

PURCHASING DIVISION
CITY OF WORCESTER
MASSACHUSETTS 01608-1895
ROOM 201 - CITY HALL, 455 Main Street
PHONE (508) 799-1220

SEALED BID INVITATION
(Supplies, Material, Equipment, Services)

AN EQUAL OPPORTUNITY AFFIRMATIVE ACTION EMPLOYER

SEALED BID NO. CR-8477-J6

DATE: June 30, 2025

CITY OF WORCESTER
Christopher J. Gagliastro, MCPPO
Purchasing Agent

BUYER: Jerry Kucera

NOTICE TO BIDDERS
TERMS AND CONDITIONS

All bids are subject to the terms and conditions and specificity herein set forth except where specifically deleted by the City of Worcester in Section No. 6 below.

COMPLETE ORIGINAL COPY (including ALL pages) OF THIS BID MUST BE SUBMITTED IN A SEALED ENVELOPE:

DATE: July 23, 2025 TIME: 10:00 A.M. LOCAL TIME

PLACE: Purchasing Division, Room 201, City Hall, Worcester, Massachusetts

MARK SEALED ENVELOPE **"Sealed Bid No. CR-8477-J6, Fire Alarm Testing and Inspection Services / WPS"**

The name and address of the bidder must appear in the upper left hand corner of the envelope. The City of Worcester is not responsible for bids not properly marked.

GENERAL

1. This Bid Invitation covers: provide fire alarm testing and inspection services as per the requirements and specifications of the City of Worcester Public Schools for a period of one year from date of contract. This contract may be renewed for a second and third one (1) year period, at the sole discretion of the City of Worcester, the option of which will be determined at the end of each contract period (See Page 10).
2. A certified check or bid bond made payable to the "City Treasurer, City of Worcester" in the Amount of \$ N/A must accompany this bid.
3. All bids received will be publicly opened and read in the Bid Room at City Hall at date and time shown above.
NO BID WILL BE ACCEPTED AFTER TIME AND DATE SPECIFIED
4. A performance bond in the amount of \$ N/A of the total dollar award is required.
5. A payment bond in the amount of \$ N/A of the total dollar award is required.
6. All terms and conditions are applicable to this proposal except the following section numbers which are hereby deleted from this invitation: all apply
7. **Other:** Please go to <http://www.worcesterma.gov/e-services/bids/closed-bids> to obtain results.

Questions pertaining to this bid must be directed to Jerry Kucera via e-mail at kucerajs@worcesterma.gov

8. The following meanings are attached to the defined words when used in this bid form.
 - (a) The word "City" means The City of Worcester, Massachusetts.
 - (b) The word "Bidder" means the person, firm or corporation submitting a bid on these specifications or any part thereof.
 - (c) The word "Contractor" means the person, firm or corporation with whom the contract is made by carrying out the provisions of these specifications and the contract.
 - (d) The words "Firm Price" shall mean a guarantee against price increases during the life of the contract.
9. Any prospective bidder requesting a change in or interpretation of existing specifications of terms and conditions must do so within five (5) days (Saturdays, Sundays and Holidays excluded) BEFORE scheduled bid opening date. All requests are to be in writing to the Purchasing Division (or e-mailed at: kucerajs@worcesterma.gov). No changes will be considered or any interpretation issued unless the request is in our hands within five (5) days (Saturdays, Sundays and Holidays excluded) BEFORE scheduled bid opening date.
10. The contractor will be required to indemnify and save harmless the City of Worcester, for all damages to life and property that may occur due to his negligence or that of his employees, subcontractors, etc., during this contract.
11. The Contract Agreement will be in the form customarily employed by the City of Worcester and is on file in the Purchasing Division at City Hall.
12. Bids which are incomplete, not properly endorsed, or signed, or otherwise contrary to these instructions will be rejected as informal by the Purchasing Agent. **Conditional bids will not be accepted.**
13. The Bidder must certify that no official or employee of the City of Worcester, Massachusetts is pecuniarily interested in this proposal or in the contract which the bidder offers to execute or in expected profits to arise therefrom, unless there has been compliance with provisions of G.L. C. 43 Sec. 27, and that this bid is made in good faith without fraud or collusion or connection with any other person submitting a proposal.
14. As the City of Worcester is exempt from the payment of Federal Excise Taxes and Massachusetts Sales Tax, prices quoted herein are not to include these taxes.
15. All prices are to be firm F.O.B. Destination, City of Worcester, Massachusetts, unless otherwise indicated by the City. **Time reserved for award is ninety days.**
16. In case of error in the extension prices quoted herein, the unit price will govern.
17. It is understood and agreed that should any price reductions occur between the opening of this bid and delivery of any order, the benefit of all such reductions will be extended to the City.
18. The City of Worcester reserves the right to reject any and all bids, wholly or in part, and to make awards in a manner deemed in the best interest of the City.
19. Awards will be made to the bidder quoting the lowest net price in accordance with the specifications.
20. The supplier will be bound by all applicable statutory provisions of law of the Federal Government, the Commonwealth of Massachusetts, the City of Worcester, and the Department of Public Safety of the Commonwealth of Massachusetts.
21. Any bid withdrawn after time and date specified, the bidder shall forfeit deposit on bid as liquidated damages.
22. The contractor will not be permitted to either assign or underlet the contract, not assign either legally or equitably any monies hereunder, or its claim thereto without the previous written consent of the City Treasurer and of the Purchasing Agent of the City of Worcester.
23. If this bid shall be accepted by the City, and the bidder shall fail to contract as aforesaid and to give a bond in the amount as specified in Section 4, within ten (10) days, (not including Sunday or a legal Holiday) from the date of the mailing of a notice from the City to him/her, according to the address given herewith, that the contract is ready for signature, the City may by option determine that the bidder has abandoned the contract and thereupon the

proposal and acceptance shall be null and void and the bid security accompanying this proposal shall become the property of the City as liquidated damages.

24. When quoting, the bidder shall submit a signed copy of this bid form, and if bid accepted by the City shall constitute part of the contract of purchase. Do not detach any part of this form 30B (Sealed Bid Goods & Services) when submitting a bid. Bidder must sign and return complete form 30B (Sealed Bid Goods & Services).
25. If in the judgment of the Purchasing Agent any property is needlessly damaged by an act or omission of the contractor or his/her employees, servants or agent, the amount of such damages shall be determined by the Purchasing Agent of the City of Worcester and such amount shall be deducted from any money due the contractor or may be recovered from said contractor in actions at law.
26. It is agreed that deliveries and/or completion are subject to strikes, lockouts, accidents and/or Acts of God.

INSURANCE AND WORKER'S COMPENSATION

27. COMMERCIAL GENERAL LIABILITY INSURANCE: Contractor to supply the City of Worcester with certificates of insurance evidencing general liability coverage of not less than \$ 1,000,000.00 per occurrence / \$ 2,000,000.00 aggregate.
28. AUTOMOBILE LIABILITY INSURANCE: Contractor to supply the City of Worcester with certificates of insurance evidencing automobile liability coverage, bodily injury and property damage combined single limit, of \$ 1,000,000.00 (all owned, hired, and non-owned autos).
29. COMPENSATION INSURANCE: The contractor shall furnish the City of Worcester with certificates showing that all of his/her employees who shall be connected with this work are protected under statutory worker's compensation insurance policies.
30. The Contractor shall carry public liability insurance with an insurance company satisfactory to the City so as to save the City harmless from any and all claims for damages arising out of bodily injury to or death of any person or persons, and for all claims for damages arising out of injury to or destruction of property caused by accident resulting from the use of implements, equipment or labor used in the performance of the contractor or from any neglect, default or omission, or want of proper care, or misconduct on the part of the Contractor or for anyone of his employ during the execution of the contract.
31. Prior to starting on this contract, the Contractor shall deposit with the Contracting Officer certificates from the insurer to the effect that the insurance policies required in the above paragraphs have been issued to the Contractor. The certificates must be on a form satisfactory to the Purchasing Agent.
32. Except as may otherwise be stated herein, the Contractor shall also carry bodily injury and property damage insurance in an amount not less than those set forth above covering the operation of all motor powered vehicles owned or operated by the Contractor and engaged in this contract.

DISCOUNT

33. Prompt pay discounts will be considered when determining the low bid except when discounts are for a period of less than 30 days. In this event discounts will not be taken into consideration when determining low bid.
34. Time, in connection with discount offered, will be computed from date of completion and/or delivery and acceptance at destination, or from date correct bill or voucher properly certified by the contract is received if the latter date is later than the date of completion and acceptance and/or delivery and acceptance.

GUARANTEE

35. The bidder to who a contract is awarded guarantees to the City of Worcester all equipment, materials and or workmanship for a period of one (1) year after final inspection and acceptance and shall replace promptly any defective equipment, materials and/or workmanship required without additional cost to the City.

DELIVERIES AND COMPLETION

36. It is understood and agreed that in the event of failure on the part of the bidder to indicate date of delivery and/or completion, delivery and/or completion will be made within twelve (12) days from date of notification. Should the successful bidder fail to make delivery or complete contract within time specified, the City reserves the right to make the purchase on such orders at the open market and charge any excess over contract price to the account of the successful bidder, who shall pay the same.
37. The contractor shall familiarize himself with the location and facilities for storage.
38. The City through its Purchasing Division reserves the right to divert delivery from one location to another, and to allow for any change in operating conditions or for any other cause not now foreseen and to proportion deliveries according to available storage facilities.

SAMPLING AND ANALYSIS

39. Each bidder must state the commercial name of the product quoted, name, and address of operator or agent from whom the product will be purchased and in addition shall furnish an analysis of the product, date of analysis, by whom made and their address.
40. Samples of the product to be delivered may be taken by a representative of the City, either prior to delivery or while it is being delivered in the storage facilities at destination, or will be taken from the storage facilities to which the product has been delivered as determined from time to time by the Purchasing Agent. Bidder agrees to furnish the necessary manual labor, without additional cost required to assemble the physical samples, which is to be performed under the direction of the City representative.
41. The representative of the City taking the samples shall be given the opportunity, while sampling, to affix his or her signature to the delivery slip each item represented in his/her sample.
42. Any product after the sampling and analysis, not found meeting the requirements of the contract shall be sufficient cause for the cancellation of the contract at the option of the Purchasing Agent.
43. If any product is found that does not meet the analysis submitted by the bidder in his/her proposal, the Purchasing Agent may, at his or her option, exercise his/her right to reject the product and require that all or any part thereof shall be removed promptly by and at the expense of the contractor and replace it forthwith with a product satisfactory to the Purchasing Agent, or to retain the product and compensate the contractor in an amount as determined by the Purchasing Agent and the City Manager.
44. It is understood and agreed that it shall be a material breach of any contract resulting from this bid for the Contractor to engage in any practice which shall violate any provisions of Massachusetts General Laws, Chapter 151B, relative to discrimination in hiring, discharge, compensation, or terms, conditions or privileges of employment because of race, color, religious creed, national origin, sex, age or ancestry.
45. The undersigned as bidder, declares that the only parties interested in this proposal as principals are named herein; that this proposal is made without collusion with any other person, firm or corporation, that no officer or agent of the City is directly or indirectly interested in this bid; and he/she proposes and agrees that if this proposal is accepted he/she will contract with the City in accordance with the specifications, also the terms and conditions as spelled out in this bid form.
46. No Person, including but not limited to corporations, partnerships, limited partnerships or limited liability corporations, shall be eligible to receive a contract under this invitation to bid and/or requires for proposal if that person has been convicted of any felony offense involving the distribution of controlled substances as that term is defined under Chapter 94C of the General Laws and, for contracts to be performed for on-site services to the Worcester Public Schools, if that person or any person to be employed by that person in the performance of such on-site services has been convicted of a "sex offense" or a "sex offense involving a child" or a "sexually violent offense" or would meet the definition of "sexually violent predator" as those terms are defined in Section 178C of the General Laws and who must register with the sex offender registry board.

