



Halifax Elementary School

464 Plymouth Street, Halifax, Massachusetts 02338

Fire Protection System Evaluation

Schematic Design Submission

March 3, 2017

Prepared for:

Town of Halifax
499 Plymouth Street, Halifax, Massachusetts 02338

Prepared by:

H&A | **H A B E E B & A S S O C I A T E S**
A R C H I T E C T S



Acknowledgements

Owner

Town of Halifax

499 Plymouth Street, Halifax, Massachusetts 02338

Charlie Seelig, Halifax Town Administrator

Halifax Elementary School

494 Plymouth Street, Halifax, Massachusetts 02338

Matthew Durkee, Head Custodian

Project Management

The Vertex Companies, Inc.

400 Libbey Parkway, Weymouth, Massachusetts 02189

Jon Lemieux, P.E.

Architect

Habeeb & Associates Architects

150 Longwater Drive, Suite 201, Norwell, MA 02061

Scott Bancroft, AIA Project Manager

Fire Protection Engineer

Shekar & Associates, Inc.

775 Pleasant Street #14, East Weymouth, MA 02189

S. Chandrashekar, P.E. Principal

Gary Goss, Designer



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Section 1 – Introduction

Habeeb & Associates Architects was retained by the Town of Halifax, Massachusetts as the Architect Engineer for the preparation of this Fire Protection System Study Project at the Halifax Elementary School. This Study is to be performed as a consultant to the town with no MSBA involvement. The Halifax Elementary School building consists of several renovation projects/additions over the years. The original building was constructed in 1958, followed by additions in 1964, 1975 and 1992. The 1992 addition connected the buildings together. The original 1958 building, 1964 addition and 1975 building are all one story and the 1992 addition is two stories. The 1975 addition is now the Halifax Town Library and it will not be included in the scope of this study. The main entrance to the building is at the true north side of the original building.

This study covers an interior assessment of the existing fire protections, recommendations and conclusions for potential remedies and solutions.

Section 2 – Executive Summary

In accordance with its agreement with the Town of Halifax, **Habeb** & Associates Architects (**H&A**) has completed a Fire Protection System Evaluation Report to establish a preliminary scope of construction for the Halifax Elementary School in Halifax, Massachusetts. The intent of this report is to review the applicable codes and to define the scope of work required to provide a complete sprinkler system for the building.

The Halifax Elementary School was originally constructed in 1958. This was followed by additions in 1964, 1975 and 1992. The 1992 addition connected the buildings. The original 1958 building, 1964 addition and 1975 building are all one story and the 1992 addition is two stories. The 1975 addition is now the Halifax Town Library and is not included in the scope of this report. The main entrance to the building is at the true north side of the original building.

The Town of Halifax retained the **H&A** team to produce the Fire Protection System Report. As an integral part of the Project Team, Shekar & Associates, Inc. assumed the responsibility of the Fire Protection Engineer. The **H&A** team visited the Halifax Elementary School to assess the existing Fire Protection System. The school is approximately 90,000 square feet and is not fully sprinklered. The existing system is a dry pipe sprinkler system (Refer to Photos #1-5). Compressed air is introduced into the system (Refer to Photo #4) after the dry pipe alarm check valves. The Schedule 40 steel pipes are installed throughout the system. Over the years, these pipes have corroded from the inside out, creating tiny pinhole leaks throughout, requiring replacement.

A Hydrant Flow Test was performed by JB Engineering, Inc. on February 21, 2017. The test results were as follows (Appendix B):

Static:	75 PSI
Residual:	72 PSI
Pito:	45
Total GPM:	1130

A 6" water service enters the Basement Mechanical Room. The results of the Hydrant Flow Test indicate that the 6" pipe does not have to be increased in size.

Recommendations:

1. Demolition and removal of entire Dry Pipe System.
2. Demolition and removal of all existing Schedule 40 pipe, alarms, valves and heads.
3. Building-wide installation new wet pipe system, alarm check valves with accessories.
4. New Schedule 40 steel piping throughout.
5. Repair / replace ceilings and repair walls as required.

Refer to the drawings in Appendix A for further details.

Repair to walls and ceilings at areas of demolition and/or new installation of the wet pipe system will be required. As the sprinkler system is demolished, ceiling and possibly wall damage will be inevitable. As the new systems are installed the same type of damage may be realized.



