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# Caring For Panoramic Photographs In Small Collections

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# CARING FOR PANORAMIC PHOTOGRAPHS IN SMALL COLLECTIONS

by

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B.F.A., Emily Carr University, 2007

A thesis

presented to Ryerson University and  
George Eastman House, International Museum of Photography and Film

in partial fulfillment of the  
requirements for the degree of  
Master of Arts  
in the Program of  
Photographic Preservation and Collections Management

Toronto, Ontario, Canada, 2012  
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Caring for Panoramic Photographs in Collections  
Master of Arts  
Kathleen A. Kinakin  
Photographic Preservation and Collections Management, 2012  
Ryerson University

## Abstract

Silver gelatin panoramic photographs produced in the first half of the 20th century are commonly found in archives and collections. Many were rolled for ease of storage, and their present condition means the information in the images is inaccessible. Panoramic prints in collections, whether rolled or flat, present a challenge to archivists and collection managers in terms of their treatment, housing, digitization and storage.

Working with rolled panoramic prints from a private collection as a case study, this thesis examines possible solutions to the issues of caring for panoramas in collections. Conservators and collection managers were also consulted to broaden the survey. A procedure for digitizing rolled panoramas is proposed as a solution for providing access to the image information if conservation treatment is not a viable option. Humidification and flattening treatments are discussed, and solutions are presented for the housing, storage and digitization of these oversized objects.

## Acknowledgements

This thesis would not have the scope and variety of information that it does without the thoughts and suggestions from so many people who were willing to share their knowledge with me, and who were incredibly patient with my questions. My thanks especially go to Greg Hill for taking the time to reply to my many e-mails, Dee Psaila for her excitement about this project and the time and effort she has contributed toward its success, John Slavin who allowed me into his studio and shared his thoughts and expertise, Janet Kepkiewicz and Tania Passafiume for their insight into panoramas in archives, and for Janet's very helpful photographs, Sara Shpargel who made time to answer my questions and followed up by sending explanatory photographs, Sue Bigelow for the tours and for sharing her experience, and to James Bowers, Jamie Allen, Carla Klük, Melissa Potter, Katharine Whitman and everyone else who took the time to respond to my questions for being so open to sharing their knowledge. Thanks also to Mike Robinson for encouraging me to pursue those ideas that seemed a little crazy, and for his enthusiasm toward researching panoramic photographs. I am deeply grateful to those who allowed me to work with the panoramas in their collection and who provided support and suggestions while I was learning how to care for such large objects.

Special thanks goes to my fellow PPCM friends who have been so supportive throughout the last two years, and who are always ready to offer advice and encouragement. Together we have accomplished great things. Thanks also to my friends who have encouraged me to keep writing. Without their motivation, my research and this paper would have been much more challenging to complete.

This thesis is dedicated to those people working in small, underfunded collections who believe in the importance of preserving our photographic history.

These collections contain some of our most valuable treasures.



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Note: All illustrations are by the author unless otherwise stated in the accompanying caption.

## Introduction

Panoramic photographs were a popular format for landscape and group portraits in the first half of the 20th century and they are commonly found in photographic collections. Because of their size and unconventional dimensions, they present a challenge to archivists in terms of their handling, storage, documentation and access for research. Panoramas can reach lengths of up to 120 cm or more and methods used to document, house and store conventional formats cannot always be applied to these oversized objects. As well, many panoramic photographs have been stored rolled and over time have become less flexible, making it unsafe to unroll them without risking damage to the emulsion. Access to the image is almost impossible, and the object is then of little value for research or display. In this rolled state, making the information in the image accessible requires the print to undergo treatment to humidify and flatten it. The treatment introduces moisture to the print in order to relax the paper fibres enough that it can be safely unrolled. Because this involves physical manipulation of the print, it is a procedure that is normally done by a conservator. In a large institution with a dedicated conservation department, this is normally a straightforward procedure, but for a small archive, this may not be an option. This means that not only is the image inaccessible to researchers, its contents are often unknown to the caretakers of the collection.

Using rolled panoramic photographs that are part of a private collection as a case study, this thesis explores the issues around access to these types of objects, and discusses procedures that could be applied to their treatment and subsequent care and handling. An archive's purpose and function is to be entrusted with the collection and care of important historical documents, and to be open to the public for research. There is a need to balance the care of the objects with their value for research, and finding solutions that consider both, while also accounting for the institution's needs and resources is a challenge. Often what would be considered best practices for treating and housing an object is not practicable, and the reality is that an institution may find it

necessary to do what it can while working with existing limited resources. One option for providing access to a rolled panorama that this thesis examines is a method of documenting the print without fully humidifying and flattening it. While this procedure requires experience in handling photographic objects, it is not as complex as completing the full humidification and flattening treatment. It also requires less resources and time, and therefore may be a practical alternative for a small institution to make the image available for research.

This thesis also reviews humidification and flattening treatments, and addresses questions that should be considered if the decision is made to treat the object. As well, options for housing and storing both rolled and flat panoramas, and methods for digitizing the image are presented. The intention is that this information will assist archivists and collection managers in institutions with varied resources find solutions to the issues encountered when accessing, housing and storing large panoramic photographs.

## Literature Survey

The issues around access, documentation, housing and storage of panoramic photographs in archives seems to be addressed sporadically and inconsistently in publications and literature about the preservation of photographic objects in archives, but it could be that at the time the majority of literature was written, photographic preservation was a new field. In a pamphlet published in the 1980s by the Society of Archivists in Great Britain titled *Archival Care of Still Photographs*, T. J. Collings states that archival concerns about photographic material is a relatively new development,<sup>1</sup> and Alice Swan wrote in her 1981 article "Problems in the Conservation of Silver Gelatin

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<sup>1</sup> Collings, *Archival Care of Still Photographs*, un-numbered pages.

Prints" that the field of photograph conservation is extremely new.<sup>2</sup>

When seeking solutions to the problems of caring for panoramic photographs in archives, information can be obtained from both archival and conservation sources. Archival sources mainly address the issues around housing and storage, providing information for a variety of skill levels, while literature on conservation is aimed toward specialists trained in treating physical objects. To understand what has been written about how to care for rolled panoramas, and on the issue of access, books on conservation and preservation, papers from archives and other institutions, and conservation websites were consulted to find as much information as possible about the policies and procedures of archivists and conservators. Anything in the publications relating to documenting, housing and storage was also noted.

The first item in the "Code of Ethics and Guidance for Practice" manual by the Canadian Association for Conservation of Cultural Property states "it is the responsibility of the conservation professional, acting alone or with others, to strive constantly to maintain a balance between the need in society to use a cultural property, and to ensure the preservation of that cultural property."<sup>3</sup> This statement considers both the intellectual and physical qualities of an object, making it clear that finding a balance between access to the information in the object and the proper care of the object is of utmost importance.

In *Photographs: Archival Care and Management*, published by the Society of American Archivists in 2006, Mary Lynn Ritzenthaler notes that if possible, the research value of the photograph should be considered before deciding whether to undertake treatment of the objects, though this is not always easily determined in the case of tightly rolled panoramas as evidenced by the objects that are part of this case study. Without being

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<sup>2</sup> Norris, *Issues in the Conservation of Photographs*, 533.

<sup>3</sup> Canadian Association for the Conservation of Cultural Property, *Code of Ethics and Guidance for Practice*, 1.

able to see the image, we can not be sure of its importance. Ritzenthaler outlines the risks and potential problems involved in humidifying and flattening rolled prints, stating that this treatment should be done by a conservator. However, she adds that depending on the circumstances, it is something that could be done by archivists who were trained by conservators.<sup>4</sup>

Descriptions of the techniques for humidifying and flattening photographs are provided in literature aimed specifically at conservators. In *Fundamentals of Photograph Conservation: A Study Guide* by Klaus B. Hendriks published in 1991, a two-page chapter titled "Flattening Prints and Negatives" discusses humidification and flattening of photographic prints. Hendriks outlines the method used to correctly place the humidified print between blotters, but the description of the procedure is not detailed enough to be carried out without further instruction.<sup>5</sup> Notes from the Archives Conservators discussion group at the 2002 conference of the American Institute of Conservation titled "Humidification and Flattening" covers the treatment of paper objects but does not include photographs at all. As well, there is a detailed discussion about methods for humidifying documents in *Line, Shade and Shadow: The Fabrication and Preservation of Architectural Drawings* by Lois Olcott Price that provides diagrams and gives instructions for the different methods of humidifying and flattening documents.<sup>6</sup> While the book doesn't specifically include photographic objects, it explains the procedures in detail and it could be used as a reference while keeping in mind the properties and precautions unique to photographic emulsions.

Because humidification and flattening is a procedure normally done by a conservator, literature written for archivists generally does not give detailed information about the treatment of rolled prints or issues of access. A brochure published in 2004 by the

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<sup>4</sup> Ritzenthaler et al., *Photographs : Archival Care and Management*, 234.

<sup>5</sup> Hendriks, *Fundamentals of Photograph Conservation*, 304-305.

<sup>6</sup> Price, *Line, Shade and Shadow*, 313-319.

International Federation of Library Associations and Institutions titled "Care, Handling, and Storage of Photographs" written by Mark Roosa from the Library of Congress mainly covers storage conditions and factors that contribute to deterioration. It does not discuss specific issues affecting photographs other than to say that during the initial evaluation, material with special preservation problems should be noted for treatment by a conservator.<sup>7</sup>

The storage of panoramic photographs is also an issue. Once unrolled, many are oversized, making it difficult to apply practices that are normally used with smaller conventional formats. Housing flattened oversized prints is often covered, though not in great detail, other than to say that the same materials can be used as with the smaller prints, and that they should be stored flat. Roosa notes that rolling oversized photographs for storage should be avoided to prevent the gelatin from cracking when they are unrolled. Conversely, Ritzenthaler describes a method of storing flat panoramic photographs by rolling them onto a cylindrical core in cases where they are too long to be properly accommodated by existing flat storage.<sup>8</sup> In a technical bulletin titled "The Care of Black and White Photographic Collections: Cleaning and Stabilization" published in 1980 by the Canadian Conservation Institute, Siegfried Rempel includes a section on curled prints. While he doesn't discuss access or humidification and flattening of the prints, he does give a step-by-step process for storing the curled prints on a supporting tube to prevent damage that would occur if the object is crushed.<sup>9</sup> A full page of illustrations accompanies this description. One book that does discuss housing is *Design & Materials for Photographic Housings* written in 2008 by Dee Psaila. She devotes a section in the chapter on "Housing Suggestions" to panoramas, describing and illustrating two methods that could be used to house panoramic photographs. She notes that every institution will have to deal with

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<sup>7</sup> Roosa, *Care, Handling and Storage of Photographs*, 5.

<sup>8</sup> Ritzenthaler et al., *Photographs: Archival Care and Management*, 234.

<sup>9</sup> Rempel, *The Care of Photographs*, 97-98.



panoramas as part of their collection and that they can be problematic if there is not space designed to accommodate them.<sup>10</sup> Literature describing housing for oversized paper objects could also be applied to photographs. The Northeast Document Conservation Center website has an article titled "Storage Solutions for Oversized Paper Artifacts" describing solutions for large documents.<sup>11</sup> While it doesn't specifically refer to photographic material, the discussion of various storage options is relevant and informative.

In terms of the digitization of panoramic prints, Roosa notes the need to duplicate objects that are fragile or deteriorating to reduce handling and further damage, but no mention is made of objects that may not be accessible for documentation such as a rolled panorama. Sue Bigelow, the digital conservator at the City of Vancouver Archives provides a detailed description of the procedures they used to digitize 370 Cirkut camera negatives on a flatbed scanner. Though it applies to negatives, the information could be applied to flat prints as well, provided the institution has access to a scanner of this type. *The AIC Guide to Digital Photography and Conservation Documentation*, edited by Jeffrey Warda and published by the American Institute for Conservation provides a detailed discussion about equipment required for documentation, procedures for image capture, and colour correction and post processing, but only briefly covers oversized objects in a section on "Mosaicking."<sup>12</sup> Ritzenthaler also briefly discusses documenting panoramas in sections but provides little detail about the procedure.<sup>13</sup>

After reviewing a variety of literature representing the varied perspectives of conservation professionals and collection managers, it is clear that further discussion of

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<sup>10</sup> Psaila, *Design & Materials for Photographic Housings*, 55.

<sup>11</sup> Northeast Document Conservation Center. "4.9 Storage Solutions for Oversized Artifacts," accessed November 2, 2011, [http://www.nedcc.org/resources/leaflets/4Storage\\_and\\_Handling/09OversizedArtifacts.php](http://www.nedcc.org/resources/leaflets/4Storage_and_Handling/09OversizedArtifacts.php).

<sup>12</sup> Warda, *The AIC Guide to Digital Photography and Conservation Documentation*, 138-139.

