Supplement 1- Storage Standards for Archival Facilities

a. Design and structural standards applicable to archival facilities in addition to regulatory standards pursuant to 36 CFR 1234.

(1) Facilities must be designed in accordance with the applicable national, regional, state, or local building codes (whichever is most stringent) and applicable federal regulations to provide protection from building progressive collapse or failure of essential equipment from earthquake hazards, wind speed hazards, hurricanes, and other potential natural and manmade disasters. Holdings storage units, exhibit cases, and other containers housing NARA archival holdings must be secured to prevent collapse.

(2) When authorized to construct or alter buildings, NARA will give due consideration to local codes in accordance with 40 U.S.C. § 3312. NARA is under no obligation to conform to state or local laws, regulations, and codes, except with respect to local codes relating to earthquake hazards, wind speed hazards, hurricanes, and other potential natural and manmade disasters as specified directly above.

(3) The plans for the facility or renovation project must be reviewed by RX at each submission stage, and RX must be involved throughout the development and construction process. Plans must also be reviewed by the program office or custodial unit that will store archival holdings in the space.

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

(5) Fire resistance-rated firewalls and supporting construction must be independent of other structural building elements, so that they remain intact with complete building collapse. The location of firewalls must allow for a continuous wall assembly from exterior wall to exterior wall, and from the ground slab through the roof structure (e.g., parapet). Holdings storage rooms, which serve as dedicated holdings space for permanent storage, must also be protected. Specific fire resistance rating for firewalls or fire barriers must be designed to protect the holdings storage rooms as follows:

(a) Between adjacent holdings storage rooms - four-hour rating.

(b) Between holdings storage rooms and adjacent spaces, and between processing rooms and adjacent spaces - two-hour rating.

(6) Facility fire protection systems and structural systems must be designed by a licensed fire protection engineer and a licensed structural engineer to avoid catastrophic failure of the structure due to an uncontrolled fire on one or more levels.

(7) A floor load limit must be established for the holdings storage room by a licensed

structural engineer. 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.

(8) The building envelope must be designed to limit outside air exchange. Circulation of outside air and make-up air must be achieved through a deliberate system. Intake air must be integrated into the return side of the HVAC system serving holdings storage rooms, undergoing the same filtration and climate conditioning as the re-circulated air.

(9) A continuous air barrier must be installed as part of the entire exterior wall and roof construction of the facility, including appropriate flashing at all transitions between materials and building systems and all penetrations in the exterior enclosure. All operable penetrations in the building envelope such as doors and windows must be fitted with seals and weather stripping to minimize air and pest infiltration.

(10) The building must be designed to accommodate NARA environmental requirements in a highly energy efficient manner following Guiding Principles for Sustainable Federal Buildings created by the Office of Energy Efficiency & Renewable Energy.

(11) The building envelope must be moisture tolerant, allowing the relative humidity standards to be maintained without damage to the structure. This is a particular concern for facilities in a cold climate.

(12) Vapor barriers must be installed between any two areas that have different humidity and temperature requirements. Within the building envelope, areas for storing, processing, and displaying holdings must be separated from other parts of the building by a non-permeable air barrier. The holdings storage rooms must be provided with sufficient insulation to support the required level of relative humidity and temperature. NARA requires the following minimum building envelope insulation requirements. Where the local or national code exceeds these minimum requirement values, use the most extensive local or national code.

(a) Minimum roof insulation standard is R-30.

(b) Minimum wall insulation standard is R-19.

(13) Vestibules must be considered as a means to stabilize the environment in holdings storage rooms. The processing room can serve as a vestibule to the holdings storage room. Doorways, duct runs, sprinkler runs, and all other penetrations in holdings storage room must be well-sealed as appropriate to limit the flow of air in and out of the room.

b. **Standards necessary to protect holdings against water damage**
All standards must be applied in accordance with national, state, or local building codes,

whichever is the most stringent.

(1) **Location of facility.** The facility must be sited a minimum of five feet above and 100 feet away from any current 100-year flood plain area, or be protected by an appropriate flood wall that conforms to local or regional building codes.