Estimated Construction Cost:

- Sprinkler System demolition \$54,000
- Ceiling removal \$7,500
- New Sprinkler System installation \$533,052
- New / repair ceilings \$81,000
- Repair of walls \$46,000

Sub Total **\$721,552**

Overhead and Profit (12%) \$86,586

Contingency (10%) \$72,155

Total \$880,293

STUDY REPORT

for

HALIFAX ELEMENTARY SCHOOL

Fire Protection System

Prepared by:

**S. Chandrashekar, P.E. & Gary Goss
SHEKAR & ASSOCIATES, INC.
775 Pleasant Street #14
East Weymouth, Massachusetts 02189**

February 21, 2017

Preface

Shekar & Associates, Inc. (SAI) prepared this report for Halifax Elementary School. The purpose of the report was to survey the existing conditions at the school including evaluation of the building's fire protection system. This report contains analysis and recommendations for a new fire protection system for the entire school.

Throughout the project SAI worked closely with representatives of the Halifax Elementary School facility group (Mr. Matthew Durkee, Head Custodian) and Habeeb & Associates Architects (Mr. Scott Bancroft, AIA) to achieve the project objectives.

This report covers an assessment of existing conditions, recommendations and conclusions for proposed remedies and solutions.

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1.0 Executive Summary

1.1 Background

S. Chandrashekar & Scott Bancroft visited the school on February 3, 2017. Matthew Durkee showed the existing sprinkler system throughout the school.

Mr. Durkee provided existing as-built drawings prepared by Durate & Perry Plumbing & Heating, Inc. dated 6/23/93.

The school is not fully sprinklered.

Total area of the school is approximately 90,000 sq. ft.

1.2 Scope of Work

The scope of this project is to review the existing fire protection system and prepare an existing conditions study report. The report will include recommendations for a new fire protection system for the entire school.

1.3 Conclusions and Recommendations

The existing sprinkler system is a dry system with two dry pipe main alarm check valves. (Refer to photos 2-5.) Compressed air is introduced into the system after the dry pipe alarm check valves. Schedule 40 steel pipes are installed throughout the system.

Since non-galvanized steel pipes are used, these pipes have corroded from the inside. Temporary patchwork is provided at many locations to stop the leaks. (Refer to Photo 8.) Leaky steel pipes are a major problem in the building.

Our recommendation is to replace the dry pipe alarm check valves, air compressor and steel pipes throughout the building.

Replace the dry pipe sprinkler system with a wet pipe sprinkler system with two wet pipe alarm check valves, Schedule 40 steel pipes throughout the building, quick response upright and pendant sprinkler heads for the entire school.

The existing 6" incoming service, double check valve, fire department connection & related items may be retained.

2.0 Existing Conditions Assessment

2.1 Fire Protection

- 2.1.1 6" water service enters the basement mechanical room. 6" supervisory gate valves, double check valve and 6" pipe header are located in the basement. 4" siamese connection and water motor gong are located outside. Two 4" dry pipe alarm check valves and supervisory gate valves are connected to a 6" header, (Refer to Photo 5.) Original air compressor is disconnected from the system. The size is too small. At present, an automatic control compressor is used to keep the air pressure in the system. (Refer to Photo 4.)
- 2.1.2 Schedule 40 steel pipes are used throughout the dry pipe system. Pipes are corroded and there are leaks at many places. Temporary pipe clamps are used to stop leaks.
- 2.1.3 Upright and pendant sprinkler heads are used in spaces.
- 2.1.4 Refer to drawings FP-100, FP-101, FP-102 & FP-103 for details.

3.0 Design Approach / New Systems

3.1 Fire Protection

- 3.1.1 Existing Schedule 40 steel pipes beyond dry pipe alarm check valves and sprinkler heads will be removed from the building.
- 3.1.2 A new wet pipe system will be designed throughout the building. Entire 90,000 sq. ft. school will be covered with wet pipe sprinkler system.
- 3.1.3 Two new wet pipe alarm check valves with all accessories will be installed.
- 3.1.4 Schedule 40 steel pipes will be run throughout the building.
- 3.1.5 Quick response upright and pendant sprinkler heads will be used at all occupied spaces.
- 3.1.6 Existing 6" incoming service and double check valves may be retained.
- 3.1.7 Refer to drawings FP-104, FP-105, FP-106 & FP-107 for details.

