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Records Conservation Board

State Records Center

Public Records Division

Back to:

Records Management Home

Massachusetts Archives Home

Secretary of the Commonwealth Home

Technical Bulletin 1

Performance Standards of Safes and Vaults

Issued by the Supervisor of Public Records
May 18, 1995

Version 2 (1996)

AUTHORITY
Chapter 66, s.11 MGL requires the officers in charge of state departments, county commissioners, city councils or selectmen to provide fire-resistant rooms, safes or vaults for the safekeeping of the public records of their governmental unit (2 Op. Atty. Gen. 1899, p. 48). Pursuant to s. 1 of this statute, the Supervisor of Public Records is authorized to promulgate standards for the construction and use of these vaults, rooms and safes (8 Op. Atty. Gen. 1929, p. 594).

EFFECTIVE DATE
These performance standards become effective on May 18, 1995.

GENERAL
All vaults for the storage of public records shall provide the minimum level of protection specified hereunder. The Supervisor of Public Records does not specify any particular materials or technique for the construction of public records vaults. The Supervisor will approve vaults for the storage of public records upon receipt of the certification of licensed or registered fire protection and structural engineers that the proposed construction will have a fire resistance and structural integrity equivalent to or greater than that specified in the following performance criteria.

SIZE
A vault size of 5,000 cubic feet or less is considered optimal. Where large volumes of records must be protected, it is permissible to construct a vault with a capacity of up to 25,000 cubic feet. It must be realized that, because of the volume of combustible materials stored within it, this larger structure is at greater risk of fire and should be equipped with a fire suppression system.

MEDIA PROTECTION
All vaults intended for the storage of paper records shall be so constructed that, when fitted with the 6-hour required hereunder shall, in the event of fire in the surrounding structure, maintain an internal temperature of 350 or below for a period of not less than 6 hours. These standards provide the maximum available level of fire protection for paper records, but cannot safeguard film or magnetic media against either hear or humidity. If magnetic media have not been copies and dispersed or otherwise duplicated for protection, vaults or portions thereof used for the storage of this media must be equipped with data safes or an inner core designed to minimize temperature rise and moisture intrusion. These safes and cores shall be so constructed or equipped

that, in the even of fire in the surrounding structure, the internal temperature and relative humidity shall remain below 125 and 80%, respectively for a period of at least 2 hours. It is the responsibility of the records custodian to provide all media with the level of protection specified above and to provide the Supervisor with the engineerís certification to that effect.

CONSTRUCTION
Except in Type I or Type II-222 fire resistive construction as defined by NFPA 220, Standard on Types of Building Construction, all vaults shall be ground-supported and structurally independent of surrounding structures. Supporting structures for vaults shall be sufficient to support the full weight of the vault structure and its contents.

Since shrinkage or volume change, stresses may result in hairline cracking that will be detrimental to the vault structure, all concrete members should have a minimum reinforcing as specified in the ACI Code, and all masonry walls should have minimum reinforcing as specified in Paragraph 1113.5.3 of the Commonwealth of Massachusetts State Building Code.

All building members supporting the vault shall be noncombustible. All structure materials used in the construction of a vault shall have a fire resistance rating of 6 hours. All interior fittings and finish shall be noncombustible.

If connected to the building in any manner, the connection shall be made so that in the event of the collapse of the building, the surrounding building members may move or fall without affecting the fire-resistive qualities of the vault. All beams or bearing members adjoining the vault shall be designed to release freely in case of failure. Vault construction shall not be used as a support or bearing for the structural members of the building. Walls shall have sufficient lateral strength to withstand impact of collapsing building members, or toppling machinery or equipment.

Construction of vaults below grade level should be avoided whenever possible because of the dangers posed by the "cooking" effect of fallen debris, flooding from natural causes or fire fighting efforts, and the difficulties of maintaining proper environmental control.

In non-fire resistive buildings, the vault roof shall be designed to accommodate a minimum live load of 350 pounds per square foot. In all cases, ample accommodation should be made for protection against impact loading by falling equipment or building members and against accumulations of burning debris.

WATERTIGHTNESS
Walls, roofs and floors shall be effectively waterproofed. No combustible membrane or coating shall be used except on a roof exposed to the weather.

Provisions shall be made to prevent the entry of water at door openings.

Ample drainage shall be provided to prevent rain or fire fighting water accumulating on the roof.

PENETRATION
Wall penetrations shall be allowed only for access, HVAC systems, sprinkler systems, electric lighting and limited energy circuits. Wall openings shall be as small as possible and shall be sealed with approved or listed fire-rated materials and devices to prevent smoke, heat, flame or water penetration. Conduit, if used, shall be sealed inside and

outside.

Roofs shall not be pierced for any purpose.

Floors shall not be pierced, except that floors of vaults constructed on grade may be pierced to allow the passage of sprinkler piping or HVAC ducts.

VAULT DOORS
All vault doors shall be Underwritersí Laboratories Class 350 rated 6 hours or equivalent. ORDINARY FIRE DOORS SUCH AS HOLLOW METAL, TINCLAD, SHEET METAL, OR METALCLAD TYPES; STEEL PLATE TPE AND FILE ROOM DOORS ARE NOT ACCEPTABLE AS VAULT DOORS.

Vault doors shall be equipped with combination-type locks with an Underwritersí Laboratories approved relocking device designed to hold the door in case of mechanical, explosive or torch attack on the door. The lock mechanism shall be of the type enabling a person locked inside the vault to open the door easily from the inside. All day gates shall be similarly equipped.

Vault doors shall be equipped with smoke or heat-actuated release mechanisms to close them in case of fire.

ENVIRONMENTAL CONTROL
For paper and magnetic media, a stable environment with an average temperature of 70F or below and an average relative humidity of 30-50% shall be maintained. A temperature below 70F and a relative humidity of 40-45%, with fluctuations limited to no more than +2 F and +3% RH, is considered optimal. Storage facilities for first-generation silver halide microfilm shall maintain a constant temperature of below 70F and relative humidity of between 20 and 30%. If it is not possible to meet these optima, minimization of temperature and humidity fluctuations shall be the guiding concern. These parameters should be accomplished by controlling the external environment surrounding the storage space. Where this is not feasible, the storage space may be equipped with a heating/ventilation/air conditioning system. All equipment related to such a system shall be located outside the storage space.

FIRE DETECTION SYSTEMS
Automatic fire detection systems shall be installed in accordance with NFPA 71, Signaling Systems for Central Station Service; NFPA 72, Protective Signaling Systems; and NFPA 72E, Automatic Fire Detectors. The systems shall be relied on only when there is an assurance that the alarms will bring prompt response at all times.

FIRE SUPPRESSION SYSTEMS
Vaults may be equipped with automatic sprinkler protection installed in accordance with NFPA 13, Standard for the Installation of Sprinkler Systems.

Class A fire extinguishers or a standpipe systems with a small hose, suitable for use by the occupants of the building, shall be provided in a convenient location outside the vault door.

WIRING AND LIGHTING
All wiring shall be in conformance with NFPA 70, National Electrical Code. Fixed lighting only shall be provided in the vault. Lighting shall be limited to explosion proof or vapor proof lamps and controlled only from a 2-pole switch located outside the vault.

SHELVING
All shelving shall be of noncombustible construction and as fully enclosed as possible. All shelving shall be a minimumof 3 inches above the floor of the vault. Electrically powered mobile shelving shall not be installed.
Records and containers shall be separated by at lest 6 inches from any piping or conduits within the vault. Where sprinklers have been installed, a clearance of 18 inches shall be maintained below sprinkler heads.

SAFES AND RECORD CONTAINERS
Safes and insulated record containers to be used for the storage of paper records shall provide protection equivalent to that of Underwritersí Laboratory Class 350, rated for 4 hours. Equipment for storage of magnetic and photographic media shall be Class 150 rated 2 hours. Combinations of equipment or the use of inserts or liners to achieve equivalent levels of protection are permitted. Ratings by recognized testing laboratories other than Underwritersí Laboratories shall be recognized.

CERTIFICATION TO SUPERVISOR OF PUBLIC RECORDS
Prior to storage of public records in a newly constructed or renovated vault, the contracting agency shall provide the Supervisor of Public Records with signed and sealed certifications from all relevant engineers that the foregoing standards have been met or exceeded. No vaults which are not so certified may be used for the storage of public records.

FOR MORE INFORMATION
For more information, please contact the Records Management Unit. The Records Management Unit is available to help government officials and their staffs with records management. Analysts can assist you with:
Technical Assistance, including:

* Development of records management programs
* Records inventory
* Analysis of record-keeping systems
* Appraisal and scheduling of records
* Implementation of schedules

Training Sessions and Presentations. Analysts will plan an agenda tailored to the records management needs of your agency or department. Analysts frequently speak at meetings of professional associations. Sample topics include:

* Records Retention and Disposition
* Safety and Security of Records
* Records Lifecycle
* Care and Handling of Records
* Public Records Issues

Publications. The Records Management Unit publishes technical bulletins, project reports, the Records Management Manual and the newsletter, FYI. To obtain copies of our publications, visit our Web site or contact us at:

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Records Management Unit
220 Morrissey Blvd.
Boston, MA 02125

617-727-2816 Phone
617-288-8429 Fax
www.sec.state.ma.us/arc/arcrmu
recman@sec.state.ma.us

APPENDIX 1: RELATED BULLETINS FROM THE SUPERVISOR OF PUBLIC RECORDS
Please see our web site or contact the Records Management Unit for the following publications:

Maintenance of Records Storage Areas (03-92)

Security and Custody of Records Created Outside the Town Hall (04-94)

Designation of Records Custodian (02-96)

Massachusetts Archives

William Francis Galvin, Secretary of the Commonwealth

Related pages:

Records Conservation Board

State Records Center

Public Records Division

Back to:

Records Management Home

Massachusetts Archives Home

Secretary of the Commonwealth Home

Technical Bulletin 3

Records Security

Version 2 (1999)

Purpose
Two of the prime responsibilities of records custodians are ensuring the physical security of the operational records and preserving the corporate memory of the agency/department.
Loss of records can result in:
* Disruption of government business and services.
* Legal risks and excessive legal bills.
* Severe operational and financial setbacks.
* Damage to the interests of the constituency.
* Loss of political and historical context and legitimacy.
There are also legal repercussions if the custodian's responsibilities have been clearly enunciated. Failure to provide for the security of records in the face of clear requirements to do so may well be interpreted as negligence.

Threats to Records
Records custodians have a responsibility to protect their records against a variety of threats including fire, flood, theft, vandalism, pests and environmental damage. In the past, this was relatively straightforward: today, advancements in storage technologies and a proliferation of record media have complicated the task.

Environment
Now records custodians must provide protection for a variety of media, including paper, photographic film and magnetic media. Each recording media has its own environmental requirements and limits at which irreversible degradation will occur. These requirements must be taken into consideration when planning for the security of public records.

Paper
Paper is the most durable of recording mediums. While paper can survive temperatures up to 350EF., humidity levels up to100%, or total immersion in water, only a stable environment will assure long-term security and preservation. Temperatures below 70EF. and relative humidity of 40-45% are optimal. Due to the difficulty and expense of meeting these criteria, it is permissible to maintain average vault temperatures of 70EF. or below and an average relative humidity of 30-50%, with daily fluctuations of ±2EF. and ±3%RH. The Supervisor of Public Records publication Performance Standards for Safes and Vaults mandates that in the event of a fire, storage spaces with public records may not exceed the upper limit of 350o for the duration of a fire.

Photographic Film
Silver halide microfilm masters require a constant temperature of 70EF. or below and a

relative humidity of 20-30% for long-term preservation. It is preferable that temperatures do not exceed 65EF, and cooler temperatures are preferable. Storage space designed for the protection of paper records is not sufficient for the low humidity storage requirements of film. Storage requirements for film are specified in 950 CMR 39.06 of Regulations on Using Microfilm.

Magnetic media
Magnetic media has a much lower tolerance for high heat and humidity levels than paper. Magnetic media begins to suffer severe degradation at 150EF. and relative humidity of 85% and above. Storage space designed for the protection of paper records cannot protect magnetic media from the heat of a fire or the moisture generated by fire-suppression efforts. Periodic copying and dispersal of media, and specialized Class 150 records storage devices or vaults are necessary for the protection of magnetic media; please see the "Records Storage Equipment" section for more details. Storage devices and vaults must meet the guidelines specified in the Supervisor of Public Records publication Performance Standards for Safes and Vaults.

Please see the Records Management Unitís Web page at www.sec.state.ma.us/arc/arcrmu for a copy of the publications mentioned, or contact the RMU (617-727-2816 or recman@sec.state.ma.us) for a paper copy. For more information, please see the "Environment" section of Northeast Document Conservation Centerís Preservation of Library and Archival Materials at www.nedcc.org/index2.htm

Dirt and Pollutants
Cleanliness of the vault is essential to the protection of the records. Dust and pollutants can damage records and are sources of ignition. Unsanitary conditions are a hazard and are a breeding ground for insects and vermin. Prohibit food, drink and plants from the vault. Remove trash daily, and do not allow collected trash to accumulate in areas directly outside the building.

Protect archival records from dust and pollutants by housing them in archival-quality folders and boxes. The folders and boxes should meet the American National Standards Institute (ANSI) standard for permanence, Z39.48-1992. The alkaline reserve serves as a buffer between the contents and a potentially harsh environment. Boxes and folders meeting the ANSI standard will create a stable micro-environment for permanent records. For more information, please see the "Storage" section of this publication.

Maintain an overall environment that is as dust-free as possible:
* Change furnace and air conditioner filters on a regular schedule, e.g., quarterly.
* Use vacuum cleaners equipped with high-efficiency, particulate air (HEPA) filters if possible, so as not to redistribute dust. Sweeping is discouraged, since it stirs up and scatters dirt.
* Avoid introducing materials that create internal pollutants, such as wooden cabinets and shelves, cleaning compounds, andcarpeting.
* Do not store records near copying machines, which produce ozone and toner dust.
Records should be properly boxed and shelved. Boxes should not hang over shelf edges. Records should be promptly returned to their boxes; boxes should be promptly reshelved. Lit tobacco products, matches or lighters should be prohibited from the vault.

Cleaning compounds with ammonia, chlorine, solvents or volatile oils should not be used in the vault. Typically dust cloths and water are sufficient. Use caution with water because of the risk of spills and raising the relative humidity in a confined area. Make

sure shelves are completely dry prior to reshelving. For more information, please see Northeast Document Conservation Centerís technical leaflet "Cleaning Books and Shelves" at www.nedcc.org/tleaf43.htm.

Insects and Vermin
Pests indicate an environmental problem such as high humidity or gaps in the building structure, or poor housekeeping. Unless there is a specific problem, avoid regularly scheduled chemical treatments. Chemicals emit strong odors that may create long-term problems for staff, records, and record users.

There is no all-purpose solution for eliminating every pest problem. Practice a preventive approach to pest management. Maintain good housekeeping, prohibit food, beverages and plants, monitor the environment, use the least toxic eradication methods first, and work with your pest control professional. A pest infestation inside records boxes indicates a serious condition. Call the Records Management Unit at 617-727-2816 immediately.

Light
Artificial and natural light causes irreparable and irreversible damage. Vault areas should not have windows: if records are in an environment where they are exposed to light, cover windows with shades or drapes that completely block the light. This will also help maintain a stable temperature. Turn off interior lights when they are not in use and install ultraviolet (UV) filters on florescent lights. Store archival records in archival-quality folders and boxes.

Photocopiers are a powerful source of light. Avoid repeatedly copying the same record. Create "surrogates" or use copies for heavily requested records. Provide users with surrogate copies to reduce wear and tear on originals.

Mold
Excessive heat, poor air circulation, and relative humidity above 65% can provide a suitable climate for mold growth. If relative humidity goes over 65% for more than two days, or the airflow is stagnant, there is a risk of mold growth. High humidity is especially problematic in basements, where ground water and cooler temperatures encourage water vapor to collect. The appearance of mold indicates a serious condition and requires immediate action.

