035	77.440 -1.299 0.316	Vel = 2.67
TEST			100.00 348.34						76.457	Qa = 100.00 K Factor = 39.84



... Fire Protection by Computer Design

EASTERN FIRE PROTECTION
170 KITTYHAWK AVE.
P.O. BOX 1390
AUBURN, MAINE 04211-1390
800-274-1507

Job Name : MERRILLS WHARF 3RD FLR PEND
Drawing : EXISTING WOOD CONSTRUCTION
Location : 258 COMMERCIAL ST PORTLAND, MAINE
Remote Area : 1 OF 1
Contract : AU-4660-10
Data File : 2-4660.3REVVATER.wx1

Hydraulic Design Information Sheet

Name - MERRILL'S WHARF 3RD FLR PEND Date - 03/08/11
 Location - 258 COMMERCIAL ST PORTLAND, MAINE
 Building - EXISTING WOOD CONSTRUCTION System No. - 1 OF 1
 Contractor - EASTERN FIRE PROTECTION CO., INC Contract No. - AU-4660-10
 Calculated By - WILLIAM FLYNT Drawing No. - 2 OF 3
 Construction: (X) Combustible () Non-Combustible Ceiling Height - VARIES
 Occupancy - OFFICE LIGHT HAZARD

S (X) NFPA 13 (X) Lt. Haz. Ord.Haz.Gp. () 1 () 2 () 3 () Ex.Haz.
 Y () NFPA 231 () NFPA 231C (X) Figure 11.2.3.1.1 Curve LIGHT

S Other

T Specific Ruling Made By Date

E
 M Area of Sprinkler Operation - 917 System Type Sprinkler/Nozzle
 Density - .1 (X) Wet Make TYCO
 D Area Per Sprinkler - 130 () Dry Model TY-FRB
 E Elevation at Highest Outlet - 50'-9" () Deluge Size 1/2"
 S Hose Allowance - Inside - () Preaction K-Factor 5.6
 I Rack Sprinkler Allowance - () Other Temp.Rat.155
 G Hose Allowance - Outside - 100

N

Note REMOTE AREA REDUCED PER NFPA 13 (2010) SECTION 11.2.3.2.3.1

Calculation Flow Required - 353.6 Press Required - 88 AT TEST POINT
 Summary C-Factor Used: 120 Overhead 100 Underground

W Water Flow Test: Pump Data: Tank or Reservoir:
 A Date of Test - 03/28/11 Cap. -
 T Time of Test - 2:30 PM Rated Cap.- Elev.-
 E Static Press - 110 @ Press -
 R Residual Press - 78 Elev. - Well
 Flow - 1380 Proof Flow
 S Elevation - 10'-0"

U

P Location - OFF 8" IN PRIVATE YARD MAIN OFF EXISTING HYDRANT

P

L Source of Information -
 Y EASTERN FIRE PROTECTION

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
 A Longitudinal Transverse
 G

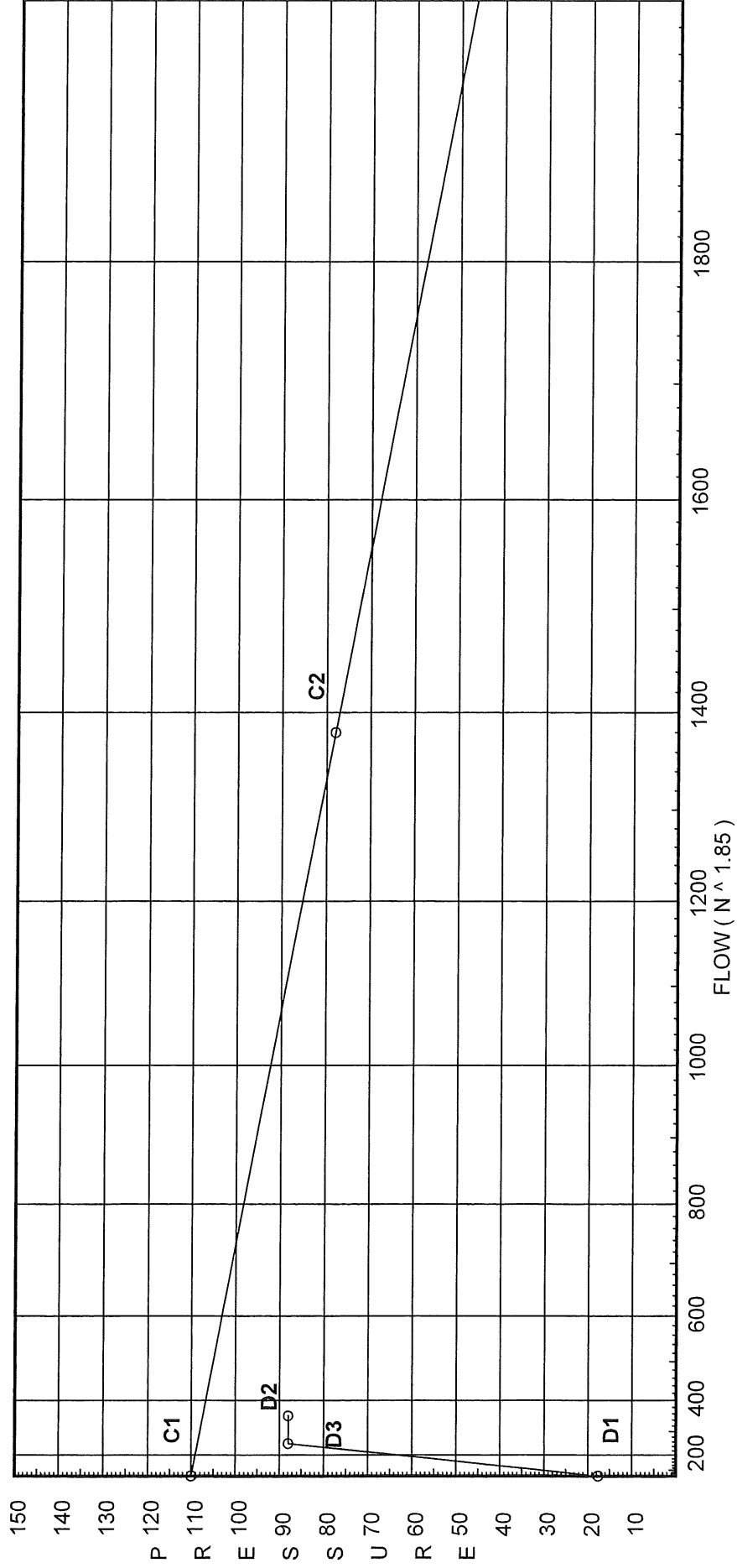
E Horizontal Barriers Provided:

