



**Canadian Council of Archives
Conseil canadien des archives**

Basic Conservation of Archival Materials : Revised Edition, 2003

Chapter 4 – Care

Introduction

Care of an archival collection must be an ongoing part of daily activities. If the collection is in good order, staff will be more likely to care for, and reshelve items.

Handling

Each time you handle archival materials carefully and correctly, you are practicing “hands-on conservation” in its most basic sense. Every archive can promote good handling techniques – among researchers as well as staff – as a means of keeping the collection in good condition.

Handling Procedures for Staff

- Handle archival materials as little as possible.
- Wear cotton gloves or latex gloves when handling photographs.
- Do not apply hand lotion or cream immediately before handling archival materials.
- Use both hands or a temporary support when holding and carrying items, especially if they are fragile.
- Plan ahead before moving archival records. Clear the route, open doors and remove obstructions. Make sure that there is space available to put the item down at your destination.
- Don't try to carry too much at once. Use a trolley or a book truck or make several trips.
- House all archival materials in archival quality enclosures.
- Choose a box of an appropriate size for the material that is to be stored in it. The contents should be able to be easily removed and replaced. A partially empty box should be “filled” with loosely wadded acid-free tissue or with spacers of mat board or acid-free cardboard so that the materials are held upright. Don't overfill the box.
- Provide adequate shelf space for each box or object. Resist the temptation to force just one more box on the shelf.
- Use a locking stepladder to reach collections on upper shelves. Pulling anything off a high shelf from ground level creates the risk of damaging materials or injuring a staff member.
- Isolate new accessions on arrival until they have been examined for signs of pest activity and mould. Never house mouldy or pest infested collections in your main storage area.

For Archival Materials in Use

- Limit the number of records provided to a researcher at one time.
- Provide adequate space for researchers so that records can be handled safely.
- Always remove the record from its protective enclosure by pulling on the enclosure, not on the object.
- When making photocopies, do not force archival materials onto the copier plate.
- Never use pens when working with archival materials. Always use pencil, which can be erased if a document is inadvertently marked.
- Reshelve materials promptly.
- Do not circulate or lend deteriorated material. Have copies made for these purposes. If damaged documents or photographs must be used before they can be conserved, encapsulate them to reduce the risk of further deterioration.
- Check all material when researchers return it after use. By undertaking this survey, you not only review its condition but you indicate to researchers that you are monitoring their use of the material.
- Treat minor problems immediately, before returning items to the general collection. Flatten folded corners, remove staples and other metal clips, elastic bands, and all other fasteners that can cause discolouration and staining. Place books with loose spines or covers into boxes, provide support for photographs and drawings with brittle backing boards, and so on.
- When archival materials must be clipped together use only plastic, plastic coated, anodized aluminum or stainless steel paper clips. A slip of acid-free paper should be placed between the clip and the archival document to prevent marking the document.
- Pressure sensitive adhesive tapes should not be used on any archival records. Adhesive tapes tend to discolour over time and stain the record. "Archival quality" adhesive tapes, while perhaps better than other adhesive tapes, are not recommended as long-term aging tests still show inconclusive results.

Encapsulation

Encapsulation is a method by which a clear, plastic sleeve is used to enclose damaged and/or heavily used documents. Encapsulation allows for easier handling of documents and can also offer support for oversized records. Clear plastic film of polyethylene terephthalate/polyester is used to sandwich the document between two sheets of the film. Trade names for polyethylene terephthalate include DuPont Mylar Type D and Melinex Type 516. Using double-sided 3M # 415 tape to hold the two sheets of polyester together is an inexpensive alternative to heat or ultrasonic welding of the polyester film. The CCI Notes 11/10 *Encapsulation* gives a detailed description on how to encapsulate a document with polyester film.

