

State of Florida

Records Storage and Facilities Guidelines for Archives and Historical Records Repositories



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Florida Department of State
Ken Detzner, Secretary of State
Division of Library and Information Services
Bureau of Archives and Records
Management

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Introduction

Records Storage Guidelines for Archives and Historical Records Repositories provides guidelines concerning the design and construction of archives and the conversion of existing facilities to meet storage standards. Public records and manuscripts are placed in archives to ensure their continued availability to their users. The first step in ensuring that they will remain available is to store them properly.

While there are similarities between records center storage and archival storage, in many cases they differ. This is a result of the different functions and purposes of the records stored in each site. Their storage conditions are based on whether records are inactive and have a predetermined disposition date or are permanently valuable. Due to this distinction, archival storage often employs more stringent condition controls. Facilities should be adapted to address the individual concerns of the records that are housed within. If your facility is intended to store nonpermanent records that do not have long-term historical research value, see our *Public Records Center Facilities Guidelines*.

For usability purposes, this handbook has been organized into five major topics: building site and construction; archival environment; fire protection; security; and materials and storage equipment. Each section begins with a high level overview before moving on to more detailed description. The main text portion of each segment is followed by end notes for the reader to use if a more in-depth review beyond the scope of this guide is required. A glossary and select bibliography are also included.

This handbook is not intended to be used as a means to certify commercial or government archives facilities. Instead it is meant to be used as a guide for those interested in creating a storage space for archival records or in reevaluating a current storage environment.

I. Building Site and Construction

Providing a safe environment for archival records is essential for creating a viable archival program. Creating a safe environment is dependent on finding an appropriate location and constructing or retrofitting a building with permanency in mind. When choosing a building site and constructing the building, the major focus should be on the safety of the staff and visitors and the preservation of archival collections.

This portion of the handbook provides recommendations addressing the main concerns when choosing a site and constructing or retrofitting a building, including information about ideal construction materials and building layout for an archival facility.

While this section provides ideal recommendations for site selection and building construction, institutions may face a variety of limitations preventing achievement of these ideals. Each institution should determine to what extent these ideals can be reached based on its authority and resources.

The section begins with a discussion on site selection, including considerations when choosing a site, studies and surveys necessary to evaluate the site, and landscaping considerations. The section discusses building construction by examining the local, state and federal codes affecting construction in public institutions. Ideal construction materials for the structure of the facility are presented in an easy to use chart, followed by information about building layout and a brief discussion of floor loads and lighting.

If you are building a new facility, please refer to *Archival and Special Collections Facilities: Guidelines for Archivists, Librarians, Architects, and Engineers* and “Archives II, National Archives at College Park: Using Technology to Safeguard Archival Records” (see Bibliography).

Site Selection and Considerations

When choosing a site for your facility, key stakeholders should be in agreement on what is expected, who has decision making powers and what resources are available. The first steps are to identify the key stakeholders, develop criteria for making the decision and agree on a process for making decisions.¹ Once the stakeholders have been identified and you have developed the criteria for the site selection, you can begin looking for a site.

Considerations for Choosing a Site²

Want	Avoid
Short response time for emergency services	Susceptible to flooding, less than 5 feet above and 100 feet away from any 100-year-old floodplain area
Ability for a swift evacuation in an emergency	Area beneath or adjacent to electromagnetic radiation
Access to entire perimeter	Area near polluted areas or contaminated land, such as landfill
Accessible to employees and visitors	Area at high risk from natural disasters
Space to accommodate building and expansion, site access and service roads, sufficient parking and loading zones for busses and other large vehicles, space for required storm water management areas, and separation between different areas	Close to sites that increase risk of fire or explosions; could be a target in an armed conflict; emit harmful gasses, smoke or dust; or attract rodents

Conducting risk assessments, technical studies and surveys of the boundary and property lines will aid you in selecting an appropriate location. Identify the location of improvements such as pavement, buildings and other structures, and easements. Have a survey conducted that meets the standards of the “Minimum Standard Detail Requirements for ALTA/ACSM Land Title Surveys,” as adopted by the American Land Title Association, the American Congress of Surveying and Mapping, and the National Society of Professional Surveyors.³

For the technical studies, the National Environmental Policy Act guidelines provide the method for evaluating site alternatives and provide for an assessment strategy when there are competing sites.

Other assessments may include:

- Geotechnical investigation:
 - Depth of bedrock
 - Soil strata
 - Percolation rates
 - Pavement and drainage recommendations
 - Geothermal activity
- Security risk assessment – external assessment of site-related security risks:
 - Proximity to multilane highway
 - Proximity to railroad line
 - Proximity to dam
- Archaeological assessment – most likely necessary if facility is planned on public land or with public money. If facility is built on private land using private money, archaeological assessment might not be required. Since archivists and archaeologists share similar interests in preserving history, it is a good idea to have one performed.⁴

Landscaping is an important consideration. It needs to be designed for water control and integrated pest management and be low maintenance. Avoid vegetation within 18 inches of the building, and prune limbs and roots away from the building.⁵

Building Construction

Codes and Laws

When building a new facility or retrofitting an existing facility, it is essential to be aware of and adhere to the local, county, state and federal laws that affect construction. Before construction begins, you should contact the local jurisdiction for the project. If the site is on land owned or funded by the federal government, impacts a historic district or has historic structures on it, you will need to follow guidelines specified by the Historic Preservation Act.⁶

The site needs access to a water supply, a storm drainage system, electrical power and a telecommunication system, and it needs to have emergency vehicle access. You need to contact your highway or transportation department, utility companies, local police, local fire department, fire marshal, telephone company and other appropriate agencies or service providers to make these arrangements.

Structure

When constructing a new facility or looking at existing facilities, consider the permanent nature of the facility, and be aware of building considerations and ideal building materials. Permanent construction is essential. The facility should have a useful life of more than 100 years and be designed with a high level of durability and longevity.

Before beginning construction, consider the cost benefits and tradeoffs between various storage systems and methods, structural loading designs, amount of built floor space, and future expansion needs. The building should contain flexible storage arrangements for growing collections of materials with varying storage and environmental requirements. When considering expansion, remember that it is generally less expensive to increase building height than to increase footprint area for the same amount of volume of stored materials. However, multiple stories impacts fire protection for the structure.

