



The Selection & Development of Local Government Records Storage Facilities

By Thomas Wilsted, CA, FSAA

Records Management Technical Bulletins

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The Municipal Clerks Education Foundation (MCEF), established in 1984, is a tax-exempt, nonprofit foundation under Section 501 (C)(3) created to raise funds for its partner, the International Institute of Municipal Clerks. IIMC uses these funds to promote, train and educate Municipal Clerks, making them proficient in the services they provide for the citizens of their community. MCEF is a diverse team of volunteers who are passionately committed to helping IIMC pursue its educational objectives.



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Preface

Like every organization, local governments create and maintain large quantities of records. Many of these records not only are of great value to the local government, but also are of concern and essential to the citizens of the community. Federal and state-mandated program requirements, changes in growth and development patterns, expanded service needs, the use of computers and other technologies for creating and using information, and the proliferation of copies in various formats, have all contributed to this enormous accumulation of records. Each publication is intended to make available to local governments the basic principles, policies, and guidelines that should be followed in establishing a sound records management program and in carrying out sound records management practices.

The series is intended for local officials, with limited resources, who lack formal records management or archival training but who have custodial responsibility for records. These local governments include townships, villages, cities, counties, school districts, and other local political subdivisions and special-purpose districts. Each of the following publications in the series includes a bibliography that refers to other reading for more detailed information and guidance.

Overview:

Starting a Records Management Program, The Daily Management of Records and Information, Making Your Records Management Program Successful, Managing Records on Limited Resources, Funding Your Records Management Project

Creation, Collection and Storage:

Identifying and Locating Your Records, Establishing Records Retention, The Selection and Development of Local Government Records Storage Facilities, Developing a Records Storage System

Preservation, Promotion, Use and Access:

Archives for Local Governments, Protecting Records, Using and Storing Microfilm

Care, Management, and Preservation of Electronic Records:

E-Mail Management, Selecting and Using Document Imaging Systems, Managing Electronic Records, Preparing for E-Discovery

Copies of these bulletins are available on the IIMC and NAGARA websites.
IIMC at www.iimc.com • www.nagara.org

Acknowledgements

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Table of Contents

Local Government Records.....	1
Seeking Solutions for Paper Records Storage.....	1
Storage Cost Comparison Per Cubic Foot of Records	2
Comparison of Outsourcing Records Center Storage and Outsourced Scanning.....	2
Scanning Versus Storage Costs	2
Records Retention and Records Center.....	2
Developing a Records Center	2
Records Center Capacity.....	3
Records Center Components.....	3
Receiving/Loading Dock.....	3
Records Storage	3
Standard Ceiling Height.....	4
High Ceiling Height	4
Offices.....	5
Things to Consider – Building/Site.....	5
Things to Consider – Building Design.....	6
Things to Consider – The Building Envelope.....	7
Things to Consider – Building Security	7
Things to Consider – Building Environment.....	8
Things to Consider – Fire Protection	8
Things to Consider – Shelving Needs and Requirements	9
Things to Consider – Specialized Vaults.....	9
Sources of Assistance.....	10
Record Center Bibliography	10

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Local Government Records

Local government officials create records on a daily basis to meet their operational and statutory needs. Materials range from minutes of meetings, to correspondence with the public, to databases of financial transactions to maps and plats of property. These records come in a variety of formats and levels of significance. Some material must be preserved permanently to meet state and local government statutory record requirements while others must be kept for months or years. Although pundits have been predicting a paperless office for more than thirty years, we still live in a world where some documents are retained in paper. Even though a portion of records are maintained in an electronic format, records storage continues to be a major responsibility for local government officials.

Without an organized and well-designed records center, material often accumulates in other locations. These may include closets, garages, basements, attics, and similar spaces. Such locations put records at risk of loss or damage, and make locating and retrieval of records difficult.



