1 First Floor Plan - 1/4"
Scale: 1/4" = 1'–0"

CRAWL SPACE LAYOUT
BENEATH OLD VAULT FLOOR
SCALE: 1/4"=1'–0"

KEYED NOTES:

- (A) RELOCATE EXISTING 1" DROP TO NEW CEILING TILE AS SHOWN, INSTALL NEW SPRINKLER–(TYPICAL UNLESS NOTED).
- (B) TIE INTO EXISTING 2" CROSSMAIN WITH A 2X1 TEELOX.
- (C) REMOVE EXISTING PENDENT SPRINKLER AND 1" DROP, RUN NEW PIPE TO HEAD IN CLOSET UNDER STAIRS.
- (D) CUT NEW 1" TEE INTO EXISTING BRANCHLINE.
- (E) TIE INTO EXISTING 1" PLUGGED 90° ELL
- (F) REPLACE EXISTING 1x1½ ELL WITH NEW 1" ELL

2 First Floor Plan - 1/4"
Scale: 1/4" = 1'–0"

28	155°	RELIABLE MODEL F1FR56 BRASS UPRIGHT	QUICK RESPONSE, STANDARD COVERAGE K=5.6, 1/2" NPT, SIN RA1425
27	155°	RELIABLE MODEL F1FR56 RECESSED PENDENT	QUICK RESPONSE, STANDARD COVERAGE WHITE. K=5.6, 1/2" NPT. SIN RA1414
4	155°	RELIABLE MODEL F1FR56 HORIZONTAL SIDEWALL	QUICK RESPONSE, STANDARD COVERAGE WHITE, K=5.6, 1/2" NPT, SIN RA1435
14	155°	RELIABLE MODEL F1FR QREC HORIZONTAL SIDEWALL	QUICK RESPONSE, EXTENDED COVERAGE WHITE. K=8.0. 3/4" NPT. SIN R4862

LEGEND:

- UPRIGHT SPRINKLER ON A BRANCH LINE
- UPRIGHT SPRINKLER ON A 1" SPRIG
- RECESSED PENDENT SPRINKLER ON A 1" DROP
- HORIZONTAL SIDEWALL SPRINKLER
- RISE OR DROP
- GROOVED RIGID COUPLING
- (XX) HYDRAULIC REFERENCE POINT
- (X'–X") CEILING HEIGHT
- HANGER

F ℄= X'–X"	FINISHED FLOOR TO PIPE CENTERLINE
C ℄= X'–X"	CEILING TO PIPE CENTERLINE
CTE	CONNECT TO EXISTING
– – – – – –	EXISTING PIPE SHOWN DOTTED
———	NEW PIPE SHOWN SOLID

FIRE PROTECTION SUBCONTRACTOR: DEAN & ALLYN, INC.
STATE OF MAINE CONTRACTOR'S LICENSE NUMBER FSC262
EXPIRATION DATE: JUNE 30, 2017

WORKING DRAWINGS PREPARED BY:
THEODORE E. CLARKE
NICET LEVEL IV
CERTIFICATION #71654
STATE OF MAINE RMS LICENSE NUMBER RMS208
EXPIRATION DATE: JUNE 30, 2017

GENERAL NOTES:

ALL 1" TO 2" THREADED PIPE IS TO BE SCH. 40 BLACK STEEL U/N.
ALL 2" TO 3" GROOVED PIPE IS TO BE SCH. 10 BLACK STEEL U/N.
ALL THREADED PIPE FITTINGS ARE TO BE BLACK CAST IRON, CLASS 125 U/N.
DIMENSIONS SHOWN ON THREADED PIPE ARE CENTER TO CENTER U/N.
DIMENSIONS SHOWN ON GROOVED PIPE ARE "CUT" LENGTHS U/N.
PENDENT SPRINKLERS IN ACOUSTIC TILE CEILINGS ARE TO BE CENTERED IN TILES UNLESS NOTED.
SUFFICIENT HEAT TO PREVENT FREEZING OF THE WET PIPE SPRINKLER SYSTEM IS REQUIRED TO BE FURNISHED BY THE BUYER/OWNER.