Certain records should not be encapsulated as an electrostatic charge can build up on the polyester film causing particles of loosely bound surface medium to lift off the paper and cling to the polyester film. Records that should not be encapsulated include:

- charcoal, chalk, pastel, soft pencil or media with flaking or unstable paint
- parchment or vellum, as the inks and colours generally do not penetrate into the skin, but instead sit on the surface
- damp or mouldy materials

Rules for Researchers

Draw up a list of rules for researchers and make them a condition of use of the archives. Staff should understand the preservation principles underlying the rules in order to administer them effectively. The rules suggested below may be reproduced on a handout to be shown to each researcher.

1. Eating, drinking and smoking are not permitted in the archives.
2. Coats, brief cases and large bags should be left at the coat rack or in the lockers provided.
3. Use a pencil for taking notes rather than a pen or markers. Consider supplying researchers with pencils as a way to ensure that this requirement is met.
4. Handle archival materials carefully. Never write on, or use these materials as a backing pad while writing.
5. Do not force bound materials (books) open. Support the book covers from beneath to avoid strain on the hinges.
6. Archival material must not be marked, cut, torn, folded, soiled or in any way damaged. Any accidents, or the discovery that records are damaged or not in order, should be reported at once to the staff.
7. To prevent unnecessary exposure to light, keep material covered or in its protective box or folder when not in use.
8. Keep all materials in order within the proper box or folder.
9. Do not remove records from their protective Mylar sleeves or envelopes without permission.
10. Use cotton gloves when handling photographs.
11. All photocopying will be done by staff.
12. Archival material may not be removed from the archives for any reason. Researchers should be prepared to present bags and briefcases for inspection when leaving the archives. [Alternately, the policy may be that bags and briefcases must be left with the security guard or archivist.]

Alternatives to Handling Original Materials

Substituting a reproduction for the original is the best way to protect records which are fragile or frequently used. Common methods of reproduction include photocopies, photographs, microforms and digital scanning.

Photocopies

Making photocopies is the least expensive method and is acceptable for most archival records and is safe for most archival records and acceptable for most researchers' needs. Avoid repeated photocopying of any item as the exposure to the intense light causes fading and added handling increases the risk of damage. Make one high-quality photocopy or photograph and use it as a master for all further copying.

It is easy to damage fragile records on a photocopier. To prevent damage:

- Don't force the record flat onto the copier plate.
- Tightly bound books should be copied on a book photocopier which has an angled platen which decreases stress on the binding.
- Don't copy records larger than the photocopier platen as the record may be damaged when it is moved as each record segment is copied.
- If a large format copier is to be used with oversized records (e.g. maps, plans) a polyester sleeve should be used to minimize risks associated with handling and mechanical feeder problems
- Don't use the automatic feed option for copying records as they can get stuck in the machine and damaged.
- Remove fasteners or clips prior to photocopying.

Paper used to make archival photocopies should meet the standard, "Copies from Office Copying Machine for Permanent Records" – ASTM D 3458-92.

Photographs

Photography is a more expensive option than photocopying. However, photography does have the advantages of providing high-quality copies of good permanence and exposing the records to less light exposure and less risk of damage from handling than photocopying.

Microforms

Microforms, either microfilm or microfiche, are often used as substitutes for rare or fragile records. Records like newspapers, which are bulky and have a high potential for deterioration but which are valued for their informational content may be more stable and useful in this form.

Preservation microfilming is a multi-step process. Ideally, two silver halide master negatives and one use copy should be made. One silver halide master copy should be stored in a secure off-site location with temperature and relative humidity controls. The second silver halide master copy becomes the master from which the user copies are made. User copies are generally diazo or vesicular films.

Excellent procedures and guidelines for preservation microfilming can be found in the Research Library Group's *Archives Microfilming Manual* edited by Nancy Elkington.

Digital Copies

Scanning is another method used to make copies of original materials. Scanning is relatively inexpensive and enables archives to make collection material available digitally over the Internet on portable magnetic or optical media. Advantages to this method include the ability to make multiple, exact copies; no loss between generations; and the ability to use advanced search, retrieval and manipulation of the data. Handling methods used for making photocopies should be followed for scanning.