*Photo- Courtesy National Archives
And Records Administration*

Records come in a variety of shapes and sizes. Formats that fit this category include meeting agendas and minutes, copies of significant correspondence, legal documents and correspondence, and copies of some financial records. Retention times vary for different record categories. However, where such records are maintained in office space, the result is a significantly higher storage cost.

Local governments have made enormous strides toward creating and storing records in electronic

formats. Examples include e-mail that is used for internal and external communication, databases of common types of information and financial records of income and expenditure.

Seeking Solutions for Paper Records Storage

Records accumulating in government offices take up valuable storage space and require staff time to maintain. Options for lowering costs and/or improving access include digitization, use of storage vendors or creating locally managed records center storage.

Technology alone is not a local government panacea. “Just scan it” does not alleviate the storage problem. Initial scanning costs are only the beginning of an investment in a scanning-based system. For example, there are costs for maintaining/ migrating imaged files as hardware/ software changes, power costs for servers, and Information Technology personnel to maintain and administer the effort. Finally, there is a dollar cost to index the records in order to find what you need. All of these add to initial scanning costs.

Storing records in local offices is generally the most expensive alternative a local government can choose. Such equipment occupies eight square feet of floor space, when accounting for space needed to access its contents, and is equivalent to eight records center boxes. Although space costs will vary by state and region, a comparison of potential costs is provided below on the basis of costs per square foot of office space. Comparator costs are based on materials held in the respective state records center, and show a clear advantage to using a records center over office filing cabinets and the space they occupy.

Storage Cost Comparison Per Cubic Foot of Records

Location	Office	Records Center
New York	\$72	\$7
Pennsylvania	\$12-18	\$2.40
Michigan	\$8-22	\$1.27

Comparison of Outsourcing Records Center Storage and Outsourced Scanning

Many offices have turned to the scanning of local government documents as an alternative to maintaining their original records in storage. While this is a cheaper alternative for records held for long periods, it is less cost-effective for records kept for less than thirty years.

Following is a comparison of costs for scanning versus outsourcing of records storage, developed by the state of New York. This example involves digitizing 100,000 cubic feet of non-current records or storing them with a storage vendor. Scanning costs assumed outsourcing the work to a vendor, but did not include transportation, staff sorting or preparation. Initial costs for scanning are a one-time cost incurred during the first year.

Scanning Versus Storage Costs

Year	Records Center Storage	Scanning
1	\$3,410,000	\$30,606,000
2	\$3,893,000	\$0
3	\$4,400,150	\$0
4	\$4,932,858	\$0
29	\$31,618,447	\$0

Records Retention and Records Centers

Successful records centers are only effective if their owners create, maintain and use record retention schedules. Retention schedules allow agencies to destroy records regularly that have passed their retention dates. As older records leave the facility, this provides space for newly created records in existing cabinets rather than adding file cabinets with increased demand on floor space.

An effective records program necessitates not only records retention schedules, but also requires a records policy that encourages staff to use the records schedule/records center and budgets staff to carry out the program. Agencies considering a records center should assign one or more individuals to operate the facility and carry out records policies by following records retention schedules.

Developing a Records Center

Records centers come in various shapes and sizes. Local government size and volume of records will impact the building dimensions. A small town records center might be developed as part of a current warehouse or areas separated from existing office space. Larger towns or cities might have a separate floor or distinct building if the volume of records demands it.

There are economies of scale through a shared records center. Two or more local governments might consider a cooperatively operated records center. Note the experience of Troup County, Georgia in the technical bulletin on archives administration.

Another factor to consider is whether a records storage center will house only non-permanent records or store records eventually slated for the archives. In the latter case, higher quality storage should be provided if material is stored in the records center for an extended period of time.

Records centers provide more efficient storage because records are housed vertically on shelves rather than in expensive file cabinets. Shelving fills a room closer to capacity, while space located above file cabinets remains unused. High-rise shelving is more cost efficient when combined with a low-cost warehouse facility, resulting in significant savings.