City Water Supply:

C1 - Static Pressure : 110
C2 - Residual Pressure: 78
C2 - Residual Flow : 1380

Demand:

D1 - Elevation : 17.649
D2 - System Flow : 253.645
D2 - System Pressure : 87.962
Hose (Demand) : 100
D3 - System Demand : 353.645
Safety Margin : 19.461



Fittings Used Summary

EASTERN FIRE PROTECTION
MERRILLS WHARF 3RD FLR PEND

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	
B	0	0	0	0	0	6	7	10	0	12	9	10	12	19	21	0	0	0	0	0	
E	1	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61	
Fsp	Fitting generates a Fixed Loss Based on Flow																				
G	0	0	0	0	0	1	1	1	1	2	2	3	4	5	6	7	8	10	11	13	
L	0.5	1	2	2	2	3	4	5	5	6	8	9	13	16	18	24	27	30	34	40	
S	4	5	5	7	9	11	14	16	19	22	27	32	45	55	65	76	87	98	109	130	
T	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.

Flow Summary - NFPA 2007

EASTERN FIRE PROTECTION
MERRILLS WHARF 3RD FLR PEND

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SUPPLY ANALYSIS

<i>Node at Source</i>	<i>Static Pressure</i>	<i>Residual Pressure</i>	<i>Flow</i>	<i>Available Pressure</i>	<i>Total Demand</i>	<i>Required Pressure</i>
TEST	110.0	78	1380.0	107.422	353.64	87.962

NODE ANALYSIS

<i>Node Tag</i>	<i>Elevation</i>	<i>Node Type</i>	<i>Pressure at Node</i>	<i>Discharge at Node</i>	<i>Notes</i>
301	50.75	5.6	7.0	14.82	
302	50.75	5.6	7.08	14.9	
303	50.75	5.6	7.2	15.02	
304	50.75	5.6	7.62	15.46	
305	50.75	5.6	8.58	16.41	
306	50.75	5.6	9.46	17.23	
307	50.75	5.6	10.68	18.3	
309	50.75	5.6	10.29	17.96	
310	50.75	5.6	10.39	18.05	
311	50.75	5.6	10.75	18.36	
312	50.75	5.6	11.67	19.13	
313	50.75	5.6	12.75	20.0	
314	50.75		14.85		
316	50.75		18.38		
317	50.75	5.6	17.32	23.3	
318	50.75		19.37		
319	50.75	5.6	19.47	24.71	
321	50.75		20.5		
308	50.75		20.65		
316A	50.75		20.76		
321A	50.75		21.2		
28	50.75		24.29		
29-3	50.75		37.73		
HDR2	8.0		82.54		
FLG	7.0		88.93		
TEST	10.0		87.96	100.0	

