Town of Sudbury

Community Preservation Committee

http://www.sudbury.ma.us
email: cpc@sudbury.ma.us

PROJECT SUBMISSION FORM

Submitter: Sudbury Historical Society

Submission Date: October 4, 2018
Revised for 11/7/18 CPC Meeting

Group or Committee Affiliation (if any):

Submitter's address :

322 Concord Rd. Sudbury, Ma

Submitter's email & phone number:

director@sudbury0176.org

Purpose (please select all that apply):

___ Open Space
___ Community Housing
X Historic
___ Recreation

Project Manager's email & phone number: director @sudbury01776.org 978-443-3747

Project Name: Fire Detection for Loring Parsonage

Project Description: Design and install an aspirating smoke detection system (VESDA) for the Loring Parsonage

Costs:

Fiscal Year	Total Project Cost	CPC Funds Requested	Other Funding Sources (amount and source)
2020	63,000	63,000	
2021			
2022			
2023			
2024			
Total			

How does this project meet the General Criteria and Category Specific Criteria for CPC projects (see attached)?

See attached.

Does this project fall within the jurisdiction or interest of other Town Boards, Committees or Departments? If so, please list the boards, committees or departments, whether applications and/or presentations have been made, and what input or recommendations have been given.

For Community Preservation Committee Use:

Form received on:_____ Project presented to CPC on: _____

Reviewed by:_____ Determination:_____

Request for Funding for a Very Early Smoke Detection System (VESDA) at the Loring Parsonage

Meeting the CPC Historical Criteria, a VESDA would:

1. Protect an historic, cultural, and architecturally significant town-owned building that is located within the Old Town Center Historic District which is listed on the National Register of Historic Places;
2. Protect irreplaceable historic documents and artifacts related to the history of the Town of Sudbury; and
3. Provide public benefit by protecting an asset that the Town recently restored with town-approved funds.

Historical Significance

The 300-year-old Loring Parsonage, as the oldest extant building in Sudbury's Town Center, is one of the most historically important buildings in Sudbury. It was built in 1730, starting out as a traditional New-England style two-room house, one over one, with a fireplace on the right. Then it was expanded into a four-room house, two over two, which created the massive center chimney. It predates the Hosmer House by more than 60 years. It is a classic example of colonial building evolution and construction methodology. Through it we see how a small two room house evolves into an 8-room homestead over the course of 300 years.

The house was built for Reverend Israel Loring when he moved from East Sudbury (Wayland) to Sudbury becoming the new minister for the Sudbury Meeting House, now known as First Parish of Sudbury. The Parsonage became "his homestead" as he refers to it in his will. He lived here with his family until his death in 1772 at age 90. The Wheeler Family inherited this house through marriage and it continued in the Wheeler family until Walter Haynes inherited it thru his wife, who was a Wheeler, in 1802. This house was kept as a tavern by Walter Haynes from about 1810 to 1830. By 1881 Walter had died, and Elisha Haynes had inherited it and was running a profitable dairy farm with many outlying buildings and fields. It remained in the Haynes Family until 1931 when the Town purchased the building.

The Loring Parsonage has served as the site of Town offices, the Fire Chief's residence, and many other uses until 2016. It is historically significant because it has stood mostly intact in the Town Center as Sudbury has evolved from a small Puritan village to the town it is today. In the spring of 2019 the Sudbury Historical Society will relocate its operations to the Loring Parsonage, bringing with it the Society's collections of historic treasures. The SHS collections include objects that predate the arrival of the Puritans to Sudbury, valuable historical documents attesting to our town's history over last 350+ years, and objects that are important within the community such as works of art, photographs, family bibles, genealogical records, vast research, and so on, making it even more important that no harm should come to the building or its contents.

Background

The Loring Parsonage building has had limited use for the last 15 or so years and was falling into disrepair. Since 2014 the Sudbury Historical Society has been raising funds for the restoration and

repurposing of the Loring Parsonage for the Sudbury History Center. In 2016 the Sudbury Historical Society began the first phase of the project with partial stabilization of a portion of the building. The SHS has brought together approximately $1, 700,000 with over $1,000,000 of that sum raised by the Historical Society. The remaining money has come from two trusts set up by private citizens for a history museum and $400,000 from a CPA grant approved by Town Meeting in 2016.

Construction on the second phase of the repurposing project began in October 2018 and it is anticipated that the project will be completed in the spring of 2019. Although a fire alarm system will be installed when construction is completed, the initial plan was to also include an aspirating smoke detector system (ASD trade name VESDA) as part of project. However, the cost of following public procurement laws forced this very desirable safety element from the project and the SHS did not have enough funds available to include the VESDA system. It is the Sudbury Historical Society's belief that such a system would significantly increase the safety and security of the building, the historic artifacts in the Sudbury Historical Society's collection, and also visitors, volunteers, and staff working at the History Center. The advantage of a VESDA system is that it is so sensitive and by continuously monitoring the air in a building, it is able to detect smoke or other dangerous particulates hours, possibly days before a fire. Once any smoke, gas or particulates are detected the Sudbury Fire Department is alerted. One of Sudbury's fire stations is located less than a quarter mile from the Loring Parsonage however, fire personnel may be out on multiple calls or on calls to other towns, so would not necessarily be close by. Having the early warning system can buy valuable time to allow fire personnel to respond to the emergency call.

The CPC previously funded a VESDA system for the Hosmer House and it has apparently been working well at that site. It would be tragic that after investing nearly two million dollars it this historic building the Parsonage, and its contents, could be lost because an early warning fire detection system is not in place to protect this town asset.

Estimated Cost

The Sudbury Historical Society has received a cost estimate from Fire Equipment, Inc. for both the design and installation of a VESDA system in the Loring Parsonage. Fire Equipment, Inc. also designed and installed the VESDA system at the Hosmer House. Like the Hosmer House, the Loring Parsonage will need early detection in the basement, first floor, and second floor. The estimate from Fire Equipment Inc. is attached. At this point in time the SHS has begun a third phase of its capital campaign to raise funds for the interior outfitting of the History Center. Should the CPC decline our request for funds then the SHS will have to add the VESDA expenses into the budget for the interiors planning. Raising funds for the VESDA system, in addition to funds that the SHS will need to purchase archival storage equipment, office equipment, furnishings for the visitors center and other spaces, and to design exhibits will be a significant challenge for the SHS on top of what has been raised to date for the restoration of this building.

Endorsements

Endorsements for a VESDA system in the Loring Parsonage are included in the CPC application from the Sudbury Fire Chief, John Whalen, and the Sudbury Historical Commission.

Sally Hild - SHS Director

From: Scott Doneghy <sdoneghy@feinewengland.com>
Sent: Wednesday, October 24, 2018 9:12 AM
To: Stewart Hoover
Cc: Sally Hild - SHS Director; katinafontes@gmail.com
Subject: RE: Sudbury Historical Commission -Vesda Estimate for Loring Parsonage

Stewart: I would increase my price 5% to cover any price escalation between now and October 2019 when the work may actually occur.

Regards,

Scott

Scott Doneghy

Fire Equipment Incorporated

o: 888.296.1381 d: 781.827.5116

a: 20 Hall Street, Medford, MA 02155

w: www.feinewengland.com e: sdoneghy@feinewengland.com

-----Original Message-----
From: Stewart Hoover [mailto:shoover@stonept.com]
Sent: Tuesday, October 23, 2018 4:40 PM
To: Scott Doneghy <sdoneghy@feinewengland.com>
Cc: Executive Director <Director@Sudbury01776.org>; katinafontes@gmail.com
Subject: RE: Sudbury Historical Commission -Vesda Estimate for Loring Parsonage

Hi Scott,
We have include your estimate of Vesda system for the Loring Parsonage to the Community Preservation Committee. If the CPC agrees to fund this project we will not have the funds until after June 1st 2019 as it must first be brought forward at our Town Meeting in April/May of 2019. The estimated included an expiration date of November 16th of this year. Can you extend the expiration date until June 15th, 2019 or if not what would you estimate the cost would be by that date.
Thanks,
Stewart

-----Original Message-----
From: Scott Doneghy [mailto:sdoneghy@feinewengland.com]
Sent: Monday, September 17, 2018 11:17 AM
To: shoover@stonept.com
Subject: Sudbury Historical Commission -Vesda Estimate for Loring Parsonage

Stewart: Attached is an estimated cost to provide and install the Vesda system for the Loring Parsonage.