If mold occurs, reduce the temperature and relative humidity. Do not move records or try to remove mold from records without first consulting preservation personnel.

Determining the mold species is an important first step in addressing the mold outbreak. Some molds can present very serious health concerns. Even dormant (dry or powdery) mold spores can be readily redistributed within a storage space, becoming active (velvety) when environmental conditions are favorable for growth.
If you discover records with mold, immediately contact the Records Management Unit at 617-727-2816.

Records Storage Equipment
Records storage equipment and facilities should be designed and constructed to protect paper, photographic film and magnetic media against catastrophic events such as fire or flood, malicious attack or theft, and against long-term threats caused by environmental factors.

Storage units should be fire resistant in the sense of being noncombustible, and must be

heat resistant, in order to prevent degradation or auto-ignition of the records. Storage units must protect records against water intrusion and high humidity levels. It is crucial that records storage units (vaults, records safes, or insulated files) prevent the transfer of heat and that the storage units maintain their structural integrity.

Unrated devicesóincluding the so-called Old Line steel and cast iron safes found in many officesócannot be relied upon to provide the required level of protection. Although Old Line safes have been known to survive serious fires, they cannot be counted on to provide the heat-resistance or impact-resistance necessary to safeguard public records. Old-fashioned steel plate vault doors, with or without inner doors, provide only 10 or 15 minutes of fire protection, respectively. Unrated steel or wood filing cabinets, desks, etc., only provide 5 minutes of fire protection.

Storage equipment is tested by various testing laboratories e.g., Underwriters' Laboratories and is classified in terms of interior temperature limits and time in hours. For non-paper records, protective storage devices are classified 150 and rated 1, 2 or 4 hour e.g., the storage unit can maintain an internal temperature of 150EF. or below for 1, 2 or 4 hours. Units that are classified 150 require the maintenance of 80% or below internal relative humidity for the period tested.

For paper records, devices are classified to 350o and rated 1, 2 or 4 hour, with an allowance for 100% internal relative humidity. Devices may be equipped with inserts for greater fire resistance or for the storage of mixed media; for example, a storage device for paper records may be fitted with small, internal units for magnetic media. These devices may carry more than one classification and rating. The first classification applies to the whole unit and the second classification applies to the insert, e.g. 350 4 hour/150 4 hour.
Ratings assigned to various records storage devices are as follows:

Insulated Records Containers Class 150 rated for 4, 2 and 1 hour
Class 350 rated for 4, 2 and 1 hour
Fire-resistant Safes Class 350 rated for 4 and 2 hour
Insulated Filing Devices Class 350 rated for 1 hour
Insulated File Drawers Class 350 rated for 1 hour
Vault Doors Class 350 rated for 6, 4 and 2 hour
Insulated File Room Doors Class 350 rated for 1 and 1/2 hour Since fires often result in the collapse of structures, the fire-rated storage device must be able to withstand high impact e.g., the force of dropping through the building floor. This is tested as part of the classification rating.

Vaults must be constructed to withstand the impact of falling building members, equipment and the stresses and strains of collapsing structural members. Vaults must be constructed so that a fire will not: destroy the vault structural supports; produce stresses that will cause the walls, floors or ceilings to crack; cause the vault to erode due to sudden cooling from fire hose streams; and so that the vault will in no way lose its structural integrity.
It is undesirable to locate vaults and other record storage units in the basement of buildings, since burning debris may accumulate in the basement and create a "cooking effect." This leads to high temperatures for longer periods of time than would otherwise be the case. Basement units are also more susceptible to the impact of falling equipment and structural members. It is also more difficult to evacuate personnel from basement units.
In addition to fire-imposed hazards, basement areas are more prone to flooding and high humidity than areas at or above grade. This increases the risk of environmental

and preservation hazards.

VAULT OPERATIONS

Because of the expense and inherent size limitations of vault construction, it is crucial that the vault is utilized effectively. The vault is specifically designed to ensure the safe preservation of the government records. Using the vault for the storage of supplies, office machines, seasonal decorations, equipment or other non-record materials is a waste of valuable and secure space, and is an egregious misuse of scarce government resources.

Secure space is a limited resource: care must be taken to determine which records are stored in the vault. In order to make the most efficient use of vault space, public records should be prioritized as outlined in the following section, "Vital Records Management." Records that should be given priority for vault storage are records that are 1) vital to the operation of the organization, or are 2) archival due to their historical value and importance for preserving institutional and community memory. Secondary space allocations should be made for records appraised as important. If the vault cannot accommodate all important or useful records, provisions should be made for their storage in fire-resistant file rooms as specified in NFPA-232, Protection of Records. When planning the size and location of a new or reconstructed vault, records custodians should consider the current volume of records needing protection and attempt to estimate future space needs; this estimate should take into account projected growth estimates for the community and the annual accumulation of each record series. In the planning stage, it is appropriate to explore various avenues for reducing the growth of records e.g., miniaturization, electronic archiving of electronic records, and implementation of a comprehensive information management program and review.

Since vital records are usually active records, consider the needs of all involved and ensure convenient access to the vault. It may be desirable to construct two or more small vaults that are readily accessible to the operational offices, rather than a single large vault that is distant and inconvenient to access.

Supervision and Control

The vault should be under responsible supervision at all times. If the vault is not under constant surveillance, it should be closed and locked at all times it is not in use. Only authorized personnel should be allowed access to the vault: the authorization procedure should be documented in the record management policies and procedures manual, and it should designate which individuals are authorized to deposit or remove records. The vault should be inspected several times a day and at closing time to ensure that all records are properly shelved, all waste papers are removed, and that the door is closed and locked.

Removal of records should be controlled through the use of a sign-out or charge-out system. An example is the use of an outguide, a stiff cardboard divider with a protruding tab, which is placed in the box in place of the folder. The outguide should be ruled and labeled so that the worker may write in the file name, his name and the date the file was removed. There are many variations of sign-out systems ranging from basic lists to the use of bar codes. Whatever system is decided on, it should be documented in the records management policies and procedures manual.

It is highly recommended that a single officer or employee be placed in charge of the vault. This individual should have the authority to: control access to and change the combination; allocate space; establish requirements for boxing and labeling records; accept or reject records to be stored, based on the vital records program; and require the removal or rescheduling of records that have exceeded the required retention period.

Equipment
All filing equipment should be noncombustive throughout. If mobile shelving is installed, it must be of the mechanical type. Only equipment needed to service the files should be allowed in the vault. Desks, chairs and other furniture should be forbidden. If possible, ladders needed to reach upper shelves should be stored outside the vault; ladders should only be brought into the vault as needed. In the event of a fire or other emergency, the vault lights will probably fail, and it is essential that the vault aisles are kept clear. Aisles cluttered with boxes or equipment present a safety hazard.

Filing cabinets provide extremely inefficient storage and should not be used. Optimize space with shelving: shelving allows five times as much storage per square foot as equivalent office space. High-density shelving allows ten to twelve times as much storage per square as equivalent office space. Shelving should be designed for standard-size record boxes (typically 10" x 12" x 15"), as this will maximize the use of space.

Shelves that are closed on the ends and that have a front closure system, and mobile shelving in the compressed position, provide additional protection against fire and water damage from sprinkler heads or fire suppression. These systems also reduce air circulation, which may lead to mold growth. If closed systems are chosen, the environment should be carefully monitored.

Storage
All files should be properly arranged prior to boxing: only important records should be sent to the vault. Remove duplicate records and other non-essential materials. Record boxes should be of uniform size and clearly labeled with the office of origin, contents and span and disposal dates. For a sample inventory database (including box labels), please see the "Tools and Models" section of the Records Management Unit Web page at www.magnet.state.ma.us/sec/arc/arcrmu/arctoo.htm. In order to prevent mixing records with different offices of origin, each office should be assigned its own storage area in the vault.

Record containers should be at least 6 inches from piping and conduit that penetrates the wall. Record containers should be at least 4 inches from the wall to allow for maximum air circulation. Record containers should be kept a minimum of 18 inches below sprinkler deflectors. All records should be stored on shelves that are a minimum of 3 inches above the floor of the vault.

Storage Boxes and Enclosures for Permanent Paper Records
Paper records should be stored in archival-quality folders and boxes (low lignin or lignin-free, buffered, pH 8.5 or above). The folders should be stored in archival-quality boxes with lids. The calcium carbonate "buffer" of archival-quality materials prevents the formation of acid in paper records.

Select the appropriate-sized boxes and folders for paper records. Do not overstuff folders, and do not bend the materials to fit the folder or box. Folders should stand upright in the box. If necessary, use archival-quality fillers to support the folders and to prevent them from falling over.

Mark folders in pencil: pen and labels are chemically unstable and labels will fall off. Purchase supplies from companies that specialize in archival products. Contact the Northeast Document Conservation Center at 978-470-1010 or see their technical leaflet "Preservation Suppliers and Services" at www.nedcc.org/listsup.htm for a list of suppliers. Also see the Massachusetts Historical Records Advisory Boardís (MHRAB)

technical leaflet "Preservation Basics" at www.magnet.state.ma.us/sec/arc/arcaac/aacipre.htm.

See the Records Management Unitís publications page www.magnet.state.ma.us/sec/arc/arcrmu/arcpub.htm for more information on archival storage of non-paper records or contact the Records Management Unit at 617-727-2816. Also see the Northeast Document Conservation Centerís "Storage and Handling" section of Preservation of Library and Archival Materials: A Manual at www.nedcc.org/index4.htm.

VITAL RECORDS MANAGEMENT

There is a small percentage of information within any organization that is crucial to the successful operation of the organization. Without this information, the organization cannot function. These records are the vital records of the organization.

Although vital records typically constitute 3-5% of the organization's total information stock and may have only short-term value, vital records are essential for the:

* Operation of the organization
* Resumption or continuation of operations following a disaster
* Re-establishment of the legal, financial and functional status of the organization
* Determination and protection of the rights and obligations of the employees and citizens. Loss of this information can result in: vulnerability to litigation; exposure to unplanned financial losses due to financial settlements or revenue loss; disruption of the continuity of operations; loss of efficiency; and damage to the interests of the citizens and employees of the organization.

The objective of vital records management is to minimize risks and hazards to vital information, and to do so in the most efficient and economical manner possible. In the public sector, vital records programs protect the public interest, ensure the maintenance of individual rights, and preserve the public trust.

Establishing a Vital Records Program

Before implementing a comprehensive plan to safeguard vital records, the organization must complete a thorough study of its records. This study should include: determination of records classification; physical volume by class; storage space requirements; costs of the loss of each class; protection needed; and handling procedures.

Records Classification

Records are generally classified in one of four groups in a scheme suggested by the National Fire Prevention Association:

CLASS DEFINITION EXAMPLE
RECOMMENDED
PROTECTION

Class I

Vital Records essential to the continued life of the organization. These records are irreplaceable because they give evidence of legal and financial status, and of the rights and obligations of the organization. Vital records are generally housed in active storage. Accounts receivable, contracts, charters, minutes, payroll, ordinances and resolutions, master personnel listings, all documentation needed to run and read electronic records systems. Fire resistant vaults and safes, dispersal.

Class II
Important Records necessary to the continued life of the organization. While the records can be replaced or reproduced, this can only be done at considerable cost in time and money. These records may be housed in either active or inactive storage. Accounts payable, tax lists, directives. Fire resistant safes, vaults or file rooms.

Class III
Useful

Records useful to the continued life of the organization.

These records may be replace although their loss would cause temporary inconvenience. Bank statements, correspondence. Fire resistant safes, file rooms, filing devices.

Class IV
Non-essential Records that have no present value and should be destroyed. Requests answered, advertisements, announcements. Use, then destroy.

Although there is a tendency to equate vital records with records that have historic or archival value, they are not always one and the same. The life span of vital records may be very brief, and may inversely proportional to its importance to the organization. While archival records have enduring interest and historical value, they may not be relevant to the continued functioning of the governmental unit.

Documentation of computer systems, accounts receivable and insurance policy information are essential to restoring operations after a disaster, even though this information may have a brief usable life or retention period. On the other hand, records such as militia lists, Civil War records, and pre-1870 correspondence have historical interest and should be retained permanently, but they are not essential to the resumption or maintenance of government operations. The vital and archival categories are not mutually exclusive: records frequently fall into both categories. Since the protection of vital records should take precedence over other records, vital records classifications should be carefully assigned.

Protection Methods
To determine the most appropriate level of vital records protection, estimate the severity of potential disasters. The severity of the disaster, costs of protection, and budgetary levels will dictate the level of protection. There are two means of protection available to local governments in Massachusetts: on-site storage, and duplication and dispersal.

1. On-site storage
Considerations for on-site storage of vital records include the analysis and improvement of buildings or facilities, equipment and supplies, and establishing procedural controls.

1. Building considerations. Establish the adequacy of the floor-load capacity, lighting, ventilation, environmental controls, wall and door fire ratings, smoke and fire alarms and fire suppression systems. Eliminate hazards such as leaks and pest infestation.

2. Equipment considerations. Determine whether the vaults, safes and storage devices meet or exceed Underwriters' Laboratories specifications.

Underwriters' Laboratories tests and rates storage and filing equipment on the basis of impact resistance and internal fire and humidity levels during various lengths of exposure to fire. As a general rule, paper begins to deteriorate at 350EF., and magnetic media and photographs begin to deteriorate at 150EF. Storage devices for magnetic media must also be able to maintain an internal relative humidity of below 85%. See the "Vault Operations: Equipment" section for more details.

3. Procedural considerations. Routinely update vital records; prohibit food, beverages and smoking in records areas; do not store combustible materials with records; conduct periodic electrical, building and fire inspections; and periodically test the vital records program through simulation of post-disaster scenarios. See the "Vault Operations" section for routine procedural considerations.

The vital records program should not rely exclusively on on-site storage: there is always the risk that a single area can be destroyed or suffer near total destruction in a disaster. Duplication and dispersal of vital records must be part of the vital records program.

2. Duplication and Dispersal
Off-site storage of original, record copies of public records is forbidden under Massachusetts statutes. Duplication of vital records and storing the copies away from the central or primary office if one method of protecting vital records. This strategy is most effective for records that have been microfilmed and for records that are maintained in electronic format.

The environmental requirements for storing master microfilm negatives are very stringent; see the "Threats to Records" section for more detail. To ensure the safety of master microfilm and to ensure proper environmental controls, consider storing the master negatives with the Massachusetts State Records Center or with a private vendor. The State Records Center provides this service free of charge; please see the Additional Information section for contact information. In the event of a disaster, the off-site repository should be able to rapidly retrieve and copy the master negative. The master negative should never be used as a use copy. The master copy should only be used to produce duplicate film.

Electronic records should be backed up at frequent intervals; see the Records Management Unit publications for more detail. Backup copies should be stored off-site; reciprocal arrangements should be made between offices to store their backup copies. Programs and documentation needed to retrieve and read the backup copies should be secured at an off-site location. Agencies and departments should be aware of others who are using the same hardware and software: in the event of a disaster, it may be possible to utilize their hardware and/or software. Electronic archiving may also be investigated as a security measure.

In all cases, the dispersed records should be retained for their full retention periods and should be made available to the appropriate officers.

Program Staff
The Vital Records Coordinator
If the office already has a comprehensive records management program, the records manager is the most appropriate person to coordinate the vital records protection program. If a comprehensive records management program does not exist, appoint a

coordinator who has experience with records management e.g., a staff member of the Clerk's office. It is essential that all members of the organization recognize the authority of the coordinator: the coordinator should act with the administrationís authority and should have authority over vital records for all departments.

Most local governments have emergency response procedures for dealing with disasters. Public safety, public works and other personnel are all assigned a role in safeguarding lives and property. These procedures typically do not involve a long-term plan for preserving information and restoring severely disrupted operations, except for physical services such as water, electricity and public safety. A vital records program should be designed to preserve information that is essential to governmental functions. The vital records program should be part of the emergency response program and/or local disaster plans. The vital records coordinator should be part of the overall emergency planning process.

