

**MILFORD SCHOOL DISTRICT**

SAU 40  
100 West Street  
Milford, NH 03055  
603-673-2202  
Fax 603-673-2237

**Michael Tenters**  
Director of Curriculum

**Robert Marquis**  
Superintendent of Schools

**Jennifer Burk**  
Business Administrator

March 22, 2017

Dear Potential Bidder:

Enclosed is an Invitation to Bid on the construction of Fire Alarm system to the Milford Middle School for the Milford School District. When submitted, bids must include completed Cost Statement, Good Faith Statement, the Experience/Performance Statement, and evidence of insurability and bonding capability, if applicable.

**A pre-bid Meeting has been scheduled for March 31, 2017 at 9:00 AM at the site: Milford Middle School, 33 Osgood Road Milford, NH 03055. Site visits will not be allowed prior to April 4, 2017.**

**A firm completion date has been set for August 25, 2017. Late penalties will apply.**

Please call if you require further information about the needs of the District or our general requirements.

Sincerely,

Jennifer Burk  
Business Administrator  
Milford School District

Enclosures:

Good Faith Statement  
Cost Statement  
Statement of Experience and Ability to Perform  
Invitation to Bid

Milford Middle School Fire Alarm  
MILFORD SCHOOL DISTRICT  
BID

**GOOD FAITH STATEMENT**

To Whom It May Concern:

The undersigned represents that this proposal is made in good faith, without fraud, collusion or connection of any kind with any other bidder for the same work; that he has informed himself fully in regard to the Specifications for the Fire Alarm system at the Milford Middle School for the Milford School District of Milford, New Hampshire, and has made his own examinations and estimates and from them makes this proposal.

The undersigned understand that the Milford School District reserves the right to waive any formalities in, to reject any and all bids or any part thereof, and/or accept any bid or part thereof, or to select a bidder whose bid is not the lowest, which it considers to be for the best interest of the Milford School District.

With the above understanding, the undersigned proposes to remove and replace the fire alarm system and all associated wiring and components at the Milford Middle School for the Milford School District and to comply in all respects with said specifications for the sum or sums stated.

COMPANY:

\_\_\_\_\_

ADDRESS:

\_\_\_\_\_

NAME (typed or printed): \_\_\_\_\_

SIGNATURE: \_\_\_\_\_

TITLE:

\_\_\_\_\_

DATE:

\_\_\_\_\_

Milford Middle School Fire Alarm  
MILFORD SCHOOL DISTRICT  
BID

**STATEMENT OF BUSINESS EXPERIENCE AND  
ABILITY TO PERFORM**

1. How long have you been in business? \_\_\_\_\_ Years
2. How many \_\_\_\_\_ have you completed? \_\_\_\_\_
3. Please attach a list of the schools and work you have completed or at which you are currently engaged, including the name of the facility and project, the approximate square footage of the project, and the year the construction was complete.
4. Other
  - a. The Bidder shall provide copies of the company's employee safety training program, personnel policies (including criminal background check policy), and work rules.
  - b. The Bidder shall provide four (4) current references, including email addresses and phone numbers, two (2) of which should be school districts in New Hampshire.
  - c. The Bidder shall disclose any active or pending litigation against the Bidder.
  - d. The Bidder shall provide a copy of the Certificate of Authority from the New Hampshire Department of State indicating the Bidder may transact business in the State of NH.
  - e. For bids in excess of \$100,000, The Bidder shall submit certifications of employee 10-hour OSHA safety training.
  - f. The Bidder shall submit EPA lead paint certifications for company(ies) and employees.

BIDDER:

\_\_\_\_\_

ADDRESS:

\_\_\_\_\_

NAME:

\_\_\_\_\_

\_\_\_\_\_  
Signature Title Date

**Milford Middle School Fire Alarm**  
**MILFORD SCHOOL DISTRICT**  
**BID**  
**COST STATEMENT**

List items, if necessary:

_____	\$ _____
_____	\$ _____
_____	\$ _____
_____	\$ _____
_____	\$ _____
_____	\$ _____
_____	\$ _____
_____	\$ _____
_____	\$ _____
_____	\$ _____
_____	\$ _____

**TOTAL (all-inclusive, not-to-exceed price)**      \$ \_\_\_\_\_

BIDDER:  
\_\_\_\_\_

ADDRESS:  
\_\_\_\_\_

NAME:

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Signature

Title

Date

**Milford Middle School Fire Alarm**  
**MILFORD SCHOOL DISTRICT**  
**BID**  
**INVITATION TO BID**

**SECTION I**

**General Requirements**

The Milford School District, by its School Board (hereinafter called the "School District"), invites bids from responsible parties to provide a complete fire alarm system. The School District reserves the right to reject any or all bids as it deems to be in the best interests of the School District.