Housekeeping

Basic housekeeping is lacking in glamour but is an essential part of archival work. A clean, neat well-organized storage area helps to prevent accidents, and reduces deterioration of the collection from soiling and physical damage. It also encourages staff and researchers to respect the collection.

Regular housekeeping duties should include:

- Inspecting archival storage areas weekly, or at least monthly, looking for poor shelving of records, water leaks, presence of pests, etc.
- Organizing a regular cleaning programme to ensure that storage areas, work room surfaces and reading tables are clean and dust-free.
- Restricting eating, drinking and smoking to designated areas elsewhere in the building or outside. The presence of food crumbs or drink spills encourages pests and can cause staining of archival materials, while smoking produces pollutants and increases the risk of fire.

Storage Area

A well-designed storage area has sufficient unused space to allow for expansion of the collection. The layout of the storage area should serve the needs for both the collections and staff. The storage area should:

- Have aisles wide enough to allow people to pass each other without bumping into or brushing against shelved materials.
- Have the lowest level of shelving at least 10–15 cm above the floor.
- Have shelves and cabinets set away from outside walls and position them in a way that allows air to circulate around them.
- Not have shelves situated near water pipes, heating pipes or any other source of heat.
- Position light fixtures over aisles rather than over shelving for efficient use of lighting.
- Have several large, flat surfaces available throughout or near the storage area for the examination of maps or contents of archival document boxes.

- Have no archival materials stored on the floor as they are at greater risk from water damage and pests. Have a supply of 2 x 4"s on hand so that if a large collection arrives and must be set on the floor the 2 x 4"s can be used to create a temporary platform.

Storage Systems

In most archives, storage systems consist of shelving. Shelving units should be strong and made from a material that does not adversely affect the collection stored on them.

Shelves, whether metal or wood, should have no sharp edges or corners, and their surfaces should be smooth and non-abrasive. Shelving units for archival storage must be solidly braced if freestanding, or secured to a wall or to the ceiling. A top cover on the shelves is advisable to reduce the amount of dust settling on materials and reduce water damage from a roof leak, burst pipes or an activated sprinkler system.

Storage systems must be tailored to the various types of materials in the collection. While open shelving can usually accommodate document and book storage, certain other materials such as microfilm, framed art, oversized maps and architectural drawings require specialized systems such as drawers or cabinets.

Shelving units are generally made from steel with either a powder coating or baked enamel coating or wood.

Powder Coated Steel

Powder coated steel is often the preferred choice in storage units as it appears to be the most non-reactive of the shelving choices. Unlike some baked enamel units, powder coating does not appear to off-gas any damaging byproducts. Powder coating is made by heat fusing synthetic polymer particles onto the steel forming a tough continuous surface.

Baked Enamel Steel

Baked enamel steel shelving has long been considered the shelving of choice due to availability and cost. However, in recent years there has been concern about potential off-gassing byproducts, such as formaldehyde, being released by shelving that has not been baked at the appropriate temperature or for an insufficient amount of time. However, these off-gassing byproducts are only considered to be a serious problem in areas with very poor air exchange rates and in enclosed storage units such as map and filing cabinets.

Wood

Wood is not recommended as shelving materials as all woods release a variety of damaging acidic emissions. The amount of acids emitted varies among species and types of wood used (interior grade plywood, exterior grade plywood, medium density/high density overlay plywood (MDO/HDO), etc). If wood must be used to construct shelves or other storage units the following recommendations should be followed:

- Use medium- or high-density overlaid plywood (MDO/HDO).
- Seal all wood surfaces especially the edges of wood panels as they emit substantially more acidic off-gassing byproducts than the surfaces.

No sealant provides complete protections from acidic emissions. The choice of sealant is important as sealants vary in their ability to act as a barrier.

