

1. Executive Summary

A global preservation assessment was carried out at the City of Winnipeg Archives on Monday, Tuesday and Wednesday 23 - 25 September 2002.

This global preservation assessment was sponsored by the Association of Manitoba Archives (AMA) as part of its "cooperative" grant program. The AMA's purpose for undertaking a cooperative approach is to enable as many AMA institutional members as possible to have timely and cost-effective access to a professional conservator. Completion of a global preservation assessment is now a requirement for grant eligibility for Canadian Council of Archives (CCA) preservation grants.

The top 10 recommendations are listed below in priority order. Their report recommendation number is listed next to the priority ranking.

RECOMMENDATION 1 (Report #1)

The issue of custodial authority must be addressed. If the City of Winnipeg Archives is to have an effective preservation program then the City of Winnipeg must have custodial authority of all archival records.

The lack of custodial authority also poses real concern with regard to the security of the records. Currently, departments still control records and departmental staff can sign in at the reception desk and then retrieve records from the stacks unassisted. This is a cause for concern on many levels: record handling is not supervised; records which are designated as archival may leave the building to be consulted off-site; privacy issues are of concern as it was noted that many of the boxes are identified as "confidential" and as there is no monitoring of staff during record retrieval confidentiality may be compromised.

RECOMMENDATION 2 (Report #44)

Write an archives specific disaster plan/salvage procedures manual.
Coordinate with City of Winnipeg emergency preparedness programs.

RECOMMENDATION 3 (Report #13)

Develop a written conservation/preservation policy. The written policy could also highlight the special needs collections such as magnetic media, oversize records etc. If the issue of custodial authority of the archival records has not been resolved this should be noted in the conservation/preservation policy.

RECOMMENDATION 4 (Report #17)

All records designated as archival should be rehoused into appropriate archival quality enclosures.

RECOMMENDATION 5 (Report #5)

An environmental monitoring program should be in place to monitor the relative humidity and temperature.

RECOMMENDATION 6 (Report #4)

Ask Central Control/Civic Building to provide the Archives with monthly HVAC printouts of storage conditions and relative humidity and temperature set points for 380 William Street.

RECOMMENDATION 7 (Report #19)

Record series which are designated as archival from inception i.e. Council Minutes, Bylaws etc. should be created on permanent paper. Permanent paper is paper that meets ANSI/NISO standard Z39.48-1992. There are many papers on the market which meet these standards. This standard is available as a free PDF download from www.techstreet.com/cgi-bin/detail?product_id=36497
The Canadian Standard CGSB-9.70-2000 *Permanence of Paper for Records, Books and Other Documents* should also be consulted and can be ordered from the Standards Council of Canada.

RECOMMENDATION 8 (Report #8)

All wood components in storage furniture should be upgraded to baked enamel or powder coated metal. See the Northeast Document Conservation Center *Storage Furniture: A Brief Review of Current Options*, Technical Leaflet Section 4, Leaflet 2 www.nedcc.org/plam3/tleaf42.htm

RECOMMENDATION 9 (Report #21)

The Assessment Rolls, fire plans and all other heavy oversize bound volumes should be stored either horizontally or spine edge down.

RECOMMENDATION 10 (Report #27)

See the Cook Report 8.2 Disbanding the Present 'Museum Collection' for a very lucid, practical approach to dealing with this collection.

2. List of Recommendations

The 45 recommendations listed in this report are grouped below. These recommendations are not listed in priority order as they are presented in the order found in the report.

Introduction

RECOMMENDATION 1

The issue of custodial authority must be addressed. If the City of Winnipeg Archives is to have an effective preservation program then the City of Winnipeg must have custodial authority of all archival records.

General Facility/Environment

RECOMMENDATION 2

The use and current configuration of the basement storage area should be reassessed in light of the removal of records to the Ross Street Records Centre. This clearing of the basement assessment for much needed facility upgrading and reinstallation of compact storage units to maximize storage usage. The building should be assessed to determine which are the load bearing walls. Non load bearing walls could be removed so that longer runs of compact shelving units could be installed. This would provide a more efficient use of space.

RECOMMENDATION 3

All windows fittings should be assessed –putty; seal etc. Consideration should be given to installing new, more energy efficient windows. The criteria for meeting the Municipal Heritage Grade II designation would have to be consulted to ensure that this recommendation could be undertaken.

RECOMMENDATION 4

Ask Central Control/Civic Building to provide the Archives with monthly HVAC printouts of storage conditions and relative humidity and temperature set points for 380 William Street.

RECOMMENDATION 5

An environmental monitoring program should be in place to monitor the relative humidity and temperature.

RECOMMENDATION 6

The HVAC air filtration system should be reviewed to determine what type of filters are in use and how often they should be changed. Regular dusting/cleaning procedures should be modified to include dusting.

RECOMMENDATION 7

If plans for a new archival facility or a renovated 380 William Avenue location go ahead it is strongly recommended that the design specifications for both the physical structure and equipment (HVAC, lighting etc.) be reviewed by a cultural building specialist.

RECOMMENDATION 8

All wood components in storage furniture should be upgraded to baked enamel or powder coated metal. See the Northeast Document Conservation Center *Storage Furniture: A Brief Review of Current Options*, Technical Leaflet Section 4, Leaflet 2 www.nedcc.org/plam3/tleaf42.htm

RECOMMENDATION 9

Boxes should not be stored on the top shelf of either mobile or stationary units. This is particularly true in the basement where some boxes are placed directly under the fluorescent light fixtures and are abraded every time the shelving units are moved.

RECOMMENDATION 10

Baked enamel or powder coated map cabinets should be installed to house the architectural drawings, maps and plans.

RECOMMENDATION 11

Rack storage should be considered for the framed records. Installation of rack storage would require that the shelving units be reconfigured. A vertical storage unit could be constructed and inserted into the current shelving unit.

RECOMMENDATION 12

Upgrade current rolled storage methods. See the Northeast Document Conservation Center Technical Leaflet *Storage Solutions for Oversized Paper Artifacts* located at www.nedcc.org/plam3/tleaf49.htm

Policies

RECOMMENDATION 13

Develop a written conservation/preservation policy. The written policy could also highlight the special needs collections such as magnetic media, oversize records etc. If the issue of custodial authority of the archival records has not been resolved this should be noted in the conservation/preservation policy.

Pests

RECOMMENDATIONS 14

New accessions should be inspected for pest evidence either prior to, or upon receipt of, the records. Ideally, new accessions should be housed in a 'holding or isolation' room rather than the workroom or in the stacks until they have been inspected. A records holding room should be incorporated into facility upgrading plans for the Archives.

RECOMMENDATION 15

An integrated pest management program should be implemented.

RECOMMENDATION 16

The staff lunch/coffee room should not be located in the archives stacks area of the building. It should be moved to an area isolated from archival records.

Records Storage

RECOMMENDATION 17

All records designated as archival should be rehoused into appropriate archival quality enclosures.

RECOMMENDATION 18

Specific requirements for archival enclosures should be given to the City of Winnipeg Archives or City Clerk's office purchasing departments.

RECOMMENDATION 19

Record series which are designated as archival from inception i.e. Council Minutes, Bylaws etc. should be created on permanent paper. Permanent paper is paper that meets ANSI/NISO standard Z39.48-1992. There are many papers on the market which meet these standards. This standard is available as a free PDF download from www.techstreet.com/cgi-bin/detail?product_id=36497
The Canadian Standard CGSB-9.70-2000 *Permanence of Paper for Records, Books and Other Documents* should also be consulted and can be ordered from the Standards Council of Canada.

RECOMMENDATION 20

An overall shelf check should be undertaken to ensure that if books which are stored vertically are vertical and not on an angle; that books stored horizontally are not over stacked and that smaller volumes are not piled beneath larger volumes.

RECOMMENDATION 21

The Assessment Rolls, fire plans and all other heavy oversize bound volumes should be stored either horizontally or spine edge down.

RECOMMENDATION 22

A survey should be undertaken to determine which bound volumes should be placed in boxes, four-flap book wrappers or other book enclosures.

RECOMMENDATION 23

A policy should be developed to determine which volumes will remain bound and which maybe unbound. For example, the Fire Plans are currently bound and are cumbersome to handle and access. Because of their weight and size damage can easily occur during handling. The plans could be disbound, encapsulated in Mylar Type D or Milinex 516 (both are poly ethylene terephthalate) and housed flat in map cabinets.

RECOMMENDATION 24

Baked enamel or powder coated map cabinets should be installed for the storage of maps and plans.

RECOMMENDATION 25

The condition of the Andrew Carnegie oil painting should be assessed by a paintings conservator. At the very least it should have padded blocks placed under the frame edge to protect the frame. The padded blocks would also raise the painting off the floor to minimize any water damage in the event of sewer backup or broken pipe etc.

RECOMMENDATION 26

Rack storage should be considered for the framed records. Rack storage would be difficult to install with the current configuration of shelves. Upgrade current rolled storage methods. See the Northeast Document Conservation Center Technical Leaflet *Solutions for Oversized Paper Artifacts* located at <http://www.nedcc.org/plam3/tleaf49.htm>

RECOMMENDATION 27

See the Cook Report 8.2 Disbanding the Present 'Museum Collection' for a very lucid, practical approach to dealing with this collection.

RECOMMENDATION 28

All photographic media enclosures should meet the following requirements:

- All photographic enclosures must meet the Photographic Activity Test (PAT).
- Black and white photographic materials should be stored in buffered envelopes that have passed the PAT. The acceptable pH ranges from 7 - 9.5.
- Colour or processed diazo photographic materials may be stored in buffered envelopes that pass the PAT. The acceptable pH should not exceed 8.
- Photographic Activity Test (PAT) (ANSI/NAPM IT9.16-1993 /ISO 14523:1997)
- Photographic Processed Films, Plates, and Papers - Filing Enclosures and Storage Containers (ISO 18902 - 2001)

RECOMMENDATION 29

Survey the black and white negative collections so that the cellulose nitrate, cellulose acetate and polyester negatives can be identified. The cellulose nitrate should be isolated and stored separately from the rest of the collection. Cellulose acetate negatives should be surveyed to see if they have developed 'Vinegar Syndrome. A-D Strips should be used to determine what stage of deterioration the cellulose acetate negatives are in. See Appendix 9: Photographic Negatives.

RECOMMENDATION 30

Review procedures for preservation microfilming. Ensure that ANSI MS23-1998 is being followed. Confirm that the storage environment for the archival master copies housed at the Federal Record Centre - Winnipeg - meet the requirements outlined in ANSI MS23-1998.

RECOMMENDATION 31

Develop a cold storage system for the cellulose nitrate, cellulose acetate and colour photographic media. See Appendix 2: Cold Storage.

RECOMMENDATION 32

Enclosures for magnetic media can include acid-free card enclosures and all "safe" archival plastics. Plastic enclosures selected for archival use should not contain plasticizers, slip agents, ultraviolet inhibitors, dyes, coatings or other materials that can break down leading to the deterioration of the enclosed record. Safe plastics include: polyester (polyethylene terephthalate) Mylar Type D or Milinex 516; polypropylene; polyethylene - high density; polystyrene and polycarbonate.

RECOMMENDATION 33

Undertake a collection survey of the videotape records in order to determine which tapes should be migrated first.

Exhibition/lighting levels

RECOMMENDATION 34

Where appropriate use copies of archival records for exhibit. If originals must be used limit exhibition time and ensure that appropriate illumination is used.

RECOMMENDATION 35

Follow the guidelines in the ANSI/NISO Z39.79-2001 publication
“Environmental Conditions for Exhibiting Library and Archival Materials”
located at www.niso.org/standards/index.html

RECOMMENDATION 36

Develop an archival records loan policy.

