

# *Washingtoniana II: Conservation of Architectural Drawings at the Library of Congress*

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## **ABSTRACT**

In 1987, a multifaceted architectural drawings<sup>1</sup> project, known as Washingtoniana II, began at the Library of Congress.<sup>2</sup> The purpose of this ongoing, collaborative effort between the Library's Conservation Office and the Prints and Photographs Division is to preserve and make available 40,000 drawings related to Washington, D.C. The size, diversity, and complexity of this collection and the need to prepare it for service to the public have required some innovative and cooperative approaches. By providing appropriate housing and stabilization and through the creation of catalog records which will be available internationally, the Washingtoniana II project will make the entire collection accessible for the first time. This paper will describe the Washingtoniana II collection, the preservation component of the project, and some of the techniques which are being used to preserve this unique and valuable collection.

## **BACKGROUND**

The goals of the Washingtoniana II project are to physically process the 40,000 drawings, create catalog records, research and write an illustrated guide to the collection, and perform conservation surveys and treatment. The project's staff includes paper conservators, curators, catalogers and processing assistants. A series of generous grants from the Morris and Gwendolyn Cafritz Foundation have supported the preservation component of the project by providing for two full time paper conservators, the hiring of other conservators on a consultant basis, and the purchasing of supplies for treatment and housing. To address the preservation needs of the collection, there is one conservator at the technician level for routine treatments and one conservator at an advanced level for more complex treatments. The conservators are able to draw on the administrative and technical support of the Conservation Office. Two years of conservation survey and treatment have been completed and one more year is needed to finish the preservation component of the project. Due to budget, time, and staffing constraints, the preservation component of the project first addresses the stabilization and housing of the entire collection and secondly addresses the treatment of individual objects.

## **DESCRIPTION OF THE COLLECTION**

The Washingtoniana II collection documents the history and development of architecture, design, and engineering in the Washington D.C. metropolitan area. To be included in this project drawings must be by Washington-based architects, designers or engineers, depict buildings physically located in Washington, or be commissioned by clients such as the federal government. The drawings have been acquired by copyright deposit, purchase, and gift, and some drawings have been given specifically as a result of this project. The Washingtoniana II collection has been described as "tracing the development of architectural drawing in the United States as both an art form and a professional tool from its earliest or crudest expressions to its most recent and sophisticated manifestations."<sup>3</sup> Drawings from some of the most important architectural competitions held in the United States are represented in the collection, including the United States Capitol Competition, the competition to design the first building of the Library of Congress, and the competition to design the Vietnam Veterans Memorial. The collection ranges from master presentation drawings, working drawings, and full size details, to major portions of the archives of an architect's office.

The collection includes many of the types of materials used for architectural drawings such as: drawings on tracing paper, linen, and illustration board; reproduction techniques, e.g., blueprints and diazo prints; photographic processes, e.g., prints, negatives, slides, and photostats; and bound materials, e.g., sketchbooks and scrapbooks. There is also a significant amount of manuscript and textual material, e.g., building specifications and correspondence. Good quality drawing papers, such as the hand-made laid and wove papers used for early presentation drawings, also are represented in the collection. Whatman papers, for example, were used for many of the early watercolor renderings. However, poor quality papers are in abundance, such as the oversize, machine-made, wood pulp and lignin-containing papers used for working drawings and full size details. The architectural drawings date from the late 18th century to the 1980's and the size of the drawings can range from a few inches to many feet.

## CONDITION OF THE COLLECTION

When considering the preservation concerns of architectural drawings it must be kept in mind that many architectural drawings were never intended to serve any function beyond their original, practical purpose. They were considered to be expendable and the permanence of the materials used in their execution was not a consideration. Therefore, the preservation concerns of architectural drawings often are related to the quality of the starting materials as well as subsequent storage and handling.