(2) **Roof.** The facility design must ensure that the roof membrane does not permit water to penetrate the roof. Equipment must be mounted with sufficient roof clearance to allow future replacement of the roof without the need for disconnecting or removing the equipment.

(a) Major HVAC equipment must not be mounted directly above holdings areas. Roof penetrations are prohibited over holdings storage rooms, processing rooms, and exhibit galleries.

i. Small fans and vents can be roof mounted but must not be located over any holdings areas.

ii. To allow future replacement of the roof without the need for disconnecting or removing the equipment, any equipment mounted on the roof must be panned and drained.

(b) Avoid roof penetrations, including vents, over holdings areas. Local codes may require automatic roof vents designed solely to vent in the case of a fire. During cold weather, there is a risk of condensation on metal components of these vents because of the humidity requirements in holdings storage rooms. Extra caution is required to ensure these vents are properly sealed and insulated to avoid condensation and water damage to the holdings.

(c) Do not install windows, skylights, or sloped glazed windows in areas where holdings are stored, processed, or displayed.

(3) **Piping**

(a) Do not run piping (except fire protection sprinkler piping) through or directly above holdings storage rooms, research rooms, processing rooms, exhibit galleries, or any other area where holdings are routinely present. The term “Research room” as used herein shall refer to a secure room where researchers may use original holdings and which require researcher identification cards for entry.)

(b) Mechanical rooms and mechanical equipment, including water tanks and cooling towers, must not be located over any holdings storage, processing, or research rooms, or exhibit galleries. When major equipment is located adjacent to holdings storage, special precautions must be taken to guard against water infiltration. These measures may include drain pans, recessed floors, raised areas, water detection systems, and sump pumps.

(c) If drainage piping from roof drains in existing buildings runs through holding storage rooms, 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 records storage room. Vertical pipe risers in records storage rooms should be fully enclosed by shaft construction with appropriate maintenance access panels.

(d) No fountains, pools, or standing water are allowed over or adjacent to areas where holdings are stored, processed, used, or exhibited.

(e) All pipes must be tested and found to be watertight prior to concealment in walls, floors, or false ceilings.

(4) **Location of holdings within the NARA Archival Facility**

(a) Do not store holdings below grade, adjacent to water sources, or in any locations vulnerable to water infiltration, such as below gardens, parking lots, plazas, driveways, or roadways where traffic can impact the integrity of the roofing system and cause leakage or moisture infiltration into storage rooms.

(b) Cave/underground facilities may be exempted from the requirement for above-ground storage if the facilities meet the other standards in this directive.

(c) Store records at least three inches from the floor.

(d) If storing records along an exterior wall, maintain clearance between the wall and records to prevent condensation and facilitate inspection and cleaning.

(e) Holdings must not block vents or returns. This requirement will necessitate coordination between the HVAC system(s) design and the layout of storage furniture.

(f) The location of ductwork throughout storage and exhibit galleries must be designed to meet the required environmental conditions while providing the maximum amount of usable space.

(g) If holdings are stored on the shelving canopy, they must be housed in closed-lid containers and otherwise protected from water. NARA's testing has shown a shelving canopy protects holdings from water damage in the case of sprinkler, roof, and other leaks, and distributes sprinkler discharge more efficiently in the case of fire.

c. **General heating, ventilation, and air conditioning (HVAC) requirements**

(1) Holdings storage rooms must be served by dedicated HVAC system(s) that are separate from those serving the remainder of the facility. The system(s) may be stand-alone units or fully integrated systems. All other areas of the building may

share the same HVAC system(s), although certain areas may require additional controls.

(2) Air handling units serving holdings areas must provide sufficient air exchanges and mixing to maintain requirements for temperature, relative humidity, pollutant control, and positive pressure. The system should be designed and operated following ASHRAE Standard 62.1 - 2016, Ventilation for Acceptable Indoor Air Quality. Occupant density values for holdings areas must be based on consultation with NARA, not default values.

(3) Redundant equipment such as fans, heating and cooling coils, humidification supply, dehumidification systems, pumps, and controls should be considered for holdings storage rooms in order to maintain conditions during maintenance or equipment failures. One hundred percent redundancy in air handler units provided by one additional unit or with load transfers from non-holdings areas should be considered.