RECOMMENDATION 37

Implement a regular light-monitoring program.

RECOMMENDATIONS 38

Survey the framed records to determine which should be reframed to
conservation standards.

RECOMMENDATION 39

Do not display documentary art on outside walls. Consider exhibiting archival
copies in office areas.

Emergency Preparedness

RECOMMENDATION 40

Water monitors which are monitored off site should be installed in the basement.

RECOMMENDATION 41

Invite the fire department to inspect the building so that improvements may be
made.

RECOMMENDATION 42

All overhead pipes, electrical conduits etc. should be clearly labelled and
identified both on the pipes etc. in the basement and on building drawings.

RECOMMENDATION 43

All archival records should be stored at least 6” off the floors and 12” away from
outside walls and water sources.

RECOMMENDATION 44

Write an archives specific disaster plan/salvage procedures manual.
Coordinate with City of Winnipeg emergency preparedness programs.

RECOMMENDATION 45

Update the disaster/salvage plan annually so that note can be made of changes in emergency supplier outlets changing addresses, telephone numbers and contact people.

3. Global Preservation Assessment Overview

A global preservation assessment was carried out at the City of Winnipeg Archives on Monday, Tuesday and Wednesday 23 – 25 September 2002.

This global preservation assessment was sponsored by the Association of Manitoba Archives (AMA) as part of its “cooperative” grant program. The AMA’s purpose for undertaking a cooperative approach is to enable as many AMA institutional members as possible to have timely and cost-effective access to a professional conservator. Completion of a global preservation assessment is now a requirement for grant eligibility for Canadian Council of Archives (CCA) preservation grants.

The global preservation assessment form used during this site visit is an abridged version of the CCA’s *The Conservation Assessment for Archives* by Jane Dalley.

The goals for undertaking this global preservation assessment of the City of Winnipeg Archives are to develop an overall collections care program; to ensure that preventive conservation is an integral part of the archives function and to identify short and long-term preservation goals. Preventive conservation can be defined as any measure taken to safeguard a collection. If the major portion of our documentary heritage is to survive it must be cared for collectively and not individually. Traditionally, conservation is thought of as the treatment of single valuable objects. Treatment conservation is still valid, but for any conservation program to be effective, the whole collection must be considered in its entirety. Over the long term, an integrated preventive conservation program can minimize the need for individual treatments or at least reduce them to more manageable numbers.

A preventive conservation program is centred on a stable environment. Other components of the program include the use of appropriate storage materials for different media, implementing care and handling procedures, carrying out routine building maintenance operations and developing an institution specific disaster plan. Each one of these components can prevent or reduce potential damage.

4. Introduction

The City of Winnipeg Archives and Records Control Branch is responsible for the acquisition, maintenance, preservation and availability of records that are of enduring historical significance to the City of Winnipeg.

The City of Winnipeg Archives houses 25,000 linear feet or 7,620 linear meters of records. Currently, the City of Winnipeg Archives does not have custodial authority over most of the archival records housed 380 William Avenue. This lack of custodial authority leads to many unnecessary complications with regard to the long-term preservation of the archival records. Refer to the Cook Report Recommendations 1 - 10 for of Records Management Mandate and Infrastructure and Priority Issues for Management.

Only office supplies, and not specifically for preservation purposes, currently have a budget line There is no budget allocation for the purchase of archival enclosures which essentially means that the City of Winnipeg does not have a holdings maintenance program.

The Archives has 5 full time staff with and additional 2FTEs on assignment from elsewhere in the Department. At the time of the site visit 3 students were also working at the archives.

Archives staff have responsibility for the preservation of the holdings and attempt to monitor the situation where possible and to report problems but their job descriptions do not reflect these activities. Staff have attended AMA workshops on preservation and related archival issues.

RECOMMENDATION 1

The issue of custodial authority must be addressed. If the City of Winnipeg Archives is to have an effective preservation program then the City of Winnipeg must have custodial authority of all archival records.

The lack of custodial authority also poses real concerns with regard to the security of the records. Currently, departments still control records and departmental staff can sign in at the reception desk and then retrieve records from the stacks unassisted. This is a cause for concern on many levels: record handling is not supervised; records which are designated as archival may leave the building to be consulted off-site; privacy issues are of concern as it was noted that many of the boxes are identified as “confidential” and as there is no monitoring of staff during record retrieval confidentiality may be compromised.

The following reports were consulted while writing this Global Preservation Assessment.

- Manitoba Heritage Conservation Service/Ridgen Report submitted in two parts 21 April 1997 and in a letter to Mary Jambor 13 June 1997.
- In the Public Trust: A Strategic Plan for the Archives and Records Management Services in the City of Winnipeg submitted by Terry Cook 29 November 1999.
Council adopted the Cook Report, in principle, on January 26, 2000
- Renovating the Past: A Business Plan to Revitalize the City of Winnipeg Archives and Records Centre, (submission date unknown).

The City of Winnipeg Archives staff gave their time and knowledge generously. Of particular assistance were Jody Baltessen and Evelyn West.

5. General Facility/Environment

The City of Winnipeg Archives and Records Control Centre occupies two locations. The primary location for the City of Winnipeg Archives is 380 William Avenue in the old Carnegie Library building. The secondary location at 311 Ross (formerly the Paulines Biscuit Factory) will function as a record centre for non-archival records. As the Ross Street location is not designated to house archival materials it is not included in the assessment. The Ross Street Records Centre is scheduled to come on stream in the fall of 2002.

RECOMMENDATION 2

The use and current configuration of the basement storage area should be reassessed in light of the removal of records to the Ross Street Records Centre. This clearing of the basement and subsequent reassessment could allow for much needed facility upgrading and reinstallation of compact storage units to maximize storage usage. The building should be assessed to determine which are the load bearing walls. Non load bearing walls could be removed so that longer runs of compact shelving units could be installed. This would provide a more efficient use of space.

The Carnegie Library was built in 1903. The Carnegie Library building has undergone a number of renovations since 1903. In 1911, a two storey addition was added to the rear of the building. In 1939 and 1948 concrete piles were added to prevent building shifts. In the early 1960s a new mezzanine floor was added and the building was rewired. The building is designated a municipal heritage building Grade II. While the municipal heritage building criteria was not reviewed discussion during the site visit indicated that the 'front – original 1903 construction' cannot be modified.

The building officially became the City of Winnipeg Archives in 1977. At that time an HVAC system was installed. General refurbishment occurred in 1996 when the reading rooms were repainted, rugs installed in the public/staff work areas and archives staff cube offices were installed.

The building is a Tyndal limestone and mortar construction. It has a basement (partially below grade) and two storeys with a mezzanine off each storey. The roof is flat. Venting was installed on the roof around 1997 or 1998 in an effort to reduce high humidity levels. No environmental monitoring data was available during the site visit to see what the relative humidity and temperature levels were prior to and after this renovation.



Double pane windows are found on all levels. The windows at ground /basement level are blocked off with sheets of plywood. Windows on the main and second floor have vertical blinds, fabric roll blinds or plywood to reduce light levels. During the site visit all the blinds were closed except for those in the staff work area. Many of the windows have cracked glass panes which in some cases are held in place with transparent tape. The transparent tape is also used to reduce draughts in the winter.

RECOMMENDATION 3

All windows fittings should be assessed -putty; seal etc. Consideration should be given to installing new, more energy efficient windows. The criteria for meeting the Municipal Heritage Grade II designation would have to be consulted to ensure that this recommendation could be undertaken.

The Civic Buildings Department is responsible for all mechanical and structural maintenance and cleaning.

The Archives has an DDC-controlled, full feature HVAC (heating, ventilating and air conditioning) system which was installed in 1988. This system is remotely monitored and controlled at City Hall Central Control The Ridgen Report states that local monitoring and control is possible through an on-site PC.

Currently, the City of Winnipeg Archives does not have an environmental monitoring program nor, to the best of the staffs' knowledge have printed HVAC output reports from Central Control being requested.

RECOMMENDATION 4

Ask Central Control/Civic Building to provide the Archives with monthly HVAC printouts of storage conditions and relative humidity and temperature set points for 380 William Street.

During the site visit environmental readings were taken with a Psychro-dyne psychrometer. A psychrometer measures relative humidity and temperature. Psychrometers only do "spot" readings and as such are of limited value. However, the psychrometer is invaluable in terms of checking the calibration/accuracy of hygrothermographs and HVAC output. The psychrometer readings were as follows:

Location	Area	Relative Humidity	Temperature
Basement	A	44%	18°C
	D	44%	18°C
	B	44%	19°C
	C	44%	19°C
	Vault	44%	19°C
	F	44%	19°C
	E	44%	19°C
Main Floor	Public Research	40%	19°C
	Staff Cube East facing window	40%	19°C
	Archive File Bay 307	44%	19°C
1 st Mezz.	Shelf 382	42%	19.5°C
2 nd Floor	Rolled Plans area	42%	19°C
	K Assessment Rolls	45%	17°C

Environmental control within the established environmental guidelines is critical for long-term preservation of the collections. Temperature and relative humidity levels are directly related. When the temperature in a given area drops the relative humidity increases as cool air can not hold as much moisture as warm air. Conversely, when the temperature increases the relative humidity drops. A general rule of thumb dictates that for every 5°C increase in temperature reactions rates (in our context – increased degradation rates) double. So, the higher the temperature the faster material degrades or interacts with its storage enclosure. In the case of the City of Winnipeg Archives the temperature reading of 19°C within the accepted parameters for a mixed media archival storage area. However by making one relatively simple change – dropping the temperature 14-15°C in the storage area – you would effectively double the life expectancy of those archival records!

RECOMMENDATION 5

An environmental monitoring program should be in place to monitor the relative humidity and temperature.

A monitoring program should be implemented and work in conjunction with the Central Control/Civic Building off-site monitoring. On-site monitoring is important as it can be used to ensure the accuracy of the off-site monitoring units. It can also be used to identify favorable micro-environments (such as areas of lower temperature or lower relative humidity) which could be used to store more sensitive media.

Monitoring equipment may be borrowed from the Manitoba Museum of Man and Nature Preservation Outreach program or from the Canadian Conservation Institute.

Manitoba Museum of Man and Nature
Barry Hillman
Museum Advisory and Training Services
190 Rupert Avenue
Winnipeg, MB

R3B 0N2
Tel: 204-988-0672
bhillman@ManitobaMuseum.mb.ca

Canadian Conservation Institute
Maureen McDonald
1030 Innes Road
Ottawa, Ontario
K1A 0N3
Tel: 613-998-3721

Conversely, the City of Winnipeg Archives could apply for preservation grant to purchase environmental monitoring equipment. Grants are available from the Canadian Council of Archives under their Canadian Program for the Conservation for of Archival Records (CPCAR). This grant program is a 50:50 matching program. The deadline is toward the end of December or early January. (It varies slightly from year to year). Grant information and application forms may be downloaded from <http://www.cdncouncilarchives.ca/>



During the site visit heavy dust accumulation was noted throughout the archives. This was particularly true on the main floor and main floor mezzanine.

RECOMMENDATION 6

The HVAC air filtration system should be reviewed to determine what type of filters are in use and how often they should be changed. Regular dusting/cleaning procedures should be modified to include dusting.

The dust noted is of particular concern since most of the archival records are not housed in appropriate archival enclosures.

Recommendations for Particulate Filtration		
	Level of filtration %	
	(Lull 1995:7)	(Wilson 1995:3)
Combined stack and user areas	Filter to remove better than 50% of 0.5 micron particles	60-80
Stack areas, users excluded except for retrieval		90-95
Optimum preservation areas		>95

Lull, William, P. and P. Banks. 1995. *Conservation Environment Guidelines for Libraries and Archives*. Ottawa: Canadian Council of Archives.