Storage costs are significantly affected by records density. Maintaining records on shelves 16 boxes high versus 8 boxes high can nearly halve the yearly cost per square foot. Other options to increase density include storing records boxes two deep on shelves, thereby lowering the number of aisles required. Another option is mobile shelving equipment. It is more expensive to purchase but almost doubles the storage density.

Records center locations also have an impact. Record centers close to the local government offices increase their use and make material more accessible to staff. However, rental or purchase costs may be higher or lower depending upon the records center location.

Records Center Capacity

Records center planners must know the volume of materials that the space must house. To maximize space, records should be stored in records center boxes that are 10 X 12 X 15 inches. Such containers allow either letter or legal size records to be stored in the same type of box.

Counting existing records center boxes gives planners one measure of the amount of storage that will be required. How much material is already in storage? What is the records volume stored in filing cabinets and in other spaces?

Below is an approximate conversion of various types of storage equipment to a one cubic foot records center box:

- Letter size file drawer = 1.5 record center boxes
- Legal size file drawer = 2 record center boxes
- Letter size lateral file drawer = 2.5 records center boxes
- Legal size lateral file drawer = 3 records center boxes
- 44 35mm. microfilm boxes = 1 records center box
- Letter size transfer carton – 2 records center boxes

More detailed record conversion equivalents can be found at:

http://sos.georgia.gov/archives/who_are_we/rims/state_records_center/conversion_table.htm or
<http://www.tennessee.gov/tsla/aps/tama/tama-02containers.pdf>

Once data on material in storage is gathered, plan for additional growth even though records will be regularly destroyed per retention schedules. Plan for growth of 30-40% beyond the initial estimate.

All shelving can be purchased initially, or space can remain empty and shelving purchased as the need arises.

Records Center Components

Records center activities are affected by local government size and resources. However, functions may be consolidated organizationally and physically to gain program efficiency.

Receiving/Loading Dock

A records center needs space for in-coming materials. Size of this space will reflect whether the inactive records area is a large, stand-alone records center or a smaller space within an existing building. A large building may have its own loading dock with tractor-trailer access, for loading/ unloading trucks. Whatever the size, space should be dedicated to receiving new materials.

A large receiving area should have floor space for pallets carrying boxes of records, spaces for pallet jacks or other moving equipment, tables for sorting incoming records or boxes, and a small amount of shelving for sorting purposes. A computer workstation may create box lists or check new materials against an existing list. Loading dock/receiving space should be immediately adjacent to the records storage area.

Records Storage

Records storage, the most critical element in any records center, should be the focal point of planning. Space should be available for at least five years of records growth, preferably ten years or more. Planning should envision that after the records center is in operation, nearly as many records will be destroyed as those that are entering. However, in real life that often is not the case. Planners armed with good statistical data on records growth should allow for an appropriate capacity so that the records center is not full after just two or three years.

Another consideration is whether the records center holds only records that are ultimately slated for disposal, or whether archival records are stored in the facility as well. If a large amount of archival records are housed in the building, planners should consider developing a separate archival storage area

with appropriate preservation, environmental and lighting standards.

Various methods allow for the storage of a large volume of records in a relatively small building footprint. Each option requires a minimum level of floor strength and will vary depending on the particular option. Planners should consult structural engineers and shelving vendors to ensure that existing or planned floors will meet load requirements.

Standard Ceiling Height

Option 1 Standard Shelving

Many records centers are designed with standard ceiling heights of ten feet or less. In such situations there are a variety of means of increasing shelving density.

First, use standard records center shelving that holds three standard records center boxes. Such shelves are 42 inches wide by 15 inches deep.

Second, design shelving as high as possible, leaving space above shelves for heating ducts, smoke detectors and sprinkler systems. For example, designing shelving eight boxes high rather than seven boxes high can increase capacity by 14%.



Standard Shelving California State Archives

Third, consider shelving boxes two deep instead of a single row of boxes per shelf. Using 42 inch by 30 inch shelves removes two aisles per double-faced bay of shelving and doubles capacity within the existing space. Such an arrangement makes retrieval

somewhat more difficult but should not be a major consideration if records are primarily in the space for storage and not access.