47. The Contractor shall at all times enforce strict discipline and good order among his employees and shall not employ for work or services relating to this contract any unfit person or anyone not skilled in the task assigned to him. In light of the fact that the performance of this contract requires the Contractor and its employees to have significant interaction with the public, the Contractor shall require all employees who may perform services under this contract to conduct themselves in a courteous, professional manner. If the Contractor is notified by the Contract Officer that any person engaged upon the work is incompetent, unfaithful, disorderly, discourteous, or otherwise unsatisfactory, then such person shall be discharged from providing services or work pursuant to this contract. Without limiting the generality of the foregoing, intimidation, threats and/or violent conduct of any kind or nature directed to members of the public are absolutely prohibited. Failure to comply with this requirement shall be grounds for termination of the contract.
48. The Contractor's performance may be evaluated on an ongoing basis including but not limited to consideration of complaints received from members of the public. In order to facilitate this evaluation, the Contractor shall provide the City with documents and records upon request. The Contractor shall further obtain from its employees authorization that appropriate City personnel may obtain all available criminal offender information ("CORI") from the Criminal History Systems Board. A high number of unresolved complaints, any number of complaints that are particularly severe, or employment of individuals who have been convicted of assault or other violent crimes shall be grounds for the early termination or non-renewal of the contract by the City.
49. The procurement officer shall award the contract to the lowest responsible and responsive bidder. The term "responsible bidder" means "a person who has the capability to perform fully the contract requirements, and the integrity and reliability which assures good faith performance." Consistent with its duty to maintain public order and promote public safety, the City has determined that this contract is of a type and nature so as to be particularly sensitive due, at least in part, to the contractor's inherent access and dealings with the members of the general public. Therefore, the City has concluded that additional scrutiny is justified as it determines whether a particular bidder is responsible, having the integrity and reliability to properly perform the requested services. This may entail consideration of the contractor's system of oversight, training and supervision of its employees, including but not limited to its requirement of a high standard of customer service and courtesy in its dealings with the public. The bidder's care and diligence in hiring and assigning its employees will also be considered. In making its determination, the City reserves the right to examine any and all information at its disposal, including but not limited to prior City contracts, the experiences and information obtained from current and former customers (whether identified by the bidder as references or not), as well as other sources available to the City, including but not limited to court documents, newspapers, financial reports (such as DUNS), and certain police data and reports.
50. The Contractor, acting through its owner(s) or any of its employees, or its agents or sub-contractors and any of their employees, shall not engage in any behavior, whether during the course of its duties under this contract or at any other time, that is illegal, criminal or otherwise shocking or offensive to the general public. The determination whether any particular behavior is illegal, criminal or shocking to the general public shall rest in the sound judgment of the Contracting Officer or the City Manager. In making such determination, the Contracting Officer or the City Manager shall apply the general standards of the community. No criminal conviction or formal charges shall be required to make such determination. Such behavior need be something more than trivial and something which would cause the general public to have concerns either about the safety of individuals coming in contact with the Contractor or about the character and integrity of the individuals with which the City does business. Violation of this provision shall be grounds for immediate and unilateral termination of this contract by the City upon five days' notice as otherwise provided herein

GIVE FULL NAMES AND RESIDENCES OF ALL PERSONS INTERESTED IN THE FOREGOING PROPOSAL.

(NOTICE: Give first and last name in full; in case of corporations, give corporate name and names of President, Treasurer, and Manager; and in case of firms give names of the individual members)

Name	Address	Zip Code
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

KINDLY FURNISH THE FOLLOWING INFORMATION REGARDING BIDDER:

(1) If a Proprietorship

Name of Owner _____

Business Address _____

Zip Code _____ Telephone No. _____

Home Address _____

Zip Code _____ Telephone No. _____

(2) If a Partnership
Full names and addresses of all partners

<u>Name</u>	<u>Address</u>	<u>Zip Code</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____

Business Address _____ Zip Code _____

Tel. No. _____

(3) If a Corporation

Full Legal Name _____

State of Incorporation _____ Qualified in Massachusetts ? Yes _____ No _____

Principal Place of Business _____
Street P.O. Box

City/Town State Zip

Telephone No. _____

Place of Business in Massachusetts _____
Street P.O. Box

City/Town State Zip

Telephone No. _____

GIVE THE FOLLOWING INFORMATION REGARDING SURETY COMPANY

Full Legal Name of Surety Company _____

State of Incorporation _____ Admitted in Massachusetts ? Yes _____ No _____

Principal Place of Business _____
Street P.O. Box

City/Town State Zip

Place of Business in Massachusetts _____
Street P.O. Box

City/Town State Zip

Telephone No. _____

NOTE

The Office of the Attorney General, Washington, D.C. requires the following information on all bid proposals amounting to \$1,000.00 or more.

F.I.D. Number of bidder _____

This number is regularly used by companies when filing their "EMPLOYER'S FEDERAL TAX RETURN, U.S." Treasury Department Form 941.

AUTHORIZED SIGNATURE OF BIDDER _____ TITLE _____
PLEASE SIGN

DATE _____ BID SECURITY \$ _____

The name of Customer Service Representative and the Contract Administrator responsible for servicing this account in the event of contract award are:

NAME (PLEASE PRINT) *Customer Service Rep.* _____ TEL. NO. _____

NAME (PLEASE PRINT) *Contract Administrator* _____ TEL. NO. _____

FAX NUMBER _____ FAX # _____

E-MAIL (Customer Service Rep.): _____

E-MAIL (Contract Administrator): _____

UNDER MASSACHUSETTS GENERAL LAWS, CHAPTER 30B: SECTION 10, THE FOLLOWING CERTIFICATION MUST BE PROVIDED:

Section 10. A person submitting a bid or a proposal for the procurement or disposal of supplies, or services to any governmental body shall certify in writing, on the bid or proposal, as follows:

" The undersigned certifies under penalties of perjury that this bid or proposal has been made and submitted in good faith and without collusion or fraud with any other person. As used in this certification, the word "person" shall mean any natural person, business, partnership, corporation, union, committee, club, or other organization, entity, or group of individuals."

(Please Print) _____
Name of Person Signing Bid

Signature of Person Signing Bid

Company

No award will be made without vendor certification of the above.

Bidders must state and identify the product offered, such as manufacturer's name, trade name, brand name and quality next to each item. WE MUST KNOW WHAT HAS BEEN OFFERED.

The quantities shown herein are estimated only and the Contractor will be required to furnish all quantities ordered by the City during the period of the contract.

YES X NO _____

Delivery to be made to: Worcester, MA

This Bid includes addenda numbered _____

NO PRICE ADJUSTMENTS ALLOWED. PRICES QUOTED ARE FINAL. CHECK BEFORE SIGNING!

BIDDER TO COMPLETE ITEMS BELOW

Item No.	Estimated Quantity	Description	Mfg.	Model No.	Unit Price	Total Amount
		<p>Provide fire alarm testing & inspection services per the attached requirements and specifications of the City of Worcester Public Schools.</p> <p><i>*Bidders shall provide price per school location.</i></p> <p>** Must bid all school locations. Award to be made in the aggregate.</p> <p>Any and all questions regarding this bid must be directed to Jerry Kucera at kucerajs@worcesterma.gov</p>				See pricing pages

TERMS, PROMPT PAY DISCOUNT _____% 30 DAYS, NET 45 DAYS.

DELIVERY AND/OR COMPLETION TO BE MADE WITHIN as required by the City DAYS FROM DATE OF NOTIFICATION BY THE CITY.

NAME OF BIDDER _____

DISCLOSURE OF CONTRACT RENEWAL

This contract may be renewed for a second and third year at the sole discretion of the City of Worcester, the option of which will be determined at the end of the current contract year.

In no event will increase exceed _____ % for the second contract year.

In no event will increase exceed _____ % for the third contract year.

(TO BE COMPLETED BY BIDDER)

Name

Date

Title

IF VENDOR DOES NOT WISH TO BE CONSIDERED FOR A SECOND AND THIRD YEAR OPTION, PLEASE INDICATE BY CHECKING THIS BOX: ☐

IMPORTANT

It is understood and agreed, that failure by the bidder to complete the above increase statement, it is the bidders intent to accept a second and third year option at zero (0) percent increase.

All other Terms and Conditions to remain the same.

Specifications

Fire Alarm Testing and Inspection Services / WPS - Bid #: CR-8477-J6

The Worcester Public Schools are seeking to retain a licensed fire alarm contractor to perform services related to fire alarm inspection and testing for all fifty-five (55) public school buildings.

Firms responding to this request shall be properly licensed and of adequate size and sufficiently staffed to perform the assignment described herein within the 4 scheduled noted herein.

Testing and inspections for all fifty-five (55) buildings must be completed within **four (4) months** of receipt of the purchase order.

Scope of work

Services shall include the following:

- Perform fire alarm inspection, testing, and maintenance in accordance with requirements of Chapter 14 of NFPA 72 and information detailed in Appendix A.
- Document inspection and testing at each building in accordance with requirements of Chapter 14 of NFPA 72 and information detailed in Appendix A.
- Identify devices and/or components that require replacement or repair of existing systems. Provide cost estimates based on the deficiencies identified. Cost estimates are to be submitted to Worcester Public Schools with labor and materials listed as separate items. This document is to be emailed to: Kevin Peloquin (PeloquinK@worcesterschools.net) and Rich Ikonen (ikonenr@worcesterschools.net).
- Note deficient devices and/or components within each building as part of the report. Identify location of devices, quantities of devices, and addresses within the inspection report.
- Testing shall be performed 3pm-11pm, Monday through Friday, as scheduled with the facilities department five (5) days in advance.

Invoicing and Payment

Every ten (10) working days, the contractor shall submit documentation for buildings that have had completed fire alarm testing and inspection, deficiencies have been identified and documented, and their respective invoices for this work.

Invoices should be sent to: wpsacctspayable@worcesterschools.net within 30 days of work being completed.

Attachments

Appendix A – 2019 NFPA 72, Chapter 14: Inspection, Testing + Maintenance

Appendix B - List of 55 Worcester Public Schools buildings

BID #: CR-8477-J6 / Fire Alarm Testing & Inspection Services - WPS**Pricing Page by Location**

	SCHOOL	ADDRESS	PRICE
BURNCOAT QUADRANT	Burncoat High School	179 Burncoat St.	\$
	Burncoat Middle School	135 Burncoat St.	\$
	Burncoat St. Preparatory School	526 Burncoat St.	\$
	Clark St. School	280 Clark St.	\$
	Greendale Head Start	130 Leeds St.	\$
	Harlow St. School	15 Harlow St.	\$
	Lincoln St. School	549 Lincoln St.	\$
	McGrath Elementary School	493 Grove St.	\$
	Norrback Ave. School	44 Malden St.	\$
	Thorndyke Rd. School	20 Thorndyke Rd.	\$
	Wawecus Rd. School	20 Wawecus Rd.	\$
	Worcester Arts Magnet School	315 St. Nicholas Ave.	\$
	Worcester Technical High School	1 Skyline Dr.	\$

DOHERTY QUADRANT	Chandler Community School	114 Chandler St.	\$
	Worcester Dual Language Magnet School	525 Chandler St.	\$
	Durkin Administration Building (DAB)	20 Irving St.	\$
	Doherty Memorial High School	299 Highland St.	\$
	Elm Park Community School	23 N. Ashland St.	\$
	Fanning Building	24 Chatham St.	\$
	Flagg St. School	115 Flagg St.	\$
	Foley Stadium	305 Chandler St.	\$
	Forest Grove Middle School	495 Grove St.	\$
	Jacob Hiatt Magnet School	772 Main St.	\$
	May St. School	265 May St.	\$
	Midland St. School	18 Midland St.	\$
	Mill Swan Head Start	337 Mill St.	\$
	Nelson Place School	35 Nelson Place	\$
	James L Garvey Parent Info Center	768 Main St	\$
	Tatnuck Magnet School	1083 Pleasant St.	\$
	Taylor Building	770 Main St.	\$
	West Tatnuck School	300 Mower St.	\$

	SCHOOL	ADDRESS	PRICE
NORTH QUADRANT	Belmont Community School	170 Belmont St.	\$
	City View School	80 Prospect St.	\$
	Grafton St. School	311 Grafton St., Building 1&2	\$
	Lake View School	133 Coburn Ave.	\$
	North High School	140 Harrington Way	\$
	Rice Square School	76 Massasoit Rd.	\$
	Roosevelt School	1006 Grafton St.	\$
	The Gerald Creamer Center	120 Granite St.	\$
	Union Hill School	1 Chapin St.	\$
	Worcester East Middle School	420 Grafton St.	\$

SOUTH QUADRANT	Alternative School	22 Waverly St.	\$
	Canterbury St. School	129 Canterbury St.	\$
	Claremont Academy/Woodland	15 Claremont St.	\$
	Columbus Park School	75 Lovell St.	\$
	Gates Lane School	1238 Main St.	\$
	Goddard School of Science and Technology	14 Richards St.	\$
	Heard St. Discovery School	200 Heard St.	\$
	Millbury St. Head Start	389 Millbury St.	\$
	New Citizens Center	1407A Main St.	\$
	Quinsigamond School	14 Blackstone River Rd.	\$
	South High School	170 Apricot St.	\$
	Sullivan Middle School	140 Apricot St.	\$
	University Park Campus School	15 Freeland St.	\$
	Vernon Hill School	211 Providence St.	\$

* Low bid price based on this total	GRAND TOTAL	\$ _____ *
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BIDDER NAME: _____

connecting conductors or equivalent path so that the restoration to normal of a single open or a single ground-fault condition in the installation conductors or other signaling channels is automatically indicated within 200 seconds.