Final Calculations - Hazen-Williams - 2007

EASTERN FIRE PROTECTION
MERRILLS WHARF 3RD FLR PEND

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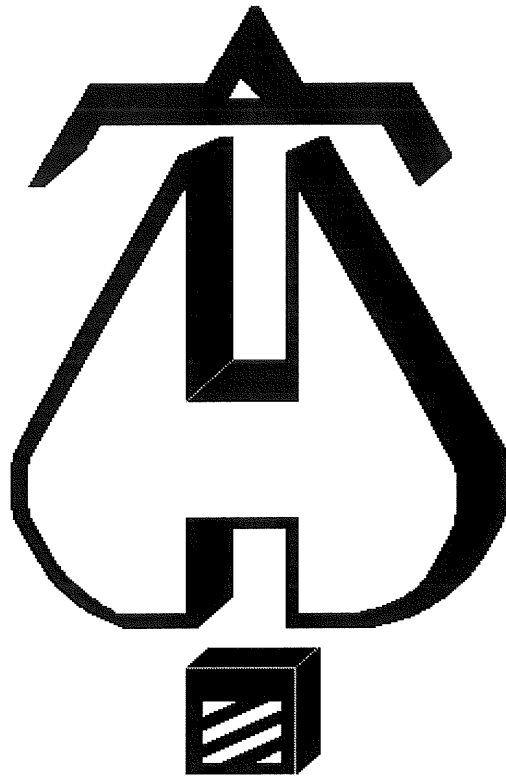
Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqv.	Ln.	Pipe Fng's Total	CFact Pf/Ft	Pt Pe Pf	*****	Notes	*****
301 to 302	50.750 50.750	5.60	14.82	1.5		0.0	8.500	120	7.000			
						0.0	0.0		0.0			
			14.82	1.61		0.0	8.500	0.0093	0.079	Vel =	2.34	
302 to 303	50.750 50.750	5.60	14.90	1.5		0.0	3.460	120	7.079			
						0.0	0.0		0.0			
			29.72	1.61		0.0	3.460	0.0335	0.116	Vel =	4.68	
303 to 304	50.750 50.750	5.60	15.02	1.5		0.0	5.960	120	7.195			
						0.0	0.0		0.0			
			44.74	1.61		0.0	5.960	0.0716	0.427	Vel =	7.05	
304 to 305	50.750 50.750	5.60	15.46	1.5		0.0	7.750	120	7.622			
						0.0	0.0		0.0			
			60.2	1.61		0.0	7.750	0.1241	0.962	Vel =	9.49	
305 to 306	50.750 50.750	5.60	16.40	1.5		0.0	4.540	120	8.584			
						0.0	0.0		0.0			
			76.6	1.61		0.0	4.540	0.1936	0.879	Vel =	12.07	
306 to 307	50.750 50.750	5.60	17.23	1.5		0.0	4.330	120	9.463			
						0.0	0.0		0.0			
			93.83	1.61		0.0	4.330	0.2820	1.221	Vel =	14.79	
307 to 308	50.750 50.750	5.60	18.31	1.5	2T	16.0	9.420	120	10.684			
						0.0	16.000		0.0			
			112.14	1.61		0.0	25.420	0.3921	9.968	Vel =	17.67	
308			0.0									
			112.14						20.652	K Factor =	24.68	
309 to 310	50.750 50.750	5.60	17.96	1.5		0.0	7.500	120	10.286			
						0.0	0.0		0.0			
			17.96	1.61		0.0	7.500	0.0133	0.100	Vel =	2.83	
310 to 311	50.750 50.750	5.60	18.05	1.5		0.0	7.500	120	10.386			
						0.0	0.0		0.0			
			36.01	1.61		0.0	7.500	0.0479	0.359	Vel =	5.67	
311 to 312	50.750 50.750	5.60	18.35	1.5		0.0	9.000	120	10.745			
						0.0	0.0		0.0			
			54.36	1.61		0.0	9.000	0.1028	0.925	Vel =	8.57	
312 to 313	50.750 50.750	5.60	19.13	1.5		0.0	6.040	120	11.670			
						0.0	0.0		0.0			
			73.49	1.61		0.0	6.040	0.1795	1.084	Vel =	11.58	
313 to 314	50.750 50.750	5.60	20.00	1.5		0.0	7.500	120	12.754			
						0.0	0.0		0.0			
			93.49	1.61		0.0	7.500	0.2801	2.101	Vel =	14.73	
314 to 316	50.750 50.750		0.0	1.5	1T	8.0	4.580	120	14.855			
						0.0	8.000		0.0			
			93.49	1.61		0.0	12.580	0.2801	3.524	Vel =	14.73	
316 to 316A	50.750 50.750		0.0	1.5	1T	8.0	0.500	120	18.379			
						0.0	8.000		0.0			
			93.49	1.61		0.0	8.500	0.2801	2.381	Vel =	14.73	
316A			0.0									
			93.49						20.760	K Factor =	20.52	
317 to 318	50.750 50.750	5.60	23.30	1	2E 1T	4.0	2.920	120	17.316			
						5.0	9.000		0.0			
			23.3	1.049		0.0	11.920	0.1727	2.058	Vel =	8.65	

Final Calculations - Hazen-Williams - 2007

EASTERN FIRE PROTECTION
MERRILLS WHARF 3RD FLR PEND

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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	*****
318 to 319	50.750 50.750		0.0 23.3	1.5 1.61		0.0 0.0	4.670 4.670	120 0.0216	19.374 0.0 0.101		Vel = 3.67	
319 to 321	50.750 50.750	5.60	24.72 48.02	1.5 1.61	1T	8.0 0.0	4.580 8.000 12.580	120 0.0816	19.475 0.0 1.027		Vel = 7.57	
321 to 321A	50.750 50.750		0.0 48.02	1.5 1.61	1T	8.0 0.0	0.500 8.000 8.500	120 0.0816	20.502 0.0 0.694		Vel = 7.57	
321A			0.0 48.02						21.196		K Factor = 10.43	
308 to 316A	50.750 50.750		112.14 112.14	3 3.26		0.0 0.0	8.500 0.0 8.500	120 0.0127	20.652 0.0 0.108		Vel = 4.31	
316A to 321A	50.750 50.750		93.49 205.63	3 3.26		0.0 0.0	11.250 0.0 11.250	120 0.0388	20.760 0.0 0.436		Vel = 7.90	
321A to 28	50.750 50.750		48.01 253.64	3 3.26	2T	40.319 0.0	13.830 40.319 54.149	120 0.0572	21.196 0.0 3.095		Vel = 9.75	
28 to 29-3	50.750 50.750		0.0 253.64	3 3.26	3T 3L 1Fsp 1S 1B	60.478 20.159 0.0 21.503 13.44	67.000 115.580 182.580	120 0.0572	24.291 3.000 10.437		* Fixed loss = 3 Vel = 9.75	
29-3 to HDR2	50.750 8		0.0 253.64	3 3.26	10L 3T 1Fsp 1S 1B	67.198 60.478 0.0 21.503 13.44	245.000 162.619 407.619	120 0.0572	37.728 21.515 23.300		* Fixed loss = 3 Vel = 9.75	
HDR2 to FLG	8 7		0.0 253.64	3 3.26	5L	33.599 0.0	10.000 6.720 16.720	120 0.0572	82.543 5.433 0.956		* Fixed loss = 5 Vel = 9.75	
FLG to TEST	7 10		0.0 253.64	6 6.16	3L 1G 1T	20.785 2.309 23.094	45.000 46.189 91.189	100 0.0036	88.932 -1.299 0.329		Vel = 2.73	
TEST			100.00 353.64						87.962		Qa = 100.00 K Factor = 37.71	



... Fire Protection by Computer Design

EASTERN FIRE PROTECTION
170 KITTYHAWK AVE.
P.O. BOX 1390
AUBURN, MAINE 04211-1390
800-274-1507

Job Name : MERRILLS WHARF 4TH FLR PEND
Drawing : EXISTING WOOD CONSTRUCTION
Location : 258 COMMERCIAL ST PORTLAND, MAINE
Remote Area : 1 OF 1
Contract : AU-4660-10
Data File : 3-4660.4SubmittalREVVWATER.wx1

Hydraulic Design Information Sheet

Name - MERRILL'S WHARF 4TH FLR PEND Date - 2/22/11
 Location - 258 COMMERCIAL ST PORTLAND, MAINE
 Building - EXISTING WOOD CONSTRUCTION System No. - 1 OF 1
 Contractor - EASTERN FIRE PROTECTION CO., INC Contract No. - AU-4660-10
 Calculated By - WILIAM FLYNT Drawing No. - 3 OF 3
 Construction: (X) Combustible () Non-Combustible Ceiling Height - VARIES
 Occupancy - 4TH FLR EXPOSED PENDENT .1/1061 SQ FT