Preferred Building Materials⁷

Building Feature	Recommended Materials and/or Construction	Additional Considerations
Building frame	Steel, masonry and concrete	
Exterior walls	Masonry or other durable, fire-resistant products	
Building interior	Easy to maintain and constructed of durable, fire-resistant products	
Building insulation	Built to minimize or eliminate air infiltration through walls, windows, doors and roof	Helps conserve energy and protects from rapid expansion of temperature and humidity.
Floors	Steel reinforced concrete	<i>See the end of this section.</i>
Pools and fountains		Avoid; if facility has them, additional protection against water intrusion is necessary.
Exterior openings		Pay special attention to exterior foundation gaps, exterior roll doors, loading dock areas, attic windows, aerators and floor drains. Take special care to prevent animals from entering the building.
Roof	Durable, long-lasting and noncombustible materials	Roofs should be sloped to ensure water drains away from archival storage areas and to avoid water ponding; consider installing water sensors in the stacks to detect leaks in the roof and sprinkler systems.
Mechanical systems	Components should be accessible without entering into archival storage spaces.	Larger facilities should have a separate HVAC system that services the stacks and other critical areas to ensure stacks, processing areas and exhibits are isolated from sources of pollutants, such as loading docks, food prep areas and painting. Mechanical spaces and

		water piping should not be above or adjacent to stacks. If they are, special measures should be taken.
Electrical systems		Consider overall energy consumption of building. Consider having standby generator for emergency power for archival facilities.

Interior Building Layout

Whether constructing a new archival facility or looking for an existing facility, distinct areas are necessary, including records storage space, records processing areas, offices, employee support spaces, a research room, visitor support spaces and maintenance spaces. This section discusses the recommended features of the different spaces and emphasizes that they need to be safe, secure, comfortable, durable and accessible.

When building or choosing the records storage space in your archival facility, your main concerns will be long term safety and preservation of the records and maximization of your storage space. To prevent damage to the records, you will want to take measures to ensure that temperature and humidity levels are controlled and that the possibility of water damage is reduced. The storage area should not be located below ground level unless adequate flood detection and prevention systems are in place. Windows, skylights, roof penetrations and rooftop mounted equipment should not be in or above the storage space. By compartmentalizing the storage space, you can limit the loss of records in case of fire or system failure. You may want to consider movable stack shelves, which will allow you to maximize storage space. A final, major consideration is controlling access to the storage areas, which may be achieved with high-tech key access or simply with locked doors. By limiting the people who have access, you can protect the records from being lost, misplaced or stolen.⁸

Records processing areas provide space for archivists to review, arrange and describe the collections. The space should be close to storage areas, receiving areas and office areas. The workspaces ideally should not be located in the records storage areas because the environmental standards necessary in those areas are generally uncomfortable for extended work activities. The space should be large enough to accommodate employees processing collections and the equipment and furniture necessary for processing.

Depending on the size of your staff and your organizational needs, offices for administrative and archival purposes may be necessary. The archival office areas, which can be used in place of or in addition to records processing areas, may require environmentally separate spaces for preservation and curatorial operations and security from unauthorized visitors. There should be secure access to the archival storage spaces from these offices.⁹

Having your storage space for archival and office supplies accessible from the office areas is a good idea. You also want to consider employee support spaces, such as cafeteria or lunchroom areas, restroom facilities, parking spaces and employee entrances from the parking area or street. When planning the lunchroom area, ensure that employees do not walk through processing or storage spaces with their food or beverages to reach the designated areas.

Visitors will need adequate space to use the archival records. Whether this is a separate room or a table in the office areas, the space should be comfortable for the visitor and safe for the records. The research space should be large enough to house furniture necessary for research purposes and visible to staff to monitor use of the records. You may also want to

provide lockers or another secure space for the visitors to place their bags, briefcases, coats or other belongings to prevent damage to or theft of the records. See Section IV, Security, for more on this.

If space or finances allow for it, a lobby provides a central location for visitors to access directories, schedules and general information. Space for security staff will allow you to provide an additional level of security. Visitors will need access to restrooms and possibly spaces to eat. Whether visitors and staff use the same or separate restroom and food facilities depends on your institution's preferences and resources.¹⁰

You will need additional space for operations and maintenance. Spaces to consider include utility service entry rooms, mechanical and electrical equipment rooms, maintenance closets with janitor sinks and a secured receiving and loading area.¹¹

Floor Loads

When planning for the necessary spaces in your archival facility, it is essential to the safety of the building, staff and visitors, and collections that you consider the floor loads – the weight the floors can hold per square foot. Open-stack floors require a floor load that can hold 150 pounds per square foot. Mobile shelving systems require a floor load of 250 pounds per square foot. A structural engineer can determine the proper floor loading based on storage and shelving requirements. When determining the floor loads, you should consider the wet weight of stored materials in the event of sprinkler activation.¹²

Lighting

Please refer to Section II of this handbook for more information.

End Notes

¹ Thomas P. Wilsted, *Planning New and Remodeled Archival Facilities* (Chicago: Society of American Archivists, 2007), 10.

² Michele E. Pacifico and Thomas Wilsted, *Archival and Special Collections Facilities: Guidelines for Archivists, Librarians, Architects, and Engineers* (Chicago: Society of American Archivists, 2009), 8.

³ *Ibid.*, 11.

⁴ *Ibid.*, 10-12.

⁵ *Ibid.*, 13-17.

⁶ *Ibid.*, 13.

⁷ *Ibid.*, 23-28.

⁸ Edward Acker and Paul O'Connell, "Archives and Record Storage Building," *Whole Building Design Guide: A Program of the National Institute of Building Sciences*, modified May 25, 2010, accessed April 22, 2014, http://www.wbdg.org/design/archives_records.php.

⁹ *Ibid.*

¹⁰ *Ibid.*

¹¹ *Ibid.*

¹² Pacifico and Wilsted, *Archival and Special Collections Facilities*, 24.

II. Archival Environment

All buildings have ideal environmental conditions based upon their contents and purpose. Due to the nature of archival materials and the goal of long-term preservation, achieving an appropriate archival environment requires continuous planning, evaluation and adjustment.