<sup>13</sup> Ritzenthaler et al., *Photographs: Archival Care and Management*, 371.

the ethics and roles of archivists and conservators is required to define and establish contemporary standards for the treatment of rolled panoramic photographs. Published information about current procedures for treatment, housing and storage, and issues around access to rolled prints is limited, and procedures for flat prints are generally addressed only briefly. This survey of available publications reveals a need for a complete and detailed practical approach to dealing with panoramic photographs in archives that includes all aspects of their care.

## Methodology

In order to understand the issues that arise when caring for panoramic prints in collections, and to discover practices and techniques used in different institutions, I consulted conservators and collection managers at the City of Vancouver Archives, the Archives of Ontario, Library and Archives Canada (LAC), the Art Gallery of Ontario, the Canadian Conservation Institute, the National Archives and Records Administration (NARA) in Washington D.C., George Eastman House in Rochester N.Y. and the Nova Scotia Archives, as well as several conservators in private practice. Conservators were queried about the treatments they perform when humidifying and flattening prints, and about their thoughts on documenting a rolled panorama. As well, they were asked whether they felt it was possible that an archivist might be able to perform the same or similar treatment, and under what circumstances it would be best to consult a conservator. Collection managers were asked about the methods they use to house and store panoramic prints, and what solutions were found for addressing the problems that are specific to their institutions. In addition, I worked with a group of rolled prints in a private collection as a case study, allowing me to gain firsthand experience with panoramic photographs in a collection. This helped me to better understand the issues that arise when documenting, housing and storing these oversized objects, and assisted me in providing suggestions for their care and handling.

## A Case Study of Rolled Panoramas by H.O. Dodge

The rolled panoramas that make up this case study are from a private collection, and were acquired in 2002 as part of a lot of 46 smaller panoramic contact prints of images taken in Alaska. They came to the collection as two tightly rolled groups with multiple prints in each so their length and the exact number of prints was not known, and the information in the images could not be seen (fig.1). It was determined that they are 20 cm high and are silver gelatin prints, likely contact prints from a Cirkut camera negative which would date them to sometime in the first part of the 20th century. Cirkut cameras were produced in the United States between 1904 and 1941 and were used by many photographers for large group portraits and to document the landscape and cityscape.<sup>14</sup>



**Figure 1.** The two groups of rolled panoramas used in the case study. The panoramas were in this condition when they were acquired.

The panoramas in the case study were very tightly rolled and neither the photographer's inscription nor any significant image information could be seen in the exposed areas of the images. This problem of inaccessibility of the image information in rolled panoramas was underscored when these prints were later humidified and flattened. It was discovered that these panoramas, which have been in the collection for several years and were thought to be images of Alaska, are actually images of Grand

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<sup>14</sup> A brief description of the Cirkut camera is included in Appendix 1.

Falls, Newfoundland taken by Harry O. Dodge.<sup>15</sup> As well, the collection contains another photograph by Dodge, making these photographs more important as they add to the understanding of his body of work. Through this case study, it is apparent that finding a solution to the problem of access could provide researchers with new information for study, and assist archivists by helping them better understand what their collection contains.

## Addressing the Issue of Rolled Panoramic Photographs in Collections

Presented with a rolled panorama that has been acquired for a collection, an institution will decide on a course of action based on many different factors. Institutions have a responsibility to provide the best possible care for the objects in their collection and to properly preserve them for the future. At the same time, practical considerations must be addressed with regards to the resources and policies of the institution. This includes available funding, time constraints, storage space, and the mandate to provide access to the material for research. An example is the Archives of Ontario Code of Practice that states it "will provide access to archival information while ensuring these materials are protected for generations to come".<sup>16</sup> A balance between access to the material, and what might be considered best practices for preservation of the material must be considered. Possible options include leaving the rolled prints as they are and providing archival storage for them until such time as there are the means to treat them, documenting the image without fully humidifying and flattening the print and storing it rolled, or treating the print by humidifying and flattening it prior to storage.

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<sup>15</sup> Information about the photographer H.O. Dodge, and the images of Grand Falls can be found in Appendix 1.

<sup>16</sup> Archives of Ontario. "Code of Practice: Our Guiding Principles," accessed March 28, 2012, <http://www.archives.gov.on.ca/english/about/code-of-practice.aspx>.

## Leaving the Print Rolled

Depending on the circumstances, it may be best to leave the print rolled. An example of this was found at the Nova Scotia Archives. The archivist discussed their procedures for dealing with rolled photographs, noting that because they don't have a conservator on staff, the prints are housed in an archival box as is and access for researchers and staff is restricted. She adds that most of the prints are loosely rolled, which enabled staff to see the name of the photographer imprinted in the corner and to view a limited amount of image content. This information was then recorded in the catalogue record. When funds become available, the prints will be sent to a conservator for treatment.

As much information should be recorded about the image and the object as possible if it is decided to leave the panorama rolled. The height of the roll may help identify which camera was used to take the photograph, as the majority are contact prints from Cirkut camera negatives and are in standard sizes of 8", 10", 12" or 16". If no information was given about the object at the time it was acquired, it may be possible to see a partial inscription by the photographer in the edge of the print by unrolling the edge slightly.<sup>17</sup> The object should be stored in a sturdy housing that will protect it from being crushed.<sup>18</sup> All of the conservators consulted recommended that when circumstances permit, the prints should be treated by humidification and flattening as it is better for the long-term preservation of the photographs to store them flat.

## Documenting a Rolled Panoramic Print

Documenting the image using digital image capture while the print is still rolled could be a viable alternative for providing access to the information if the humidification and flattening treatment is not a practical option. There are several benefits to this procedure that make it worth considering. It is a cost effective method for making an object that was previously inaccessible and its image contents unknown,

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<sup>17</sup> For recommendations on handling rolled prints, refer to pages 13-14.

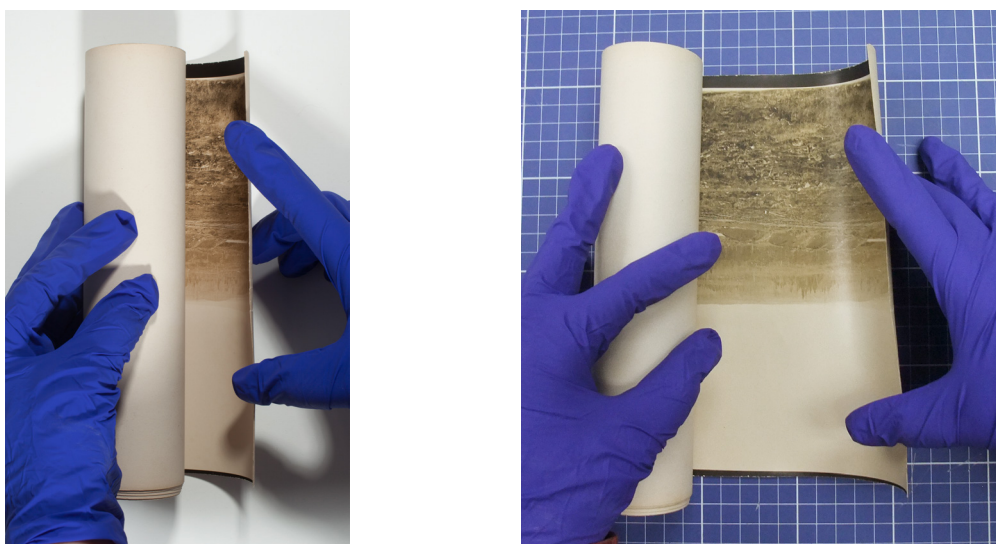
<sup>18</sup> Options for housing rolled prints are discussed in the section on housing on pages 26-28.

available for research. It can also assist archivists by helping them better understand what is in their collection. Creating a high resolution digital file is often sufficient for most researchers and may make the humidification and flattening treatment not immediately necessary. It also allows archivists and collection managers to determine if the photograph is significant enough to consider conservation treatment, and having a digital file of the image content may help them justify finding funding for the treatment. The main drawback to this procedure is the risk of damage to the photograph since any time an object is handled, as in unrolling a panorama, there is the possibility for damage to occur. However, most conservators consulted during this research feel that if an institution has staff experienced with photographic material then this procedure would be manageable. It was also stressed that the preservation of the object is of utmost importance and if an archivist is unsure of either the procedure or handling rolled prints, it is advisable to first consult a conservator.

Relative humidity (RH) is the measurement of the amount of water vapour in the air and is the most important variable in ensuring the safe handling of rolled prints. Higher RH levels in the storage environment increase the flexibility of photographic objects because moisture absorbed by the paper fibres and the gelatin based emulsion allows the print to be manipulated more easily than a print containing less moisture. An example of the effect of RH can be seen in figure 2 where the difference in flexibility between a print that has been stored in 23% RH compared to the same print stored in 45% RH for one week becomes apparent when the print is unrolled.

Most damage is done to rolled prints from improper handling and by unrolling them with too much force when they are not flexible enough, causing vertical cracks in the emulsion, or in some cases, causing the print to tear or break. Several conservators have recommended that the print be kept in an environment with a minimum RH of around 50-60% for at least 24 hours before being able to safely unroll sections of it for

documentation. This allows the print to absorb moisture, reducing the physical stress placed on the paper fibres and the emulsion when it is unrolled. If the print is tightly rolled, a longer period in this environment may be needed for the humidity to penetrate the roll sufficiently. One conservator suggested that this procedure could be performed at a time of year when the ambient humidity is naturally higher if it is not possible to control the relative humidity in the storage environment. A more complex option for introducing humidity is to create an isolated environment such as a humidity chamber that contains a higher RH if the ambient RH in the storage area is lower than 50%.<sup>19</sup>



**Figure 2.** The difference in flexibility in a print when stored in different RH levels. On the left, the print has been stored in an environment with an average relative humidity of 23%. On the right, the same print after storage in an environment of 45% RH. The print is being unrolled to a point where resistance is felt.

The condition of the print also needs to be considered before undertaking any procedures or treatments. A conservator should be consulted for prints that are very torn or brittle. Prints that have tape or adhesive on them, or that have inscriptions in ink could be documented, but should not be put in a humidity chamber without the advice of a conservator as the high humidity may cause changes in the adhesive, or the ink may bleed, resulting in damage.

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<sup>19</sup> For details on humidifying a rolled print in a humidity chamber, see pages 22-24.



## Handling Rolled Prints

The print can be examined before documentation or treatment by rolling it from one end to the other, inspecting both sides as they are uncovered and allowing any issues to be identified prior to performing the documentation procedure. When opening rolled prints, use two or more contact points on the edge of the print and not one in the centre as this could tear the paper (fig. 3). Do not let the end of the print or the roll snap back, instead, support it until it has come back to its natural curl. When inspecting the print, unroll the end and let it curl into a second roll as it comes off the first side, as if looking at a scroll. Roll each side to advance through the print, looking at both the recto (front) and verso (back) to see any possible problems (fig. 4).



**Figure 3.** Unrolling the end of a print. Use two points of contact on the edge rather than one in the center.



Tears in the end of a rolled panorama, likely from unrolling it with only one thumb or finger in the center.



**Figure 4.** Rolling through a print for inspection.



If the relative humidity of the environment where the print is being stored is 50% or more, and the paper feels flexible enough to be unrolled at least 10 to 20 cm without cracking the emulsion, then it is safe to proceed with documentation. Determining whether a print is flexible enough to safely unroll is a matter of experience, as is developing a feel for knowing how far to proceed without forcing it. Most conservators consulted stated that there is no precise method for knowing when the roll is being forced, except to say that if it feels like too much resistance is felt while unrolling the print, then stop. Several also suggested obtaining a rolled panorama from a market or photo show that was produced at a similar time for use as a test. In this way, it is possible to get a feel for how the paper and emulsion react to different levels of humidity in the environment, as well as to test the set up for the documentation procedure. This print could also be used to test the effectiveness of a humidity chamber before attempting to humidify archival materials. While each print has different issues and all will not react in the same manner, this is a good way to become comfortable with handling these types of objects.

## The Procedure for Documenting a Rolled Panorama

Before unrolling a print to document it, have all necessary materials close at hand to avoid having to let go of the roll to retrieve something. It may be helpful to have a second person assist with the procedure. If the print has been in a humidity chamber prior to documentation, set up the equipment and test the exposure in advance. The change to a lower humidity while the print is being documented will cause it to become less flexible in a relatively short time. If the lights being used for documentation emit any heat, this will also cause the print to lose moisture quickly and become less flexible. It is important to use a copy stand or tripod with a horizontal arm when documenting panoramas as it will create more consistent images of each section, as well as making it

easier to handle the object.<sup>20</sup>

Besides the camera and lighting equipment, the basic materials required are two weights, two strips of interleaving tissue or other acid free paper and two pieces of mat board or corrugated board that are at least as wide as the print and approximately 40 - 60 cm long.

To begin, working on a copy stand, place the rolled print on one end of one of the boards. Unroll the end of the print using two points of contact, and place the weight on the strip of interleaving tissue on the end of the print. Unroll the print across both boards, taking care not to force it open (fig. 5). If there are already cracks in the emulsion, or if the paper wants to pop up rather than lay flat, it is advisable to put weights on the edges of the print as well.