Many of the recently acquired drawings had been tightly rolled or folded and stored in varying environmental storage conditions for extended periods. The outsides of folds and the ends of rolls often are dirty and crumpled and all of these drawings have some degree of surface dirt. The drawings on better quality paper have, in general, suffered fewer problems than the drawings on poor quality supports. The tracing paper drawings and the blueprints have been the most susceptible to tears, losses, and reinforcement with pressure sensitive tapes. Many different types of tracing papers are in the collection, including papers made translucent through mechanical methods, chemical treatment, and through the addition of resins or oils. The condition of these drawings depends on the paper quality, the method of achieving translucency, and subsequent care. The condition of the blueprints, used since the mid-19th century to provide copies of architectural drawings, is often dependent on the quality of the paper support and the thoroughness of processing. Blueprints are working tools; therefore, due to their past storage and handling, many of them have large tears, major losses, and reinforcements with pressure sensitive and paper tapes. The diazo print, used since the early 20th century, surpassed the blueprint as the reproduction technique of choice since it created a positive image and was less expensive. However, the diazo print presents several preservation concerns that result from the residual dye forming compounds left throughout the paper support after processing. The paper support can yellow, darken and become brittle long after fabrication due to the instability of these residual chemicals. Diazo prints tend to stain any material with direct contact and can retain a sharp, distinctive odor and an oily or greasy feel. Linen drawings, usually ink on a starch coated fine weave cloth, have been found to be very durable although they can also suffer from poor storage and handling. The starch coating is sensitive to abrasion, moisture, and mishandling and is vulnerable to mold and insect attack. Recently, many drawings have been executed with ink on polyester film supports. To date, no problems have been noted concerning embrittlement of the plastic films or lifting of the ink.

Many of the preservation concerns of the master presentation drawings are related to the several types of

backings which were applied sometime between 1930 and 1960 (Figures 1 and 2). These backings range from a single sheet of white government bond paper to multiple layers of bond paper, Kraft paper, and linen. The purpose of these backings appears to have been to make very important drawings more sturdy by attaching them to strong supports. However, through this process, the paper texture was obliterated, the drawings have become cockled, yellow and brittle, and, in some cases, no allowance was made for a double sided object.

In addition to drawings, there are bound materials and photographs in this collection. The photographs and books often are dirty, with some structural damage, such as tears and breaks, and are in need of proper housing. Photograph and book conservators are consulted regarding this aspect of the collection. With their guidance, the paper conservators are able to address some of the housing and basic stabilization needs of these objects within the scope of the Washingtoniana II project.

## DESCRIPTION OF THE PRESERVATION COMPONENT

The preservation component of the Washingtoniana II project includes: establishing priorities to ensure that basic preservation needs are met in the stipulated time frame; advising on safe handling procedures; developing appropriate housing systems for all types of materials in the collection; surveying of the collection to identify objects with conservation concerns; and performing major and minor conservation treatments. To meet the preservation needs of a collection with such varied materials and conservation concerns as this one, cooperation and collaboration among the project members is essential.

### Humidification and Flattening

An important example of the collaboration in this project was the need to humidify and flatten thousands of rolled and folded drawings so that they could be safely documented and housed (Figure 3). Two processing assistants from the Prints and Photographs Division were trained by a senior paper conservator to discreetly test media solubility and friability and then to humidify and flatten the drawings in the Conservation Office. Since the processing assistants schedule and then execute the humidification and flattening they are able to prepare efficiently for the next phase of their work which includes the physical processing, cataloging, and housing of the drawings. The paper conservators assist and give guidance in the humidification and flattening of the drawings when necessary but primarily are able to devote their time and expertise to other conservation treatments.

The humidification chamber consists of a large modified baker's rack encircled in polyethylene sheeting. An

ultrasonic humidifier supplies a fine mist into the chamber through plastic tubing attached at the top of the rack. The chamber has 24 removable screens and is most humid at the bottom. Rolled drawings can be accommodated in the chamber by removing shelves and draping the plastic sheeting further out from the sides of the chamber. The length of time for humidification varies with the needs of the drawings. Once humidified the drawings are flattened between thick blotters and under Plexiglas™. The processing assistants have humidified and flattened over 18,000 drawings using this technique.

### **Housing**

The Prints and Photographs Division and the Conservation Office worked together to develop a housing system which would address the preservation concerns of the drawings as well as the Prints and Photographs Division's available storage space and handling needs. The majority of the drawings are housed in polyester film folders (Mylar-D), which are sealed on one long side. Since the storage space in the Prints and Photographs Division is limited, up to ten drawings are housed in one polyester film folder. Drawings are individually housed if it is anticipated that they will be heavily used, if they are fragile, or have major conservation concerns. The polyester film folders offer some physical support, protect against direct handling, dust, and changes in relative humidity and temperature. The folders do not, however, protect the drawings from light, and the static charge of the polyester film folders necessitates that a sheet of silicone release paper be placed over friable media.