12.6.3 Shorts between conductors shall not be required to be monitored for integrity, unless required by 12.6.15, 12.6.16, and 10.19.2.

12.6.4 Monitoring for integrity shall not be required for a noninterfering shunt circuit, provided that a fault circuit condition on the shunt circuit wiring results only in the loss of the noninterfering feature of operation.

12.6.5 Monitoring for integrity shall not be required for connections to and between supplementary system components, provided that a single open, ground-fault, or short-circuit conditions of the supplementary equipment or interconnecting means, or both, do not affect the required operation of the fire alarm and/or signaling system.

12.6.6 Monitoring for integrity shall not be required for the circuit of an alarm notification appliance installed in the same room with the central control equipment, provided that the notification appliance circuit conductors are installed in conduit or are equivalently protected against mechanical injury.

12.6.7 Monitoring for integrity shall not be required for a trouble notification appliance circuit.

12.6.8* Monitoring for integrity shall not be required for the interconnection between listed equipment within a common enclosure.

12.6.9 Monitoring for integrity shall not be required for the interconnection between enclosures containing control equipment located within 20 ft (6 m) of each other where the conductors are installed in conduit or equivalently protected against mechanical injury.

12.6.10 Monitoring for integrity shall not be required for the conductors for ground-fault detection where a single ground-fault does not prevent the required normal operation of the system.

12.6.11 Monitoring for integrity shall not be required for pneumatic rate-of-rise systems of the continuous line type in which the wiring terminals of such devices are connected in multiple across electrically supervised circuits.

12.6.12 Monitoring for integrity shall not be required for the interconnecting wiring of a stationary computer and the computer's keyboard, video monitor, mouse-type device, or touch screen, as long as the interconnecting wiring does not exceed 8 ft (2.4 m) in length; is a listed computer/data processing cable as permitted by *NFPA 70*; and failure of cable does not cause the failure of the required system functions not initiated from the keyboard, mouse, or touch screen.

12.6.13 Monitoring for integrity of the installation conductors for a ground-fault condition shall not be required for the communications and transmission channels extending from a supervising station to a subsidiary station(s) or protected premises, or both, that comply with the requirements of Chapter 26 and are electrically isolated from the fire alarm system (or circuits) by a transmitter(s).

12.6.14 Interconnection means shall be arranged so that a single break or single ground-fault does not cause an alarm signal.

12.6.15 A wire-to-wire short-circuit fault on any alarm notification appliance circuit shall result in a trouble signal in accordance with Section 10.15, except as permitted by 12.6.5, 12.6.6, or 12.6.11.

12.6.16 Where two or more systems are interconnected, the systems shall be connected using Class A, B, N, or X circuits as described in Section 12.3.

12.7* Nomenclature. The following nomenclature shall be used to identify the required properties of the system(s) interconnections and survivability:

- (1) System(s) interconnections
- (2) Survivability levels (not required if Level 0)
- (3) Shared pathway levels (not required if Level 0)

Chapter 13 Reserved

Chapter 14 Inspection, Testing, and Maintenance

14.1 Application.

14.1.1 The inspection, testing, and maintenance of systems, their initiating devices, and notification appliances shall comply with the requirements of this chapter.

14.1.2 The inspection, testing, and maintenance of single- and multiple-station alarms and household alarm systems shall comply with ~~14.4.5 and 14.4.6~~. (SIG-HOU)

14.1.3 Procedures that are required by other parties and that exceed the requirements of this chapter shall be permitted.

14.1.4 The requirements of this chapter shall apply to both new and existing systems.

14.1.5 The requirements of Chapter 7 shall apply where referenced in Chapter 14.

14.2 General.

14.2.1 Purpose.

14.2.1.1* The purpose for initial and reacceptance inspections ~~shall be~~ to ensure compliance with approved design documents and to ensure installation in accordance with this Code and other required installation standards.

14.2.1.2* The purpose for initial and reacceptance tests of fire alarm and signaling systems ~~shall be~~ to ensure system operation in accordance with the design documents.

14.2.1.3* The purpose for periodic inspections ~~shall be~~ to assure that obvious damages or changes that might affect the system operability are visually identified.

14.2.1.4* The purpose for periodic testing ~~shall be~~ to statistically assure operational reliability.

14.2.2 Performance.

14.2.2.1 Performance Verification. To ensure operational integrity, the system shall have an inspection, testing, and maintenance program.

14.2.2.1.1 Inspection, testing, and maintenance programs shall satisfy the requirements of this Code and conform to the equipment manufacturer's published instructions.

14.2.2.1.2* Inspection, testing, and maintenance programs shall verify correct operation of the system.

14.2.2.2 Impairments/Deficiencies.

14.2.2.2.1 The requirements of Section 10.21 shall be applicable when a system is impaired.

14.2.2.2.2 System deficiencies shall be corrected.

14.2.2.2.3 If a deficiency is not corrected at the conclusion of system inspection, testing, or maintenance, the system owner or the owner's designated representative shall be informed of the ~~deficiency~~ in writing within 24 hours.

14.2.2.2.4 In the event that any equipment is observed to be part of a recall program, the system owner or the system owner's designated representative shall be notified in writing.

14.2.3 Responsibilities.

14.2.3.1* The property or building or system owner or the owner's designated representative shall be responsible for inspection, testing, and maintenance of the system and for alterations or additions to this system.

14.2.3.2 Where the property owner is not the occupant, the property owner shall be permitted to delegate the authority and responsibility for inspecting, testing, and maintaining the fire protection systems to the occupant, management firm, or managing individual through specific provisions in the lease, written use agreement, or management contract.

14.2.3.3 Inspection, testing, or maintenance shall be permitted to be done by the building or system owner or a person or organization other than the building or system owner if conducted under a written contract.

14.2.3.4 Where the building or system owner has delegated any responsibilities for inspection, testing, or maintenance, a copy of the written delegation required by 14.2.3.3 shall be provided to the authority having jurisdiction upon request.

14.2.3.5 Testing and maintenance of central station service systems shall be performed under the contractual arrangements specified in 26.3.3.

14.2.3.6* Service Personnel Qualifications and Experience. Service personnel shall be qualified and experienced in accordance with the requirements of 10.5.3.

14.2.4* Notification.

14.2.4.1 Before proceeding with any testing, all persons and facilities receiving alarm, supervisory, or trouble signals and all building occupants shall be notified of the testing to prevent unnecessary response.

14.2.4.2 At the conclusion of testing, those previously notified (and others, as necessary) shall be notified that testing has been concluded.

14.2.4.3 The owner or the owner's designated representative and service personnel shall coordinate system testing to prevent interruption of critical building systems or equipment.

14.2.5 System Documentation. Prior to system maintenance or testing, the record of completion and any information

required by Chapter 7 regarding the system and system alterations, including specifications, wiring diagrams, and floor plans, shall be provided by the owner or a designated representative to the service personnel upon request.

14.2.5.1 The provided documentation shall include the current revisions of all fire alarm software and the revisions of software of any systems with which the fire alarm software interfaces.

14.2.5.2 The revisions of fire alarm software, and the revisions of the software in the systems with which the fire alarm software interfaces, shall be verified for compatibility in accordance with the requirements of 23.2.2.1.1.

14.2.6 Releasing Systems. Requirements pertinent to testing the fire alarm systems initiating fire suppression system releasing functions shall be covered by 14.2.6.1 through 14.2.6.6.

14.2.6.1 Testing personnel shall be qualified and experienced in the specific arrangement and operation of a suppression system(s) and a releasing function(s) and shall be cognizant of the hazards associated with inadvertent system discharge.

14.2.6.2 Occupant notification shall be required whenever a fire alarm system configured for releasing service is being serviced or tested.

14.2.6.3 Discharge testing of suppression systems shall not be required by this Code.

14.2.6.4 Suppression systems shall be secured from inadvertent actuation, including disconnection of releasing solenoids or electric actuators, closing of valves, other actions, or combinations thereof, for the specific system, for the duration of the fire alarm system testing.

14.2.6.5 Testing shall include verification that the releasing circuits and components energized or actuated by the fire alarm system are electrically monitored for integrity and operate as intended on alarm.

14.2.6.6 Suppression systems and releasing components shall be returned to their functional operating condition upon completion of system testing.

14.2.7 Interface Equipment and Emergency Control Functions.

14.2.7.1* Testing personnel shall be qualified and experienced in the arrangement and operation of interface equipment and emergency control functions.

14.2.7.2 Testing shall be accomplished in accordance with Table 14.4.3.2.

14.2.8 Automated Testing.

14.2.8.1 Automated testing arrangements that provide equivalent means of testing devices to those specified in Table 14.4.3.2 at a frequency at least equivalent to those specified in Table 14.4.3.2 shall be permitted to be used to comply with the requirements of this chapter.

14.2.8.2 Failure of a device on an automated test shall result in an audible and visual trouble signal.

14.2.9* Performance-Based Inspection and Testing. As an alternate means of compliance, subject to the authority having jurisdiction, components and systems shall be permitted to be inspected and tested under a performance-based program.

14.2.10* Test Plan.

14.2.10.1 A test plan shall be developed to clearly establish the scope of the testing for the fire alarm or signaling system.

14.2.10.2 The test plan and results shall be documented with the testing records.

14.3 Inspection.

Δ 14.3.1* Unless otherwise permitted by 14.3.2, visual inspections shall be performed in accordance with the schedules in Table 14.3.1 or more often if required by the authority having jurisdiction.

14.3.2 Devices or equipment that is inaccessible for safety considerations (e.g., continuous process operations, energized electrical equipment, radiation, and excessive height) shall be permitted to be inspected during scheduled shutdowns if approved by the authority having jurisdiction.

14.3.3 Extended intervals shall not exceed 18 months.

14.3.4 Initial and reacceptance inspections shall be made to ensure compliance with approved design documents and to ensure installation in accordance with this Code and other required installation standards.

14.3.5 Periodic visual inspections in accordance with Table 14.3.1 shall be made to assure that there are no changes that affect equipment performance.

14.4 Testing.**14.4.1 Initial Acceptance Testing.**

14.4.1.1 All new systems shall be inspected and tested in accordance with the requirements of Chapter 14.

14.4.1.2 The authority having jurisdiction shall be notified prior to the initial acceptance test.

14.4.2* Reacceptance Testing.

14.4.2.1 When an initiating device, notification appliance, or control relay is added, it shall be functionally tested.

14.4.2.2 When an initiating device, notification appliance, or control relay is deleted, another device, appliance, or control relay on the circuit shall be operated.

14.4.2.3 When modifications or repairs to control equipment hardware are made, the control equipment shall be tested in accordance with Table 14.4.3.2, items 2(a) and 2(d).

14.4.2.4 When changes are made to site-specific software, the following shall apply:

- (1) All functions known to be affected by the change, or identified by a means that indicates changes, shall be 100 percent tested.
- (2) In addition, 10 percent of initiating devices that are not directly affected by the change, up to a maximum of 50 devices, also shall be tested and correct system operation shall be verified.
- (3) A revised record of completion in accordance with 7.5.6 shall be prepared to reflect these changes.

14.4.2.5 Changes to the system executive software shall require a 10 percent functional test of the system, including a test of at least one device on each input and output circuit to

verify critical system functions such as notification appliances, control functions, and off-premises reporting.

14.4.3* Test Methods.

14.4.3.1* At the request of the authority having jurisdiction, the central station facility installation shall be inspected for complete information regarding the central station system, including specifications, wiring diagrams, and floor plans that have been submitted for approval prior to installation of equipment and wiring.

Δ 14.4.3.2* Systems and associated equipment shall be tested according to Table 14.4.3.2.

14.4.3.3 Video image smoke and flame detectors shall be inspected, tested, and maintained in accordance with the manufacturer's published instructions.

14.4.3.4 Gas detectors shall be inspected, tested, and maintained in accordance with manufacturers' published instructions.