SCOPE OF WORK:

REWORK EXISTING WET PIPE SYSTEM OF AUTOMATIC SPRINKLERS IN RENOVATED BANK SPACE TO ACCOMMODATE NEW PARTITION LAYOUT. SYSTEM IS DESIGNED IN ACCORDANCE WITH NFPA–13, STANDARD FOR THE INSTALLATION OF SPRINKLER SYSTEMS, 2016 EDITION, FOR LIGHT HAZARD OCCUPANY. SYSTEM IS HYDRAULICALLY CALCULATED TO PROVIDE A DENSITY OF 0.10 GPM PER SQUARE FOOT OVER THE MOST REMOTE 900 SQUARE FEET, WITH A HOSE ALLOWANCE OF 100 GPM.

DEAN & ALLYN, INC.
FIRE PROTECTION • SPECIAL HAZARD
116 LEWISTON ROAD, GRAY, MAINE 04039
(207)657–5646 FAX:(207)657–5647

Reviewed for Code Compliance
Inspections Division
Approved with Conditions
Date: 12/14/16

SCALE 1/8"=1'–0"	SCALE 1/4"=1'–0"	SCALE 3/8"=1'–0"			DANA A. STEWART NICET IV – #064544		
				APPROVED BY	DATE	SURVEYED BY	TEC 10/17/16
					/ /	DRAWN BY	TEC 10/31/16
					/ /	CHECKED BY	DAS
					/ /	AT DEAN & ALLYN, INC	
		0 SUBMIT FOR APPROVAL	10/31/16		/ /	SCALE 1/8"=1'–0" U/N	
		REVISIONS	DATE		/ /	SHEET NO. FP–001	

DRAWING TITLE: OVERALL SPRINKLER LAYOUT

REV. 0

JOB:
MACHIAS SAVINGS BANK
193 MIDDLE STREET
PORTLAND, MAINE 04101

NO. OF SPRINKLERS SHOWN ON THIS SHEET: 73
NO. OF SPRINKLERS ON JOB: 73

CONTRACT WITH: CAP SERVICES, LLC
49 BRUCE HILL ROAD, CUMBERLAND, MAINE 04021

CONTRACT NO. C161373

Date: _

. . . Fire Protection by Computer Design

DEAN & ALLYN, INC.
116 LEWISTON ROAD
GRAY, MAINE 04039
207-657-5646

Job Name	:	C1373 Machias Bank Area 1
Drawing	:	FP-002
Location	:	193 Middle Street, Portland, Maine
Remote Area	:	Area 1.wx1
Contract	:	C1373
Data File	:	C1373 Machias Bank Area 1.WX1

HYDRAULIC CALCULATIONS
for

Project name: Machias Savings Bank
Location: 193 Middle Street, Portland, Maine
Drawing no: FP-002
Date: 10-14-2016

Design

Remote area number: Area 1.wx1
Remote area location: Bank Lobby
Occupancy classification: Light Hazard
Density: 0.1 - Gpm/SqFt
Area of application: 900 - SqFt
Coverage per sprinkler: 320 - SqFt
Type of sprinklers calculated: K=8.0
No. of sprinklers calculated: 7
In-rack demand: N/A - GPM
Hose streams: 100 - GPM
Total water required (including hose streams): 350.622 - GPM @ 72.8563 - Psi
Type of system: Wet
Volume of dry or preaction system: N/A - Gal

Date: _

Water supply information

Date: 06/28/2016
Location: Corner of Middle Street and Exchange Street
Source: Portland Water District

Name of contractor: DEAN & ALLYN, INC.
Address: 116 LEWISTON ROAD / / GRAY, MAINE 04039
Phone number: 207-657-5646
Name of designer: T Clarke
Authority having jurisdiction: Maine State Fire Marshal's Office
Notes: (Include peaking information or gridded systems here.) Safety Margin: 19.6 PSI

Water Supply Curve C

DEAN & ALLYN, INC.
C1373 Machias Bank Area 1

Page
Date

City Water Supply:
C1 - Static Pressure : 93
C2 - Residual Pressure: 86
C2 - Residual Flow : 1500

Demand:
D1 - Elevation : 5.
D2 - System Flow : 25(
D2 - System Pressure : 72
Hose (Demand) : 10(
D3 - System Demand : 35(
Safety Margin : 19

Rev

A

Date: 1

Fittings Used Summary

DEAN & ALLYN, INC.
C1373 Machias Bank Area 1

Page
Date

Fitting Legend

Abbrev.	Name	½	¾	1	1¼	1½	2	2½	3	3½	4	5	6	8	10	12	14	16	18
Aty	Alarm Tyco AV-1							14			23		24	23					
E	NFPA 13 90' Standard Elbow	1	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45
G	NFPA 13 Gate Valve	0	0	0	0	0	1	1	1	1	2	2	3	4	5	6	7	8	10
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

Rev

A

Date: __1

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.