S (X) NFPA 13 (X) Lt. Haz. Ord.Haz.Gp. () 1 () 2 () 3 () Ex.Haz.
 Y () NFPA 231 () NFPA 231C (X) Figure 11.2.3.1.1 Curve LIGHT

S Other

T Specific Ruling Made By Date

M	Area of Sprinkler Operation - 1061	System Type	Sprinkler/Nozzle
	Density - .1	(X) Wet	Make TYCO
D	Area Per Sprinkler - 130	() Dry	Model TY-FRB
E	Elevation at Highest Outlet - 62'-3"	() Deluge	Size 1/2"
S	Hose Allowance - Inside -	() Preaction	K-Factor 5.6
I	Rack Sprinkler Allowance -	() Other	Temp.Rat.155
G	Hose Allowance - Outside - 100		

N Note REMOTE AREA REDUCED PER NFPA 13 (2010) SECTION 11.2.3.2.3.1

Calculation Flow Required - 317 Press Required - 80 AT TEST POINT
 Summary C-Factor Used: 120 Overhead 100 Underground

W	Water Flow Test:	Pump Data:	Tank or Reservoir:
A	Date of Test - 03/28/11		Cap. -
T	Time of Test - 2:30PM	Rated Cap.-	Elev.-
E	Static Press - 110	@ Press -	
R	Residual Press - 78	Elev. -	Well
	Flow - 1380		Proof Flow
S	Elevation - 10'-0"		

U Location - OFF 8" IN PRIVATE YARD MAIN OFF EXISTING HYDRANT

P Source of Information -
 Y EASTERN FIRE PROTECTION

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

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

G Horizontal Barriers Provided:
 E

Water Supply Curve (C)

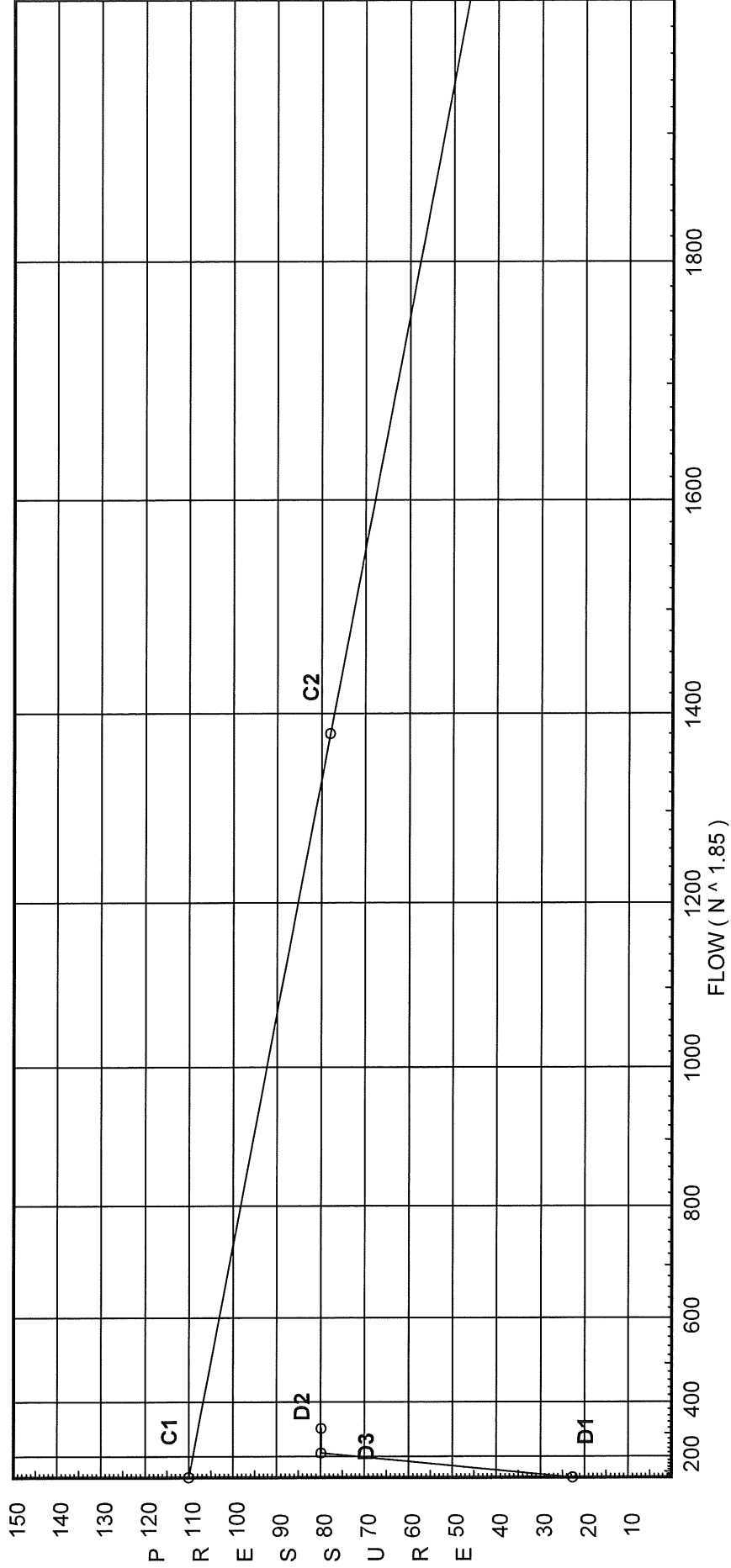
EASTERN FIRE PROTECTION
MERRILLS WHARF 4TH FLR PEND

City Water Supply:

C1 - Static Pressure : 110
C2 - Residual Pressure: 78
C2 - Residual Flow : 1380

Demand:

D1 - Elevation : 22.629
D2 - System Flow : 217.171
D2 - System Pressure : 79.836
Hose (Demand) : 100
D3 - System Demand : 317.171
Safety Margin : 28.057



Fittings Used Summary

EASTERN FIRE PROTECTION
MERRILLS WHARF 4TH FLR PEND

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
B	0	0	0	0	0	6	7	10	0	12	9	10	12	19	21	0	0	0	0	0
Fsp	Fitting generates a Fixed Loss Based on Flow																			
G	0	0	0	0	0	1	1	1	1	2	2	3	4	5	6	7	8	10	11	13
L	0.5	1	2	2	2	3	4	5	5	6	8	9	13	16	18	24	27	30	34	40
S	4	5	5	7	9	11	14	16	19	22	27	32	45	55	65	76	87	98	109	130
T	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.