(4) Air handling units and other mechanical units must not be located within the holdings storage and processing rooms. Exceptions include certain stand-alone designs that must be approved by B. Cooling coils and associated fans may be located within the cold storage room(s). However, the remaining mechanical components must be placed outside of the cold storage room.

(5) To reduce intake of pollutants and to maintain temperature and humidity levels, holdings storage rooms 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. Some spaces in the building, including the loading dock, exhibit production rooms, and areas where food is prepared, must be kept under negative pressure in relation to adjacent spaces.

(6) Areas where holdings are used, processed, stored, or exhibited must be isolated from sources of pollutants and particulates, such as the loading dock, machine rooms, food preparation areas, or rooms where woodworking or painting takes place. Doors to the holdings 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 for such locations must have direct venting to the outdoors and must be designed such that lower quality air and environment cannot affect the holdings areas.

(7) To prevent the introduction of contaminants in the supply air, all outside air intake grills/louvers must be located at least 12 feet above the ground level and away from sources of external pollution, including areas of vehicular traffic, loading docks, and where automobiles, buses, and trucks idle.

d. **Requirements for pre- and post-occupancy testing for environmental conditions in holdings areas**

(1) The HVAC system must undergo a pre-occupancy purge sufficient to test all

systems and to remove construction dust from the ductwork and system components.

(2) Systems serving holdings areas should be operable and tested before the required aeration period, which is running the HVAC system with the filtration systems on a continuous basis for at least four weeks prior to moving holdings into the building. This will allow the system to be monitored and any necessary adjustments to be made prior to holdings exposure.

(3) The mechanical contractor for the project must be retained for 12 months after NARA accepts the building or project, and with the design engineer, must make any adjustment necessary to maintain the environmental requirements established for the project.

(4) For maximum energy efficiency, the HVAC system needs to be balanced after the holdings are shelved. The humidity buffering capacity of the holdings should also be considered. "Buffering capacity" refers to the time needed for holdings in containers to equilibrate with the temperature and relative humidity of the storage space. The buffering capacity of large volumes of cellulose-based materials is maximized at low air exchange rates.

e. **Temperature and relative humidity conditions appropriate for the preservation of holdings**

(1) The environmental conditions set out for NARA holdings takes into account: the expected holdings lifetime to be achieved, the materials and structures of holdings and their sensitivity to changes in temperature and relative humidity, as well as energy efficiency, local climate, and the significance of the records and national security classified records. In general, cooler temperatures and drier relative humidity conditions effectively extend the useful life of the holdings.

(2) **Supplement 2, Table 1** sets out the permissible upper and lower temperature and relative humidity conditions in areas where holdings are stored, processed, exhibited, and used. Fluctuation between these upper and lower limits is acceptable. (**See Supplement 2, Table 1, Temperature and Relative Humidity**)

(3) "Seasonal drift" describes the slow and gradual changes in the targeted indoor temperatures of holdings storage rooms that allow for closer alignment with outside temperatures. Drift benefits the energy efficiency of NARA facilities and may be used in actual operation of the general building systems(s) to reconcile energy efficiency and the external climate. For example, during the winter, storage rooms can be heated and humidified at the lower limits in Supplement 2, Table 1. Because lower temperatures provide enhanced preservation benefits, the additional cost and resources needed to heat a storage room to a higher allowable temperature or to maintain a flat line condition has no preservation benefit.

(4) When required storage conditions specified in Supplement 2, Table 1 are not available, the Custodial Unit must consider significance of the holdings,

sensitivity of the materials, and practical considerations when determining storage locations. Holdings with higher significance and/or higher sensitivity have higher priority for required storage conditions.