Pressure / Flow Summary - STANDARD

DEAN & ALLYN, INC.
C1373 Machias Bank Area 1

Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area
DP01	9.0	5.6	7.17	na	15.0	0.1	150
EQ01	11.0		6.61	na			
DP02	9.0	5.6	7.17	na	15.0	0.1	150
EQ02	11.0		6.84	na			
101	11.0	K = K @ EQ01	26.91	na	30.25		
102	11.0	K = K @ EQ02	29.74	na	31.27		
103	11.0	K = K @ EQ02	41.98	na	37.15		
104	11.0		47.55	na			
105	12.29		49.81	na			
106	12.29		50.1	na			
107	12.29		50.15	na			
108	-2.17		72.1	na			
TR	-2.17		72.77	na			
BR	-6.083		75.23	na			
FF	-6.083		75.27	na			
CITY	-6.08		75.45	na	100.0		
TEST	0.0		72.86	na			
110	13.17	8	16.0	na	32.0	0.1	320
111	13.17	8	20.35	na	36.09	0.1	320
112	13.17	8	24.97	na	39.97	0.1	320
113	13.17	8	30.09	na	43.89	0.1	320
114	13.17		43.66	na			

Date: _

The maximum velocity is 23.95 and it occurs in the pipe between nodes 113 and 114

Hyd. Ref. Point	Qa / Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt / Pe / Pf	Pt / Pv / Pn	******* Notes
DP01	15.00	1.049	E	2.0	2.000	7.175		K Factor = 5.60
to		120.0		0.0	2.000	-0.866		
EQ01	15.0	0.0762		0.0	4.000	0.305		Vel = 5.57
	0.0							
	15.00					6.614		K Factor = 5.83
DP02	15.00	1.049	T	5.0	2.000	7.175		K Factor = 5.60
to		120.0		0.0	5.000	-0.866		
EQ02	15.0	0.0764		0.0	7.000	0.535		Vel = 5.57
	0.0							
	15.00					6.844		K Factor = 5.73
101	30.25	1.049		0.0	10.140	26.907		K Factor @ node
to		120.0		0.0	0.0	0.0		
102	30.25	0.2798		0.0	10.140	2.837		Vel = 11.23
102	31.28	1.049		0.0	11.760	29.744		K Factor @ node
to		120.0		0.0	0.0	0.0		
103	61.53	1.0405		0.0	11.760	12.236		Vel = 22.84
103	37.15	1.38	E	3.0	5.500	41.980		K Factor @ node EQ02
to		120.0		0.0	3.000	0.0		
104	98.68	0.6558		0.0	8.500	5.574		Vel = 21.17
104	0.0	1.38	E	3.0	1.290	47.554		
to		120.0		0.0	3.000	-0.559		
105	98.68	0.6557		0.0	4.290	2.813		Vel = 21.17
105	0.0	2.157		0.0	3.930	49.808		
to		120.0		0.0	0.0	0.0		
106	98.68	0.0746		0.0	3.930	0.293		Vel = 8.66
106	0.0	3.26		0.0	4.810	50.101		
to		120.0		0.0	0.0	0.0		
107	98.68	0.0100		0.0	4.810	0.048		Vel = 3.79
107	151.94	3.26	14E	131.707	128.660	50.149		
to		120.0	T	20.159	151.866	6.263		
108	250.62	0.0559		0.0	280.526	15.683		Vel = 9.63
108	0.0	4.26	2E	26.334	18.125	72.095		
to		120.0		0.0	26.334	0.0		
TR	250.62	0.0152		0.0	44.459	0.676		Vel = 5.64
TR	0.0	4.26	G	2.633	3.917	72.771		
to		120.0	Aty	30.284	46.084	1.695		
BR	250.62	0.0152	E	13.167	50.001	0.759		Vel = 5.64
BR	0.0	4.26		0.0	2.958	75.225		
to		120.0		0.0	0.0	0.0		
FF	250.62	0.0152		0.0	2.958	0.045		Vel = 5.64
FF	0.0	6.16	E	20.084	30.000	75.270		
to		140.0	G	4.304	67.425	-0.001		
CITY	250.62	0.0019	T	43.037	97.425	0.184		Vel = 2.70
CITY	100.00	12.24	T	90.124	200.000	75.453		Qa = 100
to		140.0		0.0	90.124	-2.633		
TEST	350.62	0.0001		0.0	290.124	0.036		Vel = 0.96
	0.0							
	350.62					72.856		K Factor = 41.08