**Figure 5.** Unroll the first section while placing a weight on the end.

An alternative would be to use a very clean sheet of glass to lie on the print (fig. 6). Be aware that depending on the thickness and type of glass, it will shift the colour balance slightly, giving it a greenish cast. Do not let the glass slide across the surface while placing or removing it to prevent scratches in the emulsion.

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<sup>20</sup> For a more detailed discussion about some of the technical aspects of documentation and post processing, refer to the section titled "Digitizing Panoramic Photographs" beginning on page 45.

**Figure 6.** Using a piece of glass to hold the print flat.

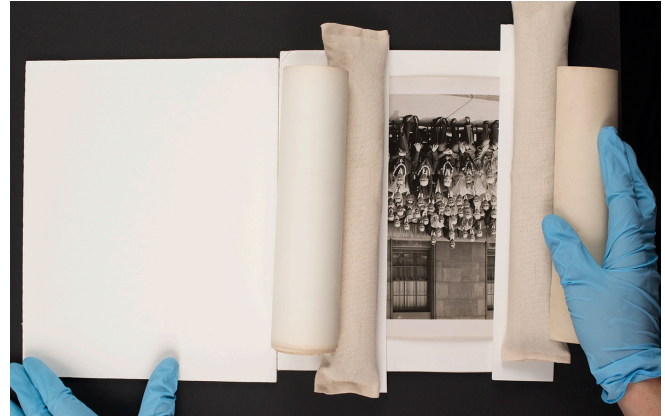


After unrolling the print so that at least 20 - 30 cm is visible, place the second weight with interleaving tissue on the print next to the roll to keep it from springing back (fig. 7). Photograph the exposed section of the print. The print should fill the frame as much as possible without cropping the edges of the object or seeing the weights in the image.

**Figure 7.** The first section ready to document.



To move to the next section, remove the weight on the end of the print while supporting it to ensure that it doesn't snap back to the roll, and place it next to the other weight. Leave approximately 5 - 7 cm between the weights to allow the images to overlap enough to be stitched properly (fig. 8). By placing the first board on the other side of the second and rolling the print onto it, the assembly can be repositioned under the camera more easily.



**Figure 8.** Place the weight to leave overlap between frames. Move the board from one side to the other and continue to unroll the print.

Remove the second weight and unroll the print further. Repeat these steps until the full length of the print has been documented (fig. 9). The files can now be digitally combined in Adobe Photoshop to create a complete image.<sup>21</sup>



**Figure 9.** Unroll the print to the next section.

## Humidification and Flattening Treatment

There are several benefits to humidifying and flattening rolled prints. Once flat, it is easier to access the physical object for those researchers who want to study the materiality of the photograph as well as the image contents. Prints that have not been fully humidified and are still rolled are generally not accessible for research, so

<sup>21</sup> For details on processing and stitching, refer to pages 52-54.

studying a digital surrogate, if available, would be the only option for accessing the image.

There are also some drawbacks to humidifying and flattening prints that should be considered before the decision is made to proceed. Large format materials for both the treatment and subsequent housing will be required, which can be costly. A large, very flat surface is needed to treat the print, and because its length may not be known until it is unrolled, a sufficient amount of space should be available for the procedure. The treatment process can be time consuming, with the humidification taking up to 24 hours, and the print weighted to dry for several days or more. After treatment, the flattened panoramas require long flat shelves for storage that may not easily be found in a smaller storage environment.

For various reasons it might not be feasible to hire a conservator to humidify and flatten prints but there is still a need to provide access to the photograph. In these situations, archivists may find it necessary to treat the prints themselves. Most conservators consulted for this research felt that the treatment could be carried out by an archivist or collection manager who is experienced with handling photographic objects, and who is familiar with the procedure. However, they recommended seeking the advice of a conservator if possible in order to help assess the issues that are specific to the situation. It was also recommended that it be treated by a conservator in instances where the print is in poor condition, or is brittle, cracked, very dirty, or has adhesives or ink on the surface. In *Photographs: Archival Care and Management*, Mary Lynn Ritzenthaler also suggests that because of the potential problems, humidification should be done by a conservator, but that if appropriate, a conservator could be consulted to examine the material and assess the risks, and provide training for staff to carry out the treatment.<sup>22</sup> One conservator hesitated to say that archivists and collection managers

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<sup>22</sup> Ritzenthaler et al., *Photographs: Archival Care and Management*, 234.

could perform the treatment because unexpected issues can arise that they may not be able to properly deal with, and that it should be left to a conservator. Several conservators suggested that if there are a large number of panoramas to treat, and archivists have limited experience with handling photographs, it might be beneficial and more cost effective to have a conservator provide some initial training. One conservator suggested that several institutions could pool resources and have a conservator consult with them as a group.

### Treatment of the H.O. Dodge Panoramas in the Case Study

When the rolled panoramas in the case study were acquired in 2002, there wasn't time to dedicate to treating them so they were housed in an archival box as is and stored on a shelf next to the other objects in the acquisition. After considering options for the treatment of these panoramas, and in consultation with the collection manager, it was decided that they would be humidified and flattened by a conservator because there was now time to dedicate to their housing and storage, funds were available for the treatment, and it would be a good opportunity to observe the process and better understand it.

The conservator decided that the best method of treatment would be to humidify the print while it is unrolled and held flat. This method uses damp towels or blotters to introduce moisture to the print, which has been placed between layers of Hollytex and Gore-Tex. It requires a large working area for both the humidification and flattening process. This configuration is referred to by Lois Alcott Price in *Line, Shade and Shadow* as a "Gore-Tex or Tyvek sandwich" and is described as a useful technique for humidifying oversized material.<sup>23</sup> She refers mainly to works on paper but the technique is also used for photographic material under the right circumstances. The

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<sup>23</sup> Price, *Line Shade and Shadow*, 315.

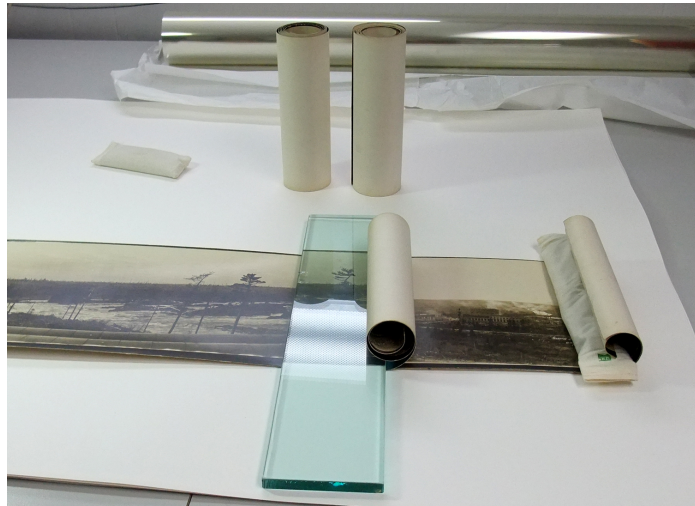


purpose of the Gore-Tex is to prevent liquid from coming in direct contact with the print, allowing only humidity through. Hollytex is a thin spun polyester material with a random fibre pattern that provides a clean even surface for direct contact with the print. This method of humidification introduces moisture to the print very quickly, so it should be carefully monitored to ensure the emulsion does not become too soft and cause damage to the surface. As well, if left too long, any discolouration on the verso could migrate through the paper and stain the emulsion.

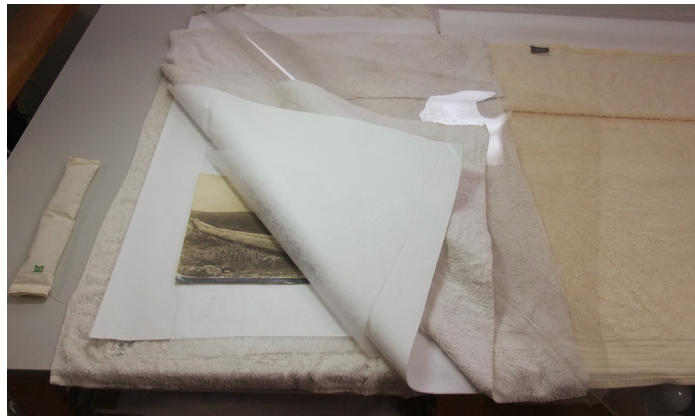
After careful examination, the conservator first unrolled the prints to separate them from each other, assess any potential problems, and find out how long they were so materials and working space could be allocated for treatment (fig. 10). The prints had been stored in an environment with a 45% RH for one week before arriving at the conservators, and he felt that they were flexible enough to be unrolled for treatment.

To treat an individual print, slightly damp towels were laid on the counter. A sheet of Gore-Tex was placed on the damp towels, followed by a sheet of Hollytex. The print was unrolled on this stack with weights on the ends to hold it flat. Weights were also placed on the sides of the print in areas where there were cracks or small tears that needed to be stabilized. Another layer of Hollytex and Gore-Tex were laid on top followed by a layer of dampened towels (fig. 11). The weights were carefully moved to the outside of the stack, and a sheet of Mylar was placed on top to help retain moisture. This stack was left for approximately 30 minutes before removing the print for flattening. Flattening prints requires a continuous, very smooth surface to work on to prevent dents or surface deformations in the print, and a glass-topped table was used for this purpose. The print was sandwiched between layers of Hollytex and blotters, with large sheets of 1.2 cm glass placed on top to provide enough pressure to hold the print flat as it dried (fig.12). The blotters should be flat with no cockling, and in a single sheet rather than two sheets next to one another to prevent lines or distortions from

forming in the emulsion. This step must be done quickly as the print will begin to dry immediately after it is removed from the humid environment and will start to curl. The blotters were changed after two hours and the print was then left to fully dry for two days.



**Figure 10.** Unrolling the prints in the case study to inspect and separate them.



**Figure 11.** Humidifying the prints between damp towels, Gore-Tex and Hollytex.



**Figure 12.** The prints were dried in a blotter stack with sheets of glass used as weights.



## Humidification Using a Humidity Chamber

Another method of humidifying and flattening prints is to place the rolls in a humidity chamber and allow them to relax enough that they can be easily unrolled and flattened for permanent storage. This method is the one commonly used by most conservators consulted for several reasons. Many felt that it reduced the risk of cracking and damage to the emulsion because the print is more relaxed when it is unrolled. Some also stated that it was a more cost effective way to treat the prints, as Gore-Tex in sizes large enough to cover large panoramas can be costly. The conservator who treated the panoramas in the case study prefers the sandwich method because in addition to being a faster method of introducing humidity to the print, it eliminates the risk of contamination from dirt or ink transferring between parts of the print that are in contact with each other while in a roll. He did add that if the roll is not flexible enough to fully unroll, it may need to be relaxed in a humidity chamber before being treated.

Using a humidity chamber to humidify prints is referred to in several publications for conservators and archivists. While the objects being discussed for treatment are mainly architectural drawings and other works on paper, the procedure for photographs is very similar, though the fragility of photographic emulsion and its sensitivity to moisture should be taken into account. Stephanie Watkins provides a detailed discussion about the procedures in the article "Practical Considerations for Humidifying and Flattening Paper," giving examples of the different types of humidity chambers that are used and providing illustrations for each. These include trays, sinks, lidded garbage cans and screened drying racks.<sup>24</sup>

One method commonly employed at the Archives of Ontario is to use a tray or a sink to create a humidity chamber. The conservator there feels that it is an easy way to safely introduce moisture to a photographic print and is something that can be set up

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<sup>24</sup> Watkins, "Practical Considerations for Humidifying and Flattening Paper," 62.

anywhere. A darkroom tray that easily fits the rolled print is used to create the chamber. Two narrow pieces of thick glass are placed in the bottom to raise a plastic crate that has been cut to fit into the tray. The crate, often referred to as an egg crate louvre, is the cover of a fluorescent lighting fixture and can easily be found in a hardware store. Water is put in the tray that just covers the bottom, and the crate prevents the water from coming in contact with the print. An alternative is to use damp blotters or damp absorbent cloths such as a chamois in the bottom to avoid splashing water on the print.

The temperature of water depends on the level of humidity required and how quickly the RH needs to be raised. Room temperature water will raise the RH levels gradually and is not as likely to cause condensation inside the chamber. Warm or hot water will raise the RH more quickly but there is an increased risk of condensation forming on the cover of the chamber that could come into contact with the print, which must be avoided. Watkins notes that the cool water chamber and slower rise in RH helps the moisture penetrate more evenly in some types of material.<sup>25</sup>

The rolled print is placed on a sheet of spun polyester on the crate, and glass or Plexiglas is placed over the tray as a cover. Plastic clipped to the rim of the tray can also be used and may create a better seal, but it must be pulled taut and not allowed to sag in the center as this would provide a place for condensation to drip from. It is possible that the roll could slowly expand during the process so ensure that there is enough clearance between the object and the cover to facilitate this. The conservator at the Archives of Ontario recommends leaving the roll in the humidity chamber for 24 hours to allow the humidity to fully penetrate to the inside layers. She notes that the print will feel cool to the touch on the back of a hand when it has absorbed enough moisture. The print should not be left in the humidity chamber for more than 24 hours to avoid the

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<sup>25</sup> Ibid., 62.

risk of mould growth.