**GENERAL CONDITIONS:**

1. A Pre-bid Meeting has been scheduled for **March 31, 2017 at 9:00 AM** at the site: Milford Middle School, 33 Osgood Road Milford, NH 03055.
2. Should any prospective bidder desire clarification or interpretation of any items in the advertisement, invitation to bid, general conditions and specifications, he shall request such, via email, from the Director, Buildings and Grounds S.A.U. #40, at [wcooper@milfordk12.org](mailto:wcooper@milfordk12.org), and the question put and the answer given by the Buildings and Grounds Director will be given, and every effort will be made to share the question and answer with all known bidders.
3. All bids must be submitted on the official forms (attached hereto), sealed, labeled "**Sealed Fire Alarm System Milford Middle School Bid**" and delivered to the Office of the Superintendent of Schools, 100 West Street, Milford, New Hampshire 03055, by **April 13, 2017 at 11:00 AM**.
4. Bidders will submit one (1) original bid and three (3) copies. All proposals must be on the forms provided and signed by the individual, partnership or corporation making the same; when made by a corporation, proposals must be signed by the officers thereof authorized to bind it by contract and be accompanied by a copy, under seal, of his authority to sign. Additional pages may be attached, dated, and signed by an authorized representative of the successful bidder, if additional space is required to provide a complete response.
5. No bid shall be withdrawn for a period of thirty-five (35) days from date of submission.
6. The bidders are invited to be present at the public bid opening at the Office of the Superintendent of Schools, 100 West Street, Milford, New Hampshire, at **11:00 AM on April 13, 2017**.

7. Awarding of the contract will be within thirty-five (35) days of the bid opening.
8. The competency, responsibility, experience, reputation, and financial standing of the bidders will be considered in making the award. The School District reserves the right to reject any or all bids, wholly or in part, to waive any informality therein, to accept any bid even though it may not be the lowest bid, and to make award which in its sole and absolute judgment will best serve the School District's interests. Bidders shall bid specifications and any exceptions must be noted.
9. All Bidders will be certified by the Secretary of State of the State of New Hampshire to transact business in the State of New Hampshire. Each Bidder shall provide a copy of the Certificate of Authority from the New Hampshire Department of State indicating the Bidder may transact business in the State of NH.
10. All bidders shall submit, with their bids, evidence from insurance and/or Surety Company (ies) licensed to do business in the State of New Hampshire, which it shall provide the bidder with insurance coverage, a performance bond, and a payment bond in the amount required herein if the bidder is successful.
11. A **Performance Bond** and a **Payment Bond** each in the total estimated amount of the annual contract shall be furnished before a contract is signed. The successful bidder shall procure and maintain in force a performance bond from an insurance or surety company licensed to do business in the State of New Hampshire for the benefit of the School District conditioned upon the faithful performance of the terms of the contract, in an amount equal to one hundred percent (100%) of the contract. The successful bidder shall procure and maintain in force a payment bond from an insurance or surety company licensed to do business in the State of New Hampshire for the benefit of the School District conditioned upon the faithful payment for goods and services required to complete the terms of the contract, in an amount equal to one hundred percent (100%) of the contract. The cost to maintain the performance and payment bonds is to be included in the bid price.

The successful bidder will be required to indemnify the School District for any loss that they may sustain from any cause arising out of the performance or lack of performance of the agreement by the successful bidder.

12. **Automobile and general liability insurance** shall be carried by the successful bidder during the life of the Agreement in the amount of five million dollars (\$5,000,000) per occurrence. The insurance may be arranged under a single policy or by a combination of an underlying policy with the balance provided by an Excess or Umbrella policy.