Flow Summary - NFPA 2007

EASTERN FIRE PROTECTION
MERRILLS WHARF 4TH FLR PEND

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SUPPLY ANALYSIS

<i>Node at Source</i>	<i>Static Pressure</i>	<i>Residual Pressure</i>	<i>Flow</i>	<i>Available Pressure</i>	<i>Total Demand</i>	<i>Required Pressure</i>
TEST	110.0	78	1380.0	107.893	317.17	79.836

NODE ANALYSIS

<i>Node Tag</i>	<i>Elevation</i>	<i>Node Type</i>	<i>Pressure at Node</i>	<i>Discharge at Node</i>	<i>Notes</i>
35	62.25	5.6	7.0	14.82	
36	62.25	5.6	7.07	14.89	
38	62.25	5.6	7.83	15.67	
37	62.25		7.92		
31	62.25	5.6	8.06	15.9	
32	62.25	5.6	8.83	16.64	
33	62.25	5.6	10.53	18.17	
34	62.25	5.6	13.0	20.19	
21	62.25	5.6	7.96	15.8	
22	62.25	5.6	8.05	15.89	
23	62.25	5.6	8.19	16.03	
24	62.25	5.6	8.96	16.76	
25	62.25	5.6	9.81	17.54	
26	62.25	5.6	11.35	18.86	
27	62.25		18.17		
28	62.25		18.26		
29	62.25		29.09		
HDR2	8.0		73.58		
FLG	7.0		80.89		
TEST	10.0		79.84	100.0	

Final Calculations - Hazen-Williams - 2007

EASTERN FIRE PROTECTION
MERRILLS WHARF 4TH FLR PEND

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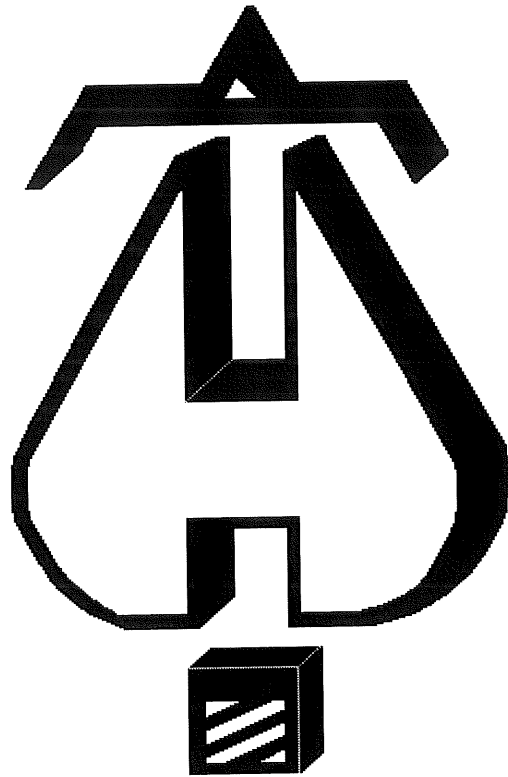
Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqv.	Ln.	Pipe Ftng's Total	CFact Pf/Ft	Pt Pe Pf	*****	Notes	*****
35 to 36	62.25 62.25	5.60	14.82	1.5		0.0 0.0	8.000 0.0	120	7.000 0.0			
			14.82	1.61		0.0	8.000	0.0092	0.074	Vel =	2.34	
36 to 37	62.25 62.25	5.60	14.89	1.5	3L 1T	6.0 8.0	11.080 14.000	120	7.074 0.0			
			29.71	1.61		0.0	25.080	0.0336	0.843	Vel =	4.68	
37			0.0 29.71						7.917	K Factor =	10.56	
38 to 37	62.25 62.25	5.60	15.67	1.5		0.0 0.0	8.450 0.0	120	7.830 0.0			
			15.67	1.61		0.0	8.450	0.0103	0.087	Vel =	2.47	
37 to 31	62.25 62.25		29.71	1.5		0.0 0.0	2.000 0.0	120	7.917 0.0			
			45.38	1.61		0.0	2.000	0.0735	0.147	Vel =	7.15	
31 to 32	62.25 62.25	5.60	15.90	1.5		0.0 0.0	6.000 0.0	120	8.064 0.0			
			61.28	1.61		0.0	6.000	0.1282	0.769	Vel =	9.66	
32 to 33	62.25 62.25	5.60	16.65	1.5		0.0 0.0	8.500 0.0	120	8.833 0.0			
			77.93	1.61		0.0	8.500	0.2000	1.700	Vel =	12.28	
33 to 34	62.25 62.25	5.60	18.17	1.5		0.0 0.0	8.370 0.0	120	10.533 0.0			
			96.1	1.61		0.0	8.370	0.2947	2.467	Vel =	15.14	
34 to 28	62.25 62.25	5.60	20.19	1.5	1L 1T	2.0 8.0	2.540 10.000	120	13.000 0.0			
			116.29	1.61		0.0	12.540	0.4195	5.260	Vel =	18.33	
28			0.0 116.29						18.260	K Factor =	27.21	
21 to 22	62.25 62.25	5.60	15.80	1.5		0.0 0.0	9.000 0.0	120	7.958 0.0			
			15.8	1.61		0.0	9.000	0.0104	0.094	Vel =	2.49	
22 to 23	62.25 62.25	5.60	15.89	1.5		0.0 0.0	3.660 0.0	120	8.052 0.0			
			31.69	1.61		0.0	3.660	0.0380	0.139	Vel =	4.99	
23 to 24	62.25 62.25	5.60	16.03	1.5		0.0 0.0	9.500 0.0	120	8.191 0.0			
			47.72	1.61		0.0	9.500	0.0807	0.767	Vel =	7.52	
24 to 25	62.25 62.25	5.60	16.76	1.5		0.0 0.0	6.040 0.0	120	8.958 0.0			
			64.48	1.61		0.0	6.040	0.1407	0.850	Vel =	10.16	
25 to 26	62.25 62.25	5.60	17.53	1.5		0.0 0.0	7.000 0.0	120	9.808 0.0			
			82.01	1.61		0.0	7.000	0.2199	1.539	Vel =	12.92	
26 to 27	62.25 62.25	5.60	18.87	1.5	2T	16.0 0.0	5.170 16.000	120	11.347 0.0			
			100.88	1.61		0.0	21.170	0.3224	6.826	Vel =	15.90	
27 to 28	62.25 62.25		0.0	3		0.0 0.0	8.410 0.0	120	18.173 0.0			
			100.88	3.26		0.0	8.410	0.0103	0.087	Vel =	3.88	