After removing the print from the chamber, work on a very flat surface and unroll it onto a stack of blotters. The blotters should be at least the same size as the print but preferably larger, and not stained or cockled as any deformations or contamination will transfer to the print. Place a sheet of Hollytex on top to provide a very smooth, clean surface for the emulsion, followed by another layer of blotters. Use sheets of Plexiglas or glass to weigh down the stack just enough to hold it flat. This is left for one to two weeks to fully flatten. As soon as the print is removed from the blotter stack, it should be encapsulated or put into a folder to prevent it from beginning to curl again. As an alternative to a tray, the conservator also discussed placing the glass blocks and crate in the bottom of a sink and covering it with a sheet of Plexiglas to create a humidity chamber. If the crate is smaller than the size of the sink, ensure that the print will not roll off and come into contact with the water.

The humidification and flattening treatment is the best preservation option for a rolled print, however this is only the case if it is done properly. Issues can arise during treatment that are beyond the skill of an archivist to deal with so avoiding situations where they may come up will prevent damage to archival material. Prints that are in poor condition, have ink or adhesives on the surface or are very brittle or cracked may require a conservator to treat them. For some institutions, having an archivist or collection manager perform the treatment may be the most practical solution to the issue of access to the image. Consulting a conservator for advice and guidance will help ensure the best possible care for the objects.<sup>26</sup>

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<sup>26</sup> For suggestions on how to find a conservator, refer to Appendix 2.

## Housing and Storage

Methods used for the housing and storage of conventional silver gelatin prints may not be practical for a larger panoramic format, though the principles are the same. Material costs and time spent caring for the objects increase with their size, making them a challenge for institutions with limited resources.

Before committing to treatment to flatten rolled panoramas, their potential final size must be considered and a detailed plan should be made for housing and storage. There are several things to consider when assessing housing requirements. Where the print will be stored often dictates what housing solutions are best. How it will be used and accessed, and the frequency of requests for individual prints affect choices made for both housing and storage. Materials and resources that are available to house and store the print, and the skill level needed to construct custom housing will play a significant role in all housing projects. Options for housing using very limited materials should be considered while keeping in mind what could be done when more resources become available. The needs and resources of the institution and the condition of the object will ultimately determine the appropriate housing solution.

Prints that are left rolled can be safely housed as they are to facilitate condensed storage in standard sized containers, or rolled onto a cardboard tube for support. Prints that have been humidified and flattened are generally encapsulated immediately after treatment to stabilize them and help them remain flat. There are many options for housing flat prints, including mounting onto a support board, housing in a folder or clamshell box, or in cases where the print is very long, rolling them onto a large diameter tube for easier storage.

## Housing Rolled Prints

If the print is in very poor condition or it is not practical to re-roll it onto a tube, it should be carefully wrapped in acid free paper and housed in an archival box. If necessary, the paper can be secured by loosely tying it with cotton tape. Write the accession information on the paper before rolling it onto the print or on a label attached to the tape. Without internal support, prints in rolls risk damage by being crushed and should be placed in the box with enough cushioning that they are not able to move around. If the rolls are small and light, two to three layers could be stacked in a box, but more than this is not recommended to avoid damage to the rolls beneath.



The left end of the roll was left open, and on the right end, tabs were made to help secure the negative when it was placed upright in the storage box.



**Figure 13.** Housing for nitrate negatives at Library and Archives Canada.  
Photo courtesy of Library and Archives Canada.

Library and Archives Canada found a solution for storing rolled panoramic nitrate negatives by rolling them in archival paper with notches folded in at one end to hold the negative, tying cotton twill tape around the roll and storing them vertically in a container (fig.13). This method could also be applied to rolled prints that are not too wide if they will be stored indefinitely, and is a good way to store a number of rolls in one box. The collection manager at LAC suggested that if there is a plan to humidify and flatten the prints within the following five years, this type of housing might not be

the best use of time and materials. Instead, she suggests housing the rolls in a flat archival box until treatment as this would require fewer resources, and the boxes could later be reused for another purpose.

If it is possible to re-roll the print, it can be put on a cardboard core and housed in a box with supports. There is less risk of it being crushed when housed this way, though it does require more time and materials. Use a cardboard tube that is slightly larger than the diameter of the roll and allow at least two to three centimetres of the tube to extend from each end of the print. In *The Care of Photographs*, Siegfried Rempel describes rolling a print onto a mailing tube for storage and wrapping the tube in acid free paper.<sup>27</sup> The conservator at the Archives of Ontario notes that any type of cardboard tube can be used but prefers to wrap it in Mylar as it provides an impermeable barrier between the print and the cardboard.



**Figure 14.** Rolling a print onto a tube for support.  
If the tube is not made from archival material,  
it is first wrapped in Mylar to protect the print.

To roll the print onto a tube, first unroll the print slightly, using at least two points of contact on the end to avoid tearing the paper. Begin rolling the end of the print onto the prepared tube while carefully unrolling the rest of the roll (fig. 14). It may be beneficial

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<sup>27</sup> Rempel, *The Care of Photographs*, 98.

to add interleaving tissue into the roll if the print is very dirty, or has adhesives or other residue on it to prevent transfer between the recto and verso of the print. Wrap the finished roll with acid free tissue or paper and loosely tie cotton twill tape around the tube to secure the paper if necessary.

Prints rolled onto tubes can be stored horizontally or vertically in an archival box. If the tube is placed horizontally in the box, supports for the ends of the tube can be constructed out of corrugated board or Ethafoam (fig. 15). This will raise the roll off the bottom, preventing a pressure point on the print that could cause deformations if the roll is heavy.



**Figure 15.** A support cut from a piece of Ethafoam.

## Housing Flat Prints

There are a number of options for housing prints that have been humidified and flattened or that are flat when they are acquired. The ideal solution will be based on the needs and resources of the institution, and on the prints themselves. Housing materials can be costly, and funds available for supplies will be a factor in determining the best option. The time available and skills needed to build custom housing for non-conventionally sized prints will influence the decisions that are made. Another important consideration is the accessibility of the prints by staff and researchers. How often they will be needed and how many people are available to handle and move them

will determine what housing methods are employed and where the prints are stored. It may be useful to have frequently requested prints housed individually or in small groups rather than larger groups to avoid excessive handling of unrequested prints. As well, when a large number of prints are stored in one box, it may require two people to handle it. The size and condition of the print, and the presence of information on the verso will also help dictate how the print is housed. The final storage location should be considered when planning housing solutions. Many panoramas are too long to fit on a standard shelf and institutions may not have access to oversize shelving or map drawers, making it necessary to store prints on the top of a shelving unit. There are risks involved with this, such as increased exposure to light or potential water damage from fire suppression systems that can be mitigated by constructing housing in a particular way or with specific materials.

## Encapsulation

Encapsulating prints will provide protection, but it can be costly and time consuming, and may not be practical or desirable for some institutions. It also may not be appropriate for all prints depending on their condition. If the print will not be encapsulated, care should be taken when handling it and when it is being accessed for research as it does not have the protection and support of the Mylar and can be damaged more easily. Folders can be made for individual prints from an archival folder stock or Perma/dur board. This allows intellectual information to be written on the folder for each print, helps keep the print flat, and makes selecting individual prints from the group easier than if they were housed together with interleaving tissue between each one. A number of these can be placed in a secondary housing, such as a box, constructed from archival corrugated board or Coroplast.

Archival uncoated polyester film such as 4 mil or 5 mil Mylar type D or Melinex 516 should be used if the print will be encapsulated, as it is considered safe for use in direct



contact with photographic materials. The sheets can be sealed with an ultrasonic or heat sealer if available, but for large sizes, this may not be practical. Instead, archival double-sided tape such as 3M #415 is used to adhere the Mylar sheets together. Because paper fibres have the ability to remember how they were previously treated, the print will attempt to curl again if not held flat. The Mylar helps to keep the print flat as well as provide support for it, and protects it from fingerprints and other contamination while being handled. Because it is transparent, the print can remain in the enclosure while being viewed. The disadvantage of Mylar is the electrostatic charge it produces, attracting dust and debris that could damage the emulsion. Mylar should not be used for prints with flaking emulsion as the electrostatic charge could cause the emulsion to come loose from the print.

To encapsulate a print, use two sheets of Mylar that are at least five to eight centimetres larger than the print on all sides. Work on a clean flat surface large enough to support the entire sheet, and clean the Mylar surfaces that will contact the print with a soft brush to remove any dust. The edges can be sealed on two, three or four sides depending on preference. Sealing on only two adjacent sides will allow the print to be easily removed but does not provide as much stability as if it were sealed on the two long sides or on all four sides. Sealing the print on the two long sides allows it to be removed or repositioned if necessary but will provide more security while being handled. If the print is sealed on all four sides, leave a gap in the tape on either end of the print to allow air to escape. In the book *Polyester Film Encapsulation* published by the Library of Congress, Margaret Brown states that a space of .4 centimetres should be left between the artifact and the tape.<sup>28</sup> The conservator at the Archives of Ontario suggests leaving a space of approximately .7 cm from the print on all sides to prevent any accidental contact between the print and the adhesive. When encapsulating large prints and panoramas, be aware that their size and weight could cause them to shift. Leaving

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<sup>28</sup> Brown, *Polyester Film Encapsulation*, 4.

too much space around the print allows for more movement within the enclosure and should be avoided. The publication *CCI Notes* number 11/10 contains detailed information regarding encapsulation and can be consulted for further reference.<sup>29</sup>

## Mounting and Housing Encapsulated Prints

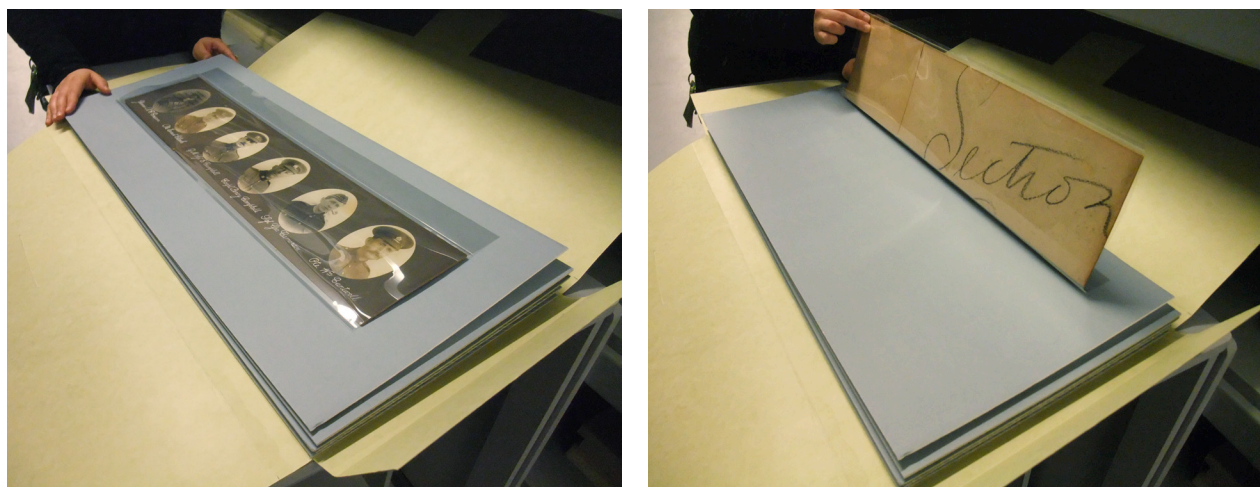
Mounting the encapsulated prints onto archival board makes them easier for one person to retrieve and transport, and protects them from damage due to improper handling, as well as providing a space to record intellectual information. It also gives additional support to prints that have cracks or tears in the emulsion. Very large prints should be handled by two people whenever possible, even if mounted. Options for mounting encapsulated prints include archival corrugated board, Coroplast or 4-ply archival mat board. Archival corrugated board is less expensive than mat board, is easy to work with and will remain rigid. Archival 4-ply mat board gives a nicer aesthetic and is the thinnest option, allowing maximum storage capacity when a number of mounted prints are stored in one container. However, it is not as sturdy as corrugated board and tends to bend while being handled. Coroplast is sturdier than corrugated board and mat board, and may be better suited for mounting very large prints.

Once a material is selected, the method of mounting the encapsulated prints needs to be considered. 3M #415 double-sided tape is used to fasten the Mylar to the board. If there are any inscriptions or information on the verso, the print can be attached to the mount along the top edge only. This technique was employed for a series of panoramas at the Archives of Ontario to provide access to the information that was inscribed on the verso of panoramic composites (fig. 16). When encapsulating a print that will be mounted in this manner, leave approximately 2 to 3 cm of Mylar above the print and attach it to the board using double-sided tape within this strip. This allows the verso to be viewed while the print remains attached to the board. If there is no information on

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<sup>29</sup> Canadian Conservation Institute, *CCI notes* 11/10. <http://www.cci-icc.gc.ca/publications/notes/11-10-eng.aspx>.

the verso, the print can be attached to the board on both the top and bottom if desired. This will keep the print more secure, especially when mounting very large prints. The fact that the verso contains no information should be recorded on the mount, and if the print is being documented, both the recto and verso should be photographed.