The Vital Records Team
The vital records team assists the program coordinator and is an important part of a successful vital records program. The major function of the team is to help the coordinator determine which functions and supporting records are vital to the organization, and to ensure that they are properly safeguarded. Administration, finance, law, information systems, and records management experience are important background for team members.

Communications
All officials should be aware of the importance of their vital records, and how critical they are to the survival of the organization. In larger organizations, it may be desirable to have a vital records manual; smaller organizations may find a simple master list to be sufficient. Vital records should be designated on the master records inventory. It is essential that the vital records program is part of management policy.

Summary
A vital records management program:
* Prevents the loss of information that is critical to the daily operations of government organizations.
* Begins with a records inventory that describes the function of the record within the organization.
* Classifies records into one of four categories: vital, important, useful or nonessential.
* Selects appropriate protection methods to safeguard vital records.
* Permits the organization to continue functioning during a disaster and to reestablish services after the disaster.
* Should be part of management policy, and should be part of community emergency response and local disaster plans.

ADDITIONAL INFORMATION
For more information, please see Northeast Document Conservation Centerís Preservation of Library and Archival Materials: A Manual at www.nedcc.org/newman.htm and see the Massachusetts Historical Records Advisory Board (MHRAB) technical leaflet "Preservation Basics" at www.magnet.state.ma.us/sec/arc/arcaac/aacipre.htm. Also watch the Records Management Unitís Web page at www.sec.state.ma.us/arc/arcrmu for new technical bulletins.

For more information, please contact the Records Management Unit.

The Records Management Unit is available to help government officials and their staffs with records management. Analysts can assist you with:

Technical Assistance including:
* Development of records management programs
* Records inventory
* Analysis of record-keeping systems
* Appraisal and scheduling of records
* Implementation of schedules

Training Sessions and Presentations. Analysts will plan an agenda tailored to the records management needs of the agency/department. Analysts frequently speak at meetings of professional associations. Sample topics include:
* Records Retention and Disposition
* Safety and Security of Records
* Records Lifecycle
* Care and Handling of Records
* Public Records Issues

Workshops. Let the Records Management Unit teach a workshop at your next professional association meeting.

For more information, please contact:
Massachusetts State Archives
Records Management Unit
220 Morrissey Blvd.
Boston, MA 02125
617-727-2816 Phone
617-288-8429 Fax
www.sec.state.ma.us/arc/arcrmu
recman@sec.state.ma.us

For information on storing microfilm at the State Records Center, please contact:
State Records Center
220 Morrissey Blvd.
Boston, MA 02125
617-727-2816 Phone
617-288-4505 Fax

APPENDIX 1: RELATED BULLETINS FROM THE SUPERVISOR OF PUBLIC RECORDS
Please see our web site or contact the Records Management Unit for the following publications:

Requirement to Use Permanent Paper (02-93)

Recording Material for Permanent Public Record (05-94)

Security and Custody of Records Created Outside the Town Hall (04-94)

Designation of Records Custodian (02-96)

Facsimile Transmissions (01-92)

Backing Up and Archiving Electronic Records (01-96)

Home | Search | Index | Feedback | Contact | Back to Massachusetts Archives Home | Top of Page

Related pages:
Records Conservation Board
State Records Center
Public Records Division
Back to:
Records Management Home
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Secretary of the Commonwealth Home

Technical Bulletin 2

Establishing a Micrographics Program

Version I (1993)

INTRODUCTION
The decision to use microrecords must arise from a municipality's specific circumstances and needs. When considering a microfilm application, the municipality should carefully consider its current situation and information needs and its short- and long-term goals. The various information management strategies available to it will have a broad impact on the manner in which it conducts its business and the services it seeks to provide for its constituents.

As with any technology, microfilm is a tool and not a cure-all; microfilming will not solve systemic faults in an information management system. Poor filing, inadequate indexing, redundant copies, poor information flow or failure to dispose of obsolete materials will not disappear with the establishment of a microfilm program. Rather, the municipality will spend a large amount of money to create a miniaturized version of poorly filed, redundant, inadequately indexed obsolete records.

A technological implementation should not be considered until the existing information system has been examined and optimized. Only at this point will municipal officers be able to clearly identify what problems, if any, exist, and the areas in which a microrecords program can make for better management. In all cases, it should be remembered that an information management system cannot center solely around microfilm. Microfilm is only one component of a successful system that may include paper, magnetic tapes and disks, and optical data storage systems.

PROS AND CONS
When considering a possible microfilm application, it important to be aware of both the advantages and disadvantages of the technology.

Storage space reduction
Storage space reductionis probably the attribute most frequently associated with the use of microfilm. Records reduced to microform occupy as little as 2% of the space required for the original paper documents. Vendors and other enthusiasts have interpreted this figure to mean that space savings of 98% could be realized through microfilming. Such a figure is unrealistic and ignores the fact that many records must be retained in hard copy even after they have been microfilmed, and that space freed by microreduction will need to be devoted to retrieval equipment such as reader/printers. It has been found that in applications where files are frequently referenced, such as insurance claims, the space savings were in the area of only 15%. Nevertheless, the space reduction afforded by microfilm can be substantial, particularly if the records being filmed are particularly bulky and not subject to frequent retrieval.

File integrity

File integrity is another major benefit to be realized from microfilm. Once a file has been filmed, its constituent records are locked in place in the order and condition in which they were sent to the camera. Alteration of the file is difficult and the retention of a master film copy at an offsite location acts as a backup ensuring that any tampering will be detected. To this extent, the accuracy of filmed files and other records is greater than that of their paper counterparts that are subject to tampering and alteration. Of course, this very integrity precludes the use of microfilm for "live" records, that is, records that must, in the course of business, be regularly annotated or amended. Updating of entire files, however, can be accomplished through the use of jackets or computer assisted retrieval (CAR) indexing programs.

Security of information

Security of information is perhaps the greatest benefit of a microfilm program. The most certain way to ensure the physical security of vital or archival information is to duplicate the source record and store a copy at a secure remote site. Although this is not feasible where large volumes of paper records are concerned, it can be quite efficient in the case of microforms. The security duplicate film provides a back-up should the office copy be damaged or destroyed, and is a control in the unlikely event that the office copy of somehow tampered with or otherwise called into question. Because magnetic media are inherently unstable, transfer to microfilm through a computer output microfilm (COM) application can secure the preservation of long-term information from a short-term medium. Where the original records are themselves of value, the use of microfilm can be substituted in use for the paper records, enhancing their longevity. If the microfilm is designed for long-term retention, the security copy must be on silver-type gel emulsion film and stored under strict security and environmental conditions to ensure preservation and continued usefulness.

Ease and speed of retrieval

Ease and speed of retrieval of microfilmed information are made possible by the reduction in size from the original source documents and by competent indexing systems. Miniaturized information can easily be stored in the working office and can be accessed in seconds rather than in minutes or hours needed for paper stored in file rooms or stored off site. Digital reader-printers allow the retrieved image to be directly faxed or emailed to an off-site recipient or distributed to one or more desktops over the network.

Cost savings

It may be difficult to cost-justify a microfilm conversion based on any one of these factors: cost savings result from a combination of benefits. Rapid retrieval, reduced on- and off-site storage costs, reduced storage equipment requirements, enhanced file and record security, and increased flexibility and productivity in office arrangement and information management can result in significant dollar savings.

User resistance

User resistance is often one of the strongest factors acting against the success of a microfilm program. Some users simply cannot come to terms with not having a piece of paper before them. Other complaints are more substantive and should be dealt with either in the planning phase or during implementation. Indexing may be inadequate and information retrieval difficult or time consuming; the reader may be in a location that makes its use inconvenient; film quality may be poor and the records difficult to read; arrangement of records on film may make the film difficult to use; the display size, format or quality of the reader may cause eye strain or fatigue in the user. Failure to address user problems can lower productivity and endanger the entire program.

Turnaround time
Turnaround time can also limit the acceptability of microrecords. If records are unavailable for excessive periods of time during filming, the organization's operations may be adversely affected.

Startup costs
Startup costs are high, involving not merely filming of records, but creation of indexes, user training and the purchase and lease of equipment.

Legal acceptability
Legal acceptability of microfilm records is often of concern to custodians. However, Massachusetts and Federal laws make ample provision for the use of the medium. Chapter 66, Section 3 of the Massachusetts General Laws establishes microfilm as an acceptable medium for the maintenance of public records. The hearsay and best evidence rules are addressed by C.233 ss.79A, 79D and 79E of the General Laws. Section 79E is an acceptance of the Uniform Photographic Copies of Business and Public Records Act that, along with the Uniform Rules of Evidence, addresses these issues at the Federal level. These laws make microphotographic copies of public records admissible in evidence regardless of whether the original record is still extant. To comply with these laws the microcopy must be:

1. An accurate representation of the original record.
2. Recorded on a durable medium.
3. Identified and certified as an accurate representation of the original record.
4. Created in the regular course of business as part of a program to preserve records on microfilm. This requirement does not preclude one-time microfilm projects designed to eliminate a backlog of records and to initiate a regular program. Of course, there may be other statutory or regulatory requirements that demand the retention of the original hard copy records even after they have been filmed. Prior to filming, always consult any oversight bodies that have an interest in the records and the Office of the Supervisor of Public Records, to determine hard copy retention requirements. None of these considerations apply to computer output microfilm (COM), since COM is an original record and not a copy.

IMPLEMENTING THE PROGRAM
Feasibility Study
Having determined: that the existing system is fundamentally sound; that implementation of other basic records management techniques will not solve existing problems or deliver the desired results; understanding the drawbacks and benefits of microfilm, the organization can conduct a feasibility study to determine the parameters of a microfilm program that can suit its needs.

The first step in the study is to examine the records that will be involved in the program. A number of questions should be asked about the records:

* What are the size, condition and color of the documents?
* What are the frequency and nature of changes or amendments made to the documents or files?
* How long are the records scheduled for retention?
* How often are the records accessed? The answers to these questions may decide whether special filming equipment or formats will be needed or whether the records should be microfilmed at all. Oversized, fragile or colored documents require special equipment, handling or photographic techniques. Frequently altered records need special indexing or perhaps ought not to be filmed at all. Except in the face of high

security demands, it seldom makes sense to film small volumes of records that are seldom referred to, or, except when space is critical, records with short retention periods.
* Who uses the records?
* How are they used?
* Where are the records?
* Where are the users?
* How many records are unavailable when requested on any given day? The answers to these questions will determine the type of microform to be used, the number of copies and the number and type of retrieval devices needed. The records may be used by office staff, auditors and other oversight personnel, researchers, the public at large or by all these groups. The level of usage will dictate the number of copies of film that must be made available and its potential location(s) (in-office only, in office and library, etc.). If several persons need access to records or files simultaneously, multiple copies of film or digitizing readers may be indicated. Similarly, if users are physically remote from the location of the records, it may be desirable to create duplicates to be sent to the user locations or to use digital reader-printers to transmit individual records on an as-needed basis. The needs of the user groups and the types of information they wish to extract from the records will also drive the type of indexing which will be required.
* How many pages does the average document/file contain? Are the pages double sided?
* Are records stapled or clipped together?
* What is the daily rate of accumulation? The answers to these questions can begin to suggest possible costs for the program. File size and whether the documents are double sided obviously will affect cost. Rate of accumulation will determine how frequently or at what point the files must be filmed. Staples, clips, double-sided documents, all mean more work and expense in the document preparation stage.

Film Formats
The microform to be used will be determined by the characteristics of the records to be filmed and film's intended use. There are a variety of microforms available, some with very limited and specific applications; for the purposes of this discussion, only five will be considered: roll film, microfiche, film jackets, aperture cards and computer output microfilm.

The most common and least expensive microform is roll film. Available in 16, 35 and 105mm widths, it is used for filming source documents or, to a lesser extent, computer output. The film most commonly used for business documents is 16mm. This film is available in a variety of lengths, most commonly 100 or 215 feet, and may be as a loose roll or encased in a cartridge or cassette. While the cassette format is nearly extinct, the cartridge type of enclosure is very popular and can be accommodated by most readers; it has the marked virtue of eliminating the tiresome fumbling associated with threading the film into the reader and protects the film from damage caused by handling. At the standard reduction ration of 1:24, a 100-foot roll of 16mm film can contain 2,500-3,000 letter-sized pages, and a 215-foot roll 5,400 or more pages.

35 and 105mm film are generally in loose rolls and are used for oversized documents such as maps or engineering drawings, or for library or archival applications. A 215-foot roll of 35mm film can contain 1,200 D-size drawings. Because of the size variations of archival records, roll of film may contain fewer documents at a considerably higher cost.

Records are filmed sequentially on roll film and once filmed are locked in the order in

which they went to the camera. Thisformat lends itself to chronological or other sequential files and until recently was limited to closed series which were not subject to updating. Computerized indexing schemes now make it possible to film records out of sequence or add to or integrate records in a filmed file. Each out-of-sequence record, however, must be accessed separately and may even be on an entirely different roll of film. This substantially slows information retrieval time.

Microfiche is a flat or unitized film piece produced from a roll of 105mm film that is usually cut into 6-inch lengths. Fiche is generally produced using a "step and repeat" camera or by copying from a microfilm jacket and is a much costlier format to produce than is roll film. Fiche lends itself especially to micropublishing, but is also used for other applications such as checks, payroll and invoices. Cameras that produce fiche generally can accept only individual documents. Although it is possible to create fiche of bound volumes it is not recommended.

An index is often included directly on the fiche with documents located on a horizontal/vertical grid. At the standard 24x reduction, a fiche can contain 98 pages (14 horizontal by 7 vertical).
Fiche are identified by an eye-readable header across the top of the fiche. This header may also be color-coded to facilitate filing. The size and amount of information on a fiche makes it an ideal format for distribution of data.

Microfilm jackets are polyester cards of the same 4x6 inch size as microfiche with sealed channels created along their horizontal axes. Frames of developed film are then "stuffed" into the channels. The channels may accommodate 16 or 35mm film. Jackets are useful for subject-specific applications where reference must be made to a particular individual or other subject. A jacket may be configured to include 35mm film images of plans along with 16mm images of specification sheets. They are easily updateable and very simple to reference but do not provide the file integrity of roll film or microfiche and are understandably more expensive.
A variant of the jacket is the jacket card. These are often preprinted with specific information with channels to allow the addition of microfilm to keep the file up to date.

Jackets are often copied to fiche for office use and distribution.

Aperture cards are standard-sized tab cards that accommodate developed microfilm, usually a frame of 35mm film. Indexing information is typed along a header or punched into the card itself for automated retrieval. This format has its primary application in filming plans, drawings, maps and blueprints.

Computer output microfilm (COM) is created through a process closely related to electronic publishing. Information from a computer is converted into an eye-readable form and imaged directly onto film. This process is much faster and cheaper than standard technologies for printing to paper. Some COM recorders allow the film to be imaged directly from internal memory without having to create a separate tape. The COM film can then be created on line.

COM may be in roll format but a fiche format is the most common. A standard fiche of COM can contain 270 pages of computer printout at the standard COM reduction ration of 48x.

Two variants of COM deserve note. These are computer input microfilm (CIM) and documents scanned to microfilm. CIM is essentially an input mode for optical character recognition (OCR) systems. Text is recorded on microfilm that can be then optically

scanned, converted into ASCII format and input into a computer system. Documents scanned to microfilm are first optically scanned using a laser scanner, converted a format that can drive a COM recorder, and then committed to film; this type of film is usually used as a back-up for optical data storage systems.

Retrieval Hardware

Unless microfilm is to be used only as a security device, it will be necessary to provide a reader or reader-printer to read the filmed documents. Readers and reader-printers range from very simple devices for reading microfiche to massive computer-linked robotic units that can automatically load film, retrieve images and make multiple copies. The simplest and cheapest of these machines is the microfiche reader. Roll film readers are considerably more costly. Readers are available which are capable of accepting both formats.

