State Archives Vault Specifications

Requirements have been excerpted from (1) *Architectural and Design Standards for Presidential Libraries [July 2018], National Archives and Records Administration,* and *(2) Standard for the Protection of Records, NFPA 232, 2012.*

Section I: Archival Vault (Archives Vault)

A. The Archives Vault room must have access controls and must be designed as an access-controlled area with only two (2) entrances that can be secured from the rest of the building.
    a. Archives Vault must have direct access to the Reading Room and staff offices.
    b. There must be two entry ways from the Archives Vault Room to other parts of the archival area. Specifically, one to the Reading Room and one to the Administrative area.
B. A security camera should be located at each entrance to this space.
C. The Archives Vault room must have ceilings of a minimum of 12-feet in height.
D. The floor must be reinforced concrete with an epoxy finish with high loadbearing capacity for the weight of holdings. Archives Vault will contain rows of heavy-duty shelving.
    a. The State Archives holds an excess of 10,000 cubic feet of records.
E. Due to the heavy stress loads on flooring, the room should be on the ground floor if possible.
F. The supporting structures for archives shall be of adequate strength to carry the full load, including the wet weight of the archive structure and its contents. Floor bearing capacity – 200 psf assuming books/ paper
G. Carpets are **prohibited** in Archives Vault.
H. To minimize damage by pests, the staff break, or lunchroom, should be as far away as possible from Archives Vault and processing rooms.
I. To minimize damage by water, the restrooms should be as far away as possible from Archives Vault and processing rooms.
J. To minimize damage by light, all light fixtures in Archives Vault must be LED.

Area	Light Level in Lux	Maximum UV Level in microwatts per lumen	Dimmers or Sensors Required
Exhibit Galleries	30-200	10	both dimmers and sensors required
Storage Rooms	200-500	10	sensor activated

K. Lighting must be motion activated in Archives Vault. Normal light levels must provide at least 200 Lux, but not more than 500 Lux measured 36 inches above the floor level. Levels of ultraviolet radiation must not exceed 10 microwatts/lumen. Lighting must be at least 36 inches away from holdings.
L. Occupancy sensors should be installed for lighting in the Exhibition space.
M. There shall be no windows or natural light into this space.
N. Pendant lamps and extension cords shall not be used within Archives Vault.
O. Fixed lighting shall be used for illumination of all portions of Archives Vault to preclude the use of temporary lighting

P. The floor, walls, and ceiling in Archives Vault and processing space must be primed and painted to prevent dust.
    a. An approved water-based acrylic latex paint must be used for walls and ceiling.
    b. Storage floors must be concrete, sealed to prevent dust and provide an easily cleanable surface. A low VOC acrylic membrane-curing compound must be used for the concrete floors of the Archives Vault rooms, followed by two coats of a floor epoxy. The VOC outgassing of any epoxy and floor coatings in Archives Vault and processing rooms must be limited by restricting the use of toluene and xylene in the floor coating mix.
    c. The State must approve sealants, caulks, gaskets, and weather-stripping used in the storage rooms.

Q. The following materials are **prohibited** from use in Archives Vault and processing rooms:
    a. Cellulose nitrate lacquers and adhesives
    b. Cellulose diacetate fabrics
    c. Polyurethane products, especially foams and carpet pads but including most polyurethane paints and varnishes
    d. Oil-based and alkyd resin paints and varnishes, and oil-based caulks and glazing compounds
    e. Latex paint that is based on vinyl acrylic, or styrene acrylic latex. Acrylic latex is generally acceptable
    f. Acid-curing silicone sealants and adhesives or similar products that emit acetic acid during cure
    g. Products that release ammonia during cure
    h. Sulfur containing materials that could release SO2 such as natural and synthetic sulfur vulcanized rubber, animal glue, wool, sulfur-based dyes, and disodium phosphate fire retardant treatments
    i. Most pressure sensitive adhesives and contact cements and adhesives
    j. Polyvinyl chlorine polymers (PVCs)
    k. Formaldehyde emitting compounds, especially urea-formaldehyde, such as might be found in particleboard, interior-grade plywood, and formaldehyde-finished fabrics and wall coverings
    l. Woods such as oak known to have high acid content and any wood or wood product that is not sealed to prevent off gassing
    m. Vinyl
    n. Amine based products
    o. Biocides
    p. Cellulose acetate containing fabrics and films
    q. Unsealed concrete, due to its production of fine particulate, alkaline dust
    r. Self-leveling floor compounds

R. Formaldehyde-based insulation and foam in place insulation must be avoided throughout the building and must not be used in Archives Vault rooms or exhibit galleries.

Section II: Environment

Note: Research by conservators, scientists, and other preservation specialists has shown that extremes of humidity, elevated temperatures, particulate and gaseous pollutants, ultraviolet radiation, and unrestricted lighting will damage archival and artifact holdings.