The archival environment section is intended to provide information that will allow staff to ensure appropriate environmental conditions for the storage areas of the archives. If areas do not meet acceptable levels, the overall vulnerability of all collections is increased.

The section begins with a discussion of climate controls. A chart of standard levels of humidity and temperature dependent upon format is included for easy reference. The remainder of the section discusses environmental controls as well as procedures that act as deterrents for pests, insects and mold growth. Lighting standards close the section.

Climate Controls

Climate controls are essential to the preservation and protection of an archives's collection. The goal of a heating, ventilation and air conditioning (HVAC) system is to maintain appropriate humidity and temperature levels; provide clean, filtered air; and reduce the levels of pollutants in the building. Once the proper HVAC system is installed, monitoring of the temperature and humidity levels must become part of daily activities. Only by monitoring the levels will archivists be able to detect any undesirable fluctuations or other issues. The table below lists optimum temperature and relative humidity levels based upon format.

Temperature and Relative Humidity by Format¹³

Format	Temperature	Relative Humidity
Paper	60 F	30%
Film: Nitrate-Base	36 F	30%
Film: Acetate-Base	40 F maximum: black and white and color	50% maximum: black and white and color
Film: Polyester-Base	54 F maximum: black and white 40F maximum: color	50% maximum: black and white and color
Film: Photographic Paper Prints	64 F maximum: black and white 36 F maximum at up to 40% relative humidity or 27 F maximum between 40% and 50% relative humidity: color	50% maximum: black and white @ 27 F, 50% maximum: color @ 36 F, 40% maximum: color
Glass Plates	60 F maximum	50% maximum
Magnetic Tape: Acetate	50 F maximum	50% maximum
Magnetic Tape: Polyester	50 F maximum	50% maximum
CD & DVD	50 F maximum	50% maximum

The ultimate goal where climate control is concerned is to achieve realistic levels that can be maintained long term. Fluctuation in temperature and humidity poses the greatest threat to records. Survey your institution's individual requirements and use the above guidelines and best

practices to establish in-house rules for climate control. Professional archives staff have expertise in the standards and requirements to best maintain the specific collections within their building. Make sure archives staff are included in discussions with maintenance staff when addressing climate control issues.¹⁴

Environmental Controls: Housekeeping

Good housekeeping affects all environmental controls; this is where prevention starts. The level of success achieved by housekeeping-related prevention techniques is controlled by employees. If minor problems are not treated, they could impose threats on the collection because of neglect.

It is important to create a list of parameters all employees must follow when working with archival materials. Rules should be applied throughout the building, except for in those areas that have been specifically designated otherwise. Eating and drinking must be prohibited in the archives stacks and all areas where records are handled. It is important to perform frequent cleaning of the stacks and processing areas. This should be built into weekly or monthly routines to maintain the cleanest environment possible for both employees and archival collections. Cleaning supplies should not emit any fumes harmful to records or staff and should be stored away from the records storage area.

Environmental Controls: Mold and Mildew

The Society of American Archivists' *A Glossary of Archival and Records Terminology* defines mold as "a fungus that grows on organic matter"¹⁵ and mildew as "a fungus that obtains its food from the organic substance on which it grows and that generally has the appearance of a gray or white powder."¹⁶ Both terms are used interchangeably and refer to myriad microorganisms that have a negative, and often irreversible, effect on archival collections.

Mold depends wholly upon the environment, preferring damp and dark climates with little air circulation. Mold can develop in stages, lying dormant until moisture and darkness return to promote further growth. Proper climate controls and air circulation and ventilation are essential to reducing the risk of mold development.

The presence of mold is most frequently detected by the odor it produces and then by its visual cues. If mold is found within a collection, it should be immediately removed from the stacks to stop the growth from infecting nearby boxes. Designate a space in the building to isolate affected collections. Allow for enough room to triage and re-assess the afflicted records throughout the recovery process. The best way to eradicate mold is to eliminate all moisture from the affected records. In drying out the records, usually by introducing the records to extreme cold by way of a freezer, the mold spores are destroyed.¹⁷ For further discussion of the process, please see our Disaster Recovery for Public Records Custodians, Libraries and Archives webpage (info.florida.gov/records-management/disaster-recovery).

Once the affected records undergo the process of drying out the mold, the spores will be able to be removed by lightly brushing off the fragments from the material. Often, the mold will leave a trace of its existence in the form of off-colored marks and stains. Because some species of mold can have lasting health effects if inhaled, take precautions when handling affected materials by wearing masks and minimizing time spent around the mold.¹⁸

Environmental Controls: Pests and Insects

Like mold, proper housekeeping techniques help to lessen the risk of pests and insects. Unfortunately, they are never wholly unavoidable. There are many species of pests that are

attracted to paper and, as such, are a constant threat to archival collections. The most common pests are silverfish, firebrats, psocids and cockroaches.¹⁹

The use of pesticides was a major treatment method in the past, until its adverse effects on staff and collections became known. Current best practice points to Integrated Pest Management (IPM), which employs non-chemical treatments in place of harmful pesticides. The focus of IPM is on routine housekeeping; on-going monitoring, inspection and evaluation of collections; and staff education. The strategy also promotes habitat modification via a commitment to removing food sources and ensuring that the climate within the archives is maintained. Insects are drawn to moisture, often present as a result of higher temperature and humidity levels. This risk will be lessened if proper climate controls are in place.²⁰ In the event of an infestation, collections affected should be immediately removed from the rest of the archives's holdings.

Archivists should also inspect new accessions, checking for signs of pests before bringing the boxes into the stack area. In some cases, routine freezing of records can be beneficial when accessioning records that are in a less than desirable physical state.

Lighting

Proper lighting is a key component of long-term preservation. Incorrect use of lighting in areas where collections are stored and used greatly diminishes the life and quality of the records. If the lighting is too strong, especially in storage areas, it will affect climate controls by increasing the temperature of the room.

