DISPLAY THIS CARD ON PRINCIPAL FRONTAGE OF WORK

CITY OF PORTLAND

BUILDING PERMIT

This is to certify that RICHARD J& HAYES

Located At 62 CUMBERLAND AVE

Job ID: 2011-03-536-UI

CBL: 013 - - L - 002 - 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

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

City of Portland, Maine - Building or Use Permit Application

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

Job No:	Date Applied:	CBL:	
2011-03-536-UI **2011-2421 FSS**	**04/04/2011**	**013 - - L - 002 - 001 - - - - -**	
Location of Construction: **62 CUMBERLAND AVE**	Owner Name: **ECO CAPITAL LLC**	Owner Address: **19 IVIE RD** **CAPE ELIZABETH, ME 4107**	Phone:
Business Name:	Contractor Name: **EASTERN FIRE PROTECTION – Wiliam Flynt**	Contractor Address: **PO Box 1390, Kittyhawk Ave., Auburn, ME 04210**	Phone: **784-1507**
Lessee/Buyer's Name:	Phone:	Permit Type: **FSS**	Zone: **R-6**
Past Use: Three family (permit #10-1199)	Proposed Use: Three family – install Water Based Fire Suppression System	Cost of Work: Fire Dept: __✓__ Approved w/ conditions ___ Denied ___ N/A Signature:	CEO District: Inspection: Use Group: Type: Signature:
Proposed Project Description: **62 Cumberland UI Permit#10119 – Fire Suppression System**		Pedestrian Activities District (P.A.D.)	
Permit Taken By:			

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 electrial work.
3. Building permits are void if work is not started within six (6) months of the date of issuance. False informatin may invalidate a building permit and stop all work.

Zoning Approval

Special Zone or Reviews	Zoning Appeal	Historic Preservation
___ Shoreland	___ Variance	__✓__ Not in Dist or Landmark
___ Wetlands	___ Miscellaneous	___ Does not Require Review
___ Flood Zone	___ Conditional Use	___ Requires Review
___ Subdivision	___ Interpretation	___ Approved
___ Site Plan	___ Approved	___ Approved w/Conditions
__ Maj __Min __ MM	___ Denied	___ Denied
Date: Ok w/ condition 4/6/11 AFBR	Date:	Date: AFBR

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 appication 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

Director of Planning and Urban Development
Penny St. Louis

Job ID: 2011-03-536-UI **Located At:** 62 CUMBERLAND **CBL:** 013 - - L - 002 - 001 - - - - -

Conditions of Approval:

Zoning

1. This permit is being approved on the basis of plans submitted. Any deviations shall require a separate approval before starting that work.
2. This property shall remain a three family dwelling. Any change of use shall require a separate permit application for review and approval.

Fire

A State Permit is required.

The sprinkler system shall be installed in accordance with NFPA 13R. The basement parking garage shall be designed in accordance with NFPA 13.

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.

The Fire Department will require Knox locking caps on all Fire Department Connections on the exterior of the building.

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

The sprinkler system shall be supervised by Central Station. The FACP/DACT shall be protected by a smoke detector and one manual pull station shall be located inside the front door. A separate Fire Alarm Permit is required. All fire alarm installation and servicing companies shall have a Certificate of Fitness from the Fire Department.

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

Kelly
795 6314 will send electronic plans by email

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.

Taxes OK

Installation address: 62 CUMBERLAND AVE CBL: 013 L 002

Exact location: (within structure) ENTIRE BLDG

Type of occupancy(s) (NFPA & ICC): NFPA 13R APARTMENT/CONDO

Building owner: PAUL LEDMAN

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

Supervisor phone: 784-1507 E-mail: FLYNTWA@TEAMEASTERN.COM

Installing contractor: EASTERN FIRE PROT. License No: 101

Contractor phone: 784-1507 E-mail:

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: NFPA 13R Edition:

*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: $12,000

PERMIT FEE: $150.00

($10 PER $1,000 + $30 FOR THE FIRST $1,000)

RECEIVED
APR - 4 2011
By mail

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

Dept of Building Inspections
City of Portland Maine

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: 3/31/11

EASTERN FIRE PROTECTION
P.O. Box 1390
Kittyhawk Ave.
Auburn, ME 04210

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

LETTER OF TRANSMITTAL

DATE	3/31/11	JOB NO.	AN-4634-10
ATTENTION	LANNIE DOBSON		
RE:	62 CUMBERLAND AVE.		

TO CITY OF PORTLAND
BLDG INSPECTION DEPT
389 CONGRESS ST., PORTLAND, ME 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
1	1 OF 1	3/29/11	FIRE SPRINKLER SYSTEM PLAN 30x42	C
1	1 OF 1	3/29/11	" " " " 11x17	
1		3/29	HYD CALCULATIONS AREA#1 / AREA#2	C
1		3/31	PERMIT APPLICATION	
1		3/31	CHECK #150.00 PERMIT FEE	

Status code

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

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

RECEIVED
APR - 1 2011
Dept. of Building Inspections
City of Portland Maine

REMARKS _____

COPY TO _____

SIGNED _____

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

Fee Code Description	Charge Amount	Permit Charge Adjustment	Permit Charge Adj Remark	Payment Date	Receipt Number	Payment Amount	Payment Adjustment Amount	Payment Adj Comment
Electric Commercial Permit Fee	$55.00			3/7/11	1698	$55.00		

Permit #: 20112421

Permit Data

Location Id	Structure Description	Permit Status	Permit Description	Issue Date	Reissue Date	Expiration Date
1610	3- unit residential 1 owner occ 2 rental	Initialized	Water-based fire suppression system			

Inspection Details

Inspection Id	Inspection Type	Inspection Result Status	Inspection Status Date	Scheduled Start Timestamp	Result Status Date	Final Inspection Flag

Fees Details

Fee Code Description	Charge Amount	Permit Charge Adjustment	Permit Charge Adj Remark	Payment Date	Receipt Number	Payment Amount	Payment Adjustment Amount	Payment Adj Comment
Job Valuation Permit Based Fee	$140.00							

User Defined Property	Value
Fixtures-Incandescent	32
Ranges	1
Receptacles	1
Receptacles	30
Receptacles	60
Smoke Detectors	3
Smoke Detectors	12
Switches	2
Switches	15
Switches	40
Washing Machine	1

Permit #: 20111696

Permit Data

Location Id	Structure Description	Permit Status	Permit Description	Issue Date	Reissue Date	Expiration Date
1610	3- unit residential 1 owner occ 2 rental	Initialized	3- unit residential 1 owner occ 2 rental			

Inspection Details

Inspection Id	Inspection Type	Inspection Result Status	Inspection Status Date	Scheduled Start Timestamp	Result Status Date	Final Inspection Flag

Fees Details

Fee Code Description	Charge Amount	Permit Charge Adjustment	Permit Charge Adj Remark	Payment Date	Receipt Number	Payment Amount	Payment Adjustment Amount	Payment Adj Comment

