

DISPLAY THIS CARD ON PRINCIPAL FRONTAGE OF WORK



CITY OF PORTLAND BUILDING PERMIT

PERMIT ISSUED

MAR 18 2011

This is to certify that BACK COVE COMPANY

Located At 127 MARGINAL

Job ID: 2011-03-571-FAFS

CBL: 025 - -B - 014 - 001 - -City of Portland

has permission to Walgreens Fire Suppression Water Based System

provided that the person or persons, firm or corporation accepting this permit shall comply with all of the provisions of the Statutes 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

[Handwritten signature]

Fire Prevention Officer

[Handwritten signature] 3-15-11

Code Enforcement Officer / Plan Reviewer

THIS CARD MUST BE POSTED ON THE STREET SIDE OF THE PROPERTY.

PENALTY FOR REMOVING THIS CAR

PERMIT ISSUED

MAR 18 2011

BUILDING PERMIT INSPECTION PROCEDURES

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

or email: buildinginspections@portlandmaine.gov

City of Portland

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. Final - Commercial

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.

Job ID: 2011-03-571-FAFS

Located At: 127 MARGINAL

CBL: 025 - - B - 014 - 001 - - - -



PORTLAND MAINE

PERMIT ISSUED

MAR 13 2011

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

Director of Planning and Urban Development
Penny St. Louis

Conditions of Approval:

Fire

1. The sprinkler system shall be installed in accordance with NFPA 13. Compliance letters are required.
2. Fire department connection type and location shall be approved in writing by fire prevention bureau.
3. System acceptance and commissioning must be coordinated with alarm and suppression system contractors and the Fire Department. Call 874-8703 to schedule.
4. Installation of a sprinkler or fire alarm system requires a Knox Box to be installed per city ordinance.
5. The Fire Department will require knox locking caps on all Fire Department Connections on the exterior of the building.
6. Application requires State Fire Marshal approval.
7. 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.

Building

1. Application approval based upon information provided by applicant. Any deviation from approved plans requires separate review and approval prior to work.
2. All penetrations between rated walls shall be protected with approved firestop materials, per Sec. 712 of IBC.
3. Sprinkler systems to be designed and installed per IBC 2009 standards Sec. 903.3 and NFPA 13, a compliance letter is required.
4. Separate permits are required for any electrical, plumbing, fire alarm, HVAC systems, heating appliances, including pellet/wood stoves, commercial hood exhaust systems and fuel tanks. Separate plans may need to be submitted for approval as a part of this process.

PERMIT ISSUED

MAR 18 2011

Job No: 2011-03-571-FAFS	Date Applied: 3/10/2011	CBL: 025 - - B - 014 - 001 - - - - -	
Location of Construction: 127 MARGINAL	Owner Name: COVE COMPANY BACK	Owner Address: 5 MILK ST PORTLAND, ME - MAINE 04112 City of Portland	Phone:
Business Name:	Contractor Name: Garland, Scott	Contractor Address: P.O. Box 1285 LEWISTONMAINE04240	Phone: 0104
Lessee/Buyer's Name:	Phone:	Permit Type: FIRE SYS WB - Fire Suppression Water Based	Zone: B-7
Past Use: Retail - Walgreen's	Proposed Use: Same: Retail - Walgreens - To add a fire suppression system	Cost of Work: 6000.00	CEO District:
		Fire Dept: <input checked="" type="checkbox"/> Approved w/conditions <input type="checkbox"/> Denied <input type="checkbox"/> N/A	Inspection: Use Group: M Type: 5B IBC-2009 Signature: [Signature]
Proposed Project Description: 127 Marginal Walgreens sprinkler	Pedestrian Activities District (P.A.D.)		

Permit Taken By: Lannie	Zoning Approval		
1. This permit application does not preclude the Applicant(s) from meeting applicable State and Federal Rules. 2. Building Permits do not include plumbing, septic or electrical work. 3. Building permits are void if work is not started within six (6) months of the date of issuance. False informatin may invalidate a building permit and stop all work.	Special Zone or Reviews <input type="checkbox"/> Shoreland <input type="checkbox"/> Wetlands <input type="checkbox"/> Flood Zone <input type="checkbox"/> Subdivision <input type="checkbox"/> Site Plan _ Maj _ Min _ MM Date: [Signature] 3/11/11	Zoning Appeal <input type="checkbox"/> Variance <input type="checkbox"/> Miscellaneous <input type="checkbox"/> Conditional Use <input type="checkbox"/> Interpretation <input type="checkbox"/> Approved <input type="checkbox"/> Denied Date:	Historic Preservation <input checked="" type="checkbox"/> Not in Dist or Landmark <input type="checkbox"/> Does not Require Review <input type="checkbox"/> Requires Review <input type="checkbox"/> Approved <input type="checkbox"/> Approved w/Conditions <input type="checkbox"/> Denied Date: [Signature]
	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
RESPONSIBLE PERSON IN CHARGE OF WORK, TITLE		DATE	PHON

Job Summary Report
Job ID: 2011-03-571-FAFS

Report generated on Mar 10, 2011 12:51:03 PM

Job Type: Fire Alarm / Suppression **Job Description:** 127 Marginal Walgreens **Job Year:** 2011
Building Job Status Code: Initiate Plan Review **Pin Value:** 843 **Tenant Name:**
Job Application Date: **Public Building Flag:** N **Tenant Number:**
Estimated Value: 6,000 **Square Footage:**
Related Parties: COVE BACK *Property Owner*
 Sprinkler Systems Inc - Scott Garland *FIRE ALARM INSTALLER*

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: 3444

Location Details

Alternate Id	Parcel Number	Census Tract	GIS X	GIS Y	GIS Z	GIS Reference	Longitude	Latitude
B00534	025 B 014 001	M					0	0

Location Type	Subdivision Code	Subdivision Sub Code	Related Persons	Address(es)
1				127 MARGINAL WAY

Location Use Code	Variance Code	Use Zone Code	Fire Zone Code	Inside Outside Code	District Code	General Location Code	Inspection Area Code	Jurisdiction Code
WHOLESALE		URBAN COMMERCIAL						CENTRAL BUSINESS DISTRICT

Structure Details

Structure: commercial

Occupancy Type Code:

Structure Type Code	Structure Status Type	Square Footage	Estimated Value	Address
Office & Professional Buildings	0			127 MARGINAL WAY

User Defined Property Value

Permit #: 20111792

Permit Data

Amund *Not in Queue*

Job Summary Report
Job ID: 2011-03-571-FAFS

Report generated on Mar 10, 2011 12:51:03 PM

Page 2

Location Id	Structure Description	Permit Status	Permit Description	Issue Date	Reissue Date	Expiration Date
3444	commercial	Initialized	Walgreens Water Based System			

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

Fee Code Description	Charge Amount	Permit Charge Adjustment	Permit Charge Adj Remark	Payment Date	Receipt Number	Payment Amount	Payment Adj Amount	Payment Adj Comment
Job Valuation Fees	\$80.00							



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.

Installation address: Marginal Way & Chestnut Street CBL: 025 B 014

Exact location: (within structure) Front

Type of occupancy(s) (NFPA & ICC): Ordinary Group II

Building owner: Walgreens

Managing Supervisor (RMS): Clayton Saucier License No: 442

Supervisor phone: (207)782-0104 E-mail: clayton@sprinklersystemsinc.com

Installing contractor: Sprinkler Systems Inc. License No: 093

Contractor phone: (207)782-0104 E-mail: scott@sprinklersystemsinc.com

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: N.F.P.A. 13 Edition: 2007

*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 that all work to be approved in writing.

Submit all information to the City of Portland.

Prior to acceptance of any work, the contractor shall provide all fire system contractors with a copy of the permit.

Acceptance test must be coordinated with the contractor and the City of Portland.

All installation(s) must comply with the applicable code standard(s).

COST OF WORK: \$6,000.00

PERMIT FEE: \$60.00

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

RECEIVED

FEB 10 2011

Dept. of Building Inspections

City of Portland Maine

Room 315, Portland, Maine 04101.

Acceptance test must be coordinated with the contractor and the City of Portland.

Acceptance test must be coordinated with the contractor and the City of Portland.

Acceptance test must be coordinated with the contractor and the City of Portland.

Applicant signature: [Signature]

DATE: 2/10/2011

RECEIVED

DEPT. OF BUILDING INSPECTIONS
CITY OF PORTLAND MAINE
MAR 10 2011

*2/10/11
Scott, spoke with you on 2/15, still need electronic files + another \$20.00.
Thank you
Jay B*

26307 26483

Sprinkler Systems, Inc.

P.O. Box 1285

Lewiston, ME 04243-1285

TO: Portland Water District
P.O. Box 3553
Portland, Maine 04104

Letter of Transmittal

DATE	January 26, 2011	JOB #	10-101
ATTENTION:			
RE: Walgreens Marginal Way			

WE ARE SENDING YOU:

Attached Under separate cover via _____ the following items:

- Shop drawings Prints Plans Samples Specifications Wavier or Liens
 Copy of letter Change order Signed Contracts _____

COPIES	DATE	NO.	DESCRIPTION
2			Shop Drawings – Fire Sprinklers 1 of 2
2			Shop Drawings – Fire Sprinklers 2 of 2
2			Hydraulic Calculations
1			Portland Permit Application
1			State issued Permit
2			8x11 Drawings
1			Check in amount of \$60.00 for Permit Fee

THESE ARE TRANSMITTED as checked below:

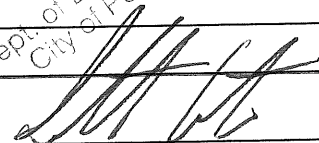
- For your approval Approved as submitted Resubmit _____ copies for approval
 For your use Approved as noted Submit _____ copies for distribution

REMARKS:

RECEIVED
MAR 10 2011

Dept. of Building Inspections
City of Portland Maine

SIGNED: Scott Cote





State of Maine
Department of Public Safety
Fire Sprinkler System Permit



9225

Walgreens

Located at: Marginal Way & Chestnut St Ext
 In the Town of: Portland
 Occupancy/Use: Mercantile
 Type of System: NFPA 13

Permission is hereby given to:

Sprinkler Systems, Inc.

PO Box 1285
 Lewiston, ME 042431285
 Contractor License # 93

according to plans submittal filed with the Licensing and Inspections Unit and are now approved.

This application form/plans are filed under log # 2101327 , and no departure from application form/plans shall be made without prior approval in writing. This permit is issued under the provisions of Title 32, Chapter 20, Section 12004-I. Nothing herein shall excuse the holder of this permit for failure to comply with local ordinances, zoning laws, or other pertinent legal restrictions. Each permit issued shall be displayed/available at the site of construction.

This permit was issued on 9/13/2010 for a fee paid of \$100.00

This permit will expire at midnight on Saturday, March 12, 2011

Anne H. Jordan
 Commissioner

Fire Department Connection Location/Type per Local Fire Department

Within 30 days of the completion of a new fire sprinkler system or an addition to an existing fire sprinkler system, a fire sprinkler system contractor shall provide to the Licensing and Inspections Unit a copy of this permit signed and dated by the certified responsible managing supervisor representing that the fire sprinkler system has been installed according to specifications of the approved plan to the best of the supervisor's knowledge, information, and belief. This requirement is part of the sprinkler law, and neglect of this duty is grounds to not renew the contractor's license to do work in the State of Maine. All sprinkler licenses expire June 30th every year.

Job completed, tested and verified on date of _____

RMS for this job: Dow Curtis

RMS Signature: _____



DENALI
FIRE PROTECTION, INC.
DESIGN INSTALLATION SERVICE
1000 SOUTH MAIN STREET
DENVER, COLORADO 80202
(303) 539-4526 FAX (303) 539-9514



DATE: 03/15/06
DRAWN BY: JRM
CHECKED BY: JRM
SCALE: AS SHOWN

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) STANDARDS.
2. ALL WORK SHALL BE IN ACCORDANCE WITH THE CITY OF DENVER FIRE DEPARTMENT STANDARDS.
3. ALL WORK SHALL BE IN ACCORDANCE WITH THE COLORADO FIRE INSURANCE STANDARDS.
4. ALL WORK SHALL BE IN ACCORDANCE WITH THE INTERNATIONAL FIREMANS' UNION (IFM) STANDARDS.

LEGEND:

SCHEMATIC 1-310	CENTRAL
SCHEMATIC 1-312	CENTRAL
SCHEMATIC 1-313	CENTRAL
SCHEMATIC 1-314	CENTRAL
SCHEMATIC 1-315	CENTRAL
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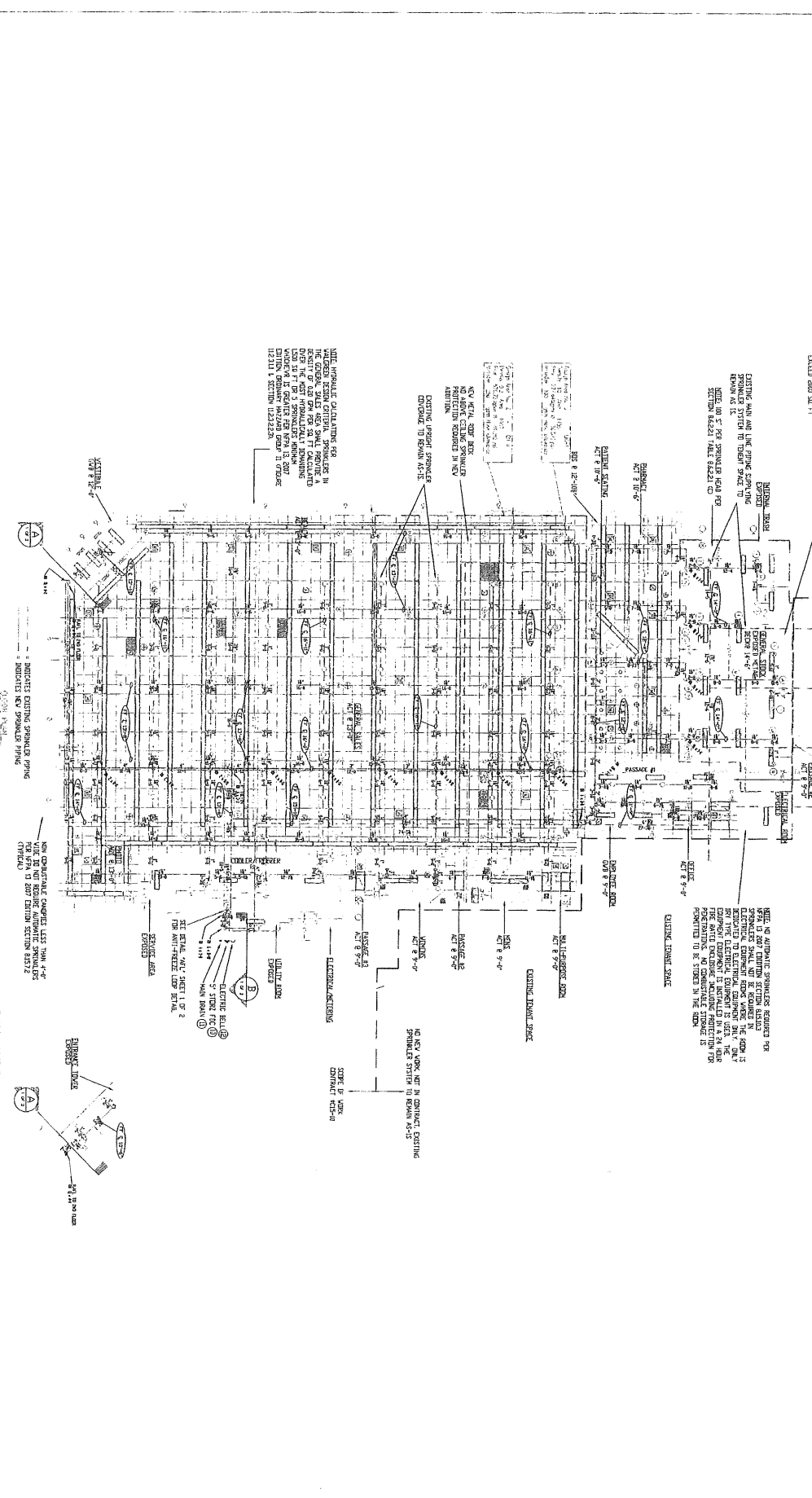
LEGEND:

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SCHEMATIC 1-418	CENTRAL
SCHEMATIC 1-419	CENTRAL
SCHEMATIC 1-420	CENTRAL

REVISIONS:

NO.	DESCRIPTION	DATE
1	ISSUED FOR PERMIT	03/15/06
2	REVISION 1: ADD WORK TO SECTION 12.00	03/15/06
3	REVISION 2: CORRECT WORK TO SECTION 12.00	03/15/06
4	REVISION 3: CORRECT WORK TO SECTION 12.00	03/15/06
5	REVISION 4: CORRECT WORK TO SECTION 12.00	03/15/06
6	REVISION 5: CORRECT WORK TO SECTION 12.00	03/15/06
7	REVISION 6: CORRECT WORK TO SECTION 12.00	03/15/06
8	REVISION 7: CORRECT WORK TO SECTION 12.00	03/15/06
9	REVISION 8: CORRECT WORK TO SECTION 12.00	03/15/06
10	REVISION 9: CORRECT WORK TO SECTION 12.00	03/15/06

DATE: 03/15/06
DRAWN BY: JRM
CHECKED BY: JRM
SCALE: AS SHOWN



NOTE: ALL WORK SHALL BE IN ACCORDANCE WITH THE NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) STANDARDS.
ALL WORK SHALL BE IN ACCORDANCE WITH THE CITY OF DENVER FIRE DEPARTMENT STANDARDS.
ALL WORK SHALL BE IN ACCORDANCE WITH THE COLORADO FIRE INSURANCE STANDARDS.
ALL WORK SHALL BE IN ACCORDANCE WITH THE INTERNATIONAL FIREMANS' UNION (IFM) STANDARDS.