The choice of retrieval equipment will depend upon the type of film being used in the office, its use and frequency of reference, and the need to generate hard copy of the images. The convenience and comfort of users should be a prime consideration in choosing the type of retrieval hardware (and film format) which will be used. Inconvenience and discomfort associated with microfilm use will decrease productivity, engender hostility among researchers and endanger the program. If users are expected to spend a considerable amount of time in front of the reader, it is important to provide large screens with good illumination and contrast to minimize eye strain. The readers should be provided with comfortable seating and located in a comfortable area convenient to the employees' normal workstations. Readers intended for retrieval of maps and plans should be equipped with interchangeable or zoom lenses to allow the user to inspect details of the images. If the readers are to be used by researchers, or if several employees are expected to be accessing the records simultaneously, a sufficient number of readers and film copies should be provided to minimize waiting time and consequent reduced productivity and user dissatisfaction.

The public records laws apply to micro-images as well as to paper. If a record is on film, a copy must be provided on request. A reader/printer should be easily available to each office for this purpose.

Indexing

There are a number of ways in which microfilm can be indexed. The choice of indexing scheme is determined by the amount and type of records being filmed, the anticipated frequency of retrieval, the use to which the retrieved images will be put, and whether image retrieval is a time sensitive component of office procedure.

The simplest form of indexing roll film is simply to label the box with the contents and to use a combination of flash targetsand blank frames like folder tabs and dividers in a conventional paper filing system to separate the groups of images on the film. The user can consult a log to identify the proper roll of film and then browse the roll until the proper record group is located.

Roll film can be indexed by odometer reading, that is, by the number of inches of film as indicated by a dial on the reader, or by sequentially numbered frames on the roll. An image is then located by advancing the film to the proper frame number or odometer "mileage." It may also be indexed by blip coding. In this type of indexing, small patches of constant size and density are recorded on the film as each document is photographed. These "blips" can then be read by a photoelectric cell either integral to the reader or available as an add-on. By recording the documents as they are filmed an accurate index can be created with each set of blips corresponding to a single document. The correct blip code can be determined from the index and the reader set to

advance the film to the proper location.

Microfiche and jackets are identified by an eye-readable header across the top of the unit. This header contains the important indexing data for the images on the unit. The header may be color-coded and the units arranged as they would be in a conventional filing system. Fiche may also contain an internal index, usually located in the lower right-hand corner indicating the location of a particular document on the vertical/horizontal (numeric/alphabetic) grid.

Aperture cards are indexed in a similar manner. Additionally, indexing information may be keypunched onto the card itself to allow for automated retrieval.

These manual or semi-automated retrieval schemes can be successfully applied where the records involved are sequentially or otherwise logically arranged in closed series, and speed of access is not an important consideration. However, where records cannot be filmed in such a logical sequence or where rapid access or access by a complex combination of parameters is needed, these schemes cannot suit the needs of the organization. In these situations, a more sophisticated indexing scheme is needed, and this need is filled by a computer-assisted retrieval (CAR) system. Briefly stated, a CAR system involves on-line entry of index information to a database management system to create, maintain, retrieve and manipulate an electronic index to the locations of records on film. The index information may be linked to filmed record identifiers such as blips or bar codes, or may be text-associated. Sophisticated CAR systems can conduct Boolean searches and display microform addresses in complex relationships. A CAR system is necessary to any application that calls for integration of microfilm into an active information management system.

THE FILMING PROCESS

All microfilming of public records is governed by 950 CMR 39.00, Regulations on Using Microfilm. These regulations are designed to ensure that all public records are filmed in accordance with the industry standards specified by the American National Standards (ANSI) and the International Standards Organization (ISO), and that the quality and longevity of the film is equal to or greater than that of the original source documents.

Document Preparation

Preparing documents for filming is the most time-consuming, labor intensive part of the microfilm program. All files to be filmed must be carefully inspected to ensure proper arrangement and that all unnecessary or redundant material has been properly removed. Documents within the files must then be inspected for mutilations, tears, stains or obliteration, and placed in the proper orientation for filming. All paper clips and staples must be removed, and folded or curled documents flattened; this is particularly important when automatic feeders are to be used since folded or curled documents can jam in the feeder. All camera operator or other targets should be inserted in the files, and the camera operator should be notified if any adhesives or pressure sensitive tape is present since the adhesive can foul the feed mechanism or document beds of the cameras.

Record series or files are usually filmed in the order in which they were originally created or maintained. However, filming provides an opportunity to reorganize and rationalize file organization into a sequence that may be more valuable to the user. Misplaced items should be placed in proper sequence and extraneous materials purged. Missing items should be identified and missing document targets inserted for filming.

While this process may sound simple and straightforward, it can be grueling and devour unforeseen quantities of staff time if done in-house.

Targets
A number of non-record pages must be inserted among the records to be filmed. These targets may be informational for the persons using the film, or technical, relating the production and quality control of the film. The targets that must be included in filming are specified in 950 CMR 39.05(6) and the captioned ANSI standards, and include:

* Start/end targets, indicate the start and end point of filmed records, series or batches, these targets should be large enough to be read without magnification
* Retake targets indicate the starting point of retakes, i.e., images which had to be reshot because of poor quality in the first attempt, appropriate technical targets, and an end target reading: "END OF RETAKES FOR ROLL NUMBER _____"
* Roll Number targets indicate the number of the film roll in characters large enough to be read without magnification
* Classification/Restriction targets indicate that a record or group of records may be restricted under the provisions of c.4 s.7 cl.26 GLM. An end target should also be included
* Space targets may be used to separate series or batches of records
* Missing Document targets indicate that a record is missing from the series or is located in another place
* Exhibit targets indicate that an item in a file could not be filmed and is located in some other place. These are generally limited to physical evidence or other non-documentary material
* Record Identification targets consist of statements by the record custodians identifying the records delivered for filming, including their status and range. Also called the Declaration by Records Custodian, this document is essential if the records are to be admissible in a court of law
* Declaration by Camera Operator target is the camera operator's statement identifying the records received and the manner of filming
* Technical targets are included for quality control and are used to test for reflectance, resolution, density and reduction ratio

Film Base
In recognition of the fact that all media are impermanent, microfilm is no longer spoken of as archival. Rather, current terminology refers to the length of time the film can be expected to survive under optimal conditions, designated as the LE (life expectancy) rating. Currently, two types of film base are in use for creating master microfilm negatives: cellulose-ester and polyester. Cellulose-ester film has been in use since about 1908. Experience and accelerated aging tests have shown it to degrade with exposure to heat and humidity and in the course of use; based upon this rate of degradation, it has been designated LE 100, or as having an expected usable life of 100 years. Polyester film bases, introduced in about 1956, have many advantages over cellulose-ester including greater strength, stiffness, tear resistance, flexibility, and dimensional stability. Although actual use experience has only been about 35 years, accelerated aging tests and other investigations indicate that polyester base films will have a life expectancy of 500 years and are rated LE 500. Since both types of film are priced about the same, it is likely that cellulose-ester films will tend to disappear from the market. Cellulose-ester films should only be used when it is necessary to splice the microimages into previously created rolls of the same stock. Records with a retention period of 15 years or more must be filmed on polyester LE 500 stock.
Only non-flammable, safety film may be used.

Film Emulsion

Silver gelatin emulsion films must be used for the creation of first generation master microfilms. These films consist of a film base coated with a light-sensitive emulsion of silver halide crystals suspended in gelatin. When the source document is filmed, the silver halide crystals exposed to the light (usually blank) areas of the document are converted into free silver atoms, while those exposed to the dark (text) areas are left unaltered. Thus, the light from the source document passing through the camera lens and striking the film surface forms a latent image. This latent image must then be developed or processed to become stable and readable. During the development or processing stage, discussed at more length below, chemicals are used to convert the exposed halide crystals to metallic silver, thereby creating black areas on the film, and to remove the remaining, unexposed silver crystals, leaving these areas blank. The image thus formed is a negative, or reversed image of the original document with text appearing white on a black background.

Antihalation

During exposure, the light from the source document may penetrate the emulsion layer and reflect back off the film base to form ghost images known as halation. To prevent this, most film contains some type of antihalation compound either integrated into the film as a layer between the emulsion layer and the base or as a dye backing to the film.

The Cameras

There are three basic camera types used in making microfilm copies of original documents. The choice of camera is dictated by the nature of the source document, i.e., dimensions, paper weight, condition, or other physical characteristics; the volume of documents; and the intended use of the film product.

Rotary cameras, having the general size of an office photocopier, lend themselves to the high speed filming of large volumes of documents. These units are usually equipped with automatic feed mechanisms that feed documents to the camera at a very high rate of speed. The high rate of throughput is maintained by the camera mechanism that allows the lens to move in tandem with the document, taking the picture while both are in motion. The source documents filmed in this manner must be uniform in size and weight to allow the automatic feeder to function properly. An ideal application for this type of camera is cancelled checks.

Rotary cameras may also be provided with devices to automatically feed unbursted computer printouts for filming.

Planetary cameras, by contrast, require the source document and the camera to be stationary during the filming process. This provides a marginally higher quality image than that provided by a rotary camera, along with much greater latitude in the type and condition of the records that it can film. Planetary cameras are the cameras of choice for archival microfilming.

The most common configuration for planetary cameras is a flat document bed with dual light sources directed down on the document from above and the camera suspended directly over the document. This arrangement allows a wide variety of documents to be filmed, including full-size engineering plans and bound volumes. Lighting may be adjusted to compensate for the condition of the original document, and the camera can be shifted up and down for a wide range of reduction ratios.

Another version of the planetary camera puts the lens and light source below the document bed. This type camera closely resembles a photocopier and documents are

filmed in much the same manner as they would be copied: face down on the document bed, or through an automatic feeder. This type camera is not as versatile as the camera-above style.

The quality and versatility of the planetary camera must be weighed against the fact that it is a slow and labor-intensive method of filming. In all but the auto-feed mode, the source documents must be placed on the document bed by hand and the shutter manually triggered. Even with auto-feed, the documents must come to a full stop before the shutter is activated. The throughput is limited to 800-1,000 documents an hour, equal to the capacity of a rotary camera operating in manual-feed mode.

Step-and-repeat cameras are essentially planetary cameras specially designed to create microfiche. A document is placed on the copy board, the shutter is tripped and the document is exposed to the first position on the fiche; the camera then steps to the next position on the film and the sequence is repeated; hence, the name. Documents may also be automatically fed in both the camera-over and camera-under configurations. Throughput is slow, as with planetary cameras.

COM (computer output microfilm) recorders are not cameras as we typically understand them but a combination computer peripheral and high-speed microfilmer which converts binary, digital data into human-readable alphanumeric or graphic information with no intermediate paper. The recorders may use one of three technologies. In CRT photography, an image is displayed on a CRT inside the recorder; the image is then photographed by a high-speed microfilm camera. Laser beam recording uses directed lasers to record information directly onto dry silver film in much the same way as in a paper laser printer. Electron beam recorders, used mostly for graphics, are a type of CRT recorder in which the electron beam is directed onto the film rather than the display screen to create an image.

Image Orientations

In roll film applications, images may appear in comic (horizontal) or cine (vertical) mode. In comic mode, the images on the film follow one after the other "like a comic strip" with the short axis of the page and the text on it parallel to the long axis of the film. As the film is scrolled through the reader, the images appear in a normal readable pattern. In cine mode, the long axis of the documents is parallel to the long axis of the film and when viewed in the reader the pages appear to be on their sides. These images may be produced in simplex, duplex, duo or duoduplex mode.

In simplex mode, a single image is created that fills the entire width of the film. In duplex mode the front and back of the document appear side by side across the width of one exposure. Duo records images along one half of the usable width of the film, the exposures are made in one direction then reversed and made in the opposite direction on the other half of the film. Duoduplex uses mirrors to create side by side images of the front and back of a document along one half of the film width, when the roll is completed, the film is reversed and the process repeated.

Configurations of microfiche may be horizontal, vertical or serpentine i.e., back and forth (or up and down).

Reduction Ratios

One of the primary reasons for using microfilm is to reduce the size of the original volume of records. The extent of this reduction is called the reduction ratio. This is the number of times a given linear dimension of the source document is reduced when photographed. Expressed as 24:1 or 24X, a reduction ratio of 24 means that both the

horizontal and vertical aspects of the source document have been reduced to 1/24th their original size, yielding an image that is 1/576th the size of the original. For archival microfilming, records should be reduced as little possible to provide greatest resolution.

A wide variety of reduction ratios are available for use in microfilming, but 24X is generally considered to be the standard when filming normal documents. A reduction ratio of 32X is common for rotary cameras, however, and the standard for COM is now 48X. Some applications, such as old manuscripts or engineering drawings may dictate other reductions. In all cases the primary consideration should be to create records which are of high quality and compatible with the readers in use in the organization. The reduction ratio must be able to ensure a resolution level of 8.0.

Resolution
Resolution refers to the ability of the lens, optical system or emulsion to reproduce fine detail in the photographic reproduction of the original record. Since most microfilm is high-resolution film, the most likely areas for problems involving resolution to arise are in the optical system or camera lens. Lines should appear sharp and well defined. Using the Quality Index method described in Practice for Operational

Procedures/Inspection and Quality Control of First Generation, Silver-Gelatin Microfilm of Documents (ANSI/AIIM MS-23), this means that a letter "e", 2mm high will resolve to the 5.0 test pattern. To ensure that this resolution will be achieved, it is necessary that a series of test shots are taken and read against the appropriate test charts.

Density
Density is simply the amount of light that is stopped or allowed to pass through the developed film. If density values are too low, the film will appear faded or "washed out." On the other hand, too high density will cause fine, light lines to fill and bold black lines to spread. The density must be constantly monitored using a densitometer to ensure that optimal density is maintained.

Processing
Exposing the film in the camera creates a latent image on the film. With a latent image the chemical reactions that create a visible image have been set in motion by exposing the sensitive film to light, but the image is not yet visible and may still be altered or destroyed by additional exposure. To transform the latent image into a visible one, the film must now be processed or developed.

The development process essentially consists of immersing the exposed film in an alkaline reagent that transforms the latent image to a visible one by converting the exposed silver halide crystals to black metallic silver. The process is then stopped in an acid bath after which the film is fixed, that is, immersed in a "fixer" or "hypo" solution to wash away the unexposed silver crystals to leave clear areas on the film. The film is then washed in fresh water and dried. The images created by this process have a negative polarity, that is, they show a reversal of the light and dark areas of the original document. Some processors can accommodate extra steps to reverse this polarization (reversal processing) to create a positive image. Processing should be done within 24 to 48 hours of filming.

Processors are fully automated and self contained and range in size from tabletop to floor-standing. Processing generates large amounts of chemical waste including silver residues, which must be handled and disposed of with extreme care and in accordance

with all applicable local, state and federal environmental and safety regulations.

QUALITY CONTROL
Microfilming is a costly process and extreme care must be exercised throughout the entire program to ensure that records are properly prepared, filmed and processed. Following processing, post film inspection must be made to ensure that the film is of the highest possible quality. The following inspections must be made and reports filed:

* Completeness. The film must be inspected to ensure that all records have been filmed as intended.
* Sequence. The records must be in the proper sequence in which they were submitted to the camera operator.
* Format. The images must be in the intended format consistently throughout the film.
* Film image defects. The images must be free of defects such as over or under exposure, fogging, water spots, curling, double exposures, etc.
* Density. The density must be checked with a densitometer to ensure it is within the proper parameters and provides images of high quality.
* Resolution. The resolution must be checked using the appropriate test charts and targets. Residual thiosulfate ion or hypo residue. Excessive hypo or thiosulfate residue left over from processing will react with the metallic silver and cause the image to fade and become discolored. The film must be subjected to one of the tests specified in 950 CMR 39.00 and the captioned ANSI standards to ensure that the processed film is within acceptable tolerances.

Reports of the deficiencies found should be made and filed with the records of the program.

If deficiencies are severe, it may be necessary to refilm the entire roll. If only individual records are affected, these should be reshot and spliced at the end of the roll along with the prescribed retake targets and certificates. Only one retake section should be spliced to each roll.