Wilson, William K. 1995. *Environmental Guidelines for the Storage of Paper Records*. NISO TR01-1995. Bethesda, MD: NISO Press.
www.techstreet.com/list_niso_stds.tmp

RECOMMENDATION 7

If plans for a new archival facility or a renovated 380 William Avenue location go ahead it is strongly recommended that the design specifications for both the physical structure and equipment (HVAC, lighting etc.) be reviewed by a cultural building specialist. Designing a successful and well functioning archives or museum is a complex and highly specialized task. By spending a small sum of money and having the architectural and engineering plans reviewed at the early stages will conceivably save you considerable amounts later on. The following are specialists in the field.

Murray Frost
Cultural Building Consulting Inc.
15515 Columbia Avenue
White Rock, BC
V4B 1K5
Tel: 604 -538 - 9223

You may also be able to get assistance from the Canadian Conservation Institute.

Siegfried Remple
Senior Advisor, Collections Preservation
1030 Innes Road
Ottawa, Ontario
K1A 0N5
Tel: 613/446-1680
Fax: 613/446-1966
Email: siegfried_rempel@pch.gc.ca

Ala Rekrut, Chief Conservator at the Provincial Archives of Manitoba should be contracted for specialists within the provincial government.

Publications of note in facility planning include:

An excellent publication which outlines the generally accepted environmental standards for an archival facility is:

Lull, William, P.

1995. *Conservation Environment Guidelines for Libraries and Archives*, Ottawa, Canadian Council of Archives.

This book is available from the Canadian Council of Archives.

Other useful publication include:

1999. Museums, Libraries and Archives. In *ASHRAE Applications Handbook*. Atlanta: American Society of Heating, Refrigeration and Air-Conditioning Engineers. 20.1-20.13. (See Appendix 5: ASHRAE Chapter 20 Table 2)

McCormick-Goodhart, Mark. 1999. Methods for Creating Cold Storage Environments. In *Care of Photographic Moving Image & Sound Collections, 19-25*, Leigh Lodge: Institute of Paper Conservation.

Tétreault, Jean. 1999. *Coatings for Display and Storage in Museums*. CCI Technical Bulletin No. 21. Ottawa: Canadian Conservation Institute.

Wilson, William K. 1995. *Environmental Guidelines for the Storage of Paper Records*. NISO TR01-1995. Bethesda, MD: NISO Press.
www.techstreet.com/list_niso_stds.tmpl

Storage Furniture

A wide variety of storage furniture is used throughout the Archives. Compact/Mobile shelving units are used in several areas in the basement. The compact/mobile shelving units generally have plywood or a wood composite



board shelves rather than the archivally accepted baked enamel or powder coated metal shelves.

Stationary shelving units are also located in the basement and in all storage locations throughout the archives. The stationary shelving units may be metal, or metal/ wood shelf combination or simply wood shelves.

RECOMMENDATION 8

All wood components in storage furniture should be upgraded to baked enamel or powder coated metal. See the Northeast Document Conservation Center *Storage Furniture: A Brief Review of Current Options*, Technical Leaflet Section 4, Leaflet 2 www.nedcc.org/plam3/tleaf42.htm

RECOMMENDATION 9

Boxes should not be stored on the top shelf of either mobile or stationary units. This is particularly true in the basement where some boxes are placed directly under the fluorescent light fixtures and are abraded every time the shelving units are moved.

Framed Records/Documentary Art

Currently, the framed records/ documentary art are housed either in mobile wooden bins, on the floor or on tables.

Oversize Records

It was obvious during the site visit that space is at a premium in the archives. The oversize maps and plans are housed in a metal 'pigeon hole' unit. Other oversize records are housed on mobile wooden bins.

RECOMMENDATION 10

Baked enamel or powder coated map cabinets should be installed to house the architectural drawings, maps and plans.

RECOMMENDATION 11

Rack storage should be considered for the framed records. Installation of rack storage would require that the shelving units be reconfigured. A vertical storage unit could be constructed and inserted into the current shelving unit.

RECOMMENDATION 12

Upgrade current rolled storage methods. See the Northeast Document Conservation Center Technical Leaflet *Storage Solutions for Oversized Paper Artifacts* located at www.nedcc.org/plam3/tleaf49.htm

6. Policies

The City of Winnipeg Archives has no written preservation policy nor does the archives have a written long-term preservation plan. The necessity of developing a preservation program with associated policies has been identified in the Cook Report and the Ridgen Report. The Ridgen Report refers to an interim conservation policy drafted by Cathy Collins, then conservator of the Winnipeg Art Gallery, but that policy does not appear to be active.

The Archives does have a Reading Room Protocol and Handling of Holdings in Storage guideline which are given to researchers.

Preservation Policies

No one preservation policy will fit all institutions as they vary in size, record types, staffing levels and funding. However, certain fundamental elements provide the foundation to a successful preservation policy.

A preservation policy is generally composed of the following elements:

- Mandate/Mission Statement – the preservation policy must work within the provisions of the institution’s mandate/mission statement
- Purpose - generally, the purpose of most archival collections is to provide access to and preservation of the records
- Standards/Commitments -outlines what the policy is actually committing the institution to do
- Role and Responsibility - identifies which person/s within the institutions is responsible for implementing the policy and procedures. In smaller institutions one person will be responsible for many functions including preservation.
- Definition of terms - defines any preservation specific terminology
- Procedures - outlines the step-by-step approach to carrying out the policy, e.g. a care and handling policy

A successful preservation policy should:

- outline the institution’s preservation aim and objectives to the governing board, staff, volunteers, and donors

- provide staff/volunteers with directions and means to achieving the policy standards/guidelines
- provide a gauge by which the success of the preservation program can be measured
- provide a gauge by which the institution can measure its performance against other like institutions
- provide a document for ongoing/continuing integration of preservation practice with in all components of archival practice
- provide clear documentation to funding/granting agencies of an institution's commitment to long-term preservation – when taken together with an institution's acquisition policy and global preservation assessment a clear, lucid preservation program that is fully integrated to the benefit of the whole institutions is presented.

A basic framework for a preservation policy for a small to medium sized archives should include a commitment to:

- the concept and practice of preventive conservation as a fundamental objective of the archives policy
- review and update the preservation policy on a regular basis
- establish, monitor and maintain standards for temperature, relative humidity and light levels
- develop and update of an institution specific disaster plan
- implement care and handling guidelines
- provide a clean, organized storage environment and of sufficient size to house the records
- undertaking a reformatting program where necessary e.g. cellulose nitrate or cellulose acetate negatives, audio cassettes etc.
- consult with a conservation professional before undertaking any treatment, restoration or other invasive action which may affect the record
- establish procedures to prevent damage from vandalism, pests and other sources of damage as determined from the assessment
- to conduct on-going staff training in preservation.

RECOMMENDATION 13

Develop a written conservation/preservation policy. The written policy could also highlight the special needs collections such as magnetic media, oversized records etc. If the issue of custodial authority of the archival records has not been resolved this should be noted in the conservation/preservation policy.

Useful references for policy development are:

National Preservation Office (UK)

www.bl.uk/services/preservation/npo8.pdf

The best starting point for preservation policy development and searching policies on the internet is the National Preservation Office (UK) website. The NPO has produced an excellent publication titled *Building Blocks for a Preservation Policy*. This publication outlines the components to include in a policy, defines what a policy is, offers a preservation policy checklist and lists further preservation policy readings.

Marrelli, Nancy. *Implementing Preservation Management A How-To Manual for Archives*, Réseau des Archives du Québec, Montréal, 1996.

National Library of Australia Preservation Policy

<http://www.nla.gov.au/policy/pres.html>

Carlton University Preservation Policy for Non-Electronic Records

http://www.carleton.ca/cu/aboutus/policies/archives_policies/preserv.htm

7. Pest Control

Generally, the records do not appear to have a problem with pest damage. Records are not inspected for signs of pest activity when they enter the Archives. The Archives does not have an isolation area to hold records on arrival.

Pest infestations are always a concern in a large, retrofitted facility such as the City of Winnipeg Archives where moisture sources are readily available as noted in the pictures below.



Food consumption does not have to happen in the archives for pests to be a problem. Unless one actively looks for pest infestation the problem may be overlooked.

The Ridgen Report outlines the results of pest control monitoring program undertaken 21 April - 8 May 1997. Ridgen lists the identified insects which included very small numbers of dermestid larvae and book lice. Insect traps continue to be placed in various locations throughout the Archives and monitoring indicates that pests are not an on-going problem.

While this ongoing use of insect traps is commendable the Archives should consider implementing an Integrated Pest Management Program (IPM). The Archives building is old and badly in need of overall refurbishment. Pests have many areas on ingress: arriving in uninspected record transfers, through the

many areas in the basement where cracks in the walls are clearly visible. Water sources (faucets, sewer caps etc.) are readily available for pests' use.

By their very nature, IPM programs are archive-specific due to their individual sites, buildings, pest problems, collection types, etc. However, an excellent overview of an IPM program is outlined in the Northeast Document Conservation Center Leaflet "Integrated Pest Management" found at <http://www.nedcc.org/plam3/index3.htm> . Another excellent web site for information on pest management is Chapter 5: Biological Infestations of the US National Parks Service *Museum Handbook Part I* (1998). This is available online at: www.cr.nps.gov/museum/publications/MHI/CHAP5.pdf

RECOMMENDATIONS 14

New accessions should be inspected for pest evidence either prior to, or upon receipt of, the records. Ideally, new accessions should be housed in a 'holding or isolation' room rather than the workroom or in the stacks until they have been inspected. A records holding room should be incorporated into facility upgrading plans for the Archives.

RECOMMENDATION 15

An integrated pest management program should be implemented.

RECOMMENDATION 16

The staff lunch/coffee room should not be located in the archives stacks area of the building. It should be moved to an area isolated from archival records.

8 . Record Storage

The City of Winnipeg Archives does not have an effective holdings maintenance program. During the site visit, it was estimated that over 99% of the archival records are housed non-archival enclosures. While there is a desire to house the records in appropriate archival enclosures the Archives has no written requirements for archival enclosures nor does it have a specific budget allocated to rehousing the records to even minimal archival preservation standards.



As noted in the pictures above, in many instances, such as the oversize architectural drawings and plans located on the second floor no enclosures are provided at all. Similarly, many of the records housed in Area G are housed folded in thirds in their original acidic file transfer boxes with no lids.

RECOMMENDATION 17

All records designated as archival should be rehoused into appropriate archival quality enclosures.

RECOMMENDATION 18

Specific requirements for archival enclosures should be given to the City of Winnipeg Archives or City Clerk's office purchasing departments.

Poor quality acidic enclosures may transfer acids to the enclosed record causing embrittlement, discolouration and may increase the rate of deterioration. Enclosures should provide protection from dust, mishandling and pollutants. They should also provide physical support. Most archival enclosures are made from either paper or plastic. The choice of using either paper or plastic will depend on the type of record being enclosed and on the archives environmental conditions.

All archival paper enclosures should contain:

- Acid-free materials
- Fully bleached, alpha cellulose (highly processed wood pulp) or rag (cotton or linen) pulp
- Free of lignin and ground wood
- Paper with a pH between 7 and 8.5 with an alkaline reserve of 2% calcium carbonate or other suitable alkaline buffer
- Paper that is alkaline or neutral sized

Paper enclosures selected for photographic enclosures must meet the above recommendations in addition to passing the Photographic Activity Test (ANSI/NAPM IT9.16-1993 /ISO 14523:1997)

Plastics Enclosures

Plastic enclosures selected for archival use should not contain plasticizers, slip agents, ultraviolet inhibitors, dyes, coatings or other materials that can break down leading to the deterioration of the enclosed record.