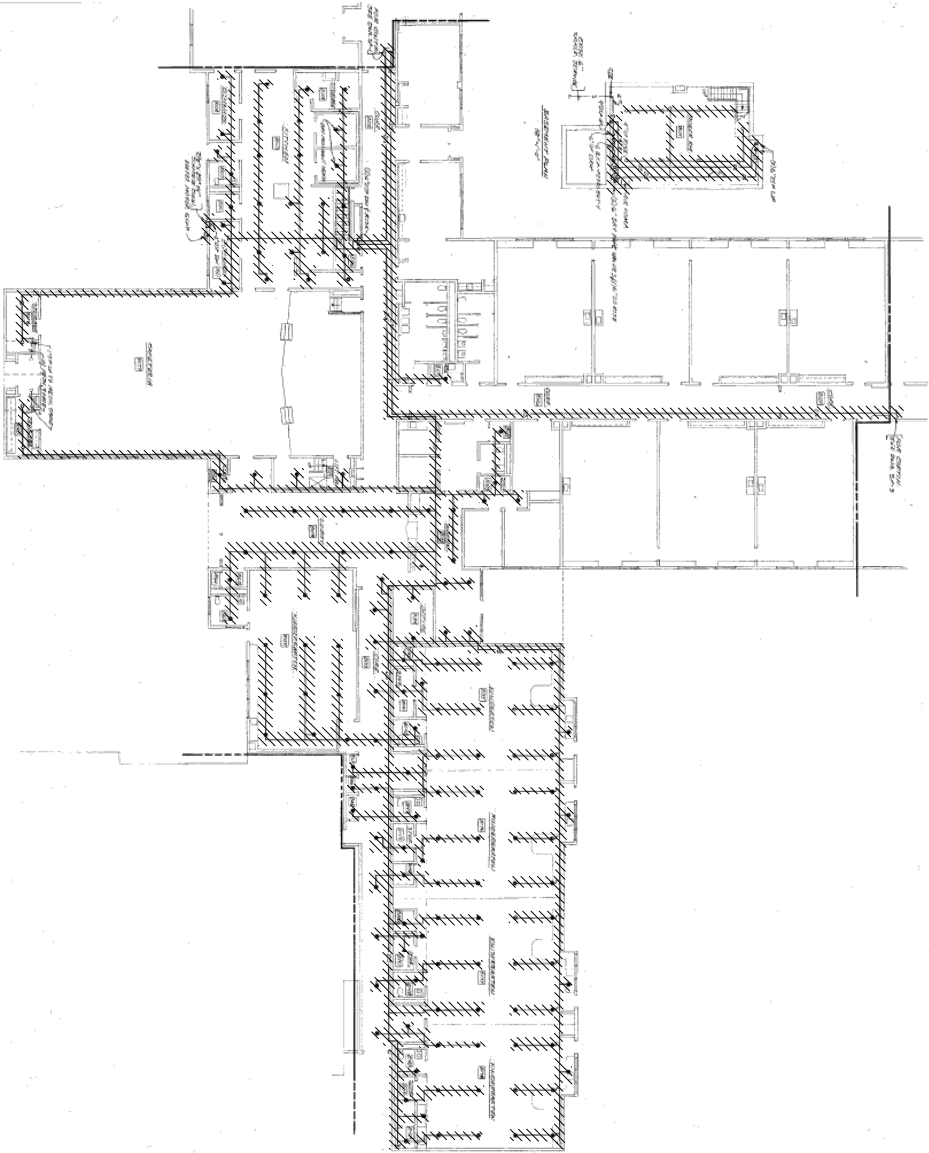
4.0 Schematic Drawings

- FP-100 Wing A Sprinkler Demolition
- FP-101 Wing B Sprinkler Demolition
- FP-102 Wing C Lower Level Sprinkler Demolition
- FP-103 Wing C Upper Level Sprinkler Demolition
- FP-104 Wing A Sprinkler New Work Plan
- FP-105 Wing B Sprinkler New Work Plan
- FP-106 Wing C Lower Level Sprinkler New Work Plan
- FP-107 Wing C Upper Level Sprinkler New Work Plan



- 2-15-17
-
- 100% STUDY

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REVISIONS:

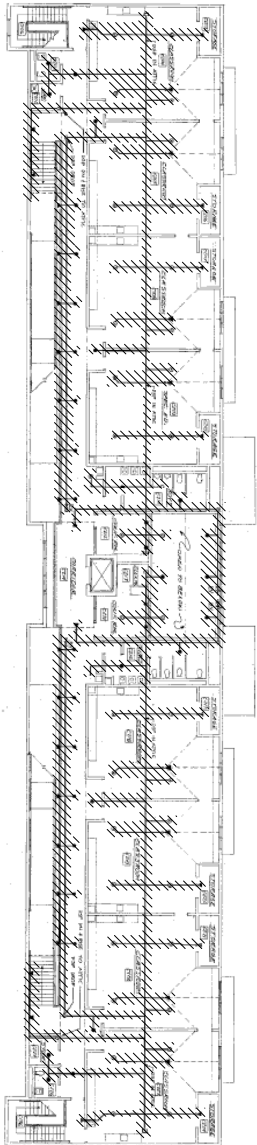
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CHECKED BY: SC

JUNG B
SPONSOR
DEMOLITION PLAN

FP-101

2-15-17
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2-15-17
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HALIFAX ELEMENTARY SCHOOL
HALIFAX, MA

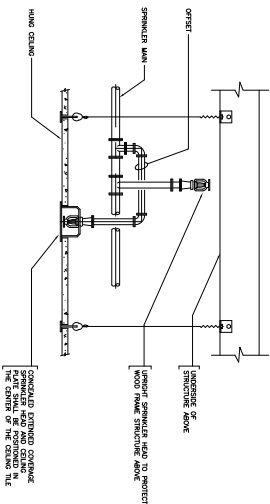
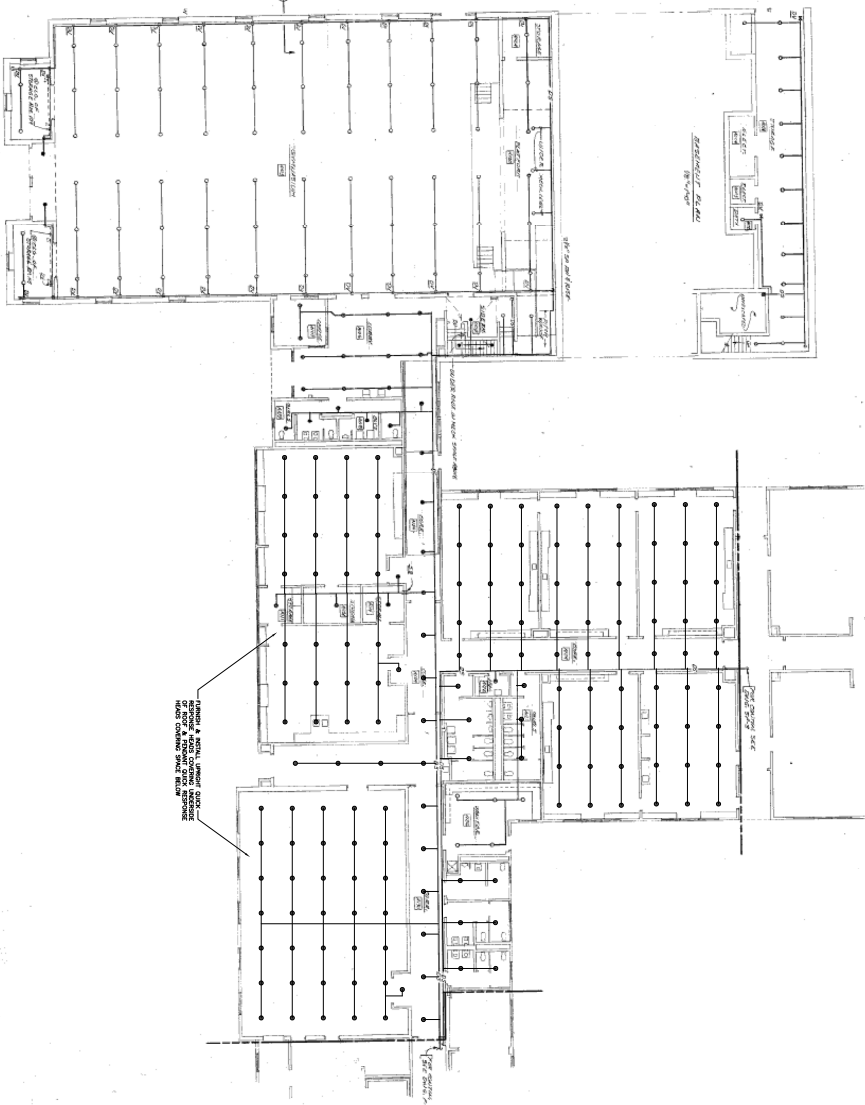