Regards,

Scott

Scott Doneghy
Fire Equipment, Inc.
20 Hall Street
Medford, MA 02155-6319
Office: (888) 296-1381 x308
Cell: (617) 719-1249
Fax: (888) 296-1384

Attachments for CPA Application – VESDA Fire Protection System for Loring Parsonage

1. Description of project
2. Letters of support and recommendation
3. Cost estimates
4. Background Information on ASD (Aspirating Smoke Dectection)

Request for Funding of a Very Early Smoke Detection System (VESDA) for the Loring Parsonage

Background

Since 2014 the Sudbury Historical Society has been planning for and raising funds for the restoration and repurposing of the Loring Parsonage for the Sudbury History Center. The total amount that has been raised through various funding sources is approximately $1,670,000. Partial rehab was completed in the spring of 2016 and the second phase of construction will begin in October 2018. It is anticipated that the project will be completed by May of 2019. Although a fire alarm system will be installed when construction is completed there is not sufficient funding in the Phase II budget for an early warning system such as VESDA. Such a system would significantly increase the safety and security of the building, the historical artifacts in the Sudbury Historical Society's collection, and visitors and persons working in the History Center. The beauty of a VESDA system is that it can detect the potential of a fire long before the fire occurs. This is done through very sensitive and continuous sampling and monitoring of the air in the building. Once any smoke, gas or particulates are detected the Sudbury Fire Department is alerted. The Fire Station is located less than a quarter mile from the Loring Parsonage, however there may be cases when fire personnel are called to fight multiple fires in town or in surrounding towns and are therefore farther away from the Town Center. Having even more advance warning from the VESDA system would allow Sudbury's firefighters to respond to the call at the Parsonage or enlist backup from another town. The CPC previously funded a VESDA system for the Hosmer House which has been installed and is working effectively.

The Loring Parsonage is nearly 300 years old and is an important part of the history of Sudbury. It was first used by the Reverend Israel Loring as his parsonage, then later as the home of his descendants. Next, the Haynes family owned it and operated a dairy farm on the town center property and it has been used by the Town of Sudbury since the 1930s. The building has had limited use for the last 15 or so years and was falling into disrepair. In 2016 the Sudbury Historical Society took on the task of the restoration and repurposing of this town treasure into the Sudbury History Center. We have brought together approximately $1, 700,000 with over $1,000,000 of that sum raised by the Society itself through private donations and grants. The remaining money has come from two town-held trusts set up by private citizens for a history museum and $400,000 from a CPA grant approved in 2016. Although the initial plan was to include an aspirating smoke detector (ASD trade name VESDA) system as part of project, the cost of following public procurement laws forced this very desirable safety element to be temporarily held from the project budget. The advantage of a VESDA system is that it is so sensitive and by continuously monitoring the air in a building, it is able to detect smoke or other dangerous particulates hours, and possibly days before a fire. It would be tragic that after investing nearly two million dollars into this historic property it could be lost because an effective fire detection system is not in place.

Estimated Cost

The Society has received a cost estimate from Fire Equipment Inc. for both the design and installation of a VESDA system for the Loring Parsonage. Fire Equipment Inc. designed and installed the VESDA system

for the Hosmer House as well. Like the Hosmer, the Loring Parsonage will need early detection in the basement, first floor, and secondfloor. The estimate from Fire Equipment Inc. is attached.

Endorsements

Endorsements for a VESDA type system in the Loring Parsonage have been provided by the Sudbury Fire Chief, John Whalen, and the Sudbury Historical Commission. (See letters attached)

The Sudbury Historical Society appreciates the CPC's consideration of funds for this system. For more information about the Sudbury Historical Society, its mission and operations, and the status of the Sudbury History Center, please contact the SHS at 978/443-3747 or visit sudbury01776.org or find the lastest news on Facebook.com/The01776.

TOWN OF SUDBURY
FIRE DEPARTMENT
77 HUDSON ROAD
SUDBURY, MASSACHUSETTS 01776

JOHN M. WHALEN
CHIEF OF DEPARTMENT

TEL: 978-443-2239
FAX: 978-440-5305

September 18, 2018

To: Community Preservation Committee

Subject: Loring Parsonage

This letter is to provide support for the installation of an enhanced fire detection system as part of the Loring Parsonage rehabilitation project. The installation of a Very Early Smoke Detection Apparatus (VESDA) detection system will provide for quick notification of a smoke or fire event in the building. These types of systems continually monitor the properties in the air to detect minute levels of smoke, this early detection will provide for fast Fire Department notification.

In July of 2017 a VESDA system was installed in the Hosmer House to provide additional fire detection, this system has proven very reliable with no nuisance alarm activations. With proper maintenance and repair these systems can provide years of service to protect the Town's investment in this rehabilitation project.

Sincerely,

John M. Whalen

John M. Whalen
Fire Chief

Sudbury Historical Commission
Sudbury Centre
Sudbury, MA 01776

October 3, 2018

Sudbury Community Preservation Committee
Flynn Building
278 Old Sudbury Road
Sudbury, MA. 01776

To whom it may concern:

The Sudbury Historical Commission (SHC) held a public meeting on Tuesday, September 25th, 2018. One of our agenda items included a request from the Sudbury Historical Society (SHS) for support in their application to the Sudbury Community Preservation Committee (CPC) regarding the installation of a Fire Protection System (VESDA) at the Loring Parsonage. The SHC unanimously approved a motion to support the SHS to seek funding from the CPC for the installation of a Fire Protection System at the Loring Parsonage.

Thank you,

Chris Hagger
Chair – Sudbury Historical Commission

DELIVERY BY: EMAIL TO SHOOVER@STONEPT.COM

September 17, 2018

Sudbury Historical Society,
C/O Stewart Hoover
322 Concord Road
Sudbury, MA 01776

SUBJECT: SUDBURY HISTORICAL SOCIETY – LORING PARSONAGE – VESDA FIRE DETECTION DESIGN DRAWINGS & CONTRACTOR SITE MEETINGS

Dear Mr. Hoover:

Thank you for the opportunity to provide a proposal to prepare a set of Vesda fire detection design documents for bidding purposes all for the Loring Parsonage located at 288 Old Sudbury Road, Sudbury, MA. The Vesda system will be designed in accordance with Massachusetts State Building Code (MSBC), 9th Edition; which by reference adopts NFPA 72, "National Fire Alarm and Signaling Code," 2016 Edition.

The effort will include the following fire protection engineering services:

- Site survey work of the Loring Parsonage to layout the Vesda piping throughout the historical dwelling. Attention to concealing of the piping is included.
- Design of a Vesda fire detection system throughout the Loring Parsonage to include attic, 2nd floor, First floor and basement and tie in alarms to the existing fire alarm panel and monitoring system. Additional notification appliances are not included since they should be installed as part of the existing base building fire alarm system.
- Prepare Vesda specification, include CPVC pipe specification, provide Vesda piping layout drawings to include locations of devices, Vesdas, battery cabinets, sample ports, displays, tie-in to existing fire alarm system, monitoring station complete with installation notes.
- Complete battery calculations and Aspire II air flow calculations to insure there is adequate standby power and verify Vesda transport and response times.

- Layer onto drawings, Bill of Materials, installation notes, Vesda details, sampling port details, wiring notes, gluing instructions, start-up and commissioning details.
- The completed bid documents comprised of Vesda drawing & calculations will be stamped by a registered Massachusetts, fire protection engineer
- Bid package front end information, legal and commercial language, advertising of project, collection & review of bids, bidding directions, contractor visit date, site meeting date all will be provided by the Town of Sudbury and incorporated into the bid documents.
- (1), one meeting is included to attend a site kick off meeting with prospective bidding contractors. Four, (4) hours have been allocated for this meeting and RFIs.
- All bidding contractors are to contact Fire Equipment, Inc. to obtain Vesda pricing for inclusion with their bid for "Engineer of Record" services such as witness of final acceptance testing, construction control documents, and final affidavits.

At the end of this effort, the town of Sudbury will own a complete FPE stamped bid package suitable for bidding a Vesda fire detection system for the Loring Parsonage.

FEE, TERMS AND CONDITIONS

The above Scope of Services will be provided on a fixed fee basis for **$10,550.00** with no retainage. The work will be periodically invoiced at the completion of specific milestones.

Payments may be by credit card or check. A purchase order is required. Upon approved credit, payments are due 30 days after receipt of invoice. This proposal is valid for 30 days. Please refer to this proposal on the purchase order to acknowledge your acceptance of the Scope, Price & Terms.

Thank you for the opportunity to submit this proposal to the Town of Sudbury, MA.