Date: _

Final Calculations - Hazen-Williams

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*******	Notes
110	32.00	1.049		0.0	14.000	16.000		K Factor = 8.00	
to		120.0		0.0	0.0	0.0			
111	32.0	0.3104		0.0	14.000	4.346		Vel = 11.88	
111	36.09	1.38		0.0	14.000	20.346		K Factor = 8.00	
to		120.0		0.0	0.0	0.0			
112	68.09	0.3301		0.0	14.000	4.621		Vel = 14.61	
112	39.97	1.61		0.0	14.000	24.967		K Factor = 8.00	
to		120.0		0.0	0.0	0.0			
113	108.06	0.3662		0.0	14.000	5.127		Vel = 17.03	
113	43.89	1.61	3E	12.0	7.720	30.094		K Factor = 8.00	
to		120.0		0.0	12.000	0.0			
114	151.95	0.6879		0.0	19.720	13.565		Vel = 23.95	
114	0.0	1.61	T	8.0	0.880	43.659			
to		120.0		0.0	8.000	0.381			
107	151.95	0.6880		0.0	8.880	6.109		Vel = 23.95	
	0.0								
	151.95					50.149		K Factor = 21.46	

Date: _

Date: _

. . . Fire Protection by Computer Design

DEAN & ALLYN, INC.
116 LEWISTON ROAD
GRAY, MAINE 04039
207-657-5646

Job Name	:	C1373 Machias Bank Area 2
Drawing	:	FP-002
Location	:	193 Middle Street, Portland, Maine
Remote Area	:	Area 2.wx2
Contract	:	C1373
Data File	:	C1373 Machias Bank Area 2.WX2

HYDRAULIC CALCULATIONS
for

Project name: Machias Savings Bank
Location: 193 Middle Street, Portland, Maine
Drawing no: FP-002
Date: 10-14-2016

Design

Remote area number: Area 2.wx2
Remote area location: Bank Lobby
Occupancy classification: Light Hazard
Density: 0.1 - Gpm/SqFt
Area of application: 900 - SqFt
Coverage per sprinkler: 256 - SqFt
Type of sprinklers calculated: K=8.0
No. of sprinklers calculated: 8
In-rack demand: N/A - GPM
Hose streams: 100 - GPM
Total water required (including hose streams): 383.9 - GPM @ 72.5 - Psi
Type of system: Wet
Volume of dry or preaction system: N/A - Gal

Date: _

Water supply information

Date: 06/28/2016
Location: Corner of Middle Street and Exchange Street
Source: Portland Water District

Name of contractor: DEAN & ALLYN, INC.
Address: 116 LEWISTON ROAD / / GRAY, MAINE 04039
Phone number: 207-657-5646
Name of designer: T Clarke
Authority having jurisdiction: Maine State Fire Marshal's Office
Notes: (Include peaking information or gridded systems here.) Safety Margin: 19.9 PSI

Water Supply Curve C

DEAN & ALLYN, INC.
C1373 Machias Bank Area 2

Page
Date

City Water Supply:
C1 - Static Pressure : 93
C2 - Residual Pressure: 86
C2 - Residual Flow : 1500

Demand:
D1 - Elevation : 5.
D2 - System Flow : 28
D2 - System Pressure : 72
Hose (Demand) : 10
D3 - System Demand : 38
Safety Margin : 19

Rev

A

Date: 1

Fittings Used Summary

DEAN & ALLYN, INC.
C1373 Machias Bank Area 2

Page
Date

Fitting Legend

Abbrev.	Name	½	¾	1	1¼	1½	2	2½	3	3½	4	5	6	8	10	12	14	16	18
Aty	Alarm Tyco AV-1							14			23		24	23					
E	NFPA 13 90' Standard Elbow	1	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45
G	NFPA 13 Gate Valve	0	0	0	0	0	1	1	1	1	2	2	3	4	5	6	7	8	10
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

Rev

A

Date: __1

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.