The polyester film folders have buffered paper (Archivart Lining Paper) placed behind all individually housed drawings and after every fourth drawing if group housed (Figure 4). The buffered paper with a surface pH of approximately 8.0 and a calcium carbonate reserve of 9-10% buffers the environment around the drawing and can absorb acidic material from the drawing, which the polyester film folder alone cannot. The buffered paper is used with all types of drawings in the collection including diazo prints and blueprints. In group housings, the buffered paper is interleaved to isolate drawings with pressure sensitive tapes and other types of attachments. The inclusion of the buffered paper in conjunction with excellent environmental conditions in the storage area, is extremely beneficial in the long term preservation of these objects, especially when all the "treatment" a drawing may receive is appropriate housing. Blueprints, diazo prints, and tracing papers drawings are housed separately from one another in their own folders. This has been especially important with diazo prints since they tend to stain any material with direct contact.

The processing assistants use the polyester film fold-

ers to house most of the drawings during physical processing and the Conservation Office prepares any other type of housing, such as mats or book boxes. The standard sizes of the folders range from the smallest of 14" x 18" to the largest folder size of 46" x 75". Once housed in the polyester film folders, the larger objects are stored in map cases and smaller objects are stored in archival quality boxes. Oversize drawings are rolled onto tubes or if horizontal storage is preferred they are stored flat in specially made folders in a designated area of the Prints and Photographs Division.

The bound materials and photographic materials have required different housing and handling than the drawings and are stored separately from the drawings. The small photographs are stored vertically in paper folders in archival manuscript size boxes; larger photographs, usually mounted, are stored horizontally in the same type of archival boxes as the drawings. Clamshell boxes have been constructed for some of the rare books in the collection and phase boxes have been constructed to keep books with detached covers or spines together until they can receive additional treatment.

### **Handling**

Safe handling practices, an integral part of the preservation of this collection, were developed through an interactive process between the Conservation Office and the Prints and Photographs Division. For example, the old method of accessing a folder at the bottom of a drawer was to roll back the top folders (often quite heavy) without knowing the fragile nature of the drawings within. After several discussions and trials, some handling changes were made, such as sliding folders over into an adjacent open drawer while locating a folder further down, and using a spatula made of sturdy board to remove folders from a drawer. In addition, carrying portfolios and a wide flat cart are used to transport the objects. Larger drawings, in sound condition and housed in polyester film folders, are effectively transported in a custom built cart fitted with a gently curved bed. Handling the objects without rolling them back has not significantly increased the time needed to retrieve a drawing and ensures that the objects remain in good condition. The issue of how the drawings are handled and served to the public is vital to the overall preservation of this collection.

### **Treatment Priorities and Surveying**

With the varied nature of the drawings in this collection, including everything from master presentation drawings to large archives of blueprints and diazo prints, it is not possible to address each drawing to the same degree. The primary task at hand is to stabilize the collection so that it can be handled safely by the staff and

researchers. Therefore, due to time constraints, the size of this collection, and the range of conservation problems, it was evident from the outset of this project that not all items would receive full treatment. Surrogates have been considered for this collection since their use would minimize light exposure and wear and handling of some of the drawings, in particular the fragile and large drawings (Figure 5). Furthermore, with a surrogate, some objects would rarely be handled and thus possibly require little treatment. Surrogates for selected portions of the collection will be provided once the history of demand is determined. Treatment priorities were established taking into account the greater handling that the drawings will receive with no complete surrogate of the collection. Consequently, a significant amount of treatment has been required to prepare a collection of this diversity and size for use by the public.

The selection of objects for treatment is expedited by a two-step survey process which identifies the drawings with the most pressing needs. First, the processing assistants conduct an initial survey of conservation concerns (noting the presence of pressure sensitive tape, brittleness, backings, tears, losses, mold, and any other suspicious feature) while recording architect and building information in a computer database. This initial survey of the collection eliminates the need for the conservators and curators to examine objects in sound condition and allows them to concentrate on those drawings with conservation concerns. During the second step of the surveying, the selection of objects for treatment is made by the conservators and curators using the state of preservation and the curatorial priority of the object (its expected use, and its informational, research, and aesthetic value). The highest priority objects selected for treatment then are those with high curatorial priority and which can not be safely handled without treatment due to the presence of physical and/or chemical conditions causing deterioration. This may include the presence of weak areas, pressure sensitive tapes, poor quality backings, large tears and major losses (Figure 6). Objects such as the blueprint in Figure 6 are stabilized by mending the tears and bridging the large areas of loss with an appropriate weight Japanese tissue. Objects in poor condition but which have low curatorial priority are not selected for treatment but instead are individually housed. As stated before, the only "treatment" some objects with low curatorial and conservation priorities receive at this time is appropriate housing. Other examples of objects not selected for immediate treatment include drawings with small tears, and drawings with pressure sensitive tape outside the image area. A checklist form with condition entries specific to the needs of this collection is used by the conservators to record information about the support, media, condition, and the curatorial and conservation priorities.