The best strategy when evaluating the archival environment created by your current lighting or when constructing a new building is to take into consideration the main function of each room. The activities performed in each room should guide both the type and strength of lights chosen. Refer to the table below, adapted from Michele F. Pacifico and Thomas P. Wilsted's *Archival and Special Collections Facilities: Guidelines for Archivists, Librarians, Architects, and Engineers*, which is intended to simplify targeted lighting levels based upon location within the building.

Lighting Levels²¹

Location Within Building	Lighting Level (Lux and Foot Candles)	Maximum UV Level (Microwatts per Lumen)
Stacks	19-46 foot candles 200-500 lux	10
Processing Room	19-46 foot candles 200-500 lux	10
Conservation Laboratory	19-46 foot candles 200-500 lux	10
Reading Room: General	19-46 foot candles 200-500 lux	10
Reading Room: Microfilm Viewing Area	5-9 foot candles 50-100 lux	10
Exhibit	3-19 foot candles 30-200 lux	10

If your archives is unable to remove existing light sources that are below standard, there are options available to lessen the possibility of damage. For example, the adverse effects of fluorescent lighting can be eliminated by placing protective filters over them. Like other aspects of an archives storage area, lighting should be tailored to the specific needs of the institution.

End Notes

¹³ Adapted from Michele E. Pacifico and Thomas Wilsted, *Archival and Special Collections Facilities: Guidelines for Archivists, Librarians, Architects, and Engineers* (Chicago: Society of American Archivists, 2009), 32-36.

¹⁴ Ernest A. Conrad, "A Realistic Preservation Environment," *U.S. National Archives and Records Administration*, accessed April 16, 2014, <http://www.archives.gov/preservation/environmental-control/realistic-preservation-environment.html>.

¹⁵ Richard Pearce-Moses, *A Glossary of Archival and Records Terminology* (Chicago: The Society of American Archivists, 2005), 254.

¹⁶ *Ibid.*, 253.

¹⁷ National Park Service, "Mold and Mildew: Prevention of Microorganism Growth In Museum Collections," *U.S. National Archives and Records Administration*, last modified July 1993, accessed April 16, 2014, <http://www.archives.gov/preservation/environmental-control/mold-prevention.html>.

¹⁸ "My Records Have Mold Growing on Them. What Should I Do?," *U.S. National Archives and Records Administration*, accessed June 17, 2014, <http://www.archives.gov/preservation/holdings-maintenance/mold.html>.

¹⁹ Beth Lindblom Patkus, "Emergency Management: 3.10 – Integrated Pest Management," *Northeast Document Conservation Center*, accessed June 18, 2014, <http://www.nedcc.org/free-resources/preservation-leaflets/3.-emergency-management/3.10-integrated-pest-management>.

²⁰ *Ibid.*

²¹ Pacifico and Wilsted, *Archival and Special Collections Facilities*, 80-81.

III. Fire Protection

Fire damage to archival collections can be permanent and irreparable. Fire protection should be addressed as early in the process as possible. Without a good fire protection system in place, the facilities and archival collections, as well as human lives, are in danger.

This portion of the handbook provides information about creating a fire protection program that protects the structure and archival collections, as well as human lives.

The section begins with a discussion of local, state and federal codes and standards. An examination of the three components of a good fire protection system – prevention, detection and suppression – follows.

Standards for the Protection of Records

This section is not a comprehensive list of local, county, state or federal laws and codes regarding fire protection and prevention. The section includes the major codes to be familiar with and ways to find out more about local and county laws and codes.

National Fire Protection Association (NFPA) codes and standards (nfpa.org/codes-and-standards) provide methods to prevent the occurrence and manage the impact of fires and to protect people. NFPA's codes and standards affect "virtually every building, process, service, design, and installation in society today."²² Some notable standards and codes for archival facilities include NFPA 232, *Standard for the Protection of Records*; NFPA 232A, *Guide for Fire Protection for Archives and Records Centers*, 1995 Edition; and NFPA 909, *Code for the Protection of Cultural Resource Properties – Museums, Libraries, and Places of Worship*. Also noteworthy are NFPA 10, *Standard for Portable Fire Extinguishers*; NFPA 13, *Standard for the Installation of Sprinkler Systems*; and NFPA 750, *Standard on Water Mist Fire Protection Systems*.

Created by the Division of State Fire Marshal, the Florida Fire Code Advisory Council and the Florida Building Commission, the *Florida Fire Prevention Code*, used in conjunction with the *Florida Building Code*, provides a comprehensive set of state guidelines for fire safety. The State Fire Marshal is responsible for the reduction of the loss of life and property to fire and other disasters statewide through internal and external leadership, standards and training, prevention and education, and fire and arson investigation. More information about the *Florida Administrative Code* Rules regulating the Division of State Fire Marshal is available at www.flrules.org/gateway/Division.asp?DivID=359. The *Florida Fire Prevention Code* is at myfloridacfo.com/division/sfm/bfp/floridafirepreventioncode.htm#.U-4mifldXVs.

When looking into fire protection for your archival facility, you should also be aware of the requirements of the Americans with Disabilities Act. As a part of the Florida Americans with Disabilities Accessibility Implementation Act, the 2012 *Florida Accessibility Code for Building Construction* was adopted pursuant to Section 553.503, *Florida Statutes*. To find out more about the code, please visit the Department of Professional and Business Regulation's website at floridabuilding.org/c/default.aspx. You can access the code at [floridabuilding.org/fbc/committees/accessibility/aac/Changes to Law/2012 Florida Accessibility Code Final%20.pdf](http://floridabuilding.org/fbc/committees/accessibility/aac/Changes%20to%20Law/2012%20Florida%20Accessibility%20Code%20Final%20.pdf).

Be sure to work with your city and county to adhere to the local fire codes affecting your archival facility.

Fire Prevention

This section discusses the methods to prevent fires by making your facility as fire resistant

as possible. It provides information about the leading causes of fires, preventative measures to reduce the threat of fire, and recommendations for further safeguarding the building and training employees if fires occur.