Such policy will name the School District as a coinsured and a certificate of such insurance must be received by the Business Administrator upon execution of the contract and prior to the start of any work on the project. The successful bidder will immediately notify the School District if the successful bidder receives any notice from

the insurance company or companies providing such insurance coverage that such company or companies intends to cancel any part of such insurance; such notice shall be in addition to any obligation of the insurance company or companies to notify the School District as an additional insured.

The successful bidder shall agree to hold harmless the School District and any of the School District's officials, elected or otherwise, and its employees from claims for damages, including legal expenses, for property damage and/or personal injuries, and/or bodily injuries, including death, which may arise from or out of the operation hereunder.

The successful bidder shall maintain **Workers' Compensation Insurance** for all employees engaged in the project. The successful bidder will immediately notify the School District if the successful bidder receives any notice from the insurance company or companies providing such insurance coverage that such company or companies intends to cancel any part of such insurance; such notice shall be in addition to any obligation of the insurance company or companies to notify the School District as an additional insured.

For bids in excess of one hundred thousand dollars (\$100,000), or where hazardous materials are involved, the successful bidder shall, prior to the performance of any work under the contract, provide the School district with certification of the successful completion of a 10-hour Occupational Safety and Health Administration (OSHA) construction safety program for each on-site employee, including those of any subcontractor, as required by NH RSA 277:5-a.

The successful bidder shall procure and maintain in force **Builder's Risk insurance** in an amount equal to 100% of the project construction costs. A certificate of such insurance must be received by the Business Administrator upon execution of the contract and prior to the start of any work on the project. The successful bidder will immediately notify the School District if the successful bidder receives any notice from the insurance company providing such insurance coverage that such company intends to cancel any part of such insurance.

13. The successful bidder will provide a copy of the bidder's (and any subcontractor's) EPA-required certification to conduct lead-based paint activities or renovations, and copies of employees' individual certifications for same.
14. The successful bidder will provide a project schedule to the School District prior to starting work on the project and at least monthly updates thereafter.
15. The School District will provide a contract document to the successful bidder and will not be restricted to any document template developed by outside organizations such as the American Institute of Architects (AIA) or the Design Build Institute of America (DBIA).
16. The School District shall pay the successful bidder for contract expenses on a monthly



basis.

17. In addition to any other rights the School District may have, the School District shall have the right to declare the successful bidder in default if (a) the successful bidder becomes insolvent; (b) a voluntary or involuntary petition in bankruptcy is filed by or against the successful bidder.
18. The contract may be terminated by the School District for unsatisfactory performance of the contract. In instances of unsatisfactory performance, the School District shall give written notice to the successful bidder citing the unsatisfactory performance and giving the successful bidder fourteen (14) days to improve its performance to the satisfaction of the School District. If the performance of the successful bidder does not improve to the satisfaction of the School District, within the fourteen (14) day period, the School District may terminate the contract by providing written notice to the successful bidder, notifying it of final termination fourteen (14) days from the date of receipt of said notice.
19. Should termination of the contract occur, the School District may employ another contractor or contractors to complete the project, and, in the case of termination for unsatisfactory performance, hold the successful bidder herein responsible for any extra or added expense, loans, or damages suffered by the School District.
20. The successful bidder will appoint a qualified supervisor. Said person will be available to the School District's representative at all times. Said person will be responsible for enforcing with employees and contractors connected with the project the State of New Hampshire law prohibiting smoking on school property. Said person will be responsible for requiring employees and contractors connected with the project to be properly attired in shirts, long pants, and appropriate footwear (no bare torsos or shorts). Said person will be responsible for enforcing courteous conduct on the site with employees and contractors connected with the project (no swearing or vulgar language).
21. A firm completion date of **August 25, 2017** has been set. The contract will include provisions for a **penalty of \$500 per day** for late completion, to be deducted from the amount due under the contract.
22. As-built plans and warranties shall be provided to the School District within sixty (60) days of substantial completion of the project.
23. The successful bidder will invoice the School District monthly, terms net 45, interest rate of 0% for late payment. Invoice payment shall be subject to the receipt of lien waivers and no payment shall become due absent applicable waivers. The School District will hold **5%** retainage on the total cost of the project for one year or until such time as as-built plans and maintenance and warranty documents have been delivered, whichever is later.