If ceiling height is limited, mobile shelving provides another option for increased storage capacity.

Mobile shelving runs on carriages mounted on metal rails installed at or above floor level. Such systems save space by eliminating most aisles and can add 50-100% to existing capacity, depending on the building layout and pillar locations. Access is gained by moving shelves manually or electrically to the appropriate aisle to gain access to the required boxes. Shelves can be planned for one or two box depth although most space is gained through the use of mobile carriages.



Mobile Shelving Chemical Heritage Foundation

High Ceiling Height

Single Floor Option 1

If a building has a high ceiling (18-20 feet or more), a variety of shelving configurations might be used. Industrial type shelving could be installed with box height of 12-16 boxes using 42X15" shelves.



*New Jersey State Archives
Records Center*

Access can be gained to higher shelves using platform ladders or electric lifts to access boxes. Shelving density can be increased further by shelving boxes in double depth rows on 42X30" shelves, eliminating additional aisles.

Single Floor Option 2

A second method of shelving a space with high ceilings is to use tall shelving combined with metal catwalks at eight foot levels. This allows an individual to access seven shelves in height on each level.



High Bay Shelving University of Buffalo

Such arrangements use stairs to move from one level to the next. Boxes can either be carried between levels, or an elevator can provide box movement between levels.

Single Floor Option 3



X-Tend High Bay Mobile Shelving

A recent development in dense records storage is the high bay mobile storage system. Such systems put mobile shelving units up to 50 feet in height on metal tracks laid in the floor.

Such systems eliminate most aisles and records can be stored two deep on shelves. Access to records is by manned self-propelled electric lifts.

Offices

The number and size of office spaces depends on the size, location and functional requirements of the records center. A full-time records manager will need an office with a desk, telephone, and computer connection. Larger programs may have multiple offices or use office landscape/cubicles.

If the records program digitizes or has a microfilm program, space will be required for these functions as well. These should be separated from standard offices since staff must maintain required light levels for optimum duplication. Also, additional space may be needed for sorting and organizing records prior to copying.

If shredding of documents is not outsourced, space will be needed for these operations. This space could be part of, or adjacent to, the loading dock or the records storage area. Logically, the next step after shredding is shipment of material for recycling or disposal.

Things to Consider – Building/Site

There are a significant number of issues when choosing a building and its site. First, does the building provide sufficient space for currently held inactive records and for adequate expansion. Plan a building space for existing non-current records with at least ten years growth capacity in its current configuration and fifteen to twenty years, if possible. Review the lot or space in the same building for future growth.

Buildings designed for warehouse or industrial use can sometimes be renovated as a records center. Single story buildings generally have the floor strength needed for the weight generated by paper records, as well as sufficient open space for stack areas. However, they may require additional strengthening. Buildings designed for heavy equipment may have sufficient floor strength as needed for records stored above ground level.

Institutions sometimes consider basement space for records storage. However, such space should be avoided whenever possible. Although such spaces may offer adequate floor loading and lower cost heating/cooling, they have several distinct negative features. First, basements are likely to have overhead water pipes which have the potential for leaks and water damage. Also, even a pipe break from an upper floor may result in water damage reaching the basement. Basements generally have low ceilings which do not allow for higher density records storage, and do not allow for building expansion if the space becomes full. Finally, basement areas are often damp. Mold can quickly develop within records in buildings located in areas with high humidity. If planners are considering a basement, they should review the space to ensure that it is not above an underground stream or in a space with a high water table that might later lead to flooding.

Planners should review the building location. Never select a building located within a flood plain or adjacent to a lake, river or ocean. All have the potential to bring flooding conditions and loss or damage to records.

Avoid locations where earthquakes are common. This is not an option in a number of states. Potential buildings should be evaluated by structural engineers for collection/human safety and shelving installations should be firmly mounted within the building to meet existing state earthquake standards.