Redox Blemishes
Redox blemishes, or measles, are red spots that form on film due to the reaction of the silver with atmospheric pollutants. Left unchecked, the spots, which may start out as mere pinpoints, can grow in size and spread, eventually obliterating images or rendering them unreadable. Treatment of the film with gold, sulfides or selenide has been proven to provide a certain level of protection for film and to increase its longevity. Gold treatment is effective but quite expensive; selenium has been shown to be only partially effective. The best treatment for film to date is with sulfides. Kodak Brown Toner and IPI SilverLock are two products which involve bathing film in a polysulfide solution to convert the most of the silver in the processed microfilm to silver sulfide. Silver sulfide does not react with atmospheric pollutants and therefore has a greater longevity than untreated film. The treatment is inexpensive and relatively safe by both health and environmental standards. Use of this type of treatment is highly recommended. For further information, contact the Image Permanence Institute, Rochester Institute of Technology, 70 Lomb Memorial Drive, Rochester, New York, 14623-5604, 716-475-5199 or Eastman Kodak for more information.

DUPLICATE FILM
The silver halide master film should never be used as a reference or working film. It should be safely stored under the conditions described below to serve as a security copy for the filmed records. Duplicate copies of the master should be made for actual office and reference use. Duplicates may be made from silver, diazo or vesicular films.

Silver gelatin duplicating film also called print film is also composed of silver halide crystals suspended in an emulsion on a film base. The master is duplicated to the print film by exposing it to light and the latent image is developed in the same manner as the original master film. The polarity of the duplicate will be reversed from that of the master. The process is slow and costly, and usually limited to making a duplication master from which other, tertiary copies can be made.

Diazo duplicating films are so named because they consist of an emulsion of diazonium salts on the film base. When ultraviolet light is transmitted through the master negative, the salts are dispersed in the areas of the diazo film that correspond to the light areas of the master. The latent image is then developed by exposure to ammonia fumes. Because of their physical construction, diazo films are sturdier and can take more handling and abuse than their silver emulsion counterparts, but they degrade much faster and their image quality will become severely degraded after only 50 years. Diazo duplicates retain the polarity of the master negative.

Vesicular duplicating film consists of a light sensitive emulsion suspended in a thermoplastic resin on a polyester base. When ultraviolet light is transmitted through the master onto the vesicular film pressure pockets are formed creating the latent image. Rapid application of heat then develops the image by deforming the emulsion that hardens when the heat is removed. Image polarity is the reverse of the master negative.

STORAGE

Like all record media, microfilm is subject to degradation due to age, handling and environmental conditions, and needs careful protection to ensure its long-term survival. Diazo and vesicular duplicate films are easily reproduced from the master negative or silver duplication master. These films are also tough, scratch resistant and relatively tolerant of suboptimal environmental conditions. These films are intended for office use and can be stored under normal office conditions, avoiding extremes of heat and cold and humidity. Care should be taken in handling, of course, and the films, reader plates and drives should be kept clean and in good operating condition.

The master negative should be safely stored in a secure, environmentally controlled, fire and heat resistant area and should be used onlyin extreme circumstances. Silver emulsion film is more fragile than the duplicate films and, since the emulsion is an organic substance, is also susceptible to greater environmental damage. Heat and humidity can weaken the emulsion and also promote mold growth. Long-term retention of the master negative film can only be ensured by storage under strictly controlled conditions. The film must be stored in a vault constructed to the standards prescribed in the National Fire Protection Association Publication NFPA 232, except that the vault must be modified to allow for a heating/ventilation/air conditioning installation to maintain the necessary environmental parameters. The vaults must maintain a constant temperature of 70oF. or lower, and relative humidity of 20-30% with daily fluctuations of not more than 5%. The HVAC system must be fitted with air filters to prevent air-entrained impurities from entering the vault. Because of the environmental requirements, it is not feasible to store film in vaults primarily intended for the storage of paper records. It may be necessary to seek a vendor who can provide offsite vault facilities. The State Records Center, operated by the Office of the Secretary of State, can provide such storage space, free of charge. Small quantities of film may be stored in safes, UL class 150 rated for 4 hours (or equivalent).

All enclosures and storage containers for the master film must be chemically nonreactive and non-corroding. Materials used must also be chemically stable and

resistant to giving off reactive fumes after heating to 150oF. for 4 hours. Great care must be taken that only photographically stable adhesives are used in containers and enclosures as provided in ANSI IT 9.2. If there is any question that proper humidity, ventilation or air purity will not be maintained, all film must be stored in sealed containers.

INSPECTION

Periodic inspection of stored master negatives is essential. The procedures for inspection of the film are set out in 950 CMR 39.07. Every 2 years, a statistical sample of the total volume of microfilm must be inspected for evidence of damage or deterioration. The inspection shall include: rereading of resolution test target and remeasurement of films density; inspection for residual processing chemicals, microbial growths, film curl or discoloration, excessive brittleness, evidence of separation of the emulsion from the base ("blocking or fused film"), adhesion of the emulsion, base shrinkage and the presence of redox blemishes. Cans, boxes, and reels of film should also be inspected for evidence of rust, corrosion and other deterioration.

Problems that are noted in film or storage containers and housings are often not isolated incidents, and if they are the result of conditions subsequent to processing they can become contagious and spread throughout the film collection. If samples of any lot of film rated as in fair condition, additional samples must be inspected. All film of any lot rated as poor must be inspected. All film rated as poor or bad shall be replaced. Reports of the inspections shall be made to the Supervisor of Public Records.

IN-HOUSE OR VENDOR SERVICE

In determining whether the program should be carried out in-house, there are a number of issues to be considered. An in-house operation has a number of advantages:

* Control of records is not compromised, records stay on-site and under the control of their custodians within the offices.
* Turnaround time is reduced since there is no transit time between the office and the location of the filming, and the filming is done according to a rigid schedule.
* Access to the records is not impeded; since they never leave the office, they can be accessed at any time. An in-house system allows effective centralized control of the entire program, including the ability to build the program into an overall information management environment.

Conducting an in-house microfilm program is most effective in economies of scale where there is sufficient work to fully employ both cameras and operators. Where there is sufficient volume of material to be filmed, an in-house program can result in significant cost savings and management benefits.

An in-house program, however, involves a significant investment in equipment and personnel. A simple desktop planetary camera will cost around $5,000, and a low- to medium-volume rotary camera will run at least $10,000. If the filming program is to be used for more than creation of security copies, it must be flexible enough to accommodate a variety of film sizes, formats and retrieval techniques and will require multiple cameras. Trained, skilled personnel must operate the cameras; sloppiness or incompetence by the camera operators can ruin an entire program, not only by spoiling a batch of film, but also by destroying the faith of users in the quality and usability of their output. A program depending on poorly trained, sporadically employed personnel is doomed to failure.

A film program also requires that a considerable amount of space be dedicated to the

cameras and the document preparation area. Records must be processed and filmed in secure, clean areas where their physical security and file integrity can be assured.

Even in large-scale micrographics programs, the advisability of in-house film processing must be carefully assessed. Processing involves chemicals that may be governed by federal, state and local health, safety and environmental regulations. Compliance with these regulations may require plumbing and ventilation modifications to be made to the building, and involve a level of compliance activity that would make in-house processing economically unfeasible.

Careful cost analyses must be performed to determine whether an in-house program is realistic. There are three alternatives to such a program:

* Cooperative programs can be established between two or more entities to create an economically feasible program.
* A vendor can be contracted to perform the entire program.
* Hybrid programs can be implemented with certain applications (e.g. high-volume filming of uniform records such as checks) being conducted in-house on automated equipment, and more critical or specialized operations contracted to a vendor. Contracting out the entire program is the most common alternative.

DEALING WITH A VENDOR

When selecting a microfilm vendor, it is important to consult with other agencies which have gone through the process themselves and which have experience in dealing with vendors. By tapping the experience of others, you can anticipate the process and be aware of the virtues or failings of the vendors who are likely to respond to your request.

At the request for proposal stage and throughout the entire project, it is essential to be able to communicate freely and clearly with the vendors. The vendors must be provided with sufficient information to submit an adequate response and they must be able to show that they are aware of all the factors that will influence their work on the program.

Bonding

Since the vendor may require that valuable records be moved offsite, it is highly recommended that he be required to post a bond to guarantee their security. A bond should also be secured to ensure that the performance of the vendor in terms of quality and delivery of the finished product will be as promised.

Information for the Vendor

To successfully formulate a response to an RFP and carry out a program, the vendor must be provided with a variety of information:

* Description of records to be filmed. The vendor must know the physical characteristics of the records: bound or loose; size; one- or two-sided; paper weight; color; and damage; whether they contain any documents that will require special handling e.g., brittle paper or documents in which inks have leached through and are visible on the opposite side of the page. All these factors will affect the equipment used, throughput time and cost of the job.

The description of the records should also indicate if they are active or inactive, and the estimated retrieval frequency. The manner of retrieval and any particular reference patterns should also be noted to allow the proposal to be tailored to meet the needs of the records' users.

* Rationale for Filming. The vendor will need to know the reason the records are being filmed in order to develop the most suitable program. Are the records being filmed for security, to save space or as part of an overall information management program? The reasons for filming, and the anticipated use of the film will dictate the format and retrieval systems needed.
* Arrangement and Editing. How will the records be delivered to the vendor? What will the vendor's responsibilities be for arranging files and document preparation? In general, weeding and arranging files should be done by the contracting agency. Document preparation, however, is a laborious task that consumes large amounts of staff time and requires a relatively large amount of space. Vendors customarily charge between $9 and $13 per hour for this service, but unless the contracting agency has plenty of staff it is generally considered a good investment.
* Access Restrictions. The vendor needs to know whether any records are confidential or restricted. This information assists in determining format and targeting or indexing requirements, and allows the vendor to make necessary security arrangements.
* Work Space. The vendor will need to know where the work is to be performed. The volume of records and the types of equipment needed will affect the vendor's willingness to work off site.
* Time Frame. The vendor will need to know what turn around time is expected for particular batches of records and for completion of the entire job.
* Public Records Requirements. All public records are governed by the provisions of c.66 MGL. The vendor must be made aware of the provisions of this chapter with regard to security and access to records. The actual filming of the records is governed by 950 CMR 39.00, Regulations on Using Microfilm; these regulations incorporate current industry standards and should be provided to the vendor. Information to be Provided by the

Vendor
For their part, the vendors making proposals must provide certain information and proofs:
* Knowledge of Governmental Operations. The vendors must be able to demonstrate familiarity with the operations of the governmental office letting the contract, and that they will be able to tailor a program best suited to the office's needs.
* Track Record. The vendors should be able to demonstrate that they have successfully undertaken similar projects before. References and recommendations of clients are helpful.
* Knowledge of Public Records Requirements and Compliance Capabilities. The vendors must be able to demonstrate their awareness of the requirements of c.66 MGL. They must be able to demonstrate how they intend to provide for issues such as records segregation, security, confidentiality and access within the terms of the chapter. The fact that the records may be on the vendor's premises in no way relieves the custodian of the requirements of the chapter.
* Flexibility. The filming program which best suits the client's needs may involve several different film formats and indexing and retrieval strategies. A vendor who has only overhead planetary cameras cannot provide the best service where large volumes of standardized records must be filmed. A CAR system is essential for filming active case files. It is wise to reviewa vendor's equipment inventory and staffing levels to determine whether the proposal has been predicated upon the vendor's capabilities rather than the office's needs or if it is even realistic.

If the microfilm is to be integrated into an information management program, the vendors must be able to show that they are thoroughly familiar with other facets of such a program including paper document management, electronic information management and optical data storage systems.

The vendor must also be able to show an operational flexibility that will ensure that the job will be completed on time in the event of unforeseen circumstances, even if this requires going to additional shifts.

* Knowledge of Industry and Regulatory Standards. The vendors must be able to demonstrate their familiarity and ability to comply with the provisions of 950 CMR 39.00 and the national and international standards governing the production of microfilm.
* Support and Training. The vendor must be able to support all equipment sold to the client. More importantly, the vendor must be able to provide training for all of the client's users. The best conceived and executed micrographics program will come to naught if the end users are not comfortable with it. Training must include instructions on how to use the hardware, make and transmit prints, use indexes (including CAR databases) and how to update indexes.

SUMMARY

Properly implemented, a well-thought-out micrographics program can provide a variety of benefits to government offices and be part of a powerful information management program. Improperly implemented, it can be a major waste of money. Preliminary study of the technology and the functions and dynamics of the office, and consultation with experts including vendors, professional associations such as AIIM and ARMA, and the Office of the Supervisor of Public Records are essential if the program is to succeed.

ADDITIONAL INFORMATION

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Dalton, Steve. "Microfilm and Microfiche." Preservation of Library and Archival Materials: A Manual. Andover, MA: Northeast Document Conservation Center, 1999. Also available at www.nedcc.org/tleaf51.htm.
Elkington, Nancy, editor. RLG Archives Microfilming Manual. Mountain View, CA: Research Library Group, 1994.
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"Resources for Facsimile Replacement of Out of Print and Brittle Books." Preservation of Library and Archival Materials: A Manual. Andover, MA: Northeast Document Conservation Center, 1999. Also available at www.nedcc.org/tleaf52.htm.
Saffady, William. Micrographic Systems. 3rd Edition. Silver Spring, MD: Association of Information and Image Management, 1990.
Saffady, William. Optical Disk vs Micrographics. Westport, CT: Mecklermedia, 1993.
Smith, Charles. Micrographics Handbook. Dedham, MA: Artech House, 1978.
Thomas, Bill. The Thomas Handbook of Quality Control in the Microfilm Industry. Burnsville, MN: MicroD Interntional, 1990.

Standards for the production of microfilm are established by the American National Standards Institute (ANSI) and associated organizations and are available from:

American National Standards Institute

1430 Broadway
New York, NY 10018
Phone 212-642-4916
Fax 212-398-0023
Web www.ansi.org ANSI also distributes standards of the International Standards Organization (ISO).

ANSI and ISO standards relating to microfilm and document imaging are also available from the Association of Information and ImageManagement (AIIM). AIIM is a professional organization dedicated to information and image management and publishes its own journal, Inform. For more information or a listing of ANSI or ISO standards and AIIM technical reports:

Association of Information and Image Management
1100 Wayne Avenue
Suite 1100
Silver Spring, MD 20910-5699
Phone 301-587-8202
Fax 301-587-2711
Web www.aiim.org
See www.aiim.org/industry/standards/97stdcat.htm for the AIIM catalog of standards.
The Association of Records Managers and Administrators (ARMA) is another professional organization dedicated to efficient management of records. ARMA publishes a journal, Records Management Quarterly, and a number of publications for the guidance of persons in the records management field. Contact:

Association of Records Managers and Administrators
4200 Somerset
Suite 215
Prairie Village, KS 66208
Phone 800-422-2762 or 913-341-3808
Fax 913-341-3742
Web www.arma.org The Society of American Archivists (SAA) is a professional organization that provides leadership, training and information for the identification, preservation and use of the nationís historical records. SAA is an excellent source of educational material, including many of the resources listed in the bibliography. SAA also publishes the American Archivist and Archival Outlook. Contact:

Society of American Archivists
527 S. Wells, 5th Floor
Chicago, IL 60607
Phone 312-922-0140
Fax 312-347-1452
Web www.archivists.org

The Supervisor of Public Records is charged by Chapter 66 of the General Laws of Massachusetts with oversight of the public records of the Commonwealth, counties, cities and towns. Pursuant to this mandate, the Supervisor publishes the Records Management Manuals for state, municipal and county records. A series of policy statements, Supervisor's Bulletins, explicate policy on various issues and provide further guidance for record custodians. 950 CMR 39.00, Regulations on Using Microfilm, are a part of the Code of Massachusetts Regulations and govern the use of microfilm for retention of public records.

