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# CCI Notes

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## General Precautions for Storage Areas

### Introduction

Most museums are able to display only a small percentage of their holdings, so many artifacts must spend the majority of their museum lives in storage. These objects in storage are just as important as those on display, and require the same quality of long-term protection. Well-designed storage facilities that are regularly maintained are therefore of primary importance. This Note is a basic introduction to this complex subject, and includes reading lists at the end of each section for further study.

### The Storage Area

#### Location

Collection storage areas are best located away from public areas. They should be in the centre of the building away from exterior walls, and have no narrow corridors, sharply angled access ways, stairs, or narrow doors (the better the access, the less the potential for neglect). Basements and attics are usually not appropriate due to temperature fluctuations, extremes of relative humidity (RH), and potential leaks or floods.

Water damage is a threat to storage areas in any location in a museum or

gallery. Water or steam pipes are a hazard due to potential leaks and condensation, so locate storage areas away from pipes or, if this is not possible, inspect the pipes regularly. If there is any risk of flooding, locate storage areas above the flood plain; install water detectors and sump pumps if necessary. As a further precaution, store objects off the floor on shelves, platforms, or blocks, and cover them loosely with plastic sheeting.

Store artifacts in a different location than non-collection items (e.g. display props, packing boxes or materials, paint, tools, and other supplies) if possible.

Keep a separate storage location for new artifacts and other materials entering the museum. In this temporary holding area the objects can acclimatize slowly to the museum's environment before being unpacked and inspected. Objects with insect infestations or mould growth can be isolated in this area, thus preventing spread through the rest of the museum.

#### Storage units

Different categories of objects require different storage methods, e.g. screens, racks, metal or wood shelving, metal

or wood cabinets, drawing cabinets, platforms, and rolled storage. The choice of method and material depends on the resources available to the institution and on the type of artifact being stored. Whatever kind of unit is chosen, it should be made of materials that are chemically inert and have good long-term stability. The same rules apply to wrapping, padding, and support materials. Paints or other finishes used on storage systems should also be of proven stability.

### Procedures

For seasonal museums that are closed or unheated during the winter, drain pipes in the fall to prevent freezing. Inspect roofs, uninsulated walls, overhead pipes, and other fittings regularly for signs of leakage or condensation.

Prohibit smoking and the storage or consumption of food and beverages in storage areas, and post appropriate signs.

Keep collection storage rooms locked, with entry to the storage area and movement of objects into or out of storage controlled by authorized personnel.

Ensure that work not related to the function of the storage room is done elsewhere (i.e. preparing exhibition furniture, framing works, packing artifacts for travel, and similar activities should not be carried out in a storage area). Use work stations within the storage only for tasks related to documentation and movement of the collection.

### Further reading

CCI Notes (Ottawa: Canadian Conservation Institute):

- 1/3 *Closing a Museum for the Winter*, 1988.
- 3/1 *Preventing Infestations: Control Strategies and Detection Methods*, 1996.
- 14/2 *Emergency Preparedness for Cultural Institutions: Identifying and Reducing Hazards*, 1995.

CCI Technical Bulletins (Ottawa: Canadian Conservation Institute):

- No. 12 *Controlling Museum Fungal Problems*, 1991.
- No. 13 *Controlling Vertebrate Pests in Museums*, 1991.
- No. 21 *Coatings for Display and Storage in Museums*, 1999.

Other publications:

Alberta Museums Association. *Basic Principles of Artifact Storage*. Calgary: Alberta Museums Association, 1993.

Barclay, R.L., A. Bergeron, and C. Dignard. *Mount-making for Museum Objects*. Ottawa: Canadian Conservation Institute, 1998.

Hillberry, J.D., and S.K. Weinburg. "Museum Collection Storage." pp. 155–175 in *Care of Collections* (edited by S.J. Knell). New York: Routledge, 1994.

Johnson, E.V., and J.C. Horgan. *Museum Collection Storage*. Technical Handbooks for Museums and Monuments. Protection of Cultural Heritage. No. 2. Paris: UNESCO, 1979.

Lowell, P.N., ed. "Conservation." pp. 211–487 in *Manual of Curatorship: A Guide to Museum Practice* (edited by J.M.A. Thompson). London: Butterworth-Heinemann, 1992.