A free-standing building under consideration should be evaluated for ease of access and adjacent free space. Is there room to bring in trucks to deliver and remove records and provide space for staff/visitor parking? Renovated buildings may require additional parking; architects are familiar with local requirements for the number and size of required parking spaces.

Planners should review a building and its site in relation to other government structures. Lower cost buildings at a significant distance from other agencies make the building less convenient and can add record transportation costs. However, buildings near the government offices may be desirable, yet purchase or renting may make them less cost ineffective.

Things to Consider –Building Design

If possible, a single story building with at least a twelve foot ceiling is preferred over a building with multiple floors. If storage density is critical, select buildings with even higher ceilings. Multiple floors require an elevator for moving records vertically as they enter/ leave the building and often don't provide as flexible a building layout. Square or rectangular buildings allow for easier and more efficient shelving layouts and should be selected whenever possible.

Against increasing energy costs, plan a building that limits these expenses as much as possible. Facilities should be well insulated with appropriate vapor barriers in walls and ceilings. Buildings without windows or skylights provide better records protection and lower energy costs by not allowing heat build-up or cold penetration in records storage areas.

Evaluate heating and air-conditioning systems for energy efficiency and upgrade if necessary. Despite the high initial expense, cost savings over time more than make up for the initial investment.

Can the building provide all or most of the functionality required of a records center? If staff offices are required, or if digitization or microfilming is carried out, is sufficient office space available?

If large trucks will be picking up and delivering a large volume of records, is there a loading dock as well as adequate space for shipping and receiving? Also, if the building has multiple stories, is the elevator large and strong enough to move large volumes of records between floors?

In a stand-alone building, planners should evaluate the roof's ability to handle local weather conditions. Pitched roofs are preferred to flat roofs because they allow water and melting snow to drain more easily from the building. Adequate gutters should drain water away from the building; this will not allow moisture to seep into building sidewalls or basements. All roofs should be carefully inspected to ensure that they are weather-proof and will not require immediate replacement. Avoid a building that uses roof drains that go through a potential records storage space since these may leak as the building ages.

Carefully evaluate lighting and fire protection systems in potential buildings. Fluorescent lighting is generally used in records center storage. However, lighting placement is critical to ensure adequate light, particularly if tall shelving is selected. Lighting banks should generally be located directly over aisles or run at right angles to shelving runs to ensure even lighting. Lighting locations can be moved relatively easily, but adds an additional cost.

Review the level of fire protection/suppression available in an existing building. Because of the combustibility of paper records, a fire suppression system is critical and must be added if it is not already installed.

Things to Consider – The Building Envelope

One of the goals of a records center is to provide low-cost storage for non-current records. Buildings designed or built as warehouses often serve this purpose very well. However, with increasing energy costs combined with concerns for security, records preservation and access, planners should carefully review the building envelope.

A building envelope consists of the outside walls of a structure, the building floor and ceiling. Building floors should be steel reinforced concrete to support the heavy weight of shelving and records boxes. Minimum capacity should be 150 pounds per square foot for standard shelving arrangements, higher where shelving of more than eight boxes in height or mobile shelving are planned. Mobile shelving, and very dense/high shelving may require floor loads of 300 pounds per square foot. Consult structural engineers to evaluate floors where no floor load data is available.

Vapor barriers beneath concrete are recommended for new construction to avoid moisture transfer from the ground into the structure. Concrete should be coated with low-volatile organic compound (VOC) water-based paint or sealant to seal in concrete dust. If planners are using mobile shelving, a super-smooth surface may be required to ensure the smooth operation of mobile carriages.

Solid walls are preferred over those with windows except for office spaces. Windows provide greater heat loss/gain, affecting both energy efficiency and building security. Walls should be insulated with a higher “R” insulating value in very hot or cold climates.