N 14.4.3.5 Testing of CO System Detectors. For all carbon monoxide system detectors installed after January 1, 2012, carbon monoxide tests shall be performed at initial acceptance and annually by the introduction of carbon monoxide into the sensing chamber or element.

14.4.4* Testing Frequency. Unless otherwise permitted by other sections of this Code, testing shall be performed in accordance with the schedules in Table 14.4.3.2 or more often if required by the authority having jurisdiction.

14.4.4.1 Devices or equipment that are inaccessible for safety considerations (e.g., continuous process operations, energized electrical equipment, radiation, and excessive height) shall be permitted to be tested during scheduled shutdowns if approved by the authority having jurisdiction. Extended intervals shall not exceed 18 months.

14.4.4.2 If automatic testing is performed at least weekly by a remotely monitored fire alarm control unit specifically listed for the application, the manual testing frequency shall be permitted to be extended to annually. Table 14.4.3.2 shall apply.

14.4.4.3* In other than one- and two-family dwellings, sensitivity of smoke detectors shall be tested in accordance with 14.4.4.3.1 through 14.4.4.3.6.

14.4.4.3.1 Sensitivity shall be checked within 1 year after installation.

14.4.4.3.2 Sensitivity shall be checked every alternate year thereafter unless otherwise permitted by compliance with 14.4.4.3.3.

14.4.4.3.3 After the second required calibration test, if sensitivity tests indicate that the device has remained within its listed and marked sensitivity range (or 4 percent obscuration light gray smoke, if not marked), the length of time between calibration tests shall be permitted to be extended to a maximum of 5 years.

14.4.4.3.3.1 If the frequency is extended, records of nuisance alarms and subsequent trends of these alarms shall be maintained.

Table 14.3.1 Visual Inspection

Component		Initial Acceptance	Periodic Frequency	Method	Reference
1.	All equipment	X	Annual	Ensure there are no changes that affect equipment performance. Inspect for building modifications, occupancy changes, changes in environmental conditions, device location, physical obstructions, device orientation, physical damage, and degree of cleanliness.	14.3.4
2.	Control equipment:				
	(1) Fire alarm systems monitored for alarm, supervisory, and trouble signals			Verify a system normal condition.	
	(a) Fuses	X	Annual		
	(b) Interfaced equipment	X	Annual		
	(c) Lamps and LEDs	X	Annual		
	(d) Primary (main) power supply	X	Annual		
	(e) Trouble signals	X	Semiannual		
	(2) Fire alarm systems unmonitored for alarm, supervisory, and trouble signals			Verify a system normal condition.	
	(a) Fuses	X	Weekly		
	(b) Interfaced equipment	X	Weekly		
	(c) Lamps and LEDs	X	Weekly		
	(d) Primary (main) power supply	X	Weekly		
	(e) Trouble signals	X	Weekly		
3.	Reserved				
4.	Supervising station alarm systems — transmitters			Verify location, physical condition, and a system normal condition.	
	(1) Digital alarm communicator transmitter (DACT)	X	Annual		
	(2) Digital alarm radio transmitter (DART)	X	Annual		
	(3) McCulloh	X	Annual		
	(4) Radio alarm transmitter (RAT)	X	Annual		
	(5) All other types of communicators	X	Annual		
5.	In-building fire emergency voice/alarm communications equipment	X	Semiannual	Verify location and condition.	
6.	Reserved				
7.	Reserved				
8.	Reserved				
9.*	Batteries				10.6.10
	(1) Valve-regulated lead-acid (VRLA) batteries				
	(a) General	X	N/A	Ensure month and year of manufacture is marked in the month/year format on each battery cell/unit. Verify tightness of battery connections. Inspect terminals for corrosion, excessive container/cover distortion, cracks in cell/unit or leakage of electrolyte. Replace any battery cell/unit if corrosion, distortion, or leakage is observed.	
	(b) Marking	N/A	Semiannual	Verify marking of the month/year of manufacture on each battery cell/unit. Replace any cell/unit if alarm equipment manufacturer's replacement date has been exceeded.	
	(2) Primary (dry cell) other than those used in low-power radio (wireless) systems in accordance with Chapter 23	X	Semiannual	Verify marking of the month/year of manufacture. Replace if alarm equipment/battery manufacturer's replacement date has been exceeded. Replacement date not to exceed 12 months. Verify tightness of connections. Inspect for corrosion or leakage. Replace any battery cell/unit if corrosion or leakage is observed.	

(continues)

Table 14.3.1 *Continued*

Component	Initial Acceptance	Periodic Frequency	Method	Reference
10. Reserved				
11. Remote annunciators	X	Semiannual	Verify location and condition.	
12. Notification appliance circuit power extenders	X	Annual	Verify proper fuse ratings, if any. Verify that lamps and LEDs indicate normal operating status of the equipment.	10.6
13. Remote power supplies	X	Annual	Verify proper fuse ratings, if any. Verify that lamps and LEDs indicate normal operating status of the equipment.	10.6
14. Transient suppressors	X	Semiannual	Verify location and condition.	
15. Reserved				
16. Fiber-optic cable connections	X	Annual	Verify location and condition.	
17. Initiating devices			Verify location and condition (all devices).	
(1) Air sampling				
(a) General	X	Semiannual	Verify that in-line filters, if any, are clean.	17.7.3.6
(b) Sampling system piping and sampling ports	X	N/A	Verify that sampling system piping and fittings are installed properly, appear airtight, and are permanently fixed. Confirm that sampling pipe is conspicuously identified. Verify that sample ports or points are not obstructed.	17.7.3.6
(2) Duct detectors				
(a) General	X	Semiannual	Verify that detector is rigidly mounted. Confirm that no penetrations in a return air duct exist in the vicinity of the detector. Confirm the detector is installed so as to sample the airstream at the proper location in the duct.	17.7.5.5
(b) Sampling tube	X	Annual	Verify proper orientation. Confirm the sampling tube protrudes into the duct in accordance with system design.	17.7.5.5
(3) Electromechanical releasing devices	X	Semiannual		
(4) Fire extinguishing system(s) or suppression system(s) switches	X	Semiannual		
(5) Manual fire alarm boxes	X	Semiannual		
(6) Heat detectors	X	Semiannual		
(7) Radiant energy fire detectors	X	Quarterly	Verify no point requiring detection is obstructed or outside the detector's field of view.	17.8
(8) Video image smoke and fire detectors	X	Quarterly	Verify no point requiring detection is obstructed or outside the detector's field of view.	17.7.7; 17.11.5
(9) Smoke detectors (excluding one- and two-family dwellings)	X	Semiannual		
(10) Projected beam smoke detectors	X	Semiannual	Verify beam path is unobstructed.	
(11) Supervisory signal devices	X	Quarterly		
(12) Waterflow devices	X	Quarterly		
18. Reserved				
19. Combination systems			Verify location and condition (all types).	
(1) Fire extinguisher electronic monitoring devices/systems	X	Semiannual		
(2) Carbon monoxide detectors/systems	X	Semiannual		
20. Alarm control interface and emergency control function interface	X	Semiannual	Verify location and condition.	
21. Guard's tour equipment	X	Semiannual	Verify location and condition.	
22. Notification appliances			Verify location and condition (all appliances).	
(1) Audible appliances	X	Semiannual		

(continues)

▲ Table 14.3.1 *Continued*

Component	Initial Acceptance	Periodic Frequency	Method	Reference
(2) Loudspeakers	X	Semiannual		
(3) Visual appliances				
(a) General	X	Semiannual		18.5.5
(b) Candela rating	X	N/A	Verify the appliance candela rating marking or the FACU controlled candela rating agrees with the approved drawings.	18.5.5
23. Exit marking audible notification appliances	X	Semiannual	Verify location and condition.	
24. Reserved				
25. Two-way emergency communications systems	X	Annual	Verify location and condition.	
26. Reserved				
27. Supervising station alarm systems — receivers				
(1) Signal receipt	X	Daily	Verify receipt of signal.	
(2) Receivers	X	Annual	Verify location and normal condition.	
28. Public emergency alarm reporting system transmission equipment			Verify location and condition.	
(1) Publicly accessible alarm box	X	Semiannual		
(2) Auxiliary box	X	Annual		
(3) Master box				
(a) Manual operation	X	Semiannual		
(b) Auxiliary operation	X	Annual		
29. Reserved				
30. Mass notification system				
(1) Monitored for integrity			Verify a system normal condition.	
(a) Control equipment				
(i) Fuses	X	Annual		
(ii) Interfaces	X	Annual		
(iii) Lamps/LED	X	Annual		
(iv) Primary (main) power supply	X	Annual		
(b) Secondary power batteries	X	Annual		
(c) Initiating devices	X	Annual		
(d) Notification appliances	X	Annual		
(2) Not monitored for integrity; installed prior to adoption of the 2010 edition			Verify a system normal condition.	
(a) Control equipment				
(i) Fuses	X	Semiannual		
(ii) Interfaces	X	Semiannual		
(iii) Lamps/LED	X	Semiannual		
(iv) Primary (main) power supply	X	Semiannual		
(b) Secondary power batteries	X	Semiannual		
(c) Initiating devices	X	Semiannual		
(d) Notification appliances	X	Semiannual		
(3) Antenna	X	Annual	Verify location and condition.	
(4) Transceivers	X	Annual	Verify location and condition.	

Note: N/A = not applicable, no minimum requirement established.

For other than VRLA or primary (dry) cell batteries, refer to the battery manufacturer's published instructions or IEEE 450, *Recommended Practice for Maintenance, Testing, and Replacement of Vented Lead-Acid Batteries for Stationary Applications*, for vented lead-acid batteries, and IEEE 1106, *Recommended Practice for Installation, Maintenance, Testing, and Replacement of Vented Nickel-Cadmium Batteries for Stationary Applications*, for nickel-cadmium batteries.

Table 14.4.3.2 Testing

Component		Initial Acceptance	Periodic Frequency	Method
1.	All equipment	X		See Table 14.3.1.
2.	Control equipment and transponder			
	(1) Functions	X	Annually	Verify correct receipt of alarm, supervisory, and trouble signals (inputs); operation of evacuation signals and auxiliary functions (outputs); circuit supervision, including detection of open circuits and ground faults; and power supply supervision for detection of loss of ac power and disconnection of secondary batteries.
	(2) Fuses	X	Annually	Verify rating and supervision.
	(3) Interfaced equipment	X	Annually	Verify integrity of single or multiple circuits providing interface between two or more control units. Test interfaced equipment connections by operating or simulating operation of the equipment being supervised. Verify signals required to be transmitted at the control unit.
	(4) Lamps and LEDs	X	Annually	Illuminate lamps and LEDs.
	(5) Primary (main) power supply	X	Annually	Disconnect all secondary (standby) power and test under maximum load, including all alarm appliances requiring simultaneous operation. Reconnect all secondary (standby) power at end of test. Test redundant power supplies separately.
3.	Alarm control unit trouble signals			
	(1) Audible and visual	X	Annually	Verify operation of control unit trouble signals. Verify ring-back feature for systems using a trouble-silencing switch that requires resetting.
	(2) Disconnect switches	X	Annually	If control unit has disconnect or isolating switches, verify performance of intended function of each switch. Verify receipt of trouble signal when a supervised function is disconnected.
	(3) Ground-fault monitoring circuit	X	Annually	If the system has a ground detection feature, verify the occurrence of ground-fault indication whenever any installation conductor is grounded.
	(4) Transmission of signals to off-premises location	X	Annually	Actuate an initiating device and verify receipt of alarm signal at the off-premises location. Create a trouble condition and verify receipt of a trouble signal at the off-premises location. Actuate a supervisory device and verify receipt of a supervisory signal at the off-premises location. If a transmission carrier is capable of operation under a single- or multiple-fault condition, actuate an initiating device during such fault condition and verify receipt of an alarm signal and a trouble signal at the off-premises location.
4.	Supervising station alarm systems — transmission equipment			
	(1) All equipment	X	Annually	Test all system functions and features in accordance with the equipment manufacturer's published instructions for correct operation in conformance with the applicable sections of Chapter 26. Except for DACT, actuate initiating device and verify receipt of the correct initiating device signal at the supervising station within 90 seconds. Upon completion of the test, restore the system to its functional operating condition.
	(2) Digital alarm communicator transmitter (DACT)	X	Annually	If test jacks are used, conduct the first and last tests without the use of the test jack. Except for DACTs installed prior to adoption of the 2013 edition of NFPA 72 that are connected to a telephone line (number) that is also supervised for adverse conditions by a derived local channel, ensure connection of the DACT to two separate means of transmission. Test DACT for line seizure capability by initiating a signal while using the telephone line (primary line for DACTs using two telephone lines) for a telephone call. Ensure that the call is interrupted and that the communicator connects to the digital alarm receiver. Verify receipt of the correct signal at the supervising station. Verify each transmission attempt is completed within 90 seconds from going off-hook to on-hook. Disconnect the telephone line (primary line for DACTs using two telephone lines) from the DACT. Verify indication of the DACT trouble signal occurs at the premises fire alarm control unit within 4 minutes of detection of the fault. Verify receipt of the telephone line trouble signal at the supervising station. Restore the telephone line (primary line for DACTs using two telephone lines), reset the fire alarm control unit, and verify that the telephone line fault trouble signal returns to normal. Verify that the supervising station receives the restoral signal from the DACT.