NOTE: ALL AIRPUMP SPRINKLERS REQUIRE FOR EACH 12'00" SECTION SECTION AS SHOWN. ELECTRICAL CONNECTIONS TO EACH AIRPUMP SPRINKLER SHALL BE MADE IN ACCORDANCE WITH THE NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) STANDARDS. ALL WORK SHALL BE IN ACCORDANCE WITH THE CITY OF DENVER FIRE DEPARTMENT STANDARDS. ALL WORK SHALL BE IN ACCORDANCE WITH THE COLORADO FIRE INSURANCE STANDARDS. ALL WORK SHALL BE IN ACCORDANCE WITH THE INTERNATIONAL FIREMANS' UNION (IFM) STANDARDS.

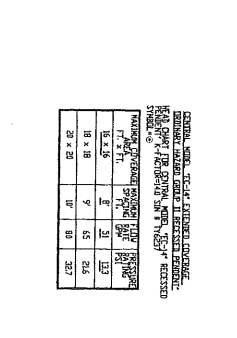
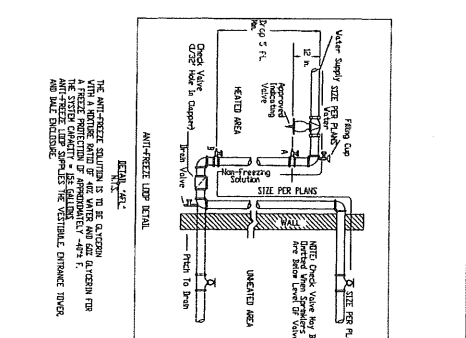
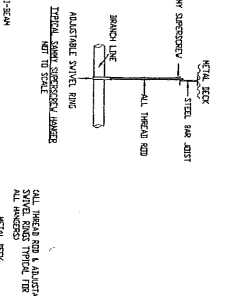
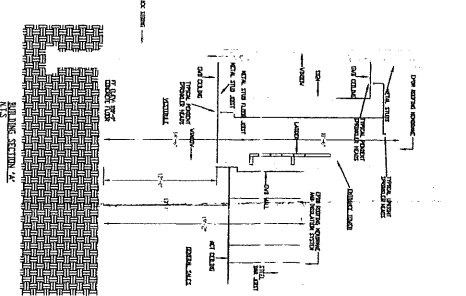
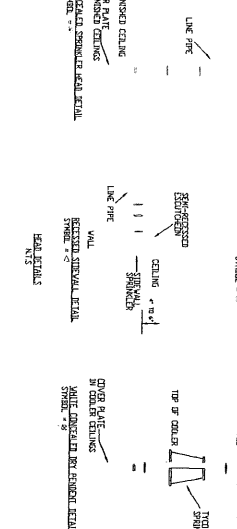
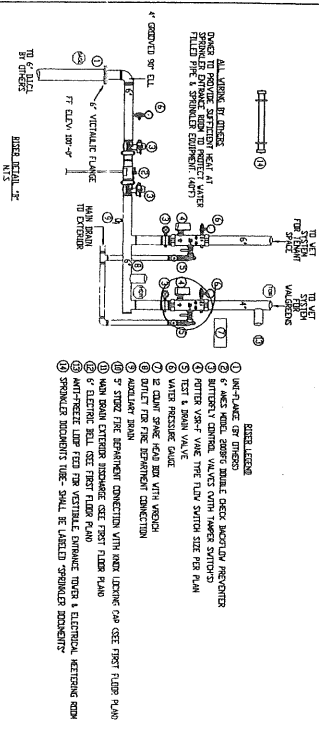
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INDICATES DOTTING SPRINKLER PIPING

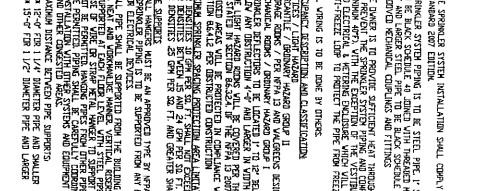
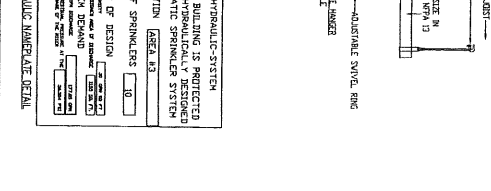
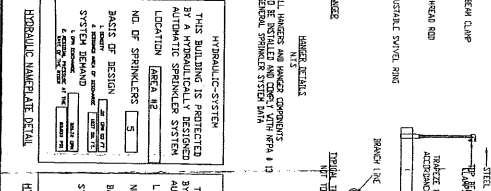
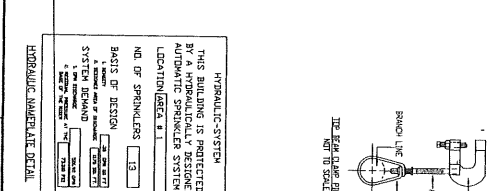
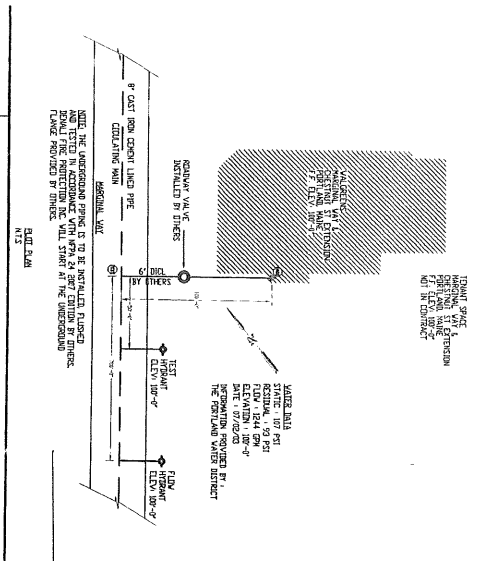
NON-DRAGSINKER CONDUITS LESS THAN 4" IN DIAMETER SHALL BE INSTALLED IN ACCORDANCE WITH THE NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) STANDARDS.

INDICATES SPRINKLER PIPING



GENERAL SPRINKLER SYSTEM DATA	
1. BUILDING GENERAL DESCRIPTION OR DESCRIPTION OF USE	GENERAL OFFICE
2. BUILDING ADDRESS	70 ROLLER PARK ROAD
3. CONTRACTOR	DEVALI FIRE PROTECTION INC.
4. AREA PROTECTED BY SPRINKLER SYSTEM	10,000 SQ. FT.
5. SPRINKLER SYSTEM DESIGN	WET PIPE SYSTEM
6. MANUFACTURER	TYCO
7. SPRINKLER SYSTEM DESIGNER	DEVALI
8. SPRINKLER SYSTEM DESIGN CHECKED BY	DEVALI
9. CONTRACTOR	DEVALI

SPRINKLER HEAD SCHEDULE	
SPRINKLER TYPE	MANUFACTURER
1. BRASS UPRIGHT	TYCO
2. BRASS PENDANT	TYCO
3. BRASS UPRIGHT	TYCO
4. BRASS PENDANT	TYCO
5. BRASS UPRIGHT	TYCO
6. BRASS PENDANT	TYCO
7. BRASS UPRIGHT	TYCO
8. BRASS PENDANT	TYCO
9. BRASS UPRIGHT	TYCO
10. BRASS PENDANT	TYCO

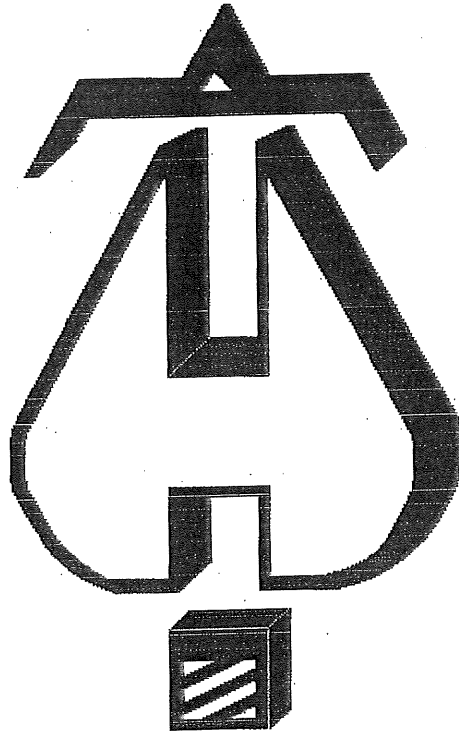


HYDRAULIC SYSTEM	
1. THIS BUILDING IS PROTECTED BY AUTOMATIC SPRINKLER SYSTEM	YES
2. THIS BUILDING IS PROTECTED BY AUTOMATIC SPRINKLER SYSTEM	NO
3. THIS BUILDING IS PROTECTED BY AUTOMATIC SPRINKLER SYSTEM	NO
4. THIS BUILDING IS PROTECTED BY AUTOMATIC SPRINKLER SYSTEM	NO
5. THIS BUILDING IS PROTECTED BY AUTOMATIC SPRINKLER SYSTEM	NO
6. THIS BUILDING IS PROTECTED BY AUTOMATIC SPRINKLER SYSTEM	NO
7. THIS BUILDING IS PROTECTED BY AUTOMATIC SPRINKLER SYSTEM	NO
8. THIS BUILDING IS PROTECTED BY AUTOMATIC SPRINKLER SYSTEM	NO
9. THIS BUILDING IS PROTECTED BY AUTOMATIC SPRINKLER SYSTEM	NO
10. THIS BUILDING IS PROTECTED BY AUTOMATIC SPRINKLER SYSTEM	NO

DEVALI
FIRE PROTECTION INC.
70 ROLLER PARK ROAD
OXFORD, MAINE 04450
(603) 539-4566 FAX (603) 539-6544

NO.	REVISION	DATE	BY	CHKD.
1	ISSUED FOR PERMIT	02/10/10	DEVALI	DEVALI
2	REVISED PER COMMENTS	02/10/10	DEVALI	DEVALI
3	REVISED PER COMMENTS	02/10/10	DEVALI	DEVALI
4	REVISED PER COMMENTS	02/10/10	DEVALI	DEVALI
5	REVISED PER COMMENTS	02/10/10	DEVALI	DEVALI
6	REVISED PER COMMENTS	02/10/10	DEVALI	DEVALI
7	REVISED PER COMMENTS	02/10/10	DEVALI	DEVALI
8	REVISED PER COMMENTS	02/10/10	DEVALI	DEVALI
9	REVISED PER COMMENTS	02/10/10	DEVALI	DEVALI
10	REVISED PER COMMENTS	02/10/10	DEVALI	DEVALI

SHEET 1 OF 1



... Fire Protection by Computer Design

Denali Fire protection, Inc.
270 Tiger Hill Road
Your Street Address 2
Oxford, Maine 04270
207-539-4226

Job Name : WALGREENS AREA GENERAL STORAGE
Building : WOOD & STEEL STRUCTURE
Location : MARGINAL WAY AND CHESTNUT STREET EXTENSION PORTLAND, MAINE
System : 1
Contract : C15-10
Data File : 1-C1510.WXF

Hydraulic Design Information Sheet

Name - WALGREENS Date - 08/24/10
 Location - MARGINAL WAY AND CHESTNUT STREET EXTENSION PORTLAND, MAINE
 Building - WOOD & STEEL STRUCTURE System No. - 1
 Contractor - DENALI FIRE PROTECTION, INC. Contract No. - C15-10
 Calculated By - CKD Drawing No. - 2
 Construction: () Combustible (X) Non-Combustible Ceiling Height - 14'-6"
 Occupancy - GENERAL STORAGE

S (X) NFPA 13 () Lt. Haz. Ord.Haz.Gp. () 1 () 2 () 3 () Ex.Haz.
 Y () NFPA 231 () NFPA 231C () Figure Curve
 S Other PER WALGREENS DESIGN SPECIFICATIONS
 T Specific Ruling Made By Date

	Area of Sprinkler Operation - 1175	System Type	Sprinkler/Nozzle
M	Density - .35	(X) Wet	Make CENTRAL
D	Area Per Sprinkler - 94	() Dry	Model ELO-231B
E	Elevation at Highest Outlet - 114.0	() Deluge	Size 3/4"
S	Hose Allowance - Inside -	() Preaction	K-Factor 11.2
I	Rack Sprinkler Allowance -	() Other	Temp.Rat.286
G	Hose Allowance - Outside - 500		

Note

Calculation Flow Required - 1020.91 Press Required - 76.539 AT TEST
 Summary C-Factor Used: 120 Overhead 140 Underground

W	Water Flow Test:	Pump Data:	Tank or Reservoir:
A	Date of Test - 07/02/03		Cap. -
T	Time of Test -	Rated Cap.-	Elev.-
E	Static Press - 107	@ Press -	
R	Residual Press - 93	Elev. -	Well
S	Flow - 1244		Proof Flow
U	Elevation - 100		

P Location - 100'-0" FROM THE BUILDING
 L Source of Information - PORTLAND WATER DISTRICT
 Y

C	Commodity PAPER GOODS	Class III	Location GENERAL STOCK RM
O	Storage Ht. 12'	Area	Aisle W. 8'
M	Storage Method: Solid Piled 50 %	Palletized %	Rack 50

S	(X) Single Row	() Conven. Pallet	() Auto. Storage	() Encap.
R	() Double Row	() Slave Pallet	() Solid Shelf	(X) Non
T	() Mult. Row		() Open Shelf	