### Treatment Techniques

The goal of conservation treatment is to allow safe handling of the objects and to arrest or slow deterioration. Many of the drawings in this collection which are selected for treatment require the basic and often routine treatments of dry cleaning, mending, and some paper tape and pressure sensitive tape removal. These minor treatments are recorded on a checklist treatment form with entries pertinent to this collection. Major treatments, those involving backing removals and bathing for example, use a more involved condition and treatment report form. All major treatments are documented photographically with 4" x 5" black and white negatives and prints and color transparencies of the recto if color is present. Color slides (35 mm) are used to document some minor and major treatments.

Pressure sensitive tape was targeted as a high priority for treatment because of migration of adhesive and staining, embrittlement, and possible obscuring of or loss of image. Rubber based tapes are addressed first and then the more recently applied acrylic based tapes. Mechanical (heat, scraping, crepe erasers, etc.) and solvent methods (chambers, poultices, suction disc, etc.) are used, after testing, for pressure sensitive tape carrier and adhesive removal. Care is taken when using heat and moisture with blueprints and diazo prints so that they are not altered. Pressure sensitive tapes applied directly over friable media and to the image side of blueprints and diazo prints have been especially difficult to remove. Often some of the blue fibers of blueprints have already detached and the image layer of diazo prints has already delaminated and these are firmly bound into the adhesive layer of the tape. In some cases, where loss of image would result from attempts to remove the carrier and/or adhesive, the tape is left intact and the drawing is individually housed. Stains from pressure sensitive tapes are generally not addressed unless the stain is disfiguring or endangering an object with high curatorial priority.

Removal of surface dirt is important since it can be abrasive in the group housings and can be spread by researchers and staff. Grated and solid vinyl erasers (Staedtler "Mars") are used for dry cleaning of surface dirt. Cleaning powders, like Scum-X, were tried early on in the project but were found to be too abrasive and too difficult to remove.

Major tears are mended for handling reasons and to arrest propagation. Originally, heat set tissue was used for mending. Heat set tissue mending was fast and the compatibility of the heat set tissue with the transparency of tracing papers was desirable. It has been found, however, that heat set tissue does not always adhere well to many of the supports and in general does not stand up to the handling that the drawings receive. Now, an appro-



priate weight Japanese tissue and wheat starch paste are used for mending tears on all supports. These mends have been found to be very secure and the time for mending, with well organized materials, has not significantly increased. Large areas of loss on blueprints, diazo prints, and most tracing paper drawings are bridged with toned, appropriate weight Japanese tissue. For the most curatorially important drawings, losses are filled with toned Japanese or Western papers.

In addition to the minor treatments of dry cleaning, mending, and tape removal, some drawings in the collection require major treatment including backing removals, water bathing, mending, filling, and lining. These treatments involve sensitive media, removal of multiple mountings which were applied over drawings, and oversize drawings. The selection of objects for major treatment takes into account the additional time and resources which are required to perform larger, more complex treatments. Since so many drawings were mounted to poor quality backings in the past, highest priority is given to the drawings with known or suspected drawings obscured on the verso and actively endangered primary supports.