Permit #: 20111697

Permit Data

Location Id	Structure Description	Permit Status	Permit Description	Issue Date	Reissue Date	Expiration Date
1610	3- unit residential 1 owner occ 2 rental	Initialized	for permit#101199			

Inspection Details

Inspection Id	Inspection Type	Inspection Result Status	Inspection Status Date	Scheduled Start Timestamp	Result Status Date	Final Inspection Flag

Fees Details

4/4/11

Job Summary Report
Job ID: 2011-03-536-UI

Job Type:	UI - Building Permit	**Job Description:**	62 Cumberland UI Permit#10119	**Job Year:**	2011
Building Job Status Code:	Permit Issued	**Pin Value:**	801	**Tenant Name:**	
Job Application Date:		**Public Building Flag:**	N	**Tenant Number:**	
Estimated Value:		**Square Footage:**			

Related Parties:

RICHARD J HAYES	*Property Owner*
BAUMAN Electric - ROBERT BAUMAN	*ELECTRICAL CONTRACTOR*
Eastern Fire Protection Co.,Inc - Eastern Fire Protection Co.,Inc Eastern Fire Protection Co.,Inc	*SPRINKLER CONTRACTOR*
Island Carpentry Inc - Mike White	*GENERAL CONTRACTOR*

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

Location ID: 1610

Location Details

Alternate Id	Parcel Number	Census Tract	GIS X	GIS Y	GIS Z	GIS Reference	Longitude	Latitude
R11269	013 L 002 001		M				-70.249607	43.665169

Location Type	Subdivision Code	Subdivision Sub Code	Related Persons	Address(es)
1				62 CUMBERLAND AVENUE NORTH

Location Use Code	Variance Code	Use Zone Code	Fire Zone Code	Inside Outside Code	District Code	General Location Code	Inspection Area Code	Jurisdiction Code
VACANT LAND		NOT APPLICABLE					DISTRICT 1	EAST END

R-1

Structure Details

Structure: 3- unit residential 1 owner occ 2 rental

Occupancy Type Code:

Structure Type Code	Structure Status Type	Square Footage	Estimated Value	Address
Three - Four Family Building	0			62 CUMBERLAND AVENUE NORTH

Longitude	Latitude	GIS X	GIS Y	GIS Z	GIS Reference

User Defined Property	Value
Dryers	1
Fixtures-Incandescent	1
Fixtures-Incandescent	5

BUILDING PERMIT INSPECTION PROCEDURES

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

or email: buildinginspections@portlandmaine.gov

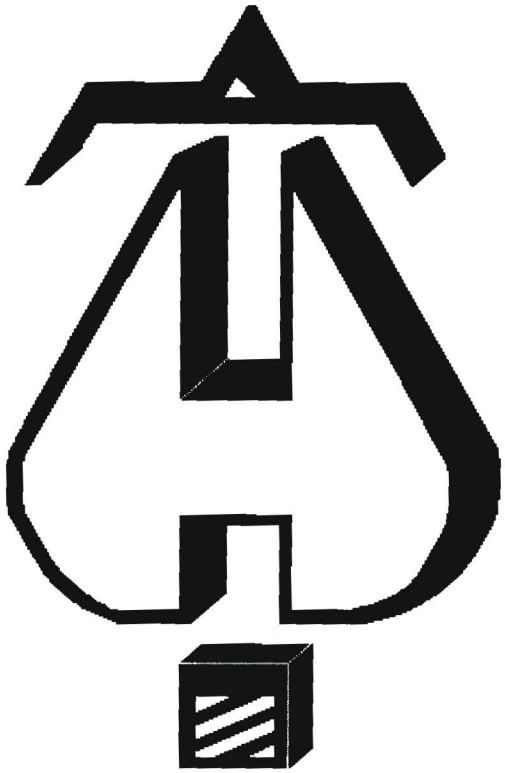
With the issuance of this permit, the owner, builder or their designee is required to provide adequate notice to the city of Portland Inspections Services for the following inspections. Appointments must be requested 48 to 72 hours in advance of the required inspection. The inspection date will need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

1. A final inspection shall be coordinated between sprinkler and fire alarm contractors and the fire department.

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 OCCU0PIED.



. . . Fire Protection by Computer Design

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

Job Name	:	62 CUMBERLAND AVE
Building	:	APARTMENT / CONDO
Location	.	PORTLAND
System	:	1 OF 1
Contract	:	AN-4634-10
Data File	:	AREA#2 3RD FLOOR.WXF

HYDRAULIC DESIGN INFORMATION SHEET

Name - 62 CUMBERLAND AVE — Date - 3-28-11
Location - PORTLAND
Building - APARTMENT / CONDO — System No. - 1 OF 1
Contractor - EASTERN FIRE PROTECTION — Contract No. - AN-4634-10
Calculated By - GRD — Drawing No. - 1 OF 1
Construction: (X) Combustible ( ) Non-Combustible — Ceiling Height 8'-0"
OCCUPANCY - RESIDENTIAL DWELLING UNIT

SYSTEM DESIGN

Type of Calculation: ( )NFPA 13 Residential (X)NFPA 13R ( )NFPA 13D
Number of Sprinklers Flowing: ( )1 ( )2 (X)4 ( )
( )Other
( )Specific Ruling — Made by — Date

Listed Flow at Start Point - 16 Gpm — System Type
Listed Pres. at Start Point - 13.2 Psi — (X) Wet ( ) Dry
MAXIMUM LISTED SPACING 16 x 16 — ( ) Deluge ( ) PreAction
Domestic Flow Added - 0 Gpm — Sprinkler or Nozzle
Additional Flow Added - 0 Gpm — Make TYCO Model LFII 2334
Elevation at Highest Outlet - 135.5Feet — Size 1/2" K-Factor 4.4
Note: — Temperature Rating 155

Calculation Summary — Gpm Required 67.042 Psi Required 52.681 At Test
C-Factor Used: Overhead 150 Underground 150

WATER SUPPLY

Water Flow Test:		Pump Data:	Tank or Reservoir:
Date of Test	- 8-16-07	Rated Cap.	Cap.
Time of Test	-	@ Psi	Elev.
Static (Psi)	- 60	Elev.	
Residual (Psi)	- 24	Other	Well
Flow (Gpm)	- 1254		Proof Flow Gpm
Elevation	- 100		