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

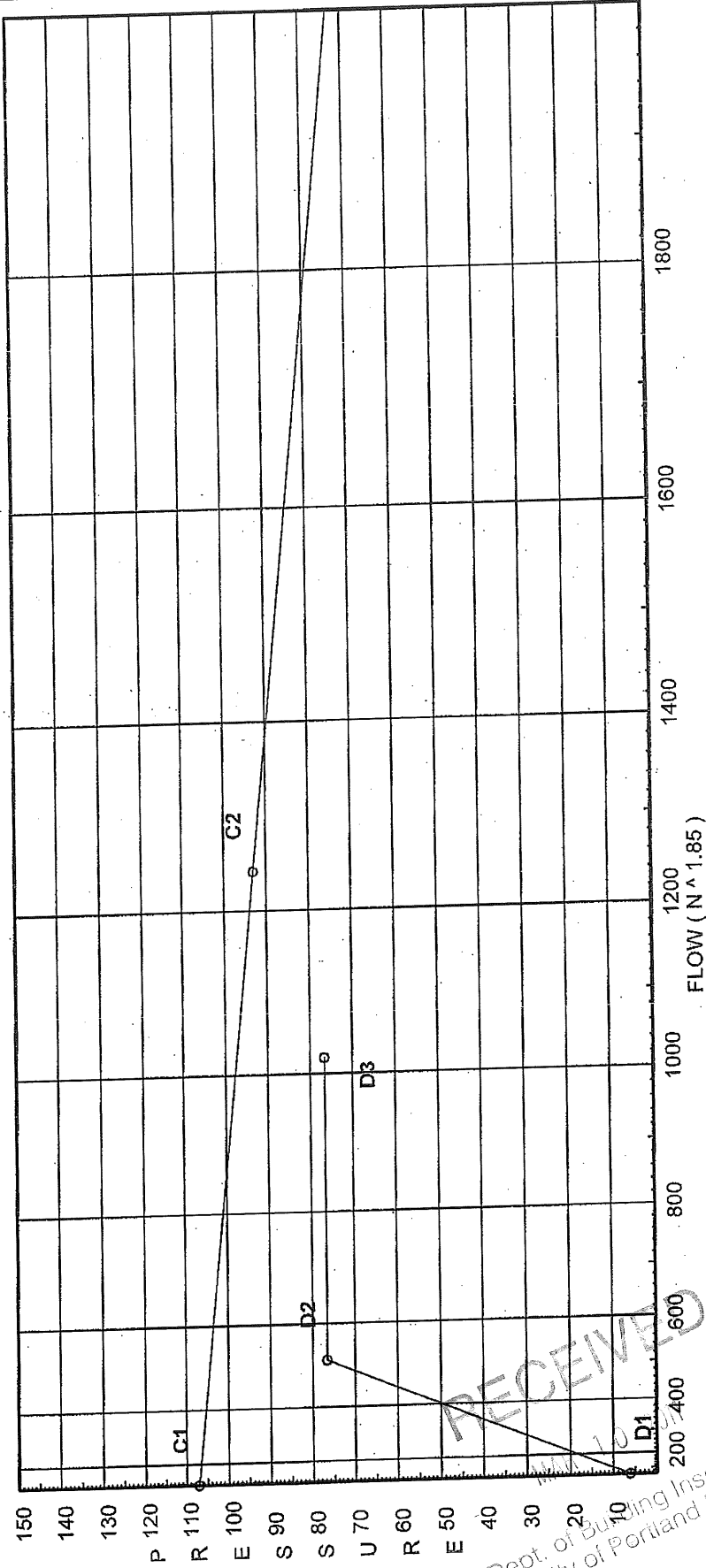
E Horizontal Barriers Provided:

Water Supply Curve (C)

Denali Fire protection, Inc.
WALGREENS AREA GENERAL STORAGE

City Water Supply:
 C1 - Static Pressure : 107
 C2 - Residual Pressure: 93
 C2 - Residual Flow : 1244

Demand:
 D1 - Elevation : 6.063
 D2 - System Flow : 520.92
 D2 - System Pressure : 76.539
 Hose (Adj City) : 500
 Hose (Demand) : 1020.92
 D3 - System Demand : 20.749
 Safety Margin



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 Dept. of Building Inspections
 City of Portland Maine

Fittings Used Summary

Denali Fire protection, Inc.
WALGREENS AREA GENERAL STORAGE

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 Generic Butterfly Valve	0	0	0	0	0	0	7	10	0	12	9	10	12	19	21	0	0	0	0	0
E 90° Standard Elbow	2	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61
G Generic 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
L Long Turn Elbow	1	1	2	2	2	3	4	5	5	6	8	9	13	16	18	24	27	30	34	40
T 90° Flow thru Tee	3	4	5	6	8	10	12	15	17	20	25	30	35	50	60	71	81	91	101	121

Units Summary

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

Pressure / Flow Summary - STANDARD

Denali Fire protection, Inc.
WALGREENS AREA GENERAL STORAGE

Node No.	Elevation	K-Fact.	Pt Actual	Ph	Flow Actual	Density	Area	Press Req.
1	114.0	5.6	23.44	na	27.11	0.2	121	7.0
2	114.0	5.6	22.22	na	26.4	0.2	121	7.0
1A	114.0		24.91	na				
3	114.0	11.2	25.9	na	57.0	0.35	94	7.0
3A	114.0		27.49	na				
3B	112.67		29.24	na				
4	114.0	11.2	24.92	na	55.91	0.35	94	7.0
5	114.0	11.2	25.62	na	56.69	0.35	94	7.0
5A	114.0		27.26	na				
5B	112.67		29.06	na				
6	114.0	11.2	8.78	na	33.18	0.35	94	7.0
7	114.0	11.2	8.63	na	32.9	0.35	94	7.0
6A	114.0		12.26	na				
8	114.0	11.2	13.22	na	40.72	0.35	94	7.0
9	114.0	11.2	15.53	na	44.14	0.35	94	7.0
9A	114.0		18.36	na				
9B	112.67		21.03	na				
10	114.0	11.2	14.71	na	42.96	0.35	94	7.0
10A	114.0		20.18	na				
11	114.0	11.2	20.61	na	50.85	0.35	94	7.0
12	114.0	11.2	22.43	na	53.05	0.35	94	7.0
12A	114.0		25.12	na				
12B	112.67		28.38	na				
3C	112.67		40.94	na				
5C	112.67		41.09	na				
9C	112.67		41.63	na				
12C	112.67		43.51	na				
A	112.67		50.8	na				
A1	113.67		51.96	na				
A2	113.67		57.87	na				
TOR	113.67		60.18	na				
HDR	104.0		67.42	na				
BASE	100.0		75.31	na				
TEST	100.0		76.54	na	500.0			

The maximum velocity is 21.8 and it occurs in the pipe between nodes 9 and 9A

Final Calculations - Hazen-Williams

Denali Fire protection, Inc.
WALGREENS AREA GENERAL STORAGE

Page 5
Date 08/24/10

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
1	27.11	1.049	1T	5.0	1.460	23.435			K Factor = 5.60	
to		120		0.0	5.000	0.0			Vel = 10.06	
1A	27.11	0.2285		0.0	6.460	1.476				
	0.0						24.911		K Factor = 5.43	
	27.11									
2	26.40	1.049	1T	5.0	7.375	22.220			K Factor = 5.60	
to		120		0.0	5.000	0.0			Vel = 9.80	
1A	26.4	0.2175		0.0	12.375	2.691				
1A	27.11	1.682		0.0	12.330	24.911				
to		120		0.0	0.0	0.0			Vel = 7.73	
3	53.51	0.0806		0.0	12.330	0.994				
3	57.00	1.682	1L	2.475	2.670	25.905			K Factor = 11.20	
to		120		0.0	2.475	0.0			Vel = 15.96	
3A	110.51	0.3085		0.0	5.145	1.587				
3A	0.0	1.682	1L	2.475	1.330	27.492				
to		120		0.0	2.475	0.576			Vel = 15.96	
3B	110.51	0.3085		0.0	3.805	1.174				
3B	0.0	1.682	2L	4.95	23.080	29.242				
to		120	1T	9.9	14.850	0.0			Vel = 15.96	
3C	110.51	0.3084		0.0	37.930	11.699				
	0.0						40.941		K Factor = 17.27	
	110.51									
4	55.91	1.682		0.0	8.000	24.922			K Factor = 11.20	
to		120		0.0	0.0	0.0			Vel = 8.07	
5	55.91	0.0875		0.0	8.000	0.700				
5	56.69	1.682	1L	2.475	2.670	25.622			K Factor = 11.20	
to		120		0.0	2.475	0.0			Vel = 16.26	
5A	112.6	0.3193		0.0	5.145	1.643				
5A	0.0	1.682	1L	2.475	1.330	27.265				
to		120		0.0	2.475	0.576			Vel = 16.26	
5B	112.6	0.3193		0.0	3.805	1.215				
5B	0.0	1.682	2L	4.95	22.830	29.056				
to		120	1T	9.9	14.850	0.0			Vel = 16.26	
5C	112.6	0.3193		0.0	37.680	12.033				
	0.0						41.089		K Factor = 17.57	
	112.60									
6	33.18	1.049	1T	5.0	5.500	8.778			K Factor = 11.20	
to		120		0.0	5.000	0.0			Vel = 12.32	
6A	33.18	0.3321		0.0	10.500	3.487				
	0.0						12.265		K Factor = 9.47	
	33.18									
7	32.90	1.049	1T	5.0	6.125	8.629			K Factor = 11.20	
to		120		0.0	5.000	0.0			Vel = 12.21	
6A	32.9	0.3268		0.0	11.125	3.636				
6A	33.18	1.682		0.0	8.000	12.265				
to		120		0.0	0.0	0.0			Vel = 9.54	
8	66.08	0.1191		0.0	8.000	0.953				
8	40.72	1.682		0.0	8.000	13.218			K Factor = 11.20	
to		120		0.0	0.0	0.0			Vel = 15.42	
9	106.8	0.2895		0.0	8.000	2.316				

Final Calculations - Standard

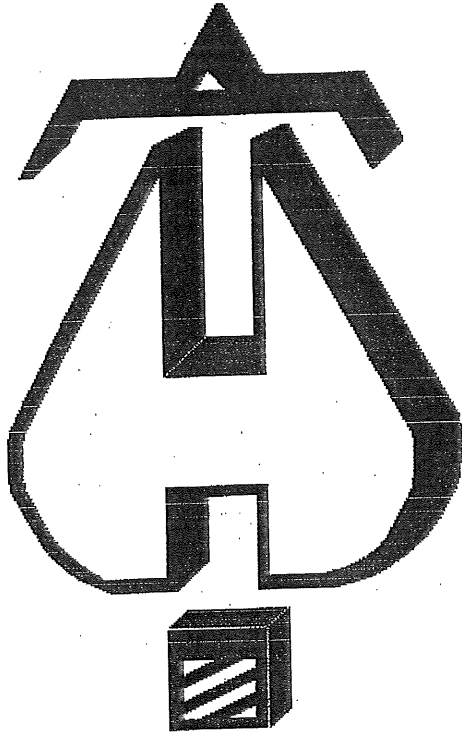
Denali Fire protection, Inc.
WALGREENS AREA GENERAL STORAGE

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftnng's Total	Pt Pe Pf	Pt Pv Pn	***** Notes *****
9	44.15	1.682	1L	2.475	2.670	15.534		K Factor = 11.20
to 9A	150.95	120		0.0	2.475	0.0		Vel = 21.80
9A	0.0	0.5493		0.0	5.145	2.826		
to 9B	150.95	1.682	1L	2.475	1.330	18.360		Vel = 21.80
9B	0.0	120		0.0	2.475	0.576		
to 9C	150.95	0.5490		0.0	3.805	2.089		Vel = 21.80
9C	0.0	1.682	2L	4.95	22.670	21.025		
to 9C	150.95	120	1T	9.9	14.850	0.0		Vel = 21.80
	0.0	0.5492		0.0	37.520	20.605		
	150.95					41.630		K Factor = 23.40
10	42.96	1.049	1T	5.0	5.210	14.714		K Factor = 11.20
to 10A	42.96	120		0.0	5.000	0.0		Vel = 15.95
10A	0.0	0.5355		0.0	10.210	5.467		
to 11	42.96	1.682		0.0	8.000	20.181		Vel = 6.20
11	50.85	120		0.0	0.0	0.0		
to 12	93.81	0.0538		0.0	8.000	0.430		Vel = 6.20
12	53.05	1.682		0.0	8.000	20.611		K Factor = 11.20
to 12A	146.86	120		0.0	0.0	0.0		Vel = 13.55
12A	0.0	0.2278		0.0	8.000	1.822		
to 12A	146.86	1.682	1L	2.475	2.670	22.433		K Factor = 11.20
12A	0.0	120		0.0	2.475	0.0		Vel = 21.21
to 12B	146.86	0.5219		0.0	5.145	2.685		Vel = 21.21
12B	0.0	1.682	1L	2.475	2.670	25.118		
to 12C	146.86	120		0.0	2.475	0.576		Vel = 21.21
12C	0.0	0.5221		0.0	5.145	2.686		
to 12C	146.86	1.682	1T	9.9	19.080	28.380		Vel = 21.21
	0.0	120		0.0	9.900	0.0		
	146.86	0.5219		0.0	28.980	15.126		Vel = 21.21
	0.0					43.506		K Factor = 22.27
3C	110.51	3.26		0.0	12.000	40.941		
to 5C	110.51	120		0.0	0.0	0.0		Vel = 4.25
5C	112.61	0.0123		0.0	12.000	0.148		
to 9C	223.12	3.26		0.0	12.000	41.089		Vel = 8.58
9C	150.94	120		0.0	0.0	0.0		
to 12C	374.06	0.0451		0.0	12.000	0.541		Vel = 14.38
12C	146.86	3.26		0.0	16.000	41.630		
to A	520.92	120		0.0	0.0	0.0		Vel = 14.38
A	0.0	0.1172		0.0	16.000	1.876		
to A1	520.92	3.26	2L	13.44	20.250	43.506		Vel = 20.02
A1	0.0	120		0.0	13.440	0.0		
to A2	520.92	0.2164		0.0	33.690	7.292		Vel = 20.02
A2	0.0	3.26	1I	6.72	0.670	50.798		
to A2	520.92	120		0.0	6.720	-0.433		Vel = 20.02
A2	0.0	0.2164		0.0	7.390	1.599		
to A2	520.92	4.26	1T	26.334	74.170	51.964		Vel = 11.73
A2	0.0	120		0.0	26.334	0.0		
	520.92	0.0588		0.0	100.504	5.911		

Final Calculations - Standard

Denali Fire protection, Inc.
WALGREENS AREA GENERAL STORAGE

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv. Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
A2 to TOR	0.0 520.92	4.26 120 0.0588	2I 18.434 0.0 0.0	20.790 18.434 39.224	57.875 0.0 2.306		Vel = 11.73		
TOR to HDR	0.0 520.92	4.26 120 0.0588	1B 15.8 1T 26.334 0.0	9.670 42.134 51.804	60.181 4.188 3.047		Vel = 11.73		
HDR to BASE	0.0 520.92	6.357 120 0.0084	1L 11.316 0.0 0.0	8.000 11.316 19.316	67.416 7.732 0.162		* Fixed loss = 6 Vel = 5.27		
BASE to TEST	0.0 520.92	6.16 140 0.0073	1E 20.084 1G 4.304 1T 43.037	100.000 67.425 167.425	75.310 0.0 1.229		Vel = 5.61		
	500.00 1020.92				76.539		Qa = 500.00 K Factor = 116.69		



... Fire Protection by Computer Design

Denali Fire protection, Inc.
270 Tiger Hill Road
Your Street Address 2
Oxford, Maine 04270
207-539-4226

Job Name : WALGREENS AREA #2 RETAIL
Building : WOOD & STEEL STRUCTURE
Location : MARGINAL WAY & CHESTNUT STREET EXTENSION
System : 1
Contract : C15-10
Data File : 2-C1510.WXF

Hydraulic Design Information Sheet

Name - WALGREENS Date - 08/24/10
 Location - MARGINAL WAY & CHESTNUT STREET EXTENSION
 Building - WOOD & STEEL STRUCTURE System No. - 1
 Contractor - DENALI FIRE PROTECTION, INC Contract No. - C15-10
 Calculated By - CKD Drawing No. - 2
 Construction: () Combustible (X) Non-Combustible Ceiling Height - 13'-0"
 Occupancy - RETAIL MERCANTILE

S (X) NFPA 13 () Lt. Haz. Ord. Haz. Gp. () 1 (X) 2 () 3 () Ex. Haz.
 Y () NFPA 231 () NFPA 231C (X) Figure 11.2.3.1.1 Curve OH II
 S Other PER NFPA 13 SECTION 11.2.3.2.2.3 & 11.2.3.2.3.1
 T Specific Ruling Made By Date