### CONCLUSION

The Washingtoniana II project is making it possible to catalog, access, and preserve 40,000 drawings which represent a rich collection of American architectural, design, and engineering history. The project has provided a better understanding of the treatment and housing requirements of a diverse drawing collection which will be handled by the public in the near future. The project has also helped to develop treatment priorities for large collections and a way of re-evaluating them if necessary to ensure that the overall preservation goals of the collection are being met. The collaborations between the staffs of the Conservation Office and the Prints and Photographs Division to address the preservation goals of the project have been very successful. In addition, several areas of possible investigation have come to light as a result of this project, including: methods of pressure sensitive tape removal from the image side of blueprints and diazo prints; issues related to the use of self adhesive tonal shading film (like Zip-a-Tone); the long term preservation of blueprints, diazo prints, drawings produced by CAD (computer assisted design), and drawings on plastic films with electrostatically deposited ink; the exhibit requirements of the varied media; and the care, storage, and access of oversized drawings. The anticipated completion date of the processing, housing, and treatment of the Washingtoniana II drawings is December, 1994.

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### NOTES

<sup>1</sup> The term "architectural drawings" is used for simplicity and actually refers to architectural, design, and engineering drawings.

<sup>2</sup> Washingtoniana I was a project to process and catalog photographs of the Washington, D.C. area.

<sup>3</sup> Morris and Gwendolyn Cafritz Foundation Grant Application, 1992.

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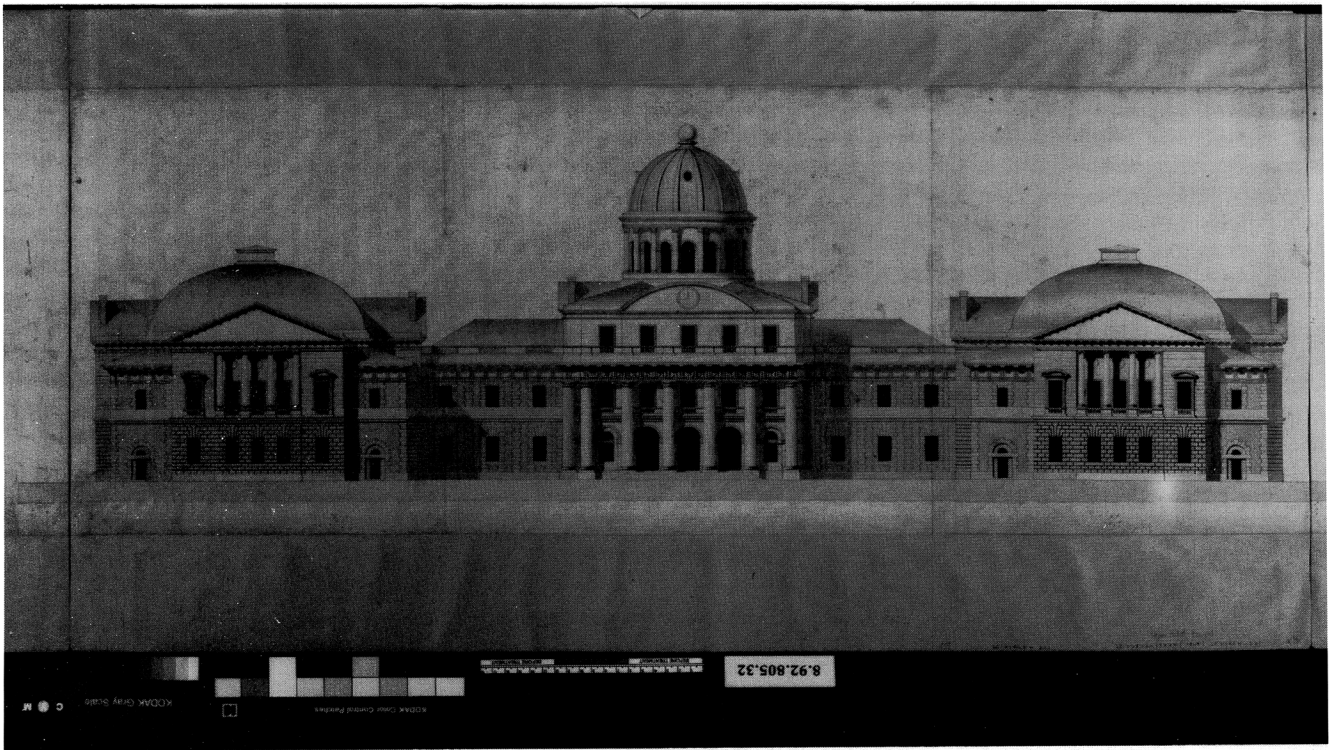


Fig. 1 Ink and watercolor drawing for the United States Capitol, before treatment, showing the poor quality backing. The slits in the extreme left and right of the drawing were made at the time the drawing was mounted so that it could be folded.