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REVISIONS:		
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CHECKED BY:	SC

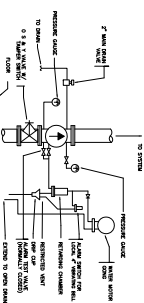
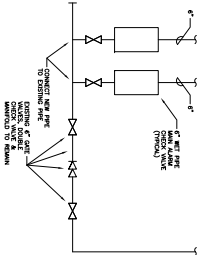
WING C
UPPER LEVEL
SPRINKLER
DEMOLITION PLAN
FP-103



3 TYPICAL SPRINKLER INSTALLATION (ABOVE AND BELOW CEILING)
SCALE: NONE

FIRE PROTECTION LEGEND

- WINKING RECESSED QUICK RESPONSE PENDANT HEAD
- WINKING UPRIGHT QUICK RESPONSE SPRINKLER HEAD



DETAIL OF WET PIPE MAIN ALARM CHECK VALVE
NOTE: SEE SHEET

HALIFAX ELEMENTARY SCHOOL
HALIFAX, MA

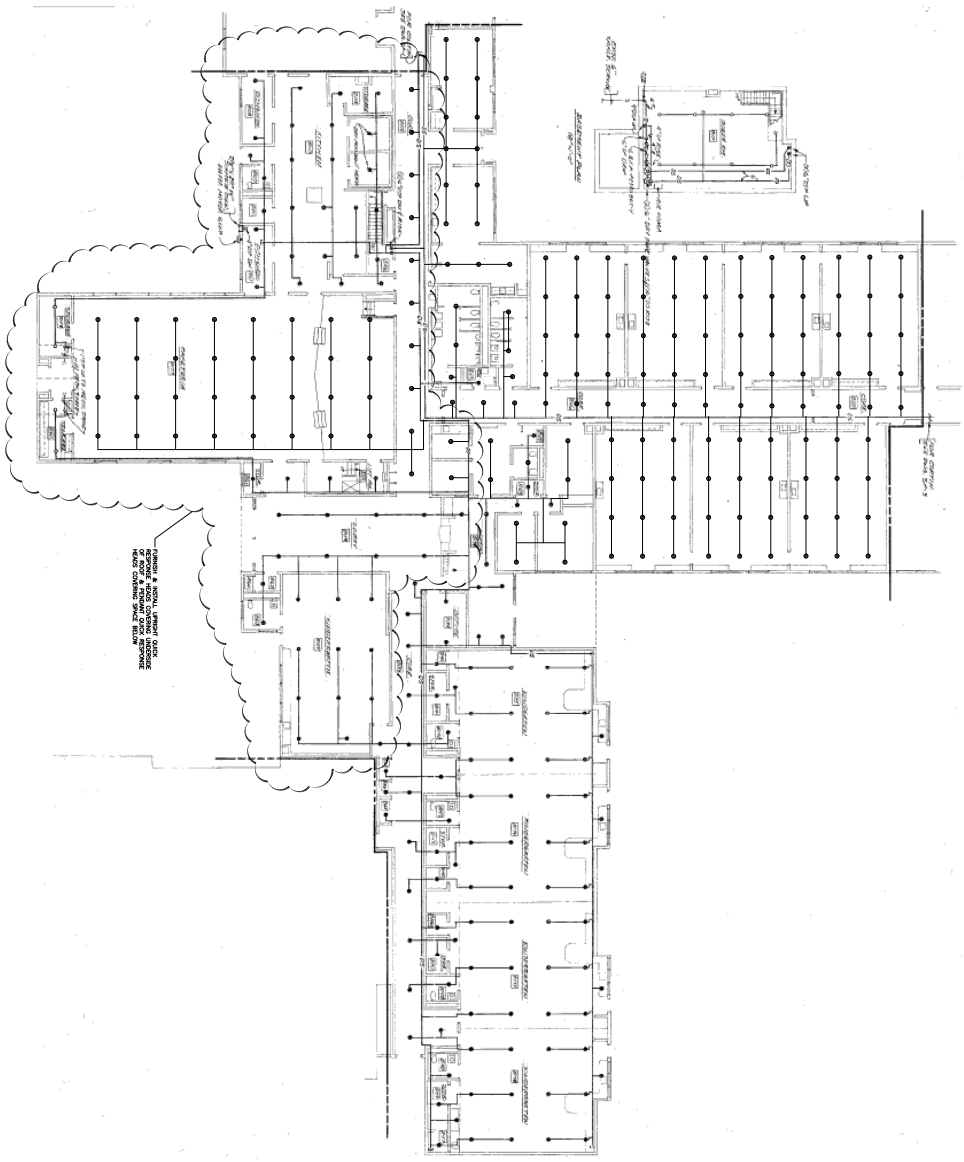


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UNGA
SPRINKLER
NEW WORK PLAN
2-15-17
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FP-104

REVISIONS:	DATE:	DESCRIPTION:

PROJECT NO.: 1603.00
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HALIFAX ELEMENTARY SCHOOL HALIFAX, MA



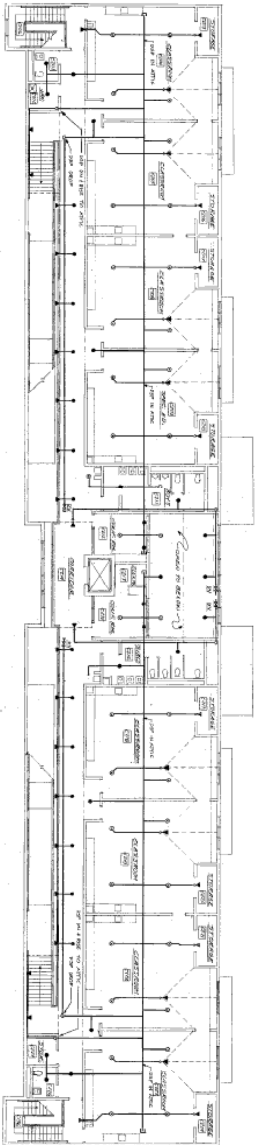
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REVISIONS:		
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PROJECT NO: 1003.00
DATE: FEB/2017
SCALE: 1/1" = 1'-0"
DRAWN: GNG
CHECKED BY: SC

JUNG B
SHEKAR & ASSOC.
NEW WORK PLAN
FP-105

2-15-17
100% STUDY



REVISIONS:		
MARK	DATE	DESCRIPTION