## SECTION II

### Project Summary

*The following information is provided with the best information available. Any omissions or deficiencies should be brought to the attention of the School District. Clarifications and amendments will be shared with all known bidders.*

**This project shall be “Turn-Key” in nature with a firm completion date of August 25, 2017.**

#### **SUMMARY**

The current system was installed in 1992 and is obsolete. The system has had numerous issues over the past few years ranging from card problems to audio and strobe malfunctions. The Milford School District is soliciting proposals for the replacement of the Fire Alarm Control Panel, all associated wiring and all associated fixtures (smoke detectors, pull stations, duct smokes, heat detectors, etc.).

## SECTION III

### Bid Specifications

#### 1) General Conditions:

The successful bidder shall have visited the site of the proposed work in order to fully acquaint and familiarize himself with conditions as they exist and the character of the operations to be carried out under the scope of this contract and make such on-site and subsurface investigations as he may see fit so that he understands fully the site, facilities, difficulties and any restrictions attending the execution of this work. The failure or omission of the successful bidder to receive or examine any form, instrument, and document or to visit the site and acquaint their company with the conditions there existing, shall in no way relieve him from any obligations with respect to the performance of the proposed contract and the work therein.

The successful bidder shall adhere to all applicable federal, state, and local codes, rules, and regulations, latest codes in effect.

Engineering and plans stamped by New Hampshire Licensed engineer(s) are the

responsibility of the successful Bidder. Where the site maps and conceptual floor plan differ from bid specifications, the bid specifications are to be followed.

The successful bidder shall provide any and all dumpsters, storage containers, and portable toilets to be utilized by the Contractor and any of their sub contractors for the duration of this project.

The use of asbestos or asbestos products will not be permitted in any form in this project.

The successful bidder shall obtain any and all permits, licenses, and permissions required for the project at the successful bidder's expense.

Should any site work be conducted while school is in session, the fullest consideration will be given to students and staff safety after consultation with School District Officials.

Testing may be required by the School District to determine that materials or workmanship provided meet the specified requirements. The employment of a testing laboratory shall in no way relieve the successful bidder of his obligation to perform all work in accordance with contract requirements. The testing laboratory shall procure all samples and specimens, shall provide all necessary testing equipment and personnel and make all deliveries of samples to the laboratory.

The School District shall be responsible for oversight of and payment for initial testing as indicated in the specifications. If retests are required because of failure, the successful bidder shall be responsible for the costs of retesting.

The Milford School is soliciting proposals for the replacement of the Fire Alarm Control Panel, all associated wiring and all associated fixtures (smoke detectors, pull stations, duct smokes, etc.) Located at Milford Middle School, 33 Osgood Road, Milford, New Hampshire. Currently there are a total of 104 Horn/ strobe units, 15 pull stations, 55 smoke detectors, 2 heat detectors and 28 door magnets. Attached is a map of building and locations for new hardware. All counts shall be field verified by contractor.

1. Cutting and patching may be required and those costs must be included in the pricing.
2. Removal and disposal of existing equipment including wiring is the responsibility of the contractor.
3. All direct and indirect costs that the Milford School District is likely to incur must be included
4. Standards and Code compliance: Comply with applicable portions of NEMA standards and NEC.
5. NFPA Compliance: Comply with all applicable requirements of NFPA No.72 standard.
6. FM Compliance: Provide fire alarm and detection system and accessories which

are FM – approved.