(continues)

Table 14.4.3.2 *Continued*

Component	Initial Acceptance	Periodic Frequency	Method
			<p>Disconnect the secondary means of transmission from the DACT. Verify indication of the DACT trouble signal occurs at the premises fire alarm control unit within 4 minutes of detection of the fault. Verify receipt of the secondary means trouble signal at the supervising station. Restore the secondary means of transmission, reset the fire alarm control unit, and verify that the trouble signal returns to normal. Verify that the supervising station receives the restoral signal from the secondary transmitter.</p> <p>Cause the DACT to transmit a signal to the DACR while a fault in the telephone line (number) (primary line for DACTs using two telephone lines) is simulated. Verify utilization of the secondary communications path by the DACT to complete the transmission to the DACR.</p>
(3) Digital alarm radio transmitter (DART)	X	Annually	Disconnect the primary telephone line. Verify transmission of a trouble signal to the supervising station by the DART occurs within 4 minutes.
(4) McCulloh transmitter	X	Annually	<p>Actuate initiating device. Verify production of not less than three complete rounds of not less than three signal impulses each by the McCulloh transmitter.</p> <p>If end-to-end metallic continuity is present and with a balanced circuit, cause each of the following four transmission channel fault conditions in turn, and verify receipt of correct signals at the supervising station:</p> <ol style="list-style-type: none"> (1) Open (2) Ground (3) Wire-to-wire short (4) Open and ground <p>If end-to-end metallic continuity is not present and with a properly balanced circuit, cause each of the following three transmission channel fault conditions in turn, and verify receipt of correct signals at the supervising station:</p> <ol style="list-style-type: none"> (1) Open (2) Ground (3) Wire-to-wire short
(5) Radio alarm transmitter (RAT)	X	Annually	Cause a fault between elements of the transmitting equipment. Verify indication of the fault at the protected premises, or transmission of trouble signal to the supervising station.
(6) Performance-based technologies	X	Annually	<p>Perform tests to ensure the monitoring of integrity of the transmission technology and technology path. Where shared communications equipment is used as permitted by 26.6.3.1.14, provided secondary (standby) power sources shall be tested in accordance with Table 14.4.3.2, item 7, 8, or 9, as applicable.</p> <p>Where a single communications path is used, disconnect the communication path. Manually initiate an alarm signal transmission or allow the check-in (handshake) signal to be transmitted automatically. Verify the premises unit annunciates the failure within 200 seconds of the transmission failure. Restore the communication path.</p> <p>Where multiple communication paths are used, disconnect both communication paths. Manually initiate an alarm signal transmission. Verify the premises control unit annunciates the failure within 200 seconds of the transmission failure. Restore both communication paths.</p>
5. Emergency communications equipment			
(1) Amplifier/tone generators	X	Annually	Verify correct switching and operation of backup equipment.
(2) Call-in signal silence	X	Annually	Operate/function and verify receipt of correct visual and audible signals at control unit.
(3) Off-hook indicator (ring down)	X	Annually	Install phone set or remove phone from hook and verify receipt of signal at control unit.
(4) Phone jacks	X	Annually	Visually inspect phone jack and initiate communications path through jack.
(5) Phone set	X	Annually	Actuate each phone set and verify correct operation.
(6) System performance	X	Annually	Operate the system with a minimum of any five handsets simultaneously. Verify voice quality and clarity.
6. Engine-driven generator	X	Monthly	If an engine-driven generator dedicated to the system is used as a required power source, verify operation of the generator and transfer switch in accordance with NFPA 110 by the building owner.
7. Energy storage systems (ESS)	X	Annually	If an ESS system dedicated to the system is used as a required power source, verify by the building owner operation of the ESS system in accordance with NFPA 111.

(continues)

Table 14.4.3.2 Continued

Component		Initial Acceptance	Periodic Frequency	Method
8.	Secondary (standby) power supply ^c	X	Annually	Disconnect all primary (main) power supplies and verify the occurrence of required trouble indication for loss of primary power. Measure or verify the system's standby and alarm current demand using the equipment manufacturer's data and verify the battery's rated capacity exceeds the system's power demand, including the safety margin. Operate general alarm systems a minimum of 5 minutes and emergency voice communications systems for a minimum of 15 minutes. Reconnect primary (main) power supply at end of test.
9.	VRLA battery and charger ^d			
	(1) Temperature test	X	Semiannually	Prior to conducting any battery testing, verify by the person conducting the test, that all system software stored in volatile memory is protected from loss. Upon initially opening the cabinet door, measure and record the temperature of each battery cell/unit at the negative terminal with an infrared thermometer. Replace any battery cell/unit if the temperature is greater than 18°F (10°C) above ambient.
	(2) Charger test ^f	X	Semiannually	With the battery fully charged and connected to the charger, measure the voltage across the battery with a voltmeter. Verify the voltage is within the battery/alarm equipment manufacturer's recommendations. If the voltage is outside of the specified limits, either adjust the charger to within limits or replace the charger.
	(3) Cell/Unit voltage test	X	Semiannually	With the battery fully charged and connected to the charger, measure the voltage of each cell/unit with a voltmeter. Replace the battery when any cell/unit measures a voltage less than 13.26 volts.
	(4) Ohmic test ^g	X	N/A	When the battery is installed, establish a baseline ohmic value for each battery cell/unit or where available use baseline ohmic values provided by the battery or test equipment manufacturer. In either case record the base line ohmic value on each battery cell/unit.
			Semiannually	With the battery fully charged and connected to the charger, measure the internal ohmic value of each battery cell/unit. Record the test date and ohmic value on each cell/unit. Replace the battery when the ohmic measurement of any cell/unit deviates from the established baseline by 30% or more for conductance and 40% or more for resistance or impedance. Where the battery or test equipment manufacturer's baseline ohmic values are used, replace the battery when any cell/unit has an internal ohmic value outside of the acceptable range.
	(5) Replacement/Load test ^h		3 years	Replace the battery or conduct a load test of the battery capacity. Load test the battery based on the manufacturer's specifications for a discharge rate of 3 hours or more by applying the current indicated for the selected hourly discharge rate continuously, until the terminal voltage decreases to the end voltage specified by the manufacturer. Record the test duration and calculate the battery capacity including adjustment for ambient temperature. Replace the battery if capacity is less than or equal to 80% or at the next scheduled test interval if battery capacity is less than 85%.
10.	Public emergency alarm reporting system — wired system	X	Daily	Manual tests of the power supply for public reporting circuits shall be made and recorded at least once during each 24-hour period. Such tests shall include the following: (1) Current strength of each circuit. Changes in current of any circuit exceeding 10 percent shall be investigated immediately. (2) Voltage across terminals of each circuit inside of terminals of protective devices. Changes in voltage of any circuit exceeding 10 percent shall be investigated immediately. (3) ⁱ Voltage between ground and circuits. If this test shows a reading in excess of 50 percent of that shown in the test specified in (2), the trouble shall be immediately located and cleared. Readings in excess of 25 percent shall be given early attention. These readings shall be taken with a calibrated voltmeter of not more than 100 ohms resistance per volt. Systems in which each circuit is supplied by an independent current source (Forms 3 and 4) require tests between ground and each side of each circuit. Common current source systems (Form 2) require voltage tests between ground and each terminal of each battery and other current source. (4) Ground current reading shall be permitted in lieu of (3). If this method of testing is used, all grounds showing a current reading in excess of 5 percent of the supplied line current shall be given immediate attention. (5) Voltage across terminals of common battery on switchboard side of fuses. (6) Voltage between common battery terminals and ground. Abnormal ground readings shall be investigated immediately. Tests specified in (5) and (6) shall apply only to those systems using a common battery. If more than one common battery is used, each common battery shall be tested.

(continues)

Table 14.4.3.2 *Continued*

Component		Initial Acceptance	Periodic Frequency	Method
11.	Remote annunciators	X	Annually	Verify the correct operation and identification of annunciators. If provided, verify the correct operation of annunciator under a fault condition.
12.	Reserved			
13.	Reserved			
14.	Reserved			
15.	Conductors — metallic			
	(1) Stray voltage	X	N/A	Test all installation conductors with a volt/ohmmeter to verify that there are no stray (unwanted) voltages between installation conductors or between installation conductors and ground. Verify the maximum allowable stray voltage does not exceed 1 volt ac/dc, unless a different threshold is specified in the manufacturer's published instructions for the installed equipment.
	(2) Ground faults	X	N/A	Test all installation conductors, other than those intentionally and permanently grounded, for isolation from ground per the installed equipment manufacturer's published instructions.
	(3) Short-circuit faults	X	N/A	Test all installation conductors, other than those intentionally connected together, for conductor-to-conductor isolation per the manufacturer's published instructions for the installed equipment. Also test these same circuits conductor-to-ground.
	(4) Loop resistance	X	N/A	With each initiating and indicating circuit installation conductor pair short-circuited at the far end, measure and record the resistance of each circuit. Verify that the loop resistance does not exceed the limits specified in the manufacturer's published instructions for the installed equipment.
	(5) Circuit integrity	X	N/A	For initial and reacceptance testing, confirm the introduction of a fault in any circuit monitored for integrity results in a trouble indication at the fire alarm control unit. Open one connection at not less than 10 percent of the initiating devices, notification appliances and controlled devices on every initiating device circuit, notification appliance circuit, and signaling line circuit. Confirm all circuits perform as indicated in Sections 23.5, 23.6, and 23.7.
		N/A	Annually	For periodic testing, test each initiating device circuit, notification appliance circuit, and signaling line circuit for correct indication at the control unit. Confirm all circuits perform as indicated in Sections 23.5, 23.6, and 23.7.
16.	Conductors — nonmetallic			
	(1) Fiber optics	X	N/A	Test the fiber-optic transmission line by the use of an optical power meter or by an optical time domain reflectometer used to measure the relative power loss of the line. Test result data must meet or exceed ANSI/TIA 568-C.3, <i>Optical Fiber Cabling Components Standard</i> , related to fiber-optic lines and connection/splice losses and the control unit manufacturer's published specifications.
	(2) Circuit integrity	X	N/A	For initial and reacceptance testing, confirm the introduction of a fault in any circuit monitored for integrity results in a trouble indication at the fire alarm control unit. Open one connection at not less than 10 percent of the initiating devices, notification appliances, and controlled devices on every initiating device circuit, notification appliance circuit, and signaling line circuit. Confirm all circuits perform as indicated in Sections 23.5, 23.6, and 23.7.
		N/A	Annually	For periodic testing, test each initiating device circuit, notification appliance circuit, and signaling line circuit for correct indication at the control unit. Confirm all circuits perform as indicated in Sections 23.5, 23.6, and 23.7.
17.	Initiating devices ^j			
	(1) Electromechanical releasing device			
	(a) Nonrestorable-type link	X	Annually	Verify correct operation by removal of the fusible link and operation of the associated device.
	(b) Restorable-type link ^k	X	Annually	Verify correct operation by removal of the fusible link and operation of the associated device.
	(2) Fire extinguishing system(s) or suppression system(s) alarm switch	X	Annually	Operate the switch mechanically or electrically and verify receipt of signal by the fire alarm control unit.
	(3) Fire-gas and other detectors	X	Annually	Test fire-gas detectors and other fire detectors as prescribed by the manufacturer and as necessary for the application.
	(4) Heat detectors			
	(a) Fixed-temperature, rate-of-rise, rate of compensation, restorable line, spot type (excluding pneumatic tube type)	X	Annually (see 14.4.4.5)	Perform heat test with a listed and labeled heat source or in accordance with the manufacturer's published instructions. Assure that the test method for the installed equipment does not damage the nonrestorable fixed-temperature element of a combination rate-of-rise/fixed-temperature element detector.