The first step to preventing fires is knowing the avoidable causes of fires and ways to control potential ignition sources. The leading causes of fire are heating devices, such as space heaters, heating and air conditioning equipment, and cooking stoves. By either prohibiting the presence of space heaters or other nonessential heating devices or practicing care and diligence with these types of devices, you can reduce the threat of fire. Other leading causes of fires include arson and suspected arson and faulty electrical wiring.²³

Renovations and repairs can increase the risk of fires. To lessen the threat of fire, take measures to ensure that all combustible materials are protected when contractors use welding, cutting or burning equipment. All mechanical equipment should be installed by professionals in compliance with codes and be maintained, inspected and tested in accordance with recognized safe practices. Safeguard against fuel sources used during construction. Do not use flammable finishes on carpeting, ceilings or tiles. Store and dispose of flammable liquids in approved safety cans, and do not store or place materials against electrical outlets. Smoking should be prohibited.²⁴

There are additional measures that can be taken when constructing your archival facility or when training staff. These measures will not prevent a fire from occurring but will greatly reduce the risk or spread of the fire. If possible, the walls, floors and ceilings of collection storage and handling areas should be constructed of 2-hour fire-rated materials. Install fire doors to protect openings in fire walls. Do not leave fire doors propped open, and ensure they latch and close without assistance.

Properly training staff on how to react if a fire occurs is vital. Protecting the lives of employees and visitors is your highest priority. At the very least, have a disaster preparedness plan in place that instructs employees about how to report a fire and safely evacuate the building. Instruct employees on how to turn on an alarm either by phone, mobile pull station or some other manner. Conduct fire drills to familiarize staff with procedures and alarm sounds. Establish and familiarize staff with exit routes. Ensure that egress paths are unobstructed; exit doors are accessible, unlocked and not blocked; and exit signs are operating and visible.

Detection

Detection devices should be used throughout the building to alert the appropriate people to a fire and quicken the response. For detection to be successful, human intervention needs to be almost immediate. Smoke detectors offer the best means for detecting a fire in its early stages. The two most common kinds of smoke detector are spot-type photoelectric, which reacts quickly to smoldering fires producing visible smoke, and ionization, which reacts quickly to the invisible products of combustion and flaming fires. Before choosing a smoke detector, you may want to consult a fire protection specialist for advice.²⁵

Prior to installation, you will need to decide the purpose of the smoke detector. If the detector is meant to protect lives, sounding an alarm will be sufficient. If the detector is also meant to alert trained professionals to fight the fire, the system would need to be monitored around the clock. All smoke detectors require periodic testing and maintenance.²⁶

Fire Suppression Systems

Fire extinguishers, automatic sprinklers and lightning protection systems are essential components in protecting your facility from fire.

NFPA 10, *Standard for Portable Fire Extinguishers*, provides requirements to ensure that portable fire extinguishers work to provide a first line of defense against fires of limited size. The

standard covers the selection, inspection, maintenance, recharging and testing of portable fire extinguishing equipment.²⁷

Automatic fire suppression systems designed to quickly control or extinguish fires are the best protection against large fires. Suppression systems minimize fire damage to your building and archival collections, reduce water damage resulting from firefighting operations, and prevent loss of life or injury. Suppression systems have been proven to be reliable, whether they are gas or water supplied systems, depending upon their purpose.²⁸

Fire Suppression Systems²⁹

Type of System	How It Works	Best Area to Use
Gas automatic fire suppression	Releases a specific type of gas into a sealed room to extinguish the fire	Suitable only for tightly sealed rooms that can contain the gas once it is discharged; Any breach in the room will permit the gas to escape and void its usefulness. Gas requires above-average maintenance and does not protect the building's structure.
Automatic sprinkler	Utilizes sprinkler heads held shut or sealed by an element that melts or breaks away at predetermined temperature, allowing only sprinkler heads nearest the fire to open and discharge water onto the fire; limiting the water released allows the archival records to sustain less damage; water used by firefighters is released indiscriminately into the archival records, which has the potential to cause more damage	
Wet pipe automatic sprinkler	Ready to operate when a fire is detected, since overhead pipes are filled with water	Cannot be used where freezing temperatures are possible or where mechanical damage to pipes is likely
Pre-action automatic sprinkler	Has dry overhead pipes and requires supplemental fire detection systems that release a valve allowing water to fill pipes	Can be used in storage areas, since water is not released until a head is activated, reducing the risk of water damage

Dry pipe automatic sprinkler	Filled with air under pressure, which is significant enough to hold the valve closed; When a sprinkler head opens, the air bleeds off and the water valve is allowed to open.	Can only be used in areas subject to freezing, such as loading docks and unheated structures
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End Notes

²²“Codes and Standards,” *National Fire Protection*, accessed September 15, 2014, <http://www.nfpa.org/codes-and-standards>.

²³ Andrew J. Wilson, “Fire Protection in Cultural Institutions,” *U.S. National Archives and Records Administration*, accessed April 16, 2014, <http://www.archives.gov/preservation/emergency-prep/fire-prevention.html>.

²⁴ Ibid.

²⁵ Ibid.

²⁶ Ibid.

²⁷ Michele E. Pacifico and Thomas Wilsted, *Archival and Special Collections Facilities: Guidelines for Archivists, Librarians, Architects, and Engineers* (Chicago: Society of American Archivists, 2009), 46.

²⁸ Wilson, “Fire Protection in Cultural Institutions.”

²⁹ Ibid.

IV. Security

The subject of security derives its importance from the unique nature of archival collections: most are one of a kind. If collections are severely damaged or lost as a result of poor collections management, patron handling or theft, archivists have no way to recover the records.

There are two main goals of security: to protect the collections and to protect staff and patrons. Following the security practices discussed below will address both aims. This section is organized into three subsections: Building Security, Collections Security and Disaster Planning.

Building Security

Elements of security should be incorporated into the building itself. Paying attention to the grounds, limiting the number of windows and doors, and installing alarm systems are the first steps in establishing building security. Entrances to and from the roof should be secured. Avoid the use of skylights and roof lights. Be mindful of the number of doors, opting for the lowest number necessary. Equip all doors with locks and make sure all are locked when the archival facility is closed. If it is financially possible, employing main entrance security guards further enforces proper building security.³⁰

Collections Security

Staff are the most important component in achieving collections security. By creating, adhering to, documenting and periodically reevaluating the policies and procedures specific to the archives, archivists can successfully safeguard collections.