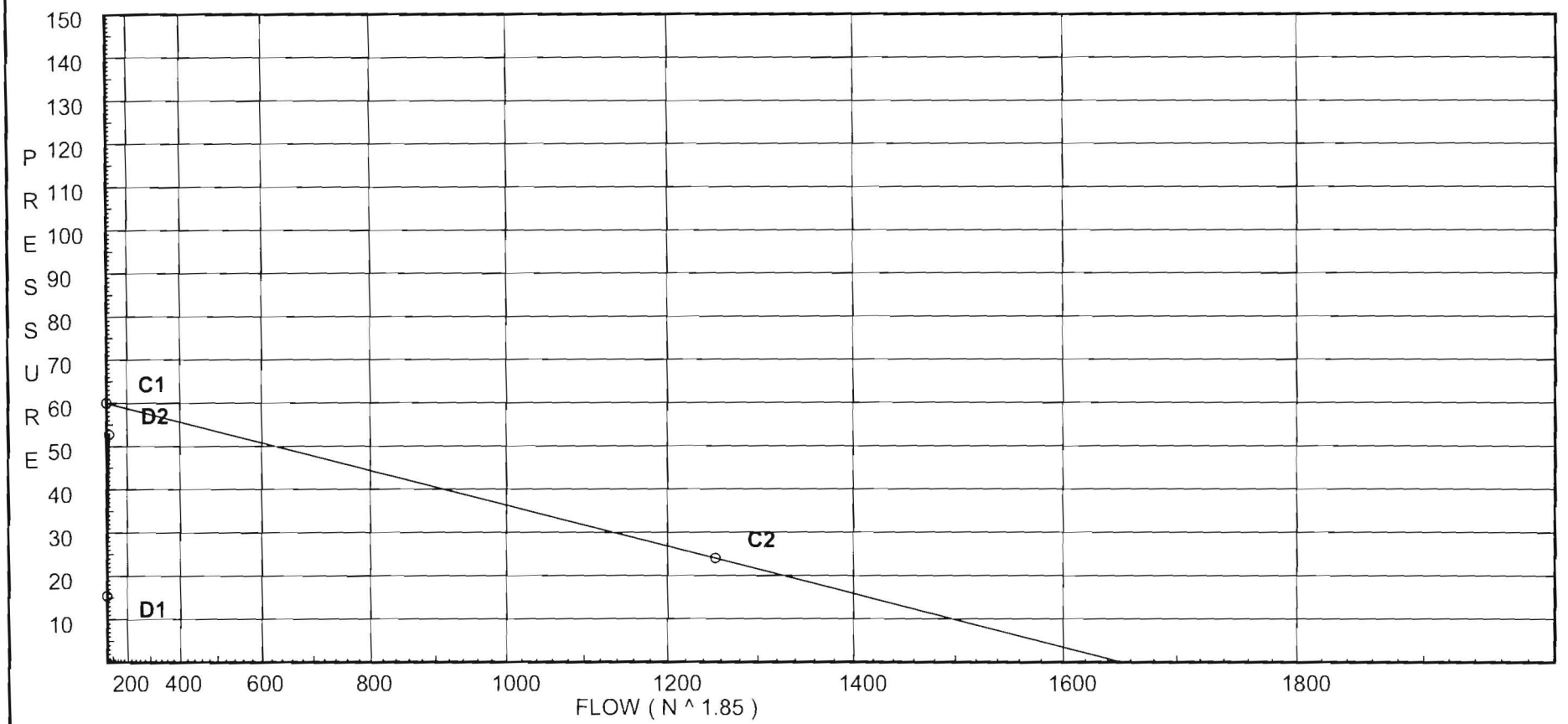
Location: SEE PLOT PLAN

Source of Information: PORTLAND WATER DISTRICT

City Water Supply:
- C1 - Static Pressure : 60
- C2 - Residual Pressure: 24
- C2 - Residual Flow : 1254

Demand:

D1 - Elevation	:	15.375
D2 - System Flow	:	67.042
D2 - System Pressure	:	52.681
Hose (Demand)	:	
D3 - System Demand	:	67.042
Safety Margin	:	7.159



Fitting Legend

Abbrev.	Name	½	¾	1	1¼	1½	2	2½	3	3½	4	5	6	8	10	12	14	16	18	20	24
E	NFPA 13 90' Standard Elbow	1	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61
Fsp	Flow Switch Potter VSR	Fitting generates a Fixed Loss Based on Flow																			
G	NFPA 13 Gate Valve	0	0	0	0	0	1	1	1	1	2	2	3	4	5	6	7	8	10	11	13
I	90' Grvd-Vic Elbow #10	0	0	2	3	4	3.5	6	5	8	7	8.5	10	13	17	20	23	25	33	36	40
J	90'Tee-Branch Grv Vic #20	0	0	4.5	6	8	8.5	10.8	13	17	16	21	25	33	41	50	65	78	88	98	120
N *	CPVC 90'Ell Harvel-Spears		7	7	8	9	11	12	13	0	0	0	0	0	0	0	0	0	0	0	0
O *	CPVC Tee - Branch	3	3	5	6	8	10	12	15	0	0	0	0	0	0	0	0	0	0	0	0
T	NFPA 13 90' Flow thru Tee	3	4	5	6	8	10	12	15	17	20	25	30	35	50	60	71	81	91	101	121

Units Summary

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

Note: Fitting Legend provides equivalent pipe lengths for fittings types of various diameters. Equivalent lengths shown are standard for actual diameters of Sched 40 pipe and CFactors of 120 except as noted with *. The fittings marked with a * show equivalent lengths values supplied by manufacturers based on specific pipe diameters and CFactors and they require no adjustment. All values for fittings not marked with a * will be adjusted in the calculation for CFactors of other than 120 and diameters other than Sched 40 per NFPA.

SUPPLY ANALYSIS

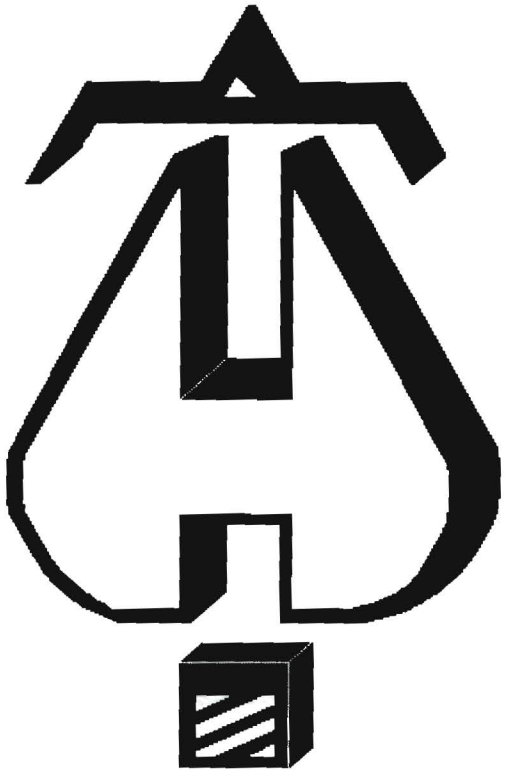
Node at Source	Static Pressure	Residual Pressure	Flow	Available Pressure	Total Demand	Required Pressure
TEST	60.0	24	1254.0	59.84	67.04	52.681