7. UL Labels: Provide fire alarm and detection system components which are UL-listed and labeled.
8. ADA Compliance: Provide equipment and mounting to ADA guideline and New Hampshire building code requirements.
9. Provide a new addressable fire alarm system panel with voice evacuation for the facility, including but not limited to:
  - a. Approvals from and coordination with the Milford Fire Department.
  - b. Initiating devices such as pull stations, heat and smoke detectors duct smoke detectors (duct smoke detectors shall have remote test/indicator stations, coordinate locations with Milford Fire Department).
  - c. Interconnections to elevator/chair lift ( if so applicable)
  - d. Voice evacuation system with speakers and microphone located in fire alarm control panel, provide microphone and pre-recorded message approved by Milford Fire Department.
  - e. Connections to HVAC equipment for control by Fire Department personnel during an emergency.
  - f. Alarm devices, including strobes and connections to Owner are selected monitoring system.
  - g. Connection to Milford Fire Department/Milford Area Communications Center via Game well master box
10. Provide devices and equipment as indicated in these specifications and drawings Contractor will need to submit working drawings, calculations, product submittals and any other requested documents to the Milford Fire Department necessary to secure their approval. Final system shall be complete, tested and operable, as well as approved by local and state officials.
11. The system including, but not necessarily limited to operation, functions, material, supervision, devices, equipment, and installation shall be designed, manufactured, installed, and tested in accordance with the applicable requirements and standards of the following
  - a. The Town of Milford Fire Department
  - b. The State of New Hampshire, State Fire Marshall, Department of Safety, Concord, New Hampshire.
  - c. Factory Mutual Engineering Corporation, (FM) Factory Mutual system Publication.
  - d. National Fire Protection Association, including standards no. 72no. 90A, no. 70 and others as applicable.
  - e. Underwriters Laboratories, Inc. Fire Protection List.
  - f. International Building Code as published by the International Code Council and adopted in the State of New Hampshire Building Code as amended.
12. All equipment shall be listed by UL for fire alarm detection systems and shall be by one manufacturer regularly engaged in the manufacturing of complete fire alarm systems.
13. Refer to NFPA Codes and Standards for all applicable fire system terms and

definitions.

14. The word “Manufacturer” as used in this article, Fire Alarm system, is the person or entity, who engineered, designed, developed, tested, and fabricated the fire alarm control panel which is the major component of the fire alarm system.
15. The installation shall be supervised, checked and guaranteed as to performance by the manufacturer. The manufacturer or authorized representative shall provide engineering supervision without claim for extra compensation.
16. Initial tests and adjustments shall be performed under this section. Furnish all equipment necessary and perform all work required to determine the operation of the complete system and modify the system to meet the requirements of the contract documents.
17. Shop Drawings submitted for review shall include but shall not be limited to itemized list of equipment, quantities, dimension drawings of all equipment, mechanical characteristics of all equipment, electrical characteristics of all equipment, sequence of operation of each item and complete system, one line drawing. Typical wiring diagrams shall not be submitted and will not be accepted as meeting the above wiring diagram requirement. The wiring diagram shall include conduit sizes, conductor sizes and number of conductors in each conduit. As –built drawings shall be submitted to the Owner
18. Failure to meet the above requirements shall be cause for rejecting the system when submitted.
19. Provide three brochures for the Owner that shall contain complete written operating instructions, floor plans, wiring diagrams and maintenance instructions.
20. Operation: The activation of any manual fire alarm station, or the automatic actuation of any thermal detector, system smoke detector, or any other approved alarm initiating device shall immediately result in the following:
  - a. The Milford Fire Department shall be notified via Master box.
  - b. The device in alarm shall annunciate at the main Fire Alarm Control Panel.
  - c. All audible alarm signals shall sound. The voice evacuation system shall announce an alarm and all strobes shall be activated.
  - d. All visual alarms signals shall flash.
  - e. If alarm signals are silenced for any reason they shall automatically resound if another device activates in general alarm.
  - f. In the event of a commercial power interruption the system shall automatically transfer to an emergency standby battery source which shall be calculated for 60 hours of standby capacity followed by fifteen (15) minutes of general alarm capacity.
21. Scheduling
  - a. Any schedule will need to be mutually agreed upon between the contractor and The Milford School District prior to the commencement of any work
  - b. Milestones will be set and agreed upon by both the owner (School District) and the contractor.
  - c. Due to the time constraints for this project, contractor will notify Owner

- of any delay in a timely manner.
- d. Four (4) copies of the project schedule will be made and two (2) will be given to the Owner and two (2) to the contractor.