**Figure 16.** An encapsulated print at the Archives of Ontario mounted on the top edge only. The print was encapsulated with several centimeters of Mylar above the tape at the top to allow it to easily flip up and see the verso.

When mounting a number of panoramas of different sizes, the size of the board can be standardised to make storage easier. The Archives of Ontario has designated four standard sizes of mounting board that are used for varying sizes of prints. These range from small and medium that are made from cut sheets of archival corrugated board, with the medium being designed to fit into a map drawer, to large and extra large that are made of full sized sheets of Coroplast in 246 cm (8') and 368 cm (12') lengths. When mounting encapsulated panoramas to the larger Coroplast boards, they will mount two prints parallel if the sizes are appropriate (fig. 17). Four or five mounting boards are then stacked together and are held together by velcro tabs placed between each board. A cover board is placed on top to create a housing package that is then stored on a wide shelf. The prints mounted on the smaller size boards are stacked in groups of five and

housed in a phase box enclosure made from folder stock that is secured with cotton twill tape (fig. 18). When using cotton twill in any application, care must be taken to avoid creating a pressure point where the knot is tied. Place the knot on the edge of a box that will be stacked, or off to one side on rolls that are stored together.



**Figure 17.** Long panoramas mounted on Coroplast at the Archives of Ontario. Some are mounted parallel to each other when two will fit on the standard size board used by the archive.

**Figure 18.** Mounted panoramas in phase boxes on a shelf at the Archives of Ontario.



Encapsulated prints can also be housed in a folder made of archival corrugated board, Coroplast or archival mat board to provide support and prevent light and dust from reaching the print. To make a folder, cut two sheets of board that are five to ten centimetres larger than the print on all sides, and hinge them on one long side using Tyvek or similar archival tape that is suitable for hinging. When closed, it can be secured with cotton twill ties. Several prints can be housed in one folder together (fig. 19). If there are a large number of prints, a sink mat type of folder can be constructed by adhering a frame of one or two layers of board around the edge of the base board, providing more space for the prints between the base and the cover. The cover is hinged as above and secured with cotton twill ties. This configuration is discussed and illustrated by Dee Psaila in *Design and Materials for Photographic Housings*.<sup>30</sup> Before constructing a folder, the final weight of the prints and the housing should be considered to ensure that it is not overloaded and will safely support the prints.

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<sup>30</sup> Psaila, *Design and Materials for Photographic Housings*, 57, 70-72.



**Figure 19.** Encapsulated prints in the case study housed in a Coroplast folder prior to being mounted.



Both mounted and un-mounted prints can be housed in boxes. Custom sizes will need to be produced by hand as pre-made boxes for the size of the panoramas being housed are generally not commercially available as a standard size. Custom containers could take the form of a clamshell box or a two-part box with a lid, and can be constructed from archival corrugated board or Coroplast. Corrugated board is much easier to work with than Coroplast and is opaque, which might be more appropriate for storage areas with higher levels of illumination. Coroplast is generally sturdier than corrugated board. It is also moisture resistant, making it better suited for housings that will be stored where there is a risk of water damage such as near a fire suppression system. It is recommended for storage areas that have greater fluctuations in relative humidity and temperature because it creates a more stable microclimate than corrugated board. The drawback to Coroplast is that it is difficult to work with and does not take adhesives well, which should be noted when using it to construct custom enclosures. It is recommended that Coroplast containers be constructed with metal fasteners or heat

welded to prevent the joins from failing. Not all Coroplast is opaque and if translucent material must be used, prints should be protected from light exposure by being placed in folders or using an opaque material to cover the box.

At Library and Archives Canada, using Coroplast containers is one of the solutions for housing encapsulated prints (fig. 20). Boxes with edges that are folded into a square ridge on all sides, and a lid that is attached to the bottom with double-sided thick tape have been created to hold a number of prints of varying sizes. The box sizes range from 182 cm to 244 cm in length. A spacer is used to keep the narrower prints from moving around inside the boxes (fig. 21). Some of the adhesive holding the lids on the box has failed due to the weight of the boxes and the RH in the storage environment, so cotton twill tape is used to secure some boxes closed. These containers are a good way to store many panoramas at once, but the collection manager notes that there are some drawbacks to this method of housing. They are awkward to retrieve and handle, and due to their size, there is not an adequate method of transporting them between buildings, so the prints they contain must be accessed in the location where they are stored. As well, the issues with the fasteners would need to be addressed if another institution were to adopt this method of housing.



**Figure 20.** Housing for encapsulated prints at Library and Archives Canada. Photo courtesy of Library and Archives Canada.

**Figure 21.** Spacers used in a box to prevent encapsulated prints of varying sizes from moving around.  
Photo courtesy of Library and Archives Canada.



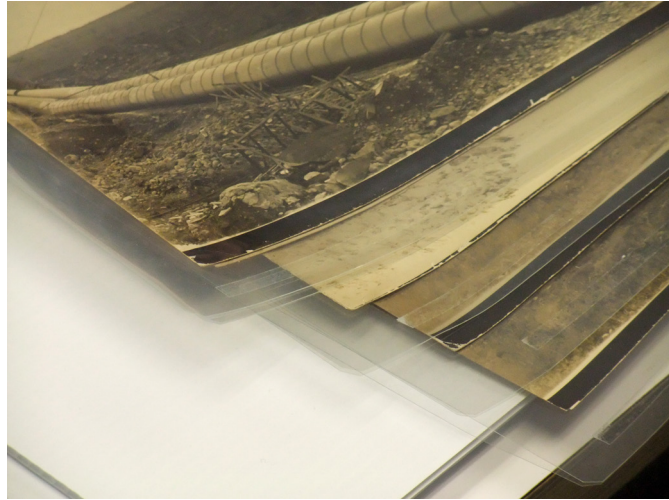
## Housing the H.O. Dodge Prints in the Case Study

Several important factors were considered before deciding on a housing solution for the panoramas in the case study. The prints are all approximately 122 cm long, making them too long to fit easily on a shelf so they will be stored on the top of the shelving unit until longer shelves are installed to fit the oversized material in the collection. It was important that the prints were accessible, and that the presentation be aesthetically pleasing. There was also the possibility that only one person might be available at a time to move them.

Once the prints were dry after treatment, they were removed from the blotter stack and immediately encapsulated in 4mil Mylar (fig. 22). The Mylar was sealed on the two long sides while the two short sides were left open. This allows researchers to look at the surface of the prints more easily because the ends are accessible, and the print can be repositioned if it slips within the Mylar enclosure. It is likely that the prints will be handled, so they were mounted individually on mat board to give them stability and make them easier to move without bending or kinking them (fig 23). 4-ply off-white



archival mat board was used for its aesthetic quality, and because it takes up less storage space so the mounted prints could all fit into one clamshell box for storage. Because there is no information on the versos, they were attached to the board on the top and bottom, and both sides of the print were documented for reference should it be necessary to study the verso.



**Figure 22.** Prints in the case study after encapsulation.



**Figure 23.** Encapsulated prints in the case study mounted on 4ply archival mat board.

A clamshell box that is able to hold all seven prints was constructed from archival corrugated board to protect them from light and dust that will be an issue when they are stored on the top shelf (fig. 24). Corrugated board was used in this case because it is easier to work with, it is opaque which reduces light exposure to the prints from the light fixtures in the ceiling of the room, and the storage area is climate controlled with no risk of water damage from pipes or sprinkler systems. A clamshell box was more suitable for housing than a phase box made of card stock because the prints are mounted on mat board, which is heavy and more flexible than corrugated board, and the clamshell box will provide better support. The clamshell box design keeps out dust while making the prints easily accessible. With seven mounted prints in the box, weight is an issue, and the box needs to be handled carefully. It is preferable to have two people to move it to and from the top shelf where it is stored but it is rigid enough that one person can handle it if necessary (fig. 25).



**Figure 24.** Clamshell box made of archival corrugated board for the mounted prints in the case study.  
Photo by sol Legault.

**Figure 25.** The clamshell box is stored on top of a shelving unit.  
Photo by sol Legault.



## Housing and Storing Very Long Prints

Very large panoramas that are too long to be practically accommodated in an existing flat storage system can be rolled onto a large tube for storage. It is recommended that whenever possible, prints be stored flat, as there is less risk of damage to the emulsion from being rolled, and it is better for their long term preservation. When rolling a flat print for storage, the largest possible diameter tube should be used. Archival cardboard tubing can be used for this purpose, but it can be costly and difficult to obtain. The conservator at the Archives of Ontario suggests using sono tubes that are normally used for constructing concrete columns and are readily available from building supply stores. These can easily be cut using a hand saw. They must first be wrapped in archival uncoated polyester film such as Mylar type D or Melinex 516 to prevent the print from coming in contact with the non-archival surface of the cardboard. Use a length of tube that is longer than the height of the print to protect the edges of the print and to allow a space where the roll can be supported without putting pressure on the print. Roll the print onto the tube and then wrap a sheet of archival paper or card stock around it to protect the print and act as a light barrier. If the roll will be stored as is on an open shelf, it should also be wrapped in a sheet of archival polyester film to prevent dust and

moisture from damaging the print. Secure the roll with a loosely tied cotton twill tape. Encapsulated and loose prints can be stored in this way, and two could be rolled onto a tube if it does not become bulky. If necessary, interleaving tissue can be used between prints that have not been encapsulated. In *Photographs: Archival Care and Management*, Mary Lynne Ritzenthaler discusses and illustrates procedures for rolled storage of very long panoramas, and suggests that once rolled, large tubes should be stored flat on shelves rather than upright on the ends, although no specific reason for this is given.<sup>31</sup> Boxes for rolled prints can be constructed to provide additional protection from light and dust. This also allows several to be stacked, making storage easier and more efficient. Ritzenthaler states that the ends of the rolls should be supported to prevent the print from becoming distorted or flattened from pressure on the bottom of the roll. Several collection managers suggested that prints on shorter tubes could be stored upright on their ends in a document box.

At the National Archives and Records Administration (NARA) in Washington D.C., the panoramas shown in figures 26 and 27 were treated and housed as part of a project undertaken in the 1990s. Two duplicate panoramas, which are over 215 cm long, were sleeved and rolled onto 21.5 cm tubes for storage. The roll is wrapped in archival paper and tied with cotton twill tape to keep it secure. The rolled panoramas are housed in a custom made two-part drop front box. Two support bars constructed from archival corrugated board covered with archival folder stock are adhered to the bottom to keep the roll stable. The photograph conservator at NARA states that after recently inspecting the prints, she did not see any adverse effects from having the roll sit directly on the bottom of the container, and felt that this arrangement is not problematic. She suggests constructing cradles from Ethafoam or corrugated board in order to keep the roll elevated. She notes that in the future, she might consider this modification if rolling panoramas, but adds that it takes more time and requires a larger box.

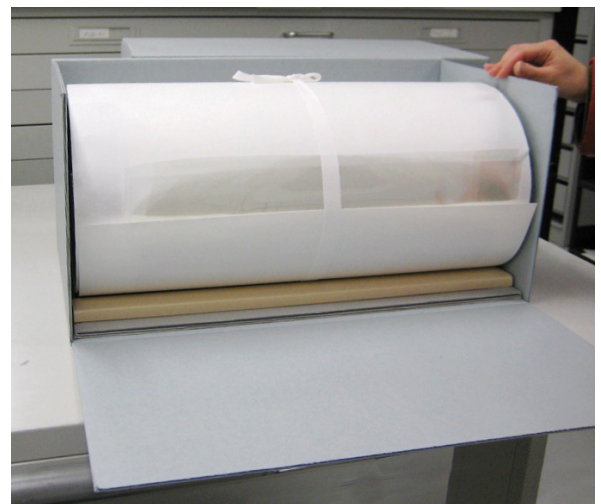
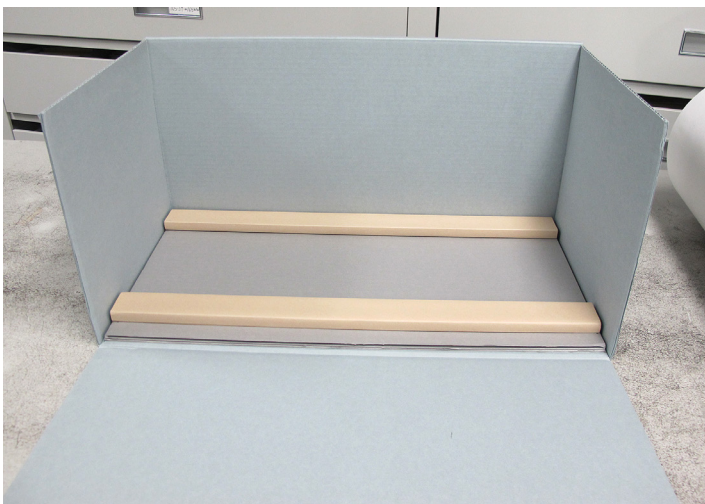
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<sup>31</sup> Ritzenthaler et al., *Photographs: Archival Care and Management*, 235.