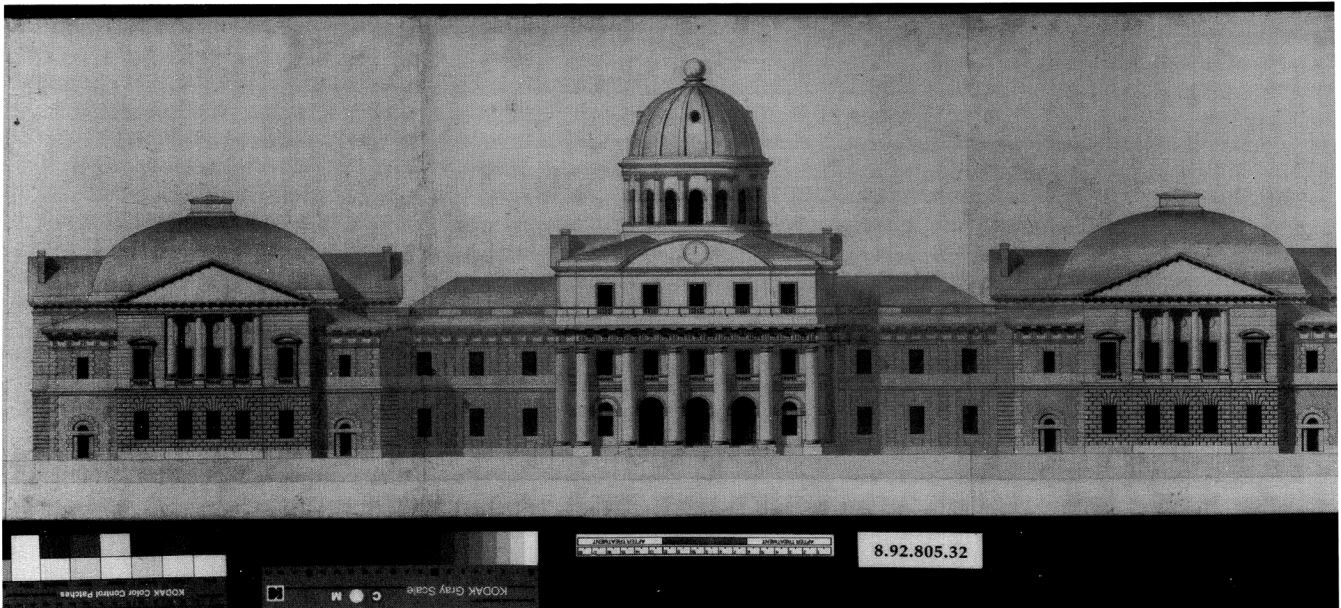


Fig. 2 After treatment. The condition of the drawing improved considerably once the poor quality backing was removed.



Fig. 3 Blueprints, diazo prints, and tracing paper drawings often arrive rolled in bundles.