Pressure / Flow Summary - STANDARD

Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area
115	13.17	8	13.1	na	28.96	0.1	256
116	13.17	8	17.92	na	33.86	0.1	256
117	13.17	8	21.9	na	37.44	0.1	256
118	13.17	8	26.36	na	41.07	0.1	256
119	13.17		42.2	na			
120	11.58		48.65	na			
108	-2.17		71.26	na			
TR	-2.17		72.11	na			
BR	-6.083		74.76	na			
FF	-6.083		74.82	na			
CITY	-6.08		75.05	na	100.0		
TEST	0.0		72.46	na			
121	13.17	8	15.07	na	31.06	0.1	256
122	13.17	8	17.43	na	33.39	0.1	256
123	13.17	8	21.6	na	37.18	0.1	256
124	13.17	8	26.18	na	40.93	0.1	256
125	13.17		42.06	na			
126	11.58		48.61	na			

Date: _

The maximum velocity is 22.47 and it occurs in the pipe between nodes 124 and 125

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes
115	28.96	1.049	4E	8.0	10.670	13.100		K Factor = 8.00
to		120.0		0.0	8.000	0.0		
116	28.96	0.2580		0.0	18.670	4.817		Vel = 10.75
116	33.86	1.38		0.0	14.000	17.917		K Factor = 8.00
to		120.0		0.0	0.0	0.0		
117	62.82	0.2844		0.0	14.000	3.982		Vel = 13.48
117	37.44	1.61		0.0	14.000	21.899		K Factor = 8.00
to		120.0		0.0	0.0	0.0		
118	100.26	0.3187		0.0	14.000	4.462		Vel = 15.80
118	41.07	1.61	E	4.0	22.320	26.361		K Factor = 8.00
to		120.0		0.0	4.000	0.0		
119	141.33	0.6017		0.0	26.320	15.836		Vel = 22.27
119	0.0	1.61	T	8.0	1.580	42.197		
to		120.0		0.0	8.000	0.689		
120	141.33	0.6016		0.0	9.580	5.763		Vel = 22.27
120	142.57	3.26	11E	103.484	112.900	48.649		
to		120.0	T	20.159	123.643	5.955		
108	283.9	0.0704		0.0	236.543	16.655		Vel = 10.91
108	0.0	4.26	2E	26.334	18.125	71.259		
to		120.0		0.0	26.334	0.0		
TR	283.9	0.0191		0.0	44.459	0.851		Vel = 6.39
TR	0.0	4.26	G	2.633	3.917	72.110		
to		120.0	Aty	30.284	46.084	1.695		
BR	283.9	0.0191	E	13.167	50.001	0.956		Vel = 6.39
BR	0.0	4.26		0.0	2.958	74.761		
to		120.0		0.0	0.0	0.0		
FF	283.9	0.0193		0.0	2.958	0.057		Vel = 6.39
FF	0.0	6.16	E	20.084	30.000	74.818		
to		140.0	G	4.304	67.425	-0.001		
CITY	283.9	0.0024	T	43.037	97.425	0.232		Vel = 3.06
CITY	100.00	12.24	T	90.124	200.000	75.049		Qa = 100
to		140.0		0.0	90.124	-2.633		
TEST	383.9	0.0001		0.0	290.124	0.043		Vel = 1.05
	0.0							
	383.90					72.459		K Factor = 45.10
121	31.06	1.049		0.0	8.000	15.075		K Factor = 8.00
to		120.0		0.0	0.0	0.0		
122	31.06	0.2938		0.0	8.000	2.350		Vel = 11.53
122	33.40	1.38		0.0	14.000	17.425		K Factor = 8.00
to		120.0		0.0	0.0	0.0		
123	64.46	0.2983		0.0	14.000	4.176		Vel = 13.83
123	37.18	1.61		0.0	14.000	21.601		K Factor = 8.00
to		120.0		0.0	0.0	0.0		
124	101.64	0.3269		0.0	14.000	4.577		Vel = 16.02
124	40.93	1.61	E	4.0	21.980	26.178		K Factor = 8.00
to		120.0		0.0	4.000	0.0		
125	142.57	0.6114		0.0	25.980	15.885		Vel = 22.47
125	0.0	1.61	T	8.0	1.580	42.063		
to		120.0		0.0	8.000	0.689		
126	142.57	0.6114		0.0	9.580	5.857		Vel = 22.47