Sincerely,

Scott Doneghy

FIRE EQUIPMENT INCORPORATED

RALPH J. PERRY
A DIVISION OF FIRE EQUIPMENT, INC.

Protecting New England. Because so much is at stake.

MEDFORD · SPRINGFIELD · HYANNIS

Proposal Information

Quote Name	Sudbury Historical Commission -Vesda Estimate for Loring Parsonage	Proposal Date	9/17/2018
Quote Number	00032193		

Proposal Submitted To:

FEI Account Name	Sudbury Historical Commission	Prepared By	Scott Doneghy
Contact Name	Stewart Hoover	Email	sdoneghy@feinewengland.com
Email	shoover@stonept.com	Phone	(781) 827-5116
Phone	(978) 460-1346	Fax	(888) 296-1384
Bill To	322 CONCORD ROAD SUDBURY, MA 01776		
Ship To	288 Old Sudbury Road Sudbury, MA 01776		

Scope of Work

Description

Fire Equipment, Inc. (FEI) offers this estimated cost to provide and install up to (4) Vesda early warning fire detectors to detect products-of-combustion throughout the Basement, First Floor, Second Floor and Attic of the Loring Parsonage located at 288 Old Sudbury Road, Sudbury, MA. The system will be installed in accordance with yet to be developed drawings 2016.

FEI will provide the Vesda equipment, Vesda Aspire flow calculations, power supplies, batteries, 3/4 CPVC pipe, fittings, and hangers, glue, sample port decals, Vesda permit, non-union mechanical and electrical labor, start-up, check-out, commissioning, Final Acceptance Test with the Sudbury Fire Department, and training of personnel. At the end of the project our FPE will supply construction control documentation.

The Vesda design is based on an exposed piping in the basement and concealed as much as practical elsewhere throughout the Parsonage.

Totals

Subtotal	$47,581.28
Total Price	$47,581.28
Tax	$0.00
Shipping and Handling	$750.00
Grand Total	$48,331.28

Payment Terms

Payment to be made according to:	Deposit of 30% of the total contract value at the execution of this agreement and prior to any commencement of work. The balance of all work will be invoiced monthly with 30 day terms and final payment is due at the completion of the project.	Expiration Date	11/16/2018

Exclusions

Exclusions	State Sales Tax. Please send a tax exemption certificate if we are awarded the work. Overtime Any other Fire Alarm Work Wiring of Vesdas to the base building fire alarm control panel, modules, or panel programming 120 VAC power to each of the (4) Vesdas and signal circuits back to the fire alarm control panel from each Vesda

Terms and Conditions

Not Included: All pricing is based on work done regular hours Monday-Friday, unless otherwise noted. Plus any applicable state taxes. Prices are valid for 60 days. Credit terms based on approval.

We Propose hereby to furnish material and labor - complete in accordance with above specifications.

All material is guaranteed to be as specified. All work to be completed in a workmanlike manner according to standard practices. Any alteration or deviation from above specifications involving extra costs will be executed only upon written orders, and will become an extra charge over and above the estimate. All agreements contingent upon strikes, accidents or delays beyond our control. Owner to carry fire, tornado and other necessary insurance. Our workers are fully covered by Workmen's Compensation Insurance.

Acceptance of Proposal - The above prices, specifications and conditions are satisfactory and are hereby accepted. You are authorized to do the work as specified. Payment will be made as outlined above.

Quote Acceptance Information

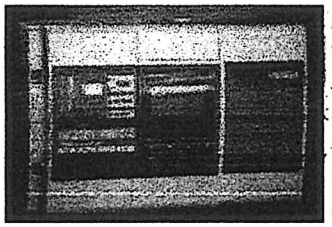
Signature

PO #
Date Signed

FIRE SECURITY SERVICES LTD.

"SUPPLIERS OF FIRE AND SECURITY ALARM EQUIPMENT AND SERVICES SINCE 1976"

VESDA Systems



A fire detection system that offers the earliest possible warning of a potential fire. A system that will ensure business continuity and freedom from nuisance alarms. A system that can adapt to the unique characteristics of any given environment. One that delivers high performance through its high quality design and its dedicated global sales and distribution channels. With hundreds of thousan

ds installed globally, the VESDA name has become synonymous with high performance very early warning smoke detection. It is the product chosen when reliable performance is crucial.

Click to enable Adobe Flash Player

VESDA works by continually drawing air into the pipe network via a high efficiency aspirator. A sample of this air is then passed through a dual stage filter.

The first stage removes dust and dirt from the air sample before it allows the sample to enter the laser detection chamber for smoke detection.

The second (ultra fine) stage provides an additional clean air supply to keep the detector's optical surfaces free from contamination, ensuring stable calibration and long detector life.

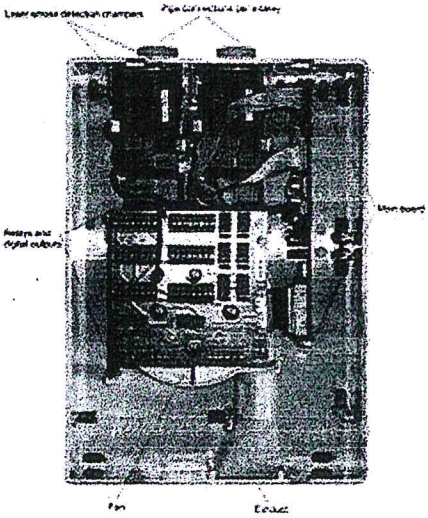
From the filter, the air sample is passed through to the calibrated detection chamber where it is exposed to a laser light source. When smoke is present, light is scattered within the detection chamber and is instantly identified by the highly sensitive receiver system.The signal is then processed and presented via a bar graph display, alarm threshold indicators and/or graphic display. The VESDA detectors are able to communicate this information to a fire alarm control panel, a software management system or a building management system via relays or a High Level Interface (HLI)

WIKIPEDIA

Aspirating smoke detector

An **aspirating smoke detector** (**ASD**) is a system used in active fire protection, consisting of a central detection unit which draws air through a network of pipes to detect smoke.[1] The sampling chamber is based on a nephelometer that detects the presence of smoke particles suspended in air by detecting the light scattered by them in the chamber. ASDs can typically detect smoke before it is visible to the naked eye.

In most cases aspirating smoke detectors require a fan unit to draw in a sample of air from the protected area through its network of pipes, such as is the case for Wagner, Safe Fire Detection's ProSeries and Xtralis ASD systems.[2]



A TOP-SENS2 ASD unit made by Wagner (Germany)

Contents

History

In 1970 the Australian Commonwealth Scientific and Industrial Research Organisation (CSIRO) used a nephelometer to carry out research into forest fires. Subsequently, the Australian Postmaster-General's Department engaged the CSIRO to investigate technologies that could prevent service interruption due to fire. After selecting a sample site to carry out research, the CSIRO suggested that the nephelometer should be used as the benchmark for the APO fire tests. This was installed to monitor smoke levels within the return-air ducts of the mechanical ventilation system, utilising a chart-recorder output display.[3]

At the conclusion of several weeks of testing, it was discovered that there no commercially available fire detection technology suitable for preventing damage to telephone equipment. One technology that did show great promise however was the nephelometer itself.[4]

In 1979, Xtralis, then IEI Pty Ltd., produced and sold an air sampling device they called VESDA (Very Early Smoke Detection Apparatus). The company redesigned the detector in 1982 to provide the reliability, features, size and reduced cost for export markets. ASD systems have gained popularity due to their ability to sense smoke long before a catastrophic incident.[5]

Design

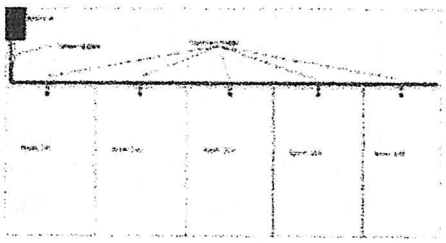
ASD design corrects shortcomings of conventional smoke detectors by using a sampling pipe with multiple holes. The air samples are captured and filtered, removing any contaminants or dust to avoid false alarms and then processed by a centralized, highly sensitive laser detection unit. If smoke is detected, the systems alarm is triggered, and signals are then processed through centralized monitoring stations within a few seconds.[6]

Unlike passive smoke detection systems, including spot detectors, ASD systems actively draw smoke to the detector through bore holes within a piping system that runs throughout the protected area. Furthermore, ASD systems incorporate integrity monitoring to ensure an alert is raised at any time the ASD's ability to detect smoke is compromised. This is not the case with passive devices that are generally only electrically monitored with no ability to determine if smoke can actually reach the detection element.