Most records center roofs are likely to be flat because of their lower building costs. However, planners should consider pitched roofs in cases where heavy rain or snowfall is the norm to allow for better run-off. Roofs should be evaluated for their maximum weight capacity. Winter snow and ice are very heavy and roofs should be designed for unusually heavy snow falls. Planners should avoid roofs with skylights and should ensure that there is adequate drainage not only to get water off the roof but that is also carried away from the building.

If archives storage is incorporated into the building, planners will need to upgrade the entire building envelope or that portion of the building housing the archives. One method of improving archival storage conditions is to locate the storage area in the building core so that it has no outside walls. This will moderate heat gain/loss and lower energy costs.

Planners should review the number and types of exterior doors. Some warehouse structures have multiple loading doors. If not all doors will be used, they can be sealed off for better security and decrease energy loss.

Things to Consider – Building Security

Security begins at the building exterior. The building should have exterior lighting during night hours as well as lights with motion detectors as an energy-saving option. Exterior fencing enhances security if a building is located in a high-crime area.

Exterior doors should be solid-core metal or wood without windows. Exterior hinged door should have non-removable pins.

Plan an alarm system if needed. An alarm, audible or inaudible, must be connected with a twenty-four hour responder to be effective. Alarm options include exterior glass breakage, door/window alarms and motion detectors for interior/exterior spaces.

Doors can be keyed, or use an electronic key-pad or a key-card swipe. If building traffic is sufficient, entry door(s) can be equipped with an automated kiosk (with audio/video connection to the records center office: allowing staff to open doors remotely).

Plan who will have access to the records center and what type of system fits into existing building patterns and use. The most common system involves the use of keyed entry. Such systems are simple to use and maintain. However, they have the disadvantage of key loss that may require re-keying. There is also the possibility of a former employee retaining a key, with continued access. Also, since key systems do not record who enters a particular door or the time they enter, a theft is difficult to trace.

If a building master key system is used, it should be carefully secured and distribution limited. Plan a system of sub-master keys which allow entry to a range of doors without providing full building access.

If the records center holds a large volume of permanent records or records of high operational value, planners may want a vault area with access limited to a small number of individuals.

Things to Consider – Building Environment

Most records centers maintain temperatures at human comfort levels. Buildings are heated in winter, and air conditioned during the summer where environments are hot and/or humid. If no archival material is stored within the records center, temperature and humidity can vary within a reasonable range.

Temperatures should be kept within a range of 66-74° Fahrenheit and 30-60% relative humidity. Humidity higher than 60% can result in mold growth, so humidity should be monitored. Air circulation will inhibit mold growth, a re-circulating heating and air conditioning system will assist in mold prevention and heating/air conditioning systems should operate on a twenty-four hour basis, seven days per week.

The records center heating, cooling and ventilation system should be equipped with appropriate filters. The system should be equipped with at least a MERV 7 filter (Minimum Efficiency Rating Value).

Archival records require a higher level storage environment. If permanent records are maintained, temperature and humidity levels tolerances must be much narrower. Temperature should be maintained within a range of 66-70° Fahrenheit and 35-50% relative humidity. Air filtration should include a MERV 14 secondary filter in addition to the primary filter.

Things to Consider – Fire Protection

Materials stored in records centers are highly flammable and a fire prevention system must be installed. Most fire codes require this. However, if they do not, a fire suppression system should still be installed. Standards for fire protection are governed by city or state fire codes and nationally by the National Fire Protection Association (NFPA). The NFPA has a variety of codes for specific pieces of fire equipment and types of records. NFPA 232 Code for Protection of Records applies specifically to records centers and archives.

The most common system for records storage areas is a wet-pipe water suppression system. Water is constantly maintained within the pipes and is released when a sensor on a sprinkler head measures a temperature of approximately 165 degree Fahrenheit. Systems release water only in the area where the fire is located and an alarm goes to a fire responder. Some systems are designed so that if water is accidentally released, an alarm is also sent to fire responders so the system can be extinguished.