(continues)

Table 14.4.3.2 *Continued*

Component	Initial Acceptance	Periodic Frequency	Method
(b) Fixed-temperature, nonrestorable line type	X	Annually	Do not perform heat test. Test functionality mechanically and electrically. Measure and record loop resistance. Investigate changes from acceptance test.
(c) Fixed-temperature, nonrestorable spot type	X	See Method	After 15 years from initial installation, replace all devices or have 2 detectors per 100 laboratory tested. Replace the 2 detectors with new devices. If a failure occurs on any of the detectors removed, remove and test additional detectors to determine either a general problem involving faulty detectors or a localized problem involving 1 or 2 defective detectors.
(d) Nonrestorable (general)	X	Annually	If detectors are tested instead of replaced, repeat tests at intervals of 5 years.
(e) Restorable line type, pneumatic tube only	X	Annually	Do not perform heat tests. Test functionality mechanically and electrically. Perform heat tests (where test chambers are in circuit), with a listed and labeled heat source or in accordance with the manufacturer's published instructions of the detector or conduct a test with pressure pump.
(f) Single- and multiple-station heat alarms	X	Annually	Conduct functional tests according to manufacturer's published instructions. Do not test nonrestorable heat detectors with heat.
(5) Manual fire alarm boxes	X	Annually	Operate manual fire alarm boxes per the manufacturer's published instructions. Test both key-operated presignal and general alarm manual fire alarm boxes.
(6) Radiant energy fire detectors	X	Semiannually	Test flame detectors and spark/ember detectors in accordance with the manufacturer's published instructions to determine that each detector is operative. Determine flame detector and spark/ember detector sensitivity using any of the following: (1) Calibrated test method (2) Manufacturer's calibrated sensitivity test instrument (3) Listed control unit arranged for the purpose (4) Other approved calibrated sensitivity test method that is directly proportional to the input signal from a fire, consistent with the detector listing or approval If designed to be field adjustable, replace detectors found to be outside of the approved range of sensitivity or adjust to bring them into the approved range. Do not determine flame detector and spark/ember detector sensitivity using a light source that administers an unmeasured quantity of radiation at an undefined distance from the detector.
(7) Smoke detectors — functional test			
(a) In other than one- and two-family dwellings, system detectors	X	Annually	¹ Test smoke detectors in place to ensure smoke entry into the sensing chamber and an alarm response. Use smoke or a listed and labeled product acceptable to the manufacturer or in accordance with their published instructions. Other methods listed in the manufacturer's published instructions that ensure smoke entry from the protected area, through the vents, into the sensing chamber can be used.
(b) Single- and multiple-station smoke alarms connected to protected premises systems	X	Annually	Perform a functional test on all single- and multiple-station smoke alarms connected to a protected premises fire alarm system by putting the smoke alarm into an alarm condition.
(c) System smoke detectors used in one- and two-family dwellings	X	Annually	Conduct functional tests according to manufacturer's published instructions.
(d) Air sampling	X	Annually	Test with smoke or a listed and labeled product acceptable to the manufacturer or in accordance with their published instructions. Test from the end sampling port or point on each pipe run. Verify airflow through all other ports or points.
(e) Duct type	X	Annually	In addition to the testing required in Table 14.4.3.2(g)(1) and Table 14.4.3.2(h), test duct smoke detectors that use sampling tubes to ensure that they will properly sample the airstream in the duct using a method acceptable to the manufacturer or in accordance with their published instructions.
(f) Projected beam type	X	Annually	Test the detector by introducing smoke, other aerosol, or an optical filter into the beam path.
(g) Smoke detector with built-in thermal element	X	Annually	Operate both portions of the detector independently as described for the respective devices.
(h) Smoke detectors with control output functions	X	Annually	Verify that the control capability remains operable even if all of the initiating devices connected to the same initiating device circuit or signaling line circuit are in an alarm state.
(8) Smoke detectors — sensitivity testing			
In other than one- and two-family dwellings, system detectors	N/A	See 14.4.4.3	¹ Perform any of the following tests to ensure that each smoke detector is within its listed and marked sensitivity range: (1) Calibrated test method (2) Manufacturer's calibrated sensitivity test instrument (3) Listed control equipment arranged for the purpose (4) Smoke detector/control unit arrangement whereby the detector causes a signal at the control unit when its sensitivity is outside its listed sensitivity range

(continues)

▲ Table 14.4.3.2 *Continued*

Component	Initial Acceptance	Periodic Frequency	Method
			(5) Other calibrated sensitivity test method approved by the authority having jurisdiction
(9) Carbon monoxide detectors/ carbon monoxide alarms			
(a) CO entry test	X	Annually	Test the devices in place to ensure CO entry to the sensing chamber by introduction through the vents, to the sensing chamber of listed and labeled product acceptable to the manufacturer or in accordance with manufacturer's published instructions
(b) Air sampling	X	Annually	Per test methods documented in the manufacturer's published instructions, verify detector alarm response through the end sampling port on each pipe run; verify airflow through all other ports as well.
(c) Duct type	X	Annually	Test or inspect air duct detectors to ensure that the device will sample the airstream in accordance with the manufacturer's published instructions.
(d) CO detector with control output functions	X	Annually	Within each protected space, verify that the control capability remains operable even if all of the initiating devices connected to the same initiating device circuit or signaling line circuit are in an alarm state.
(10) Initiating devices, supervisory			
(a) Control valve switch	X	Semiannual	Operate valve and verify signal receipt to be within the first two revolutions of the handwheel or within one-fifth of the travel distance, or per the manufacturer's published instructions. Continue to cycle outside stem and yoke valves and verify switch does not reset during full travel of the valve stem.
(b) High- or low-air pressure switch	X	Annually	Operate switch and verify receipt of signal is obtained where the required pressure is increased or decreased a maximum 10 psi (70 kPa) from the required pressure level.
(c) Steam pressure	X	Annually	Operate switch and verify receipt of signal is obtained before pressure decreases to 110 percent of the minimum operating pressure of the steam-operated equipment.
(d) Pressure supervisory devices for other sources	X	Annually	Operate switch and verify receipt of signal is obtained where the required pressure is increased or decreased from the normal operating pressure by an amount specified in approved design documents.
(e) Room temperature switch	X	Annually	Operate switch and verify receipt of signal to indicate the decrease in room temperature to 40°F (4.4°C) and its restoration to above 40°F (4.4°C).
(f) Water level switch	X	Annually	Operate switch and verify receipt of signal indicating the water level raised or lowered a maximum 3 in. (70 mm) from the required level within a pressure tank, or a maximum 12 in. (300 mm) from the required level of a nonpressure tank. Also verify its restoral to required level.
(g) Water temperature switch	X	Annually	Operate switch and verify receipt of signal to indicate the decrease in water temperature to 40°F (4.4°C) and its restoration to above 40°F (4.4°C).
(11) Mechanical, electrosonic, or pressure-type waterflow device	X	Semiannually	Water shall be flowed through an inspector's test connection indicating the flow of water equal to that from a single sprinkler of the smallest orifice size installed in the system or other listed and approved waterflow switch test methods for wet-pipe systems, or an alarm test bypass connection for dry-pipe, pre-action, or deluge systems in accordance with NFPA 25.
(12) Multi-sensor fire detector or multi-criteria fire detector or combination fire detector	X	Annually	Test each of the detection principles present within the detector (e.g., smoke/heat/CO, etc.) independently for the specific detection principle, regardless of the configuration status at the time of testing. Also test each detector in accordance with the manufacturer's published instructions. Test individual sensors together if the technology allows individual sensor responses to be verified. Perform tests as described for the respective devices by introduction of the physical phenomena to the sensing chamber of element. An electronic check (magnets, analog values, etc.) is not sufficient to comply with this requirement. Verify by using the detector manufacturer's published instructions that the test gas used will not impair the operation of either sensing chamber of a multisensor, multicriteria, or combination fire detector. Confirm the result of each sensor test through indication at the detector or control unit. Where individual sensors cannot be tested individually, test the primary sensor. ⁿ Record all tests and results.
18. Special hazard equipment			
(1) Abort switch (dead-man type)	X	Annually	Operate abort switch and verify correct sequence and operation.
(2) Abort switch (recycle type)	X	Annually	Operate abort switch and verify development of correct matrix with each sensor operated.
(3) Abort switch (special type)	X	Annually	Operate abort switch and verify correct sequence and operation in accordance with authority having jurisdiction. Observe sequencing as specified on as-built drawings or in system owner's manual.

(continues)

Table 14.4.3.2 *Continued*

Component	Initial Acceptance	Periodic Frequency	Method
(4) Cross-zone detection circuit	X	Annually	Operate one sensor or detector on each zone. Verify occurrence of correct sequence with operation of first zone and then with operation of second zone.
(5) Matrix-type circuit	X	Annually	Operate all sensors in system. Verify development of correct matrix with each sensor operated.
(6) Release solenoid circuit ^a	X	Annually	Verify operation of solenoid.
(7) Squibb release circuit	X	Annually	Use AGI flashbulb or other test light approved by the manufacturer. Verify operation of flashbulb or light.
(8) Verified, sequential, or counting zone circuit	X	Annually	Operate required sensors at a minimum of four locations in circuit. Verify correct sequence with both the first and second detector in alarm.
(9) All above devices or circuits or combinations thereof	X	Annually	Verify supervision of circuits by creating an open circuit.
19. Combination systems			
(1) Fire extinguisher electronic monitoring device/system	X	Annually	Test communication between the device connecting the fire extinguisher electronic monitoring device/system and the fire alarm control unit to ensure proper signals are received at the fire alarm control unit and remote annunciator(s) if applicable.
(2) Carbon monoxide device/system	X	Annually	Test communication between the device connecting the carbon monoxide device/system and the fire alarm control unit to ensure proper signals are received at the fire alarm control unit and remote annunciator(s) if applicable.
20. Interface equipment ^a	X	See 14.4.4.4	Test interface equipment connections by operating or simulating the equipment being supervised. Verify signals required to be transmitted are received at the control unit. Test frequency for interface equipment is the same as the frequency required by the applicable NFPA standard(s) for the equipment being supervised.
21. Guard's tour equipment	X	Annually	Test the device in accordance with the manufacturer's published instructions.
22. Alarm notification appliances			
(1) Audible ^a	X	N/A	For initial and reacceptance testing, measure sound pressure levels for signals with a sound level meter meeting ANSI S1.4a, <i>Specifications for Sound Level Meters</i> , Type 2 requirements. Measure sound pressure levels throughout the protected area to confirm that they are in compliance with Chapter 18. Set the sound level meter in accordance with ANSI/ASA S3.41, <i>American National Standard Audible Emergency Evacuation (E2) and Evacuation Signals with Relocation Instructions (ESRI)</i> , using the time-weighted characteristic F (FAST).
(2) Audible textual notification appliances (loudspeakers and other appliances to convey voice messages)	N/A X	Annually N/A	For periodic testing, verify the operation of the notification appliances. For initial and reacceptance testing, measure sound pressure levels for signals with a sound level meter meeting ANSI S1.4a, <i>Specifications for Sound Level Meters</i> , Type 2 requirements. Measure sound pressure levels throughout the protected area to confirm that they are in compliance with Chapter 18. Set the sound level meter in accordance with ANSI/ASA S3.41, <i>American National Standard Audible Emergency Evacuation (E2) and Evacuation Signals with Relocation Instructions (ESRI)</i> , using the time-weighted characteristic F (FAST). Verify audible information to be intelligible and in compliance with 14.4.11.
(3) Visual	N/A X	Annually N/A	For periodic testing, verify the operation of the notification appliances. Perform initial and reacceptance testing in accordance with the manufacturer's published instructions. Verify appliance locations to be per approved layout and confirm that no floor plan changes affect the approved layout. Verify the candela rating or method of candela control marking on each visual appliance and rating when reported by the FACU agrees with the approved drawings. Confirm that each appliance flashes.
	N/A	Annually	For periodic testing, verify that each appliance flashes.
23. Exit marking audible notification appliance	X	Annually	Perform tests in accordance with manufacturer's published instructions.
24. Emergency control functions ^a	X	Annually	For initial, reacceptance, and periodic testing, verify emergency control function interface device activation. Where an emergency control function interface device is disabled or disconnected during initiating device testing, verify that the disabled or disconnected emergency control function interface device has been properly restored, including electromagnetic devices used for door releasing services as part of a fire alarm system.
25. Two-way emergency communications systems	X	Annually	Use the manufacturer's published instructions and the as-built drawings provided by the system supplier to verify correct operation after the initial testing phase has been performed by the supplier or by the supplier's designated representative. Test the two-way communication system to verify operation and receipt of visual and audible signals at the transmitting unit and the receiving unit, respectively.