ASD systems incorporate more than one level of alarm. This allows an ASD system to provide very early warning of an event, prompting investigation at the earliest smouldering stage of a fire when it is easily addressed. Other alarm levels may be configured to provide fire alarm inputs to fire systems as well as releasing suppression systems. ASD alarm sensitivities are configurable and can be programmed to levels ranging from thousands of times more sensitive than a conventional detector, to much less sensitive. The detectors work best in non-volatile environments.[7][8][9] They can also be used in computer cabinets to alert users to the overheating of computer cables or individual computer components.[10]

Installation and placement

ASDs are suitable for environments where a highly sensitive rapid smoke detection capability is required. This makes them suitable in clean rooms; areas which contain goods easily damaged by fire, such as tobacco, electronic rooms and highly flammable liquid and gases. Often, normal point detectors will recognise the danger too late, as smoke often does not reach the ceiling quick enough for a fire to be detected in a timely fashion.[11]



An example of how a simple ASD unit with a single pipe could cover a five-room area

As they can be easily hidden, pipe networks are suitable in environments where point detectors can be considered aesthetically displeasing, such as offices, apartments and hotel rooms. This factor also makes them suitable in locations where point detectors can be easily tampered with, such as in correctional facilities.[12]

Despite their high sensitivity ASDs can be used in dusty or dirty environments as long as correct design, installation and maintenance processes are followed. Most ASD products can accommodate a broad range of environments and applications – from both confined and open spaces to the cleanest or dirtiest environment, including telecomm, control rooms, waste treatment, mining and more.[13]

See also

- Carbon monoxide detector
- Heat detector
- Smoke detector

References

1. "Aspirating Smoke Detectors (ASD)" (http://www.buildingtechnologies.siemens.com/bt/global/en/firesafety/fire-detection/cerberus-pro-fire-safety-system/special-applications/aspirating-smoke-detector/Pages/aspirating-smoke-detector.a

spx). Siemens. Retrieved 2012-08-09.

2. "VESDA Systems" (https://web.archive.org/web/20081014041132/http://www.firesecurity.co.nz/vesda.html). Fire Security Services. Archived from the original (http://www.firesecurity.co.nz/vesda.html) on October 14, 2008. Retrieved 2009-05-11.
3. *Journal of Applied Fire Science, Volume 2* (https://books.google.com/books?id=JLAYAQAAMAAJ&q=aspirating+smoke+detector+CSIRO+1970&dq=aspirating+smoke+detector+CSIRO+1970&hl=en&sa=X&ei=SkymUZ2eLpS3rgGqsIHYCw&redir_esc=y). Baywood Publishing Company. 1993. Retrieved May 29, 2013.
4. "The HISTORY of VESDA and MONITAIR" (https://web.archive.org/web/20081118222421/http://www.coleindesign.com/products_article.html). Cole Innovation & Design. Archived from the original (http://www.coleindesign.com/products_article.html) on November 18, 2008. Retrieved 2009-05-11.
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6. *Do You Have (Fire) Protection*, Strategic Facilities Check date values in: `|accessdate=` (help);
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8. *Landwards, Volumes 55-58* (https://books.google.com/books?id=ApNLAAAAYAAJ&q=Aspirating+Smoke+Detector+thousands+more+sensitive&dq=Aspirating+Smoke+Detector+thousands+more+sensitive&hl=en&sa=X&ei=jE-mUdDeNcKYqgGLrYCoAg&ved=0CD4Q6AEwAQ). Institution of Agricultural Engineers. 2000. p. 49.
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External links

- Detecting smoke in air ducts (https://archive.is/20140506212028/http://magazine.sfpe.org/fire-detection-and-alarm/duct-smoke-detection)
- Three Wavelength Integrating (http://www.cmdl.noaa.gov/aero/instrumentation/neph_desc.html)

ASD Exhaust Principles

In normal applications, it is common for the air pressure in the protected space (air pressure protected space - APS) to be the same as the air pressure in the space where the ASD is mounted and the exhaust pipe is run out of the detector (air pressure exhaust space - AES). As a result, the design software that calculates transport times and detector sensitivities assumes the air pressures of the two spaces are equal.

The sampling hole size, pipe size, transport time, and the fan aspirator speed are all functions of the air volume that passes through the sampling chamber. The sensing chamber is designed to detect smoke particles moving through the chamber at the speed of the fan. If APS is greater than AES, the velocities of the sampled air entering the chamber may be higher than the nominal fan speed, which could directly impact the detector's ability to sense smoke particles.

Conversely, if AES is greater than APS, then air pressure is pushing on the exhaust air and causing resistance and a drag on the fan. As a result, the fan may rotate slower than designed, causing an increase in transport times and a decrease of air into the sensing chamber. To eliminate the pressure difference, the exhaust air needs to be piped into the same room that is being sampled. (Figure 6)

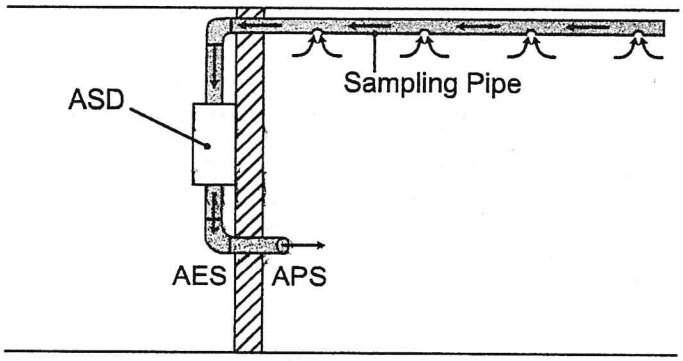


Figure 6. ASD Exhaust – AES vs APS

ASD Sampling Methods

For the purpose of this guide, there are five (5) acceptable sampling methods for all potential applications.

Primary Sampling

The name of this sampling method is misleading; it is typically a supplemental system and not the primary detection system. Primary sampling is configured to sample the air from a specific location or where the air is most likely to travel. For areas that have high airflow, such as data centers or clean rooms, the primary sampling location would be at return air grilles, air handling unit (AHUs), or air return ducts.

Secondary Sampling

This method involves configuring the sampling holes at the ceiling level, in similar locations as traditional spot-type smoke detectors. The sampling holes would be spaced in accordance with the appropriate code or standard.

Localized Sampling

This method involves protecting specific equipment/areas within a larger open space. Localized sampling may be used in a rack sampling system in a large open warehouse.

In-Cabinet Sampling

For this type of sampling method, the air sampling holes are installed to monitor specific pieces of equipment within a larger open space. This method is different from Localized Sampling because the protected volume is much smaller, and the piece of equipment is typically self-contained within a cabinet or computer rack. The ASD monitors the air used for equipment cooling. This type of sampling is typically installed on critical equipment that would cause devastating results if damaged by a fire.

In-Duct Sampling

This type of sampling uses an ASD, in place of traditional duct-mounted smoke detectors, to shut down the associated HVAC unit or close dampers to prevent the spread of smoke in the case of a fire. It can also be used to detect smoke particles being exhausted (or supplied) when a more sensitive detector is necessary.

Considerations for ASD Systems Based on Their Operating Principles

The Dilution Effect

An aspirating detection system's sensitivity is dependent on two (2) main factors: the number of sampling holes drilled in the piping network and the programmable smoke detection thresholds. The number of sampling holes can affect the dilution of the air returning to the sensing chamber. For example, when smoke is drawn into a single sample hole, it results in a dilution of the smoke concentration as it is transported through the piping network past other sampling holes that are aspirating clean air (no smoke concentration). When this volume of clean air is mixed with the smoke laden air being transported into the detection chamber, the quantity of smoke laden air is diluted. This is often referred to as the dilution effect (Figure 7).

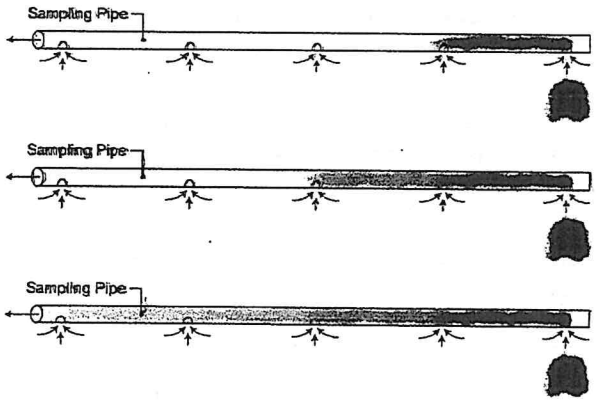


Figure 7. The Dilution Effect

In Figure 6, the gray represents smoke entering a single sampling hole at the most remote location within the pipe. The smoke combines with clear air when it is transported through the pipe, diluting the smoke density. The dilution effect is directly linked to the sampling hole quantity within the pipe network. The more sampling holes, the greater volume of air being transported to the ASD, which results in an increased dilution of the smoke suspended in the air.