To obtain copies of these publications, visit the Records Management Unit Web site or contact:
Supervisor of Public Records
Massachusetts State Archives
Records Management Unit
220 Morrissey Blvd.
Boston, MA 02125
617-727-2816 Phone
617-288-8429 Fax
www.sec.state.ma.us/arc/arcrmu
recman@sec.state.ma.us

For information on storing microfilm at the State Records Center, please contact:
State Records Center
220 Morrissey Blvd.
Boston, MA 02125
617-727-2816 Phone
617-288-4505 Fax

APPENDIX 1: RELATED BULLETINS FROM THE SUPERVISOR OF PUBLIC RECORDS
Please see our web site or contact the Records Management Unit for the following publications:

Use of Optical Media (01-93)

Massachusetts Archives

William Francis Galvin, Secretary of the Commonwealth

Related pages:

Records Conservation Board

State Records Center

Public Records Division

Back to:

Records Management Home

Massachusetts Archives Home

Secretary of the Commonwealth Home

SPR Bulletin NO. 3-92 January 21, 1992

TO: Public Records Custodians
SUBJECT: **Maintenance of Records Storage Areas**
EXPIRATION DATE: Until superseded
PURPOSE: This bulletin provides guidance and requirements for records handling practices and maintenance of dedicated records storage areas.

BACKGROUND:
Paper, magnetic media, photographic film, and other records are subject to continual change and decay. The rate of change is determined by the environment in which they are housed. Environmental characteristics such as light, temperature, humidity and air quality influence the condition and overall longevity of records and the information they contain. Handling, the human aspect of the environment, has a powerful impact on the longevity of records. When careless retrieval or refiling practices result in torn, crumpled or folded pages, paper fibers are broken, making tears more likely in the future. Magnetic media requires thoughtful handling or data loss will result. Smoking, eating, and drinking are equally as hazardous to records.

Dedicated records storage fulfills a unique function in office areas; the purpose of such storage is the protection and preservation of public records. By its nature, this function is compromised by eating, drinking, smoking, and related activities which expose records to fire, smoke, grease, oil, dirt, and other hazards.

FINDINGS:
The Supervisor of Public Records oversees the preservation of public records. See G.L. c.66, ß1 (the Supervisorís responsibility to secure the preservation of the records of the commonwealth, counties, cities or towns). Public officials are responsible for the safekeeping of the records in their custody. See G.L. c.66, ß11. Therefore, the supervisor charges public officials to provide proper handling and care of public records.

ACTIONS:
1. The use of smoking materials and the consumption of foods and beverages in dedicated records storage areas is prohibited.

2. Dedicated records storage areas should be kept clean and free of environmental hazards to records. In the case of storage areas shared by multiple offices, the executive officer should appoint an individual to monitor conditions, report and correct violations.

3. All persons should refrain from smoking and consumption of foodstuffs when handling records.

4. Officials should take reasonable care in referencing, retrieving, and refiling records

so that the physical composition of the record, and the information it contains, is not damaged.

5. When planning the construction or refurbishment of a dedicated records storage area, officials should consult Specifications for Safes and Vaults, available from this office. Specifications describe requirements for the construction of vaults; temperature and humidity levels to be maintained in them; sprinkler, heating, ventilation and air conditioning systems to be used; appropriate storage equipment; and related matters.

6. For more information about control of the environment, and its affect on record materials, officials can refer to the Records Management Manual issued for their jurisdiction, also available from this office.

QUESTIONS:
Questions regarding access to public records should be directed to the:
Public Records Division
1 Ashburton Place, Room 1719
Boston, MA 02108
Phone 617-727-2832
Fax 617-727-5914
Web www.sec.state.ma.us/pre

Questions regarding this bulletin should be directed to the:
Records Management Unit
Massachusetts State Archives at Columbia Point
220 Morrissey Blvd.
Boston, MA 02125
Phone 617-727-2816
Fax 617-288-8429
Email recman@sec.state.ma.us
Web www.sec.state.ma.us/arc/arcrmu

Massachusetts Archives

William Francis Galvin, Secretary of the Commonwealth

Related pages:

Records Conservation Board

State Records Center

Public Records Division

Back to:

Records Management Home

Massachusetts Archives Home

Secretary of the Commonwealth Home

SPR Bulletin NO. 2-96 June 6, 1996

TO: Public Records Custodians
SUBJECT: **Designation of Records Custodian**
EXPIRATION DATE: Until superseded
PURPOSE: This bulletin defines the term custodian as it applies to public records, and provides guidance for providing access to and ensuring the security of government records.

BACKGROUND:
It is the responsibility of government officers who create, receive and maintain public records to ensure their safekeeping and availability to the public. Access to public records ensures public involvement, and participation and provides a mechanism for holding government accountable for its decisions and actions. Custodial responsibilities are governed by the Public Records Law and complementary Public Records Access Regulations.

FINDINGS:
Custody of public records is in the office that creates, receives or maintains the records for use. Each officer in charge of a government office or department is the custodian of the records held by that office or department and has the primary responsibility for ensuring the safety of the records, providing access to those records and ensuring their authenticity. Where an office, board or commission does not have a clerk designated by law, it is required to appoint a clerk to keep its record books and to designate an employee to have custody of its other public records. G.L. c.66, ß6 (1994 ed.). These responsibilities are inherent in the office and cannot be delegated or contracted to another entity.

In some cases, public records are not maintained with the officers who created them or those that are primarily responsible for their use and maintenance. These records may be in the care of a records center, a central file room, a data processing department, a private contractor providing government services, a private information services vendor, or another government officer who has agreed to care for the records. In all these cases, the entity maintaining the records is acting as an agent of the record custodian, providing only for the physical care of the record, and may not take action with respect to the records without the specific authority of the custodian.

ACTIONS:
1. Access to public records is through the custodian. Contractors, records centers, data processing departments, vendors or other entities which may have physical care of public records must make those records available when directed by the records custodian.

2. Security of public records is the responsibility of the records custodian. Where records are in the physical care of entities other than the custodian, the custodian shall make ample provision by contract, memorandum of understanding, or other means to

ensure that the security of the records is ensured.

3. The records custodian is ultimately responsible for the accuracy of all information in the records in his custody, and must take all precautions to ensure the accuracy and integrity of the records.

4. The records custodian is responsible for ensuring that where disclosure of certain records is prohibited by law, those statutory mandates are observed.

5. Disposition of records is on the authority of the custodian only. Records may not be destroyed or otherwise disposed of without the specific authorization of the records custodian and the Supervisor of Public Records.

QUESTIONS:
Questions regarding access to public records should be directed to the:
Public Records Division
1 Ashburton Place, Room 1719
Boston, MA 02108
Phone 617-727-2832
Fax 617-727-5914
Web www.sec.state.ma.us/pre

Questions regarding this bulletin should be directed to the:
Records Management Unit
Massachusetts State Archives at Columbia Point
220 Morrissey Blvd.
Boston, MA 02125
Phone 617-727-2816
Fax 617-288-8429
Email recman@sec.state.ma.us
Web www.sec.state.ma.us/arc/arcrmu

SECTION 13041

FIRE VAULTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes fire-rated vault panels and doors.

1.2 SYSTEM DESCRIPTION

A. Vital records shall be protected from damage through the use of protective enclosures that limit exposure to heat to a level below which physical destruction or damage will occur. This standard defines handling techniques that provide protection from the hazards of fire, humidity and water damage. It does not consider forcible entry.

B. The Record Vault shall be ground supported or structure supported and the walls, structural members, partitions, columns, floors and roofs are to be of non-combustible materials.

C. The walls, floors and ceiling shall be of an assembly that will protect vital records against fire for its rated exposure.

D. Damage to computer media, magnetic tapes, flexible disks and similar material may begin at sustained ambient temperatures above 100 degrees F. Successful reconditioning lessens rapidly above 120 degrees F. Record vault construction for this media should provide Class 125-2 Hour protection. This requires that the temperature within the enclosure not exceed 125 degrees F. and 80% relative humidity. (NFPA-75 - Protection of Electronic Computer/Data Processing Equipment).

E. Damage to disks may begin at sustained ambient temperatures above 150 degrees F. Record vault construction for this media should provide Class 150-2 Hour protection. This requires that the temperature within the enclosure not exceed 150 degrees F. and 85% relative humidity. (NFPA-75)

F. Damage to microfilm may begin at a sustained ambient temperature of 150 degrees- 225 degrees F. in the presence of steam. Record vault construction for this media should provide Class 150-2 Hour protection. (NFPA-75)

G. Damage to paper products may begin at 350 degrees F. Record vault construction for paper records should provide Class 350-4 Hour protection. NFPA-232)

H. The design shall provide the necessary minimum resistance to heat, humidity, fire, vapor penetration and fire hose streams for the rated exposure of the record vault enclosure.

1.3 PERFORMANCE REQUIREMENTS

A. Seismic Performance: Provide modular vaults capable of withstanding the effects of earthquake motions determined according to the building code in effect for this Project or ASCE 7, "Minimum Design Loads for Buildings and Other Structures": Section 9, "Earthquake Loads," whichever is more stringent.

1.4 SUBMITTALS

A. Shop Drawings: Show details of fabrication and installation. Include construction details for materials, dimensions of individual components, location of light fixtures, and required clearances. Include the following:
   1. Plans, elevations, sections, details, and attachments to other work.
   2. Location of electrical outlets.
   3. Details of wiring for power, signal, and control systems. Differentiate between manufacturer-installed and field-installed wiring.
   4. Provide Shop Drawings prepared by or under the supervision of a qualified professional engineer.
      a. For installed products indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

B. Installer Certificates: Signed by manufacturer certifying that installers comply with requirements.

C. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who employs only workers trained and approved by vault manufacturer to install manufacturer's products.

B. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of modular vaults that are similar to those indicated for this Project in material, design, and extent.

C. Vault Assembly for Storage of Photographs and Film: Comply with NAPM IT9.11. (NEED STANDARD FOR MICROFILM/MICROFICHE) Vault chamber is required to provide a Class 150 Fire Rating to protect microfilm and Fiche as described in 1.2 (F) of the System Description.

D. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 1.

1.6 COORDINATION

A. Coordinate modular vault installation with adjacent construction to ensure that assemblies are protected against damage.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Firelock Fireproof Modular Vaults.

2. Or approved equal.

2.2 VAULT DOORS, GENERAL

A. Floor track shall have 1/4 inch diameter holes at intervals along track to provide for attaching to existing floor with fastener.

B. The vault roof panels shall have corrugated steel decking attached to protect the vault roof from sprinklers or water pipes located in areas above or from fire hose stream.

C. Vapor barrier shall be an integral part of vaults designed for magnetic media or film storage. This barrier shall prevent migration of water vapor, or steam from exterior of vault to interior of vault. Vapor barrier shall be located on the interior face of the panel.

D. All joints or seams between wall and ceiling panels shall be gasketed with high temperature fibrous insulation which meets Fire Resistance Classification ASTM E119, UL 263 Time/Temperature Curve. Fiber strips shall be used to cover all internal panel structural members to protect sheetrock (or other veneer finish) from heat exposure. All fiber utilized in panels, gasketing or door insulation shall be ceramic fiber capable of withstanding 2300 degrees F. with no breakdown of insulating efficiency. The laboratory tested rating for the fiber shall be:
   1. Flame Spread = 0 Smoke Developed = 0 Fuel Contributed = 0 as tested according to ASTM E84/UL 723 with melting point of 3200 degrees F. and continuous operating temperature of 2000 degrees F.
   2. Insulation values for all fiber utilized in panels, gasketing or door insulation shall meet standards established by ASTM C177.

E. Fire rated sheetrock of 1/2 inch minimum thickness shall be attached to the interior and exterior panel sidewalls and roof mounted on galvanized furring strips which are attached to the surface with self tapping screws.

F. If a suspended ceiling is used with surface mounted lighting, attachment to the roof panels shall be made at the panel joints. In this case, sheetrock and gasket strip are not required to be applied to the internal surface of the roof panel joints. Only Class A rated non-combustible materials shall be permitted in the space between the panels and the suspended ceiling.

G. Joints between panels and existing structure such as concrete floor shall be sealed with high temperature fibrous insulation in moldable form which meets Fire Resistance Classification ASTM E119, UL 263 Time/Temperature Curve.

H. All junction points around door stanchion and door assembly shall be packed with high temperature fibrous insulation which meets Fire Resistance Classification ASTM E119 Time/Temperature Curve.

I. Floor construction shall be designed to conform to the same level of protection as wall and ceiling construction. Floors located as slab on grade shall require no further insulation.

2.3 MODULAR PANEL

A. Class 125-2 Hour Rated Panel:
   1. Panel hall be designed to meet applicable requirements of NFPA 232-~~1986~~ 2000 Class 125-2 Hr. for protection of electromagnetic media.
   2. Thermal resistance (ASTM C 518) R = 33 @ 70 degrees F.
   3. Flammability (ASTM E 84/UL 723)
      a. Flame spread - 0 Smoke developed - 0 Fuel contributed - 0

4. Sound absorbtion characteristics:

Sound frequency, Hz	250	500	1000	2000	4000
Coefficient	0.95	0.65	0.72	0.96	1.05

5. Laboratory Testing as defined under Ul 72 and ASTM E-119 for Fire Endurance with a Listing for a minimum of four hours of fire endurance for the vault assembly and ratings as defined in this Specification.

2.4 AIR CONDITIONING AND ENVIRONMENTAL CONTROLS

A. Class 125-2 Hour Data Vault shall utilize equipment capable of controlling temperature and humidity within the range of 60-70 degrees F.and 40-50% relative humidity. This can be provided by a dedicated HVAC system or by accessing ducting from a central system. The HVAC System is not included as part of the vault manufacturer's scope of work. This equipment is detailed in the Mechanical Section of the Project Design Drawings and Specifications.
   1. A dedicated HVAC System shall be installed with condensing unit located outside the vault enclosure with the air handling system within the vault enclosure.
   2. Coolant supply and return and condensate removal shall be through CPVC tubing.
   3. AC System tube penetrations through the vault panels shall be designed to meet applicable standards for Class 125-2 Hour insulation from heat migration into vault enclosure.
   4. An intumescent potting compound which expands when heated (such as 3 M Company CP25WB) shall be used to seal around the PVC tubing penetration.
   5. Electrical service to the HVAC system shall be provided through cable tray assembly designed to meet applicable standards for Class 125-2 Hr. insulation from heat migration through the vault enclosure. (See VI. Cable Tray Specifications)

B. For HVAC provided from central environmental control system, a fire duct system designed to meet applicable standards for Class 125-2 Hour insulation from heat migration into vault enclosure shall be utilized.
   1. Damper Construction Detail The damper assembly for shall be constructed with three fire rated dampers located in series within the galvanized steel 16 gauge housing. Each shall be held in the open position by use of 165 degrees F. fusible links. The duct shall be insulated with ceramic fiber and protected from physical abuse by an external steel jacket.
   2. The damper assembly shall be field located with penetrations cut into the panel at the jobsite as specified by HVAC contractor/owner.

2.5 INSULATING DOOR ASSEMBLY

A. Class 125-2 Hour Data Vault Door Assembly
   1. Door assembly system designed to meet applicable standards for Class 125-2 Hour insulation from heat migration through the vault enclosure.
   2. Door assembly system to include an insulated vault door with an Underwriters Laboratories, Inc., 350-4 Hour rating. This door will provide a clear opening of either 32" W x 78" H or 40" W x 78" H. This door shall be installed as the exterior door in the dual door entryway. The interior door shall be installed utilizing a custom stanchion. The interior insulating door will be UL rated to 3 Hr. - 250 degrees F. Rate of Rise Classification and will be installed on the custom stanchion. Size of the clear opening shall meet or exceed that of the exterior doorway. The total system includes the dual doors, custom stanchion, insulating gasketing and automatic door closer system which is controlled through remote heat/smoke alarm units.

3. Fire Resistance (ASTM E-119, UL 263 Time/Temperature Curve). The rating of the door assembly in the closed position after duration of 2 hour test shall not exceed 125 degrees F. at the inner vault.
4. The door system shall be equipped with a LCN 4314 MED Series electromechanical closer-holder or equivalent. The hold open position can be set between 90 degrees and 180 degrees. These electrically powered units employ a solenoid operated bullet plunger valve. Whenever the unit is energized, the bullet plunger valve seals the closer's hydraulic closing circuit. Unit must close the door during any electrical power interruption to the unit, activation of the smoke detection unit and/or activation of the exterior smoke/heat alarm sensors. Doorways must be maintained free of obstructions that would prevent full closure of the door.