(5) Outdoor air design criteria must be based on weather data tabulated in the latest edition of the ASHRAE Handbook of Fundamentals. Winter design conditions must be based on the 99% column dry-bulb temperature in the ASHRAE table. Summer design conditions must be based on the 2.5% column dry-bulb temperature with its corresponding mean coincident wet-bulb temperature. In holdings areas that require temperature and relative humidity to be maintained to close tolerances, cooling loads must be based on the 1% column dry-bulb temperature with its corresponding mean coincident wet-bulb temperature.

f. **Requirements for monitoring and reporting environmental data**

Environmental monitoring data and reporting provides the critical evidence needed to optimize preservation environments. Archived data from the building management system that operates the HVAC equipment and from independent data loggers documenting the actual room conditions is required. NARA facility staff and RX must regularly review environmental data to identify concerns. When targeted conditions are not being met, appropriate actions will vary according to building ownership and lease provisions and management.

(1) **Building Management System**

(a) Temperature and relative humidity sensors, thermostats, and humidistats controlling the HVAC system must be located inside the spaces, not only within the return ducts. Depending on the size of the room and the configuration of the systems, multiple sensors may be required in a single room in order to maintain NARA requirements. When multiple sensors are used, data should be averaged for reporting and control.

(b) The outdoor temperature and relative humidity must also be monitored.

(c) The sensitivity of sensors must be at least within 2º F and 2% relative humidity.

(d) Twelve months of temperature and humidity data from the HVAC control systems must be maintained and made available upon request by RX for review. Trend data for the previous five years should be archived and similarly available for review. The temperature and humidity data should be recorded at least hourly.

(e) Facility managers in NARA-owned facilities must maintain the HVAC systems and integrated monitoring equipment according to manufacturer's specifications. The NARA facility manager or Field Support Officer is responsible for reviewing building management data and, in consultation with RX, for coordinating responses when conditions are not maintained.

(2) **Preservation Monitors**

Independent room monitoring using a separate system of data loggers according to RX guidelines is required in addition to the HVAC control systems.

(a) Temperature and relative humidity conditions in holdings areas must be monitored in a sufficient number of locations and recorded at regular intervals.

(b) NARA facility and custodial units are responsible for implementing the independent environmental monitoring program and inputting data quarterly.

(c) When conditions are not being maintained, consult with RX to determine the potential preservation impact on the holdings and to discuss any needed mitigation strategies.

g. **Limits for air pollutants: particulates and gasses**

Externally and internally generated pollutants can cause paper and photographic materials to become brittle and contribute to fading and yellowing, and contribute to corrosion of some artifacts. Particulates in the form of dust or other matter is abrasive and will damage the surface of most materials, particularly film-based and magnetic media and certain artifacts. Gaseous pollutants can build up in enclosed spaces such as exhibition cases and storage containers. The strategy outlined below focuses on evaluating, monitoring, and mitigating the risks from specific air pollutants that pose the most significant risks to most NARA holdings. Supplement 2, **Table 2** lists the allowable concentrations for specific air pollutants.

(1) **Pollutant Testing**

(a) Baseline gaseous pollutant testing using passive monitors according to RX guidelines is required to determine levels of gaseous pollutants in holdings areas. Selection of monitors will consider geographic factors (e.g., seasonal changes in outdoor pollutant levels), building-scale variables (e.g., street-level air intakes exposed to more vehicle pollutants compared to upper-level intakes), and the holdings in particular rooms (e.g. sensitivities that depend on material type, age, etc.). Results will be reported to RX.

(b) For areas where the pollutant levels exceed the limits in Supplement 2, Table 2, a mitigation strategy will be developed in consultation with RX and facility staff. This strategy might involve inspection of filter installation, replacement of spent filters, relocation of problematic materials (e.g., severely degraded acetate films), or other measures. Holding-level monitoring down to the container level may be used to identify the mitigation strategy. Follow-up monitoring will evaluate the success of the mitigation steps.

(c) The NARA facility manager or Field Support Officer is responsible for ensuring that particulate and gas filtration systems are maintained according to manufacturer's specifications and ameliorating problems as

they develop. Ongoing issues with filtration systems should be reported to RX.

h. **Required filtration systems**

(1) Gas-phase and particulate filtration systems are required in any air handling unit serving the holdings storage spaces.

(a) Both the return air and make-up air must be filtered.

(b) The gas-phase filter must be located before the final particulate filter.