- Choose exterior grade plywood over interior grade where ever possible for reduced levels of formaldehyde.
- Airtight enclosure (i.e. exhibition case with and air exchange of rate of 1/day): Seal wood with a two-part epoxy or two-part urethane paint which dries by catalyzed polymerization. Allow a four-week drying time before using the exhibition case. (Tétreault 1999:6)
- Leaky enclosure (i.e. map cabinet): Seal wood with a two-part epoxy, two-part urethane paint or a water-based acrylic latex paint which dries by coalescence. Allow a two to four week drying time. (Tétreault 1999:6)
- Open enclosures (i.e. shelving): Seal wood with a two-part epoxy, two-part urethane paint or a water-based acrylic latex paint which dries by coalescence. Allow a four day drying time. (Tétreault 1999:6)
- Sealant efficacy increases with the number of sealant coats.

Barrier Films

Barrier films such as Marvelseal 360, an aluminized polyethylene/nylon laminate, provide an impermeable barrier to emissions from wood. These films are shiny from the aluminum layer and can be ironed directly onto the wood.

Compact Storage Units

Compact or high-density storage units are shelving units that are designed to move on tracks. Compact storage units are particularly attractive for archives with space limitations or archives which have run out of room as compact units can hold many more records in the same storage space.

Exhibition of Archival Records

Many archives arrange exhibits as a way of increasing the public awareness of archival holdings. Exhibits can, however, place the archival materials at risk from light damage, poor handling, poor exhibition display and transportation.

Exhibit Policy

Archives that exhibit collection materials should have an exhibition policy for both in-house and external programmes. This policy should clearly outline:

1. Environmental requirements (light, temperature, relative humidity) for exhibition of original materials.
2. When original material will be loaned and when reproductions will be loaned. Lend original material only if it is in sound condition.
3. Security requirements.
4. Exhibition case or matting/framing requirements.

5. Staff/volunteer authority for approving exhibitions, condition reporting, transit of loan/borrowed materials, insurance, consulting a conservator, etc.
6. When lending documents to another institution, it is recommended to:
 - Prepare a condition report on all items to be loaned, and make some form of copy of each object. A photograph is the most useful type of copy.
 - Keep detailed exhibition documentation. This can include a facility report of the borrowing institution outlining environmental controls, security, etc.; complete condition reports, photo-documentation and other files as required.
 - Check with your insurance agent about coverage for the loan material. Normally the borrowing institution arranges insurance coverage based on values set by the lending institution.
 - Good packing is essential. Pack exhibition material with the assumption that it will receive less than careful handling in transit. A “Fragile” sticker is no guarantee of better treatment.
 - Do not send loan material by mail. Deliver it by hand or by bonded art carrier.
 - Evaluate the condition of the loan material immediately upon arrival at the borrowing institution. If you cannot be there to do it, ask the borrower to do so. Evaluate the condition of the loan material again when you receive it after the loan period.

Exhibit Considerations

Recommended Exhibition Light Levels		
	Lull 1995:7	Ritzenthaler 1993:62
Storage Area	11–55 lux	200–400 lux
Exhibit	55–165 lux	50 lux for light sensitive materials: watercolours, manuscript inks, felt-tip pens, coloured paper and ligneous papers 100–150 lux for less sensitive materials: paper in good condition, carbon inks *the most sensitive component of the record determines lux exposure limit
Reading Room	330–660 lux	300–600 lux: inorganic materials such as metal or stone
UV Limit	<75 microwatts /lumen <2–4% UV	