E	Area of Sprinkler Operation	- 1037	System Type	Sprinkler/Nozzle
M	Density	- .2	(X) Wet	Make CENTRAL
D	Area Per Sprinkler	- 240	() Dry	Model EC-14
E	Elevation at Highest Outlet	- 113.67	() Deluge	Size 3/4"
S	Hose Allowance - Inside	-	() Preaction	K-Factor 14.0
I	Rack Sprinkler Allowance	-	() Other	Temp. Rat. 155
G	Hose Allowance - Outside	- 250		

Note

Calculation Flow Required - 576.723 Press Required - 84.352 AT TEST
 Summary C-Factor Used: 120 Overhead 140 Underground

W	Water Flow Test:	Pump Data:	Tank or Reservoir:
A	Date of Test - 07/02/03	Rated Cap. -	Cap. -
T	Time of Test -	@ Press -	Elev. -
E	Static Press - 107	Elev. -	Well
R	Residual Press - 93		Proof Flow
S	Flow - 1244		
U	Elevation - 100.0		

P Location - 100'-0" FROM THE BUILDING
 P Source of Information - THE PORTLAND WATER DISTRICT
 L
 Y

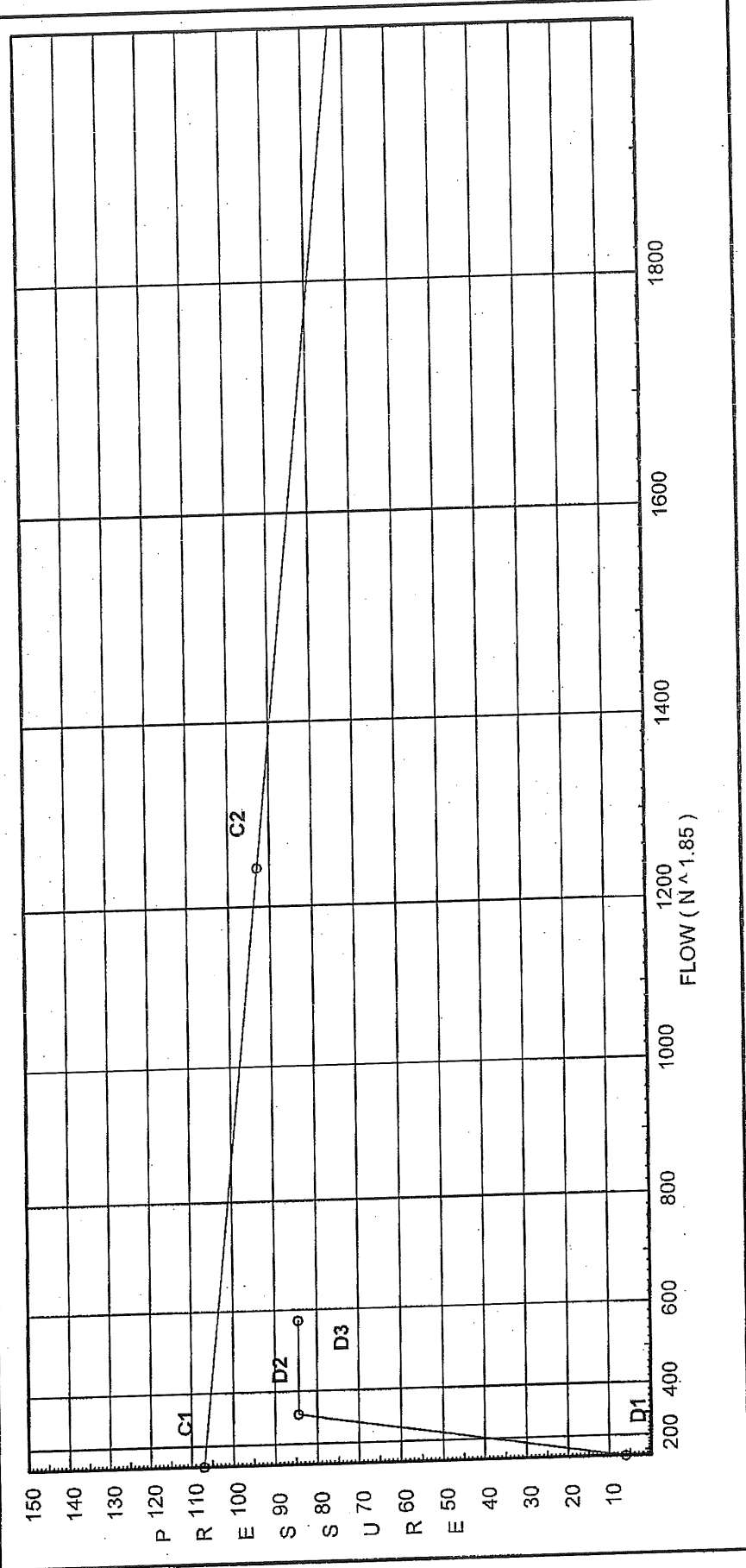
C	Commodity	Class	Location
O	Storage Ht.	Area	Aisle W.
M	Storage Method: Solid Piled	%	Palletized % Rack
M	() Single Row () Conven. Pallet	() Auto. Storage	() Encap.
S	() Double Row () Slave Pallet	() Solid Shelf	() Non
R	() Mult. Row	() Open Shelf	
O			
C			
R	K Flue Spacing	Clearance: Storage to Ceiling	
A	Longitudinal	Transverse	
G			
E	Horizontal Barriers Provided:		

Water Supply Curve (C)

Denali Fire protection, Inc.
WALGREENS AREA #2 RETAIL

City Water Supply:
 C1 - Static Pressure : 107
 C2 - Residual Pressure: 93
 C2 - Residual Flow : 1244

Demand:
 D1 - Elevation : 5,920
 D2 - System Flow : 326.723
 D2 - System Pressure : 84.352
 Hose (Adj City) : 250
 Hose (Demand) : 576.723
 D3 - System Demand : 19.272
 Safety Margin



Fittings Used Summary

Denali Fire protection, Inc.
WALGREENS AREA #2 RETAIL

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 Generic Butterfly Valve	0	0	0	0	0	0	7	10	0	12	9	10	12	19	21	0	0	0	0	0
E 90° Standard Elbow	2	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61
G Generic Gate Valve	0	0	0	0	0	1	1	1	1	2	2	3	4	5	6	7	8	10	11	13
L Long Turn Elbow	1	1	2	2	2	3	4	5	5	6	8	9	13	16	18	24	27	30	34	40
T 90° Flow thru Tee	3	4	5	6	8	10	12	15	17	20	25	30	35	50	60	71	81	91	101	121

Units Summary

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

Pressure / Flow Summary - STANDARD

Denali Fire protection, Inc.
WALGREENS AREA #2 RETAIL

Page 4
Date 08/24/10

Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
DP1	0.0	14	13.3	na	51.06	0.2	10	13.3
100	113.67	K = K @ LN1	17.48	na	51.06			
101	113.67	K = K @ LN1	18.66	na	52.76			
102	113.67	K = K @ LN1	23.06	na	58.64			
103	113.67	K = K @ LN1	17.87	na	51.63			
104	113.67	K = K @ LN1	19.08	na	53.35			
105	113.67	K = K @ LN1	23.57	na	59.29			
102A	113.67		52.88	na				
105A	113.67		54.01	na				
A2	113.67		69.65	na				
TOR	113.67		70.56	na				
HDR	104.0		76.03	na				
BASE	100.0		83.83	na				
TEST	100.0		84.35	na	250.0			

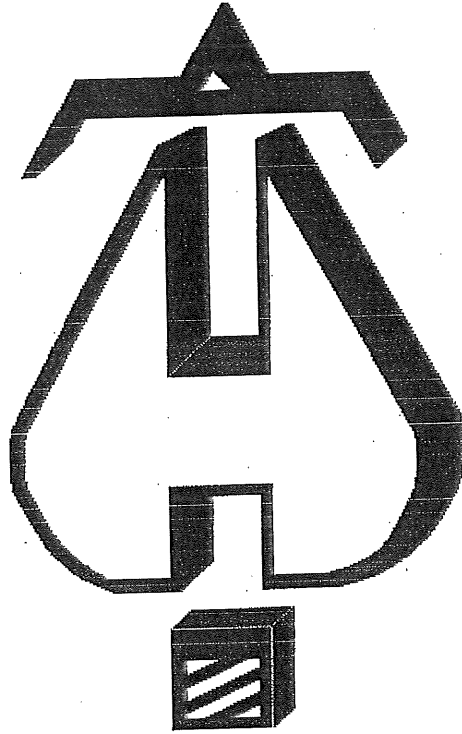
The maximum velocity is 23.72 and it occurs in the pipe between nodes 105 and 105A

Final Calculations - Hazen-Williams

Denali Fire protection, Inc.
WALGREENS AREA #2 RETAIL

Page 5
Date 08/24/10

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftnng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
DP1	51.06	1.049	1T	5.0	0.670	13.300			K Factor = 14.00	
to LN1	51.06	120		0.0	5.000	0.0			Vel = 18.95	
	0.0				5.670	4.178				
	51.06					17.478			K Factor = 12.21	
100	51.06	1.682		0.0	16.000	17.478			K Factor @ node LN1	
to 101	51.06	120		0.0	0.0	0.0			Vel = 7.37	
	51.06	0.0739		0.0	16.000	1.183				
101	52.75	1.682		0.0	16.000	18.661			K Factor @ node LN1	
to 102	103.81	120		0.0	0.0	0.0			Vel = 14.99	
	103.81	0.2748		0.0	16.000	4.396				
102	58.65	1.682	1T	9.9	37.500	23.057			K Factor @ node LN1	
to 102A	162.46	120		0.0	9.900	0.0			Vel = 23.46	
	162.46	0.6291		0.0	47.400	29.820				
	0.0					52.877			K Factor = 22.34	
	162.46					17.874			K Factor @ node LN1	
103	51.63	1.682		0.0	16.000	17.874				
to 104	51.63	120		0.0	0.0	0.0			Vel = 7.45	
	51.63	0.0754		0.0	16.000	1.207				
104	53.35	1.682		0.0	16.000	19.081			K Factor @ node LN1	
to 105	104.98	120		0.0	0.0	0.0			Vel = 15.16	
	104.98	0.2805		0.0	16.000	4.488				
105	59.29	1.682	1T	9.9	37.500	23.569			K Factor @ node LN1	
to 105A	164.27	120		0.0	9.900	0.0			Vel = 23.72	
	164.27	0.6422		0.0	47.400	30.439				
	0.0					54.008			K Factor = 22.35	
	164.27					52.877				
102A	162.46	2.635		0.0	16.000	52.877				
to 105A	162.46	120		0.0	0.0	0.0			Vel = 9.56	
	162.46	0.0707		0.0	16.000	1.131				
105A	164.26	2.635	1T	16.474	44.290	54.008				
to A2	326.72	120		0.0	16.474	0.0			Vel = 19.22	
	326.72	0.2575		0.0	60.764	15.644				
A2	0.0	4.26	2L	15.8	20.790	69.652				
to TOR	326.72	120		0.0	15.800	0.0			Vel = 7.35	
	326.72	0.0248		0.0	36.590	0.907				
TOR	0.0	4.26	1B	15.8	9.670	70.559				
to HDR	326.72	120	1T	26.334	42.134	4.188			Vel = 7.35	
	326.72	0.0248		0.0	51.804	1.286				
HDR	0.0	6.357	1L	11.316	8.000	76.033				
to BASE	326.72	120		0.0	11.316	7.732			* Fixed loss = 6	
	326.72	0.0036		0.0	19.316	0.069			Vel = 3.30	
BASE	0.0	6.16	1E	20.084	100.000	83.834				
to TEST	326.72	140	1G	4.304	67.425	0.0			Vel = 3.52	
	326.72	0.0031	1T	43.037	167.425	0.518				
	250.00					84.352			Qa = 250.00	
	576.72								K Factor = 62.79	



... Fire Protection by Computer Design

Denali Fire protection, Inc.
270 Tiger Hill Road
Your Street Address 2
Oxford, Maine 04270
207-539-4226

Job Name : WALGREENS EXISTING SYSTEM LIGHT HAZARD
Building : WOOD & STEEL STRUCTURE
Location : MARGINAL WAY & CHESTNUT STREET EXTENSION
System : 1
Contract : C15-10
Data File : 3-C1510.WXF

Hydraulic Design Information Sheet

Name - WALGREENS
 Location - MARGINAL WAY & CHESTNUT STREET EXTENSION
 Building - WOOD & STEEL STRUCTURE
 Contractor - DENALI FIRE PROTECTION, INC.
 Calculated By - CKD
 Construction: () Combustible (X) Non-Combustible
 Occupancy - ROOF SYSTEM

Date - 08/24/10

System No. - 1
 Contract No. - C15-10
 Drawing No. - 2
 Ceiling Height - 17'-1"

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 PER NFPA 13 SECTION 11.2.3.2.3.1
 T Specific Ruling Made By Date

		System Type	Sprinkler/Nozzle
M	Area of Sprinkler Operation - 1155	(X) Wet	Make CENTRAL
	Density - .10	() Dry	Model TY-FRB
D	Area Per Sprinkler - 109	() Deluge	Size 1/2"
E	Elevation at Highest Outlet - 116.92	() Preaction	K-Factor 5.6
S	Hose Allowance - Inside -	() Other	Temp.Rat.155
I	Rack Sprinkler Allowance -		
G	Hose Allowance - Outside - 100		

Note

Calculation Flow Required - 277.849 Press Required - 36.522 AT TEST
 Summary C-Factor Used: 120 Overhead 140 Underground

Water Flow Test:	Pump Data:	Tank or Reservoir:
A Date of Test - 07/02/03	Rated Cap.-	Cap. -
T Time of Test -	@ Press -	Elev.-
E Static Press - 107	Elev. -	Well
R Residual Press - 93		Proof Flow
S Flow - 1244		
U Elevation - 100.0		

Location - 100'-0" FROM THE BUILDING

Source of Information - THE PORTLAND WATER DISTRICT

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

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

Horizontal Barriers Provided:

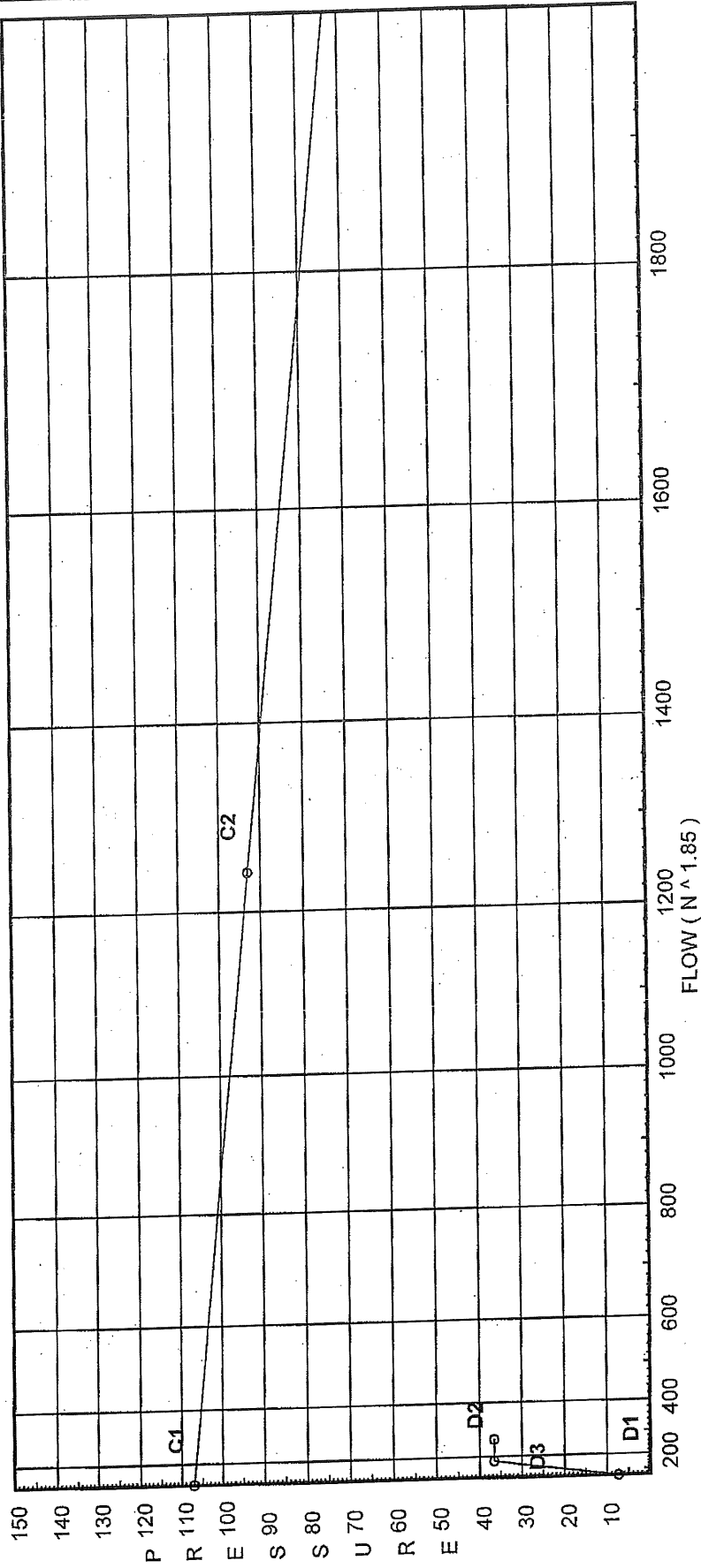
Water Supply Curve (C)