Safe plastics include:

- Polyester (polyethylene terephthalate) Mylar Type D or Milinex 516
- Polypropylene
- Polyethylene - high density
- Polystyrene
- Polycarbonate

Avoid polyvinyl chloride (PVC) plastic. The Beilstein Test (CCI Note N17/1) is simple method to determine if a plastic contains chlorine. It does not specifically identify PVC but if the test is positive, indicating that chlorine is present, the plastic would not be an appropriate archival storage material.

RECOMMENDATION 19

Record series which are designated as archival from inception i.e. Council Minutes, Bylaws etc. should be created on permanent paper. Permanent paper is paper that meets ANSI/NISO standard Z39.48-1992. There are many papers on the market which meet these standards. This standard is available as a free PDF download from www.techstreet.com/cgi-bin/detail?product_id=36497 The Canadian Standard CGSB-9.70-2000 *Permanence of Paper for Records, Books and Other Documents* should also be consulted and can be ordered from the Standards Council of Canada.

Books/ Bound Volumes



The Archives has a wide variety of bound volumes. Bound volumes are housed on wood and/or metal shelves and in virtually all cases are unboxed. The fire plans are a classic example of poor storage. The heavy, oversize volumes are stored vertically, on an angle, causing spine damage to the books.

The Assessment Rolls are housed fore edge down which places considerable stress on the spine. It should also be noted that the Assessment Roll bindings are



currently degrading rapidly as noted by the bits of leather, board etc. found on the floor all along the Assessment Roll shelves.

RECOMMENDATION 20

An overall shelf check should be undertaken to ensure that if books which are stored vertically are vertical and not on an angle; that books stored horizontally are not over stacked and that smaller volumes are not piled beneath larger volumes.

RECOMMENDATION 21

The Assessment Rolls, fire plans and all other heavy oversize bound volumes should be stored either horizontally or spine edge down.

RECOMMENDATION 22

A survey should be undertaken to determine which bound volumes should be placed in boxes, four-flap book wrappers or other book enclosures.

RECOMMENDATION 23

A policy should be developed to determine which volumes will remain bound and which maybe unbound. For example, the Fire Plans are currently bound and are cumbersome to handle and access. Because of their weight and size damage can easily occur during handling. The plans could be disbound, encapsulated in Mylar Type D or Milinex 516 (both are poly ethylene terephthalate) and housed flat in map cabinets.

Oversize Media

The storage of oversize records is a major problem. Currently, the architectural and other plans are stored in 'pigeon hole' storage units. While the pigeon hole units appear to be baked enamel they do not provide adequate protection from light, dust or indoor pollutants. Also, it is always preferable to house records flat rather than rolled. Other oversize materials are stored in mobile wooden 'v' shaped storage units.



Appropriate archival storage enclosures are not used in either example pictured.

RECOMMENDATION 24

Baked enamel or powder coated map cabinets should be installed for the storage of maps and plans.

Documentary Art and Museum Collection

The City of Winnipeg Archives has a small documentary art collection. Of particular note is the Andrew Carnegie oil painting housed in the basement.



It is currently stored on the floor with no protection for the ornate gilded frame nor of the painting itself. The frame has sustained considerable damage as has the canvas.

RECOMMENDATION 25

The condition of the Andrew Carnegie oil painting should be assessed by a paintings conservator. At the very least it should have padded blocks placed under the frame edge to protect the frame. The padded blocks would also raise the painting off the floor to minimize any water damage in the event of sewer backup or broken pipe etc.



Other documentary art/framed records are found in the 'museum collection' housed on the second floor. During the site visit the 'museum collection' was not surveyed. However, it is known that the 'museum collection' contains photographs, paintings, drawings and artifacts.

As shown in the picture to the left the 'museum collection' is virtually inaccessible, poorly housed and takes up considerable space.

RECOMMENDATION 26

Rack storage should be considered for the framed records. Rack storage would be difficult to install with the current configuration of shelves. Upgrade current rolled storage methods. See the Northeast Document Conservation Center Technical Leaflet *Storage Solutions for Oversized Paper Artifacts* located at <http://www.nedcc.org/plam3/tleaf49.htm>

RECOMMENDATION 27

See the Cook Report 8.2 Disbanding the Present 'Museum Collection' for a very lucid, practical approach to dealing with this collection.

Photographic Media

Photographic records comprise a very small component of the archival record at the City of Winnipeg Archives. While a detailed survey was not undertaken as part of the site visit, it was noted that photographic media are filed with their originating department records and are interleaved with associated textual records. Records such as the Property Planning Department Field Note Books may more properly be thought of as scrapbooks as they combine photographs and textual information all adhered to a poor quality paper.

Currently, there is little intellectual and no preservation control over the photographic media. Based on the age range of the archival record and on-site assessment it is assumed that the photographic media includes the following: cellulose nitrate (perhaps), cellulose acetate and polyester film base negatives; black and white prints and colour media. Photographic records are currently stored in a variety of enclosures none of which appears to pass the Photographic Activity Test.

As outlined in the Cook Report the City of Winnipeg should obtain custodial authority of the City's archival records and implement a city wide records management program. Assuming that these recommendations are implemented the City of Winnipeg Archives will then be the repository for a much larger photographic media collection. To that end, the City of Winnipeg Archives should be prepared to implement a cold storage program for the long-term preservation of cellulose nitrate, cellulose acetate negatives and virtually all colour photographic media.

RECOMMENDATION 28

All photographic media enclosures should meet the following requirements:

- **All photographic enclosures must meet the Photographic Activity Test (PAT).**
- **Black and white photographic materials should be stored in buffered envelopes that have passed the PAT. The acceptable pH ranges from 7 - 9.5.**

- **Colour or processed diazo photographic materials may be stored in buffered envelopes that pass the PAT. The acceptable pH should not exceed 8.**
- **Photographic Activity Test (PAT) (ANSI/NAPM IT9.16-1993 /ISO 14523:1997)**
- **Photographic Processed Films, Plates, and Papers - Filing Enclosures and Storage Containers (ISO 18902 - 2001)**

Over the years, there has been ongoing research as to whether photographic materials should be stored in buffered or unbuffered paper enclosures. The current practice outlined in ANSI IT 9.2-1998 is that all photographic media can be housed in buffered enclosures. The only exceptions are cyanotypes which should be stored in unbuffered envelopes. (Cyanotypes are an early type of photographic print and easily identified as they are blue.)

Cellulose Nitrate Negatives

See *Appendix 8: Photographic Negatives* for guidelines on negative identification.

Cellulose Nitrate Preservation Plan

1. All cellulose nitrate negatives should be identified and their condition assessed based on the five stages of deterioration outlined above. Negatives are generally identified by their edge printing, notch codes, date and context. If these non-destructive tests do not identify the negative, destructive testing may be used. Destructive tests include the burn test and the diphenylamine test. *Conserve O Gram 14/9 Identification of Film Base Photographic Materials* (www.cr.nps.gov/csd/publications/conserveogram/cons_toc.html) is a very useful guide to use when identifying film bases.
2. Isolate cellulose nitrate negatives and store them separately away from other collections.
3. Reformat negatives based on condition. The NEDCC publication "Duplication of Historic Negatives", gives a useful overview of duplication options. (www.nedcc.org/plam3/leaf53.htm)
Rehouse negatives in buffered paper envelopes that have passed the Photographic Activity Test. Ideally, cellulose nitrate negatives should be

placed in cold storage. Original cellulose nitrate negatives should, where possible, be retained even if duplicate negatives have been made.

Cellulose Acetate Negatives

Cellulose Acetate Preservation Plan

1. Identify cellulose acetate negatives.
2. As with cellulose nitrate film base cellulose acetate negatives are generally identified by their edge printing, notch codes, date and context. If these non-destructive tests do not identify the negative destructive testing may be used. Destructive tests including the burn test. *Conserve O Gram 14/9 Identification of Film Base Photographic Materials* (www.cr.nps.gov/csd/publications/conserveogram/cons_toc.html) is a very useful guide to follow when identifying film bases.
3. Assess condition of the film base.
4. The Image Permanence Institute has developed A-D Strips (Acid-Detecting) as a way to evaluate the stage of cellulose acetate film base deterioration. [These strips can be ordered directly from IPI (www.rit.edu/ipi/) or from conservation suppliers such as Carr McLean.
5. Reformat negatives based on their condition.
6. Rehouse negatives in buffered paper envelopes that have passed the PAT. Ideally, cellulose acetate negatives should be placed in cold storage. Original cellulose acetate negatives should, where possible, be retained even if duplicate negatives have been made.

RECOMMENDATION 29

Survey the black and white negative collections so that the cellulose nitrate, cellulose acetate and polyester negatives can be identified. The cellulose nitrate should be isolated and stored separately from the rest of the collection. Cellulose acetate negatives should be surveyed to see if they have developed 'Vinegar Syndrome. A-D Strips should be used to determine what stage of deterioration the cellulose acetate negatives are in. See Appendix 9: Photographic Negatives.

Microfilm

Microfilming is done onsite in an ad hoc manner. All processing is done off-site at Dines Microfilming. Both 16 and 35mm microfilm is in use.

Consult the Cook Report Section 7.12 for a discussion on the rationalization of the microfilming program. Cook recommends a move to microfilm fragile archival records rather than proforma microfilming for off-site departments. This recommendation for the most part has been implemented with only the Employee Benefits Department having operational microfilming done at the Archives.

RECOMMENDATION 30

Review procedures for preservation microfilming. Ensure that ANSI MS23-1998 is being followed. Confirm that the storage environment for the archival master copies housed at the Federal Record Centre - Winnipeg - meet the requirements outlined in ANSI MS23-1998.

The common practice followed when undertaking an preservation microfilming program is to generate three film copies:

1. Master negative (silver halide on a polyester film base according to the standards outlined in ANSI MS23-1998). The master negative should not be used and should be stored in the best environment possible.
2. Duplicate negative are usually a silver halide. The duplicate negative is used to make use copies.
3. Use copies can be made from any of a range of formats and film base types such as diazo and vesicular.

Many institutions now create an archival master microfilm (ensuring appropriate long-term storage) and then scan the microfilm to create a digital file which is then searchable using OCR. This approach reduces use of the originals, the microfilm access copy and makes the information more accessible.

Colour Photographic Media

While a collection survey was not undertaken it is assumed that the City of Winnipeg Archives has colour photographic record which includes a range of media types: slides, transparencies and colour prints.

All colour photographic processes are prone to some type of image fading. Some processes are dark fading and some are light fading. (This means that some types of colour photographs stored in your archives in archival document boxes are fading as you read this.) Archival storage of colour prints and film means cold storage. Temperature is the most important factor to control to minimize fading of colour photographs. Relative humidity is of secondary importance.

For an excellent overview of the preservation issues facing colour photographic collections consult the Image Permanence Institute (IPI) publication *Storage Guide for Color Photographic Materials* by James M. Reilly. It was published in 1998 and can be ordered from the IPI website at www.rit.edu/ipi/.

RECOMMENDATION 31

Develop a cold storage system for the cellulose nitrate, cellulose acetate and colour photographic media. See Appendix 2: Cold Storage.

The City of Vancouver Archives has installed a walk-in cold vault for the storage of cellulose nitrate, cellulose acetate and eventually colour photographic media. For further information on this project contact Sue Bigelow, Conservator, Vancouver City Archives - [Sue Bigelow@city.vancouver.bc.ca](mailto:Sue_Bigelow@city.vancouver.bc.ca).