If it is within the means of the operating budget, hire a main entrance security guard. Building guards can provide an initial and final screening of all incoming and outgoing patrons. This is often feasible for larger archives, archives within libraries, or archives that share a building with several other offices. For small institutions, archives staff sometimes must take full responsibility for security.

A major part of physical security resides in collections management. To the greatest extent possible, archival materials should be accessioned, arranged and described before they are open to public researchers. Properly organized and maintained collections prove beneficial to the repository in the event that employees need to identify missing items. Staff will not know if materials are missing if they do not know what they have.

Storage areas should be secured at all times with authorized access allowed to as few employees as possible: those who work with the collections and, if necessary, certain maintenance or security staff. Limiting the number of employees who have access to the stacks limits the number of those potentially responsible when security issues arise.

The archives reference room should be the sole location where patrons interact with records. Collections might be brought into the room and taken back to the stacks several times a day. Because of the number of patron visits and the constant shifting of archival records, security is a high priority in the reference room. The room's design and layout must allow for continuous surveillance. Keep all patron tables in clear sight of the staff area and make sure that patrons have adequate space to spread out. This will avoid clutter and confusion.

To reduce the risk of theft, archives should provide lockers or some other area for patrons to secure their bags, briefcases, coats and similar belongings before entering the research area. Sign-in is imperative, as are clearly stated and posted reference room rules, policies and procedures.³¹

The recording of all collection activities is essential to maintaining collection security. An archives should have a circulation or inventory management system or log that can track the checked out and checked in date of each box, the name of the staff member or patron using the box, and the temporary location of the box when it is away from its assigned stack location. Archives staff should integrate this system into reference desk activities and perform periodic shelf reads to ensure that the physical location of boxes matches their locations in the management system. This will allow staff to locate and rectify misplaced or mislabeled boxes on their own time, as opposed to only realizing their absence after a patron makes a request or when they are needed for an exhibit, processing or other purpose.³²

In addition to circulation logs, a missing inventory log should be maintained. A record of missing box numbers, series numbers, box sizes, dates boxes were deemed missing and assigned locations would be included in the log. Recovery information should be entered if missing records are found, including the recovery date, recovery location and any additional notes deemed necessary. This will help to identify common trends and possible security weaknesses.

Disaster Planning

Every archives or historical records repository should develop and maintain a disaster response and recovery plan. When unplanned events occur, having a concrete disaster response plan in place is essential to responding effectively and to shortening recovery time. In a patron-based operation, this is vital. At a time of tragedy, restoring order as quickly as possible is important.

Archives staff will benefit from familiarity with a previously-designed plan, which will give staff a reference point and will eliminate chaos and additional stress in the event of a disaster. Much has been written about effective disaster planning techniques because of a professional acceptance of the importance of having a contingency plan. Familiarizing oneself with the professional literature on the subject while always keeping the specific archives in mind is important.

Certain elements of disaster plans are applicable to all archives, but broad-based plans are not sufficient. Broad-based plans should be supplemented with location-specific strategies that take into consideration probable natural disasters, staff size and holdings. This will provide a condensed plan that is tailored to fit the needs of the building itself as well as the archives's specific operations. To ensure the success of a disaster plan, build in position-centric responsibilities and annual procedural reviews. This will allow for the plan to remain administratively active, current and familiar to all pertinent employees.

For additional information on the importance of disaster plans and for guidance in their creation, see Johanna Wellheiser and Jude Scott's *An Ounce of Prevention: Integrated Disaster Planning for Archives, Libraries, and Record Centers* and Miriam B. Kahn's *Disaster Response and Planning for Libraries*. For help in designing your disaster plan, see *dPlan: The Online Disaster-Planning Tool for Cultural and Civic Institutions* (dplan.org).

End Notes

³⁰ Michele E. Pacifico and Thomas Wilsted, *Archival and Special Collections Facilities: Guidelines for Archivists, Librarians, Architects, and Engineers* (Chicago: Society of American Archivists, 2009), 57-64.

³¹ National Archives and Records Administration, "Archives II, Using Technology to Safeguard Archival Records," *Technical Information Paper Number 13* (College Park, MD: NARA, 1997), 25-27.

³² State Archives, Minnesota Historical Society. "Chapter 5: How Do You Preserve and Store Government Records?" *Managing Your Government Records: Guidelines for Archives and Agencies 3* (September 2009) 3, online at http://www.mnhs.org/preserve/records/recordsguidelines/docs_pdfs/05Sept2009V3Ch5.pdf.

V. Materials and Storage Equipment

The last component of this handbook pertains to the housing enclosures and larger storage equipment necessary to ensure the longevity and safety of archival materials. Materials and storage equipment strengthen an archives's preservation program when maintained alongside the best practices discussed in the archival environment section. This section is discussed in two parts, beginning with materials and concluding with storage equipment.

Materials

The chart below is intended to help identify appropriate materials by differentiating between recommended and non-recommended materials based upon location and function. The information in this chart was derived from Michele F. Pacifico and Thomas P. Wilsted's *Archival and Special Collections Facilities*. For a more in depth discussion, please see their chapter on materials and finishes.

Recommended Materials Based Upon Location

Area of Archives	Recommended	Not Recommended
Stacks: Floor	Concrete	Wood, Bamboo, Carpet, Tile, Cork Products
Stacks: Furnishings	Steel, Chrome-Plated Steel ³³	Wood, Carpet, Fabrics
Records Processing and Holding Areas: Floor	Concrete ³⁴	Wood, Bamboo, Tile, Cork Products
Records Processing and Holding Areas: Furniture	Metal ³⁵	Solid Wood, Composite Wood
Exhibit Cases: Structure	Stainless Steel, Aluminum Metal Panels, Acid-Free Paper Honeycomb Panels, High-Density Polyethylene, Aluminum/Polyethylene Laminates, Glass, Polyester Sheets, Polypropylene Sheets	Wood
Exhibit Cases: Fabric	Undyed Cotton, Linen, Polyester, Cotton-Polyester	Wool, Silk, Fire-Retardant Treatments, Permanent Press and Shrink Proof Fabrics, Treated Fabrics
Laboratory: Floors	Concrete, Tile	Carpet, Wood
Laboratory: Furniture	Steel, Anodized Aluminum	Wood, Fabrics
Laboratory: Countertops	Epoxy Resin, Solid Surfaces, Stainless Steel	Natural Stones
Reading Room: Floors	Carpet, Wood	
Reading Room: Furniture	Steel, Chrome-Plated Steel	Wood, Composite Wood

As with all recommendations, taking best practices into consideration is most important. Incorporate them where appropriate, ultimately choosing materials that are realistically

attainable. Though wood is not recommended for reading room furniture, your repository might have a surplus of existing wood furniture that you are required to use. When deciding upon materials, put more emphasis on areas that affect your collections the most and less on those that do not apply.