**Figure 26.** Very long panoramas rolled onto a tube for storage.  
Photo credits: U.S. National Archives and Records Administration, Still Pictures, Records of the War Department General and Special Staffs, RG 165-PP-83-01, Camp Dodge, Iowa.



**Figure 27. Left:** Drop front box with supports for a rolled panorama.  
**Right:** Drop front box containing the rolled panorama. Photo by Janet Kepkiewicz.  
Photo credits: U.S. National Archives and Records Administration, Still Pictures, Records of the War Department General and Special Staffs, RG 165-PP-83-01, Camp Dodge, Iowa.

## Storage

Storage for folders and boxes containing panoramic prints can be difficult because most standard shelving units are not able to accommodate them. At the Archives of Ontario, the prints mounted on very long Coroplast boards are stored on shelves that

are extra wide and can accommodate this length (fig 28). If custom shelving is not available, suitable storage space can be found on top of shelves and cabinets but additional precautions are needed to properly protect the objects. Light exposure is an issue as the objects are closer to lights in the ceiling and do not have the benefit of shade from shelves above. As discussed in the section on housing, opaque materials should be used when constructing housings, or a sheet of opaque material can be placed on top of the box to reduce exposure. If boxes are stored on top of lower cabinets that are easily accessible by staff, signage indicating that archival material is stored there may prevent other boxes from being placed on top and causing damage.



**Figure 28.** Panoramas mounted on Coroplast, then stacked and housed on a long shelf at the Archives of Ontario.

The possibility of water damage is also an issue for objects on top of shelves or cabinets in rooms with sprinkler systems or water pipes in the ceiling. One solution to this problem used by collections managers at George Eastman House is to first wrap the box in an archival polypropylene bag, place it on the shelf, and then cover the whole shelf with an additional sheet of plastic to provide added protection. This also eliminates dust from accumulating on the box, which can be more of an issue on top shelves than on lower levels.

In the 1970s, the City of Vancouver Archives devised a way to house and store a number of panoramas that were being printed as reference copies from original negatives. Each print is sleeved in a polyethylene bag and hung by one end from a rod in a cabinet (fig. 29). Information about the object is written on a tag in a pocket at the top of the bag. Because the prints are relatively short, most being approximately 122 cm, and there are quite a number of them in the cabinet, they are fairly well supported and remain flat. However, the polyethylene bags are soft and quite flexible, and Mylar may provide better support for the prints and keep them from curling on the edges. This storage method allows for easy access to the prints and does not require long shelves for storage. The conservator emphasizes however, that these are reproduction prints made for access and this method of housing and storage would not be used for original archival material.



**Figure 29.** Hanging storage for reproduction prints at the City of Vancouver Archives.

Housing very large panoramas can be difficult because material such as 4 ply mat board and folder stock is often only readily available in lengths of up to 152 cm (60"). Materials including clear archival polyester film and some archival papers can be purchased in rolls, and are an option for creating primary housings for very long prints. Corrugated board and Coroplast, which are available in 122 x 243 cm (4" x 8') sheets, are useful for constructing secondary housings for encapsulated prints and prints in folders. Coroplast is also available from some suppliers in 122 x 368 cm (4' x 12') sheets.<sup>32</sup>

Housing and storage can be a challenge when dealing with oversized panoramic prints. Careful planning and consideration of all possible issues related to their care, including access requirements, needs of the institution, material cost and availability, skills and space needed to construct custom housing, time available to dedicate to housing, and available storage space is required before deciding on the best possible solution.

## Digitizing Panoramic Photographs

Providing a high quality digital file of a panorama for research purposes will reduce the amount of handling the object receives and minimise the risk of damage. It can also allow the information to be accessed online by a larger number of people if the catalogue records are made available through an institution's website. This helps create interest in the collection and can lead to researchers and members of the public contributing additional information about the subject. Documenting panoramas is similar to documenting conventionally sized prints in terms of equipment set-up, but because of their length, multiple images of a single print must be made and stitched together during processing to produce the resolution required to see details in the

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<sup>32</sup> Refer to Appendix 3 for a list of some of the suppliers that carry archival and packaging materials.



image. There are several ways to capture digital files, and methods that are used by the institutions surveyed include image capture using a digital camera or digital back, scanning using a flatbed scanner, and scanning using a wide format map scanner.

## Equipment

When using a camera for image capture, it is highly recommended that it be mounted on a copy stand or a tripod with a horizontal center column in order to fix the camera in place to create consistent image files, and to ensure that the camera and print being photographed remain parallel to each other. This makes the process of stitching the files together much easier, and fewer post-capture adjustments will need to be made to create an accurate, good quality final image.

The focal length of the lens will greatly affect the outcome of the stitching process and the quality of the final image. When documenting a print in several sections, it is important to use a lens that has minimal distortion. Ideally, this means a prime lens that is close to a normal length for the camera being used. For a full frame SLR this is a 50 mm lens and for a cropped sensor it is a 35 mm lens. Using a wide angle lens or a zoom lens set at a wide focal length will create barrel distortion, and the edges of the image may not stitch together properly. Distortion also occurs in wide and some normal length lenses because the lens stretches the corners of the frame as it corrects the curve that results from having a wider than normal field of view. This can cause issues when the image is stitched because the details may not align properly. Lenses designed for macro work tend to have less distortion and are sharper across the field of view, and should be used whenever possible.

For institutions that do not have access to scanners or high-end camera equipment, it is possible to use a basic 35 mm digital SLR camera, or even a good quality point and shoot, but the stitched file may need more adjustments to correct errors. Results

obtained with a point and shoot will not be of high quality and the resulting files should only be used as an aid to research. A 35 mm digital SLR with a good quality lens is preferred because it has a larger sensor and will produce higher quality images. Consult with a knowledgeable local camera shop about their recommendations for cameras and lenses appropriate to the needs and budget of the institution.

To light the subject, several photographers who were consulted recommended using flash because they emit less heat than lights that are continuous such as tungsten photoflood lamps or quartz-halogen lights, and the colour temperature is close to daylight. However, they are more expensive to purchase, are more complex to use than continuous light, and the final result of the lighting set-up can't accurately be seen because of the short flash duration used to illuminate the subject. If using flash, it is important to use flash tubes or glass covers that are UV-coated to help filter UV light that could cause damage to the object being photographed. Continuous light is generally less expensive and is easier to work with. Tungsten and quartz-halogen are a continuous source of light that produce a lot of heat and bright light which might be detrimental to the object being documented, depending on the process. Light sensitive objects may need a different type of illumination for documentation. Silver gelatin prints in good condition are generally stable enough to withstand the light exposure levels encountered during documentation.

Discussions about the different types of equipment suitable for documentation, and information about camera and lighting set-ups can easily be found online and in publications meant for the use of artists who wish to document their work. *The AIC Guide to Digital Photography and Conservation Documentation* published by the American Institute for Conservation is an excellent resource that provides information on choosing a camera and lights, explains the use of colour targets for white balance, and describes the procedure for processing digital image files. Some of the discussion

focuses on documentation for conservators but much of the information is still applicable to the documentation of prints for reference purposes.

### Points to Consider When Documenting Panoramas

The procedures and considerations for setting up the camera are applicable to documenting both rolled and flat panoramic prints. The process for moving the print along to photograph each section, and placement of the lights will differ depending on what is being documented, and on the length of the print if it is flat. When documenting a rolled print, it may need to be turned 90° on the copy stand base so it is lit from the top and bottom rather than from the sides to prevent shadows from the rolls in the area being photographed. If a very long flat print is being documented, the ends that extend past the base of the copy stand need to be supported, especially when photographing either end of the print. Before starting, ensure that if lights are mounted on stands on either side of the copy stand base, they allow enough clearance on both sides for the print to be moved easily from one end to the other without bumping them.

It is important that the print be centred and level within the frame in order for the files to stitch together, but if it is slightly off, this can easily be adjusted later using software. It is also important to keep the camera and the print being documented parallel to each other, otherwise the image will not be square in the frame. The effect can easily be seen if the print is at an extreme angle to the camera, but will often go unnoticed if the angle is minimal. When sections of a panorama are being stitched together, the software may not be able to properly align the files if they are too distorted. This results in the final image file being warped or curved, or not stitching some sections at all. The photographer at the Archives of Ontario suggests that if budget allows, a product called Zig-Align<sup>33</sup> can be used to make sure the camera and copy stand base are parallel.<sup>34</sup> He

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<sup>33</sup> Zig-Align, accessed online June 20, 2012, <http://www.zig-align.com>.

<sup>34</sup> *The AIC Guide to Digital Photography* also suggests the use of Zig-Align to ensure proper alignment of the camera and subject on pages 111, 139.

uses it to set up the large format camera for copywork, but still uses a level for small and medium format work. He also stated that he doesn't worry as much about keeping the print level in the frame, but rather adjusts each file in the software to make it level before stitching because he finds it to be more accurate. Taking time to ensure that both the camera and copy stand base are level will prevent issues during processing and reduce the need to re-photograph the object.



**Figure 30.** Photographing the print vertically in the frame, shown here in the image on the left, will require more sections to be photographed but will produce a larger file size.

The orientation of the camera on the copy stand will have an effect on the size of the final image file. Documenting the print vertically in the frame as a portrait, rather than horizontally as a landscape will result in more frames per print so the final file will be larger and have a higher level of detail (fig. 30). To document the print in vertical sections, a bracket or tripod head can be mounted on the copy stand to rotate the camera 90°. An alternative set-up mentioned in both *The AIC Guide to Digital Photography*<sup>35</sup> and in *Photographs: Archival Care and Management*<sup>36</sup> suggests mounting the print on a vertical copy board designed for this purpose that will allow for easier placement of the lights, and vertical or horizontal camera orientation. If documenting a

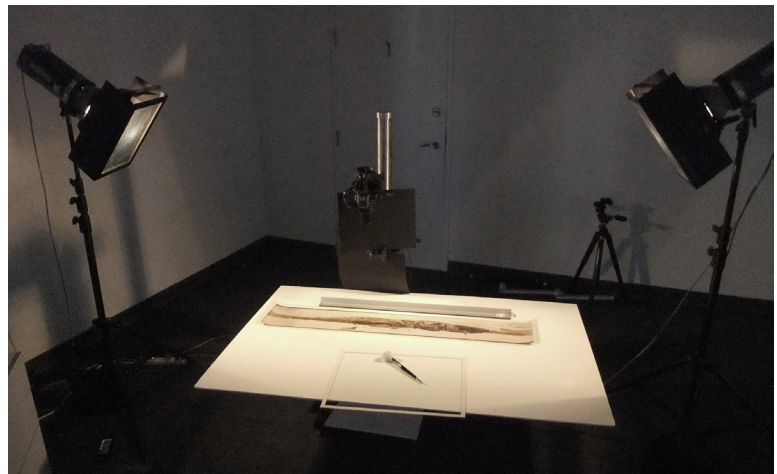
<sup>35</sup> Warda, *The AIC Guide to Digital Photography*, 111.

<sup>36</sup> Ritzenthaler, *Photographs: Archival Care and Management*, 372.

print while it is mounted vertically, ensure that it is well secured and there is no risk of it falling. It is recommended that only prints in good condition be documented in this way.

## Documenting the H.O. Dodge Panoramas

To document the encapsulated panoramas in the case study, a full frame digital camera mounted on a copy stand with a 50 mm f/2.5 macro lens and a circular polarizing filter was used. To light the object, two flash heads with polarizing filters mounted in front were placed at 45° angles to the base of the copy stand (fig. 31).



**Figure 31.** The copy stand set-up used to document the flat panoramas in the case study.

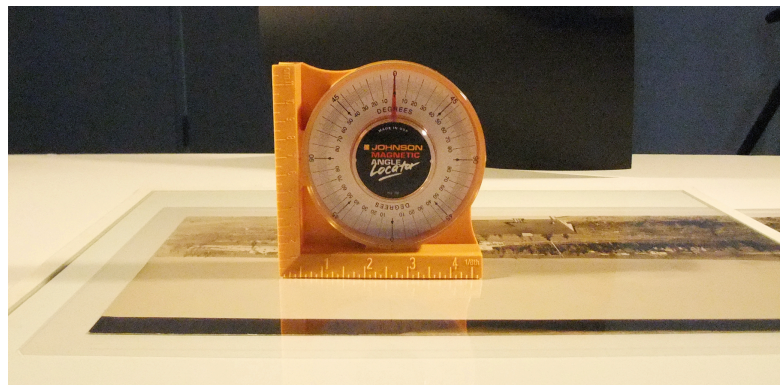
The polarizing filters are necessary to reduce the glare from the surface of the encapsulated prints. The filters are placed on the lights with the plane of polarization parallel to surface plane of the print being documented, and the polarizing filter on the lens is rotated so the plane of polarization is at 90° to that of the filters on the lights.<sup>37</sup> If a reflective object is viewed through the camera while the filter is being rotated, it is usually clear what the correct placement should be as the reflections disappear. All ambient room light was eliminated, and black material was used to flag any objects that were causing reflection in the Mylar, including the light coloured parts on the copy

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<sup>37</sup> Warda, *The AIC Guide to Digital Photography*, 115.

stand itself. The illumination on the print must be even across the area that is visible through the viewfinder. If there is any light falloff at the edges of the frame, the density in the final stitched image will be uneven. This is especially noticeable in the sky or in large light toned areas. To check the light levels, a light meter was used to take readings in the center and at the edges of the area being photographed. A colour chart was placed in the frame of the correctly exposed test shots so the file could be properly colour balanced during processing.