Reformatting Photographic Media

Digitization is not yet considered a preservation medium, however, it is an excellent access medium and used in conjunction with a cold storage program for photographic media is an effective use of resources. This combination of digitizing and cold storage is one way to meet the needs of both researchers and the long-term preservation needs of the records.

Traditionally, reformatting of photographic media was done by creating copy negatives and/or copy prints. The Northeast Document Conservation Centre Technical Leaflet Duplication of Historic Negatives outlines the various traditional reformatting options. This leaflet can be found at:

<http://www.nedcc.org/plam3/index5.htm>

The combined approach of scanning a photographic collection to meet access needs and then placing the collection into cold storage is far less expensive than making copy negatives of each image. There is also the concern that if all the preservation money is spent on creating a copy negative collection and nothing is done to improve the storage environment for photographic media then the collection of originals will continue their rapid deterioration.

Prior to undertaking any digitizing project the following references should be reviewed.

The Council on Library and Information Resources publication *Why Digitize* offers a very thoughtful and provocative overview of digitizing. One of the sections is entitled *Digitization is not Preservation – At Least Not Yet* which neatly summarizes the current state of affairs.

<http://www.clir.org/pubs/reports/pub80-smith/pub80.html>

Anne Kenny gave the keynote address at the Joint Research Libraries Group (RLG) and National Preservation Office (NPO) Preservation Conference on Guidelines for Digital Imaging. Her article on *Guidelines vs. Guidance for Digital Imaging: The Opportunity Before Us* is considered a standard reference on the subject and can be found online at:

<http://www.thames.rlg.org/preserv/joint/kenney.html>

This articles should be consulted prior to undertaking any digital imaging project.

The Cornell Library *Moving Theory into Practice Digital Imaging Tutorial* is free distance education website which tours the user though the complex world of creating a digital image project. This website can be found at:

www.library.cornell.edu/preservation/tutorial/toc.html

Magnetic Media

Audio Tapes

The City of Winnipeg Archives has a small collection of audio tapes. This collection is housed on Sony HF 60 minute tapes. It was not determined during the visit where the tape masters were located, if there were written transcripts nor who had copyright over the material.

The Colorado Digital alliance web site is an excellent source of information on guidelines and standards for digital audio projects. Project management overviews, in addition to technical information required to undertake a conversion program from analog (tape recordings) to a digital format (CD), are outlined. This web site can be found at:

<http://coloradodigital.coalliance.org/standard.html>

Video Tapes



The Archives has approximately 3 meters of VHS format videotapes. The majority of these videotapes are card slipcovers. The tapes are stored vertically in the basement storage vault. The videotapes are stored in the basement vault on wood shelves.

RECOMMENDATION 32

Enclosures for magnetic media can include acid-free card enclosures and all “safe” archival plastics. Plastic enclosures selected for archival use should not contain plasticizers, slip agents, ultraviolet inhibitors, dyes, coatings or other materials that can break down leading to the deterioration of the enclosed record. Safe plastics include: polyester (polyethylene terephthalate) Mylar Type D or Milinex 516; polypropylene; polyethylene – high density; polystyrene and polycarbonate.

The following are general storage and handling guidelines for magnetic media.

- Store cassettes, videotapes, discs and reel-to-reel tapes vertically. The reels should be supported by the hub.
- Store, play and copy all magnetic media in a clean environment.
- Use clean, lint-free gloves when handling magnetic media.
- Use clean equipment to play or copy records.
- Handle carefully so that the record is not scratched, creased or in other ways damaged.
- Use copies for researcher's use. Master copies should remain in storage.
- Store tapes tails out (in "as played" condition). Tapes should be rewound before playing.
- Rewinding of tapes every three years is recommended to maintain a low wind tension on the tape and to keep the tape edges from touching the spool. Others believe that this starts the retensioning process to begin again and so recommend that the tapes only be rewound before playing.
- Do not touch the playing surface.
- Do not drop magnetic media.
- Keep magnetic media away from strong magnetic fields

The Conservation Online (CoOl) web site contains a large section on *Preservation of Audio Material* and should be consulted for further information.

<http://stanford.edu/bytopic/audio/>

RECOMMENDATION 33

Undertake a collection survey of the videotape records in order to determine which tapes should be migrated first.

a. Identify format and condition of video tape

Video format identification guide

<http://216.149.118.71/VideoID/HomeText.htm>

b. Prioritize video tape condition using:

Jim Lidner's Priorizing Videotapes for Restoration

(CCI Modern Information Carriers Workshop Booklet Section 3, pg.9)

Videotape Preservation Fact Sheet 9: Tape Inspection

www.amianet.org/11_Information/11g_VidPres/inspection.html

Magnetic Tape Preservation Reformatting

www.vidipax.com/librefm.html

Useful section on the assessment of tape condition.

- c. **Assess current storage environment - environmental monitoring**
ISO 18923-2000 Imaging Materials - Polyester base magnetic tape -
Storage practices. (Can order online at www.ansi.org \$50 US -
electronic file).

9. Exhibition/lighting levels

The City of Winnipeg Archives does not have an formal exhibition program. However, due to the current Archives structure where city departments retain legal authority over their records they may retrieve original records for use in off-site exhibit or display. This is a concern as these records are not assessed to determine if it is safe to exhibit them nor is there any control over the length of time the records may be on exhibit. The City Archives does have a loan agreement for city departments to use archival records however this is more a registration/inventory device than a records care protocol.

RECOMMENDATION 34

Where appropriate use copies of archival records for exhibit. If originals must be used limit exhibition time and ensure that appropriate illumination is used.

Light damages materials. Damage is proportional to the duration of exposure and intensity of radiation. Light damage is cumulative. Therefore, even brief exposures under relatively high intensity light can be as damaging as extended exposure to low intensity light.

Light damage is also related to wavelength. In general, ultraviolet (UV), shorter wavelength, radiation causes more damage than the same amount of light in the visible spectrum (longer wavelengths). All wavelengths of light can cause damage but exposure to ultraviolet and the violet regions of light are the most damaging as they lead to fading, embrittlement and chemical change in materials. Chemical reactions initiated during light exposure may continue after the object has been returned to dark storage.

RECOMMENDATION 35

Follow the guidelines in the ANSI/NISO Z39.79-2001 publication "Environmental Conditions for Exhibiting Library and Archival Materials" located at www.niso.org/standards/index.html

Global Preservation Assessment

City of Winnipeg Archives

Storage Light Levels

Light level measurements were taken throughout the Archives using an INS DX-100 digital lux meter.

Location	Area	Lux	UV μwatts/lumen
Basement	A	55 - 350 compact and open shelves	Less than 75
	D	50-350	
	B	50-350	
	C	50-350	
	Vault	50-350	
	F	50-350	
	E	50-350	
Main Floor	Public Research	400-700 blinds closed	+/- 75 No UV filter film
	Staff Cube East facing window	700-1000 blinds perpendicular to window	Off UV meter No UV filter film
	Archive File Bay 307	65-500 open boxes on top shelf	Less than 75
1 st Mezz.	Shelf 382	50-455	Less than 75
2 nd Floor	Rolled Plans area	50-450	Less than 75
	K Assessment Rolls at front window	150-200 with blinds down	Less than 75

In most storage areas of the archives the lights remain off until the area is accessed by archives staff or other city staff. However, in areas such as Area K

where the Assessment Rolls are stored the light levels were monitored at 150-200 lux with the blinds closed and the lights off.

With this current system you are in essence “exhibiting” the unboxed Assessment Records 8 -12 hours a day, 365 days a year (time estimates). This is an excessive amount of light and is most likely a contributing factor to the deterioration of the Assessment Roll bindings. If you accept the idea that this material is on permanent ‘exhibit’ and light level reduction is a goal then either the blinds must be replaced with something more effective or the Assessment Rolls have to be boxed.



RECOMMENDATION 36

Develop an archival records loan policy.

An excellent publication which has a very practical section on archives and exhibits is:

Marrelli, Nancy. *Implementing Preservation Management A How-To Manual for Archives*, Réseau des Archives du Québec, Montréal, 1996.

RECOMMENDATION 37

Implement a regular light-monitoring program.

Lux and UV readings should be taken if an exhibit is mounted (either in house or off-site) or if the lighting system changes (new fluorescent tubes - new configuration of fixtures etc.) in the archives. Lux and UV meters can be ordered from conservation supply companies. See *Appendix 1: Suppliers* for a list of conservation supply companies.

RECOMMENDATIONS 38

Survey the framed records to determine which should be reframed to conservation 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* offers clear instructions on how to archivally mat and frame works on paper.

Standard mat sizes

8 x 10"	16 x 20"
9 x 11"	8 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.

Documentary art on display, such as the framed works in the staff cubicle area, are all hung on exterior walls. This is not good practice as the pictures are subject to wide temperature and in most cases relative humidity ranges. At the very least the frames should have 'bumpers' added to the bottom/back of the frame to ensure that there is a minimal air space between the frame and the wall.

RECOMMENDATION 39

Do not display documentary art on outside walls. Consider exhibiting archival copies in office areas.

10. Emergency Preparedness

The City of Winnipeg Archives does not have a disaster plan. The facility does have regularly scheduled inspections by the fire department in keeping with by-laws. The importance of having an up-to-date disaster plan cannot be strongly enough emphasized. A well-organized disaster plan can mean the difference between salvage of – or recovery of the Archives holdings.

The potential for water damage is high in this facility as water sources are located throughout the basement.



RECOMMENDATION 40

Water monitors which are monitored off site should be installed in the basement.

RECOMMENDATION 41

Invite the fire department to inspect the building so that improvements may be made.

Overhead pipes are found throughout the basement storage areas.



RECOMMENDATION 42

All overhead pipes, electrical conduits etc. should be clearly labelled and identified both on the pipes etc. in the basement and on building drawings.

RECOMMENDATION 43

All archival records should be stored at least 6" off the floors and 12" away from outside walls and water sources.

RECOMMENDATION 44

Write an archives specific disaster plan/salvage procedures manual. Coordinate with City of Winnipeg emergency preparedness programs.

RECOMMENDATION 45

Update the disaster/salvage plan annually so that note can be made of changes in emergency supplier outlets changing addresses, telephone numbers and contact people.

The following overview of the disaster planning process can be used as a prototype to start a disaster plan in your institution.

1. Make writing a disaster plan the number one priority for the upcoming year.

2. Designate one person to be responsible for seeing the plan through to completion.
3. Identify an individual or create an Archive Planning Team (APT) responsible for specific areas of the disaster plan.
4. Complete a “generic” disaster plan to function as an interim plan until the archive-specific plan is completed.

“Generic” plans can be found on the Internet at the following sites:
From the California Preservation Clearing House
<http://cpc.stanford.edu/disasters/generic/unit1.html#sect2>
From the Northeast Document Conservation Center
www.nedcc.org/plam3/tleaf34.htm
5. Identify members for the Disaster Action Team (DAT).
6. Review disaster planning and salvage literature and other similar institution’s disaster plans. Excellent information on disaster planning and disaster plan examples can be found on the Internet at Conservation Online
www.palimpsest.stanford.edu Look under Disaster Planning and Response.
7. If staffing is very limited, consider applying to the Canadian Council of Archives under the CPCAR grant program for assistance to contract a consultant to write a disaster plan. A positive aspect to this approach is that the disaster plan is written in a timely fashion by someone with disaster planning experience. A disadvantage to the approach is that no one on staff is ultimately responsible nor totally familiar with the plan. If this approach is taken, a training component should be added to the grant application to ensure that those staff/volunteers on the DAT team are aware of their responsibilities, understand how the plan works, and are confident in their abilities to meet a disaster.
8. Undertake a risk analysis of the building, surrounding area and collection. Discuss potential risks with colleagues, conservators, fire marshals, building maintenance, etc.
9. Arrange for disaster salvage training for all staff and volunteers. Nothing is more useless than a plan that is written but never read.
10. Update plan annually.