(c) Filters must be easy to access and change.

(d) For new construction, an aeration time of at least four weeks running the HVAC system with the filtration systems on a continuous basis before holdings are moved into the space must be built into the project schedule.

(2) **Gas-phase filtration system.** The filtration system may be a combination of chemisorption, adsorption, and/or catalytic processes. The system must be designed to allow access to detectors for periodic monitoring upstream and downstream of the filters to evaluate performance.

(3) **Particulate filtration system.** The particulate filtration system for archival holdings storage 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. A pressure drop measurement system or other equipment must be provided to determine when the filters need to be changed.

i. **Required humidity control systems**

(1) The air handling units serving holdings areas must be designed for dehumidification and humidification.

(a) Dehumidification may be provided through reheat of cooled air or desiccant dehumidification systems.

(b) Humidification must be achieved by a clean steam injection system (such as an electronic steam humidifier) or equivalent system located downstream of the filtration system.

(2) The water source to humidification units must remove salts and other chemicals dissolved or carried by the water. Acceptable filtration systems include reverse osmosis and deionization.

(3) Failsafe systems to ensure that relative humidity in holdings areas does not exceed those specified in Supplement 2, Table 1 are required. There must be a humidistat downstream from the humidifier that detects excessive humidity and shuts the

humidifier down rather than relying on the humidity sensors in the space.

(4) Humidification units and water supplies and drains must be designed to prevent any water leakage or overflow. The design of the system, including condensate drainage, must ensure that the system does not generate or harbor microorganisms.

(5) Humidifiers must be installed with 100% of the make-up air capacity in the base unit and 100% capacity in the zone ducts. Monitors and alarms must alert staff to over-production of humidity or a leak in water supply lines.

(6) Humidifiers must be on the supply side of the unit and must be sized based on the intended design parameters.

(7) The humidifier must be in a stainless steel duct section and must include a drain section to remove any moisture that condenses out of the air. Recovery of condensate water for reuse is encouraged.

j. **General requirements for archival storage shelving**

(1) A shelving plan that provides appropriate storage for the size and quantity of holdings and artifacts and that facilitates storage procedures that protect holdings while allowing efficient storage and access must be developed in consultation with RX. The storage plan must specify specialized shelving or adjustments to standard shelving for oversized or non-textual holdings, artifacts, and other holdings that cannot be stored safely or efficiently in standard archival configurations.

(2) Storage shelving, as appropriate to the need, may be either fixed (static) type or electrically operated compact mobile type.

(3) Only all-steel storage shelving is acceptable for archival storage. Storage shelving must have a powder-coated surface finish using a dry powder epoxy coated finish or best equivalent available that passes NARA-conducted or independent lab tests for hardness, coating stability, bending, coating adhesion, coating durability, and off-gassing limits. Powder coating must not be applied to metal surfaces onsite in the holdings storage room. For certain specialized artifact storage units, aluminum may be acceptable.

(4) The shelving must be installed, braced, and otherwise secured to prevent deflection, lean, or collapse under full load during normal use. In addition, installed shelving systems, including compact mobile shelving, must be laterally braced against seismic forces, as required by the International Building Code (IBC) and applicable local building code, either through top bracing or rotational restraint at the base.

(5) All shelves should be adjustable at a maximum of 1 ½-inch height intervals, with dimensions to accommodate the size and number of storage boxes indicated on the storage plan.

k. **The construction and finish of materials that may be used in holdings areas**

(1) NARA must approve all materials affecting the air quality in holdings areas and exhibit cases. NARA may test or direct the testing of materials to assess suitability and document approval. Sufficient time to undertake testing must be incorporated into planning and construction schedules. Materials such as paint, varnishes, caulks, and adhesives that can emit volatile organic compounds (VOCs) are of particular concern.

(2) Information on products proposed for use in holdings areas, including the specific product name, manufacturer, material safety data sheet, and intended use, must be submitted to RX for review. Initial selection of no- or low-VOC emitting materials is advised and will increase the likelihood that a product is approved for use in holdings areas.