**Figure 32.** A carpenter's level was used to level the base of the copy stand.



A very flat, sturdy piece of board that was large enough to support the length of the print was placed on the base of the copy stand. Before levelling the base and camera, adjust the height of the camera so that the width of the print fills the frame while still keeping the edges visible. A carpenter's level was used to make sure the base was level both side to side and front to back (fig. 32). The base was adjusted by placing pieces of mat board under the edges. A bubble level that fits into the hot shoe mount in the camera was used to make sure the camera was level and this was checked by placing a level on the LCD screen on the camera.

The photographs in the case study were documented with the print placed horizontally in the frame because this provided a large enough file size with good quality detail, without making the files too large and cumbersome for the computer to process. Each print was documented in four sections, which were captured by

shooting with the camera tethered to the computer and importing the files into Adobe Lightroom 4. Beginning at one end, the print was placed on the levelled copy stand base and then levelled in the viewfinder. A clean sheet of glass was placed on the section to hold it flat while it was being photographed. After the first exposure, the edge of the frame was noted and the print was moved to the next section while leaving sufficient overlap for stitching. The process continued until all sections of the print were documented.

### File Processing and Stitching

When processing the files, the colour balance was corrected by making an adjustment in the test frame that contained the colour test chart, and applying the corrections to all subsequent files. Each file was straightened in Adobe Lightroom by using the ruler in the angle adjustment tool that is available in crop mode. Once each file in the sequence was prepared, all files were selected and opened in Photomerge. To do this, first select all of the photos in the sequence, then go to Photo/ Edit in/ Merge to panorama in the Lightroom menu bar. A window will open that gives options for the type of merge you want to perform. The photographer at the Archives of Ontario suggests that either the "Collage" or "Reposition" modes should be used when stitching files from flat prints as the other modes could cause distortion of the image by applying unnecessary adjustments to the file. If the corrected files are being merged directly from Adobe Photoshop,<sup>38</sup> navigate to File/ Automate/ Photomerge, and the files can be merged if already open, or browse to the folder they are in to select them. Once Photoshop has processed the files and created the panorama, carefully inspect the image for any errors that need to be fixed.

When stitching the panoramas in the case study, some adjustments needed to be made

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<sup>38</sup> Adobe Photoshop 5 was used when stitching the panoramas directly in Photoshop, other versions may have different menu selections.

to areas that did not blend perfectly. The warp and free transform tools were used for this. It may also be useful to make adjustments to the layer masks that are created when the files are merged. The final image was cropped to remove uneven edges, but the edge of the print remained visible as part of the file. The high resolution file was saved as a .tiff, and a downsampled file was created and saved as a .jpg for the catalogue record. The original camera raw files were also saved in a folder for archiving. Both the recto and verso were documented, but only the recto was stitched into a single panorama. *The AIC Guide to Digital Photography* states that it is recommended practice to archive both the original individual files of the sections as well as the merged panorama.<sup>39</sup>

When photographing each section, some overlap is needed between them in order for the stitching software to join them together properly. The amount of overlap required depends on the level and type of detail in the image and could range from 10 to 40 percent. On the Adobe help site that explains how to use the Photomerge command, it is recommended that there be a 40 percent overlap, though the instructions are based on creating a panorama from a live scene rather than a flat photograph.<sup>40</sup> When documenting the prints in the case study, an overlap of approximately 15 percent was used. Most files stitched together properly with this amount of overlap, but in one print, one section was unable to be stitched, and in another, the end section on the right became distorted. The issue with the file that distorted the last section was solved by cropping a strip a few pixels wide off each connecting edge, and putting the files into Photomerge again. The file that left the last section on a separate line was corrected by stitching the section manually. One file was curved on the top and bottom of the frame after stitching, and this was re-photographed to correct the problem. When documenting the rolled test print, one section did not join to the rest of the image and

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<sup>39</sup> Warda, *The AIC Guide to Digital Photography*, 139.

<sup>40</sup> Adobe, "Photoshop/ Create Panoramic Images with Photomerge", accessed online, June 20, 2012. [http://help.adobe.com/en\\_US/photoshop/cs/using/WSfd1234e1c4b69f30ea53e41001031ab64-75e8a.html](http://help.adobe.com/en_US/photoshop/cs/using/WSfd1234e1c4b69f30ea53e41001031ab64-75e8a.html).



this was resolved by choosing the Auto option in Photomerge. Having more overlap between each frame and levelling the camera and copy stand base more carefully may have prevented these issues.

It should be noted that the relationship between the details in the image will change when a section of a file is stretched or warped to make minor adjustments, or if the Auto setting is chosen in Photomerge. This means that the digital image will not represent all objects accurately and any details being researched that require precise measurements should be referenced using the original print.

## Digitization Using Scanners

Alternative methods of image capture that are being used by the City of Vancouver Archives include a flatbed scanner and a wide format map scanner. An Epson 10000XL flatbed scanner was modified for a project that involved scanning several hundred panoramic nitrate negatives. Because scanning transparent material requires a section of the platen to remain clear, it was necessary to devise a way to feed the negatives through the back of the scanner. The lid of the scanner was raised with pieces of mat board to allow the negative to be safely fed through the back, and a guide was attached to the scanner bed to ensure even alignment of the negative in each file, making stitching much easier.<sup>41</sup>

The scanner is now being used for panoramic prints and while a guide is still necessary to keep the print aligned, it is possible to place the print in the long direction on the scanner bed making it possible to capture a larger section of the print. The archive is also using a wide format map scanner for image capture. Panoramic prints that are in very good condition are carefully fed through the scanner and the image is acquired in a single scan rather than having to stitch together sections. There is the

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<sup>41</sup> Bigelow, "Preserving and Digitizing the W. J. Moore Cirkut Negatives", 170.

potential to cause damage to the print as it moves through the scanner so only prints that are in good condition are scanned, and if necessary, they are placed in a Mylar folder before being put into the scanner. As well, all surfaces that come in direct contact with the print are cleaned frequently during use. Tests were first carried out on panoramic prints that were deemed expendable to ensure there was no abrasion or other damage being done to the surface.

## Making Digital Files Available for Research

By photographing or scanning a panoramic print in several sections and stitching them together, a high resolution file is created that allows close inspection of details in the image. When a large file is uploaded to a website, it can cause the page to load very slowly when opened by a web browser. Posting a smaller file on a webpage does not allow the details to be studied unless a link to a high resolution copy of the file is provided. One tool that can be used in the design of an institution's webpage to solve this problem is Zoomify.<sup>42</sup> The software sections a large image into many small tiles, which are then uploaded as a group to the site. When a viewer zooms in to study a section of the image, only those tiles with the requested information are loaded so viewing a high quality image is very fast and efficient.<sup>43</sup> The level of detail available to the viewer is relative to the original file size. The software is able to process very large files that can be viewed in the zoom window so there is no need to downsample original files. The Zoomify website states that the software is used by many museums and archives including The Getty and the Library of Congress.

In addition to having high resolution images available for viewing on their website, the City of Vancouver Archives uses the photo sharing website Flickr to post files that

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<sup>42</sup> Zoomify Inc. accessed online June 20, 2012, <http://www.zoomify.com/default.htm>.

<sup>43</sup> An example can be seen on the British Library online gallery where Zoomify is used to view a panoramic photograph by H. O. Dodge, who also photographed the images used in the case study. accessed June 23, 2012, <http://www.bl.uk/onlinegallery/features/quebec/q5pageant300azoom.html>.

are accessed by researchers and the public.<sup>44</sup> These images can be viewed with different levels of detail including the high resolution original. Photo sharing websites such as Flickr may be an option for an institution that would like to make digital files available to the public, but may not have the capacity or ability to host large files on its own website.

Digitizing panoramas benefits an institution by making its collection more easily accessible to researchers and the public while also reducing the need to handle the original object, thereby helping to preserve it. The ability to zoom in to see a high level of detail is similar to using a magnifying glass to study details in a physical print. The main difference is that because of the limited size of computer monitors, viewing a full sized digital image as a whole is not possible. Also, surface textures and the materiality of the print can't be experienced, but for most researchers and viewers these limitations are not an issue. The documentation procedure and file processing can be time consuming, and require specialized equipment and a certain amount of familiarity with using image editing software such as Adobe Photoshop. However, the benefits may make the effort worthwhile. The conservator at the City of Vancouver Archives notes that since making digital images available online, the number of requests they receive to view prints has decreased significantly. It also allows access to images in the archive's collection that were scanned from original nitrate negatives, and were not previously available for research. Documenting rolled panoramas would also make information available that was previously inaccessible. Having the images available online for the public to access can generate an increased interest in the collection and add to the understanding of the image content as more people research the images and share their findings with the institution. As with housing and storage, the needs and resources of the institution must be considered before undertaking a digitization project.

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<sup>44</sup> Flickr, City of Vancouver Archives photostream, "View of King and Jardine sawmill at First and Ontario, False Creek," accessed June 20, 2012, <http://www.flickr.com/photos/vancouver-archives/5456682469/in/set-72157625958366187/>.

## Conclusion

Many institutions do not have the necessary resources to implement what would be considered the best practices, or ideal solutions to the issues presented by panoramic photographs in their collections, but with some careful planning and considerations, practical solutions can be found that balance access to the information with preservation of the object for future research.

Having a conservator humidify and flatten rolled prints may not be an option for all institutions but with education and experience, there is the possibility that an archivist or collection manager could perform this procedure. An alternative to treatment that has been suggested in this paper provides access to the information in a rolled panorama by documenting it while leaving it rolled. Documenting both rolled and flat panoramas allows a large number of people to access the images and can be a tremendous resource for researchers as well as a benefit to the institution and to the object itself.

With planning and creative problem solving, an institution that may have limited resources can find housing and storage options that provide a safe, archival environment for the objects. Panoramas contain a wealth of information, and making them accessible for research and for the interest of the general public, while also providing them with the proper housing and storage to preserve them for future use will contribute significantly to the historical record of a community.



## Appendix 1.

### The H. O. Dodge Panoramas

Harry O. Dodge was active as a photographer in the maritime provinces of Canada in the last years of the 1800s and into the first decades of the 1900s. He was born in Annapolis County, Nova Scotia c.1873<sup>45</sup> and married Kate Perry on June 9, 1898.<sup>46</sup> He operated studios in various locations in Nova Scotia throughout his career. In *An Atlantic Album: Photographs of the Atlantic Provinces, before 1920* by Scott Robson and Shelagh Mackenzie, it states that in 1896, he advertised his studio in Middleton, Nova Scotia in *McAlpine's Nova Scotia Directory*. In 1898, he advertised a studio in Bridgewater, N.S. as well as branches in Chester and Mahone Bay. In *McAlpine's Nova Scotia Directory* from 1907-1908, there is a listing for H.O. Dodge as a photographer and proprietor of The Dodge Studios on 335 Charlotte in Sydney with a branch in Glace Bay.<sup>47</sup> Dodge died on January 25, 1947 in Sydney River, Cape Breton County, Nova Scotia at the age of 74. The certificate of death lists his occupation as a photographer and states that the last time he worked at this occupation was in 1945, meaning that Dodge continued to be a photographer into his early 70s.<sup>48</sup>

Apart from his successful studio practice as evidenced by his continued listings in

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<sup>45</sup> The Nova Scotia Vital Statistics Records list a Henry O. Dodge born on May 19, 1873 in Wilmot, Nova Scotia. Registration: Year: 1873 - Book: 1801 - Page: 139 - Number: 200, accessed June 19, 2012, <https://novascotiagenealogy.com/ItemView.aspx?ImageFile=1801-139&Event=birth&ID=2862>.

This is likely the same person as the Harry O. Dodge found in the other records and may be a misspelling as the ledger entry is difficult to read. Robson and MacKenzie list his birth as ca.1870 in Melvern Square which is located 5 kilometers from Wilmot. They also list his first name as Henry.

<sup>46</sup> This date of marriage is found in the Nova Scotia Vital Statistics Records in Registration Year: 1898 - Book: 1802 - Page: 3 - Number: 33, accessed June 19, 2012,

<https://www.novascotiagenealogy.com/ItemView.aspx?ImageFile=1802-3&Event=marriage&ID=3941>.

This record also lists his age as 26 and his profession as a photographer. Robson and MacKenzie list his date of marriage as 1895.