Transport Time

The transport time is defined as the time it takes for the smoke particulates to reach the sensing chamber. The time is measured (in seconds) from when the particulates enter the sampling point to the time they reach the sensing chamber. The times are calculated utilizing the ASD's design software and field verified during the system commissioning process.

Several parameters should be taken into account when discussing potential transport times:

- The size and number of sampling holes
- The aspirator speed setting (rpm)
- The sensitivity setting of the detector
- The total quantity and configuration of the sampling pipe

Modern codes and standards require specific transport times for different classes of ASD systems. The maximum required transport times for ASD systems can range from 60 seconds for Very Early Warning Fire Detection systems, 90 seconds for Early Warning Fire Detection systems, or 120 seconds for Standard Fire Detection systems. Refer to NFPA 72®, NFPA 76, or EN 54-20 for the required transport times.

Benefits for ASD Systems Based on Their Operating Principles

Active Detection System

The ASD system is considered an ACTIVE form of detection because the aspirator continuously draws air from the protected area into the sensing chamber. This process is continuous and does not stop unless the ASD is shut down. The active nature of the ASD provides for the earliest possible detection of the presence of smoke, thus why ASD systems are often referred to as Early Warning Fire Detection Systems.

The extremely sensitive ASD sensing chambers are another significant aspect of the active smoke detection system because they can detect smoke in a fire's incipient stage long before incurring damage to the protected space and equipment.

The Additive Effect

The ASD system overcomes dilution by the additive effect that is common to ASD systems. The additive effect is a significant benefit of ASD technology, which results in an extremely sensitive detection system, even when multiple sampling holes are present.

During the detection process, air is drawn into all sampling holes in the piping network, which allows each hole to contribute to the total air sample within the sensing chamber. As explained earlier, this is the total volume of air within the detector's sensing chamber: the more sampling holes, the greater volume of air. If multiple sampling holes are aspirating smoke laden air, then the smoke particles are combined as they are transported back to the sensing chamber. The ratio of clean air to smoke laden air is decreased. It is this additive effect that makes the overall detection system more sensitive than a traditional, spot-type smoke detection system.

Assuming the ASD's Fire Level 1 sensitivity is set at 0.25% obscuration (obs) per foot (0.25 %/ft), the ASD system is protecting a room that is 4,000 square feet, and the system is designed with the sampling holes spaced at 20 feet per hole (400 sq. ft per hole), the resulting detection system would contain 10 sampling holes. The 0.25%/ft is the sensitivity of the detector's sensing chamber.

To determine the actual sensitivity of the individual sampling hole, multiply the programmed detector obscuration rate by the total number of sampling holes in the piping network.

For example, the detector sensitivity for Fire Level 1 set at 0.25%/ft with 10 holes drilled in the piping network would correspond to an individual sampling hole sensitivity of 2.5%/ft (0.25%/ft multiplied by 10 = 2.5%/ft).

The sensitivity is similar to the obscuration rate of a traditional spot-type smoke detector. This represents the effective sensitivity of the detector if smoke enters a single sampling hole (Figure 7).

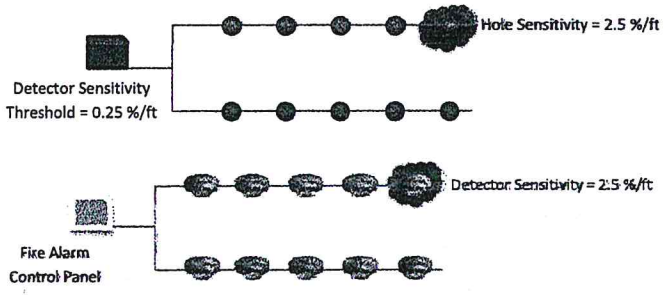


Figure 8. Comparison (ASD – point smoke detector) with smoke reaching a single sampling hole or a spot point smoke detector

The benefit of the ASD system is its active nature to draw air into all sampling holes simultaneously; the air is combined in the pipe and transported back to the detector for sampling. When air is drawn into all 10 sampling holes, the smoke particle concentration increases and the clean air concentration decreases. As the smoke particles are added together, the overall detection system sensitivity is increased.

To explain the additive effect further, take the same 4,000 square foot room with an ASD piping network with 10 sampling holes and smoke particles being drawn into two (2) sampling holes (Figure 9). To determine the new individual hole sensitivity, the obscuration rating for Fire Level 1 (0.25%/ft) is multiplied by the total number of sampling holes (10), then divided by number of holes detecting smoke (2). This results in a new effective sampling hole sensitivity of 1.25%/ft, making the ASD system twice as sensitive as a spot smoke detector at 2.5%/ft.

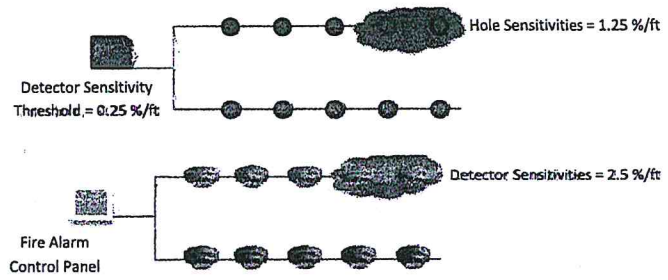


Figure 9. Comparison (ASD – point smoke detector) with smoke reaching two sampling holes or two spot smoke detectors

If smoke enters three (3) sampling holes the effective sensitivity is 0.83 %/ft. and so on.

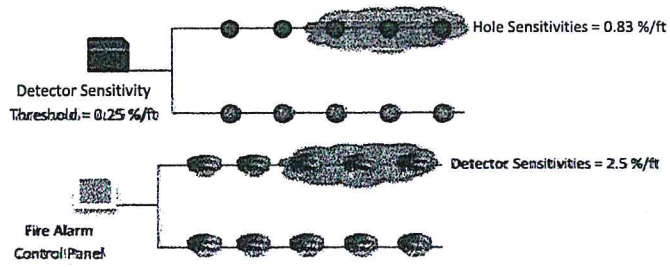


Figure 10. Comparison (ASD – point smoke detector) with smoke reaching three sampling holes or three spot smoke detectors

To further explain the additive effect, this example can be expanded to include smoke entering all 10 sampling holes. Each sampling hole would have an individual sensitivity of 0.25%/ft, making the ASD system 10 times more sensitive than spot smoke detectors at 2.5%/ft. (Figure 11).

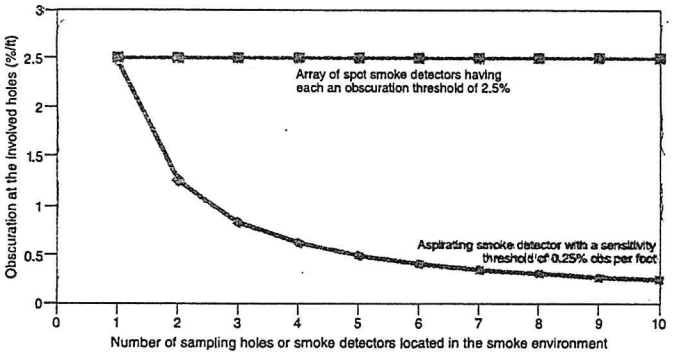


Figure 11. Additive property of the ASD system

Low Sensitivity Thresholds

Another significant ASD benefit is the sophisticated electronics that detect smoke particles at much lower obscuration rates and at multiple sensitivity levels. These detection thresholds are programmable and allow end users the flexibility to create an extremely sensitive smoke detection system for environments and occupancies that require very early smoke detection for life safety and business continuity or less sensitive for environments that are less critical in nature. The typical ASD system thresholds are UL-listed for sensitivities ranging between 0.00046%/ft (for the facilities where early smoke detection is critical) and 6.25%/ft (for environments that are not as critical).

An aspirating smoke detection system programmed to detect smoke particles at the lowest possible UL listing of 0.00046%/ft would be over 1,000 times more sensitive than traditional spot-type smoke detection systems.