Tétreault, J. "Matériaux de construction, matériaux de destruction." pp. 163–176 in *La conservation préventive*. Paris: Preprints of the Third Colloquium of the Association des Restaurateurs d'Art et d'Archéologie de Formation Universitaire, 1992. [English translation available from CCI.]

## Systems

### Environment

Environmental conditions in storage areas should be similar to those in display areas.

Ensure that lighting has an intensity of 150 lx or less, and an ultraviolet content of no more than 75 µW/lm. Turn lights off when they are not needed. Eliminate external sources of daylight with drapes or blinds, or by boarding up the windows.

Maintain temperature and RH at levels appropriate to the collections, and avoid extremes and excessive fluctuations. Monitor temperature and RH levels regularly.

Ensure adequate air circulation to discourage mould growth and insect attack.

Do not store objects near furnace pipes, radiators, or air vents.

If possible, install dust control and air filtering systems.

When planning a new storage area or redesigning an existing one, consult a conservator to determine the type of storage equipment needed, the proper use of space, and the most appropriate environmental conditions based on artifact requirements.

### Safety and security

Prepare a disaster plan covering as many contingencies as possible, including flood, fire, break-in, and any possible natural agents in the locality of the museum. Ensure that all staff are aware of their duties and responsibilities in the event of an emergency.

CCI will loan environmental monitoring equipment to institutions for a small fee. For more information, contact:  
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Do not store flammable materials (e.g. solvents, paints, varnishes, waxes, etc.) in or near the collection storage rooms. Identify any fire hazards (e.g. trash, electrical fittings, etc.) and take steps to eliminate them.

Inform the local fire service of any hazardous objects (e.g. firearms, ammunition, poisons, cellulose nitrate film, etc.) in the collection. Take steps to render this material as safe as possible, and record this information.

Keep fire extinguishers (the dry chemical or CO<sub>2</sub> type will cause the least damage to a collection) ready for use near the entrance to each storage room, and train all museum staff in their operation. Equip rooms with an early-warning fire alarm system that includes an automatic extinguishing system. If a sprinkler system is installed, ensure that it is configured to minimize the amount of water discharged in the event of a fire.

If possible, install security alarms or continuously monitor all museum facilities. Install locks on all facilities, and strictly control the location and number of keys.

If the institution is located in an area subject to seismic activity or to vibration, take measures to secure the collections and protect them from falling debris.

#### Further reading

CCI Notes (Ottawa: Canadian Conservation Institute):

- 2/4 *Environmental Monitoring Kit*, 1998.
- 2/6 *Fire Protection Issues for Historic Buildings*, 1998.
- 2/7 *Museum Fires and Losses*, 1998.
- 2/8 *Automatic Sprinkler Systems for Museums*, 1998.

CCI Technical Bulletins (Ottawa: Canadian Conservation Institute):

- No. 18 *Fire Prevention Programs for Museums*, 1997.

No. 19 *Security Hardware and Security System Planning for Museums*, 1998.

Other publications:

Cassar, M. *Environmental Management: Guidelines for Museums and Galleries*. London: Routledge, 1994.

Craddock, A.B. "Control of Temperature and Humidity in Small Collections." pp. 15–22 in *Conservation Concerns: A Guide for Collectors and Curators* (edited by K. Bachmann). Washington, DC: Smithsonian Institution Press, 1992.

Thomson, G. *The Museum Environment*, 2nd ed. London: Butterworths, 1986.

## Inspection and Maintenance

It is extremely important to carry out regular inspections to monitor the condition of objects and to identify potential problems before they occur. A clean, well organized storage area will facilitate easy access to the collection for inspection, and will minimize the potential for overlooking problems. Inspection routines can be broken down in a number of ways; daily, weekly, and longer-period inspections are perhaps the easiest for staff to put in place and maintain.

### Daily inspection

Give the storage area a cursory inspection every day to pick up signs of trouble such as leaking pipes, condensation, etc. Check RH and temperature daily and record the values for future reference (recording hygrothermographs take the labour out of this task). If no controls are installed, or if systems are not working, move sensitive objects to a safer, more stable location during periods of excessive environmental fluctuations. It is not necessary to examine objects in detail unless there are known problems that need continual monitoring.