Date: _

Final Calculations - Hazen-Williams

Hyd. Ref. Point	Qa / Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*******	Notes
126	0.0	3.26		0.0	2.030	48.609			
to		120.0		0.0	0.0	0.0			
120	142.57	0.0197		0.0	2.030	0.040		Vel = 5.48	
	0.0								
	142.57					48.649		K Factor = 20.44	

Date: _

Date: _

. . . Fire Protection by Computer Design

DEAN & ALLYN, INC.
116 LEWISTON ROAD
GRAY, MAINE 04039
207-657-5646

Job Name	:	C1373 Machias Bank Area 3
Drawing	:	FP-003
Location	:	193 Middle Street, Portland, Maine
Remote Area	:	Area 3.wx3
Contract	:	C1373
Data File	:	C1373 Machias Bank Area 3.WX3

HYDRAULIC CALCULATIONS
for

Project name: Machias Savings Bank
Location: 193 Middle Street, Portland, Maine
Drawing no: FP-003
Date: 10-14-2016

Design

Remote area number: Area 3.wx3
Remote area location: Bank Offices
Occupancy classification: Light Hazard
Density: 0.1 - Gpm/SqFt
Area of application: 900 - SqFt
Coverage per sprinkler: 150 - SqFt
Type of sprinklers calculated: K=5.6
No. of sprinklers calculated: 14
In-rack demand: N/A - GPM
Hose streams: 100 - GPM
Total water required (including hose streams): 417.9 - GPM @ 74.3 - Psi
Type of system: Wet
Volume of dry or preaction system: N/A - Gal

Date: _

Water supply information

Date: 06/28/2016
Location: Corner of Middle Street and Exchange Street
Source: Portland Water District

Name of contractor: DEAN & ALLYN, INC.
Address: 116 LEWISTON ROAD / / GRAY, MAINE 04039
Phone number: 207-657-5646
Name of designer: T Clarke
Authority having jurisdiction: Maine State Fire Marshal's Office
Notes: (Include peaking information or gridded systems here.) Safety Margin: 17.9 PSI

Water Supply Curve C

DEAN & ALLYN, INC.
C1373 Machias Bank Area 3

Page
Date

City Water Supply:
C1 - Static Pressure : 93
C2 - Residual Pressure: 86
C2 - Residual Flow : 1500

Demand:
D1 - Elevation : 7.
D2 - System Flow : 31
D2 - System Pressure : 74
Hose (Demand) : 10
D3 - System Demand : 41
Safety Margin : 17

Rev

A

Date: 1

Fittings Used Summary

DEAN & ALLYN, INC.
C1373 Machias Bank Area 3

Page
Date

Fitting Legend

Abbrev.	Name	½	¾	1	1¼	1½	2	2½	3	3½	4	5	6	8	10	12	14	16	18
Aty	Alarm Tyco AV-1							14			23		24	23					
E	NFPA 13 90' Standard Elbow	1	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45
F	NFPA 13 45' Elbow	1	1	1	1	2	2	3	3	3	4	5	7	9	11	13	17	19	21
G	NFPA 13 Gate Valve	0	0	0	0	0	1	1	1	1	2	2	3	4	5	6	7	8	10
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
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
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
Y	Mechanical Tee	2	4	5	6	8	10.5	12.5	15.5	0	22	0	0	0	0	0	0	0	0

Rev

A

Date: __1

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.

Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area
131	16.375	5.6	7.0	na	14.82	0.1	140
132	12.542	5.6	9.56	na	17.31	0.1	50
134	5.0	5.6	8.87	na	16.68	0.15	75
135A	11.0	5.6	7.26	na	15.09	0.15	75
135	9.0		8.67	na			
136	9.0	5.6	9.33	na	17.11	0.1	50
137	9.0		11.3	na			
138	8.5	5.6	10.49	na	18.14	0.1	150
139	9.0		11.93	na			
140	9.0	5.6	13.28	na	20.41	0.1	100
141	11.667	5.6	28.33	na	29.8	0.1	150
142	12.333		30.28	na			
143	12.333	5.6	28.33	na	29.81	0.1	120
144	12.333		30.42	na			
145	12.333		32.69	na			
146	10.167	5.6	29.16	na	30.24	0.1	150
147	10.667		33.5	na			
148	11.667	5.6	23.09	na	26.91	0.1	150
149A	11.667	5.6	24.48	na	27.71	0.1	150
149	12.333		25.62	na			
150	12.333		33.69	na			
151	11.667	5.6	22.95	na	26.83	0.1	150
152A	11.667	5.6	23.49	na	27.14	0.1	150
152	12.333		25.92	na			
153	10.667		35.89	na			
130	11.75		38.8	na			
106	12.375		43.25	na			
107	12.375		43.67	na			
155	11.208		48.8	na			
108	-2.17		72.86	na			
TR	-2.17		73.72	na			
BR	-6.083		76.6	na			
FF	-6.083		76.67	na			
CITY	-6.08		76.96	na	100.0		
TEST	0.0		74.37	na			