<sup>47</sup> Nova Scotia Archives. "McAlpine's Nova Scotia Directory 1907-08," accessed June 10, 2012, <http://gov.ns.ca/nsarm/virtual/directory/page.asp?Place=&Letter=&Page=1225>.

<sup>48</sup> The death certificate can be found in the Nova Scotia Vital Statistics Records in Registration Year: 1947 - Page: 1249, accessed June 19, 2012, <https://www.novascotiagenealogy.com/ItemView.aspx?ImageFile=1947-1249&Event=death&ID=323087>.

business directories, little is known about the career of Harry O. Dodge. However, some of his activities can be traced through the holdings of institutions across Canada. He photographed the Quebec tercentenary celebrations in 1908 along with views of the city and surrounding areas. The Ryerson Image Centre has three panoramas of the tercentenary celebrations in its holdings, and the collection at Library and Archives Canada contains views of the celebrations as well as panoramas of Quebec City and Ste. Anne de Beaupré.<sup>49</sup> The Nova Scotia archives has several photographs by Dodge including portraits and a panorama of Bloomingdale, a seaside residence in Halifax that is dated ca. 1910. The photograph is credited to Harry O. Dodge with the studio of Gauvin and Gentzel listed in brackets, suggesting that Dodge may have been working for or commissioned by the Gauvin and Gentzel studio at the time.<sup>50</sup> It appears that Dodge may have done a cross Canada tour taking panoramas of city and landscape views as he went. The Glenbow Museum in Calgary, Alberta has at least two photographs by Dodge in their collection. The images are panoramas of the city of Calgary taken in 1911.<sup>51</sup> The city of Vancouver Archives holds eleven panoramas by Dodge also taken in 1911.<sup>52</sup> The views are of the city and surrounding areas and measure 20 x 116 cm, similar in size to the panoramas of Grand Falls.

The panoramas in the case study are silver gelatin prints and all measure approximately 21 x 122 centimeters. The negatives were likely taken sometime between 1906 and 1911 in Grand Falls, Cape Breton, Nova Scotia. The images depict industrial

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<sup>49</sup> Library and Archives Canada. Archives search, accessed June 15, 2012, [http://collectionscanada.gc.ca/ourl/res.php?url\\_ver=Z39.88-2004&url\\_tim=2012-07-26T18%3A27%3A58Z&url\\_ctx\\_fmt=info%3Aofi%2Ffmt%3Akev%3Amtx%3Actx&rft\\_dat=3331209&rft\\_id=info%3Asid%2Fcollectionscanada.gc.ca%3Aapam&lang=eng](http://collectionscanada.gc.ca/ourl/res.php?url_ver=Z39.88-2004&url_tim=2012-07-26T18%3A27%3A58Z&url_ctx_fmt=info%3Aofi%2Ffmt%3Akev%3Amtx%3Actx&rft_dat=3331209&rft_id=info%3Asid%2Fcollectionscanada.gc.ca%3Aapam&lang=eng).

<sup>50</sup> Nova Scotia Archives. Halifax and its People, 1749-1999, accessed June 15, 2012, <http://www.gov.ns.ca/nsarm/virtual/halifax/archives.asp?ID=66>. The reference for this image is H.O. Dodge NSARM accession no. 1987-73 no. 3.

<sup>51</sup> These images appear on the Glenbow Museum website in the archival photographs database. Each panorama is catalogued in sections with one print having the file numbers NA-1055-1 to NA-1055-4 and the other with file numbers NA-5150-1 to NA-5150-5.

<sup>52</sup> City of Vancouver Archives. Authority record for H.O. Dodge, accessed June 15, 2012, <http://searcharchives.vancouver.ca/dodge-h-o;isaar>.

scenes from the pulp and paper mill site in Grand Falls. Both the mill and town were owned by the Anglo-Newfoundland Development (A.N.D.) Company, which was incorporated in 1905. The mill opened in 1909 on the Exploits River and the company town of Grand Falls was established to support its operations. The A.N.D. Company was founded and owned by the London, England based brothers Alfred and Harold Harmsworth, who also owned the *London Daily Mail* and the *London Mirror* newspapers. The Harmsworth brothers were looking for a new source of newsprint for their London papers, and in Newfoundland they found plentiful resources, a supportive timber industry and a government willing to provide them with concessions that made the development of a mill and pulp and paper industry at the Grand Falls site feasible.<sup>53</sup>

The panoramas taken by Dodge of Grand Falls show the mill site and the industrial structures as well as views of the town site. The inscriptions on two of the prints describe the dimensions and construction of the large pipes in the image. The inscription in plate 1 reads "Pipes 15 feet in diameter. 2150 feet long 2000 tons of steel / Built in 4 1/2 months by Walsh Boiler Works Holyoke Mass for / Anglo Newfoundland Development Co Grand Falls Nfld / Dodge photo / Sydney CB." The inscription in plate 2 is very similar but also includes an image number, suggesting that these photographs could have been a commission from the A.N.D Company. Plates 3 and 4 include views of the town site. The inscription on the first reads "Grand Falls Newfoundland (No 3) / Anglo-Newfoundland Development Co / Dodge photo / Sydney C.B.", with the other having the same title but with "(No 4)". An estimation of the population by the number of houses that are visible makes it likely that the negative was made before 1911 when the population was listed at 1634 residents.<sup>54</sup>

The Grand Falls-Windsor heritage society has a panorama in their collection that appears to be the same image as plate 4. The image is displayed in their online gallery

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<sup>53</sup> Botting, Ingrid Marie, "Getting a Grand Falls Job," 57-59.

<sup>54</sup> Higgins, Jenny. "Land Based Industries of the Early 1900s," accessed online June 19, 2012.



and on the bottom of their webpages but it is only about three-quarters of the image seen in the print in the case study, while the right side that contains the inscription is missing. Their website attributes the image to J.C.M. Hayward.<sup>55</sup>

## A Brief Overview of the Cirkut Camera

William J. Johnston patented the earliest version of the Cirkut camera in the United States in 1904. It went through several design improvements as well as different manufacturers as companies merged or were acquired. Eastman Kodak eventually became the distributors for the camera, first through the Century Division of Eastman Kodak in 1907, followed by Folmer & Schwing and then the Folmer Graflex Corporation.<sup>56</sup> The Cirkut was manufactured in five different sizes with the model number corresponding to the width of the film in inches. The models produced were Nos. 5, 6, 8, 10 and 16, with the No 10 being the most popular, manufactured from 1904 until 1941. This was also the last Cirkut camera model to be produced.<sup>57</sup> This information could be used to help determine which camera was used to take the Dodge panoramas, except that the larger cameras were able to take film of a smaller width. The images are 7.8 inches wide, and therefore could be from a No. 8, 10 or 16 camera. MacKay notes in *America by the Yard* that many photographers who owned a No. 10 camera used 8 inch wide film to help cut costs.

The camera operated by rotating the lens and body in one direction on a gear mechanism while the film in the film holder was advanced in the opposite direction. The exposure was made through a vertical narrow slit as the film passed. This design allowed photographers to record 360° views, though it was generally used for views of 180° or less. The Dodge panoramas appear to be views of slightly less than 180°.

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<sup>55</sup> The image found on the Grand Falls Windsor heritage website online gallery has the file number 97100. It was accessed in March 2012 but was no longer available for viewing in July 2012. The image can still be seen on the bottom of the home page.

<sup>56</sup> MacKay, Robert B. *America by the Yard*, 10.

<sup>57</sup> *Ibid.*, 11.

## Appendix 2.

### Finding a Conservator

Conservators are a valuable resource for anyone caring for a collection. In some situations, their services are necessary in order to provide the best care for an object. A good place to begin your search is on the website for the Canadian Association of Professional Conservators (CAPC). They are an organisation working to promote high standards and ethics in the field of conservation. Their website discusses what a conservator can do to help care for a collection and how to select an appropriate conservator for your objects. There is a list of members with their locations and areas of expertise.

Not all qualified conservators are members of CAPC. Contacting a conservator or collections manager in a larger institution may help find referrals for conservators who are willing to accept commissions.

The Canadian Conservation Institute is also an excellent resource. They publish *CCI Notes* that are available free online and contain advice about caring for collections, and technical bulletins about various issues that are available for purchase. As well, they provide services, training and emergency advice for a fee to institutions caring for heritage materials.

In the United States, the American Institute for Conservation performs a similar function. Their website includes articles on finding and choosing a conservator, and articles from their journal containing valuable information for anyone caring for a collection, regardless of location.

**Canadian Association of Professional Conservators**  
**Association Canadienne pour la conservation**  
**et la restauration des biens culturels**  
c/o Canadian Museums Association  
280 Metcalfe Street, Suite 400  
Ottawa, ON K2P 1R7  
[www.capc-acrp.ca](http://www.capc-acrp.ca)

**Canadian Conservation Institute**

1030 Innes Road  
Ottawa, ON K1B 4S7

toll free 1.866.998.3721 in Canada  
phone 613.998.3721

[www.cci-icc.gc.ca](http://www.cci-icc.gc.ca)

**American Institute for Conservation of Historic and Artistic Works.**

1156 15th Street NW, Ste. 320

Washington, DC 20005

phone 202.452.9545

[www.conservation-us.org](http://www.conservation-us.org)

## Appendix 3.

### Sources of Archival Material and Supplies.

This list of suppliers is not comprehensive and is meant as a starting point when searching for materials that are suitable for the treatment and housing of panoramic photographs. Not all suppliers have material in very large sizes or in rolls, and supplies may need to be ordered from several different places. Contact the suppliers directly to inquire about the possibility of special ordering larger sizes.

**Carr McLean**

461 Horner Ave.  
Toronto, ON M8W 4X2  
1.800.871.2397 in Canada  
416.252.3371  
sales@carrmclean.ca  
www.carrmclean.ca

**Gaylord Bros.**

PO Box 4901  
Syracuse, NY 13221-4901  
1.800.962.9580  
www.gaylord.com

**Sabic Polymershapes**

9150 Airport Rd.  
Brampton, ON L6S 6G1  
905.789.3100  
www.sabicpolymershapes.com  
Carries Mylar, branches across Canada.

**Talas**

330 Morgan Ave  
Brooklyn, NY 11211  
212.219.0770  
www.talasonline.com

**University Products**

517 Main St.  
Holyoke, MA 01040  
1.800.628.1912  
info@universityproducts.com  
www.universityproducts.com

**Uline Canada**

60 Hereford St.  
Brampton, ON L6Y 0N3  
1.800.958.5463  
http://www.uline.ca  
Carries 3M #415 double sided tape as well  
as general packing supplies.

**Hollinger Metal Edge**

6340 Bandini Blvd.  
Commerce, CA 90040  
1.800.862.2228  
or  
9401 Northeast Dr.  
Fredericksburg, VA 22408  
1.800.634.0491  
www.hollingermetaledge.com



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Plate 1. [pipes and reservoir]  
H.O. Dodge  
ca. 1910 (negative exposed)  
Silver gelatin print.  
sheet: 21.4 x 121.5 cm. image: 20 x 120.3 cm.

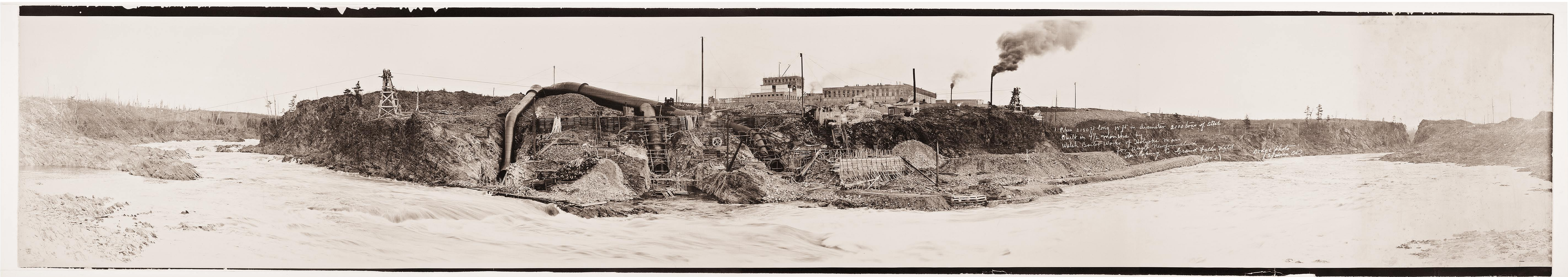


Plate 2. [industrial structures next to river]  
H.O. Dodge  
ca. 1910 (negative exposed)  
Silver gelatin print.  
sheet: 21 x 122 cm. image: 20 x 122 cm.





Plate 3. Grand Falls Newfoundland (No. 3)

H.O. Dodge

ca. 1910 (negative exposed)

Silver gelatin print.

sheet: 21.3 x 121 cm. image: 20 x 121 cm.



Plate 4. Grand Falls Newfoundland (No. 4)

H.O. Dodge

ca. 1910 (negative exposed)

Silver gelatin print.

sheet: 21 x 121.8 cm. image: 20 x 119.3 cm.