NODE ANALYSIS

Node Tag	Elevation	Node Type	Pressure at Node	Discharge at Node	Notes
DP01	7.17	5.6	11.76	19.2	
EQ01	8.17		11.44		
DP02	7.17	5.6	11.76	19.2	
EQ02	8.17		12.05		
300	135.5	4.4	13.24	16.01	
303	135.5	4.4	13.2	15.99	
301	135.5	4.4	14.86	16.96	
250	127.0		18.12		
251	127.0		20.83		
302	135.5	4.4	16.89	18.08	
252	127.0		22.84		
149	117.5		27.32		
150	117.75		27.26		
151	117.75		31.52		
152	107.0		38.15		
153	107.0		39.67		
TOR	107.0		40.28		
BASE	100.0		52.57		
UG1	100.0		52.66		
TEST	100.0		52.68		

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 ******
DP01	7.17	5.60	19.20	1		0.0	1.000	120	11.755	
to						0.0	0.0		-0.433	
EQ01	8.17		19.2	1.049		0.0	1.000	0.1210	0.121	Vel = 7.13
			0.0							
EQ01			19.20						11.443	K Factor = 5.68
DP02	7.17	5.60	19.20	1	1T	5.0	1.000	120	11.755	
to						0.0	5.000		-0.433	
EQ02	8.17		19.2	1.049		0.0	6.000	0.1207	0.724	Vel = 7.13
			0.0							
EQ02			19.20						12.046	K Factor = 5.53
300	135.500	4.40	16.01	1	1N	7.0	14.500	150	13.242	
to					1O	5.0	12.000		3.681	
250	127		16.01	1.101		0.0	26.500	0.0451	1.195	Vel = 5.40
			0.0							
250			16.01						18.118	K Factor = 3.76
303	135.500	4.40	15.99	1	1N	7.0	15.500	150	13.200	
to					1O	5.0	12.000		3.681	
250	127		15.99	1.101		0.0	27.500	0.0450	1.237	Vel = 5.39
			0.0							
250			15.99						18.118	K Factor = 3.76
301	135.500	4.40	16.96	1	3N	21.0	14.500	150	14.862	
to					2O	10.0	31.000		3.681	
251	127		16.96	1.101		0.0	45.500	0.0502	2.284	Vel = 5.72
			0.0							
251			16.96						20.827	K Factor = 3.72
250	127		32.00	1.25	4N	32.0	14.667	150	18.118	
to					1O	6.0	38.000		0.0	
251	127		32.0	1.394		0.0	52.667	0.0514	2.709	Vel = 6.73
251	127		16.96	1.5	1N	9.0	24.750	150	20.827	
to					1O	8.0	17.000		4.006	
150	117.750		48.96	1.598		0.0	41.750	0.0581	2.425	Vel = 7.83
			0.0							
150			48.96						27.258	K Factor = 9.38
302	135.500	4.40	18.08	1	2N	14.0	16.250	150	16.888	
to					2O	10.0	24.000		3.681	
252	127		18.08	1.101		0.0	40.250	0.0565	2.273	Vel = 6.09
252	127		0.0	1.5	1N	9.0	23.000	150	22.842	
to					1O	8.0	17.000		4.114	
149	117.500		18.08	1.598		0.0	40.000	0.0092	0.368	Vel = 2.89
149	117.500		0.0	1.5		0.0	4.625	150	27.324	
to						0.0	0.0		-0.108	
150	117.750		18.08	1.598		0.0	4.625	0.0091	0.042	Vel = 2.89
150	117.750		48.96	1.5	1N	9.0	24.000	150	27.258	
to					1O	8.0	17.000		0.0	
151	117.750		67.04	1.598		0.0	41.000	0.1039	4.261	Vel = 10.72

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 ******
151	117.750		0.0	1.5	1N	9.0	10.000	150	31.519	
to						0.0	9.000		4.656	
152	107		67.04	1.598		0.0	19.000	0.1039	1.974	Vel = 10.72
152	107		0.0	2	3E	15.0	9.000	120	38.149	
to					1T	10.0	25.000		0.0	
153	107		67.04	2.067		0.0	34.000	0.0449	1.525	Vel = 6.41
153	107		0.0	2	1I	4.307	2.000	120	39.674	
to					1J	10.461	14.768		0.0	
TOR	107		67.04	2.157		0.0	16.768	0.0364	0.611	Vel = 5.89
TOR	107		0.0	2	1Fsp	0.0	7.000	120	40.285	
to						0.0	0.0		12.032	* Fixed loss = 9
BASE	100		67.04	2.157		0.0	7.000	0.0364	0.255	Vel = 5.89
BASE	100		0.0	4	1E	14.534	25.000	140	52.572	
to					1T	29.067	46.508		0.0	
UG1	100		67.04	4.1	1G	2.907	71.508	0.0012	0.085	Vel = 1.63
UG1	100		0.0	6	1T	43.037	100.000	140	52.657	
to						0.0	43.037		0.0	
TEST	100		67.04	6.16		0.0	143.037	0.0002	0.024	Vel = 0.72
			0.0							
TEST			67.04						52.681	K Factor = 9.24



. . . Fire Protection by Computer Design

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

Job Name	:	62 CUMBERLAND AVE
Building	:	APARTMENT/ CONDO
Location	:	PORTLAND, MAINE
System	:	1 OF 1
Contract	:	AU-4634-10
Data File	:	AREA#1 BASEMENT.WXF

HYDRAULIC DESIGN INFORMATION SHEET

Name - 62 CUMBERLAND AVE Date - 3-29-11
Location - PORTLAND, MAINE
Building - APARTMENT/ CONDO System No. - 1 OF 1
Contractor - EASTERN FIRE PROTECTION Contract No. - AU-4634-10
Calculated By - GRD Drawing No. - 1 OF 1
Construction: (X) Combustible ( ) Non-Combustible Ceiling Height 8'
OCCUPANCY - DWELLING UNIT GARAGE

SYSTEM DESIGN

Type of Calculation: ( )NFPA 13 Residential (X)NFPA 13R ( )NFPA 13D
Number of Sprinklers Flowing: ( )1 ( )2 (X)4 ( )
( )Other
( )Specific Ruling Made by Date

Listed Flow at Start Point - 13 Gpm System Type
Listed Pres. at Start Point - 7 Psi (X) Wet ( ) Dry
MAXIMUM LISTED SPACING 16 x 16 ( ) Deluge ( ) PreAction
Domestic Flow Added - 0 Gpm Sprinkler or Nozzle
Additional Flow Added - 0 Gpm Make TYCO LFII Model PENDENT
Elevation at Highest Outlet - 108.00Feet Size 1/2" K-Factor 4.9
Note: Temperature Rating 155

Calculation Summary — Gpm Required 53.396 Psi Required 36.885 At Test
C-Factor Used: Overhead 150 Underground 140