Final Calculations - Hazen-Williams - 2007

EASTERN FIRE PROTECTION
MERRILLS WHARF 4TH FLR PEND

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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 *****
28 to 29	62.25 62.250		116.29 217.17	3 3.26	3T 3L 1Fsp 1S 1B	60.478 20.159 0.0 21.503 13.44	67.000 115.580 182.580	120 0.0429	18.260 3.000 7.831	* Fixed loss = 3 Vel = 8.35
29 to HDR2	62.250 8		0.0 217.17	3 3.26	10L 3T 1Fsp 1S 1B	67.198 60.478 0.0 21.503 13.44	257.000 162.619 419.619	120 0.0429	29.091 26.496 17.998	* Fixed loss = 3 Vel = 8.35
HDR2 to FLG	8 7		0.0 217.17	3 3.26	5L	33.599 0.0 0.0	10.000 33.599 43.599	120 0.0429	73.585 5.433 1.870	* Fixed loss = 5 Vel = 8.35
FLG to TEST	7 10		0.0 217.17	6 6.16	3L 1G 1T	20.785 2.309 23.094	45.000 46.189 91.189	100 0.0027	80.888 -1.299 0.247	Vel = 2.34
TEST			100.00 317.17						79.836	Qa = 100.00 K Factor = 35.50



... Fire Protection by Computer Design

EASTERN FIRE PROTECTION
170 KITTYHAWK AVE.
P.O. BOX 1390
AUBURN, MAINE 04211-1390
800-274-1507

Job Name : MERRILL'S WHARF 5TH FLOOR SPRIGS
Drawing : EXISTING WOOD CONSTRUCTION
Location : 258 COMMERCIAL ST PORTLAND, MAINE
Remote Area : 1 OF 1
Contract : AU-4660-10
Data File : 5-4660REVVATER.wx1

Hydraulic Design Information Sheet

Name - MERRILL'S WHARF 5TH FLR SPRIGS Date - 02/01/11
 Location - 258 COMMERCIAL ST PORTLAND, MAINE
 Building - EXISTING WOOD CONSTRUCTION System No. - 1 OF 1
 Contractor - EASTERN FIRE PROTECTION CO., INC Contract No. - AU-4660-10
 Calculated By - WILIAM FLYNT Drawing No. - 3 OF 3
 Construction: (X) Combustible () Non-Combustible Ceiling Height - VARIES
 Occupancy - 5TH FLR CONCEALED CLG SPACE .1/1118 SQ FT

S (X) NFPA 13 (X) Lt. Haz. Ord.Haz.Gp. () 1 () 2 () 3 () Ex.Haz.
 Y () NFPA 231 () NFPA 231C (X) Figure 11.2.3.1.1 Curve LIGHT

S Other
 T Specific Ruling Made By Date

M	Area of Sprinkler Operation	- 1118	System Type	Sprinkler/Nozzle
	Density	- .1	(X) Wet	Make TYCO
D	Area Per Sprinkler	- 130	() Dry	Model TY-FRB/CC2
E	Elevation at Highest Outlet	- 74'-8"	() Deluge	Size 1/2"
S	Hose Allowance - Inside	-	() Preaction	K-Factor 5.6
I	Rack Sprinkler Allowance	-	() Other	Temp.Rat.200/175
G	Hose Allowance - Outside	- 100		

N Note REMOTE AREA REDUCED PER NFPA 13 (2010) SECTION 11.2.3.2.3.1

Calculation Flow Required - 336 Press Required - 84.5 AT TEST POINT
 Summary C-Factor Used: 120 Overhead 100 Underground

W	Water Flow Test:	Pump Data:	Tank or Reservoir:
A	Date of Test - 03/28/11		Cap. -
T	Time of Test - 2:30 PM	Rated Cap.-	Elev.-
E	Static Press - 110	@ Press -	
R	Residual Press - 78	Elev. -	Well
	Flow - 1380		Proof Flow
S	Elevation - 10'-0"		