Date: _

The maximum velocity is 20.28 and it occurs in the pipe between nodes 149 and 150

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes
131	14.82	1.049	3E	6.0	6.000	7.000		K Factor = 5.60
to		120.0		0.0	6.000	1.660		
132	14.82	0.0748		0.0	12.000	0.897		Vel = 5.50
132	17.31	1.049		0.0	0.667	9.557		K Factor = 5.60
to		120.0		0.0	0.0	1.534		
137	32.13	0.3118		0.0	0.667	0.208		Vel = 11.93
	0.0							
	32.13					11.299		K Factor = 9.56
134	16.68	1.049	2E	4.0	7.500	8.868		K Factor = 5.60
to		120.0	T	5.0	9.000	-1.732		
135	16.68	0.0929		0.0	16.500	1.533		Vel = 6.19
	0.0							
	16.68					8.669		K Factor = 5.67
135A	15.09	1.049	T	5.0	2.000	7.262		K Factor = 5.60
to		120.0		0.0	5.000	0.866		
135	15.09	0.0773		0.0	7.000	0.541		Vel = 5.60
135	16.68	1.049		0.0	2.167	8.669		
to		120.0		0.0	0.0	0.0		
136	31.77	0.3064		0.0	2.167	0.664		Vel = 11.79
136	17.10	1.38	T	6.0	5.000	9.333		K Factor = 5.60
to		120.0		0.0	6.000	0.0		
137	48.87	0.1787		0.0	11.000	1.966		Vel = 10.48
137	32.13	1.61		0.0	2.917	11.299		
to		120.0		0.0	0.0	0.0		
139	81.0	0.2149		0.0	2.917	0.627		Vel = 12.77
	0.0							
	81.00					11.926		K Factor = 23.46
138	18.14	1.049	E	2.0	8.167	10.495		K Factor = 5.60
to		120.0	T	5.0	7.000	-0.217		
139	18.14	0.1087		0.0	15.167	1.648		Vel = 6.73
139	81.00	1.61		0.0	4.333	11.926		
to		120.0		0.0	0.0	0.0		
140	99.14	0.3123		0.0	4.333	1.353		Vel = 15.62
140	20.41	1.682	6E	29.699	21.333	13.279		K Factor = 5.60
to		120.0	3F	7.425	37.124	-1.444		
145	119.55	0.3567		0.0	58.457	20.854		Vel = 17.26
	0.0							
	119.55					32.689		K Factor = 20.91
141	29.80	1.049	E	2.0	6.250	28.326		K Factor = 5.60
to		120.0		0.0	2.000	-0.288		
142	29.8	0.2721		0.0	8.250	2.245		Vel = 11.06
142	0.0	1.61		0.0	3.917	30.283		
to		120.0		0.0	0.0	0.0		
144	29.8	0.0337		0.0	3.917	0.132		Vel = 4.70
	0.0							
	29.80					30.415		K Factor = 5.40
143	29.81	1.049	T	5.0	2.667	28.328		K Factor = 5.60
to		120.0		0.0	5.000	0.0		
144	29.81	0.2722		0.0	7.667	2.087		Vel = 11.07