WATER SUPPLY

Water Flow Test:		Pump Data:	Tank or Reservoir:
Date of Test	- 8-16-07	Rated Cap.	Cap.
Time of Test	-	@ Psi	Elev.
Static (Psi)	- 60	Elev.	
Residual (Psi)	- 24	Other	Well
Flow (Gpm)	- 1254		Proof Flow Gpm
Elevation	- 100		

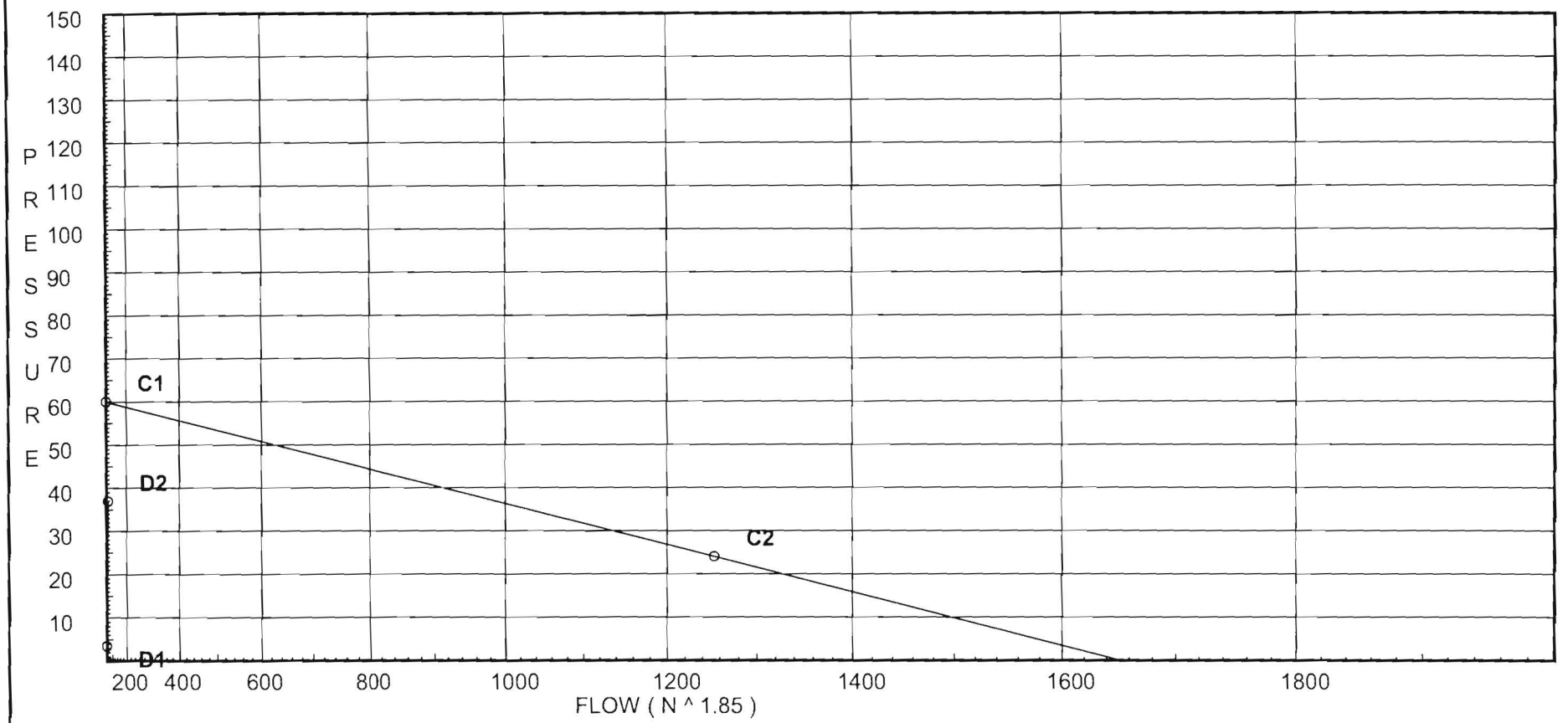
Location: SEE PLOT PLAN

Source of Information: PORTLAND WATER DISTRICT

City Water Supply:
- C1 - Static Pressure . 60
- C2 - Residual Pressure: 24
- C2 - Residual Flow : 1254

Demand:

D1 - Elevation	:	3.465
D2 - System Flow	:	53.396
D2 - System Pressure	:	36.885
Hose (Demand)	:	
D3 - System Demand	:	53.396
Safety Margin	:	23.010



Fitting Legend

Abbrev.	Name	½	¾	1	1¼	1½	2	2½	3	3½	4	5	6	8	10	12	14	16	18	20	24
E	NFPA 13 90' Standard Elbow	1	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61
Fsp	Flow Switch Potter VSR	Fitting generates a Fixed Loss Based on Flow																			
G	NFPA 13 Gate Valve	0	0	0	0	0	1	1	1	1	2	2	3	4	5	6	7	8	10	11	13
I	90' Grvd-Vic Elbow #10	0	0	2	3	4	3.5	6	5	8	7	8.5	10	13	17	20	23	25	33	36	40
N *	CPVC 90'Ell Harvel-Spears		7	7	8	9	11	12	13	0	0	0	0	0	0	0	0	0	0	0	0
O *	CPVC Tee - Branch	3	3	5	6	8	10	12	15	0	0	0	0	0	0	0	0	0	0	0	0
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.

SUPPLY ANALYSIS

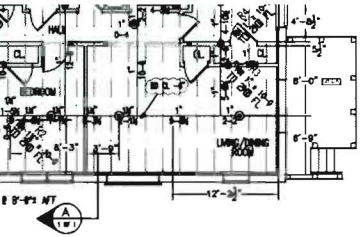
Node at Source	Static Pressure	Residual Pressure	Flow	Available Pressure	Total Demand	Required Pressure
TEST	60.0	24	1254.0	59.895	53.4	36.885

NODE ANALYSIS

Node Tag	Elevation	Node Type	Pressure at Node	Discharge at Node	Notes
DP01	0.0	4.9	7.0	12.96	
DP02	0.0	4.9	7.0	12.96	
100	108.0	4.82	7.24	12.96	K=K @ EQ01
101	108.0	4.82	7.61	13.29	K=K @ EQ01
50	108.0		9.19		
51	108.0		11.56		
52	108.0		12.46		
102	108.0	4.82	7.68	13.35	K=K @ EQ01
103	108.0	4.84	8.13	13.79	K=K @ EQ02
53	108.0		9.57		
54	108.0		11.6		
55	108.0		12.56		
AFL	108.0		23.3		
TOR	108.0		24.14		
BASE	100.0		36.81		
UG1	100.0		36.87		
TEST	100.0		36.88		