### Weekly inspection

Check artifacts and storage units located in different parts of the storage area for signs of insect infestation. In addition, look for accumulated dust or debris, as such traces are an indication of problems. Dust is abrasive and it also reacts with moisture to accelerate chemical degradation, making it important to keep storage areas as clean as possible. If necessary, perform regular housekeeping procedures: vacuum the room and storage facilities (but not the artifacts); avoid cleaning compounds that may cause damage if they come into contact with artifacts; instruct janitorial staff in safe methods of washing floors in the vicinity of artifacts.

Briefly inspect the objects in the storage area to ensure that they are adequately covered, well supported, and in their proper locations.

### Quarterly or semi-annual inspection

Inspect all objects in storage for signs of damage or other changes in condition (such information should become part of the documentation unique to each artifact). If any change in condition of objects is discovered, take whatever steps are necessary to prevent additional damage.

Check all wood, leather, paper, textile, and other organic materials for evidence of infestation and mould growth, especially after hot, humid periods. Examine metals for signs of active corrosion.

Inspect all mounts, padding, covering, and storage materials to ensure they are still doing their job.

Examine and calibrate environmental monitoring equipment. Check light levels and inspect all electrical equipment. Assess pipes, ventilators, radiators, and other installations for proper function and signs of problems. Inspect all heating and ventilating, fire protection, and security systems, and perform any necessary maintenance.

## Care of objects

Each class of objects in a museum collection requires care of a specific nature. It is important to discriminate between techniques used for the general care of objects, and techniques applied by specialists for restorative treatment and repair. Information on the basic care of a wide variety of artifact materials is dealt with in the CCI Notes series, some of which are referenced below. Treatment beyond that described is best left in the hands of a conservator.

## Further reading

CCI Notes (Ottawa: Canadian Conservation Institute):

- 6/1 *Care of Ivory, Bone, Horn and Antler*, 1988.
- 6/2 *Care of Basketry*, 1988.
- 6/3 *Care of Canoes, Kayaks and Umiaks*, 1989.
- 6/5 *Care of Quillwork*, 1988.
- 8/1 *Removing Mould from Leather*, 1993.
- 8/2 *Care of Alum, Vegetable, and Mineral Tanned Leather*, 1992.
- 8/3 *Care of Mounted Specimens and Pelts*, 1988.
- 8/4 *Care of Rawhide and Semi-Tanned Leather*, 1992.

- 9/1 *Recognizing Active Corrosion*, 1997.
- 11/2 *Storing Works on Paper*, 1995.
- 13/2 *Flat Storage for Textiles*, 1993.
- 13/3 *Rolled Storage for Textiles*, 1993.
- 13/5 *Hanging Storage for Costumes*, 1994.
- 15/1 *Care of Objects Made of Rubber and Plastic*, 1997.
- 16/1 *Care of Encased Photographic Images*, 1995.
- 16/4 *Care of Black-and-White Photographic Prints*, 1996.

CCI Technical Bulletins (Ottawa: Canadian Conservation Institute):

- No. 4 *The Care of Musical Instruments in Canadian Collections*, 1982.
- No. 8 *The Care of Wooden Objects*, 1982.
- No. 16 *Care and Preservation of Firearms*, 1995.

Other publications:

Bachmann, K., ed. *Conservation Concerns: A Guide for Collectors and Curators*. Washington, DC: Smithsonian Institution Press, 1992.

Barclay, R.L., ed. *The Care of Historic Musical Instruments*. Edinburgh: CCI/MGC/CIMCIM, 1997.

Crafts Council. *Science for Conservators: Conservation Science Teaching Series. Volume 2: Cleaning*. London, UK: Routledge/The Conservation Unit of the Museums & Galleries Commission, 1992.

Gilles, T., N. Putt, and M. De von Flindt. *The ABCs of Collections Care*. Winnipeg: Manitoba Heritage Conservation Service, 1990.

Knell, S.J., ed. *Care of Collections*. New York: Routledge, 1994.

## Emergency Contacts

In the event of any emergency situation, CCI will be pleased to provide information and assistance:

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