If archives are maintained in the records center, the planner may upgrade to a pre-action sprinkler system. Systems are connected with the smoke detectors and water is only released when two or more detectors indicate the presence of a fire. Water is not stored in the pipes but is released when the detectors indicate an alarm. Such a system prevents an accidental leak of water from the sprinkler pipes.

Planners could also consider the installation of ionization or photo-electric smoke detectors as an early warning fire system. These recognize a fire before a sprinkler system releases its water and sends an alarm to a fire responder. Installation will catch a fire in its early stages and avoid not only a larger fire but also damage from the release of water.

Things to Consider – Shelving Needs and Requirements

Shelving layouts are most effective in square or rectangular spaces. In selecting a records center building, avoid irregular, round or oval spaces since these will decrease shelving capacity.

Shelving should have one or more main access aisles. To meet Americans for Disabilities Act (ADA), these should be at least 5'3" wide. Access aisles between stack units must be at least 36" wide. In laying out shelving, planners should avoid extremely long stack runs since these require greater access times. If a building allows a long shelving run of fifty feet, it is better to have two stacks twenty-five feet long, divided by a central aisle than a single longer run of shelving.

When planning a storage space, shelving height may be affected by mechanical/fire safety equipment located between the roofs/ceiling and the top of the shelving. Fire safety requires at least 18 inches between the bottom of a sprinkler head and the top of any shelving. Heating /air conditioning ducts also require at least that amount of space, but it may be possible to locate these within aisles so they do not affect shelving height. Planners should ensure at least two feet of space between the top of any shelves and the roof or ceiling.

Records Center shelving components should be constructed of powder-coated rolled steel. Most commonly, steel uprights are made 12 gauge steel, while shelves are 18 gauge that are sometimes reinforced with steel bands. Shelving is reinforced by 12 gauge side and/or back braces attached to the uprights. Gauges can be thicker depending upon the shelving height or configuration.

Shelving uprights should allow for adjustments in one inch increments and shelves should fasten to the uprights with bolts or clips. Shelving openings should be on 11 1/2 or 23 inch centers to allow for boxes to be shelved one or two boxes high per shelf.

For greatest cost effectiveness, planners should use records center shelves that are 42 inches long by 30 inches deep. These will store twelve boxes per shelf if boxes are stored two high and two deep. However, this size shelf will result in a two inch

overhang because of the length of the box lid and 42"X 32" shelves should be ordered if planners want to avoid any overhang.

Bottom shelves should be located 3-4 inches above the floor to provide some protection in case of a minor flood or leak. A closed skirt or base should be installed beneath the bottom shelf to keep dirt and debris from collecting underneath shelving units.

For large collections of records or where floor space may be limited or expensive, new shelving alternatives are available. A number of shelving vendors provide high bay shelving that goes beyond standard 12-14 foot high shelves, normally using ladders to retrieve materials. Such units employ mobile electric lifts or pickers to access material from shelving up to 50 feet high. These also come in mobile shelving versions to gain even greater shelving density.

If the records center stores archival records or materials that will be accessed on a regular basis, it may build units that use shelves 42 inches long by 15 or 16 inches deep. These can be configured with 11 1/2 inch openings for single height boxes or 23 inch openings if boxes are stored two high.

If an agency stores a large quantity of oversize or oddly shaped material, it may set up a special storage area for these types of material, since mixing these with standard shelving significantly lessens the impact of densely packed storage.

Things to Consider –Specialized Vaults

If the government has high security records, computer back-ups or records that are vital for on-going business, it may consider building a vault within its records center.

Record vaults have very detailed requirements and must be designed to protect records in the event of a fire or other natural disaster. Their design is outlined in *NFPA 232 Code for Protection of Records*.

Vaults should be designed to protect records against fire. Walls should be constructed of fire-proof materials such as concrete/concrete block, which protect materials through a four hour fire period.

