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# Mississippi Lodge of Research No. 640

## *20/1 - Archival Storage Standards*

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### **PURPOSE**

This directive establishes structural, environmental control, fire safety, preservation, and security standards for appropriate archival storage conditions in Mississippi Lodge of Research (MLOR) archival facilities.

### **DEFINITIONS**

For purposes of this directive, the following definitions apply

- a. Archival facility means
  - 1) A MLOR-owned or leased facility used to store archival records
- b. Archival records means
  - 1) Records, historical materials and artifacts, which have been acquired or transferred to the legal custody of the MLOR or which have been deposited in the MLOR's physical custody for a specified amount of time.
- c. Archivist means the Lodge official who has overall responsibility for the daily operations, as well as any facility management activities within that building.
- d. Records area means a records storage area, a designated processing area, an exhibit area, or a preservation (conservation, duplication, microfilm, digital imaging) laboratory. The term covers areas where records may be kept for extended periods.
- e. Records storage area means an area containing archival records that is enclosed by four fire-resistant walls, the floor, and the ceiling. All walls should be fire rated for a minimum of two hours, with any doors to the area rated at ninety minutes or more. The term includes general stack areas, vaults, and storage areas for exhibits and museum objects, but does not include reference space, staff offices, public spaces (e.g., restrooms and lobbies) or processing areas.
- f. Research room means a room in which researchers may use original records and for which they must be issued a researcher identification card.

### **GENERAL STRUCTURAL STANDARDS**

- a. The facility must be constructed with non-combustible materials and building elements, including roofs, walls, columns, and floors.

- b. A floor load limit must be established for the records storage area. The limit must take into consideration the weight of the specific type(s) of archival records to be stored, height and type of the shelving or storage equipment, the width of the aisles, the configuration of the space, etc. The allowable load limit must be posted in a conspicuous place and must not be exceeded.

## **WATER PROTECTION**

- a. *Location of facility.* The archival facility must be sited a minimum of 100 feet from any 100 year flood plain area, or be protected by an appropriate flood wall that conforms to local or regional building codes.
- b. *Roof.* The facility must ensure that the roof membrane does not permit water to penetrate the roof. Place nothing on the roof that may cause damage to the roof membrane, including equipment. Do not install skylights or sloped glazed windows in areas where records are regularly present. Avoid roof penetrations, including vents, over these areas. However, automatic roof vents, designed solely to vent in the case of a fire, with a temperature rating at least twice that of the sprinkler heads, may be used over records storage areas.
- c. *Piping*
  - 1) Do not run piping (except fire protection sprinkler piping, storm water roof drainage piping and electrical conduits) through records storage areas.
  - 2) If drainage piping from roof drains must be run through records storage areas, the piping must be run to the nearest vertical riser and must include a continuous seamless gutter sized and installed beneath the lateral runs to prevent leakage into the storage area. Vertical pipe risers in records storage areas must be fully enclosed by shaft construction with appropriate maintenance access panels.
- d. *Location of records within the facility*
  - 1) Do not store records below grade. Basements and other underground facilities may be exempted from the requirement to store records above ground if the facilities
    - a. Meet the other standards in this directive;
    - b. Demonstrate long-term low risk to records because of water, fire, or structural threats; and
    - c. Are granted a waiver from a specific standard by the Archivist.
  - 2) Store records at least 4 inches from the floor surface.

- 3) No fountains, pools, or standing water are allowed over or adjacent to areas where records are stored, processed, used, or exhibited.

### **HEATING, VENTILATION AND AIR CONDITIONING (HVAC) REQUIREMENTS**

- a. Archives storage areas, processing areas, and preservation laboratories must be served from separate HVAC systems. All other areas of the building may share the same HVAC system. HVAC equipment must not be mounted on the roof of a new facility.
- b. Air handling units serving records storage and processing areas must provide sufficient air exchanges to maintain requirements for temperature, relative humidity, and pollutant control. The number of air exchanges is determined by the planned size of the room, volume of records, volatile organic compounds coming off the records, occupancy, etc.
- c. The records storage areas of the facility must be kept under positive air pressure especially in the areas adjacent to the loading dock. Loading docks must have an air supply and exhaust system that is separate from the remainder of the facility.
- d. Areas where records are used, processed, stored, or exhibited must be isolated from sources of pollutants and particulates, such as the loading dock, machine rooms, or areas where woodworking or painting take place. Doors to the record areas must not open directly onto the loading dock, machine rooms, locations where woodworking or painting takes place, or other similar areas. The air intakes and returns must be designed such that lower quality air and environment cannot affect the records areas, and must have direct venting to the outdoors.