(continues)

Table 14.4.3.2 Continued

Component	Initial Acceptance	Periodic Frequency	Method
			<p>Operate systems with more than five stations with a minimum of five stations operating simultaneously.</p> <p>Verify voice quality and clarity.</p> <p>Verify directions for the use of the two-way communication system, instructions for summoning assistance via the two-way communication system, and written identification of the location is posted adjacent to the two-way communication system.</p> <p>Verify that all remote stations are readily accessible.</p> <p>Verify the timed automatic communications capability to connect with a constantly attended monitoring location per 24.5.3.4.</p>
26. Special procedures			
(1) Alarm verification	X	Annually	Verify time delay and alarm response for smoke detector circuits identified as having alarm verification.
(2) Multiplex systems	X	Annually	<p>Verify communications between sending and receiving units under both primary and secondary power.</p> <p>Verify communications between sending and receiving units under open-circuit and short-circuit trouble conditions.</p> <p>Verify communications between sending and receiving units in all directions where multiple communications pathways are provided.</p> <p>If redundant central control equipment is provided, verify switchover and all required functions and operations of secondary control equipment.</p> <p>Verify all system functions and features in accordance with manufacturer's published instructions.</p>
27. Supervising station alarm systems — receiving equipment			
(1) All equipment	X	Monthly	<p>Perform tests on all system functions and features in accordance with the equipment manufacturer's published instructions for correct operation in conformance with the applicable sections of Chapter 26.</p> <p>Actuate initiating device and verify receipt of the correct initiating device signal at the supervising station within 90 seconds. Upon completion of the test, restore the system to its functional operating condition.</p>
(2) Digital alarm communicator receiver (DACR)	X	Monthly	<p>If test jacks are used, perform the first and last tests without the use of the test jack.</p> <p>Disconnect each transmission means in turn from the DACR, and verify audible and visual annunciation of a trouble signal in the supervising station.</p> <p>Cause a signal to be transmitted on each individual incoming DACR line (path) at least once every 6 hours (24 hours for DACTs installed prior to adoption of the 2013 edition of NFPA 72). Verify receipt of these signals.</p>
(3) Digital alarm radio receiver (DARR)	X	Monthly	<p>Cause the following conditions of all DARRs on all subsidiary and repeater station receiving equipment. Verify receipt at the supervising station of correct signals for each of the following conditions:</p> <ul style="list-style-type: none"> (1) AC power failure of the radio equipment (2) Receiver malfunction (3) Antenna and interconnecting cable failure (4) Indication of automatic switchover of the DARR (5) Data transmission line failure between the DARR and the supervising or subsidiary station
(4) McCulloh systems	X	Monthly	<p>Test and record the current on each circuit at each supervising and subsidiary station under the following conditions:</p> <ul style="list-style-type: none"> (1) During functional operation (2) On each side of the circuit with the receiving equipment conditioned for an open circuit <p>Cause a single break or ground condition on each transmission channel. If such a fault prevents the functioning of the circuit, verify receipt of a trouble signal.</p> <p>Cause each of the following conditions at each of the supervising or subsidiary stations and all repeater station radio transmitting and receiving equipment; verify receipt of correct signals at the supervising station:</p> <ul style="list-style-type: none"> (1) RF transmitter in use (radiating) (2) AC power failure supplying the radio equipment (3) RF receiver malfunction (4) Indication of automatic switchover
(5) Radio alarm supervising station receiver (RASSR) and radio alarm repeater station receiver (RARSR)	X	Monthly	<p>Cause each of the following conditions at each of the supervising or subsidiary stations and all repeater station radio transmitting and receiving equipment; verify receipt of correct signals at the supervising station:</p> <ul style="list-style-type: none"> (1) AC power failure supplying the radio equipment (2) RF receiver malfunction (3) Indication of automatic switchover, if applicable

(continues)

Table 14.4.3.2 *Continued*

Component		Initial Acceptance	Periodic Frequency	Method
(6) Private microwave radio systems		X	Monthly	Cause each of the following conditions at each of the supervising or subsidiary stations and all repeater station radio transmitting and receiving equipment; verify receipt of correct signals at the supervising station: (1) RF transmitter in use (radiating) (2) AC power failure supplying the radio equipment (3) RF receiver malfunction (4) Indication of automatic switchover
(7) Performance-based technologies		X	Monthly	Perform tests to ensure the monitoring of integrity of the transmission technology and technology path. Where a single communications path is used, disconnect the communication path. Verify that failure of the path is annunciated at the supervising station within 60 minutes of the failure (within 5 minutes for communication equipment installed prior to adoption of the 2013 edition of <i>NFPA 72</i>). Restore the communication path. Where multiple communication paths are used, disconnect both communication paths and confirm that failure of the path is annunciated at the supervising station within not more than 6 hours of the failure (within 24 hours for communication equipment installed prior to adoption of the 2013 edition of <i>NFPA 72</i>). Restore both communication paths.
28. Public emergency alarm reporting system transmission equipment				
(1) Publicly accessible alarm box		X	Semiannually	Actuate publicly accessible initiating device(s) and verify receipt of not less than three complete rounds of signal impulses. Perform this test under normal circuit conditions. If the device is equipped for open circuit operation (ground return), test it in this condition as one of the semiannual tests.
(2) Auxiliary box		X	Annually	Test each initiating circuit of the auxiliary box by actuation of a protected premises initiating device connected to that circuit. Verify receipt of not less than three complete rounds of signal impulses.
(3) Master box				
(a) Manual operation		X	Semiannually	Perform the tests prescribed for 28(a).
(b) Auxiliary operation		X	Annually	Perform the tests prescribed for 28(b).
29. Low-power radio (wireless systems)		X	N/A	The following procedures describe additional acceptance and reacceptance test methods to verify wireless protection system operation: (1) Use the manufacturer's published instructions and the as-built drawings provided by the system supplier to verify correct operation after the initial testing phase has been performed by the supplier or by the supplier's designated representative. (2) Starting from the functional operating condition, initialize the system in accordance with the manufacturer's published instructions. Confirm the alternative communications path exists between the wireless control unit and peripheral devices used to establish initiation, indication, control, and annunciation. Test the system for both alarm and trouble conditions. (3) Check batteries for all components in the system monthly unless the control unit checks all batteries and all components daily.
30. Mass notification systems				
(1) Functions		X	Annually	At a minimum, test control equipment to verify correct receipt of alarm, supervisory, and trouble signals (inputs); operation of evacuation signals and auxiliary functions (outputs); circuit supervision, including detection of open circuits and ground faults; and power supply supervision for detection of loss of ac power and disconnection of secondary batteries.
(2) Fuses		X	Annually	Verify the rating and supervision.
(3) Interfaced equipment		X	Annually	Verify integrity of single or multiple circuits providing interface between two or more control units. Test interfaced equipment connections by operating or simulating operation of the equipment being supervised. Verify signals required to be transmitted at the control unit.
(4) Lamps and LEDs		X	Annually	Illuminate lamps and LEDs.
(5) Primary (main) power supply		X	Annually	Disconnect all secondary (standby) power and test under maximum load, including all alarm appliances requiring simultaneous operation. Reconnect all secondary (standby) power at end of test. For redundant power supplies, test each separately.
(6) Audible textual notification appliances (loudspeakers and other appliances to convey voice messages)		X	Annually	Measure sound pressure level with a sound level meter meeting ANSI S1.4a, <i>Specifications for Sound Level Meters</i> , Type 2 requirements. Measure and record levels throughout protected area. Set the sound level meter in accordance with ANSI/ASA S3.41, <i>American National Standard Audible Emergency Evacuation Signal</i> , using the time-weighted characteristic F (FAST). Record the maximum output when the audible emergency evacuation signal is on. Verify audible information to be distinguishable and understandable.

(continues)

Table 14.4.3.2 Continued

Component	Initial Acceptance	Periodic Frequency	Method
(7) Visual	X	Annually	Perform test in accordance with manufacturer's published instructions. Verify appliance locations to be per approved layout and confirm that no floor plan changes affect the approved layout. Verify the candela rating or method of candela control marking on each visual appliance and rating when reported by the FACU agrees with the approved drawings. Confirm that each appliance flashes.
(8) Control unit functions and no diagnostic failures are indicated	X	Annually	Review event log file and verify that the correct events were logged. Review system diagnostic log file; correct deficiencies noted in file. Delete unneeded log files. Delete unneeded error files. Verify that sufficient free disk space is available. Verify unobstructed flow of cooling air is available. Change/clean filters, cooling fans, and intake vents.
(9) Control unit reset	X	Annually	Power down the central control unit computer and restart it.
(10) Control unit security	X	Annually	If remote control software is loaded onto the system, verify that it is disabled to prevent unauthorized system access.
(11) Audible/visual functional test	X	Annually	Send out an alert to a diverse set of predesignated receiving devices and confirm receipt. Include at least one of each type of receiving device.
(12) Software backup	X	Annually	Make full system software backup. Rotate backups based on accepted practice at site.
(13) Secondary power test	X	Annually	Disconnect ac power. Verify the ac power failure alarm status on central control equipment. With ac power disconnected, verify battery voltage under load.
(14) Wireless signals	X	Annually	Check forward/reflected radio power is within specifications.
(15) Antenna	X	Annually	Check forward/reflected radio power is within specifications. Verify solid electrical connections with no observable corrosion.
(16) Transceivers	X	Annually	Verify proper operation and mounting is not compromised.

^aSome transmission equipment (such as, but not limited to, cable modems, fiber-optic interface nodes, and VoIP interfaces) are typically powered by the building's electrical system using a secondary (standby) power supply that does not meet the requirements of this Code. This is intended to ensure that the testing authority verifies full secondary (standby) power as required by Chapter 10. Additionally, refer to Table 14.4.3.2, items 7 through 9, for secondary (standby) power supply testing.

^bThe automatic transmission of the check-in (handshake) signal can take up to 60 minutes to occur.

^cSee Table 14.4.3.2, Item 4(I) for the testing of transmission equipment.

^dThe battery tests in Table 14.4.3.2 Item 9 are based on VRLA batteries and it is the intent that the tests specified in (1) through (4) be performed in order. For other secondary battery types, refer to the battery manufacturer's published instructions or IEEE 450, *Recommended Practice for Maintenance, Testing, and Replacement of Vented Lead-Acid Batteries for Stationary Applications*, for vented lead-acid batteries, and IEEE 1106, *Recommended Practice for Installation, Maintenance, Testing, and Replacement of Vented Nickel-Cadmium Batteries for Stationary Applications*, for nickel-cadmium batteries.

^eExample: $4000 \text{ mAh} \times \frac{1}{25} = 160 \text{ mA}$ charging current at 77°F (25°C).

^fIf the charger is adjustable, adjust the output voltage to 2.265 volts per cell ± 0.015 volts at 77°F (25°C) or as specified by the alarm equipment manufacturer.

^gSee A.14.4.3.2 Item 9(4). A load test per Item 9(5) is permitted in lieu of an ohmic test.

^hSee A.14.4.3.2 Item 9(5).

ⁱThe voltmeter sensitivity has been changed from 1000 ohms per volt to 100 ohms per volt so that the false ground readings (caused by induced voltages) are minimized.

^jInitiating devices such as smoke detectors used for elevator recall, closing dampers, or releasing doors held in the open position that are permitted by the Code (see 9.6.3 of NFPA 101) to initiate supervisory signals at the fire alarm control unit (FACU) should be tested at the same frequency (annual) as those devices when they are generating an alarm signal. They are not supervisory devices, but they initiate a supervisory signal at the FACU.

^kFusible thermal link detectors are commonly used to close fire doors and fire dampers electrically connected to the fire alarm control unit. They are actuated by the presence of external heat, which causes a solder element in the link to fuse, or by an electric thermal device, which, when energized, generates heat within the body of the link, causing the link to fuse and separate.

^lNote, it is customary for the manufacturer of the smoke detector to test a particular product from an aerosol provider to determine acceptability for use in smoke entry testing of their smoke detector/smoke alarm. Magnets are not acceptable for smoke entry tests.

^mThere are some detectors that use magnets as a manufacturer's calibrated sensitivity test instrument.

ⁿFor example, it might not be possible to individually test the heat sensor in a thermally enhanced smoke detector.

^oManufacturer's published instructions should be consulted to ensure a proper operational test. No suppression gas or agent is expected to be discharged during the test of the solenoid. See Test Plan of 14.2.10.