Any doors or structural members supporting the vault should have the same fire resistance as vault

walls. The vault should be on ground level, or if it is located elsewhere, supporting beams/vault floor must also have capability of maintaining the structure through a four hour fire. If the vault is on the ground floor, nothing should be located above it that could fall or penetrate the ceiling during a fire.

Wall, ceiling and floor penetrations for wiring or other building functions should be kept to a minimum

and carefully sealed so the fire will not penetrate those openings.

Vaults can be no more than five thousand feet in capacity if fire sprinklers are not in use. If a vault is planned with sprinklers, it can be up to 25,000 cubic feet in capacity.

Sources of Assistance

ARMA International, www.arma.org/

Association for Information and Image Management (AIIM), www.aiim.org/

International Institute of Municipal Clerks (IIMC), www.iimc.com/

National Association of Government Archives and Records Administrators (NAGARA), www.nagara.org/

Society of American Archivists, Records Management Roundtable, www.archivists.org/saagroups/recmgmt/

Record Center Bibliography

ARMA International, *Guideline for Evaluating Offsite Records Storage Facilities*, Kansas City (MO): ARMA International, 2007.

ARMA International, *Guideline for Outsourcing Electronic Records Storage and Disposition*, Kansas City (MO): ARMA International, 2008.

ARMA International, *Records Center Operations*, 2nd Ed., Kansas City (MO): ARMA International, 2002.

Artim, Nick, *An Introduction to Fire Detection, Alarm, and Automatic Fire Sprinklers*, Northeast Document Conservation Center, 2007, www.nedcc.org/resources/leaflets/3Emergency_Management/02IntroToFireDetection.php

Johnson, A. K., Jr. *The Selection and Development of Local Government Records Storage Facilities* (1992)

Mims, Julian L., "Why Records Cooperatives?", *Information Management Journal*, Vol. 38, Nov., 2004, pp. 47-52.

Minnesota State Archives, *Managing Your Government Records: Guidelines for Archives and Agencies*, "Chapter 5, How Do You Preserve and Store Government Records", St. Paul (MN): Minnesota State Historical Society, 2009. www.mnhs.org/preserve/records/recordsguidelines/guidelines5.html

National Archives and Records Administration, *Part 1234 -- Facility Standards for Records* (Revised November 9, 2009), www.archives.gov/about/regulations/part-1234.html

National Fire Protection Association, *NFPA 232 Code for Protection of Records*, Quincy (MA): National Fire Protection Association, 2007.

National Fire Protection Association, *NFPA 914 Code for Protection of Historic Structures*, Quincy (MA): National Fire Protection Association, 2007.

National Park Service, "Fire Safety 101: A Fire-Safety Self-Inspection Checklist," *Conserv O Gram*, Number 2/23 (September 2005), www.nps.gov/museum/publications/conservogram/02-23.pdf

iOgden, Sherelyn, *Storage Furniture: A Brief Review of Current Options*, Northeast Document Conservation Center, 2007, www.nedcc.org/resources/leaflets/4Storage_and_Handling/02StorageFurniture.php

Ogden, Sherelyn, *Storage Methods and Handling Practices*, Northeast Document Conservation Center, 2007, www.nedcc.org/resources/leaflets/4Storage_and_Handling/01StorageMethods.php

Patkus, Beth Lindblom and Motelewski, Karen, *Disaster Planning*, Northeast Document Conservation Center, 2007, www.nedcc.org/resources/leaflets/3Emergency_Management/03DisasterPlanning.php

Smith, Hugh, *Design Planning for the Records Center of the Future*, paper presented at ARMA International, October, 2004, www.records-management.com.au/news/PDF/Design%20Planning%20Records%20Center%20of%20the%20Future%202004-10.pdf

ⁱ E-mail from David Haury to Paul Bergeron, February 14, 2011; E-mail from Caryn Wojcik to Paul Bergeron, February 14, 2011, and E-mail from Geof Huth to Paul Bergeron, February 18, 2011.

ⁱⁱ E-mail from Geof Huth to Paul Bergeron, February 18, 2011.