### **TEMPERATURE AND HUMIDITY STANDARDS**

- a. The maximum acceptable dry bulb temperature in areas where records are stored is 65° F, and the maximum acceptable dry bulb temperature for areas where records are exhibited, processed, or used is 70° F, with a permissible variance of 5° F. In both area types, the acceptable set point for relative humidity is 35%-45%, with a permissible variance of 5%. Use cooler temperature and drier relative humidity set points whenever possible, as these conditions extend the life and significantly enhance the preservation of the records.
- b. These specified temperature and humidity standards must be maintained 24 hours per day, 365 days per year, unless otherwise stated. Once a set point is programmed, daily fluctuations must not exceed 5° F and/or 5 % relative humidity. Relative humidity levels represented in a range indicate minimum and maximum set points. Seasonal movement between these set points must not exceed 5% per month while staying within the +/-5% daily band restriction.
- c. Seasonal relative humidity drift in actual operation of the system to reconcile energy efficiency and external climate extremes in certain geographical locations and with certain building types may occur. The building should be designed to accommodate the environmental requirements in a highly energy efficient manner.

- d. Temperature and relative humidity conditions in records areas must be continuously monitored and must be recorded at intervals that are frequent enough, and in a sufficient number of locations to demonstrate and confirm compliance with the standard. The Archivist is responsible for monitoring the temperature and relative humidity conditions in the facility.

### **AIR HANDLING AND FILTRATION SYSTEMS**

The following filtration systems are required in the air handling unit for the records storage and processing areas:

- a. *Particulate filtration system.* The particulate filtration system for archival records storage and processing areas must have a Minimum Efficiency Reporting Rating (MERV) of 14 or greater based on ASHRAE 52.2, "Methods of Testing General Ventilation Air Cleaning Devices for Removal Efficiency by Particle Size." To extend the service life of the system, it may be desirable to install preliminary filters with lower MERV ratings.
- b. *Humidification control system.* The air handling units must be designed for both humidification and dehumidification. Humidification must be achieved by a clean steam injection system (such as an electronic steam humidifier), an atomized air system using clean water, or equivalent system. The design of the system must ensure that the system does not generate or harbor microorganisms.

### **FINISHES AND COATINGS**

- a. Use a water-based latex paint for painting walls and ceilings. All concrete walls in the storage area must be primed and painted to prevent dust.
- b. Use a low volatile organic compound (VOC) acrylic membrane curing compound for the concrete floors of the records storage areas, after which apply a floor epoxy. Limit the VOC off-gassing of any epoxy and floor coatings in any area where records are processed, used, stored, or exhibited to less than 0.1 part per million by restricting the use of toluene and xylene in the floor coating mix.
- c. Use a powder-coating system to paint all painted metal shelving surfaces (including map cases, museum cabinets, etc.) used within all records areas. The powder-coating polymer must be a polyester epoxy hybrid or best equivalent available that passes independent lab tests for hardness, coating stability, bending, coating adhesion, and coating durability. The paint must not exceed established off-gassing limits. Do not apply powder coating to the metal surfaces onsite in the storage area.
- d. If ceiling pipe or exterior stack wall metal panels are to be painted, use an acrylic water reducible primer covered by two latex paint coats.

## **FINISHING MATERIALS**

The following materials are not permitted in the areas where records are used, processed, exhibited and stored; including vaults, but may be used in other areas of the facility. For renovated facilities, this paragraph does not apply to previously installed or applied materials.

- a. Cellulose nitrate lacquers and adhesives
- b. Polyurethane products, including paints, varnishes, and foams
- c. Acid-curing silicone sealants and adhesives
- d. Sulfur containing materials that could release SO<sub>2</sub>
- e. Pressure sensitive adhesives that release VOCs
- f. Unstable chlorine polymers (PVCs)
- g. Formaldehyde emitting compounds, such as might be found in particle boards
- h. Vinyl
- i. Oil-based paints and varnishes

## **FLOOR COVERINGS**

Carpeting and vinyl tiles are not permitted in the records storage areas, but may be used in other parts of the archival facility. Carpeting and vinyl tiles that minimize off gassing of VOCs must be used in areas where records are regularly present. Bare concrete floors should be moisture-sealed and coated with an epoxy covering that minimizes off gassing of VOCs. A recommended coating would be General Polymer Corporation's 3505S Special Epoxy Floor Coating, which reduces harmful levels of xylenes and ethylbenzene.

## **LIGHTING**

- a. Records storage areas
  - 1) Normal light levels must not exceed 500 Lux measured 36 inches above the floor level. Ultraviolet (UV) filtration on emergency lighting is required so that UV radiation below 400 nanometers in wavelength does not exceed 75 $\mu$  W/lumen and 75  $\mu$ W per square meter of surface area.
  - 2) Where records are not protected by an enclosure:
    - a. UV filtration as specified in subpar. a(1) is required on all lights.

- b. Lights in storage areas that is not required for safety must be off when work is not taking place. Systems (e.g. motion detectors, timers, etc.) should be incorporated to ensure that light exposure to the holdings is minimized.
  