Global Preservation Assessment
City of Winnipeg Archives

Appendix: 1 Preservation Suppliers

<p>Artist's Emporium 1610 St. James Street Winnipeg, MB R3L 0H2 Tel: 204-772-2421</p>	<p>Mylar sheets; acid free mat board; foamcore</p>
<p>Carr Mclean 461 Horner Toronto, Ontario M8W 4X2 (800) 268-2138 (416) 252-3371 Fax: (800) 871-2397 http://carrmclean.ca/index.html</p>	<p>Full range of archival/preservation supplies. Discounts for AMA members Free catalogue on request.</p>
<p>Conservation Resources Intl. 8000-H Forbes Place Springfield, Virginia 22151 (800) 634-6932 (703) 321-7731 Fax: (703) 321-0629 www.conservationresources.com</p>	<p>Very informative free catalogue on request. Wide range of preservation materials.</p>
<p>Envirmaco International Inc. 8170 Devonshire Montreal, Quebec H4P 2K3 (514) 731-1550 Fax: (514) 731-2535</p>	<p>Range of Coroplast boxes and other Coroplast supplies.</p>
<p>Gaylord Bros. P.O. Box 4901 Syracuse, NY 13221-4901 (800) 841-5854 Fax: (800) 615-3779 www.gaylord.com</p>	<p>Free catalogue on request. Range of archival supplies.</p>

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<p>GE Polymershapes 15-1832 King Edward Street Winnipeg, MB R2N 0N1 Tel: 204-694-3308 Fax: 204-694-3346</p>	<p>Mylar, foamcore, Coroplast, UV filters and fluorescent tubes</p>
<p>Hollinger Corp. P.O. Box 8360 Fredericksburg, Virginia 22404-8360 (800) 634-0491 (Cdn Customer line) Fox: (800) 947-8814 Email: hollingercorp@interserf.net</p>	<p>Wide range of archival storage materials.</p>
<p>Light Impressions 439 Monroe Avenue P.O. Box 940 Rochester, New York 14603-0940 (800) 828-6216 (716) 271-8960 Fax: (800) 828-5539 www.lightimpressionsdirect.com</p>	<p>Free catalogue on request. Wide range of photographic supplies.</p>
<p>Metal Edge Inc. 6340 Bandini Blvd Commerce, Ca 90040 (800) 862-2228 Fax: (800) 822-6937 www.metaledgeinc.com</p>	<p>Archival storage supplies and the Safecare Image Archive Freezer Kit for cold storage of photographs.</p>
<p>Talas 568 Broadway New York, NY 10012 (212) 219-0770 Fax: (212) 219-0735 University Products 517 Main Street P.O. Box 101 Holyoke, Mass 01041-0101 (800) 628-1912 (413) 532-3372 Fax: (800) 528-9281 www.universityproducts.com</p>	<p>Catalogue available for a fee. Conservation supplies and materials.</p>

<u>Shelving</u>	
<p>Wearing Williams Ltd. 1140 St. James Street Winnipeg, MB R3B 0K7 Tel: 786-8881 Toll free: 1-800-954-5656</p>	<p>Steel storage shelving; mobile high density etc.</p>
<p>SS Inc. 102 King Edward Street Winnipeg, MB Tel: 204-772-9800 Fax: 204-772-9834 Toll free: 1-800-661-5639 www.shippersupply.com</p>	
<p>Waymarc Sales Ltd. 1413 Church Winnipeg, MB Tel: 204-988-4900</p>	
<u>Disaster Salvage</u>	
<p>Cromwell 801 Berry Street Winnipeg, MB Tel: 204-774-8186 1-877-774-8186 (toll free) www.cromwell.ca</p>	
<u>Fire Protection</u>	
<p>Grinnell 989 Century Street Winnipeg, MB 204-694-0140 www.grinnellfire.com</p>	<p>See also <i>Fire Alarm Systems, Fire Protection Consultants</i> in the Yellow Pages</p>

Appendix 2: Low-Cost Cold Storage for Photographic Media

The procedures for cold storage for photographic collections have undergone substantial change in the last 5 - 10 years. The most notable and practical of these changes relate to:

1. the type of cold storage units that can be used - household freezers
2. negative packing procedures

Freezers

There are several cold storage options:

1. conventional freezer
2. custom-built cold vault
3. commercial off-site cold storage

Only conventional the conventional freezer/storage system will be discussed here as it is the only low-cost on-site storage system.

Conventional Freezers

Conventional household freezers are a low-cost option and are used for cold storage of photographic media in many institutions. Household freezers are designed to operate at a temperature of -18°C (0°F).

There are three types of freezers which are readily available: chest freezers (manual defrost), upright freezers (manual defrost) and upright freezers (frost-free). Of the three freezer types listed the upright freezer with a manual defrost is the type preferred for cold storage systems for the following reasons. The upright freezer/manual defrost takes up less floor space than the chest freezer, allows for easier access to the photographic materials, and maintains the most stable temperature. Two models of upright freezers with manual defrost are the Woods FW20 Frost Free 20 cft and the Kenmore 28021 20.3 cft.

The advantages of using upright freezers that are housed on-site include:

- the ability to monitor the freezers to ensure a stable temperature within the freezer and a stable relative humidity (RH) within the zip-loc bag storage system
- proper handling and retrieval of the stored boxed materials
- faster retrieval times
- high level of security

The disadvantages of using upright freezers which are housed on-site include:

- the amount of space required to house the freezers
- the need for a back-up generator or some such fail-safe mechanism

Based on data from the cold storage preservation program at the BC Archives approximately 2700 5x7" negatives can be stored in a Woods FW20 frost free refrigerator.

Approximately 18 Coroplast boxes can be stored in the freezer i.e. 6 packages of 25 negatives per package can be stored in each box = 2700 negatives per freezer.

Supplier:

Woods FW20 Frost Free 20 cft
W.C Woods Company Ltd.
Guelph, Ontario
N1H 6L9

Tel: 519/821-0900

*contact for Vancouver distributor and current price

Kenmore 28021 20.3 cft. - made by Fridgidare
Sears
Polo Park
4570 Portage Avenue
Winnipeg

Brandon
1138 Richmond Ave
Tel: 728-7417

*contact for current price

Photographic Negative packing Procedure

The new methods for preparation and packaging of photographic materials for cold storage have, in large part, been developed by Mark McCormick-Goodhart while he was still with the Smithsonian Institution. His Critical Moisture Indicator (CMI) Method is designed to be used with either conventional household freezers or large cold storage vaults. A relatively simple negative/print packaging procedure has also been developed.

1. Commercially available freezer packing materials

A commercially available freezer packing kit is available from Metal Edge Inc. www.metaledgeinc.com in California. This may be the most cost effective method of packing the negatives for cold storage. A cost comparison with the do-it-yourself method outlined below would have to be determined.

2. Do-it-yourself freezer packing method

This do-it-yourself freezer packing method is based on research by Mark McCormick-Goodhart and procedures used at the BC Archives and the City of Vancouver Archives.

1. Negative packing system
 - overview
 - materials required
 - procedure
 - suppliers

The following is an overview of the CMI negative packing system. A detailed discussion of procedures and suppliers will follow. The CMI method of packing is required for both storage in conventional freezers and off-site cold storage facilities.

1. A group of negatives in acid-free envelopes are placed inside a polyethylene zip-loc bag.

2. A card stock wrapper is placed around the bagged group of negatives. The wrapper has reference information and an RH indicator label.
3. This bag is then placed in a second polyethylene zip-loc bag.
4. A moisture absorbent material such as dried mat board or silica gel is also placed in the second bag (this is done to absorb any moisture that may occur in the double-bag package).
5. A relative humidity (RH) indicator card is also added to the second bag to monitor the RH of the bag interior.
6. The double bag negative package is placed in a box and stored in either a conventional freezer or a cold vault.

Materials required:

Zip-loc bags

Acid-free mat board

4-ply mat board – Rising White Museum Board has passed the P.A.T

Humidity indicator cards and/or square RH indicators for wrapper card

Wrapper card

Acid-free, lignin free, light coloured card .020"

Photographic media storage boxes

The packages of negatives are housed in boxes that pass the Photographic Activity Test. Any box which has passed this test can be used. Materials which have passed this test are clearly identified in conservation supply catalogues. See Appendix 1: Suppliers for contact information.

Oven

Cooling racks

Clamps/tongs

Tools:

Cutting knife

Ruler

Mat board cutter

Bone folder

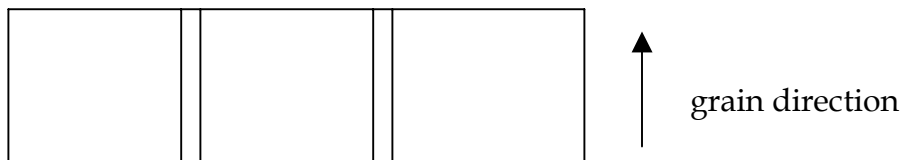
Pigma pen

Pencil

Do-it-yourself method

Prepare the packing materials.

1. Insert dividers into the photographic media storage boxes.
2. Precut acid-free mat board for envelope packages. Cut mat board approximately 0.5 cm larger than the negatives on all sides.
3. Round off the mat board corners so that they do not tear the zip-loc bags.
4. Prepare the wrapper from .020" card stock paper. Ensure that the grain direction of the paper runs parallel to the paper folds.



Allow for the thickness of the negative package (usually about 2.5 cm) in the fold.

Equilibrate packing materials and negatives to the appropriate RH and temperature. Environmental monitoring equipment can be borrowed from the Manitoba Museum of Man and Nature Museum Advisory and Training Services. The relative humidity monitoring unit should be monitored to ensure that the environment is stable and within the recommended RH levels.

Negatives can be packed when they have equilibrated to an RH range of:
32 - 57% at 20°C or 35% - 60% at 25°C.

1. Take equilibrated negatives in their buffered envelopes and place them into a zip-loc bag. Remove the excess air before closing the bag.
2. Take the prepared wrapper and write reference information on the fold with a Pigma pen.
3. Apply the self-adhesive humidity indicator card to the fold of the wrapper.
4. Wrap the folder around the sealed zip-loc negative package and place into the second/outer zip-loc bag.
5. Insert 2 sheets of dried mat board on either side of the negative package and seal the ziploc bag.
6. Place the negative package into the photographic media storage box.
7. When the box is filled put it into the freezer.

Drying the mat board

The mat board is dried in the oven to remove moisture from the board. The mat board can then act as an effective moisture wick in the negative package system.

1. Dry the mat board in the toaster oven.
2. The oven must reach a temperature of 90 - 100°C.
3. Place the pre-cut mat board into the oven once the oven has reached 90°C.
4. Do not over lap the boards as this slows down the drying process and can cause buckling of the mat board.
5. The length of 'toasting' time will be dependent on the oven. To check the moisture content of the mat board and therefore the amount of 'toasting' time required:
 1. Prepare 3 pieces of mat board.
 2. 'Toast' the first mat board for 5minutes; 'toast' the second mat board for 7 minutes and 'toast' the third mat board for 9 minutes.
 3. Remove mat boards from the oven with tongs and place on cooling racks. Cool the boards for 5 minutes.
 4. Put each of the cooled boards into separate sealed zip-loc bag along with an RH indicator card.
 5. Allow the cards to equilibrate over night.
 6. If the humidity indicator cards reads below 10% RH then the 'toaster' time is sufficient.
 7. If the RH card reads above 10% then increase the amount of time in the toaster/oven.