Date: _

Hyd. Ref. Point	Qa / Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes
144	29.80	1.61	E	4.0	6.667	30.415		
to		120.0	T	8.0	12.000	0.0		
145	59.61	0.1218		0.0	18.667	2.274		Vel = 9.39
145	119.55	3.26		0.0	3.125	32.689		
to		120.0		0.0	0.0	0.722		
147	179.16	0.0301		0.0	3.125	0.094		Vel = 6.89
	0.0							
	179.16					33.505		K Factor = 30.95
146	30.24	1.049	3E	6.0	5.333	29.155		K Factor = 5.60
to		120.0	T	5.0	11.000	-0.217		
147	30.24	0.2796		0.0	16.333	4.567		Vel = 11.23
147	179.16	3.26	2I	13.44	9.250	33.505		
to		120.0		0.0	13.440	-0.722		
150	209.4	0.0401		0.0	22.690	0.910		Vel = 8.05
	0.0							
	209.40					33.693		K Factor = 36.08
148	26.91	1.049	E	2.0	10.500	23.094		K Factor = 5.60
to		120.0		0.0	2.000	-0.288		
149	26.91	0.2254		0.0	12.500	2.817		Vel = 9.99
	0.0							
	26.91					25.623		K Factor = 5.32
149A	27.71	1.049	T	5.0	1.000	24.484		K Factor = 5.60
to		120.0		0.0	5.000	-0.288		
149	27.71	0.2378		0.0	6.000	1.427		Vel = 10.29
149	26.91	1.049	T	5.0	4.667	25.623		
to		120.0		0.0	5.000	0.0		
150	54.62	0.8348		0.0	9.667	8.070		Vel = 20.28
150	209.40	3.26	2I	13.44	10.500	33.693		
to		120.0		0.0	13.440	0.722		
153	264.02	0.0615		0.0	23.940	1.473		Vel = 10.15
	0.0							
	264.02					35.888		K Factor = 44.07
151	26.83	1.049	E	2.0	12.542	22.946		K Factor = 5.60
to		120.0		0.0	2.000	-0.288		
152	26.83	0.2240		0.0	14.542	3.257		Vel = 9.96
	0.0							
	26.83					25.915		K Factor = 5.27
152A	27.14	1.049	2E	4.0	2.875	23.486		K Factor = 5.60
to		120.0	T	5.0	9.000	-0.288		
152	27.14	0.2288		0.0	11.875	2.717		Vel = 10.08
152	26.82	1.049	E	2.0	4.333	25.915		
to		120.0	T	5.0	7.000	0.722		
153	53.96	0.8163		0.0	11.333	9.251		Vel = 20.03
153	264.02	3.26	2I	13.44	25.500	35.888		
to		120.0		0.0	13.440	-0.469		
130	317.98	0.0869		0.0	38.940	3.382		Vel = 12.22
130	0.0	3.26	3I	20.159	16.750	38.801		
to		120.0	J	17.471	37.630	-0.271		
106	317.98	0.0868		0.0	54.380	4.722		Vel = 12.22

Date: _

Final Calculations - Hazen-Williams

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*******	Notes
106	0.0	3.26		0.0	4.833	43.252			
to		120.0		0.0	0.0	0.0			
107	317.98	0.0869		0.0	4.833	0.420		Vel = 12.22	
107	0.0	3.26	5I	33.599	19.583	43.672			
to		120.0		0.0	33.599	0.505			
155	317.98	0.0869		0.0	53.182	4.619		Vel = 12.22	
155	0.0	3.26	14I	94.077	95.500	48.796			
to		120.0	Y	20.831	114.908	5.794			
108	317.98	0.0868		0.0	210.408	18.272		Vel = 12.22	
108	0.0	4.26	2I	18.434	18.125	72.862			
to		120.0		0.0	18.434	0.0			
TR	317.98	0.0236		0.0	36.559	0.863		Vel = 7.16	
TR	0.0	4.26	G	2.633	3.917	73.725			
to		120.0	Aty	30.284	46.084	1.695			
BR	317.98	0.0236	E	13.167	50.001	1.180		Vel = 7.16	
BR	0.0	4.26		0.0	2.958	76.600			
to		120.0		0.0	0.0	0.0			
FF	317.98	0.0233		0.0	2.958	0.069		Vel = 7.16	
FF	0.0	6.16	E	20.084	30.000	76.669			
to		140.0	G	4.304	67.425	-0.001			
CITY	317.98	0.0029	T	43.037	97.425	0.287		Vel = 3.42	
CITY	100.00	12.24	T	90.124	200.000	76.955		Qa = 100	
to		140.0		0.0	90.124	-2.633			
TEST	417.98	0.0002		0.0	290.124	0.050		Vel = 1.14	
	0.0								
	417.98					74.372		K Factor = 48.47	

Date: _