- Excessive exposure to light is the most common cause of damage to exhibited material.
- Eliminate ultraviolet light from the exhibit area (see Chapter 3: Environment p. 19).
- Whenever possible, illuminate display cases by track lights or other lighting located at some distance from the case.
- A maximum exhibition period of three to six months is recommended if the above lighting criteria are followed. Fugitive or light sensitive media such as watercolours, many red and blue inks, many felt pens, etc. should be displayed for a shorter duration to reduce the risk of fading.
- Blueprints and certain types of photographic prints such as salted paper prints, hand-coloured prints and early resin coated papers are extremely light sensitive and should not be displayed. As a general rule, it is a good idea not to display original photographs. Making a copy for display is preferable and not very expensive.
- If fluorescent case lights are used, mount the ballasts outside the cases to prevent heat buildup within the case.
- Do not use lamps mounted on picture frames as they cause surface heating of the framed object, as well as raising the light level.
- Seal airtight exhibit cases (air exchange of rate of 1/day) with a two-part epoxy or two-part urethane paint which dries by catalyzed polymerization. Allow a four week drying time before using the exhibition case. (Tétreault 1999:6)
- Books should be supported adequately to prevent strain on the cover joints. A book cradle can be used for this purpose. Mylar strips can be used to hold a book open – never use paper clips or elastic bands. Turning the pages on display periodically lessens the strain on the book and limits exposure to light.
- Place documents against acid-free or inert materials only.
- Do not drymount or laminate original materials under any circumstances.

Conservation Framing Standards

Conservation framing standards should be followed for matting and framing records for exhibition.

- Use acid-free buffered mat board to make a window and back mat.
- Use a conservation backing board such as Foamcore or Coroplast.
- Hinge the document to the back mat with Japanese tissue and wheat starch paste or use a large format photo corner. The photo corner method is attractive as in most case adhesive is not required.

- If original photographs are being exhibited all framing materials must pass the Photographic Activity Test.
- The CCI Notes 11/5 *Matting Works on Paper* and CCI Notes 11/9 offer clear instructions on how to archivally mat and frame works on paper.

Standard mat sizes

8 x 10"	16 x 20"
9 x 11"	18 x 24"
11 x 14"	22 x 28"
12 x 16"	30 x 40"

Note: Mat size is still quoted in imperial measurements rather than metric measurements.

Selected Readings

- Canadian Conservation Institute. 1995. *Encapsulation*. Notes 11/10. Ottawa: Canadian Conservation Institute.
- Canadian Conservation Institute. 1996. *Matting Works on Paper*. Notes 11/5. Ottawa: Canadian Conservation Institute.
- Canadian Council of Archives, Preservation Committee. 2002. *Digitization and Archives*, available in HTML or PDF on the CCA Web site (www.cdncouncilarchives.ca).
- Craddock, Ann Brook. 1992. Construction Materials for Storage and Exhibition. In *Conservation Concerns A Guide for Collectors and Curators*, ed. Konstanze Bachman, 23–29. Washington D.C.: Smithsonian Institute Press.
- Elkington, Nancy, E. ed. 1994. *RLG Archives Microfilming Manual*. Mountain View, California: Research Libraries Group.www.rlg.org
- Grattan, David. 1998. *Stability of Photocopied and Laser Printed Documents and Images: Guidelines for Canadian Archives*. Canadian Council of Archives Preservation Committee Information Bulletin 14. Ottawa: Council of Archives, Ottawa.
- Hatchfield, Pamela. 1994. Choosing Materials for Museum Storage. In *Storage of Natural History Collections: Basic Concepts*, eds. Carolyn L. Rose and Catherine A. Hawks. Society for the Preservation of Natural History Collections: Pittsburg.
- Lull, William, P., and Paul Banks. 1995. *Conservation Environment Guidelines for Libraries and Archives*. Ottawa: Canadian Council of Archives.
- Marrelli, Nancy. 1996. *Implementing Preservation Management A How-To Manual for Archives*. Montréal: Réseau des Archives du Québec.
- Ritzenthaler, Mary Lynn. 1993. *Preserving Archives and Manuscripts*. Chicago: Society of American Archivists.
- Tétreault, Jean. 1999. *Coatings for Display and Storage in Museums*, Technical Bulletin 21. Ottawa: Canadian Conservation Institute.