U Location - OFF 8" IN PRIVATE YARD MAIN OFF EXISTING HYDRANT

P Source of Information -
 L EASTERN FIRE PROTECTION

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

R K Flue Spacing Clearance:Storage to Ceiling
 A Longitudinal Transverse

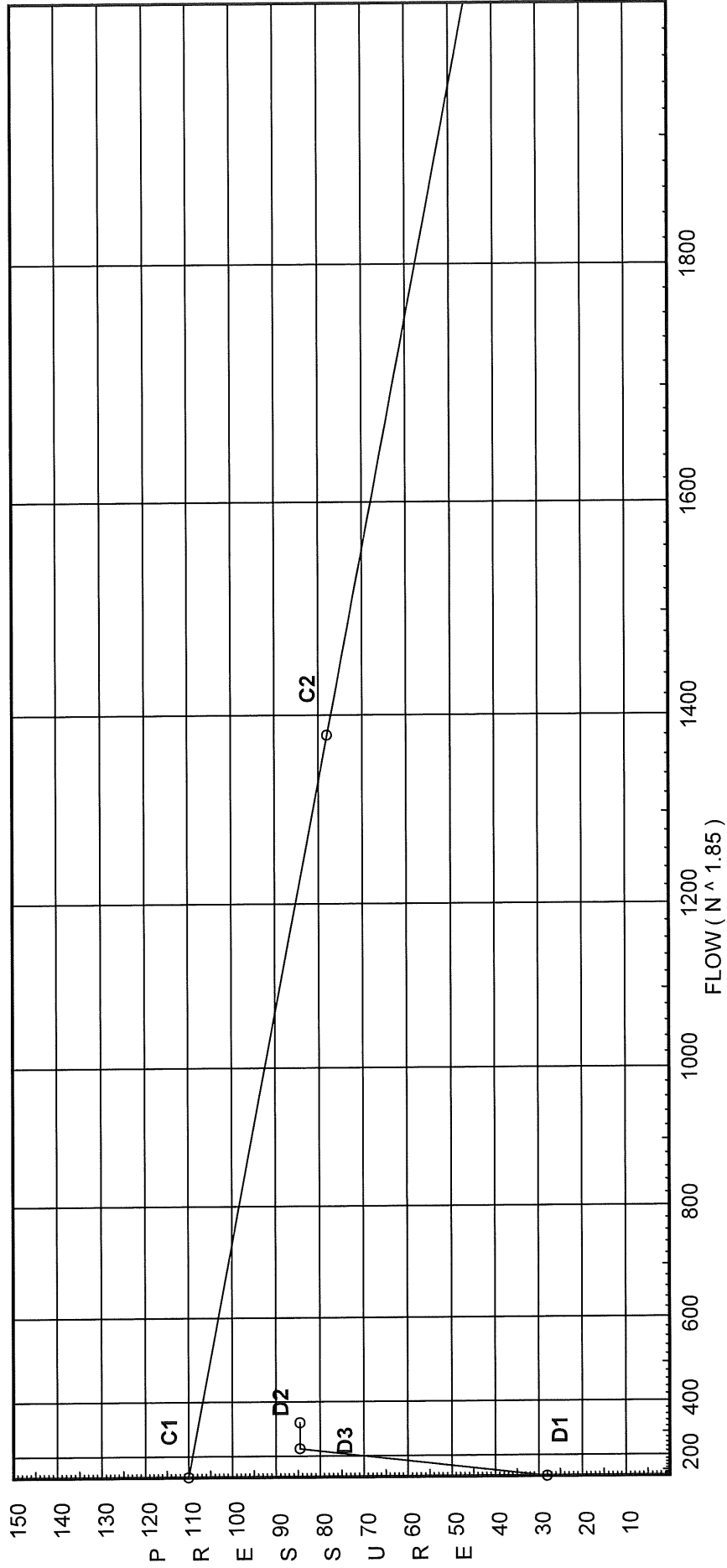
G Horizontal Barriers Provided:
 E

Water Supply Curve (C)

EASTERN FIRE PROTECTION
MERRILL'S WHARF 5TH FLOOR SPRIGS

City Water Supply:
C1 - Static Pressure : 110
C2 - Residual Pressure: 78
C3 - Residual Flow : 1380

Demand:
D1 - Elevation : 28.004
D2 - System Flow : 235.872
D2 - System Pressure : 84.553
Hose (Demand) : 100
D3 - System Demand : 335.872
Safety Margin : 23.104



Fittings Used Summary

EASTERN FIRE PROTECTION
MERRILL'S WHARF 5TH FLOOR SPRIGS

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 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	1	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
S NFPA 13 Swing Check Valve	4	5	5	7	9	11	14	16	19	22	27	32	45	55	65	76	87	98	109	130
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.

Flow Summary - NFPA 2007

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MERRILL'S WHARF 5TH FLOOR SPRIGS

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SUPPLY ANALYSIS

<i>Node at Source</i>	<i>Static Pressure</i>	<i>Residual Pressure</i>	<i>Flow</i>	<i>Available Pressure</i>	<i>Total Demand</i>	<i>Required Pressure</i>
TEST	110.0	78	1380.0	107.657	335.87	84.553

NODE ANALYSIS

<i>Node Tag</i>	<i>Elevation</i>	<i>Node Type</i>	<i>Pressure at Node</i>	<i>Discharge at Node</i>	<i>Notes</i>
S001	74.67	5.6	7.0	14.82	
S002	74.67	5.6	7.0	14.82	
S003	74.67	5.6	7.0	14.82	
14	74.66	5.48	7.36	14.88	K=K @ EQ03
15	74.66	5.4	7.93	15.21	K=K @ EQ02
16	74.66	5.4	8.51	15.76	K=K @ EQ02
17	74.66	5.4	9.01	16.21	K=K @ EQ02
18	74.66	5.4	10.04	17.12	K=K @ EQ02
19	74.66	5.4	11.59	18.39	K=K @ EQ02
12	74.66	5.4	14.46	20.54	K=K @ EQ01
13	74.66	5.4	14.58	20.63	K=K @ EQ01
1	74.66	5.48	7.3	14.82	K=K @ EQ03
2	74.66	5.4	7.86	15.14	K=K @ EQ02
3	74.66	5.4	8.43	15.68	K=K @ EQ02
4	74.66	5.4	8.93	16.14	K=K @ EQ02
5	74.66	5.4	9.96	17.04	K=K @ EQ02
6	74.66	5.4	11.49	18.31	K=K @ EQ02
7	74.67		14.67		
8	74.67		14.8		
9	74.67		15.23		
10	74.67		26.41		
HDR2	8.0		79.3		
FLG	7.0		85.56		
TEST	10.0		84.55	100.0	