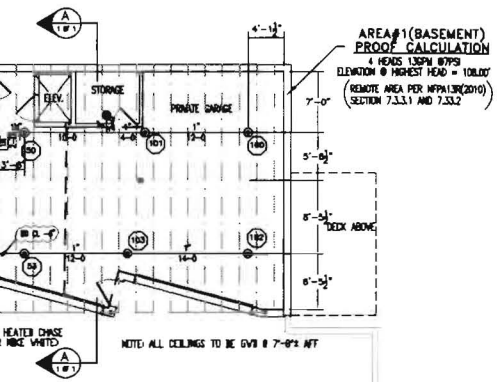
Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqv.	Ln.	Pipe Ftng's Total	CFact Pf/Ft	Pt Pe Pf	******* Notes ******
DP01	0	4.90	12.96	1	1N	7.0	1.000	150	7.000	
to						0.0	7.000		0.0	
EQ01	0		12.96	1.101		0.0	8.000	0.0305	0.244	Vel = 4.37
			0.0							
EQ01			12.96						7.244	K Factor = 4.82
DP02	0	4.90	12.96	1	1O	5.0	1.000	150	7.000	
to						0.0	5.000		0.0	
EQ02	0		12.96	1.101		0.0	6.000	0.0305	0.183	Vel = 4.37
			0.0							
EQ02			12.96						7.183	K Factor = 4.84
100	108	4.82	12.96	1		0.0	12.000	150	7.244	K = K @ EQ01
to						0.0	0.0		0.0	
101	108		12.96	1.101		0.0	12.000	0.0305	0.366	Vel = 4.37
101	108	4.82	13.29	1		0.0	14.000	150	7.610	K = K @ EQ01
to						0.0	0.0		0.0	
50	108		26.25	1.101		0.0	14.000	0.1126	1.576	Vel = 8.85
50	108		0.0	1.25	4N	32.0	34.500	150	9.186	
to						0.0	32.000		0.0	
51	108		26.25	1.394		0.0	66.500	0.0357	2.372	Vel = 5.52
51	108		0.0	1.25	2E	6.0	4.000	120	11.558	
to					1T	6.0	12.000		0.0	
52	108		26.25	1.38		0.0	16.000	0.0566	0.905	Vel = 5.63
52	108		0.0	1.25		0.0	1.750	120	12.463	
to						0.0	0.0		0.0	
55	108		26.25	1.38		0.0	1.750	0.0566	0.099	Vel = 5.63
			0.0							
55			26.25						12.562	K Factor = 7.41
102	108	4.82	13.35	1		0.0	14.000	150	7.681	K = K @ EQ01
to						0.0	0.0		0.0	
103	108		13.35	1.101		0.0	14.000	0.0322	0.451	Vel = 4.50
103	108	4.84	13.79	1		0.0	12.000	150	8.132	K = K @ EQ02
to						0.0	0.0		0.0	
53	108		27.14	1.101		0.0	12.000	0.1198	1.437	Vel = 9.15
53	108		0.0	1.25	2N	16.0	37.500	150	9.569	
to						0.0	16.000		0.0	
54	108		27.14	1.394		0.0	53.500	0.0379	2.030	Vel = 5.71
54	108		0.0	1.25	2E	6.0	4.000	120	11.599	
to					1T	6.0	12.000		0.0	
55	108		27.14	1.38		0.0	16.000	0.0602	0.963	Vel = 5.82
55	108		26.26	1.25	2E	6.0	19.000	120	12.562	
to					2T	12.0	32.000		0.0	
AFL	108		53.4	1.38	2S	14.0	51.000	0.2105	10.738	Vel = 11.45
AFL	108		0.0	1.25	1I	3.0	1.000	120	23.300	
to						0.0	3.000		0.0	
TOR	108		53.4	1.38		0.0	4.000	0.2105	0.842	Vel = 11.45

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 ******
TOR	108		0.0	2	1Fsp	0.0	7.000	120	24.142	
to						0.0	0.0		12.465	* Fixed loss = 9
BASE	100		53.4	2.067		0.0	7.000	0.0294	0.206	Vel = 5.11
BASE	100		0.0	4	1E	14.534	25.000	140	36.813	
to					1T	29.067	46.508		0.0	
UG1	100		53.4	4.1	1G	2.907	71.508	0.0008	0.056	Vel = 1.30
UG1	100		0.0	6	1T	43.037	100.000	140	36.869	
to						0.0	43.037		0.0	
TEST	100		53.4	6.16		0.0	143.037	0.0001	0.016	Vel = 0.57
			0.0							
TEST			53.40						36.885	K Factor = 8.79



NOTED ALL CEILINGS TO BE @ 8'-0" AFF

Sprinkler Head Schedule					
Symbol	Count	Thread	K-Factor	Description	Note
●	13	1/2"	4.9	TYCO LFII WHITE RECESSED PENDENT TY2234	on Drop
13 = Total Number of Heads FIRST FLOOR					

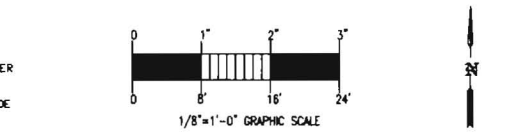


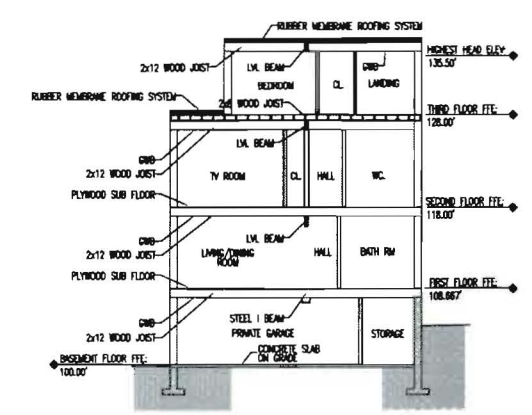
AREA #1 (BASEMENT)
PROOF CALCULATION
4 HEADS 1.35GPM @7PSI
ELEVATION @ HIGHEST HEAD = 108.00'
REMOTE AREA PER NFPA13R(2010)
SECTION 7.3.3.1 AND 7.3.3.2

BASEMENT

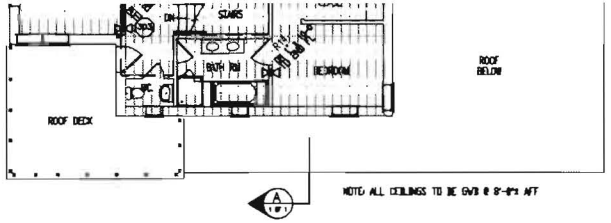
1'-0"
SQ.FT.
: 100.00'

Sprinkler Head Schedule					
Symbol	Count	Thread	K-Factor	Description	Note
◉	11	1/2"	4.9	TYCO LFII WHITE RECESSED PENDENT TY2234	ON DROP
○	2	1/2"	5.6	TYCO TY-FRB BRASS UPRIGHT TY-3131	ON LINE
●	3	1/2"	5.6	TYCO TY-FRB WHITE RECESSED PENDENT TY-3231	on Drop
16 = Total Number of Heads BASEMENT					