Pre-dried mat boards can be kept in ziploc storage bags at room temperature for several weeks without regaining excess moisture.

Suppliers:

Oven

Black and Decker Toast-R-Oven model TR400-04
(used at the BC Archives conservation lab)
or other oven that you can set to 100C

Commercially available freezer package kit

Metal Edge Inc.
6340 Bandini Blvd.
Commerce, CA
90040
Tel: 1-800-862-2228
www.metaledgeinc.com

Do-it-yourself freezer package kit

Boxes

Available from a wide range of conservation suppliers. See Appendix 1:
Suppliers.

Polyethylene Ziploc bags

Grocery stores
4x5" negatives medium size bags 18x20 cm
5x7" negatives large size bags 27x27 cm

Humidity Indicator Cards

Order ½" x ½" indicator with vinyl adhesive backing and 60% rh card
minimum order 500 cards - approx. \$300.00

James Dawson Enterprises
9 Antares Drive
Nepean, Ontario
K2E 7V5
Tel: 613/225-8333

Acid-free Mat Board

Rising Museum Mounting Board - 4 ply white - passes P.A.T approx. \$12/sheet
Framing shops

Available at most framing shops.

Wrapper

Perma/Dur Map and Print Folder (a University Products product)
Heavy Duty .020 light tan - has passed P.A.T - but not tested on an annual basis
Bury Catalog no. 731-3648
Bury Media
#10 3771 North Fraser Way
Burnaby, BC
V5J 5G5
Tel: 431- 1964 431-1965
Fax: 431-1930
E-mail: info@rbury.com

University Products
517 Main Street
P.O. Box 101
Holyhoke, Mass
01041-0101
Tel: 800/ 628-1912
To order: 800/628-1912
Fax: 800/528-9281
www.universityproducts.com

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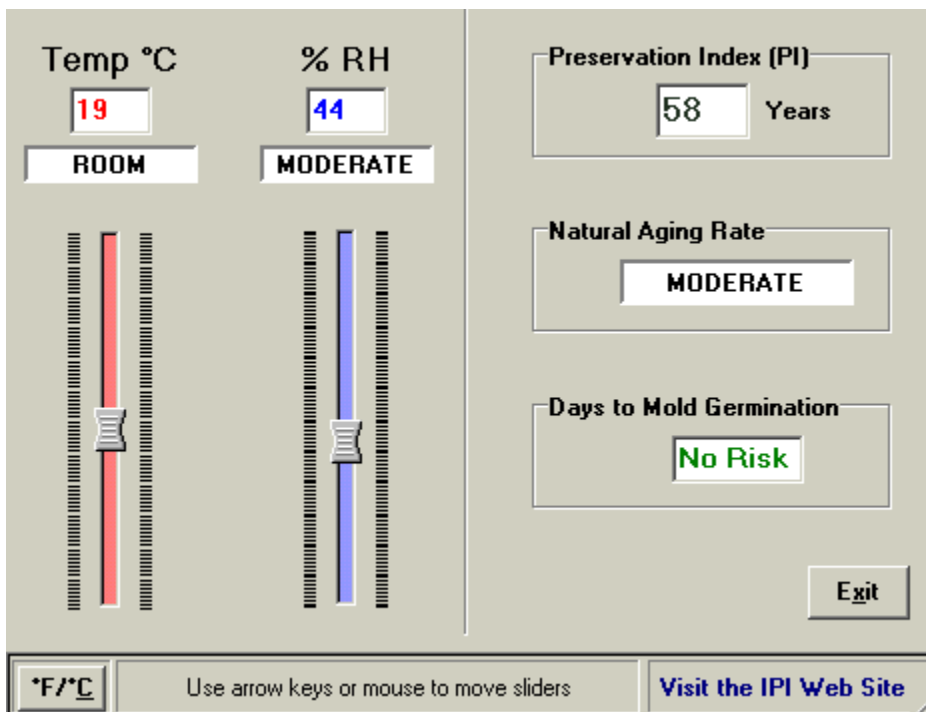
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Appendix 3: Image Permanence Institute Preservation Calculator

Interpreting Environmental Conditions

The Image Permanence Institute (IPI) has developed a computer program, “the Preservation Calculator”, to enable the collections’ manager to determine the effectiveness of their storage environment for the long-term preservation of the collections. (The IPI Preservation Calculator can be downloaded free of charge from www.rit.edu/ipi/).

The IPI Preservation Calculator can be used, for example, to determine what sort of record life expectancy the vault is currently providing the archival materials stored there. During the site visit the temperature and relative humidity reading were taken throughout the City of Winnipeg Archives. The temperature readings were (on average) 19°C and the relative humidity was 44%. Using the Preservation Calculator (see below) the PI is 58 years and the aging rate is moderate.



But what do these values really mean? The following information which explains what the values mean and how they are derived comes from the IPI's Preservation Calculator's help section.

"PI values indicate the combined effect of temperature and RH on the decay rate of organic materials in collections. PI values are characteristic of the storage environment, not the collection. Instead of vague "cooler and drier is better" statements, PI offers a way to quantify the benefits of collection storage improvements and document the return on investments made in better conditions. It is meant to be for natural aging what the Richter scale is for earthquakes: a way to communicate the magnitude of effect in quantitative terms.

Environmental conditions determine the decay rate of organic materials. The scientific basis behind PI is that increases (or decreases) in temperature will speed up or slow down the decay rate of all organic objects to about the same degree. The same is true of changes in RH. Accelerated aging data from many materials shows that although this is not strictly true in every case, it is close enough to be useful in assessing storage conditions for mixed collections.

On the other hand, the fact that climate conditions speed up or slow down deterioration to the same relative extent for all materials does not mean they all have the same life expectancy. At room conditions, a newspaper may turn brown and brittle in just a few years, while fine rag paper may require five centuries to discolor and embrittle to the same extent. If storage conditions are improved, both materials will last longer in proportion. Doubling the life expectancy of the newspaper will also double the life of the rag paper. But in absolute terms the life of the newspaper will always be shorter than that of the rag paper, regardless of conditions.

PI values range from 1 year to 9999 years. What do these year figures mean? Where did they come from?

In designing the PI concept, the Image Permanence Institute chose to use as a benchmark the approximate lifetime at room temperature of a typical

"preservation problem object". Rag paper, with its inherent long life at room temperature, is not a problem for most preservation managers. Acidic, wood-pulp paper, color photos and movies, nitrate and acetate film, herbarium specimens, and magnetic tape are all examples of "preservation problem objects". They all deteriorate significantly in about 50 years at room temperature and moderate RH.

PI values in years were designed so that the PI of 68 °F (20 °C), 45 % RH was 50 years, to reflect the behaviour of preservation problem objects. The PI of a storage condition represents how long it would take the typical preservation problem object to deteriorate significantly in that condition. Note: "significant" deterioration means noticeable discoloration or embrittlement, or other changes that involve a serious loss of appearance or functionality. It does not mean "crumble to dust." If a storage condition has a PI of 100 years, it means that a preservation problem object such as acidic paper would require 100 years to discolor to the same extent that it would in 50 years at room temperature and moderate RH."

Appendix 4: Environmental Guidelines

Appendix 5: ASHRAE Chapter 20 Table 2

Appendix 6: Pest Management

Appendix 7: 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.]

Appendix 8: Photographic Negative Identification Guide

The purpose of this Photographic Negative Identification Guide is to enable the user to:

1. identify negatives into one of the following film base groups:
 - cellulose nitrate
 - cellulose acetate
 - polyester
 2. identify stages of deterioration (where possible) in order that priority rankings can be made for reformatting and/or cold storage.
-

I. Background information on cellulose nitrate, cellulose acetate and polyester negatives

Three main types of plastic film base can be found in most archival collections:

1. Cellulose nitrate
2. Cellulose acetate
includes cellulose diacetate, cellulose acetate butyrate, cellulose acetate propionate, cellulose triacetate
3. Polyester

II. Health concerns associated with working with deteriorating negatives

Deteriorating cellulose nitrate and cellulose acetate negatives have been known to cause health problems. Symptoms have included eye irritation, rashes, nausea, headaches, swollen glands and respiratory problems.

To minimize the health problems associated with working with deteriorating negatives:

1. Work in a well ventilated area.
2. Wear cotton or latex gloves.
3. Wear glasses rather than contact lenses as gases can get trapped behind the contact lens and cause damage. Also, there appears to be less eye irritation overall when wearing glasses.
4. Limit the amount of time spent working with deteriorating negatives to 2-3 hours per day.
5. Any chemical spot testing or burn testing for negative identification should be done in a fume hood.
6. Wash hands after working with the deteriorating negatives.
7. Keep a log of odours noticed, time spent working with the negatives, and any symptoms associated with working with the negatives.
8. A respirator can also be used when working with deteriorating negatives. If a respirator is used make sure that the appropriate cartridge is used and that it is not past its expiry date.
9. Manufacturer Safety Data Sheets (MSDS) should be consulted.

III. How to handle negatives

1. Cotton or latex gloves must be worn when handling negatives.
2. Negatives should be surveyed in a well-ventilated room.
3. Before removing the negative from its original envelope transfer all catalogue information to the new envelope.
[Never reuse an envelope that has been used to store a cellulose nitrate or a cellulose acetate negative as they can be contaminated with off-gassing by-products.]
4. Only pencil should be used to write information on the new envelope.
5. When putting the identified negative into the new envelope, ensure that the emulsion side (dull, matte side) is facing away from the envelope adhesive seams.
6. If the negatives smell very strongly of either cellulose nitrate or cellulose acetate off-gassing byproducts they can be placed in the fume hood until some of the odor has dissipated.

IV. Step-by-step procedures for identifying different film bases

How to identify the negative - Non-destructive methods

See Unknown Negative Identification Key - Non-destructive methods.

Look for one of the following visual identification characteristics to identify the negative as a cellulose nitrate, cellulose acetate or polyester film base.

1. Is edge printing visible?

e.g. Kodak Safety Eastman; Ansco Safety; Agfa Nitrate

“Safety” = cellulose acetate film base

“Estar” “Cronar” = polyester

[Tips: Edge printing was not used until the late 1920s

If a 1:1 copy negative has been made then the original edge printing will be copied too. This could lead to a mis-identification.

Cellulose nitrate in roll film or film pack format are generally not identified with edge printing.]



Yes → **Positive Identification**
No → **go to #2.**

2. Positive polarizer test

Polyester negatives exhibit green and red interference colours when viewed through crossed polarized filters. Cellulose acetate and cellulose nitrate do not show these interference colours.