Denali Fire protection, Inc.
WALGREENS EXISTING SYSTEM LIGHT HAZARD

City Water Supply:
 C1 - Static Pressure : 107
 C2 - Residual Pressure: 93
 C2 - Residual Flow : 1244

Demand:

D1 - Elevation : 7.328
 D2 - System Flow : 177.849
 D2 - System Pressure : 36.522
 Hose (Adj City) : 100
 Hose (Demand) : 277.849
 D3 - System Demand : 69.603
 Safety Margin :



Fittings Used Summary

Denali Fire protection, Inc.
 WALGREENS EXISTING SYSTEM LIGHT HAZARD

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 Generic Butterfly Valve	0	0	0	0	0	0	7	10	0	12	9	10	12	19	21	0	0	0	0	0
E 90° Standard Elbow	2	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61
G Generic Gate Valve	0	0	0	0	0	1	1	1	1	2	2	3	4	5	6	7	8	10	11	13
L Long Turn Elbow	1	1	2	2	2	3	4	5	5	6	8	9	13	16	18	24	27	30	34	40
T 90° Flow thru Tee	3	4	5	6	8	10	12	15	17	20	25	30	35	50	60	71	81	91	101	121

Units Summary

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

Pressure / Flow Summary - STANDARD

Denali Fire protection, Inc.
 WALGREENS EXISTING SYSTEM LIGHT HAZARD

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 Date 08/24/10

Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
200	116.92	5.6	7.0	na	14.82	0.1	109	7.0
201	116.92	5.6	7.67	na	15.51	0.1	109	7.0
202	116.92	5.6	10.2	na	17.89	0.1	109	7.0
203	116.92	5.6	11.77	na	19.21	0.1	109	7.0
204	116.92	5.6	13.15	na	20.31	0.1	109	7.0
206	116.92	5.6	7.39	na	15.23	0.1	109	7.0
207	116.92	5.6	8.1	na	15.94	0.1	109	7.0
208	116.92	5.6	10.76	na	18.37	0.1	109	7.0
209	116.92	5.6	12.41	na	19.73	0.1	109	7.0
210	116.92	5.6	13.86	na	20.85	0.1	109	7.0
204A	116.92		15.89	na				
204B	116.92		16.69	na				
210A	116.92		16.74	na				
210B	116.92		17.58	na				
210C	115.83		19.43	na				
210D	115.83		20.87	na				
210E	115.83		21.16	na				
210F	113.67		22.79	na				
A2	113.67		23.7	na				
TOR	113.67		23.99	na				
HDR	104.0		28.6	na				
BASE	100.0		36.35	na				
TEST	100.0		36.52	na	100.0			

The maximum velocity is 14.2 and it occurs in the pipe between nodes 210 and 210A

Final Calculations - Hazen-Williams

Denali Fire protection, Inc.
WALGREENS EXISTING SYSTEM LIGHT HAZARD

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Date 08/24/10

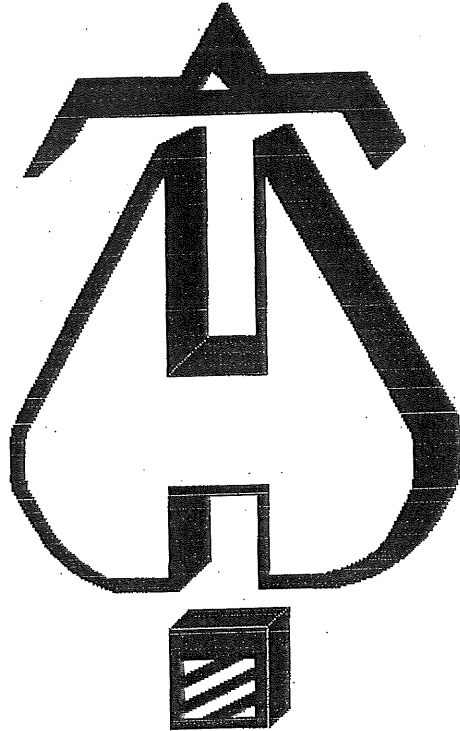
Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
200	14.82	1.049		0.0	9.000	7.000			K Factor = 5.60	
to		120		0.0	0.0	0.0				
201	14.82	0.0747		0.0	9.000	0.672			Vel = 5.50	
201	15.51	1.049		0.0	9.000	7.672			K Factor = 5.60	
to		120		0.0	0.0	0.0				
202	30.33	0.2811		0.0	9.000	2.530			Vel = 11.26	
202	17.88	1.38		0.0	9.000	10.202			K Factor = 5.60	
to		120		0.0	0.0	0.0				
203	48.21	0.1743		0.0	9.000	1.569			Vel = 10.34	
203	19.22	1.61		0.0	9.000	11.771			K Factor = 5.60	
to		120		0.0	0.0	0.0				
204	67.43	0.1530		0.0	9.000	1.377			Vel = 10.63	
204	20.30	1.61	1T	8.0	3.000	13.148			K Factor = 5.60	
to		120		0.0	8.000	0.0				
204A	87.73	0.2491		0.0	11.000	2.740			Vel = 13.83	
	0.0									
	87.73					15.888			K Factor = 22.01	
206	15.23	1.049		0.0	9.000	7.394			K Factor = 5.60	
to		120		0.0	0.0	0.0				
207	15.23	0.0786		0.0	9.000	0.707			Vel = 5.65	
207	15.94	1.049		0.0	9.000	8.101			K Factor = 5.60	
to		120		0.0	0.0	0.0				
208	31.17	0.2957		0.0	9.000	2.661			Vel = 11.57	
208	18.37	1.38		0.0	9.000	10.762			K Factor = 5.60	
to		120		0.0	0.0	0.0				
209	49.54	0.1833		0.0	9.000	1.650			Vel = 10.63	
209	19.73	1.61		0.0	9.000	12.412			K Factor = 5.60	
to		120		0.0	0.0	0.0				
210	69.27	0.1608		0.0	9.000	1.447			Vel = 10.92	
210	20.84	1.61	1T	8.0	3.000	13.859			K Factor = 5.60	
to		120		0.0	8.000	0.0				
210A	90.11	0.2617		0.0	11.000	2.879			Vel = 14.20	
	0.0									
	90.11					16.738			K Factor = 22.03	
204A	87.73	2.067	1T	10.0	0.920	15.888				
to		120		0.0	10.000	0.0				
204B	87.73	0.0737		0.0	10.920	0.805			Vel = 8.39	
204B	0.0	2.067		0.0	12.080	16.693				
to		120		0.0	0.0	0.0				
210B	87.73	0.0738		0.0	12.080	0.891			Vel = 8.39	
	0.0									
	87.73					17.584			K Factor = 20.92	
210A	90.11	2.067	1T	10.0	0.920	16.738				
to		120		0.0	10.000	0.0				
210B	90.11	0.0775		0.0	10.920	0.846			Vel = 8.62	
210B	87.74	2.469		0.0	12.000	17.584				
to		120		0.0	0.0	0.472				
210C	177.85	0.1148		0.0	12.000	1.377			Vel = 11.92	

Final Calculations - Standard

Denali Fire protection, Inc.
WALGREENS EXISTING SYSTEM LIGHT HAZARD

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Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv. Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
210C	0.0	3.068		36.000		19.433			
to 210D	177.85	120		0.0		0.0			
		0.0398		36.000		1.434		Vel = 7.72	
210D	0.0	4.026	1T 20.0	7.420		20.867			
to 210E	177.85	120		20.000		0.0			
		0.0106		27.420		0.291		Vel = 4.48	
210E	0.0	3.26	1T 20.159	3.250		21.158			
to 210F	177.85	120		20.159		0.935			
		0.0296		23.409		0.694		Vel = 6.84	
210F	0.0	3.26	1T 20.159	10.620		22.787			
to A2	177.85	120		20.159		0.0			
		0.0297		30.779		0.913		Vel = 6.84	
A2	0.0	4.26	2L 15.8	20.790		23.700			
to TOR	177.85	120		15.800		0.0			
		0.0080		36.590		0.294		Vel = 4.00	
TOR	0.0	4.26	1B 15.8	9.670		23.994			
to HDR	177.85	120	1T 26.334	42.134		4.188			
		0.0081		51.804		0.418		Vel = 4.00	
HDR	0.0	6.357	1L 11.316	8.000		28.600			
to BASE	177.85	120		11.316		7.732		* Fixed loss = 6	
		0.0011		19.316		0.022		Vel = 1.80	
BASE	0.0	6.16	1E 20.084	100.000		36.354			
to TEST	177.85	140	1G 4.304	67.425		0.0			
		0.0010	1T 43.037	167.425		0.168		Vel = 1.91	
	100.00							Qa = 100.00	
	277.85					36.522		K Factor = 45.98	



... Fire Protection by Computer Design

Denali Fire protection, Inc.
270 Tiger Hill Road
Your Street Address 2
Oxford, Maine 04270
207-539-4226

Job Name : WALGREENS AREA GENERAL STORAGE
Building : WOOD & STEEL STRUCTURE
Location : MARGINAL WAY AND CHESTNUT STREET EXTENSION PORTLAND, MAINE
System : 1
Contract : C15-10
Data File : 1-C1510.WXF

Hydraulic Design Information Sheet

Name - WALGREENS Date - 08/24/10
 Location - MARGINAL WAY AND CHESTNUT STREET EXTENSION PORTLAND, MAINE
 Building - WOOD & STEEL STRUCTURE System No. - 1
 Contractor - DENALI FIRE PROTECTION, INC. Contract No. - C15-10
 Calculated By - CKD Drawing No. - 2
 Construction: () Combustible (X) Non-Combustible Ceiling Height - 14'-6"
 Occupancy - GENERAL STORAGE

S (X) NFPA 13 () Lt. Haz. Ord.Haz.Gp. () 1 () 2 () 3 () Ex.Haz.
 Y () NFPA 231 () NFPA 231C () Figure Curve
 S Other PER WALGREENS DESIGN SPECIFICATIONS
 T Specific Ruling Made By Date

	Area of Sprinkler Operation	Density	Area Per Sprinkler	Elevation at Highest Outlet	Hose Allowance - Inside	Rack Sprinkler Allowance	Hose Allowance - Outside	System Type	Sprinkler/Nozzle
M	- 1175	- .35	- 94	- 114.0	-	-	- 500	(X) Wet	Make CENTRAL
D								() Dry	Model ELO-231B
E								() Deluge	Size 3/4"
S								() Preaction	K-Factor 11.2
I								() Other	Temp.Rat.286
G									
N									

Note

Calculation Flow Required - 1020.91 Press Required - 76.539 AT TEST
 Summary C-Factor Used: 120 Overhead 140 Underground

W Water Flow Test: Pump Data: Tank or Reservoir:
 A Date of Test - 07/02/03 Cap. -
 T Time of Test - Rated Cap.- Elev.-
 E Static Press - 107 @ Press. -
 R Residual Press - 93 Elev. - Well
 Flow - 1244 Proof Flow
 S Elevation - 100

Location - 100'-0" FROM THE BUILDING

Source of Information - PORTLAND WATER DISTRICT

C Commodity PAPER GOODS Class III Location GENERAL STOCK RM
 O Storage Ht. 12' Area Aisle W. 8'
 M Storage Method: Solid Piled 50 % Palletized % Rack 50

(X) Single Row () Conven. Pallet () Auto. Storage () Encap.
 S R () Double Row () Slave Pallet () Solid Shelf (X) Non
 T A () Mult. Row () Open Shelf

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

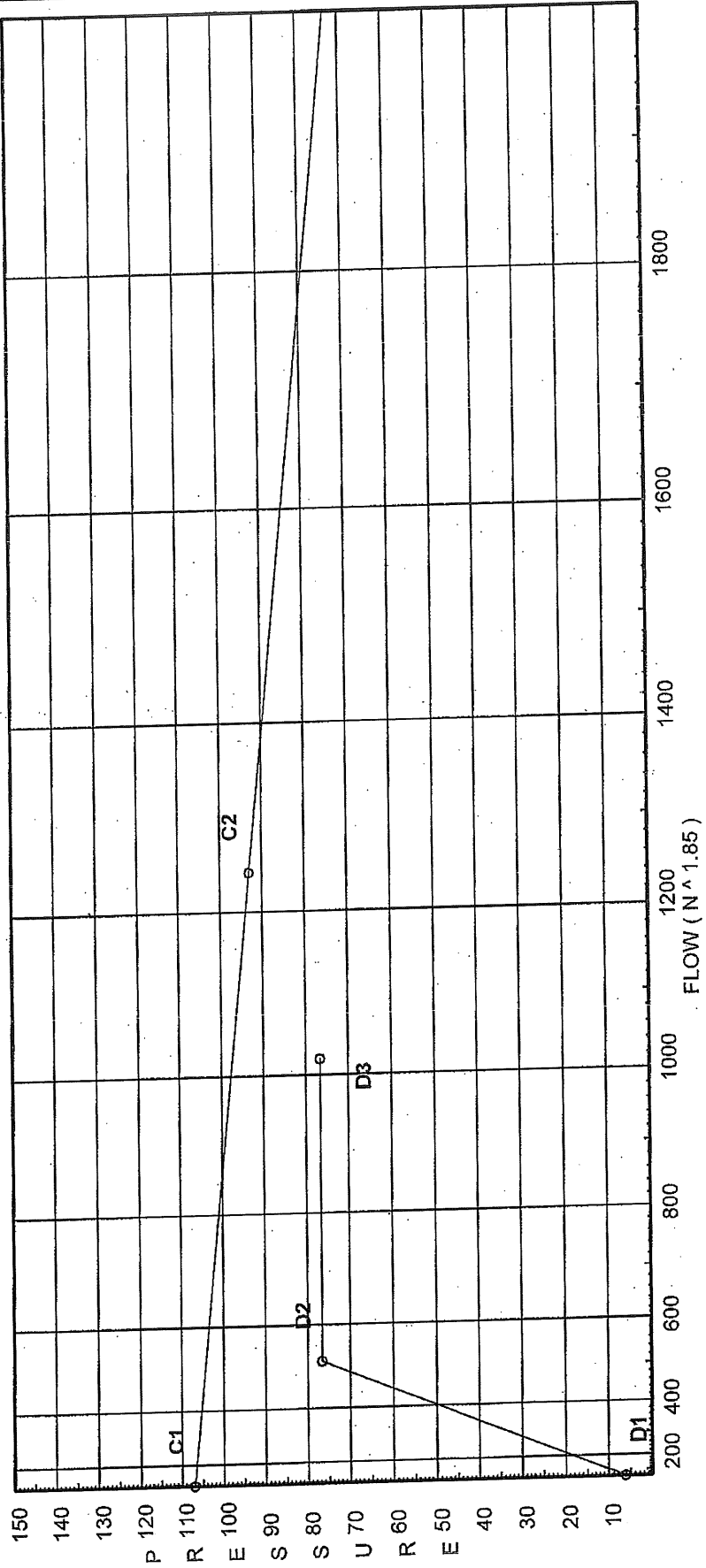
G Horizontal Barriers Provided:
 E

Water Supply Curve (C)

