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THE VALUE OF CONSERVATION AND DIGITIZATION OF ARCHITECTURAL AND DESIGN DRAWINGS FOR HISTORICAL RESEARCH

Résumé

Les collections de dessins grand format sont toujours un défi à manipuler et à stocker. La conservation et la restauration sont souvent nécessaires avant que le relogement ou la numérisation ne soit également possible. L'ingéniosité de la restauratrice-conservatrice de Heritage Leiden a été mise à l'épreuve quand on lui a demandé de préparer un nombre fixe de dessins d'architecture et de design dans un délai

très limité. Dans cet article, le flux de travail conçu, les méthodes de conservation telles que l'aplatissement, les matériaux de conservation et les solutions de stockage sont expliqués. Rendre l'objet physique disponible pour la manipulation et la numérisation offre aux chercheurs des sources historiques précieuses. Connaissant les avantages de la conservation et de la numérisation pour la recherche historique, y consacrez temps, argent et efforts.

Keywords: Architectural drawings, flattening, conservation, digitization, storage

Introduction

Large-format drawings are always a challenge to handle and store. Conservation and restoration are often needed before rehousing or digitization are even possible. In this article, I would like to share my experience as a conservator with the conservation of two large-format drawing collections and the effect their treatment had on the use of these drawings, in physical or digital form.

This whole project started with some unintended preliminary research. I had visited a fellow paper conservator at the City Archives of Amsterdam in September 2017, because I wanted to know more about

the method he used for flattening rolled-up architectural drawings. This method was based on the publication "Paper Line Light"¹ by Eva Glück and other authors, published by the Akademie der Künste, Berlin 2012. He had made some alterations, which inspired me to take a good look at the possibilities in my studio at Heritage Leiden, and I started a small pilot project there in October 2017.

In early December 2017, management was confronted with left-over budget funds,

¹ *Papier Linie Licht Konservierung von Architekturzeichnungen und Lichtpausen aus dem Hans-Scharoun-Archiv/ Paper Line Light The Preservation of Architectural drawings and Photoreproductions from the Hans Scharoun Archive*, E. Glück and others (Berlin: Akademie der Künste, 2012).



Fig. 1.1, 1.2 The Van der Heijden drawings in their previous condition and storage



Fig. 1.3 The Jilleba design drawings in their previous condition and storage

and they decided that two drawing collections were going to be digitized and therefore needed conservation treatment.

That was positive news with the negative note that the conservation had to be finished by the end of the year, which meant within one month. This was, of course, not feasible, but I started anyway. With the provided budget, materials could be bought, and two experienced conservators could be hired. Fortunately, paper conservators Annet Doves and Alexandra Nederlof were able to start on short notice.

The collections

The two chosen drawing collections were a recently acquired collection of stained-glass window design drawings from a renowned firm in Leiden called Jilleba, which celebrated their 80th anniversary in 2018 and the drawings of architectural agency Van der Heijden from Leiden,

dating from the end of the 19th century until approximately the 1950s. The Jilleba collection consisted of around 680 rolled-up drawings in a variety of sizes and types of paper. The Van der Heijden collection consisted of almost 5,200 flat and 1,800 rolled up drawings. The flat drawings were original drawings on transparent or opaque paper or photo-reproductions, such as blueprints. The rolled-up drawings consisted of all kinds of paper, either original drawings or photo-reproduction techniques. Many of these papers had been used on both sides. The condition and storage of both collections were not good. All the rolled-up drawings in both collections were physically not accessible.

Conservation

The conservation of the two collections basically consisted of dry cleaning, mending of tears, flattening and new acid-free housing.

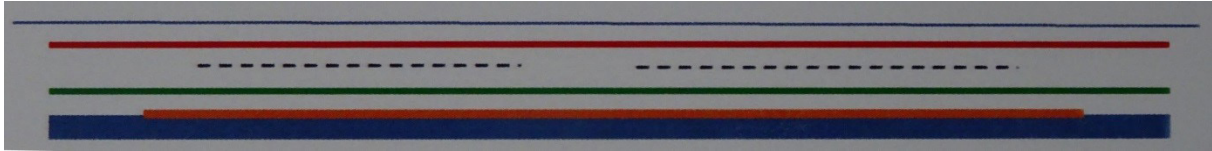


Fig. 2: Schematic representation of the single moisture layer sandwich

Dry cleaning

Dry cleaning was first done with a smoke-sponge, but soon we started using a brush and even a vacuum cleaner because the drawings were sometimes so severely soiled that the smoke-sponges were rapidly saturated with dust and dirt. Personal protection, including gloves, facial masks, and some air suction, was used during dry cleaning.

Mending tears

Depending on the amount of damage in combination with the type of paper, two methods of tear repair were used.