Final Calculations - Hazen-Williams - 2007

EASTERN FIRE PROTECTION
MERRILL'S WHARF 5TH FLOOR SPRIGS

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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	*****
S001 to EQ01	74.67 74.67	5.60	14.82 14.82	1 1.049	1T	5.0 0.0 0.0	2.000 5.000 7.000	120 0.0747	7.000 0.0 0.523		Vel = 5.50	
EQ01			0.0 14.82						7.523		K Factor = 5.40	
S002 to EQ02	74.67 74.67	5.60	14.82 14.82	1 1.049	1T	5.0 0.0 0.0	2.000 5.000 7.000	120 0.0747	7.000 0.0 0.523		Vel = 5.50	
EQ02			0.0 14.82						7.523		K Factor = 5.40	
S003 to EQ03	74.67 74.67	5.60	14.82 14.82	1 1.049	1E	2.0 0.0 0.0	2.000 2.000 4.000	120 0.0748	7.000 0.0 0.299		Vel = 5.50	
EQ03			0.0 14.82						7.299		K Factor = 5.49	
14 to 15	74.66 74.66	5.48	14.88 14.88	1 1.049		0.0 0.0 0.0	7.500 0.0 7.500	120 0.0753	7.364 0.0 0.565		K = K @ EQ03 Vel = 5.52	
15 to 16	74.66 74.66	5.4	15.21 30.09	1.25 1.38		0.0 0.0 0.0	7.930 0.0 7.930	120 0.0729	7.929 0.0 0.578		K = K @ EQ02 Vel = 6.45	
16 to 17	74.66 74.66	5.4	15.76 45.85	1.5 1.61		0.0 0.0 0.0	6.650 0.0 6.650	120 0.0750	8.507 0.0 0.499		K = K @ EQ02 Vel = 7.23	
17 to 18	74.66 74.66	5.4	16.21 62.06	1.5 1.61		0.0 0.0 0.0	7.910 0.0 7.910	120 0.1312	9.006 0.0 1.038		K = K @ EQ02 Vel = 9.78	
18 to 19	74.66 74.66	5.4	17.12 79.18	1.5 1.61		0.0 0.0 0.0	7.500 0.0 7.500	120 0.2060	10.044 0.0 1.545		K = K @ EQ02 Vel = 12.48	
19 to 8	74.66 74.67	5.4	18.39 97.57	1.5 1.61	1T	8.0 0.0 0.0	2.600 8.000 10.600	120 0.3031	11.589 -0.004 3.213		K = K @ EQ02 Vel = 15.38	
8			0.0 97.57						14.798		K Factor = 25.36	
12 to 13	74.66 74.66	5.4	20.54 20.54	1.5 1.61		0.0 0.0 0.0	7.500 0.0 7.500	120 0.0169	14.455 0.0 0.127		K = K @ EQ01 Vel = 3.24	
13 to 9	74.66 74.670	5.4	20.63 41.17	1.5 1.61	1T	8.0 0.0 0.0	2.600 8.000 10.600	120 0.0614	14.582 -0.004 0.651		K = K @ EQ01 Vel = 6.49	
9			0.0 41.17						15.229		K Factor = 10.55	
1 to 2	74.66 74.66	5.48	14.82 14.82	1 1.049		0.0 0.0 0.0	7.500 0.0 7.500	120 0.0747	7.299 0.0 0.560		K = K @ EQ03 Vel = 5.50	
2 to 3	74.66 74.66	5.4	15.14 29.96	1.25 1.38		0.0 0.0 0.0	7.910 0.0 7.910	120 0.0723	7.859 0.0 0.572		K = K @ EQ02 Vel = 6.43	

Final Calculations - Hazen-Williams - 2007

EASTERN FIRE PROTECTION
MERRILL'S WHARF 5TH FLOOR SPRIGS

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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 *****
3 to 4	74.66 74.66	5.4	15.68 45.64	1.5 1.61		0.0 0.0	6.660 0.0	120 0.0743	8.431 0.0 0.495	K = K @ EQ02 Vel = 7.19
4 to 5	74.66 74.66	5.4	16.14 61.78	1.5 1.61		0.0 0.0	7.910 0.0	120 0.1302	8.926 0.0 1.030	K = K @ EQ02 Vel = 9.74
5 to 6	74.66 74.66	5.4	17.05 78.83	1.5 1.61		0.0 0.0	7.500 0.0	120 0.2043	9.956 0.0 1.532	K = K @ EQ02 Vel = 12.42
6 to 7	74.66 74.67	5.4	18.31 97.14	1.5 1.61	1T	8.0 0.0	2.600 8.000	120 0.3007	11.488 -0.004 3.187	K = K @ EQ02 Vel = 15.31
7 to 8	74.67 74.67		0.0 97.14	3 3.26		0.0 0.0	13.160 0.0	120 0.0097	14.671 0.0 0.127	Vel = 3.73
8 to 9	74.67 74.670		97.57 194.71	3 3.26		0.0 0.0	12.300 0.0	120 0.0350	14.798 0.0 0.431	Vel = 7.48
9 to 10	74.670 74.670		41.16 235.87	3 3.26	1L 3T 1S 1G 1Fsp	6.72 60.478 21.503 1.344 0.0	73.590 90.045 163.635	120 0.0500	15.229 3.000 8.177	* Fixed loss = 3 Vel = 9.07
10 to HDR2	74.670 8		0.0 235.87	3 3.26	10L 3T 1S 1G 1Fsp	67.198 60.478 21.503 1.344 0.0	270.000 150.523 420.523	120 0.0500	26.406 31.875 21.015	* Fixed loss = 3 Vel = 9.07
HDR2 to FLG	8 7		0.0 235.87	3 3.26	5L	33.599 0.0	10.000 6.720	120 0.0500	79.296 5.433 0.836	* Fixed loss = 5 Vel = 9.07
FLG to TEST	7 10		0.0 235.87	6 6.16	3L 1G 1T	20.785 2.309 23.094	45.000 46.189 91.189	100 0.0031	85.565 -1.299 0.287	Vel = 2.54
TEST			100.00 335.87						84.553	Qa = 100.00 K Factor = 36.53