(3) The following materials are known to off-gas harmful pollutants and are prohibited from use in holdings storage rooms, including exhibit cases that will display original holdings.

(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 SO_2 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 encapsulated to prevent off-gassing

(m) Vinyl tile

(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 compound

(4) Ensure that all surfaces, including concrete, stone, and similar porous materials, do not produce dust, grit, or particulate matter by sealing the surfaces with an appropriate approved material.

(5) Use a no- or low-volatile organic compound (VOC) acrylic membrane curing material for exposed concrete, stone, and similar floors in holdings areas; after which, apply an approved low- or no-VOC floor epoxy on floor surfaces. Inorganic sealants that are no- or low-VOC, especially those based upon sodium silicates, can also be used to finish concrete, stone, and similar floors.

(6) Use a water-based acrylic latex paint to seal walls and ceilings. Consider special coatings to seal exposed rock surfaces in underground holdings storage rooms to prevent release of dust and rock debris.

(7) If ceiling pipe or exterior stack wall metal panels on shelving are to be painted, use an acrylic water reducible primer covered by two latex paint coats.

(8) Wood products including particleboard, pressboard, and similar wood composite panels must not be used inside holdings storage or processing rooms or be exposed to the air space within exhibit display cases.

(9) A minimum aeration time for off-gassing of new construction materials prevents an accumulation of pollutants from building up in rooms and enclosed exhibit cases.

(a) Four weeks between the time construction in holdings storage rooms is completed and holdings are moved into the rooms is recommended and should be built into the schedule.

(b) Newly constructed or renovated exhibit casework must be completed four weeks before installation of holdings. During this period, keep exhibit cases open to dissipate chemical off-gassing from exhibit case components. Do not install NARA holdings in casework if there is a discernible smell indicating off-gassing chemicals. Consult RX for guidance.

l. **Light exposure guidance**

(1) All sources of natural and artificial light can cause damage to holdings such as

fading and chemical degradation that affects the mechanical properties of materials. Light damage is cumulative and proportional to exposure and can be reduced by limiting the levels and/or the duration of light exposure. Acceptable visible lighting levels will depend on the sensitivity of the holdings and length of exposure. UV light should be eliminated or minimized.

(2) Occupancy sensors, user activated lighting, or other methods that activate lighting only when a user is present are preferred in holdings storage rooms and may be used to extend the length of an exhibition while complying with the specified exhibit time for an individual holding and provide additional energy efficiency.

(3) Natural light must be excluded from holdings storage rooms and exhibition galleries. If windows exist in any research, processing, or lab areas, use black-out curtains, scrims and filters, or other barriers or techniques to meet the requirements for visible, ultraviolet, and infrared radiation.

(4) A separate low-intensity maintenance lighting system for cleaning and a low intensity lighting system for security are recommended for exhibition galleries.

(5) Light must be monitored to determine the visible light levels and the amount of ultraviolet radiation falling on holdings. Measure light intensity at the same angle and in the same plane as the surface of the holding.

(6) **Holdings areas**

(a) Light levels in holdings storage rooms are required to be within 200–500 lux measured 36 inches above the floor level.

(b) Light levels in processing, research, preservation, conservation, digitization, and other areas where holdings are processed or used may be normal office level.

(c) When records are protected by a box, cabinet, or other enclosure, UV filtration is not required. The specification for UV radiation is 400 nanometers in wavelength in stacks when holdings are not protected by a box, cabinet or other enclosure.

(7) **Exhibit areas**

(a) Lighting must have the capability of full control for light levels 0–200 lux with holdings illuminated to the appropriate maximum levels as outlined in NARA 1573(A5).4.

(b) UV filtration is required so that UV radiation below 400 nanometers in wavelength falling on any holding does not exceed 10μ W/lumen.

(c) The visible light levels illuminating any holding and the length of time the holding is on display will be determined by the custodial units, in consultation with RX.

(d) Choose lighting technologies that do not generate heat or dissipate the heat generated from lamps or their housings so that holdings are not exposed to temperatures above 75°F.

m. General fire-safety requirements for NARA archival facilities

(1) NARA archival facilities must comply with requirements and recommended practices specified in NFPA 232-2017, Standard for the Protection of Records, unless a requirement in this directive is more stringent.