Polaroid lenses can be purchased in photographic supply stores and in educational toy kits in science stores.



positive test shows red and green interference colours as above

Yes —————> **Positive Identification**
No —————> **go to #3.**

3. Is there an identifiable notch code?



Yes —————> **Positive Identification**
No —————> **go to #4**

4. Can it be identified from the accession records? Or from Date?

Information from the accession records should be consulted to determine if the negative is:

- an original negative
- a copy negative
- if there is dating/accession information to indicate the plastic base type

Chronology of Film Bases

1889	Eastman Kodak - first cellulose nitrate roll film
1913	Nitrate sheet film produced
1923	First cellulose acetate film produced (16mm motion picture film only)
mid 30s	Other manufacturers (Agfa, Defender, DuPont Defender, Hammer) produced cellulose acetate films
1933	X-ray film - Kodak date of last manufacture
1938	Roll film in 135 (35mm still camera film) Kodak date of last manufacture
1939	Portrait and commercial sheet film - Kodak date of last manufacture
ca. 1940	Kodak stopped producing cellulose diacetate; produced other cellulose esters (cellulose acetate butyrate, cellulose acetate propionate) Cellulose nitrate film packs were in use until the mid 1940s 1949- Kodak date of last manufacture
1942	Aerial film - Kodak date of last manufacture
1947	Cellulose triacetate first produced
1950	Kodak stopped production of nitrate roll film in the U.S. (continued to produce in some other countries)
1951	Nitrate motion picture film discontinued by Kodak in U.S. (nb. This film was used by photographers for making still photos)
1955	First polyester film manufactured by DuPont
2000	Cellulose triacetate and polyester still in use

Yes  **Positive Identification**
No  **go to #5.**

How to identify the negative – destructive methods

See Unknown Negative Identification Key – Destructive Testing.

These tests are listed in order of accuracy and on minimal sample size.

1. The sample should be taken from an edge non-image area.
2. The sample size should be as small as reasonable possible.

1. Diphenylamine test (DPA)

The DPA tests for cellulose nitrate.

This test must be done in the fume hood! Latex gloves must be worn when mixing the reagent and undertaking the tests.

Reagent

0.5% diphenylamine in 90% sulfuric acid

1. Add 90 ml of concentrated sulfuric acid to 10 ml water. Stir continuously. Always add an acid to water – **never** the other way around!
2. Add the diphenylamine in small amounts. Stir continuously.
3. Store the reagent in a glass bottle with a plastic screw cap. The paper liner of the plastic screw top must be resistant to 90% sulfuric acid. Polyethylene and polypropylene liner and caps can be used. Label the bottle with the following:
0.5% Diphenylamine in 90% Sulfuric Acid
Corrosive
Date made (month/year)

Diphenylamine is light sensitive. Store the bottle in an amber coloured bottle and/or in the dark.

4. Safety:

Wear latex gloves when mixing the reagent and carrying out all tests.

Mix the reagent in the fume hood. Carry out all tests in the fume hood.

Always add an acid to water - never the other way around.

This is an exothermic reaction - heat is generated.

Materials needed:

Rubber/Latex gloves

Diphenylamine reagent

Scissors

Microscope slides

Known cellulose nitrate sample

Procedure:

1. Place a white sheet of paper in the fume hood as this makes it easier to interpret the test results.
2. Place a drop of the DPA reagent on the microscope slide.
3. Cut a **pinhead-sized** sample from a non-image corner of the negative and place it in the drop of DPA reagent.
4. A dark blue-violet colour will form within a minute if it is a cellulose nitrate negative.

[Tip: Always have a control/known cellulose nitrate negative sample to test before undertaking test with your collection. It is possible that both cellulose acetate and polyester negatives (?) could give a positive result to the DPA test as cellulose nitrate is used as a subbing layer (adhesive layer) in their layer structure. The subbing layer contains a very small amount of cellulose nitrate and generally takes considerably longer than a cellulose nitrate negative to give a positive test.]

CCI Note 17/2

2. Burn test

Cellulose nitrate and cellulose acetate burn. Polyester tends to melt rather than burn.

Cellulose nitrate burns intensely with a yellow flame. The residue left on the tweezers tends to be ashy when tapped.

Cellulose acetate also burns but far less intensely. The residue left on the tweezers tends not to be ashy when tapped.

The burn test can be ambiguous. This is particularly true when cellulose nitrate and cellulose acetate negatives have been housed adjacent to one another for a period of time. The thickness of the gelatin layer on some negatives can also inhibit the ability to interpret the burn test.

Materials needed:

Scissors
Gloves for handling the negative
Tweezers or tongs
Lighter or other flame source
Dish of water
Known samples of cellulose
 nitrate and cellulose acetate
Non-absorbent blotting paper
Cotton swabs
Scalpel

Procedure:

1. Cut small sample from non-image area. Sample size should be no larger than 2 - 3 mm x 15 mm.
2. Hold the sample vertically with tweezers.
3. Ignite the top of the sample so that the flame burns down the sample.
4. Cellulose nitrate samples will burn very rapidly, brightly and with a characteristic yellow flame.
5. When tapped the burned sample remnant often appears ashy. Cellulose acetate is generally more plastic-like.
6. If the test is inconclusive the gelatin layer should be removed.
7. Use the following procedure to remove the gelatin.
 - i. apply wet swab to both sides the sample while it is on the non-absorbent blotter
 - ii. when the gelatin has swelled sufficiently it can be scrapped off leaving the unknown plastic film base
 - iii. repeat burn test procedure steps 1 - 5.

3. Float test – Trichloroethylene test

This test is generally used as a secondary test in order to attempt to confirm an inconclusive DPA or burn test. This test is **NOT recommended** for the following reasons:

1. The float/trichloroethylene test is based on the differential densities of the plastic film bases. As negatives deteriorate, the density of the plastic base can change which can lead to misidentification using this test. Also, the specific gravity ranges for both cellulose nitrate and cellulose acetate can vary quite widely which can, again, cause problems in interpreting the results.
2. Trichloroethylene is **toxic and a carcinogen**.

V. How to determine the stage of negative deterioration

Once the negative has been identified as a cellulose nitrate, cellulose acetate or polyester base, the following procedure can be used to identify the stage of deterioration. The stage of deterioration will then enable the surveyor to rank the priority of the negative for reformatting.

1. Cellulose acetates

A-D (acid-detecting) strips are used to determine the deterioration state of cellulose acetate film base negatives. A-D strips have a shelf life of about one year if they remain unopened in their foil package. A-D strips are light sensitive so they must be stored in the dark. They are also moisture sensitive. If they get damp the dye may run.

Materials required:

A-D strips and A-D pencil
Zip-lock polyethylene bags

Procedure for using A-D strips:

1. Keep A-D strips in their zip-lock bag when not in use.
2. Place the negative into the zip-lock bag.
3. Place one A-D strip in contact with the non-emulsion (shiny) side of the negative.
4. Close the zip-lock bag. Do not press all the air out of the bag as oxygen is required for the A-D strip to react with the acetic acid.
5. Place the bag with the A-D strip in a dark location for 24 -36 hours.
6. After 24-36 hours, compare the colour of the A-D strip with the colour scale on the A-D pencil. If there is no colour change, leave it in for one more day. [The time for colour change depends on the temperature and ambient room relative humidity. Colour change is slower with a lower temperature and relative humidity, so if the testing is done in the photograph storage vault 4 days should be allowed for the colour change.]
7. Select one of the eight possible acidity levels which best reflects the colour change i.e. 0, 0.5, 1, 1.5, 2, 2.5, 3, 3.5
8. Discard the A-D strip after one use.

9. The zip-lock bag should only be used once as the polyethylene can absorb acetic acid and give false reading in subsequent tests.

Interpretation (Acetate Roll and Sheet Films)

Level	Film Condition	Recommended Action
0	Good - no deterioration	Cool/Cold Storage
1	Fair to good - deterioration starting	Cold storage Monitor closely
2	Poor - actively degrading	Freeze to preserve Copying advisable
3	Critical - shrinkage, warping imminent; possible handling hazard	Freeze immediately Copy immediately

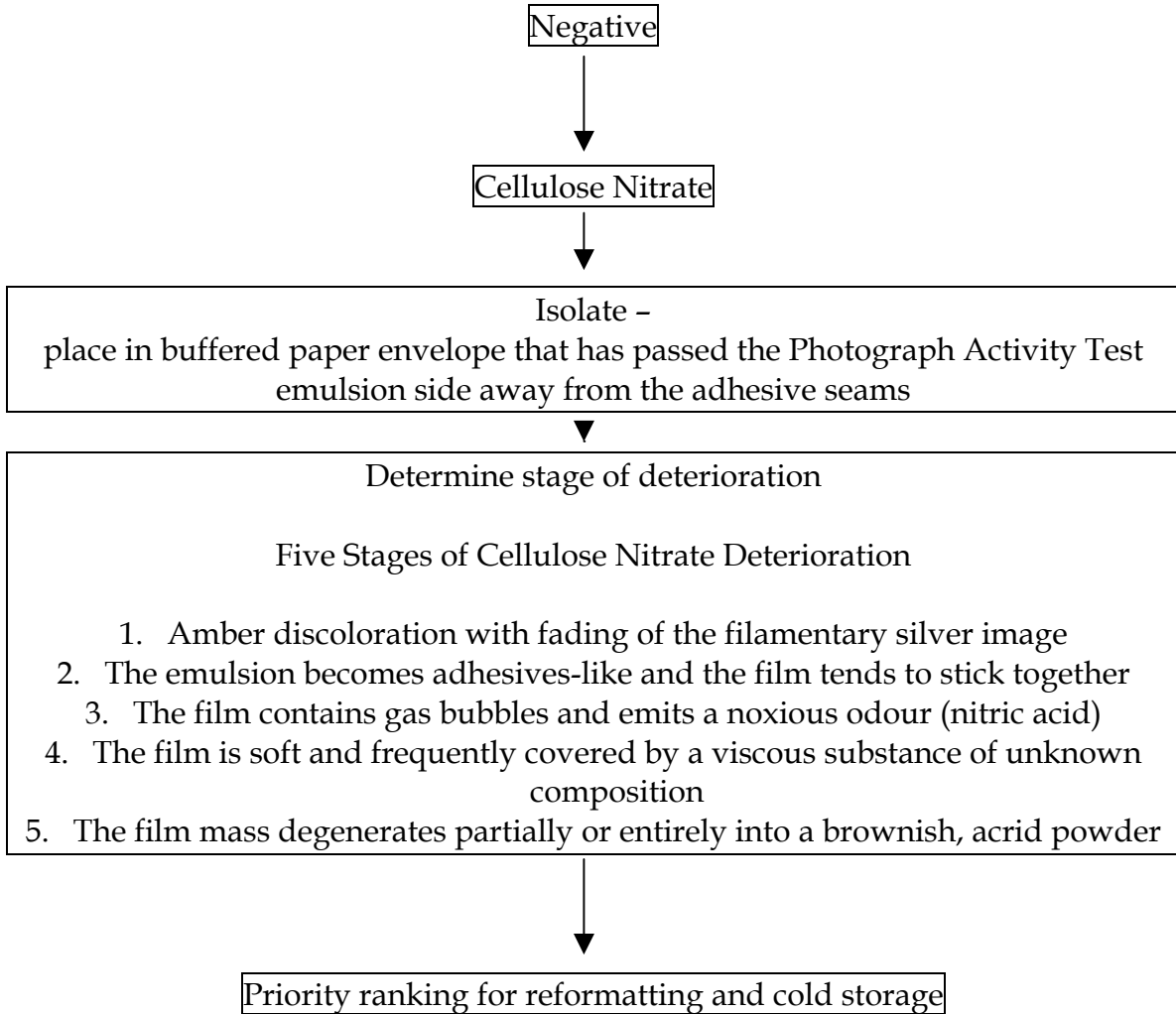
(A-D Strip booklet, pg.8)

Trouble shooting:

If there is no colour change and you have a visibly deteriorating negative, or one that you think should be deteriorating (wavy film base), then all of the acetic acid may have already volatilized from the film base.

Cellulose nitrate

There is no A-D strip equivalent for determining the stage of deterioration in cellulose nitrate. In order to rank cellulose nitrate negatives for reformatting and cold storage the following chart can be used.



	Low use	Moderate use	High use
Stage of deterioration			
Unique image			
Historical/Info value			
Monetary value			