- b. Processing areas. Lighting levels for normal office space may be used. UV filtration is required so that UV radiation below 400 nanometers in wavelength does not exceed 75µ W/lumen and 75 µW per square meter of surface area.
  
- c. Exhibit areas. Lighting must have the capability of full control for light levels 0-200 lux. UV filtration is required so that UV radiation below 400 nanometers in wavelength does not exceed 75µ W/lumen and 75 µW per square meter of surface area.
  
- d. Research rooms. Lighting levels for normal office space may be used. UV filtration is required so that UV radiation below 400 nanometers in wavelength does not exceed 75µ W/lumen and 75 µW per square meter of surface area.

### **PEST AND VERMIN CONTROL**

The archival facility must have an Integrated Pest Management (IPM) program as defined in the Food Protection Act of 1996 (Section 303, Public Law 104-170, 110 Stat. 1512).

### **FIRE SAFETY REQUIREMENTS**

- a. MLOR archival facilities must comply with requirements and recommended practices specified in NFPA 232-2000, Standard for the Protection of Records unless a requirement in this directive is more stringent.
  
- b. Do not install mechanical equipment containing motors rated in excess of 1 HP within records storage areas.
  
- c. Do not install high-voltage electrical distribution equipment (i.e., 13.2kv or higher switchgear and transformers) within records storage areas.
  
- d. Penetrations in the walls must not reduce the specified fire resistance ratings.
  
- e. Provide a redundant source of primary electric service, such as a second primary service or an appropriately rated emergency generator to ensure continuous, dependable service to the fire alarm and fire protection systems. Manual switching between sources of service is acceptable.
  
- f. Do not store hazardous materials, including records on cellulose nitrate film, in records storage areas. Records on cellulose nitrate film may include still photographic negatives, still photographic transparencies, x-rays, motion picture film and microfilm. Nitrate motion picture film and nitrate sheet film may be stored in separate areas that meet the requirements of the appropriate NFPA standard, NFPA 40 (1997), Standard for the Storage and Handling of Cellulose Nitrate Motion Picture Film, or NFPA 42 (1997), Code for the Storage of Pyroxylin Plastic.

## **SMOKE DETECTION REQUIREMENTS**

- a. The archival facility must have an approved, supervised automatic smoke detection system providing full-building coverage. Smoke detection systems must meet the requirements of NFPA 72, National Fire Alarm Code, and must be maintained in accordance with NFPA 72, Part H.
- b. Locate smoke detection devices to provide a 99 percent reliability of detecting the origin of the fire in less than 5 minutes. Use photoelectric-type detectors in records storage areas.

## **AUTOMATIC SPRINKLERS**

- a. All records storage and adjacent areas must be protected by an automatic sprinkler system that is designed to limit the maximum anticipated loss from any single fire event to a maximum of 100 cubic feet of records destroyed. Sprinkler systems for records storage areas must be separately zoned from other building areas.
- b. A wet sprinkler system, installed in accordance with NFPA 13, Standard for the Installation of Sprinkler Systems, must be used except as provided in subparagraph C. As a base standard, sprinklers should be installed on a 10 x 10 grid and capable of delivering a minimum flow rate of 0.3 gallons per minute (GPM) to the farthest point in the system.
- c. Clean agent systems that comply with NFPA 2001, Standard on Clean Agent Fire Extinguishing Systems, or pre-action sprinkler systems must be used in cold-storage rooms and other areas subject to temperatures below 40°F, and may be used in records storage vaults and museum storage areas. These systems also may be used in computer rooms and electrical and telephone closets.

## **SECURITY REQUIREMENTS**

- a. The facility must comply, at a minimum, with the security specifications for a Level I facility as defined in the Department of Justice, U. S. Marshals Service report Vulnerability Assessment of Federal Facilities dated June 28, 1995. A copy of the specifications is provided in Appendix A to 36 CFR Part 1228.
- b. The facility must have an anti-intrusion alarm system to protect against unauthorized entry.
- c. The facility must enforce controls on access to records storage areas.
- d. Special security measures may be required for records storage vaults to comply with information security requirements or to protect materials of high intrinsic or monetary value.

## **FACILITY MONITORING AND MAINTENANCE**

The Archivist must ensure that

- a. Schedules are developed for maintenance and calibration of control system devices for all major building systems in accordance with manufacturers' recommendations
- b. Scheduled maintenance is performed promptly; and
- c. Schedules are reviewed and updated annually.

## **OTHER POLICIES**

- a. Prohibit smoking, eating, and drinking in all areas in which records are stored, exhibited, or used.
- b. In facilities that have records processing areas, prohibit processing records and photocopying in the records storage areas. To ensure that records are subjected to the best environmental conditions available, retain them in processing areas for as short a time as possible.