Aspirating Smoke Detection Benefits for Diverse Applications

When it is critical to detect smoke at the incipient stage of a fire, ASD systems have many benefits.

Early Levels of Detection

ASD systems' ability to detect smoke particles at much lower obscuration levels make them ideal for areas that require the earliest possible smoke detection (before combustion an damage can occur). Typical applications include museums, historically significant buildings, culturally significant hazards, and mission-critical facilities such as data centers. Also, the programmable sensitivity ranges allow the ASD system to be customized to the individual hazard being protected, which provides the owner a greater level of flexibility.

Reliable Detection

The ASD system's detection software allows the sensing chamber to differentiate between smoke particles and dust particles that may be suspended in the sampled air. This technology makes the ASD resistant to nuisance alarms and eliminates unwanted alarms that could cause unnecessary equipment shut down, facility downtime, or premature building evacuation.

Unaffected By High Airflows

High-airflow rooms, such as data centers, telecommunication centers, and clean rooms, present a common hazard. The high airflow produces air changes within the area and dilutes smoke, making it more difficult to detect. The high air velocity carries the smoke particles away from the traditional ceiling-mounted, spot-type smoke detectors and to the HVAC units for conditioning. Larger particulates are filtered through the HVAC unit, but small particulates pass through the filter and back into the room. The smoke particles then become part of the ambient air, but they can be detected because the ASD is actively sampling the air within the protected space.

No Degradation of Aesthetics and Actions Related to Tampering

Another benefit of ASD systems is the ability to conceal the sampling pipe and remotely install the detector, which makes them suitable in environments where tampering is a concern (such as correctional facilities or schools.) They're also ideal for areas where aesthetics are a concern (i.e., historic or culturally significant spaces).

Usage in Harsh Environments

In harsh or dirty environments, large particles can damage traditional detectors' electronics and small particles can initiate nuisance alarms. The ASD system samples air from the protected space and filters potentially damaging particles, making it ideal for installation in such environments. Also, the detector is located outside the protected space, which makes ASD systems suitable for areas that have extreme temperatures (such as coolers and freezers).

Easy Maintenance

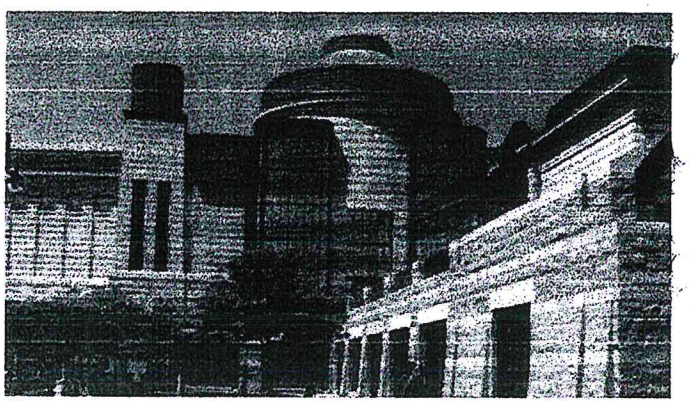
After the ASD and sampling pipe is installed, the transport times and sampling pipe pressures need to be documented. Then, the yearly maintenance consists of testing the most remote sampling holes and comparing the transport time to the commissioning documents. When sampling pipe is installed in a high ceiling or concealed in a subfloor, a test sampling point can be installed at floor level to make annual testing of the system easier and reduce annual maintenance costs.

Section 14

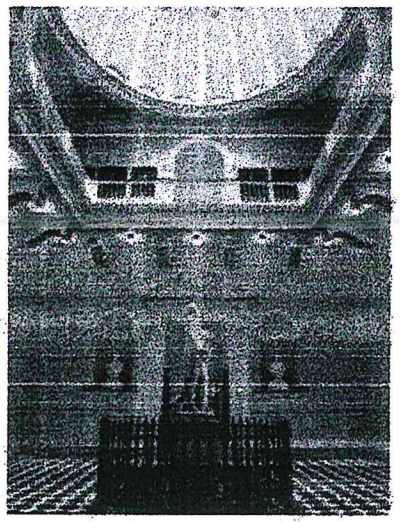
Historic and Cultural Buildings

Application Overview

Historic buildings and buildings that house cultural resources require careful approaches to fire protection, due to the unique risks and circumstances they pose. Such buildings include historically registered landmarks, religious buildings, museums, libraries, and art galleries, as well as any building or structure presenting a unique or iconic design and aesthetics. Others contain invaluable artifacts or heritage assets. Some historical buildings were built using archaic construction techniques and with materials that may no longer be available. Buildings can not only be historic in nature and difficult to re-create if damaged, but their contents can also be even more valuable and irreplaceable. Heritage and cultural collections include priceless artwork, documents, and books that are culturally and/or historically significant. Therefore, the fire safety measures applied in historic and cultural facilities need to provide a satisfactory level of fire protection and pose little or no harm to the historical fabric or valuable contents of the building. Aspirating smoke detection offers solutions for historic/cultural environments to achieve a proper balance.



Minnesota History Center



State of Virginia – Capitol Rotunda

Figure 1. Examples of historical buildings

Historic and cultural buildings are often public venues with significant crowds, and facilities like food service and child care areas are needed to accommodate the visiting public. Life safety risks should also be addressed in these applications.

Fires involving historical structures and cultural facilities can be very costly, not only in terms of damage to the structure and building contents (artifacts) but also because of the loss of business operations. Consider the Louvre in Paris and the British Museum in London, which draw approximately 9 million and 6 million visitors each year, respectively. A major fire in either of these two museums would generate significant revenue losses.

Back-of-house or nonpublic areas may often present significant fire loads or unusual fire risks, such as store rooms in museums and conservation/preservation laboratories that use flammable liquids or other chemicals. Museums and libraries use a large amount of plastic-based storage containers, including film storage, magazine dividers, storage boxes and bins, clothing bags, and various covers. Smoke produced by the combustion of these plastic materials may be thick and acrid, which can damage the museum and library collections in the area of fire origin and throughout the connected facility. It should be noted that the electrostatic characteristics of these plastic covers and bags have a tendency to attract smoke particles to clothing and other fabrics. From a fire protection perspective, book stacks and stored collections are often more comparable to warehouses than typical business occupancies.

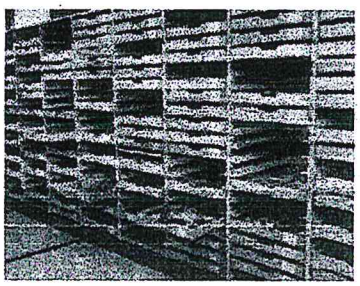


Figure 2 and 3. New York State Museum Storage Room (cardboard boxes) and Carnegie Museum of Natural History ("Big bone" collection storage room with wood boxes)

Figure 4 presents a basic depiction of the fire environment that may develop within a historic/cultural structure. The fire releases heat, light, and other products of combustion. The possible negative consequences directly attributable to the fire are as follows:

- Human injury or fatalities.
- Reduced visibility or blocked passages of building spaces.
- Fire and smoke damage or destruction of building contents.
- Fire and smoke damage or destruction of the building structure.
- Interruption of operations.
- Financial Loss

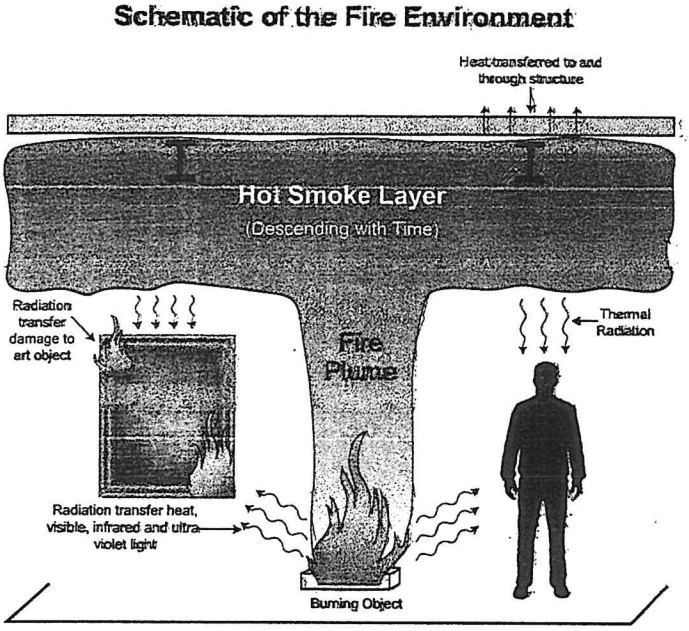


Figure 4 – Fire Environment in a Heritage Environment

Indirect consequences of a fire can also affect historic/cultural buildings and increase the need for a prompt response. The following indirect consequences are a special concern for the historic fabric and contents:

- Water damage.
- Physical damage due to fire suppression efforts with hose streams.
- Damage due to mishandling or moving of objects in emergency fire conditions.
- Damage due to a cleaning or restoration process after a fire.
- Threat of theft during fire.