Denali Fire protection, Inc.
WALGREENS AREA GENERAL STORAGE

City Water Supply:
C1 - Static Pressure : 107
C2 - Residual Pressure: 93
C2 - Residual Flow : 1244

Demand:
D1 - Elevation : 6.063
D2 - System Flow : 520.92
D2 - System Pressure : 76.539
Hose (Adj City) : 500
Hose (Demand) : 1020.92
D3 - System Demand : 20.749
Safety Margin : 20.749



Fittings Used Summary

Denali Fire protection, Inc.
WALGREENS AREA GENERAL STORAGE

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 Generic Butterfly Valve	0	0	0	0	0	0	7	10	0	12	9	10	12	19	21	0	0	0	0	0
E 90' Standard Elbow	2	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61
G Generic 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
L Long Turn Elbow	1	1	2	2	2	3	4	5	5	6	8	9	13	16	18	24	27	30	34	40
T 90' Flow thru Tee	3	4	5	6	8	10	12	15	17	20	25	30	35	50	60	71	81	91	101	121

Units Summary

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

Pressure / Flow Summary - STANDARD

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Date 08/24/10

Denali Fire protection, Inc.
WALGREENS AREA GENERAL STORAGE

Node No.	Elevation	K-Fact.	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
1	114.0	5.6	23.44	na	27.11	0.2	121	7.0
2	114.0	5.6	22.22	na	26.4	0.2	121	7.0
1A	114.0		24.91	na				
3	114.0	11.2	25.9	na	57.0	0.35	94	7.0
3A	114.0		27.49	na				
3B	112.67		29.24	na				
4	114.0	11.2	24.92	na	55.91	0.35	94	7.0
5	114.0	11.2	25.62	na	56.69	0.35		
5A	114.0		27.26	na				
5B	112.67		29.06	na				
6	114.0	11.2	8.78	na	33.18	0.35	94	7.0
7	114.0	11.2	8.63	na	32.9	0.35	94	7.0
6A	114.0		12.26	na				
8	114.0	11.2	13.22	na	40.72	0.35	94	7.0
9	114.0	11.2	15.53	na	44.14	0.35	94	7.0
9A	114.0		18.36	na				
9B	112.67		21.03	na				
10	114.0	11.2	14.71	na	42.96	0.35	94	7.0
10A	114.0		20.18	na				
11	114.0	11.2	20.61	na	50.85	0.35	94	7.0
12	114.0	11.2	22.43	na	53.05	0.35	94	7.0
12A	114.0		25.12	na				
12B	112.67		28.38	na				
3C	112.67		40.94	na				
5C	112.67		41.09	na				
9C	112.67		41.63	na				
12C	112.67		43.51	na				
A	112.67		50.8	na				
A1	113.67		51.96	na				
A2	113.67		57.87	na				
TOR	113.67		60.18	na				
HDR	104.0		67.42	na				
BASE	100.0		75.31	na				
TEST	100.0		76.54	na	500.0			

The maximum velocity is 21.8 and it occurs in the pipe between nodes 9 and 9A

Final Calculations - Hazen-Williams

Denali Fire protection, Inc.
WALGREENS AREA GENERAL STORAGE

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Date 08/24/10

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv. Ln.	Pipe Fting's Total	Pt Pe Pf	Pt Pv Pn	***** Notes *****
1	27.11	1.049	1T 5.0	1.460	23.435		K Factor = 5.60
to		120	0.0	5.000	0.0		Vel = 10.06
1A	27.11	0.2285	0.0	6.460	1.476		
	0.0					24.911	K Factor = 5.43
	27.11						
2	26.40	1.049	1T 5.0	7.375	22.220		K Factor = 5.60
to		120	0.0	5.000	0.0		Vel = 9.80
1A	26.4	0.2175	0.0	12.375	2.691		
1A	27.11	1.682		0.0	12.330	24.911	
to		120		0.0	0.0	0.0	Vel = 7.73
3	53.51	0.0806		0.0	12.330	0.994	
3	57.00	1.682	1L 2.475	2.670	25.905		K Factor = 11.20
to		120	0.0	2.475	0.0		Vel = 15.96
3A	110.51	0.3085	0.0	5.145	1.587		
3A	0.0	1.682	1L 2.475	1.330	27.492		
to		120	0.0	2.475	0.576		Vel = 15.96
3B	110.51	0.3085	0.0	3.805	1.174		
3B	0.0	1.682	2L 4.95	23.080	29.242		
to		120	1T 9.9	14.850	0.0		Vel = 15.96
3C	110.51	0.3084	0.0	37.930	11.699		
	0.0					40.941	K Factor = 17.27
	110.51						
4	55.91	1.682		0.0	8.000	24.922	K Factor = 11.20
to		120		0.0	0.0	0.0	Vel = 8.07
5	55.91	0.0875		0.0	8.000	0.700	
5	56.69	1.682	1L 2.475	2.670	25.622		K Factor = 11.20
to		120	0.0	2.475	0.0		Vel = 16.26
5A	112.6	0.3193	0.0	5.145	1.643		
5A	0.0	1.682	1L 2.475	1.330	27.265		
to		120	0.0	2.475	0.576		Vel = 16.26
5B	112.6	0.3193	0.0	3.805	1.215		
5B	0.0	1.682	2L 4.95	22.830	29.056		
to		120	1T 9.9	14.850	0.0		Vel = 16.26
5C	112.6	0.3193	0.0	37.680	12.033		
	0.0					41.089	K Factor = 17.57
	112.60						
6	33.18	1.049	1T 5.0	5.500	8.778		K Factor = 11.20
to		120	0.0	5.000	0.0		Vel = 12.32
6A	33.18	0.3321	0.0	10.500	3.487		
	0.0					12.265	K Factor = 9.47
	33.18						
7	32.90	1.049	1T 5.0	6.125	8.629		K Factor = 11.20
to		120	0.0	5.000	0.0		Vel = 12.21
6A	32.9	0.3268	0.0	11.125	3.636		
6A	33.18	1.682		0.0	8.000	12.265	
to		120		0.0	0.0	0.0	Vel = 9.54
8	66.08	0.1191		0.0	8.000	0.953	
8	40.72	1.682		0.0	8.000	13.218	K Factor = 11.20
to		120		0.0	0.0	0.0	Vel = 15.42
9	106.8	0.2895		0.0	8.000	2.316	

Final Calculations - Standard

Denali Fire protection, Inc.
WALGREENS AREA GENERAL STORAGE

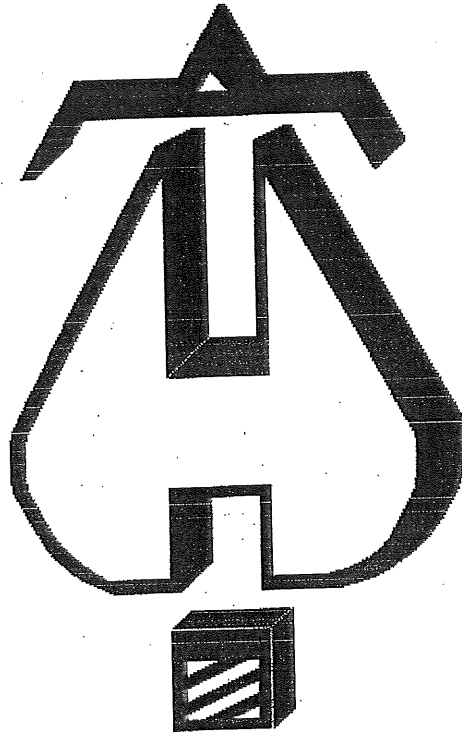
Page 6
Date 08/24/10

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
9	44.15	1.682	1L	2.475	2.670	15.534			K Factor = 11.20	
to 9A	150.95	0.5493		0.0	2.475	0.0			Vel = 21.80	
9A	0.0	1.682	1L	2.475	1.330	18.360				
to 9B	150.95	0.5490		0.0	2.475	0.576			Vel = 21.80	
9B	0.0	1.682	2L	4.95	22.670	21.025				
to 9C	150.95	0.5492	1T	9.9	14.850	0.0			Vel = 21.80	
	0.0			0.0	37.520	20.605				
	150.95					41.630			K Factor = 23.40	
10	42.96	1.049	1T	5.0	5.210	14.714			K Factor = 11.20	
to 10A	42.96	0.5355		0.0	5.000	0.0			Vel = 15.95	
10A	0.0	1.682		0.0	8.000	20.181				
to 11	42.96	0.0538		0.0	0.0	0.0			Vel = 6.20	
11	50.85	1.682		0.0	8.000	20.611			K Factor = 11.20	
to 12	93.81	0.2278		0.0	0.0	0.0			Vel = 13.55	
12	53.05	1.682	1L	2.475	2.670	22.433			K Factor = 11.20	
to 12A	146.86	0.5219		0.0	2.475	0.0			Vel = 21.21	
12A	0.0	1.682	1L	2.475	2.670	25.118				
to 12B	146.86	0.5221		0.0	2.475	0.576			Vel = 21.21	
12B	0.0	1.682	1T	9.9	19.080	28.380				
to 12C	146.86	0.5219		0.0	9.900	0.0			Vel = 21.21	
	0.0			0.0	28.980	15.126				
	146.86					43.506			K Factor = 22.27	
3C	110.51	3.26		0.0	12.000	40.941				
to 5C	110.51	0.0123		0.0	0.0	0.0			Vel = 4.25	
5C	112.61	3.26		0.0	12.000	41.089				
to 9C	223.12	0.0451		0.0	0.0	0.0			Vel = 8.58	
9C	150.94	3.26		0.0	16.000	41.630				
to 12C	374.06	0.1172		0.0	0.0	0.0			Vel = 14.38	
12C	146.86	3.26	2L	13.44	20.250	43.506				
to A	520.92	0.2164		0.0	13.440	0.0			Vel = 20.02	
A	0.0	3.26	1I	6.72	0.670	50.798				
to A1	520.92	0.2164		0.0	6.720	-0.433			Vel = 20.02	
A1	0.0	4.26	1T	26.334	74.170	51.964				
to A2	520.92	0.0588		0.0	26.334	0.0			Vel = 11.73	
				0.0	100.504	5.911				

Final Calculations - Standard

Denali Fire protection, Inc.
WALGREENS AREA GENERAL STORAGE

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv. Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
A2	0.0	4.26	2I 18.434	20.790	57.875				
to		120	0.0	18.434	0.0				
TOR	520.92	0.0588	0.0	39.224	2.306		Vel = 11.73		
TOR	0.0	4.26	1B 15.8	9.670	60.181				
to		120	1T 26.334	42.134	4.188				
HDR	520.92	0.0588	0.0	51.804	3.047		Vel = 11.73		
HDR	0.0	6.357	1L 11.316	8.000	67.416				
to		120	0.0	11.316	7.732		* Fixed loss = 6		
BASE	520.92	0.0084	0.0	19.316	0.162		Vel = 5.27		
BASE	0.0	6.16	1E 20.084	100.000	75.310				
to		140	1G 4.304	67.425	0.0				
TEST	520.92	0.0073	1T 43.037	167.425	1.229		Vel = 5.61		
	500.00						Qa = 500.00		
	1020.92				76.539		K Factor = 116.69		



... Fire Protection by Computer Design

Denali Fire protection, Inc.
270 Tiger Hill Road
Your Street Address 2
Oxford, Maine 04270
207-539-4226

Job Name : WALGREENS AREA #2 RETAIL
Building : WOOD & STEEL STRUCTURE
Location : MARGINAL WAY & CHESTNUT STREET EXTENSION
System : 1
Contract : C15-10
Data File : 2-C1510.WXF

Hydraulic Design Information Sheet

Name - WALGREENS Date - 08/24/10
 Location - MARGINAL WAY & CHESTNUT STREET EXTENSION
 Building - WOOD & STEEL STRUCTURE System No. - 1
 Contractor - DENALI FIRE PROTECTION, INC Contract No. - C15-10
 Calculated By - CKD Drawing No. - 2
 Construction: () Combustible (X) Non-Combustible Ceiling Height - 13'-0"
 Occupancy - RETAIL MERCANTILE

S (X) NFPA 13 () Lt. Haz. Ord.Haz.Gp. () 1 (X) 2 () 3 () Ex.Haz.
 Y () NFPA 231 () NFPA 231C (X) Figure 11.2.3.1.1 Curve OH II
 S Other PER NFPA 13 SECTION 11.2.3.2.2.3 & 11.2.3.2.3.1
 T Specific Ruling Made By Date

M	Area of Sprinkler Operation	- 1037	System Type	Sprinkler/Nozzle
	Density	- .2	(X) Wet	Make CENTRAL
D	Area Per Sprinkler	- 240	() Dry	Model EC-14
E	Elevation at Highest Outlet	- 113.67	() Deluge	Size 3/4"
S	Hose Allowance - Inside	-	() Preaction	K-Factor 14.0
I	Rack Sprinkler Allowance	-	() Other	Temp.Rat.155
G	Hose Allowance - Outside	- 250		

Note

Calculation Flow Required - 576.723 Press Required - 84.352 AT TEST
 Summary C-Factor Used: 120 Overhead 140 Underground

W	Water Flow Test:	Pump Data:	Tank or Reservoir:
A	Date of Test - 07/02/03		Cap. -
T	Time of Test -	Rated Cap.-	Elev.-
E	Static Press - 107	@ Press -	
R	Residual Press - 93	Elev. -	Well
	Flow - 1244		Proof Flow
S	Elevation - 100.0		

U Location - 100'-0" FROM THE BUILDING
 P
 L Source of Information - THE PORTLAND WATER DISTRICT
 Y

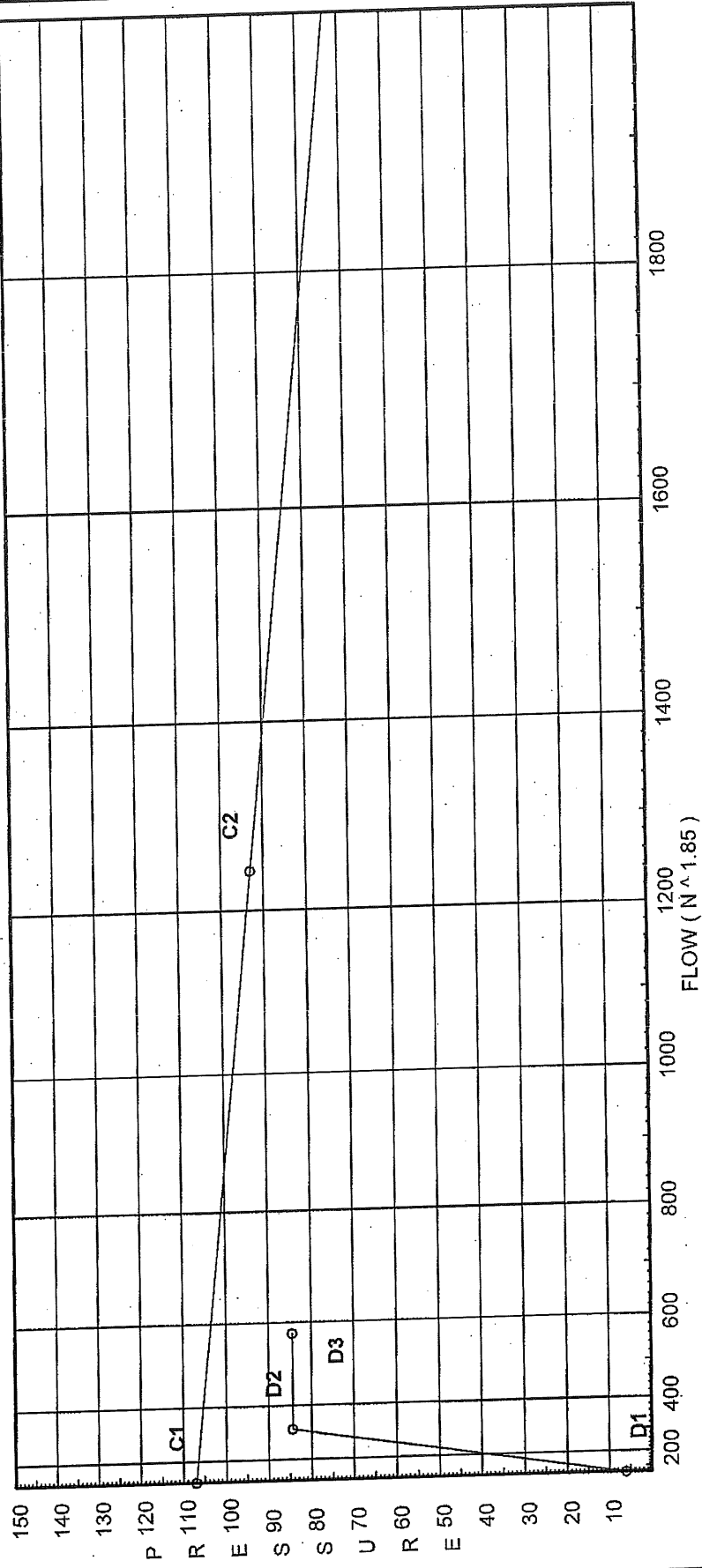
C	Commodity	Class	Location
O	Storage Ht.	Area	Aisle W.
M	Storage Method: Solid Piled	% Palletized	% Rack
M	() Single Row () Conven. Pallet () Auto. Storage () Encap.		
S	() Double Row () Slave Pallet () Solid Shelf () Non		
T	() Mult. Row () Open Shelf		
O			
R	K Flue Spacing	Clearance: Storage to Ceiling	
A	Longitudinal	Transverse	
G			
E	Horizontal Barriers Provided:		