PROJECT NO.	1603.00
DATE	7/20/07
SCALE	1/4" = 1'-0"
DRAWN BY	DMG
CHECKED BY	SC

WING C
UPPER LEVEL
SPRINKLER
NEW WORK PLAN

FP-107

HALIFAX ELEMENTARY SCHOOL
HALIFAX, MA



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APPENDIX B
Hydrant Flow Test Results

J B Engineering
96 Reservoir Park Drive
Rockland, Massachusetts 02370
(781)-871-8277

Fax (781)-878-4799

E Mail JBENGINE@AOL.Com

February 22, 2017

Re: Halifax Elementary School
Halifax Massachusetts

On February 21, 2017 at 9:00am a Hydrant Flow Test was conducted by Mass Fire Prevention, Inc. and the Halifax Water Dept. Two hydrants were flowed on the school premises. The Results of that test are as follows:

Static:	75 PSI
Residual:	72 PSI
Pito:	45
Total GPM:	1130

If you have any further questions or concerns please feel free to contact our office

Sincerely,

James N. McHugh
F.P.E



Appendix C: Existing Conditions Photographs



Photo 1: Backflow preventer



Photo 2: Dry Pipe Risers



Photo 3: Dry Pipe Risers



Photo 4: Temporary Air Compressor for Dry Pipe System



Photo 5: Dry pipe valves and accessories



Photo 6: Sprinkler Drain



Photo 7: Pendant sprinkler head



Photo 8: Temporary patch for leaky pipe



Photo 9: Sidewall sprinkler heads