Storage Equipment

The U.S. National Archives and Records Administration stresses the importance of proper archival storage by the following statement: “Storage is the first and best means of defense in safely preserving archival holdings. Choices made in storage type and methodology have the greatest influence on the long-term preservation of records.”³⁶

Archival boxes and folders are the most basic storage equipment. Boxes and folders, deemed archival by their pH and/or low-lignin levels, act as buffers against unwanted or unavoidable environmental hazards. They also help to prevent the deterioration of the records they contain that is caused by the records’ inherent characteristics, such as the acid content in paper. Folders also provide increased stability for the records, ensuring that they stay as crisp and flat as possible.³⁷

Beyond standard archival boxes and folders, a plethora of format-based storage exists. It is important to take into consideration the individual needs of each format in order to provide the best housing environment possible, as indicated in the table below.

Recommended Archival Supplies Based Upon Format

Format	Storage Guidance
Paper	Store paper items in folders and boxes appropriate for their size. If extremely fragile or oversized, store flat. Otherwise, store upright. Interleave records with archival tissue paper if there are concerns for records in poor condition or on acidic paper negatively affecting other records in the same folder. Folder individually if necessary. ³⁸
Bound Volumes	Shelve volumes vertically if the height is 22” or less, the thickness is 4” or less, and/or the condition of the volume permits it to remain vertical without inflicting damage. Shelve volumes horizontally if the height is larger than 22”, the thickness is larger than 4”, and/or the volume is a scrapbook or similar volume, where elements inside could come loose or become damaged if stored vertically. ³⁹
Photographs	Use the proper sized photograph sleeve, envelope or folder for the size of the photograph. Plastic enclosures made from polyethylene, polypropylene or polyester are also acceptable. Archival grade photograph albums are recommended, as are appropriately sized boxes. Photographs in good condition and smaller than 8x10” can be stored vertically in folders. Photographs larger

	than 8x10" or of poor condition should be stored flat. ⁴⁰ Take the photograph's size, condition and the frequency of it needing to be accessed into account when determining the proper enclosure method. ⁴¹
Photographic Negatives	Negatives can be stored the same way as photographic prints. Specialized plastic negative enclosure sheets (made with the proper plastic materials, as noted above) are also available. The sheets have standard sized slits so that the negatives can slide into the page in rows. ⁴²
Audio	Store all audio formats upright in their appropriate containers, with discs and reels stood on an edge, cassettes stood on long sides, and cylinders stood on end. Use specialized boxes with supports for reels larger than 10". ⁴³
Video and Motion Picture Film	Store film reels in appropriately sized archival cardboard, plastic or metal containers. Stack enclosures horizontally so that the film lies flat to reduce warping. ⁴⁴
Microfilm	Place within individual microfilm boxes and then house in the appropriate sized archival box or archival cabinets designed for microfilm storage. ⁴⁵
Microfiche	Place within individual microfiche sleeves, which are similar to photograph sleeves, and then house in the appropriate sized archival box. ⁴⁶

Large storage equipment is another component of an archives's storage program. One of the most important aspects is archival shelving. There are many considerations to take into account when designing, ordering and installing archival shelving that go beyond the scope of this handbook. In general terms, shelving should be of sturdy metal construction with a chemically-inert finish, and floor loads should be verified before shelving is installed to ensure that the building structure can accommodate the weight of loaded shelving. For specifications on archival shelving, please refer to Michael J. Kurtz's *Managing Archival and Manuscript Repositories* and Michelle Pacifico and Thomas P. Wilstead's *Archival and Special Collections Facilities*.

Carts, stools and ladders are also necessary. Carts allow for easy transport of boxes during processing and reference activities and prevent damage to records from being mishandled or accidentally dropped when carried by hand. Stools and ladders allow for archivists to reach the higher shelves safely.

In addition to traditional archival boxes and folders, format-based housing materials, and large storage equipment, additional supplies may be necessary to process archival records for safe storage. Interleaving paper is used to help protect fragile items and to separate highly acidic items from other materials. Bone folders are used to gently flatten creases when the

paper is not too brittle and to help lift and turn fragile pages. Microspatulas are used to safely open and remove staples. Dust and photograph brushes, cloths, masks, gloves, plastic paper clips, and spacer boards also need to be considered. For further information on these items, please consult the Holding Maintenance section of the National Archives and Records Administration's website.⁴⁷

Many archival supply vendors carry the equipment and supplies you will need. While the exploration for the best vendor may seem daunting, help is available from a variety of sources. Check with fellow archival employees and professionals in related fields who you may work with. Experienced archivists have a good idea of what supplies they have had success with. Likewise, librarians and conservators may also have vendor and manufacturer recommendations.

Another method of identifying vendors and supplies is to inquire on professional listservs or social media sites that you or your colleagues belong to. This is a great way to obtain myriad suggestions from professionals in all settings. You may find an existing discussion on the topic to consult. If not, fellow archivists will likely be willing to share their experiences and recommendations. Communication is key, whether it be with employees and outside archivists or with the vendors themselves. Take the time to discuss options, prices and shipping methods with vendors so that when you make your decision it will be with confidence and in the best interest of the collections.

End Notes

³³ According to Pacifico and Wilsted, anodized aluminum is recommended with reservations due to its reaction to some metals and its ability to rust in humidity.

³⁴ According to Pacifico and Wilsted, carpet is recommended as a flooring material only if it is a low- or no-volatile organic compound product.

³⁵ According to Pacifico and Wilsted, anodized aluminum, acrylic and glass are recommended with reservations due to the likelihood of these materials to react in humid environments and to break or scratch and cause damage to records.