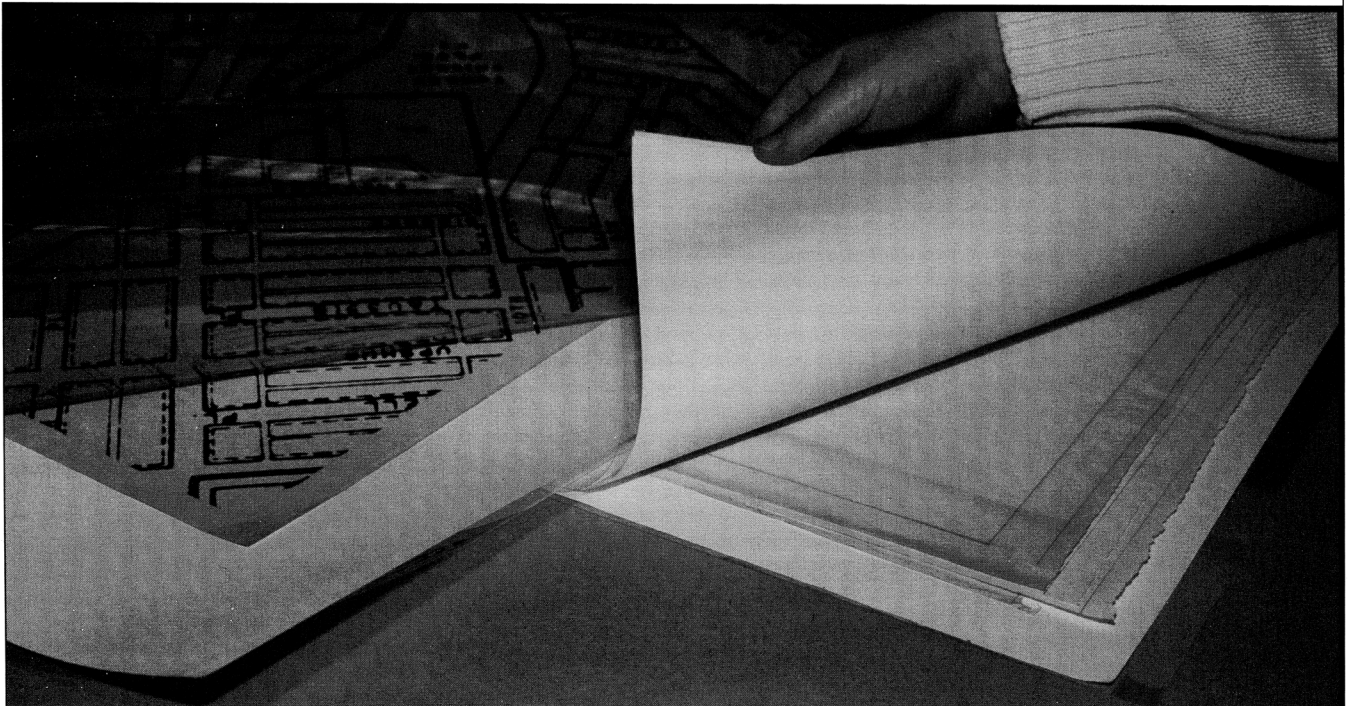


Fig. 4 A single drawing housed with buffered paper is shown at the top of this view and several drawings housed together with buffer paper is shown at the bottom.