## **PRODUCTS**

- A. Fire Alarm Control Panel: commercially available Microprocessor based monitoring and control system with voice evacuation communication command center in fire alarm panel or one of equal or better quality such as the Simplex 4100ES.
- B. A control module shall be provided to act as a central processing and indicating location for the fire alarm system. It shall include acknowledge, reset, LED test and trouble signal silence switched, annunciator trouble, system trouble and earth LED's and a trouble son alert. The control module shall also be provided with an alarm resound feature to permit subsequent alarms to resound the signals.
- C. Provide a battery charger module complete with high rate indicator and charger failure LED's. Charger shall be the automatic current limited type equipped with fuse protection and both high and trickle charge capability.
- D. Provide sealed lead-calcium batteries built into the control panel with capacity to maintain and supervise the system for (60) hours and then sound the alarm signals for (15) fifteen minutes. Battery calculations shall be provided for review and approval and battery power shall be designed to include a 20% de-rating factor or 120% of the required loads as indicated above.
- E. Provide outputs and alarm resound with flasher acknowledge (from control). They shall also be equipped with zone test / disconnect switches. They shall allow the mixing of smoke detectors, heat detectors, flow switches and other initiation devices on the same zone, without the use of limiting resistors at manual stations and detectors and without using a separate source of power for the detectors. The module shall be completely pluggable for ease of servicing, with a 50 ohm maximum line resistance.
- F. Provide signal circuit modules for control and supervision of the alarm speakers and visual signals. Each signal circuit shall have a trouble LED and fuse. Supervision shall be provided for open, shorts, and earth grounds.
- G. Provide a Drill switch in or at the fire alarm control panel.
- H. Provide adequate power supply modules supplying five amperes each of continuous filtered power, or eight amperes each of intermittent, of the proper voltage. The power supply shall be capable of furnishing the system power, and power for devices such as smoke detectors, auxiliary relays, door holders, etc. It shall contain a normal power LED, battery trouble LED and power supply trouble LED, all viewable on the front enclosure. Capability of connecting a voltage regulator shall be included.
- I. Provide control panel transformers as required to supply stepped down AC voltage to power supply modules. They shall be internally mounted and rated at 250 VA, with a secondary output of 21, 5 VAC.

- J.** Provide terminals connectors and harnesses for field connections of remote annunciators, or for the modules auxiliary contacts. Each connector shall have provisions for at least sixteen (16) separate points, and shall be fastened securely on the rack enclosure.
- K.** Provide voice communications command center with but not limited to audio control board, master microphone, audio amplifiers and voice control message per the Milford Fire Department.
- L.** Provide remote annunciator and voice control panel at the gymnasium public entrance.
- M.** System shall have the capability and separate points available to allow remote message boards to be installed and control from main office.

## **SMOKE DETECTORS**

- 1.** The Photoelectric type detector shall be a plug in unit which mounts to a twist lock base, and shall be UL listed.
- 2.** The detectors shall be of a solid state photoelectric type and shall contain no radioactive material. They will use a pulse infrared LED light source and be sealed against rear air flow entry.
- 3.** The detector shall fit into a base that is common with both the heat detector and ionization type detector and shall be compatible with other addressable detectors, addressable manual stations and addressable zone adaptor modules on the same circuit. The detector shall fit into a non- addressable base that is capable of being monitored by an addressable zone adaptor module.
- 4.** There shall no limit to the number of detectors or zone adaptor modules which may be activated or “in alarm” simultaneously. All Detectors shall be programmed for smoke verification where capable and permitted by applicable code or standard.
- 5.** There shall one smoke detector for the main electrical room and one on either side of smoke doors, which is eight (8) smoke detectors; there are a total of nine (9) detectors for the building.

## **THERMAL DETECTOR HEAD**

**1** Thermal detector heads must be UL listed. They will be a combination rate of rise and fixed temperature type and compatible with the FACP as listed.

## **PULL STATIONS**

- 1** Addressable pull stations shall be double action and compatible with FACP in its listed and approved configuration.
- 2.** Pull station tamper covers complete with local audible alarm shall be installed on all pull stations unless a protective cover is required.
- 3.** Approved protective covers shall be installed on all pull stations in gymnasium.
- 4.** Pull stations located at every entrance/exit will be replaced. All others will be removed from the system.