³⁶ "Supplies," *The U.S. National Archives and Records Administration*, accessed April 16, 2014, <http://www.archives.gov/preservation/holdings-maintenance/supplies.html>.

³⁷ "A. Boxes B. Folders," *The U.S. National Archives and Records Administration*, accessed April 16, 2014, <http://www.archives.gov/preservation/holdings-maintenance/procedures.html#boxes>.

³⁸ Ibid.

³⁹ Mary Lynn Ritzenthaler, "Guidelines for Shelving Bound Volumes," *The U.S. National Archives and Records Administration*, last modified 1990, accessed April 16, 2014, <http://www.archives.gov/preservation/storage/shelving-bound-volumes.html>.

⁴⁰ "How Should I Store My Photographic Prints?" *The U.S. National Archives and Records Administration*, accessed April 17, 2014, <http://www.archives.gov/preservation/holdings-maintenance/general-guidance.html#prints>.

⁴¹ For information on the storage of glass plate negatives, please refer to "How Do I House Glass Plate Negatives?" *The U.S. National Archives and Records Administration*, accessed April 17, 2014, <http://www.archives.gov/preservation/storage/glass-plate-negatives.html>.

⁴² "How Should I Store Negatives and Transparencies?" *The U.S. National Archives and Records Administration*, accessed April 17, 2014, <http://www.archives.gov/preservation/storage/negatives-transparencies.html>.

⁴³ "Care, Handling, and Storage of Audio Visual Materials," *Library of Congress*, accessed July 29, 2014, <http://www.loc.gov/preservation/care/record.html>.

⁴⁴ National Film Preservation Foundation, *The Film Preservation Guide: The Basics for Archives, Libraries, and Museums* (San Francisco: Great Impressions, 2004), 66-67.

⁴⁵ Library of Virginia, "Chapter 13: Microform Transfers and Procedures," in *Virginia Public Records Management Manual*, last modified March 2012, accessed July 28, 2014, <http://www.lva.virginia.gov/agencies/records>.

⁴⁶ Ibid.

⁴⁷ "Supplies."

Glossary

Below is an alphabetical list of prominent terms used throughout this handbook. Their respective definitions are included for an added reference point when needed.

Acidity: The quality in paper which causes its chemical degradation to the point that it becomes discolored and brittle and will ultimately fall apart. Usually expressed as pH value.

Accession: 1) The procedures involved in transferring legal title and taking records into the physical custody of an archives; 2) The materials involved in such a transfer.

Administrative Value: The usefulness of records for the conduct of current and/or future administrative business.

Archival Quality: Used to designate record media (paper, microfilm, photographs, film) and related supplies (inks, folders, fasteners) as suitable materials for creating and storing records of permanent value. Such materials must be stable and free of acid or other chemical contaminants.

Archives: 1) Records which are no longer required for current use but have been selected for permanent preservation because of their historical value; 2) The agency responsible for selecting, preserving and making available records of permanent value; 3) The place (room, building, or storage area) where archival records are kept.

Conservation: The component of preservation that deals with the physical or chemical treatment of records.

Cycling: The physical distortion of records as they expand and shrink based on fluctuations in temperature and humidity.

Disaster Plan: A document that sets out the measures to be taken to minimize the risk and effects of disasters, such as fires, floods, earthquake, etc., and to recover, save and secure vital records should such a disaster occur.

Disposition: The actions taken with regard to inactive records, such as destruction or transfer to an archives.

Electronic Records: Various technologies used for the storage of digitized or born-digital information.

Environmental Controls: Used to create and maintain a storage environment for records to ensure preservation. Controls include temperature, relative humidity, air quality, lighting, elimination of pests, housekeeping, security, and the protection of records from fire and water.

Floor Load: The capacity of a floor area to support a given weight; expressed in terms of pounds per square foot.

Historical Records: Records that contain significant information about the past or present and are therefore worthy of permanent preservation and systematic management for search.

Historical Value: Information about the present or past that makes the record worthy of permanent preservation for research.

Hygrothermograph: Instrument for recording the fluctuation of temperature and relative humidity that creates a graph of the fluctuations over a given period of time.

Integrated Pest Management (IPM): An ecosystems approach to pest control that uses biological, cultural and mechanical controls rather than chemical ones.

Ionization Detectors: A type of smoke detector that responds to the presence of products of combustion.

Humidity: The concentration of moisture in the atmosphere. See Relative Humidity.

Magnetic Media: A storage medium consisting of a polyester base and a metallic coating on which data is stored by selective magnetization of the surface of the coating; examples include video and audiotapes.

Microfiche: A sheet of transparent film with microimages arranged in rows and columns, usually with an area for an eye-readable description at the top.

Microfilm: Reduced scale photographic records of documentary materials; requires special environmental storage controls.

Permanent Records: Records considered to be so valuable or unique in documenting the history of an organization, person or place that they are preserved in an archives.

Photoelectric Detectors: A type of smoke detector that responds to smoke from flames.

Preservation: Actions taken to slow or prevent the deterioration or damage of archival records. Basic actions taken to provide adequate facilities for the protection, care and maintenance of archives and records.

Process: Preparation of records prior to their use by the public, which involves sorting, arrangement, re-boxing and re-folding.

Public Records: Records that are created or received by a public agency in the normal course of its business and that are open to public inspection.

Records: Recorded information, regardless of physical form or characteristics of the medium (e.g. paper, photograph, sound recordings, or computer-generated machine readable records), made or received by an organization to fulfill its legal obligations or to transact business.

Reference: The range of activities involved in providing information about or from records in archives, e.g., making records available for access and providing copies or reproductions of records.

Register: The process of formally recording patron information, such as name and address, in a log.

Relative Humidity: The ratio, expressed as a percentage, of the amount of water-vapor present in the atmosphere to the amount required to saturate it at the same temperature. Relative humidity varies with temperature.

Vital Records: Records that are essential for the ongoing business of an agency and without which the agency could not continue to function effectively. Vital records need to be identified and stored under special environmental controls.

Select Bibliography

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This is a select bibliography of resources used to compile this handbook and is not meant to be comprehensive.

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