Benefits of Aspirating Smoke Detection

Aspirating smoke detection (ASD) has many benefits for historic buildings, including:

- Low threshold alert and alarm values, which can help detect fires even if smoke levels are quite low during the incipient fire stage. This early fire detection increases the time for safe evacuation, allows for fire suppression actions to reduce potential damage, and reduces the risk of business interruption.
- Active air sampling in large open spaces such as in atria, concourses, and high ceiling spaces where smoke stratification is possible (smoke generated from small fires may not have enough buoyancy to reach the ceiling of such spaces).
- Fire detection in concealed spaces and any other areas where testing and maintenance could be difficult.
- An ability to be integrated in the historic structure and fabrics with minimal alteration, visual or otherwise.
- An ability to include different levels of warnings and alarms to provide an opportunity for building occupants to investigate and manually use fire suppressants before an automatic fire suppression system starts to operate.
- The possibility to sample in-duct for high airflow and atmospheres that contain controlled HVAC configurations.

Design Best Practices

The long list of fire risks associated with historic and cultural resource buildings is addressed with several key documents, which outline guidance and approaches for developing appropriate fire protection in such buildings. Since the 1940's, the U.S based National fire Protection Association has fostered an interested in historic buildings and contents. The NFPA's Technical Committee on Cultural Resources maintains two standards documents specific to the fire risks and concerns for preservation in historic and cultural buildings:

- NFPA 909 "Code for the Protection of Cultural Resource Properties – Museums, Libraries and Places of Worship"
- NFPA 914 "Code for Fire Protection of Historic Structures"

In recent years, efforts have been made in British, European, and ISO standards development for comparable NFPA documents, including:

- British Standard 7913: 2013 "Guide to the Conservation of Historic Buildings"
- Scotland Technical Advice Note 28 (TAN 28) – "Fire Safety Management in Heritage Buildings"

These documents contain concepts and considerations to select and implement automatic fire detection in historic buildings. They not only include early fire detection goals, but also the goals to minimize/avoid damage or irreversible changes to the historic fabric.

NFPA 909 "Code for the Protection of Cultural Resource Properties – Museums, Libraries and Places of Worship" adopts such goals and objectives related to:

- Collection preservation: associated with a reasonable level of protection for the stored collections against fire, products of combustion, fire suppression agents, and activities.
- Building preservation: associated with a reasonable level of protection for unique characteristics and fabric of these buildings against fire, products of combustion, fire suppression agents, and activities.
- Continuity of operations: associated with a reasonable level of protection against "disruption of facility operations consistent with the organization's mission and protection goals".

Cultural buildings may also be classified as historic structures; in such cases, additional fire protection goals and objectives may be also considered. NFPA 914, "Fire Protection of Historic Structures," adds to the life safety goals and historic preservation goals as follows:

- To minimize the damage to historic structures and contents from fire events including the effects of the fires and of the fire suppression actions,

SUDBURY HISTORICAL SOCIETY

Early Fire Detection

VESDA

Request: $63,000

The Historic Loring Parsonage

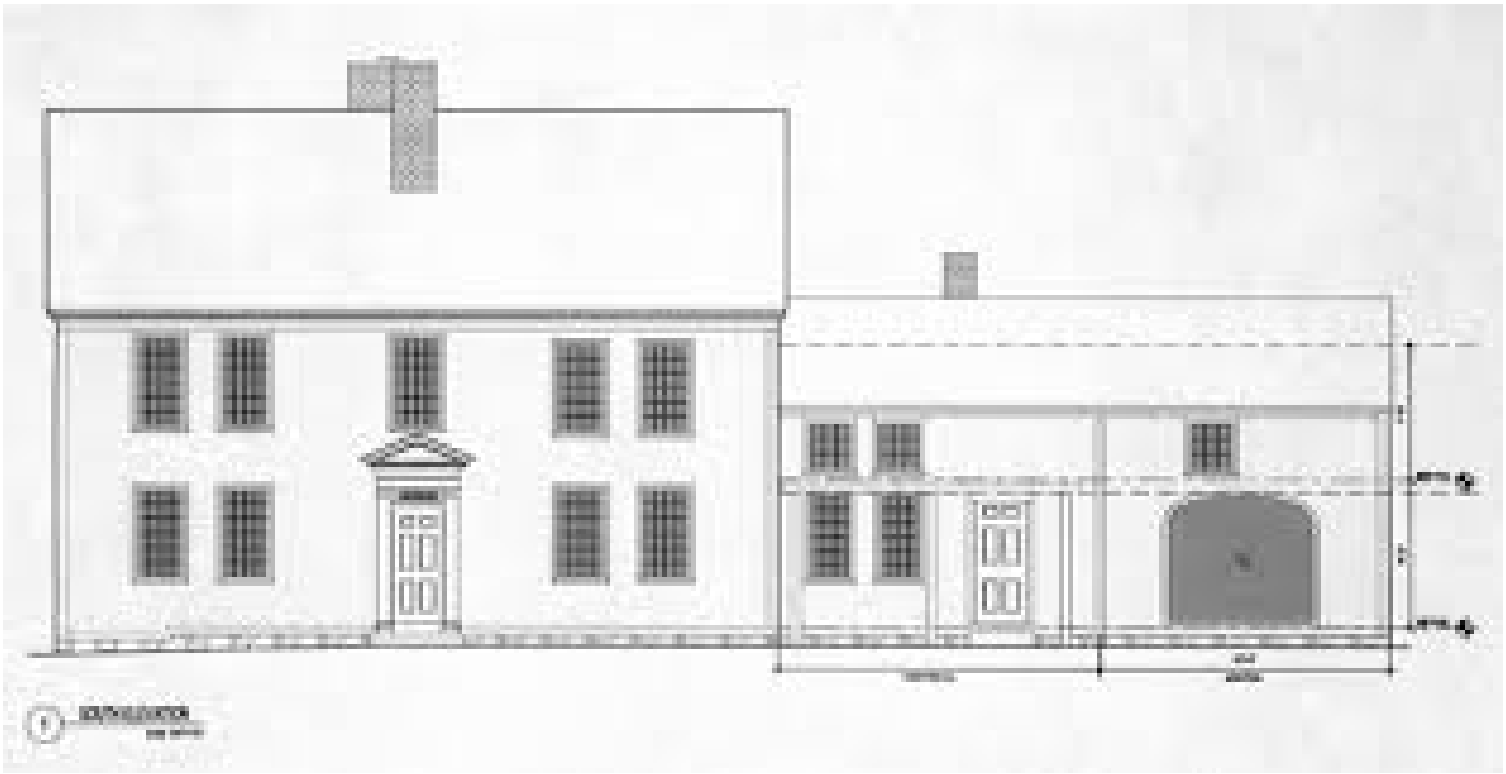
- Home built for Rev. Israel Loring in 1730
- Passed through his family and then to the Haynes family
- Has been a farm, a tavern, a home for Sudbury fire chief and until recently town offices
- Purchased by the town in the 1930's
- An important element of historic Sudbury Town Center
- One of the oldest buildings in Sudbury today
- Listed on the Massachusetts Historic Register

Loring Parsonage Many Years Ago

Loring Parsonage Three Months Ago

Loring Parsonage Today

Loring Parsonage of Tomorrow



Getting here took $1,700,000

At the completion of the restoration and repurposing of the Loring Parsonage into the Sudbury History Center nearly $1,700,000 will have been invested into this historic and cultural town treasure.

- $290,000 State grant
- $726,000 –Raised by the Sudbury Historical Society through grants and donations
- $286,000 -Trust moneys willed or raised for a Sudbury History Museum (Harry Rice and Wood Davidson trusts)
- $400,000 - CPA funds

…and more money is going to be invested outfitting the Sudbury History Center for offices and displays

It Is The Town's Building

- …and more money is going to be invested outfitting the Sudbury History Center for offices and displays
- The Loring Parsonage will remain a Town owned building.
- SHS has raised well over $1,300,000 and gifted all that to the town.
- SHS only has a 30 year lease and the town will still have jurisdiction over the building.
- If funds are not provided by source such as CPC it may be several years before SHS has the funds for a VESDA system

Security and Fire Detection at Completion of Construction

- One or more smoke detector alarms will be in every room and the basement.
- Smoke alarms will be connected to the Sudbury Fire Department
- A motion detection security alarm will be installed.
- BUT…..
- Smoke alarms fall short as they often detect a fire after the fire has begun.
- A more sensitive Aspirating Smoke Detection (VESDA) was part of the initial plan but it was crowded out by high cost of construction.