## **PHOTOELECTRIC DUCT DETECTOR**

1. The detector shall be non-polarized 24VDC type which is compatible with the fire alarm panel and obtains its operating power from the supervisory current in the fire alarm detection loop.
2. Detectors shall be of the solid state photoelectric type and shall operate on the light scattering, photodiode principle. To minimize nuisance alarms, detectors shall have an insect screen and be designed to ignore invisible particles of smoke densities that are below the factory set point. No radioactive material shall be used.
3. The detector head shall be directly interchangeable with an ionization detector type. The 24VDC detector may be reset by activating the control panel reset switch.
4. Detector construction shall have a mounting base with a twist lock detecting head that is lockable. The locking feature must be field removable when not required. Contact between the base and head shall be of the bifurcated type utilizing spring type, self-wiping contacts. Removal of the detector head shall interrupt the supervisory current of the fire alarm detection loop and cause a trouble signal at the control panel. Detector design shall provide compatibility with other normally open fire alarm detection loop devices (heat detectors, pull stations, etc.)
5. It shall be possible to alarm the detector housing by using a test switch.
6. For maintenance purposes, it shall be possible to clean the duct housing sampling tubes by accessing them through the duct housing front cover.
7. To minimize false alarms, voltage and RF suppression techniques shall be employed as well as a smoke signal verification circuit and an insect screen.
8. Auxiliary SPDT relays and/or remote LED alarm indicators and key operated alarm control panel.
9. Duct Detectors shall be capable of controlling air handling systems via the fire alarm control panel.

## **ALARM SENSORS AND ADDRESSABLE SENSOR BASES**

1. The addressable smoke sensors shall be of the photoelectric type and shall communicate actual smoke chamber values to the system control panel.
2. The addressable temperature sensors shall sense within a temperature range of 32 degrees Fahrenheit and 158 degrees Fahrenheit. The control panel will be capable of sensing either a set point of 135 degrees Fahrenheit, or a rate of rise (15 degrees F) – (20 degrees F) per minute for fire sensing. For utility sensing, a set point may be chosen with the stated range and the control panel programming will be capable of using that information to determine specific response such as warning of failure of local temperature controls.
3. The sensors shall be UL standard 268 and shall be documented as compatible with control equipment to which they are connected. The sensors shall be listed for both ceiling and wall mount applications.
4. Each sensor base shall contain a LED that will flash each time it is scanned by the



control panel (once every 4 seconds). When the control panel determines that a sensor is in alarm or a trouble condition, the control panel shall command the LED on that sensor's base to turn steady indicating the abnormal condition. Sensors which do not provide a visible indication of an abnormal condition at the sensor location shall not be acceptable.

5. Each sensor shall contain a magnetically activated test switch to provide for easy alarm testing at the sensor location.
6. Each sensor shall be scanned by the control panel for its type identification to prevent inadvertent substitution of another sensor type. The control panel shall operate with the installed device but shall initiate a "Wrong Device" trouble condition until the proper type is installed or the programmed sensor type is changed.
7. The sensor's electronics shall be immune from false alarms caused by EMI and RFI.

### **ZONE ADAPTOR MODULE**

1. Zone adaptor modules shall be used for monitoring of water flow, valve tamper, and Halon control panels (if so equipped), non-addressable detectors, and control of evacuation indicating appliances, elevator recall and elevator shut down.
2. Zone adaptor modules will be capable of mounting in a standard electric box. Zone adaptor modules will include cover plates to allow surface or flush mounting. Zone adaptor modules will receive their 24VDC power from a separate two wire pair running from an appropriate power supply.

### **ADDRESSABLE MONITOR MODULE**

1. For conventional 2- wire smoke detector and/ or contact device monitoring with style B or style D (NFPA-72 initiating device circuit) wiring supervision.
2. This type of addressable device module will provide power to, and monitor the status of a zone consisting of conventional 2- wire smoke detectors and/or N/O contact devices as specified elsewhere and identified on plans. These modules will communicate the zone's status (normal, alarm, trouble) to the control panel.

### **ADDRESSABLE CONTROL MODULE**

1. For alarm notification appliances and other device control with style Y or style Z wiring supervision.
2. This type of addressable device will provide double pole double throw relay switching that can be used to connect through easily replaceable 2 amp fuses: a circuit of alarm notification appliances to a power source; or activate a variety of controlled devices. The module will be available in either a style Y or style Z supervision version. In style Y supervised by an end of line device. In style Z supervision version, the wiring will be looped back and connected to the module to

allow continual operation of the controlled devices even if the wiring sustains a single break. These modules will communicate the supervised wiring status (normal, trouble) to the fire alarm control panel and will receive a command to transfer the relay from the fire alarm control panel.