BUILDING SECTION "A-A"
NOT TO SCALE

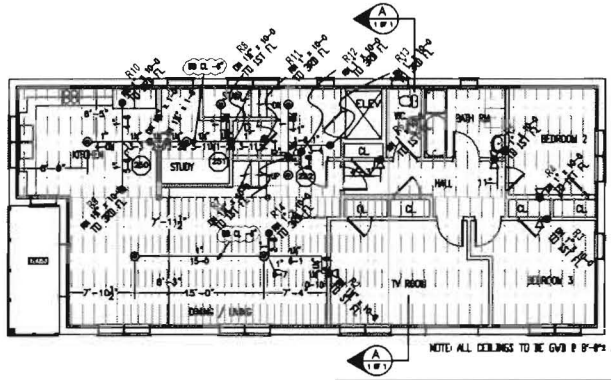


NOTED ALL CEILINGS TO BE @ 8'-0" AFF

FIRE SPRINKLER PLAN – THIRD FLOOR

SCALE: 1/8"=1'-0"
AREA PROTECTED: 770 SQ.FT.
FINISH FLOOR ELEVATION : 128.083'
COLOR CODE:

Sprinkler Head Schedule					
Symbol	Count	Thread	K-Factor	Description	Note
◁	10	1/2"	4.4	TYCO LFII WHITE HORZ SIDEWALL TY2334	
10 = Total Number of Heads THIRD FLOOR					



NOTED ALL CEILINGS TO BE @ 8'-0" AFF

FIRE SPRINKLER PLAN – SECOND FLOOR

SCALE: 1/8"=1'-0"
AREA PROTECTED: 1745 SQ.FT.
FINISH FLOOR ELEVATION : 118.083'
COLOR CODE:

Sprinkler Head Schedule					
Symbol	Count	Thread	K-Factor	Description	Note
◉	7	1/2"	4.9	TYCO LFII WHITE RECESSED PENDENT TY2234	ON DROP
◁	6	1/2"	4.4	TYCO LFII WHITE HORZ SIDEWALL TY2334	
13 = Total Number of Heads SECOND FLOOR					

LFII PENDENT K4.9 TY-2234

Maximum Coverage Area (ft. x ft.) (m x m)	Maximum Spacing (ft.) (m)	Minimum Flow (gpm) and Residual Pressure For Horizontal Ceiling (Max. 2 Inch Rise for 12 Inch Run)	Minimum Flow (gpm) and Residual Pressure For Sloped Ceiling (Greater Than 2 Inch Rise Up To Max. 4 Inch Rise for 12 Inch Run)	Minimum Flow (gpm) and Residual Pressure For Sloped Ceiling (Greater Than 4 Inch Rise Up To Max. 8 Inch Rise for 12 Inch Run)
		155°F/68°C or 175°F/79°C	155°F/68°C	175°F/79°C
12 x 12 (3.7 x 3.7)	12 (3.7)	13 GPM (49.2 LPM) 7.0 psi (0.48 bar)	13 GPM (49.2 LPM) 7.0 psi (0.48 bar)	17 GPM (64.3 LPM) 12.0 psi (0.83 bar)
14 x 14 (4.2 x 4.3)	14 (4.3)	13 GPM (49.2 LPM) 7.0 psi (0.48 bar)	13 GPM (49.2 LPM) 7.0 psi (0.48 bar)	17 GPM (64.3 LPM) 12.0 psi (0.83 bar)
16 x 16 (4.9 x 4.9)	16 (4.9)	13 GPM (49.2 LPM) 7.0 psi (0.48 bar)	13 GPM (49.2 LPM) 7.0 psi (0.48 bar)	17 GPM (64.3 LPM) 12.0 psi (0.83 bar)
18 x 18 (5.5 x 5.5)	18 (5.5)	17 GPM (64.3 LPM) 12.0 psi (0.83 bar)	17 GPM (64.3 LPM) 12.0 psi (0.83 bar)	17 GPM (64.3 LPM) 12.0 psi (0.83 bar)
20 x 20 (6.1 x 6.1)	20 (6.1)	20 GPM (75.7 LPM) 16.7 psi (1.15 bar)	20 GPM (75.7 LPM) 16.7 psi (1.15 bar)	21 GPM (79.5 LPM) 18.4 psi (1.27 bar)

(a) For coverage area dimensions less than or between those indicated, it is necessary to use the minimum required flow for the next highest coverage area for which hydraulic design criteria are stated.

(b) Requirement is based on minimum flow in GPM (LPM) from each sprinkler. The associated residual pressure are calculated using the Hydraulic Design Criteria Section for details.

TABLE A
NFPA 13D AND NFPA 13R WET PIPE HYDRAULIC DESIGN CRITERIA FOR THE SERIES LFII (TY2234) RESIDENTIAL PENDENT AND RECESSED PENDENT SPRINKLERS

LFII HORIZONTAL SIDEWALL K4.4 TY-2334

Maximum Coverage Area (a) Width x Length (ft. x ft.) (m x m)	Maximum Spacing (ft.) (m)	Minimum Flow (gpm) and Residual Pressure			
		Top-Of-Deflector-To-Ceiling: 4 to 6 Inches (100 to 150 mm)		Top-Of-Deflector-To-Ceiling: 6 to 12 Inches (150 to 300 mm)	
		155°F/68°C	175°F/79°C	155°F/68°C	175°F/79°C
12 x 12 (3.7 x 3.7)	12 (3.7)	13 GPM (49.2 LPM) 6.7 psi (0.46 bar)	13 GPM (49.2 LPM) 6.7 psi (0.46 bar)	13 GPM (49.2 LPM) 6.7 psi (0.46 bar)	13 GPM (49.2 LPM) 6.7 psi (0.46 bar)
14 x 14 (4.3 x 4.3)	14 (4.3)	13 GPM (49.2 LPM) 6.7 psi (0.46 bar)	13 GPM (49.2 LPM) 6.7 psi (0.46 bar)	13 GPM (49.2 LPM) 6.7 psi (0.46 bar)	13 GPM (49.2 LPM) 6.7 psi (0.46 bar)
16 x 16 (4.9 x 4.9)	16 (4.9)	13 GPM (49.2 LPM) 6.7 psi (0.46 bar)	13 GPM (49.2 LPM) 6.7 psi (0.46 bar)	13 GPM (49.2 LPM) 6.7 psi (0.46 bar)	13 GPM (49.2 LPM) 6.7 psi (0.46 bar)
18 x 18 (5.5 x 5.5)	18 (5.5)	17 GPM (64.3 LPM) 11.8 psi (0.81 bar)	17 GPM (64.3 LPM) 11.8 psi (0.81 bar)	17 GPM (64.3 LPM) 11.8 psi (0.81 bar)	17 GPM (64.3 LPM) 11.8 psi (0.81 bar)
20 x 20 (6.1 x 6.1)	20 (6.1)	20 GPM (75.7 LPM) 16.4 psi (1.13 bar)	20 GPM (75.7 LPM) 16.4 psi (1.13 bar)	20 GPM (75.7 LPM) 16.4 psi (1.13 bar)	20 GPM (75.7 LPM) 16.4 psi (1.13 bar)
22 x 20 (6.7 x 6.1)	22 (6.7)	23 GPM (87.1 LPM) 21.7 psi (1.50 bar)	23 GPM (87.1 LPM) 21.7 psi (1.50 bar)	23 GPM (87.1 LPM) 21.7 psi (1.50 bar)	23 GPM (87.1 LPM) 21.7 psi (1.50 bar)
24 x 20 (7.3 x 6.1)	24 (7.3)	25 GPM (94.6 LPM) 27.1 psi (1.86 bar)	25 GPM (94.6 LPM) 27.1 psi (1.86 bar)	25 GPM (94.6 LPM) 27.1 psi (1.86 bar)	25 GPM (94.6 LPM) 27.1 psi (1.86 bar)
24 x 22 (7.3 x 6.7)	24 (7.3)	26 GPM (98.4 LPM) 28.2 psi (1.94 bar)	26 GPM (98.4 LPM) 28.2 psi (1.94 bar)	26 GPM (98.4 LPM) 28.2 psi (1.94 bar)	26 GPM (98.4 LPM) 28.2 psi (1.94 bar)