Most Common Causes of Fire

- Cooking
- Electrical
- Heating
- Smoking i.e., cigarettes, cigars, pipes, etc.)

What VESDA Provides

- VESDA buys the critical time needed to:
  - speed intervention to protect life,
  - protect critical infrastructure and high-value assets.
  - mitigate risk

- At the earliest occurrence of smoke, **before** smoke can be detected by a standard smoke detector VESDA has sampled the air and sent off an alarm to the fire station.

- It adds significantly to the protection of both the building and its contents.

How VESDA Works

ASD (aspirating smoke detection) corrects the shortcomings of conventional smoke detectors by using a sampling pipe with multiple holes. The air samples are captured and filtered, removing any contaminants or dust to avoid false alarms and then processed by a centralized, highly sensitive laser detection unit. If smoke is detected, the systems alarm is triggered, and signals are then processed through centralized monitoring stations within a few seconds.

VESDA Demo

- Videos and comparison of a VESDA vs standard smoke alarm systems can be found at:

How VESDA Works

https://xtralis.com/video.cfm?id=796

The VESDA Advantage

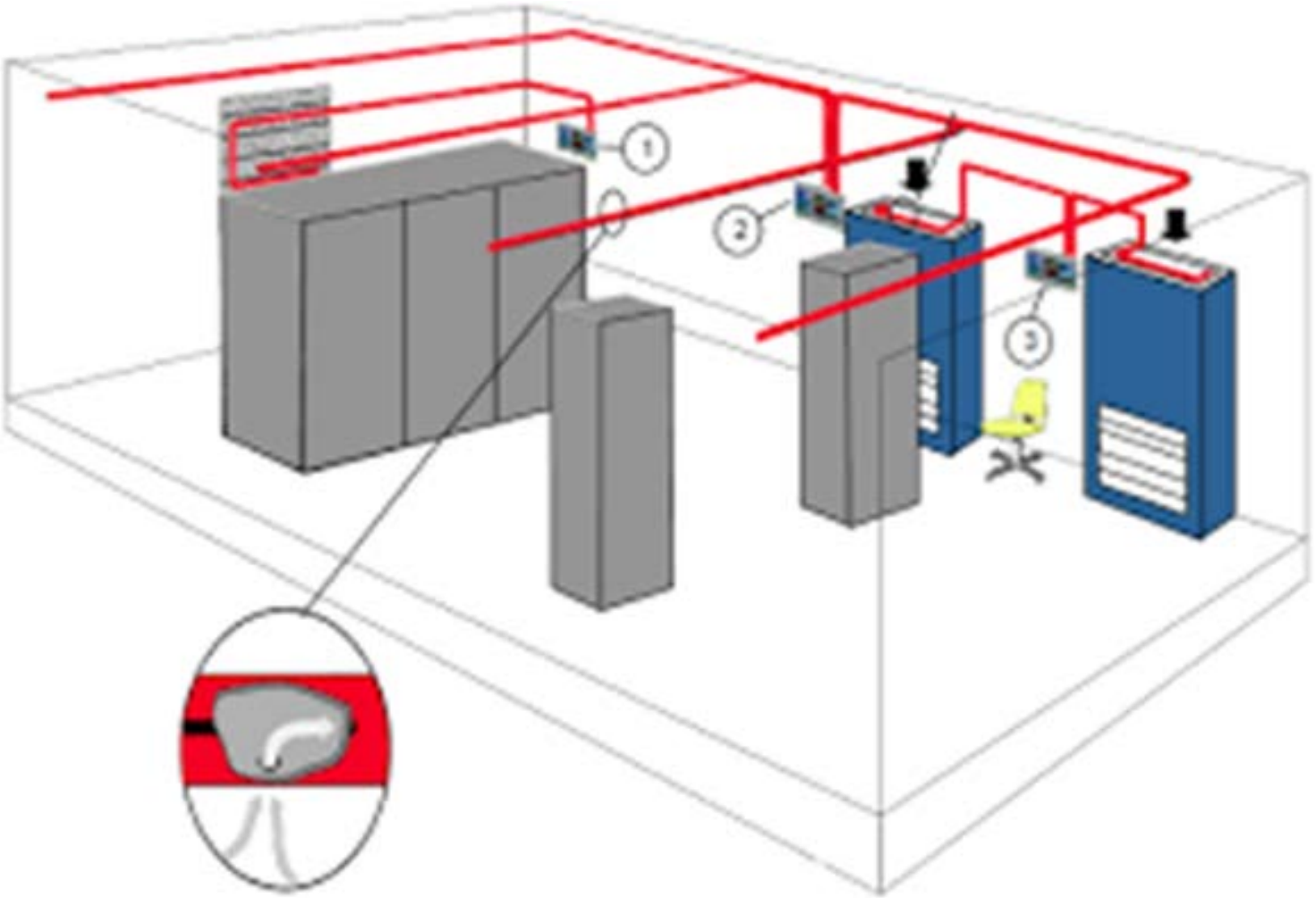
https://xtralis.com/video.cfm?id=795

VESDA Advanced Smoke Detection Demonstration

https://xtralis.com/video.cfm?id=797

Example VESDA System

Example VESDA System



Institutions That Have Installed VESDA Detection

- Hosmer House - Sudbury
- Harvard University, Fogg Art Museum – Art Storage
- Harvard University, Radcliffe Institute for Advanced Studies, Schlesinger Library – Archive Storage Vaults
- Harvard University, Memorial Church, Nave & Chapel – Early Warning Fire Detection
- Harvard University, Pusey Library – Art Collection
- Harvard University Museum Art Storage
- Museum of Fine Arts, Off Site Art Storage
- Harvard Business School – Morgan and Klarman Halls
- Robert A Vincent Early American Historical Collection & Library
- Fidelity Investments- Data Center and Art Collections
- Many ATT/Verizon/Sprint Telco sites

Institutions That Have Installed VESDA Detection (continued)

- Boston Symphony Orchestra – Symphony Hall
- Orpheum Theater
- Xcelis Technologies – High Energy Ion Implant Tools
- Skyworks Solutions – Semi-Conductor Fab
- MIT LL – R&D and computer rooms
- Raytheon – Labs
- BAE Systems – Anechoic chambers
- Boston Conservatory Theater
- Bio-gen/Genzyme/Amgen/Alnylam Pharmaceutical Manufacturing areas
- Williams College – Library
- Marlborough Middle School
- Sika Sarnafil – Manufacturing
- Solid Energy - Labs

Community Support

- **Sudbury Fire Chief, John Whalen (9/18/2018)**
- *"The installation of a Very Early Smoke Detection Apparatus (VESDA) detection will provide quick notification of a smoke or fire event in the building"*

- **Sudbury Historical Commission (9/25/2018)**
- *"The SHC unanimously approved a motion to support the SHS to seek funding from the CPC for the installation of (VESDA) Fire Protection System at the Loring Parsonage"*

Examples of Museum Fires

- National Museum of Brazil 2018
- The Derrin House, Avon, CT Historical Society 2016
- MoMA (Museum of Modern Art, NYC) 1958
- The Natural History Museum in Delhi 2016
- Taras H. Shevchenko Museum (Ontario) 1988
- Canadian Warplane Heritage Museum (Ontario) 1995
- Billings Estate Museum (Ontario) 1992
- Royal Saskatchewan Museum 1990
- P. T. Barnum's American Museum 1865

Washington Post September 5, 2008

Article on the fire at the National Museum of Brazil 2018

- ….'Yet as the 1958 MoMA conflagration reminds us, fires and other natural hazards have long posed as much a threat to leading museums in the United States and Europe as they have to their less wealthy counterparts in other parts of the world. In the United States, the long history of fires goes back to the early years of museum-building — and continues to the present day.'

Summary

- A considerable investment has been make by the Town of Sudbury, the state, private citizens and organizations to restore and repurpose the Loring Parsonage.
- It is a town treasure and will contain historic documents and artifacts.
- A small investment will provide maximum assurance the this building and its contents will be protected.