A. The minimum continuous temperature in the Archives Vault shall be 55 degrees Fahrenheit.
B. The maximum continuous temperature in the Archives Vault shall be 65 degrees Fahrenheit.
C. Temperature and relative humidity conditions in Archives Vault and processing space must be between **35 - 45%** and will be continuously monitored to not exceed +/- 5% relative humidity.
D. Archives Vault shall have a designated, separate, HVAC system.
E. Archives Vault and processing rooms and exhibit galleries must be isolated from sources of pollutants and particulates, such as the loading dock, machine rooms, or spaces where woodworking, painting, or cooking take place. Doors to the holdings rooms must not open directly onto the loading dock, machine rooms, locations where woodworking or painting take place, or other similar areas. The air intakes and returns must be designed so that lower quality air and environment does not affect the critical areas and must have direct venting to the outdoors.
F. All-air systems are preferred for the entire State Archives but are required for critical areas including Archives Vault.
G. The building envelope must be humidity tolerant, allowing the relative humidity standards to be maintained without damage to the structure. New buildings and additions must be designed to be humidity-tolerant. The ability of existing buildings to withstand the relative humidity standards must be carefully considered. Existing buildings may require specialized weatherproofing or insulation products and designs. The Archives Vault rooms must be provided with sufficient insulation to support a stable, continuous level of relative humidity and temperature.
H. Environmental control systems for the general building must be designed to provide efficient and economical seasonal climate control. Seasonal relative humidity drift may occur in actual operation of the general building system(s) to reconcile energy efficiency and external climate extremes in certain geographical locations and with certain building types
I. Archives Vault shall have a particulate filtration system to remove particulate materials form the air stream, the particulate filtration system for these areas must have a Minimum Efficiency Reporting Rating (MERV) of 14 or greater based on ASHRAE 52.2,
J. Air handling units serving Archives Vault and processing rooms must provide constant air volume and 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 holdings, volatile organic compounds (VOC) emitted within the room, occupancy, etc. The system must provide good air mixing throughout the rooms. In general, external fresh air intake must be limited to the amount required to allow human occupancy (Indoor Air Quality) and to maintain a positive pressure in storage and processing rooms. Air economizers must not be used in critical areas.

Section III: Fire and Fire Suppression

A. Alarms and alarm communications to signal presence and location of fire.
B. Fire suppression must be through an automatic suppression system. The fire suppression system must be designed to limit the maximum anticipated loss from any single fire event to a maximum of 300 cubic feet of holdings destroyed.
C. Fire barrier walls separating Archives Vault from the Reading Room and Administrative Area shall be a minimum of 2-hour fire-resistive construction.
D. Archives Vault areas shall not be constructed using exterior building walls. Fire barrier walls separating must be between Archives Vault wall(s) and exterior wall(s).
E. The wall(s) of the archives that intersect with the building wall(s) shall be bonded or keyed into the building wall(s) for the full height and width of the wall(s).
F. The State Archives vault should comply with standards for a minimum 2-hour fire door. The archive door shall have a rating, in hours of fire resistance, equivalent to the rating of the archive, as follows:
   (1) 2-hour archive – 2-hour door
G. Heating systems shall not reduce the level of humidity inside the archives to a level that results in deterioration of the records.
H. A Clean-Agency fire suppression system should be installed for Archives Vault in lieu of wet suppression. Inergen and FM 200 are approved for use. Both of these systems need to be taken into account when planning the physical layout
I. Dry-pipe systems are not permitted for any area of the building with wet suppression, unless the area is prone to freezing because it can take too long for the sprinkler to deploy, letting the fire grow too large to put out.
J. Fire panel access should be outside the Archives Vault area within close proximity to the Administrative Area.
K. Suppression systems for Archives Vault must be zoned separately from public and administrative, and other building areas.
L. Construction materials used in walls, ceilings, and floors must be rated as Class 2 (flame-spread rating of 25 or less) as tested according to the ASTM E-84 and must have a smoke development rating below 450.
M. Roof rated for fire resistance at 1/2 hour minimum, 1 hour maximum.

Section IV: Mechanics

A. Variable Air Volume systems (VAV) must not be used in critical areas including Archives Vault and processing rooms, research rooms and exhibit galleries. When VAV boxes with electric reheat are used to serve general building spaces, they must have multiple stage electric heating coils. VAV systems require separate controls to provide adequate outside air supply year-round.
B. HVAC equipment must not be mounted on the room of the facility above Archives Vault and processing space, or above the Exhibition Gallery.
C. Air handling units and other mechanical units must not be located within the Archives Vault and processing space.
D. Ductwork must be sealed to provide a leakage rate less than 3%.

E. The ductwork inside Archives Vault and processing space must be kept at a minimum while supplying the required critical environments. Ductwork must not pass through a Archives Vault to supply another area. Location of the vents and return ducts must provide even air mixing and a constant environment throughout the space while maintaining and maximizing useable space for storage equipment.
F. The HVAC system must be designed with redundancy so that modules in the system can continue operating and controlling the environment if the central station is not operating
G. Provide emergency shutdown switch for HVAC system outside of the Archives Vault, in the Administrative Area.

Section V: Security

A. All doors to Archives Vault must be monitored by door contacts. Magnetic door contacts used for this application must be resistant to magnetic defeat or tamper.
B. All the building locksets must be high security mechanical or electronic locks.
    a. Archives Vault
        i. Card Access +/- PIN
        ii. Intrusion detection: Door Contact/Motion Detection
        iii. Additional locking: Electronic-Mechanical Lock/ Cipher Lock