B. Door Assembly Construction Detail
1. The door assembly shall consist of two heat insulated doors, the first of which is an exterior stanchion integral to the modular wall panels. This stanchion shall have high temperature (2300 degrees F.) gasket strips at the junction of the wall panel and stanchion. The exterior door shall fasten to the stanchion. An inner stanchion shall be fastened to the concrete floor with anchor bolts and again at the header of the frame. Insulating gasket strips are used between the junction of exterior stanchion and interior stanchion.
2. The interior door shall be gasketed to provide a vapor seal to prevent migration of water vapor into the vault or gas fire suppressant agents out of the vault.
3. The electromechanical door closers are installed on each door to ensure that in the event of a power failure, alarm condition, temperature rise, and/or combustion vapors in the vault area, that the doors will be in the closed position to maintain the integrity of the vault enclosure.
4. Doors will be equipped with inside escape mechanism to ensure life safety evacuation in the event that personnel are within the vault during activation of the door closure system.
5. Install an emergency lighting system within vault to assist evacuation during an alarm and/or power failure. Emergency lighting is not in the scope of work of the vault chamber but is covered within the lighting diagram and specifications.

2.6 CABLE TRAY SPECIFICATIONS

A. Class 125-2 Hour Data Vault Cable Tray:
1. Cable tray assemblies are designed to meet applicable standards for Class 125-2 Hour insulation from heat migration through vault enclosure. Panel and cable tray shall be protected as shown on Standard Drawing STD-7AAA.
2. Cable tray assembly box attaches to the vault exterior and includes one 4" square electrical junction box mounted both on the exterior face and the interior face of the vault panel. PVC conduit, 1" diameter, is used to penetrate the vault panel to carry the wiring to the interior of the vault enclosure.
3. A UL rated firestop device such as CAJ 2042 shall be used to seal cable tray conduit in the event of fire. The firestop device shall be attached to a 20 Ga. steel sheet at the interior face of the panel at the point of penetration. Junction boxes shall be filled with intumescent caulk
4. Fire Resistance (ASTM E-119, UL 263 Time/Temperature Curve). Cable tray assembly shall resist migration of heat, after duration of 2 hour test, temperature shall not exceed 125 degrees F. at the inner vault.
5. Cable Tray Installation Procedure The cable tray assembly box is positioned on the exterior face of the panel and penetration points are marked and core drilled at those locations. CPVC conduit of required size is placed through the panel and the cable tray assembly box with a 1" extension exposed both at the interior and exterior surfaces. Intumescent caulk such as 3M CP25WB is used to fill junction boxes.

6. Wires are drawn through conduit and electrical system is completed. Conduit is installed to meet local codes and project specifications. J-box cover plates are attached to complete installation.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Existing Conditions
1. Walls shall not be pierced for ventilation, air conditioning or heating without the use of a fire duct system equivalent to the rated exposure of the vault enclosure. (If a dedicated unit is utilized instead of accessing an existing central system, see HVAC Specifications for Class 125-2 Hour vault.).
2. Fire duct shall be equipped with UL rated fire dampers per UL 555. Dampers shall be activated either by heat or smoke detecting devices.
3. When the duct is in the closed position, heat migration and humidity transfer should be to the standard of the media being protected.
4. The fire duct shall be equipped with an automatic closing device and a heat-actuated or smoke actuated release to close them in case of fire.
5. The fire duct shall consist of three fire rated, insulated dampers mounted in series within the duct. Dampers shall be equipped with thermal links which release above 165 degrees F. to allow the dampers to close.
6. The fire duct shall be covered with an insulating cover assembly of high temperature insulation equivalent to the vault panel insulation. Fire duct insulation shall be protected from physical abuse or removal by a steel outer jacket.
7. Fire duct shall have independent actuating devices in addition to any existing fire alarm devices.
8. For vaults utilizing a gaseous fire suppressant system to extinguish a fire within the vault enclosure, a fire and leakage rated motorized louver style damper shall be provided by the owner/owner's HVAC contractor to prevent the escape of the fire suppressant gas upon release. HVAC Contractor is required to provide a dry set of contacts to the automatic door closer or the fire suppression alarm panel so that the vault or the alarm panel can effect a closing of the HVAC Duct to prevent smoke migration into the vault during a fire or alarm event. (NEED TO COORDINATE WITH HVAC CONTRACTOR)
9. Electrical service, telephone cabling, computer connections or any other penetrations for electrical or communication cabling shall penetrate the vault in cable tray units. These units shall have ratings per ASTM-E119, equivalent to the rating of the en-closure.
10. Cable tray units shall be filled with intumescent potting compound per UL for the thickness of the wall to prevent smoke, heat, flame or water penetration.
11. All electrical service within the vault shall be in conduit and in accordance with NFPA 70, National Electrical Code.
12. Necessary lighting shall be limited to dust and vapor resistant lighting fixtures and lamps ~~vapor-proof or explosion-proof lamps~~ controlled by a 2-pole switch outside of the vault. The lighting fixtures for the vault chamber are to be provided under the electrical subcontract and are not a part of the scope of work of the vault manufacture and install. (NEED TO COORDINATE WITH ELECTRICAL AND WITH DWGS)

B. Examine areas and conditions, with Installer present, for compliance with requirements for clearance, installation tolerances, and other conditions affecting performance of modular vaults.
1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of modular vaults.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install vault assembly according to manufacturer's written instructions, including setting support angles and shims.

B. Install modular vaults level and plumb.

C. Installation Clearances: Install vault assembly according to manufacturer's written instructions for clearance between exterior of vault wall panel and existing construction and for clearance between top of ceiling and existing construction.

D. Install vault door and frame according to vault manufacturer's written instructions.

3.3 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain modular vaults as specified below:
   1. Train Owner's maintenance personnel on procedures and schedules for troubleshooting, servicing, and maintaining equipment and schedules.
   2. Review data in maintenance manuals. Refer to Division 1 Section "Contract Closeout."
   3. Review data in maintenance manuals. Refer to Division 1 Section "Operation and Maintenance Data."
   4. Schedule training with Owner with at least seven days' advance notice.

3.4 PROTECTION

A. Provide protection for stainless-steel surface of clad vault door to ensure that finish is without damage at the time of Substantial Completion.

END OF SECTION

MODULAR FIRE VAULT TECHNICAL SPECIFICATIONS

CLASS 350-4 HOUR & CLASS 125-2 HOUR VAULT

I. INTRODUCTION

This document contains guidelines for the protection of vital records stored on paper, microfilm or magnetic media within record storage vaults or enclosures. Its purpose shall be to reduce the risk of loss of vital records due to the effects of fire or prolonged heat exposure.

This specification does not seek to meet any and all requirements for record protection or life safety other than those specifically defined within the body of this text. It shall remain the responsibility of the purchaser to verify that the actual specifications utilized for their record protection requirements satisfy company policy, governmental standards, local building codes and/or commercial codes.

II. DEFINING THE RECORD ENCLOSURE AND GENERAL SPECIFICATIONS

1.0 Vital records shall be protected from damage through the use of protective enclosures that limit exposure to heat to a level below which physical destruction or damage will occur. This standard defines handling techniques that provide protection from the hazards of fire, humidity and water damage. It does not consider forcible entry.

1.1 The Record Vault shall be ground supported or structure supported and the walls, structural members, partitions, columns, floors and roofs are to be of non-combustible materials.

1.2 The walls, floors and ceiling shall be of an assembly that will protect vital records against fire for its rated exposure.

1.2.1 Damage to computer media, magnetic tapes, flexible disks and similar material may begin at sustained ambient temperatures above 100° F. Successful reconditioning lessens rapidly above 120° F. Record vault construction for this media should provide Class 125-2 Hour protection. This requires that the temperature within the enclosure not exceed 125* F. and 80% relative humidity. (NFPA-75 - Protection of Electronic Computer/Data Processing Equipment).

1.2.2 Damage to disks may begin at sustained ambient temperatures above 150° F. Record vault construction for this media should provide Class 150-2

Hour protection. This requires that the temperature within the enclosure not exceed 150° F. and 85% relative humidity. (NFPA-75)

1.2.3 Damage to microfilm may begin at a sustained ambient temperature of 150*- 225° F. in the presence of steam. Record vault construction for this media should provide Class 150-2 Hour protection. (NFPA-75)

1.2.4 Damage to paper products may begin at 350* F. Record vault construction for paper records should provide Class 350-4 Hour protection. (NFPA-232)

1.3 The design shall provide the necessary minimum resistance to heat, humidity, fire, vapor penetration and fire hose streams for the rated exposure of the record vault enclosure.

2.0 The structure surrounding the vault shall be a fire resistive Type I or Type II-222 (see Table 3 of NFPA 220-Standard on Types of Building Construction) in which the structural members including walls, partitions, columns, floors and roofs are of non-combustible materials.

2.0.1 The structure shall be of sufficient design characteristics so as to prohibit the collapse of the whole structure or portions thereof for the rated exposure of the record vaults.

2.0.2 Because of the difficulty of providing resistance to severe impacts, vaults shall be located where they will not be exposed to the fall of heavy objects in the event of collapse of the building as result of fire.

2.0.3 Special care and design should be given to the insulating of structural columns and supports per ASTM-84. Special insulating covers per UL 263-8.1 can be used to improve fire insulating characteristics for load bearing members within the structure in which the vault is to be placed.

3.0 The exterior vault door shall be a listed or labeled vault door tested in accordance with ANSI/UL 155. The vault door shall have a rating in hours of fire resistance comparable to the classification of the walls of the vault. (Six Hours-350)

3.0.1 In the event the rated exposure for the vault requires temperature

protection of Class 150-2 Hour or 125-2 Hour, a secondary fire door of UL rated 3 Hour, 250° F. Temperature Rise Classification will be required to limit heat exposure for the rated exposure of the vault. (Two Hours-125)

3.0.2 Doors shall have an automatic closing device and a heat-actuated or smoke-actuated release to close them in case of fire.

3.0.3 Doors shall have locking mechanisms of a type enabling a person accidentally locked within the vault to open the door easily from the inside.

3.0.4 Vault interior shall have emergency lighting in the event of power failure.

4.0 Walls shall not be pierced for ventilation, air conditioning or heating without the use of a fire duct system equivalent to the rated exposure of the vault enclosure. (If a dedicated unit is utilized instead of accessing an existing central system, see HVAC Specifications for Class 125-2 Hour vault.).

4.1 Fire duct shall be equipped with UL rated fire dampers per UL 555. Dampers shall be activated either by heat or smoke detecting devices.

4.1.1 When the duct is in the closed position, heat migration and humidity transfer should be to the standard of the media being protected.

4.1.2 The fire duct shall be equipped with an automatic closing device and a heat-actuated or smoke actuated release to close them in case of fire.

4.1.3 The fire duct shall consist of three fire rated, insulated dampers mounted in series within the duct. Dampers shall be equipped with thermal links which release above 165° F. to allow the dampers to close.

4.1.4 The fire duct shall be covered with an insulating cover assembly of high temperature insulation equivalent to the vault panel insulation. Fire duct insulation shall be protected from physical abuse or removal by a steel outer jacket.

4.1.5 Fire duct shall have independent actuating devices in addition to

any existing fire alarm devices.

4.1.6 For vaults utilizing a gaseous fire suppressant system to extinguish a fire within the vault enclosure, a fire and leakage rated louver style damper shall be provided by the owner/owner's HVAC contractor to prevent the escape of the fire suppressant gas upon release.

5.0 Electrical service, telephone cabling, computer connections or any other penetrations for electrical or communication cabling shall penetrate the vault in cable tray units. These units shall have ratings per ASTM-E119, equivalent to the rating of the enclosure.

5.0.1 Cable tray units shall be filled with intumescent potting compound per UL for the thickness of the wall to prevent smoke, heat, flame or water penetration.

5.0.2 All electrical service within the vault shall be in conduit and in accordance with NFPA 70, National Electrical Code.

5.0.3 Necessary lighting shall be limited to vapor and dust resistant lamps controlled by a 2-pole switch outside of the vault. Ground Fault or Arc type circuit breakers required.

6.0 FIRELOCK floor track shall have 1/4" diameter holes at intervals along track to provide for attaching to existing floor with fastener.

6.1 The vault roof panels shall have corrugated steel decking attached to protect the vault roof from sprinklers or water pipes located in areas above or from fire hose stream.

6.2 Vapor barrier shall be an integral part of vaults designed for magnetic media or film storage. This barrier shall prevent migration of water vapor, or steam from exterior of vault to interior of vault. Vapor barrier shall be located on the interior face of the panel.

7.0 All joints or seams between wall and ceiling panels shall be gasketed with high temperature fibrous insulation which meets Fire Resistance Classification ASTM E119, UL 263 Time/Temperature Curve. Fiber strips shall be

Used to cover all internal panel structural members to protect sheetrock (or other veneer finish) from heat exposure. All fiber utilized in panels, gasketing or door insulation shall be ceramic fiber capable of withstanding 2300° F. with no breakdown of insulating efficiency. The laboratory tested rating for the fiber shall be:

Flame Spread = 0
Smoke Developed = 0
Fuel Contributed = 0

as tested according to ASTM E84/UL 723 with melting point of 3200° F. and continuous operating temperature of 2000° F.

Insulation values for all fiber utilized in panels, gasketing or door insulation shall meet standards established by ASTM C177 as shown below:

Mean Temperature, * F.	K Factor
500° F.	0.4
1000° F.	0.8
2000° F.	1.8

7.0.1 Fire rated sheetrock of 1/2" minimum thickness shall be attached to the interior panel sidewalls and roof mounted on galvanized firring strips which are attached to the panel joints.

7.0.2 If a suspended ceiling is used with surface mounted lighting, attachment to the roof panels shall be made at the panel joints. In this case, sheetrock and gasket strip are not required to be applied to the internal surface of the roof panel joints. Only Class A rated non-combustible materials shall be permitted in the space between the FIRELOCK panels and the suspended ceiling.

7.0.3 Joints between panels and existing structure such as concrete floor shall be sealed with high temperature fibrous insulation in moldable form which meets Fire Resistance Classification ASTM E119, UL 263 Time/Temperature Curve.

7.0.4 All junction points around door stanchion and door assembly shall be packed with high temperature fibrous insulation which meets Fire Resistance Classification ASTM E119 Time/Temperature Curve.

8.0 Floor construction shall be designed to conform to the same level

of protection as wall and ceiling construction. Floors located as slab on grade shall require no further insulation.

8.0.1 Floors located above grade level shall be designed to allow for a raised floor to provide an insulating barrier above the concrete floor. The thickness of this insulation barrier shall be designed to supplement the concrete to provide the required level of protection for the records to be stored within the vault.

8.0.2 Vaults built within an area with raised computer flooring must be constructed on the concrete floor. The computer floor is then built into the interior of the vault to match the floor level outside the vault. In this case, the door stanchion is fabricated to allow the door to be raised to the level of the floor system. Only Class A rated non-combustible materials shall be permitted in the space between the concrete floor and/or FIRELOCK floor system and the raised computer floor.

III. MODULAR PANEL DESIGN SPECIFICATIONS

1.0 Class 350-4 Hour & Class 125-2 Hour Rated Panel

1.0.1 FIRELOCK Class 125-2 Hr. Panel designed to meet applicable requirements of NFPA 232 Class 125-2 Hr. for protection of electromagnetic media.

1.0.2 Standard panel size and configuration:

*Thickness - 8" nominal
Width - 24" nominal
Length - up to 12'
*Weight - 12-14 lbs./sq.ft.

*For composite wall construction, the 4" panel can be used with a minimum of 8" of reinforced concrete or equivalent masonry. Weight for the 4" panel is 8-10 lbs./sq.ft.