Water Supply Curve (C)

Denali Fire protection, Inc.
WALGREENS AREA #2 RETAIL

City Water Supply:
C1 - Static Pressure : 107
C2 - Residual Pressure: 93
C2 - Residual Flow : 1244

Demand:
D1 - Elevation : 5.920
D2 - System Flow : 326.723
D2 - System Pressure : 84.352
Hose (Adj. City) : 250
Hose (Demand) : 576.723
D3 - System Demand : 19.272
Safety Margin



Fittings Used Summary

Denali Fire protection, Inc.
WALGREENS AREA #2 RETAIL

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 Generic Butterfly Valve	0	0	0	0	0	0	7	10	0	12	9	10	12	19	21	0	0	0	0	0
E 90° Standard Elbow	2	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61
G Generic Gate Valve	0	0	0	0	0	1	1	1	1	2	2	3	4	5	6	7	8	10	11	13
L Long Turn Elbow	1	1	2	2	2	3	4	5	5	6	8	9	13	16	18	24	27	30	34	40
T 90° Flow thru Tee	3	4	5	6	8	10	12	15	17	20	25	30	35	50	60	71	81	91	101	121

Units Summary

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

Pressure / Flow Summary - STANDARD

Denali Fire protection, Inc.
WALGREENS AREA #2 RETAIL

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Date 08/24/10

Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
DP1	0.0	14	13.3	na	51.06	0.2	10	13.3
100	113.67	K = K @ LN1	17.48	na	51.06			
101	113.67	K = K @ LN1	18.66	na	52.76			
102	113.67	K = K @ LN1	23.06	na	58.64			
103	113.67	K = K @ LN1	17.87	na	51.63			
104	113.67	K = K @ LN1	19.08	na	53.35			
105	113.67	K = K @ LN1	23.57	na	59.29			
102A	113.67		52.88	na				
105A	113.67		54.01	na				
A2	113.67		69.65	na				
TOR	113.67		70.56	na				
HDR	104.0		76.03	na				
BASE	100.0		83.83	na				
TEST	100.0		84.35	na	250.0			

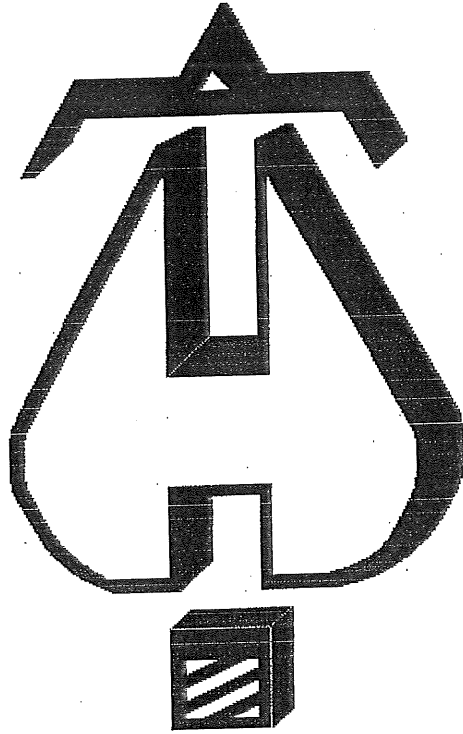
The maximum velocity is 23.72 and it occurs in the pipe between nodes 105 and 105A

Final Calculations - Hazen-Williams

Denali Fire protection, Inc.
WALGREENS AREA #2 RETAIL

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Date 08/24/10

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
DP1	51.06	1.049	1T	5.0	0.670	13.300			K Factor = 14.00	
to LN1	51.06	120		0.0	5.000	0.0			Vel = 18.95	
	0.0									
	51.06					17.478			K Factor = 12.21	
100	51.06	1.682		0.0	16.000	17.478			K Factor @ node LN1	
to 101	51.06	120		0.0	0.0	0.0			Vel = 7.37	
		0.0739		0.0	16.000	1.183				
101	52.75	1.682		0.0	16.000	18.661			K Factor @ node LN1	
to 102	103.81	120		0.0	0.0	0.0			Vel = 14.99	
		0.2748		0.0	16.000	4.396				
102	58.65	1.682	1T	9.9	37.500	23.057			K Factor @ node LN1	
to 102A	162.46	120		0.0	9.900	0.0			Vel = 23.46	
		0.6291		0.0	47.400	29.820				
	0.0									
	162.46					52.877			K Factor = 22.34	
103	51.63	1.682		0.0	16.000	17.874			K Factor @ node LN1	
to 104	51.63	120		0.0	0.0	0.0			Vel = 7.45	
		0.0754		0.0	16.000	1.207				
104	53.35	1.682		0.0	16.000	19.081			K Factor @ node LN1	
to 105	104.98	120		0.0	0.0	0.0			Vel = 15.16	
		0.2805		0.0	16.000	4.488				
105	59.29	1.682	1T	9.9	37.500	23.569			K Factor @ node LN1	
to 105A	164.27	120		0.0	9.900	0.0			Vel = 23.72	
		0.6422		0.0	47.400	30.439				
	0.0									
	164.27					54.008			K Factor = 22.35	
102A	162.46	2.635		0.0	16.000	52.877				
to 105A	162.46	120		0.0	0.0	0.0			Vel = 9.56	
		0.0707		0.0	16.000	1.131				
105A	164.26	2.635	1T	16.474	44.290	54.008				
to A2	326.72	120		0.0	16.474	0.0			Vel = 19.22	
		0.2575		0.0	60.764	15.644				
A2	0.0	4.26	2L	15.8	20.790	69.652				
to TOR	326.72	120		0.0	15.800	0.0			Vel = 7.35	
		0.0248		0.0	36.590	0.907				
TOR	0.0	4.26	1B	15.8	9.670	70.559				
to HDR	326.72	120	1T	26.334	42.134	4.188			Vel = 7.35	
		0.0248		0.0	51.804	1.286				
HDR	0.0	6.357	1L	11.316	8.000	76.033			* Fixed loss = 6	
to BASE	326.72	120		0.0	11.316	7.732			Vel = 3.30	
		0.0036		0.0	19.316	0.069				
BASE	0.0	6.16	1E	20.084	100.000	83.834				
to TEST	326.72	140	1G	4.304	67.425	0.0			Vel = 3.52	
		0.0031	1T	43.037	167.425	0.518				
	250.00								Qa = 250.00	
	576.72					84.352			K Factor = 62.79	



... Fire Protection by Computer Design

Denali Fire protection, Inc.
270 Tiger Hill Road
Your Street Address 2
Oxford, Maine 04270
207-539-4226

Job Name : WALGREENS EXISTING SYSTEM LIGHT HAZARD
Building : WOOD & STEEL STRUCTURE
Location : MARGINAL WAY & CHESTNUT STREET EXTENSION
System : 1
Contract : C15-10
Data File : 3-C1510.WXF

Hydraulic Design Information Sheet

Name - WALGREENS Date - 08/24/10
 Location - MARGINAL WAY & CHESTNUT STREET EXTENSION
 Building - WOOD & STEEL STRUCTURE System No. - 1
 Contractor - DENALI FIRE PROTECTION, INC. Contract No. - C15-10
 Calculated By - CKD Drawing No. - 2
 Construction: () Combustible (X) Non-Combustible Ceiling Height - 17'-1"
 Occupancy - ROOF SYSTEM

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 PER NFPA 13 SECTION 11.2.3.2.3.1
 T Specific Ruling Made By Date

M	Area of Sprinkler Operation	- 1155	System Type	Sprinkler/Nozzle
	Density	- .10	(X) Wet	Make CENTRAL
D	Area Per Sprinkler	- 109	() Dry	Model TY-FRB
E	Elevation at Highest Outlet	- 116.92	() 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

Calculation Flow Required - 277.849 Press Required - 36.522 AT TEST
 Summary C-Factor Used: 120 Overhead 140 Underground

W	Water Flow Test:	Pump Data:	Tank or Reservoir:
A	Date of Test - 07/02/03		Cap. -
T	Time of Test -	Rated Cap.-	Elev.-
E	Static Press - 107	@ Press -	
R	Residual Press - 93	Elev. -	Well
	Flow - 1244		Proof Flow
S	Elevation - 100.0		

U Location - 100'-0" FROM THE BUILDING
 P
 L Source of Information - THE PORTLAND WATER DISTRICT
 Y

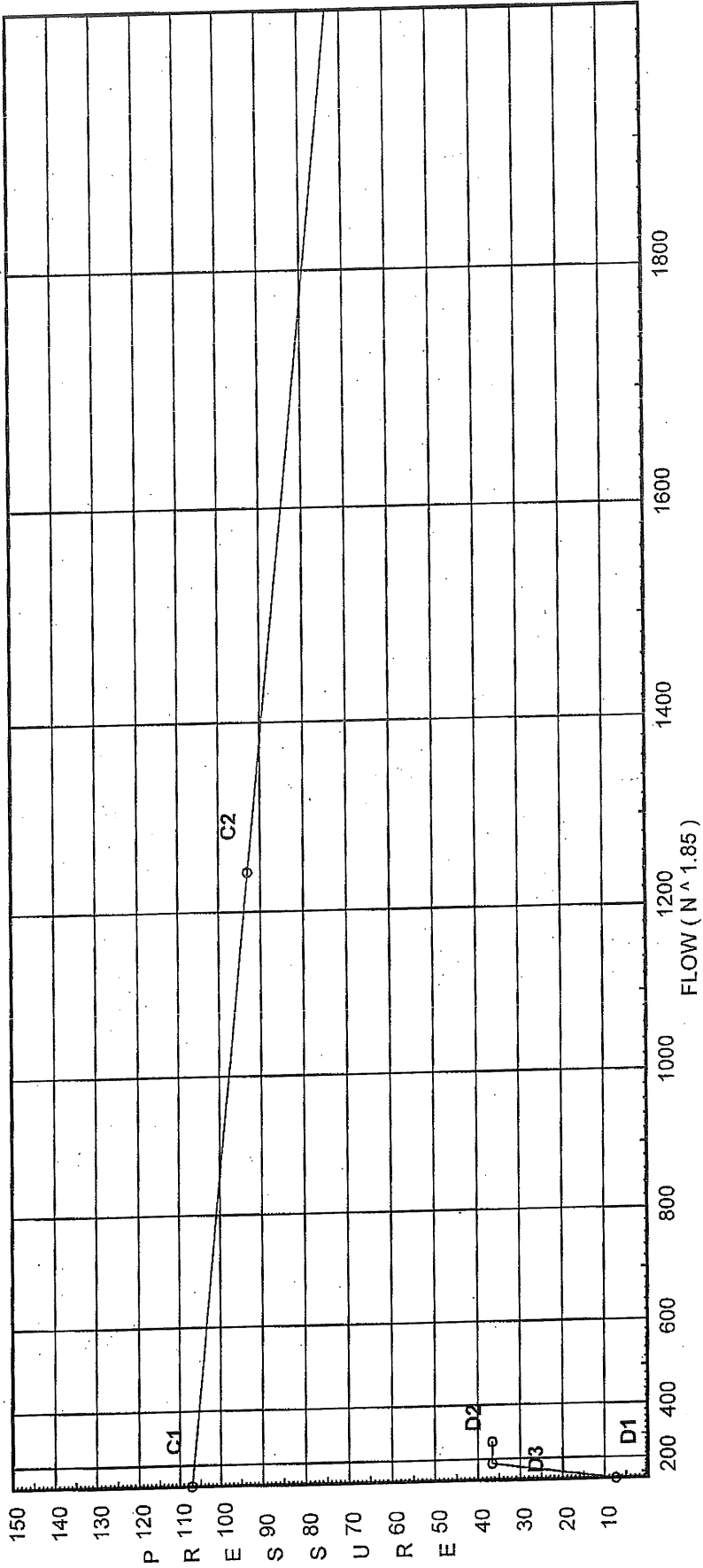
C	Commodity	Class	Location
O	Storage Ht.	Area	Aisle W.
M	Storage Method: Solid Piled	%	Palletized % Rack
M	() Single Row	() Conven. Pallet	() Auto. Storage () Encap.
S	() Double Row	() Slave Pallet	() Solid Shelf () Non
T	() Mult. Row		() Open Shelf
O			
R	Flue Spacing	Clearance:Storage to Ceiling	
A	Longitudinal	Transverse	
G	Horizontal Barriers Provided:		
E			

Water Supply Curve (C)

Denali Fire protection, Inc.
WALGREENS EXISTING SYSTEM LIGHT HAZARD

City Water Supply:
C1 - Static Pressure : 107
C2 - Residual Pressure: 93
C2 - Residual Flow : 1244

Demand:
D1 - Elevation : 7.328
D2 - System Flow : 177.849
D2 - System Pressure : 36.522
Hose (Adj City) : 100
Hose (Demand) : 277.849
D3 - System Demand : 69.603
Safety Margin



Fittings Used Summary

Denali Fire protection, Inc.
WALGREENS EXISTING SYSTEM LIGHT HAZARD

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 Generic Butterfly Valve	0	0	0	0	0	0	7	10	0	12	9	10	12	19	21	0	0	0	0	0
E 90° Standard Elbow	2	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61
G Generic Gate Valve	0	0	0	0	0	1	1	1	1	2	2	3	4	5	6	7	8	10	11	13
L Long Turn Elbow	1	1	2	2	2	3	4	5	5	6	8	9	13	16	18	24	27	30	34	40
T 90° Flow thru Tee	3	4	5	6	8	10	12	15	17	20	25	30	35	50	60	71	81	91	101	121

Units Summary

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

Pressure / Flow Summary - STANDARD

Denali Fire protection, Inc.
 WALGREENS EXISTING SYSTEM LIGHT HAZARD

Page 4
 Date 08/24/10

Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
200	116.92	5.6	7.0	na	14.82	0.1	109	7.0
201	116.92	5.6	7.67	na	15.51	0.1	109	7.0
202	116.92	5.6	10.2	na	17.89	0.1	109	7.0
203	116.92	5.6	11.77	na	19.21	0.1	109	7.0
204	116.92	5.6	13.15	na	20.31	0.1	109	7.0
206	116.92	5.6	7.39	na	15.23	0.1	109	7.0
207	116.92	5.6	8.1	na	15.94	0.1	109	7.0
208	116.92	5.6	10.76	na	18.37	0.1	109	7.0
209	116.92	5.6	12.41	na	19.73	0.1	109	7.0
210	116.92	5.6	13.86	na	20.85	0.1	109	7.0
204A	116.92		15.89	na				
204B	116.92		16.69	na				
210A	116.92		16.74	na				
210B	116.92		17.58	na				
210C	115.83		19.43	na				
210D	115.83		20.87	na				
210E	115.83		21.16	na				
210F	113.67		22.79	na				
A2	113.67		23.7	na				
TOR	113.67		23.99	na				
HDR	104.0		28.6	na				
BASE	100.0		36.35	na				
TEST	100.0		36.52	na	100.0			