3. For non supervised control
  - a. This type of addressable device will provide double pole double throw relay switching for loads up to 120VAC. It will contain easily replaceable 2 amp fuse, one on each common leg of the relay.
  - b. The module shall be supervised and uniquely identified by the control panel. Device identification shall be transmitted to the control panel for processing according to the program instructions. Should the module become non-operational, tampered with, or removed, a discrete trouble signal, unique to the device, shall be transmitted to, and annunciated at, the control panel.
  - c. The module shall be capable of being programmed for its address location on the addressable device signaling line circuit. The module shall be compatible with addressable manual stations and addressable detectors on the same addressable circuit.
  - d. All devices will be supervised for trouble conditions. The system control panel will be capable of indicating the type of trouble condition (open, short, device missing/failed). Should a device fail, it will not hinder the operation of the other system devices. Should a problem occur on a particular wire run, it will not affect the other wire runs.

#### **AUDIO VISUAL ALARM SIGNALS**

1. Furnish and install combination speaker/ strobes and strobes in accordance with Manufacturers recommendations and all applicable codes.
2. The notification devices shall be Wheelock series ET speaker/ strobes and series RSS strobes or approved equals. Combination speaker/ strobes and strobes shall be UL 1971 listed for indoor fire protection service. The devices shall provide either a continuous speaker / strobe signal with a constantly applied voltage from an addressable fire alarm control panel (FACP) or synchronized.
3. The speakers shall be UL 1480 listed for fire protective service and the strobes shall be UL 1971 listed signaling devices for the hearing impaired. All speakers shall be either 25 or 70 VRMS inputs with field selectable power taps from ¼ watt to 2 watts with listed sound output up to 90dBA for speakers and strobe speakers. Strobes shall be listed for 20-31 VDC input using filtered power or unfiltered power supply (full wave rectified). All models shall have provisions for standard reverse polarity type supervision and In / Out field wiring using terminals that accept #12 to # 18 AWG wiring.
4. Combination speaker/ strobe signals shall incorporate a Xenon flashtube enclosed in a rugged Lexan lens or equivalent with solid state circuitry. Strobe shall meet UL 1971 and produce a flash rate of one (1) flash per second minimum over the listed input voltage (20VDC-31VDC) range. The strobe intensity shall be rated per UL 1971 for 15, 30, 75 or 110 candela. Strobes shall be furnished with synchronized flash modules. All speaker / strobe shall be installed to ADA guidelines.

5. All UL 1971 listed strobe appliances shall be verified to meet FCC part 15. Class B and incorporate low temperature compensation to insure the lowest possible current consumption. Strobe activation shall be via independent input from the audio circuit.
6. The combination speaker/ strobe and strobe appliances shall be installed indoors and flush mounted. They shall mount to standard electrical hardware requiring no additional trim plate or adapter. The appliance shall be finished in a textured red color.
7. Notification appliances circuits (NAC) shall be designed with a minimum of 25% excess capacity to allow for future modifications.
8. An additional amber strobe shall be provided as an ECS alternate.
9. System shall have capability of providing textual messaging such as LED message boards or other textual messaging devices.

### **MASTER BOX**

1. The FACP shall be connected to the existing Master box to notify The Milford Fire Department of all general alarms.
- A. The Contractor shall furnish and install in accordance with manufacturer's instructions all wiring, conduit, and junction and back boxes required for the erection of the complete system as described herein and as indicated on drawings. Where pull stations are affixed in a surface mount fashion, metallic back boxes shall be used.
  - B. All wiring shall meet the requirements of all national, state and local electrical codes. The sizes of the different wires shall be specified by the manufacturer and the registered design professional with complete load drop calculations provided for review and approval. Color code shall be used throughout. All wires shall be tagged at all junction points and shall be test free from grounds or crosses between the conductors. Exposed wiring shall be in EMT conduit with all other wiring consisting of MC Cable style.
  - C. Final connection between the control equipment and wiring system shall be made under direct supervision of a representative of the manufacturer.
  - D. The contractor shall guarantee all equipment, wiring and workmanship free from inherent mechanical and electrical defects for a period of one year from date of acceptance.