(2) A water-type portable fire extinguisher should be located in holdings areas when required.

(3) Do not install mechanical equipment containing motors rated in excess of 1 HP within holdings storage rooms.

(4) Do not install high-voltage electrical distribution equipment (i.e., 13.2kv or higher switchgear and transformers) within holdings storage rooms.

(5) Penetrations in the walls must not reduce the specified fire resistance ratings.

(6) 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.

n. **Smoke detection system requirements**

(1) Holding areas 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.

(2) Locate smoke detection devices to provide a 99% reliability of detecting the origin of the fire in less than 5 minutes. Use photoelectric-type detectors in holdings storage rooms.

o. **The requirements for automatic sprinklers**

(1) All holdings storage and adjacent areas must be protected by a professionally designed automatic sprinkler system that is designed to limit the maximum anticipated loss from any single fire event to a maximum of 300 cubic feet of holdings destroyed. Sprinkler systems for holdings storage rooms must be separately zoned from other building areas.

(2) A wet sprinkler system, installed in accordance with NFPA 13, Standard for the Installation of Sprinkler Systems, must be used except for in cold storage rooms as provided in ***subpar. c.***

(3) Clean agent systems that comply with NFPA 2001, Standard on Clean Agent Fire

Extinguishing Systems, pre-action sprinkler systems, or dry pendants must be used in cold-storage rooms and other areas subject to temperatures below 40°F, and may be used in holdings storage vaults and holdings storage rooms specifically designed for artifacts.

p. **Security requirements for NARA archival facilities**

(1) The initial Facility Security Level (FSL) determination will be made as soon as practical in accordance with the Interagency Security Committee (ISC) Risk Management Process after the identification of a space requirement. The FSL determination ranges from a Level I (lowest risk) to Level V (highest risk). The determination should be made early enough in the space acquisition process to allow for the implementation of required countermeasures (or reconsideration of the acquisition caused by an inability to meet minimum physical security requirements). BX has the lead on making this determination.

(2) The facility and designated storage areas and exhibit cases must have a centrally monitored anti-intrusion alarm system to protect against unauthorized entry.

(3) The facility must enforce controls on access to the facility and all holdings storage rooms.

(4) Special security measures may be required for holdings storage vaults to comply with national security information requirements or to protect materials of high intrinsic, monetary value or specially protected holdings.

(5) BX will schedule compliance inspections of the facility based on the final FSL determination.

q. **Monitoring and maintaining the building conditions**
The NARA facility manager or Field Support Officer must ensure that:

(1) Schedules are developed for maintenance and calibration of control system devices for all major building systems in accordance with manufacturers' recommendations;

(2) Scheduled equipment maintenance is performed promptly; and

(3) Schedules are reviewed and updated annually.

r. **Frequency of building condition surveys conducted at NARA-owned facilities**
To ensure that archival facilities subject to this directive meet the standards, BF should conduct (or contract for) building condition surveys according to the following schedule:

(1) **New facilities.** Once before acceptance of a new archival facility, at two years, and again when 10 years old. After 10 years, follow the schedule for existing facilities. If any "punch-list" items are identified in the inspection before acceptance, BF must monitor correction/completion of those items.

(2) **Existing facilities.** Every five years. When an existing facility is renovated or

significantly modified, the five-year cycle begins again in the fiscal year following completion of the renovations or modifications. A pre-acceptance inspection is performed for building renovations. If any "punch-list" items are identified in the inspection before acceptance, BF must monitor correction/completion of those items.

(3) RX reviews building condition surveys. Critical issues are reported during Preservation Reviews.

s. **Assessment of facility condition and maintenance at GSA- and commercially leased storage facilities**

(1) Field Support Officers liaise with NARA lease managers, GSA, landlords, and their contractors to coordinate inspection and maintenance programs at each facility to identify and respond to problems.

(2) RX consults with Field Support Officers and custodial units at the facilities during Preservation Reviews and after records emergency incidents to evaluate inspection and maintenance programs and risk management and reports significant issues.