^pA monitor module installed on an interface device is not considered a supervisory device and therefore not subject to the quarterly testing frequency requirement. Test frequencies for interface devices should be in accordance with the applicable standard. For example, fire pump controller alarms such as phase reversal are required to be tested annually. If a monitor module is installed to identify phase reversal on the fire alarm control unit, it is not necessary to test for phase reversal four times a year.

^qChapter 18 would require 15 dB over average ambient sound for public mode spaces. Sometimes the ambient sound levels are different from what the design was based upon. Private operating mode would require 10 dB over average ambient at the location of the device.

^rWhere building, system, or occupancy changes have been observed, the owner should be notified of the changes. New devices might need to be installed and tested per the initial acceptance testing criteria.

^sSee A.14.4.3.2 and Table 14.4.3.2, Item 24.

14.4.4.3.3.2 In zones or in areas where nuisance alarms show any increase over the previous year, calibration tests shall be performed.

14.4.4.3.4 Unless otherwise permitted by 14.4.4.3.5, smoke detectors found to have a sensitivity outside the listed and marked sensitivity range shall be cleaned and recalibrated or be replaced.

14.4.4.3.5 Smoke detectors listed as field adjustable shall be permitted to either be adjusted within the listed and marked sensitivity range, cleaned, and recalibrated, or be replaced.

14.4.4.3.6 The detector sensitivity shall not be tested or measured using any device that administers an unmeasured concentration of smoke or other aerosol into the detector or smoke alarm.

14.4.4.4 Test frequency of interfaced equipment shall be the same as specified by the applicable NFPA standards for the equipment being supervised.

14.4.4.5 Restorable fixed-temperature, spot-type heat detectors shall be tested in accordance with 14.4.4.5.1 through 14.4.4.5.4.

14.4.4.5.1 Two or more detectors shall be tested on each initiating circuit annually.

14.4.4.5.2 Different detectors shall be tested each year.

14.4.4.5.3 Test records shall be kept by the building owner specifying which detectors have been tested.

14.4.4.5.4 Within 5 years, each detector shall have been tested.

N 14.4.4.5.5 Carbon monoxide apparatus that require resetting to maintain normal operation shall be restored to normal as promptly as possible after each test and alarm and kept in normal condition for operation. All test signals received shall be recorded to indicate date and time.

14.4.4.6* Circuit and pathway testing of each monitored circuit or pathway shall be conducted with initial acceptance or reacceptance testing to verify signals are indicated at the control unit for each of the abnormal conditions specified in Sections 23.5 through 23.7.

14.4.5 Single- and Multiple-Station Alarms. (SIG-HOU)

A 14.4.5.1 Single- and multiple-station alarms and connected appliances shall be inspected, tested, and maintained in accordance with Table 14.3.1, Table 14.4.3.2, and the manufacturer's published instructions.

14.4.5.2 **Alarms** and connected appliances shall be inspected and tested at least monthly.

14.4.5.3* The responsibility for inspection, testing, and maintenance of smoke alarms and connected appliances shall be in accordance with 14.2.3.

N 14.4.5.4* Notwithstanding other requirements of 14.2.3, the occupant of a dwelling unit shall be deemed qualified to perform inspection, testing, and maintenance on single- and multiple-station alarms protecting that dwelling unit when provided with information from the manufacturer or a manufacturer's certified representative.

14.4.5.5 **Alarms and connected appliances** shall be replaced when they fail to respond to operability tests.

14.4.5.6 Smoke alarms shall not remain in service longer than 10 years from the date of manufacture, unless otherwise provided by the manufacturer's published instructions.

N 14.4.5.7 Carbon monoxide alarms shall be replaced when either the end-of-life signal is actuated or the manufacturer's replacement date is reached.

14.4.5.8 Combination smoke/carbon monoxide alarms shall be replaced when the end-of-life signal **actuates** or 10 years from the date of manufacture, whichever comes first, unless otherwise provided by the manufacturer's published instructions.

14.4.5.9 Where batteries are used as a source of energy for **alarms**, the batteries shall be replaced in accordance with the alarm equipment manufacturer's published instructions.

14.4.6 Household Fire Alarm Systems. (SIG-HOU)

A 14.4.6.1 Household alarm systems shall be **inspected, tested, and maintained** at least annually according to Table 14.3.1, Table 14.4.3.2, and the manufacturer's published instructions.

N 14.4.6.2 The responsibility for inspection, testing, and maintenance of smoke alarms and connected appliances shall be in accordance with 14.2.3.

N 14.4.6.3* Notwithstanding other requirements of 14.2.3, the occupant of a dwelling unit shall be deemed qualified to perform inspection, testing, and maintenance on a household alarm system protecting that dwelling unit when provided with information and/or training from the manufacturer or a manufacturer's certified representative.

N 14.4.6.4 The installing contractor shall be required to provide the information in 14.4.6.3 in writing to the customer upon completion of the system installation.

N 14.4.6.5 Carbon monoxide detectors shall be replaced when the end-of-life signal is actuated, the manufacturer's replacement date is reached, or when they fail to respond to operability tests.

A 14.4.6.6 Maintenance of household alarm systems shall be conducted according to the manufacturer's published instructions.

14.4.7 **Circuits from Central Station.** Circuits extending from the central station that have had no signal activity in the preceding 24 hours shall be tested at intervals of not more than 24 hours.

N 14.4.8 Household Carbon Monoxide Detection Systems.

N 14.4.8.1 Testing of Household Carbon Monoxide Detection Systems.

N 14.4.8.1.1 Household carbon monoxide detection systems shall be tested by a qualified service technician at least every 3 years according to the methods in line 1 of Table 14.4.3.2.

N 14.4.8.1.2 Household carbon monoxide detection systems shall be tested in accordance with the manufacturer's published instructions.

14.4.8.1.3* Notwithstanding other requirements of 14.2.3.6, the occupant of a dwelling unit shall be deemed qualified to perform inspection, testing, and maintenance on an alarm system protecting that dwelling unit when provided with information and training from the manufacturer or a manufacturer's certified representative.

14.4.9 Public Emergency Alarm Reporting Systems.

14.4.9.1 Emergency power sources other than batteries shall be tested at least weekly in accordance with 14.4.9.1.1 and 14.4.9.1.2.

14.4.9.1.1 Testing shall include operation of the power source to supply the system for a continuous period of 1 hour.

14.4.9.1.2 Testing shall require simulated failure of the normal power source.

14.4.9.2 Unless otherwise permitted by 14.4.9.3, testing facilities shall be installed at the communications center and each subsidiary communications center, if used.

14.4.9.3 Testing facilities for systems leased from a nonmunicipal organization shall be permitted to be installed at locations other than the communications center if approved by the authority having jurisdiction.

14.4.10 In-Building Emergency Radio Communication Systems. In-building emergency radio communication systems shall be inspected and operationally tested in accordance with the requirements of NFPA 1221.

14.4.11* Voice Intelligibility.

14.4.11.1 Voice communication using prerecorded messages and manual voice announcements shall be verified as being intelligible in accordance with the requirements of 18.4.11.

14.4.11.2 Intelligibility shall not be required to be determined through quantitative measurements.

14.4.11.3 Quantitative measurements as described in Annex D shall be permitted but shall not be required.

14.5 Maintenance.

14.5.1 System equipment shall be maintained in accordance with the manufacturer's published instructions.

14.5.2 The frequency of maintenance of system equipment shall depend on the type of equipment and the local ambient conditions.

14.5.3 The frequency of cleaning of system equipment shall depend on the type of equipment and the local ambient conditions.

14.5.4 All apparatus requiring rewinding or resetting to maintain normal operation shall be rewound or reset as promptly as possible after each test and alarm.

14.5.5 Unless otherwise permitted by 14.5.6, the retransmission means as defined in Section 26.3 shall be tested at intervals of not more than 12 hours.

14.5.6 When the retransmission means is the public-switched telephone network, testing shall be permitted at weekly intervals to confirm its operation to each communications center.

14.5.7 As a part of the testing required in 14.5.5, the retransmission signal and the time and date of the retransmission shall be recorded in the central station.

14.6 Records.

14.6.1* Permanent Records. After successful completion of acceptance tests approved by the authority having jurisdiction, the requirements in 14.6.1.1 through 14.6.1.3 shall apply.

14.6.1.1 A set of reproducible as-built installation drawings, operation and maintenance manuals, and a written sequence of operation shall be provided to the building owner or the owner's designated representative.

14.6.1.2* The requirements of 7.5.7 shall apply to site-specific software.

14.6.1.3 The system owner shall be responsible for maintaining these records for the life of the system for examination by any authority having jurisdiction. Paper or electronic media shall be permitted.

14.6.2 Maintenance, Inspection, and Testing Records.

14.6.2.1 Records shall be retained until the next test and for 1 year thereafter.

14.6.2.2 For systems with restorable fixed-temperature, spot-type heat detectors tested over multiple years, records shall be retained for the 5 years of testing and for 1 year thereafter.

14.6.2.3 The records shall be on a medium that will survive the retention period. Paper or electronic media shall be permitted.

14.6.2.4* A record of all inspections, testing, and maintenance shall be provided in accordance with 7.8.2.

14.6.3 Supervising Station Records. For supervising station alarm systems, records pertaining to signals received at the supervising station that result from maintenance, inspection, and testing shall be maintained for not less than 12 months.

14.6.3.1 Records shall be permitted to be maintained on either paper or electronic media.

14.6.3.2 Upon request, a hard copy record shall be provided to the authority having jurisdiction.

14.6.4 Simulated Operation Note. If the operation of a device, circuit, fire alarm control unit function, or special hazard system interface is simulated, it shall be noted on the inspection/test form that the operation was simulated.

Chapter 15 Reserved

Chapter 16 Reserved

Appendix B

	SCHOOL	ADDRESS
BURNCOAT QUADRANT	Burncoat High School	179 Burncoat St.
	Burncoat Middle School	135 Burncoat St.
	Burncoat St. Preparatory School	526 Burncoat St.
	Clark St. School	280 Clark St.
	Greendale Head Start	130 Leeds St.
	Harlow St. School	15 Harlow St.
	Lincoln St. School	549 Lincoln St.
	McGrath Elementary School	493 Grove St.
	Norrback Ave. School	44 Malden St.
	Thorndyke Rd. School	20 Thorndyke Rd.
	Wawecus Rd. School	20 Wawecus Rd.
	Worcester Arts Magnet School	315 St. Nicholas Ave.
	Worcester Technical High School	1 Manny Familia Way
DOHERTY QUADRANT	Chandler Community School	114 Chandler St.
	Worcester Dual Language Magnet School	525 Chandler St.
	Durkin Administration Building (DAB)	20 Irving St.
	Doherty Memorial High School	299 Highland St.
	Elm Park Community School	23 N. Ashland St.
	Fanning Building	24 Chatham St
	Flagg St. School	115 Flagg St.
	Foley Stadium	305 Chandler Street
	Forest Grove Middle School	495 Grove St.
	Jacob Hiatt Magnet School	772 Main St.
	May St. School	265 May St.
	Midland St. School	18 Midland St.
	Mill Swan Head Start	337 Mill St.
	Nelson Place School	35 Nelson Place
	James L. Garvey Parent Info Center	768 Main St
	Tatnuck Magnet School	1083 Pleasant St.
NORTH QUADRANT	Taylor Building	770 Main St
	West Tatnuck School	300 Mower St.
	Belmont Community School	170 Belmont St.
	City View School	80 Prospect St.
	Grafton St. School	311 Grafton St., Building 1&2
	Lake View School	133 Coburn Ave.
	North High School	140 Harrington Way
	Rice Square School	76 Massasoit Rd.
	Roosevelt School	1006 Grafton St.
	The Gerald Creamer Center	120 Granite St.
SOUTH QUADRANT	Union Hill School	1 Chapin St.
	Worcester East Middle School	420 Grafton St.
	Alternative School	22 Waverly St.
	Canterbury St. School	129 Canterbury St.
	Claremont Academy/Woodland	15 Claremont St.
	Columbus Park School	75 Lovell St.
	Gates Lane School	1238 Main St.
	Goddard School of Science and Technology	14 Richards St.
	Heard St. Discovery School	200 Heard St.
	Millbury St. Head Start	389 Millbury St.
	New Citizens Center	1407A Main St.
	Quinsigamond School	14 Blackstone River Rd.
	South High School	170 Apricot St.
	Sullivan Middle School	140 Apricot St.
	University Park Campus School	15 Freeland St.
	Vernon Hill School	211 Providence St.