GENERAL NOTES

SPRINKLER SYSTEM INSTALLATION TO COMPLY WITH NFPA PAMPHLET # 13R, 2007 EDITION.

OCCUPANCY DESCRIPTION AND CLASSIFICATION: APARTMENT DWELLING UNITS, CORRIDORS = LIGHT HAZARD BASEMENT MECH RM = ORDINARY HAZARD GROUP 1

ALL DIMENSIONS ARE SHOWN FOR GENERAL LOCATION OF SPRINKLER HEADS ; PIPING MAY VARY TO SUIT ACTUAL FIELD CONDITIONS.

STORAGE OF MATERIAL SHALL NOT EXCEED 8'-0" IN HEIGHT.

ALL WIRING TO BE DONE BY OTHERS

⬡ = INDICATES HYDRAULIC REFERENCE POINTS.
FF CL = FINISH FLOOR UP TO CENTERLINE OF PIPE.
BJ CL = BOTTOM OF JOIST DOWN TO CENTERLINE OF PIPE.
TJ CL = TOP OF JOIST DOWN TO CENTERLINE OF PIPE.

Juncture. If this bead is not continuous around the socket shoulder, it may indicate that insufficient cement was applied.

Wipe off excess cement on the outside of the joint. The solvents will evaporate, but the solvent cement inside the fitting will stay there.

WARNING

Avoid applying too much cement. Do not allow the cement to drip beyond the bottom of fitting socket. Excessive cement on the pipe and/or fitting can result in decreasing the overall strength of the pipe and/or fitting and may cause cracks when pressure is applied. Failure to comply could result in property damage due to leaks.

Solvent cement set and cure times are a function of pipe size, temperature, relative humidity, and tightness of fit. Drying time is faster for drier environments, smaller pipe sizes, high temperatures, and tighter fits. The assembly must be allowed to set, without any stress on the joint, for 1 to 5 minutes, depending on the pipe size and temperature. Following the initial set period, the assembly can be handled carefully avoiding significant stresses to the joint. Refer to the cure time tables for minimum cure times prior to pressure testing.

Store cement in a warmer area when not in use and make sure they remain fluid. Do not allow the cement to freeze or become 'jelly-like'. Gelled cement shall be discarded.

Sprinkler heads shall be installed only after all the CPVC pipe and fittings, including the sprinkler head adapters, are solvent welded to the piping and allowed to cure for a minimum of 30 minutes. Sprinkler head fittings should be visually inspected and probed with a wooden dowel to insure that the water way and threads are clear of any excess cement.

It is an unacceptable practice to thread the sprinkler head into the adapter fitting prior to cementing the adapter to the drop.

Once an installation is completed and cured, per the appropriate table, the system should be tested with water at 200 psi for 2 hours, or at 50 psi in excess of the maximum pressure when the maximum pressure to be maintained in the system is in excess of 150 psi, in accordance with the requirements established by NFPA 13. Sprinkler systems in one and two family dwellings and mobile homes may be tested at line pressure in accordance with the requirements established by NFPA 13D. When pressure testing, the sprinkler system shall be filled with water and air bled from the highest and farthest sprinkler head before test pressure is applied. Air or cumpressed gas should never be used for pressure testing. If a leak is found, the fitting must be cut out and discarded. A new section can be installed using couplings or a union. Unions should be used in accessible area only.

NOTES

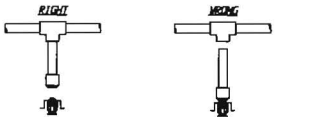
based acrylic latex paint is the preferred and recommended paint to be used on Blazemaster CPVC pipe and fittings. Oil or solvent-based paints may be chemically incompatible with Blazemaster CPVC.

Teflon thread tape is the recommended sealant for threaded connections to CPVC fire sprinkler products. When using Oatey Great White Thread Sealant, it should be applied to male threads only.

Firestop systems such as Hilti FS-One have been found to be compatible with CPVC fire sprinkler products. A list of these firestop systems can be found along with approved thread sealants on-line at www.blazemaster.com. Use only those products that have been approved.

CURE TIMES WITH ONE STEP SOLVENT CEMENT 200 psi (MAXIMUM) TEST PRESSURE			
PIPE SIZE Inches	Ambient Temperature During Cure Period		
	60°F to 120°F	40°F to 59°F	0°F to 39°F
3/4"	45 min.	1.5 hr.	24 hr.
1"	45 min.	1.5 hr.	24 hr.
1-1/4"	1.5 hr.	16 hr.	120 hr.
1-1/2"	1.5 hr.	16 hr.	120 hr.
2"	6 hr.	36 hr.	See Note 1
2-1/2"	8 hr.	72 hr.	See Note 1
3"	8 hr.	72 hr.	See Note 1

Note 1 For these sizes, the solvent cement can be applied at temperatures below 40°F, however, the sprinkler system temperature must be raised to a temperature of 40°F or above and allowed to cure per the above recommendations prior to pressure testing.



Thread the sprinkler into the adapter fitting only after the recommended cure time

Do not pre-assemble the drop assembly with the sprinkler head prior to cementing all joints

CPVC SPRINKLER HEAD INSTALLATION DETAIL

NOT TO SCALE

USE "OATEY" GREAT WHITE PIPE JOINT COMPOUND OR TEFLON TAPE ON ALL STEEL OR BRASS PIPE THREADS.

GENERAL NFPA #13R NOTES

REQUIRED APPROVALS