1.0.3 Thermal resistance (ASTM C 518) R = 33 @ 70* F.

1.0.4 Flammability (ASTM E 84/UL 723)

Flame spread - 0
Smoke developed - 0
Fuel contributed - 0

1.0.5 Sound absorbtion characteristics:

Sound frequency, Hz	250	500	1000	2000	4000
Coefficient	0.95	0.65	0.72	0.96	1.05

1.0.6 Fire Resistance (ASTM E 119, UL 263 Time/Temp. Curve)

Rating of Class 125 Data Rating after 2 hour test.
Maximum average temperature of unexposed face-125° F.

1.0.7 Panel Construction Detail (See Drawing STD-1)

FIRELOCK CL-350/CL-125 Panels (or equal) shall consist of a high Temperature (3200* F. melting point) refractory fiber core enclosed on three longitudinal sides by expanded metal mesh with structural steel supports at each corner. Vapor barrier of 20 gauge cold rolled sheet steel is used to enclose the fourth side of the panel to seal the interior of the vault against migration of steam into the vault enclosure. Proprietary design provides for fast, efficient tongue in groove, gasket sealed connection of adjacent panels. Panels are designed both for vertical and horizontal use. Fiber core shall comply with specification as described in Section II, Paragraph 7.0.

IV. AIR CONDITIONING /ENVIRONMENTAL CONTROLS SPECIFICATION

1.0 Class 350-4/Class 125-2 Hour Data Vault shall utilize equipment capable of controlling temperature and humidity within the range of 60-70° F.and 40-50% relative humidity. This can be provided by a dedicated HVAC system or by accessing ducting from a central system.

1.0.1 A dedicated HVAC System shall be installed with condensing unit

located outside the vault enclosure with the air handling system within the vault enclosure.

1.0.2 Coolant supply and return and condensate removal shall be through CPVC or Teflon® tubing.

1.0.3 AC System tube penetrations through the vault panels shall be designed to meet applicable standards for Class 125-2 Hour insulation for controlling heat-migration into vault enclosure.

1.0.4 An intumescent potting compound which expands when heated (such as 3M Company CP25WB) shall be used to seal around the CPVC/Teflon® tubing penetration.

1.0.5 Electrical service to the HVAC system shall be provided through cable tray assembly designed to meet applicable standards for Class 125-2 Hr. insulation from heat migration through the vault enclosure. (See VI. Cable Tray Specifications)

2.0 For HVAC provided from central environmental control system, a fire duct system designed to meet applicable standards for Class 125-2 Hour insulation from heat migration into vault enclosure shall be utilized.

2.0.1 Damper Construction Detail (See Drawing STD)

The damper assembly for FIRELOCK Class 125-2 Hour Vaults shall be constructed with three fire rated dampers located in series within the galvanized steel 16 gauge housing. Each shall be held in the open position by use of 165° F. fusible links. The duct shall be insulated with ceramic fiber and protected from physical abuse by an external steel jacket.

2.0.2 The damper assembly shall be field located with penetrations cut into the panel at the jobsite as specified by HVAC contractor/owner. For vault enclosures utilizing a gaseous fire suppressant system, see Par. 4.1.6 in the General Specifications section.

V. INSULATING DOOR ASSEMBLY SPECIFICATION

1.0 Class 350-4/Class 125-2 Hour Data Vault Door Assembly

1.0.1 Door assembly system designed to meet applicable standards for Class 350-4/Class 125-2 Hour insulation for heat migration through the vault enclosure.

1.0.2 Door assembly system to include an insulated vault door with an Underwriters Laboratories, Inc., 350-4 Hour rating. This door will provide a clear opening of either 32" W x 78" H or 40" W x 78" H. This door shall be installed as the exterior door in the dual door entryway. The interior door shall be installed utilizing a custom stanchion. The interior insulating door will be UL rated to 3 Hr. – 250° F. Rate of Rise Classification and will be installed on the custom stanchion. Size of the clear opening shall meet or exceed that of the exterior doorway. The total system includes the dual doors, custom stanchion, insulating gasketing and automatic door closer system which is controlled through remote heat/smoke alarm units.

1.0.3 Fire Resistance (ASTM E-119, UL 263 Time/Temperature Curve).

The FIRELOCK rating of the door assembly in the closed position after duration of 2 hour test shall not exceed 125* F. at the inner vault.

1.0.4 The door system shall be equipped with a LCN 4314 MED Series electromechanical closer-holder or equivalent. The hold open position can be set between 90° and 120°. These electrically powered units employ a solenoid operated bullet-plunger valve. Whenever the unit is energized, the bullet-plunger valve seals the closer's hydraulic closing circuit. Unit must close the door during any electrical power interruption to the unit, activation of the integral smoke detection unit and/or activation of the exterior smoke/heat alarm sensors. Doorways must be maintained free of obstructions that would prevent full closure of the door. Floor must be level and no floor covering shall be applied inside or outside the vault that obstruct the door or create a fire hazard to the vault.

1.0.5 Door Assembly Construction Detail

The door assembly shall consist of two heat-insulated doors, the first of which is an exterior stanchion integral to the modular wall panels. This stanchion shall have FIRELOCK (or equal) high temperature (2300° F.) gasket strips at the junction of the wall panel and stanchion. The exterior door shall fasten to the stanchion. An inner stanchion shall be fastened to

the concrete floor with anchor bolts and again at the header of the frame. FIRELOCK (or equal) insulating gasket strips are used between the junction of exterior stanchion and interior stanchion.

The interior door shall be gasketed to provide a vapor seal to prevent Migration of water vapor into the vault or gas fire suppressant agents out of the vault.

The electromechanical door closers are installed on each door to ensure that in the event of a power failure, alarm condition, temperature rise, and/or combustion vapors in the vault area, that the doors will be in the closed position to maintain the integrity of the vault enclosure.

Doors will be equipped with inside escape mechanism to ensure life safety evacuation in the event that personnel are within the vault during activation of the door closure system. NOTE: NFPA requires that owners install an emergency lighting system within vault to assist evacuation during an alarm and/or power failure.

NO TYPE OF FIRE SUPPRESSION GAS SHOULD BE SPECIFIED FOR THE VAULT CHAMBER THAT IS NOT ACCEPTABLE IN AN OCCUPIED AREA AS THIS IS AN ENCLOSED AREA. PLEASE NOTIFY THE FIRE SUPPRESSION CONTRACTOR THAT THIS IS AN ENCLOSED CHAMBER AND PLAN ACCORDINGLY. NOVEC 1230 by 3M or equal for vault interior.

VI. CABLE TRAY SPECIFICATIONS

1.0 Class 125-2 Hour Data Vault Cable Tray (See Drawing STD)

1.0.1 Cable tray assemblies are designed to meet applicable standards for Class 125-2 Hour insulation from heat migration through vault enclosure. Panel and cable tray shall be protected as shown on Standard Drawing STD.

1.0.2 Cable tray assembly box attaches to the vault exterior and includes four each 4" square electrical junction box mounted both on the exterior face and the interior face of the vault panel. CPVC conduit, 1" diameter, is used to penetrate the vault panel to carry the wiring to the interior of the vault enclosure.

1.0.3 A UL rated firestop device such as CAJ 2042 shall be used to seal cable tray conduit in the event of fire. The firestop device shall

be attached to a 20 Ga. steel sheet at the interior face of the panel at the point of penetration. Junction boxes shall be filled with intumescent caulk (See STD).

1.0.4 Fire Resistance (ASTM E-119, UL 263 Time/Temperature Curve).

Cable tray assembly shall resist migration of heat, after duration of four hour test, temperature shall not exceed 125° F. at the inner vault.

1.0.5 Cable Tray Installation Procedure

The cable tray assembly box is positioned on the exterior face of the panel and penetration points are marked and core drilled at those locations. CPVC conduit of required size is placed through the panel and the cable tray assembly box with a 1" extension exposed both at the interior and exterior surfaces. Intumescent caulk such as 3M CP25WB is used to fill junction boxes (See STD).

1.0.6 Wires are drawn through conduit and electrical system is completed. Conduit is installed to meet local codes and project specifications. J-box cover plates are attached to complete installation.

VII. VAULT TEST EVALUATION AND LISTING

1.0 Class 350-4/Class 125-2 Hour Data Vault Listing program

1.1 The Vault system including the Vault Door, Inner Door for data media protection, Vault Panels, Stanchions and Cable Trays shall be manufacturer certified upon completion. The Vault shall carry a one-year full warranty on all parts, labor and equipment, parts and labor included.

Community Preservation Coalition
Preserving our past. Building our future.

Documents are Historic Resources, Too

By Jennifer M. Goldson, AICP

In March 2006, the CPA statute was amended to include "documents and artifacts" within the definition of historic resources. Since that time, many communities have used CPA funds for document preservation projects, including document conservation and restoration projects and improvements to storage systems, such as installing climate controls.

However, in the process of reviewing applications for preservation of documents, CPCs and commissions have questioned which documents should qualify as "historic" under the definition contained in the CPA legislation. Since documents are not included on the State Register, it is necessary for the local historical commission to determine historic significance of documents per Section 2 of the Community Preservation Act (MGL c.44B). But, what evaluation criteria can commissions use?

Determining the Historic Significance of Documents

In discussions with document conservation professionals at the Northeast Document Conservation Center (NEDCC) and the Massachusetts Board of Library Commissioners (MBLC), the generally accepted criteria for determining the significance of buildings can be translated to documents to some extent, however, age of documents may not be as important as other factors.

Historical Value

n. ~ 1. The usefulness or significance of records for understanding the past.

2. The importance or usefulness of records that justifies their continued preservation because of the enduring administrative, legal, fiscal, or evidential information they contain; archival value.

(The Society of American Archivists: Glossary of Archival Terminology)

As Walter Newman, Director of Paper Conservation at NEDCC points out, the Society of American Archivists defines the term "historic" as "noteworthy among past events or old things" and goes on to note that the term "historic" connotes significance, whereas "historical" implies nothing more than age.

To determine significance of documents commissions can refer generally to the National Register Criteria: Is the document associated with a significant event or person? Does it have distinctive characteristics or yield important information?

As Gregor Trinkaus-Randall, Preservation Specialist at MBLC, explains, records designated as permanent on the state's records retention schedules for municipal records have an importance to the community that transcends age – that is why permanent records, like birth, marriage, and death records, can be considered historic resources under CPA if the Historical Commission determines per the statute that they are significant in ". . . the history, archeology, architecture, or culture of a city or town." However, it is important to remember that, per MGL c.44B Section 6, "The community preservation funds shall not replace existing operating funds, only augment them." You'll want to be careful that you are not using CPA funds to pay for expenditures or staff that are included in the municipality's general budget, as you would be in violation of Section 6.

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November 2, 2009

Town of Sudbury
Town Clerk's Office
322 Concord Road
Sudbury, MA 01776

Attention: Rosemary Harvell

Dear Rosemary:

Subject: Assessment of Records Storage Conditions
Town of Sudbury

This letter is submitted to summarize my analysis of the existing storage conditions for records of the Town of Sudbury in the Town Hall and Flynn Building and to confirm that those storage conditions do not satisfy the requirements of the State of Massachusetts for protection of public records. The storage conditions in the separate buildings are discussed below.

Sudbury Town Hall

The Town Hall is, of course, the location of the town clerk's office and, necessarily, the site of many current and historic records. The characteristics and features of that building may be described as follows:

- The building has two stories above grade, a full basement and an attic.
- The building is of wood frame construction classified as Type VB, unprotected combustible/ noncombustible construction by the criteria of the Massachusetts State Building Code.
- The building presently houses the Selectmen's Meeting Room, the Town Clerk's Office, the work and storage areas of the Sudbury Historical Society and miscellaneous storage areas.
- The building is unsprinklered.
- The building is provided with a partial smoke and heat detection system with interior alarms and a master box connection to the Sudbury Fire Department.
- The fire alarm panel also includes a zone for fire detection devices in the adjacent

town offices in the Loring Parsonage.

In this building, town records are stored in one 77 sf vault, a second 77 sf vault and in one 375 sf storage room. The vaults have the basic characteristics required of a vault for security and fire protection except fire suppression systems. Those two vaults satisfy the minimum requirements for vault protection of records.

The storage room does not have a fire rated enclosure, is provided with smoke detectors and is minimally secured with a wood door with padlock. It would be classified as ordinary storage not at all suitable for public records.

The Flynn Building

The Flynn Building houses multiple town administrative departments including storage spaces for many current and historic records of those departments. The characteristics and features of that building may be described as follows:

- The building has three stories above grade.
- The building is of wood frame construction classified as Type VB, unprotected combustible/ noncombustible construction by the criteria of the Massachusetts State Building Code.
- The building presently houses multiple town administrative departments including the Treasurer's Office, the Assessors Office, the Board of Health.
- The building is fully sprinklered.
- The building is provided with a partial smoke and heat detection system in addition to the water flow detector of the sprinkler system with interior alarms and a master box connection to the Sudbury Fire Department.

In this building, town records are stored in one 209 sf storage room located in the lowest level of the building. The storage room does not have a fire rated enclosure, is provided with sprinklers and smoke detectors and is minimally secured with a wood door with padlock. It would be classified as ordinary storage not at all suitable for public records.

Standards for Record Storage

Massachusetts General Laws, Chapter 66, Section 11 requires that public officials provide fire resistant rooms, safes or vaults for the safekeeping of public records. Technical Bulletin 1 titled *Performance Standards for Safes and Vaults* has been issued by the Secretary of State to document performance criteria for records storage conditions. The 1996 Version 2 edition of that standard requires the minimum characteristics of a vault for public records including but not limited to the following:

- An optimal size of 5,000 cf

- Sizes up to 25,000 cf with a fire suppression system
- A six hour fire rating
- Ground support or support by fire resistive construction
- Noncombustible construction
- Structural independence
- Location so as to avoid burial in fallen debris and resulting "cooking" due to residual burning
- Protection against flooding including water from firefighting operations
- Ability to sustain a minimum live load of 350 pounds per square foot and impact loading
- Waterproofed walls, roof and floors
- Limiting of penetration of enclosure walls, roof and floor to required utilities and fire protection equipment
- UL listed vault doors
- Environmental controls
- Automatic fire detection system
- Portable fire extinguishers
- Noncombustible, enclosed shelving
- Manually operated mobile shelving, if mobile shelving is used

Discussion

Except for the two small vaults of the Town Hall, the records storage conditions in the Town Hall and Flynn Building have few, if any, of the important features required by Technical Bulletin 1. Both buildings are of combustible construction with sprinklers for the Flynn Building but not for the Town Hall. Coverage by smoke and heat detection in the Town Hall is much less than complete. Both buildings have active occupancies with multiple potential ignition sources including copiers, computers and coffee makers. As public buildings, both the Town Hall and Flynn Building are potential targets for intentionally set fires.

As a paid-on-call firefighter of the Sudbury Fire Department for 44 years, I am also concerned about the ability of the SFD to effectively deal with a fire in these buildings, especially the unsprinklered Town Hall. Despite a knowledgeable and well-trained staff, the SFD would find itself understaffed and with limited call-back response to fight a fire in one of these relatively large buildings. At the current time, a typical fire department response to one of these buildings would be six to nine persons, depending upon the time of day. Even with the detection system of the Town Hall, the time to respond to one of the buildings combined with the time to determine the location of a fire or smoke condition within the building could be long enough to permit fire development beyond the ability of that first response. The possibility of rapid fire development in storage areas and especially in attic areas of combustible construction before additional firefighting forces arrive results in the potential for fire, smoke and water damage to a

large percentage of the building including the areas use for record storage.

Conclusions

The levels of protection against fire, smoke and water damage and the levels of security for the public records in the situations described in the Sudbury Town Hall and in the Flynn Building are well below the level that is required by MGL Chapter 66, Section 11 and Technical Bulletin 1. Creation of a properly designed records storage vault should be a very high priority for the Town of Sudbury.

If you have any questions concerning my analysis of this situation, please do not hesitate to contact me.

Very truly yours

Harold R Cutler

Harold R. Cutler

Encl.