The maximum velocity is 14.2 and it occurs in the pipe between nodes 210 and 210A

Final Calculations - Hazen-Williams

Denali Fire protection, Inc.
WALGREENS EXISTING SYSTEM LIGHT HAZARD

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Date 08/24/10

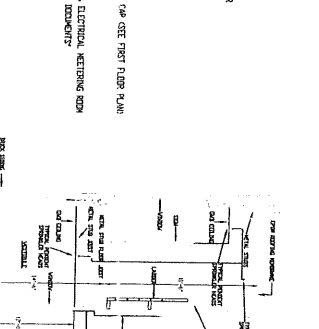
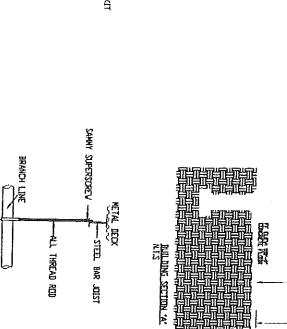
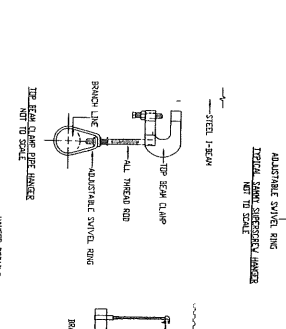
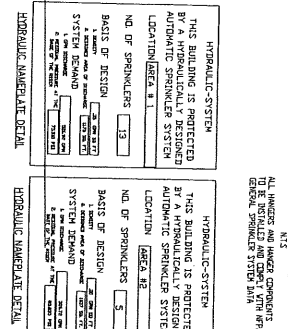
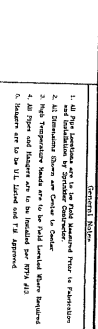
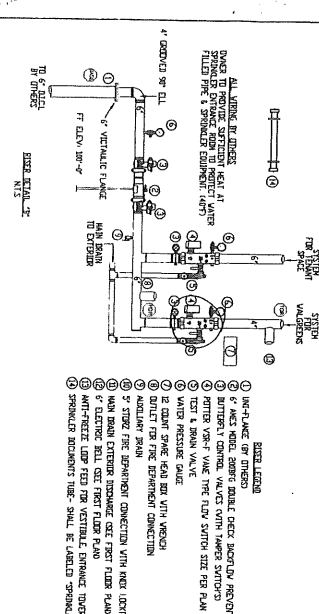
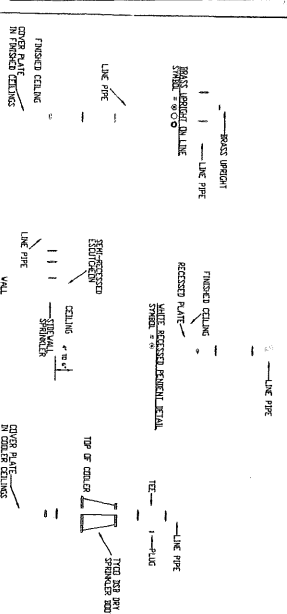
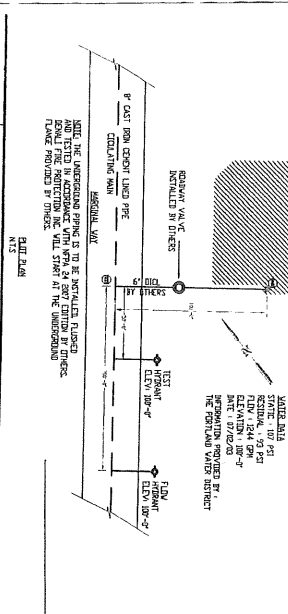
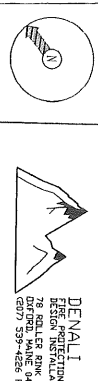
Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv. Ln.	Pipe Ftng's Total	Pt Pe Pf	Pf Pv Pn	*****	Notes	*****
200	14.82	1.049	0.0	9.000	7.000			K Factor = 5.60	
to 201	14.82	120 0.0747	0.0	0.0	0.0			Vel = 5.50	
201	15.51	1.049	0.0	9.000	7.672			K Factor = 5.60	
to 202	30.33	120 0.2811	0.0	0.0	0.0			Vel = 11.26	
202	17.88	1.38	0.0	9.000	10.202			K Factor = 5.60	
to 203	48.21	120 0.1743	0.0	0.0	0.0			Vel = 10.34	
203	19.22	1.61	0.0	9.000	11.771			K Factor = 5.60	
to 204	67.43	120 0.1530	0.0	0.0	0.0			Vel = 10.63	
204	20.30	1.61	1T 8.0	3.000	13.148			K Factor = 5.60	
to 204A	87.73	120 0.2491	0.0	8.000	0.0			Vel = 13.83	
	0.0			11.000	2.740				
	87.73				15.888			K Factor = 22.01	
206	15.23	1.049	0.0	9.000	7.394			K Factor = 5.60	
to 207	15.23	120 0.0786	0.0	0.0	0.0			Vel = 5.65	
207	15.94	1.049	0.0	9.000	8.101			K Factor = 5.60	
to 208	31.17	120 0.2957	0.0	0.0	0.0			Vel = 11.57	
208	18.37	1.38	0.0	9.000	10.762			K Factor = 5.60	
to 209	49.54	120 0.1833	0.0	0.0	0.0			Vel = 10.63	
209	19.73	1.61	0.0	9.000	12.412			K Factor = 5.60	
to 210	69.27	120 0.1608	0.0	0.0	0.0			Vel = 10.92	
210	20.84	1.61	1T 8.0	3.000	13.859			K Factor = 5.60	
to 210A	90.11	120 0.2617	0.0	8.000	0.0			Vel = 14.20	
	0.0			11.000	2.879				
	90.11				16.738			K Factor = 22.03	
204A	87.73	2.067	1T 10.0	0.920	15.888				
to 204B	87.73	120 0.0737	0.0	0.0	0.0			Vel = 8.39	
204B	0.0	2.067	0.0	12.080	16.693				
to 210B	87.73	120 0.0738	0.0	0.0	0.0			Vel = 8.39	
	0.0			12.080	0.891				
	87.73				17.584			K Factor = 20.92	
210A	90.11	2.067	1T 10.0	0.920	16.738				
to 210B	90.11	120 0.0775	0.0	0.0	0.0			Vel = 8.62	
210B	87.74	2.469	0.0	12.000	17.584				
to 210C	177.85	120 0.1148	0.0	0.0	0.472			Vel = 11.92	
				12.000	1.377				

Final Calculations - Standard

Denali Fire protection, Inc.
WALGREENS EXISTING SYSTEM LIGHT HAZARD

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Hyd. Ref. Point	Qa Qt	Dia. "C" P/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
210C	0.0	3.068		0.0	36.000	19.433				
to		120		0.0	0.0	0.0				
210D	177.85	0.0398		0.0	36.000	1.434			Vel = 7.72	
210D	0.0	4.026	1T	20.0	7.420	20.867				
to		120		0.0	20.000	0.0				
210E	177.85	0.0106		0.0	27.420	0.291			Vel = 4.48	
210E	0.0	3.26	1T	20.159	3.250	21.158				
to		120		0.0	20.159	0.935				
210F	177.85	0.0296		0.0	23.409	0.694			Vel = 6.84	
210F	0.0	3.26	1T	20.159	10.620	22.787				
to		120		0.0	20.159	0.0				
A2	177.85	0.0297		0.0	30.779	0.913			Vel = 6.84	
A2	0.0	4.26	2L	15.8	20.790	23.700				
to		120		0.0	15.800	0.0				
TOR	177.85	0.0080		0.0	36.590	0.294			Vel = 4.00	
TOR	0.0	4.26	1B	15.8	9.670	23.994				
to		120	1T	26.334	42.134	4.188				
HDR	177.85	0.0081		0.0	51.804	0.418			Vel = 4.00	
HDR	0.0	6.357	1L	11.316	8.000	28.600				
to		120		0.0	11.316	7.732			* Fixed loss = 6	
BASE	177.85	0.0011		0.0	19.316	0.022			Vel = 1.80	
BASE	0.0	6.16	1E	20.084	100.000	36.354				
to		140	1G	4.304	67.425	0.0				
TEST	177.85	0.0010	1T	43.037	167.425	0.168			Vel = 1.91	
	100.00								Qa = 100.00	
	277.85					36.522			K Factor = 45.98	

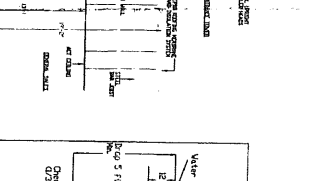


AREA	NO. OF SPRINKLERS	SPRINKLER HEAD MODEL	SPRINKLER HEAD RATING	SPRINKLER HEAD TYPE	SPRINKLER HEAD COLOR	SPRINKLER HEAD THERMALLY SENSITIVE ELEMENT (TSE) TEMP.	SPRINKLER HEAD VOLUME	SPRINKLER HEAD WEIGHT	SPRINKLER HEAD DIMENSIONS
AREA 1	13	...	...	...	...	...	...	...	...
AREA 2	3	...	...	...	...	...	...	...	...
AREA 3	10	...	...	...	...	...	...	...	...

AREA	NO. OF SPRINKLERS	SPRINKLER HEAD MODEL	SPRINKLER HEAD RATING	SPRINKLER HEAD TYPE	SPRINKLER HEAD COLOR	SPRINKLER HEAD THERMALLY SENSITIVE ELEMENT (TSE) TEMP.	SPRINKLER HEAD VOLUME	SPRINKLER HEAD WEIGHT	SPRINKLER HEAD DIMENSIONS
AREA 4
AREA 5

AREA	NO. OF SPRINKLERS	SPRINKLER HEAD MODEL	SPRINKLER HEAD RATING	SPRINKLER HEAD TYPE	SPRINKLER HEAD COLOR	SPRINKLER HEAD THERMALLY SENSITIVE ELEMENT (TSE) TEMP.	SPRINKLER HEAD VOLUME	SPRINKLER HEAD WEIGHT	SPRINKLER HEAD DIMENSIONS
AREA 6
AREA 7

AREA	NO. OF SPRINKLERS	SPRINKLER HEAD MODEL	SPRINKLER HEAD RATING	SPRINKLER HEAD TYPE	SPRINKLER HEAD COLOR	SPRINKLER HEAD THERMALLY SENSITIVE ELEMENT (TSE) TEMP.	SPRINKLER HEAD VOLUME	SPRINKLER HEAD WEIGHT	SPRINKLER HEAD DIMENSIONS
AREA 8
AREA 9



HYDRAULIC SYSTEM
 THIS BUILDING IS PROTECTED BY A HYDRAULICALLY DESIGNED AUTOMATIC SPRINKLER SYSTEM.
 LOCATION: AREA 1
 NO. OF SPRINKLERS: 13
 BASIS OF DESIGN: 1.5 GPM @ 100 PSI
 SYSTEM DEMAND: 19.5 GPM @ 100 PSI

HYDRAULIC SYSTEM
 THIS BUILDING IS PROTECTED BY A HYDRAULICALLY DESIGNED AUTOMATIC SPRINKLER SYSTEM.
 LOCATION: AREA 2
 NO. OF SPRINKLERS: 3
 BASIS OF DESIGN: 1.5 GPM @ 100 PSI
 SYSTEM DEMAND: 4.5 GPM @ 100 PSI

HYDRAULIC SYSTEM
 THIS BUILDING IS PROTECTED BY A HYDRAULICALLY DESIGNED AUTOMATIC SPRINKLER SYSTEM.
 LOCATION: AREA 3
 NO. OF SPRINKLERS: 10
 BASIS OF DESIGN: 1.5 GPM @ 100 PSI
 SYSTEM DEMAND: 15 GPM @ 100 PSI

HYDRAULIC SYSTEM
 THIS BUILDING IS PROTECTED BY A HYDRAULICALLY DESIGNED AUTOMATIC SPRINKLER SYSTEM.
 LOCATION: AREA 4
 NO. OF SPRINKLERS: 3
 BASIS OF DESIGN: 1.5 GPM @ 100 PSI
 SYSTEM DEMAND: 4.5 GPM @ 100 PSI

HYDRAULIC SYSTEM
 THIS BUILDING IS PROTECTED BY A HYDRAULICALLY DESIGNED AUTOMATIC SPRINKLER SYSTEM.
 LOCATION: AREA 5
 NO. OF SPRINKLERS: 10
 BASIS OF DESIGN: 1.5 GPM @ 100 PSI
 SYSTEM DEMAND: 15 GPM @ 100 PSI

GENERAL NOTES
 1. THE SPRINKLER SYSTEM SHALL COMPLY WITH THE NFPA 13 CODE.
 2. THE SPRINKLER SYSTEM SHALL BE DESIGNED TO PROTECT THE BUILDING AGAINST FIRE.
 3. THE SPRINKLER SYSTEM SHALL BE DESIGNED TO PROTECT THE BUILDING AGAINST FIRE.
 4. THE SPRINKLER SYSTEM SHALL BE DESIGNED TO PROTECT THE BUILDING AGAINST FIRE.
 5. THE SPRINKLER SYSTEM SHALL BE DESIGNED TO PROTECT THE BUILDING AGAINST FIRE.

GENERAL NOTES
 6. THE SPRINKLER SYSTEM SHALL COMPLY WITH THE NFPA 13 CODE.
 7. THE SPRINKLER SYSTEM SHALL BE DESIGNED TO PROTECT THE BUILDING AGAINST FIRE.
 8. THE SPRINKLER SYSTEM SHALL BE DESIGNED TO PROTECT THE BUILDING AGAINST FIRE.
 9. THE SPRINKLER SYSTEM SHALL BE DESIGNED TO PROTECT THE BUILDING AGAINST FIRE.

GENERAL NOTES
 10. THE SPRINKLER SYSTEM SHALL COMPLY WITH THE NFPA 13 CODE.
 11. THE SPRINKLER SYSTEM SHALL BE DESIGNED TO PROTECT THE BUILDING AGAINST FIRE.
 12. THE SPRINKLER SYSTEM SHALL BE DESIGNED TO PROTECT THE BUILDING AGAINST FIRE.
 13. THE SPRINKLER SYSTEM SHALL BE DESIGNED TO PROTECT THE BUILDING AGAINST FIRE.

SPRINKLER HEAD SCHEDULE

SPRINKLER TYPE	MANUFACTURER	MODEL	RATING	TEMP.	TYPE
WHITE RECESSED	EC-14	...	...	...	...
BRASS UPRIGHT	EC-14	...	...	...	...
WHITE RECESSED	EC-20B	...	...	...	...
BRASS UPRIGHT	EC-20B	...	...	...	...
WHITE RECESSED	TY-19B	...	...	...	...
BRASS UPRIGHT	TY-19B	...	...	...	...

GENERAL SPRINKLER SYSTEM DATA

- BUILDING GENERAL INFORMATION AND CONSTRUCTION DATA
- BUILDING ADDRESS: MALDEN PHARMACY
- CONSTRUCTION TYPE: STEEL STRUCTURE
- HEAD RATED BY SPRINKLER SYSTEM
- WATER SUPPLY HEAD SPACING: 18" x 18"
- WATER SUPPLY HEAD SPACING: 18" x 18"
- SPRINKLER SYSTEM DESIGN: TM
- SPRINKLER SYSTEM DESIGN: TM
- CONNECTIONS HAVE STATE LICENSE NUMBER 389