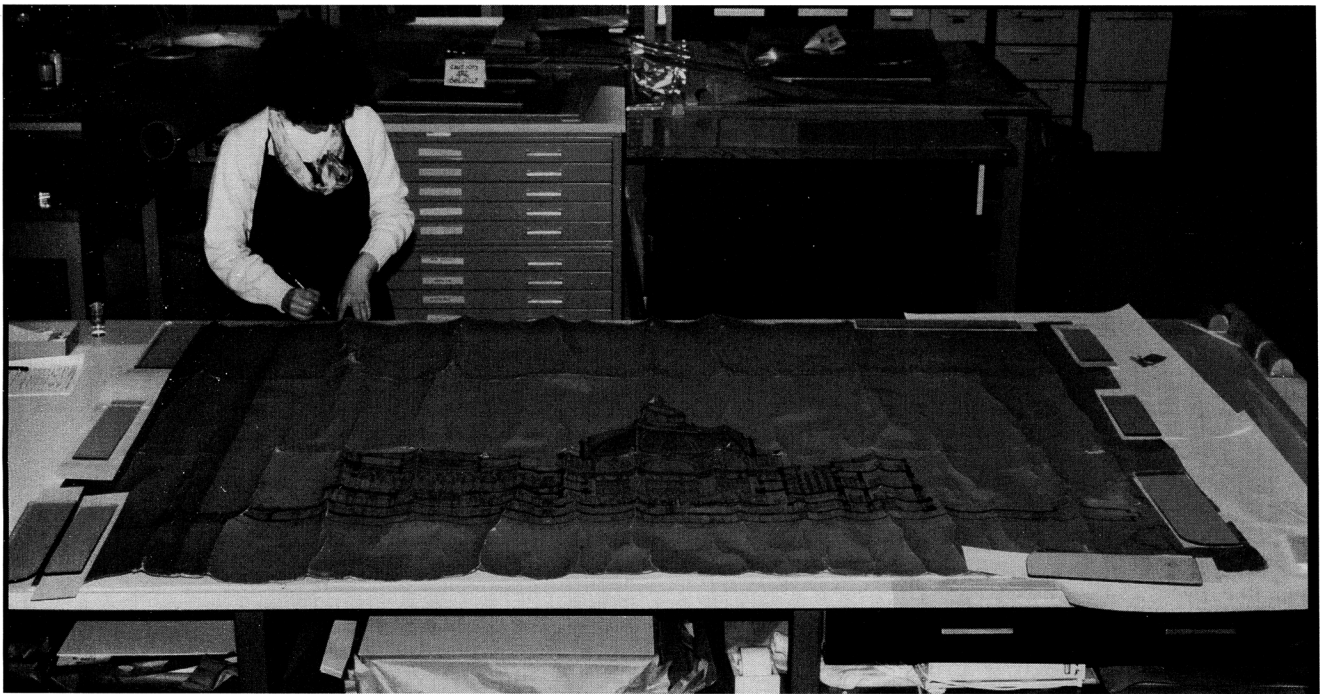


Fig. 5 Large ink drawing of the Jefferson Building, Library of Congress, shown before treatment. The handling of this fragile, important drawing will be minimized by using black and white treatment photographs as surrogates.

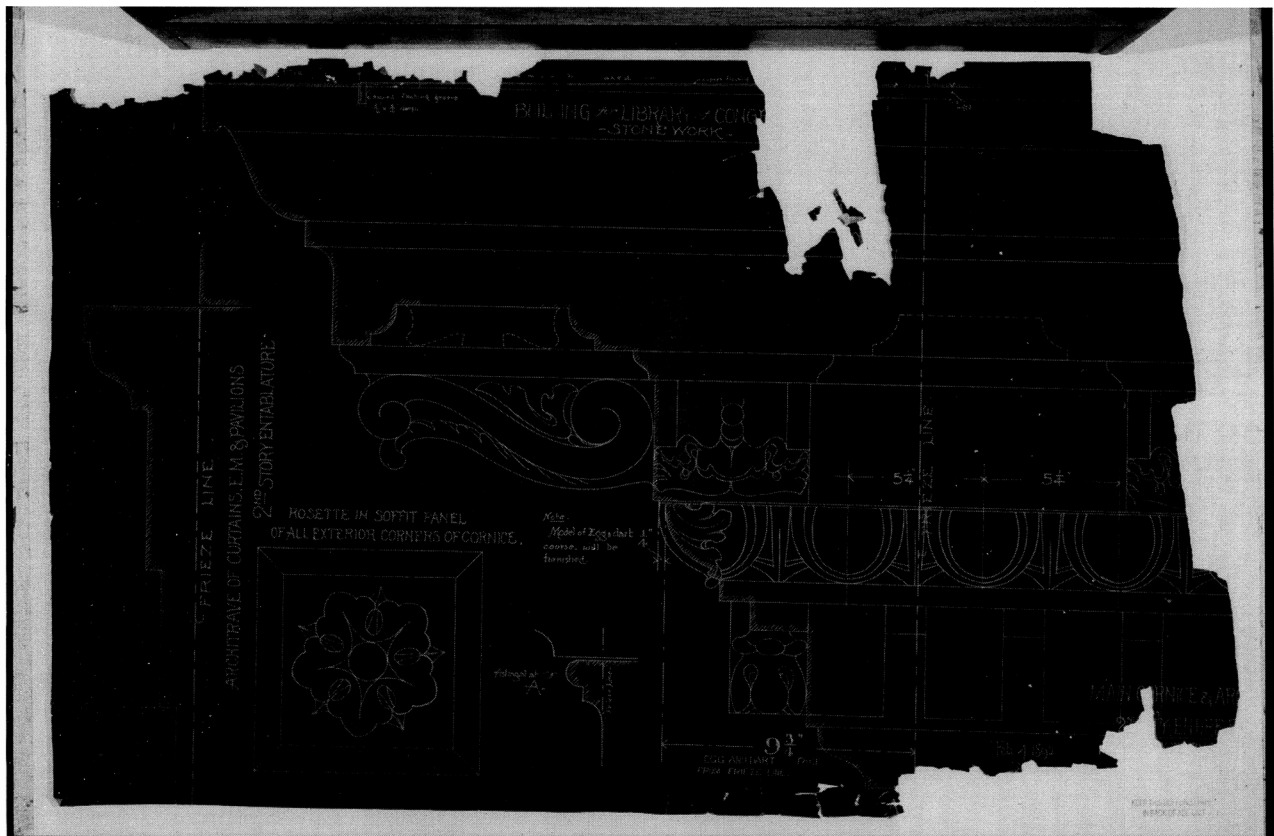


Fig. 6 This blueprint is an example of an important object which requires conservation treatment before use by researchers.