For the thicker papers, we used Japanese paper adhered with freshly cooked wheat starch paste, while for the thinner and transparent papers we used Archibond®, which is a 100% Manilla tissue, approximate weight 9,5 grams, coated with a heat-set paroloid acrylic adhesive. Even complete linings could be done with this repair paper. This, in the case of transparent papers, often had the best and less obtrusive result, compared to mending individual tears. Due to the tight schedule, the size of the drawings and logistics in the studio, the use of Archibond® turned out to be the most practical method.

Flattening

Flattening was needed in two cases, first for flat drawings with creases or severe folds and second for the rolled-up drawings. In the first case, we used ironing devices like the one used for applying the heat-set repair tissue. In the second case, we used the flattening method developed during the aforementioned pilot project.

The general idea of this flattening method is moistening the paper to relax the cellulose fibres in a safe, minimal, and controlled manner, like in a humidity chamber. After moistening, the drawings are placed in a drying stack, which is a combination of blotter paper, cardboard, and weight on top: they are taken out of this drying stack after approximately a week of drying time. We were able to create a good workflow, which made it possible to flatten about 60 to 80 drawings per day, depending on the thickness of the paper. The studio only had space for two drying stacks, which meant two days of flattening during one workweek.

Moisture sandwich

This method is generally a sandwich of materials in which the drawing is rolled out for a short period. The sandwich can consist of one moisture layer or two moisture layers. Which one you need to use depends on the thickness and the type of paper to be flattened.

Single moisture layer

A single moisture layer sandwich consists of the following layers:

First, a layer of wet blotter paper is used; the second layer is a water-vapour-permeable material, such as Gore-tex® or Sympatex®. These materials are rather expensive, so we used a much more economical material called SMS Hydrofobe², which works in a similar manner. The drawing is now safely rolled out on top of this second layer with the aid of a cardboard tube together with the top layers of the

² SMS Hydrofobe: a three layer 100% polypropylene non-woven fabric (Spunbound Meltblown Spunbound), 75 g/m².



Fig. 4: Schematic representation of the double moisture layer sandwich

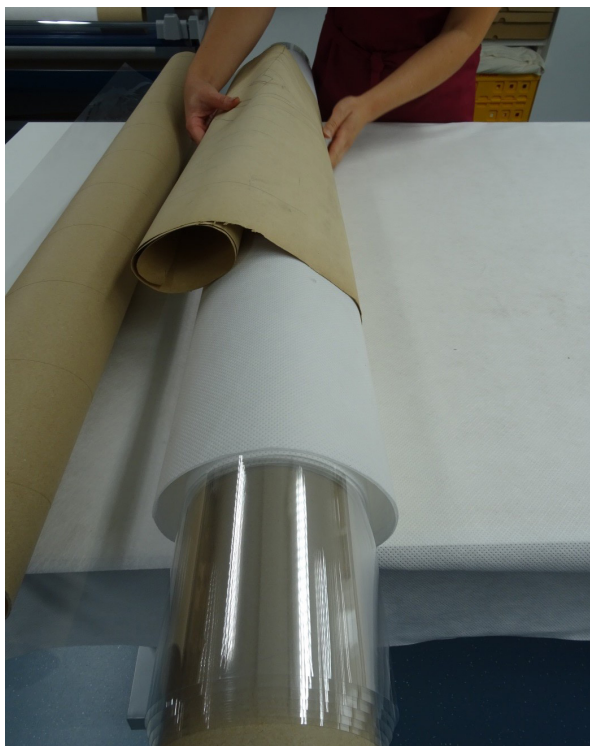


Fig. 3: Unrolling of the drawing in the moisture sandwich



Fig. 5: Jilleba drawings rolled onto a cardboard tube together with a sheet of acid-free paper

sandwich. The top two layers consist of thick Hollytex® or Reemay® and Melinex®.

Double moisture layer

If it is a double moisture layer sandwich, the top layers consist of:

SMS Hydrofobe followed by moist to wet Paraprint OL 60³ or blotter paper and thick Hollytex® or Reemay® closed with a layer of Melinex®. In both sandwiches, the top Melinex® layer keeps the moisture within the sandwich and prevents the cardboard tube from becoming wet during treatment.

Depending on the thickness of the paper of the drawing, the time in the moisture

sandwich can vary from 30 seconds to 20 minutes. The double moisture sandwich speeds up the process considerably. The length of the sandwich depends on the available tables and materials. A long sandwich could contain several drawings at the same time and, therefore, efficiency increases.

Housing

All the drawings needed to be (re)housed after conservation treatment. Even though the two collections were treated at the same time, decisions regarding the type of housing were based on different criteria per collection.

The Jilleba drawings were flattened and housed in acid-free cardboard folders if a

3 Paraprint OL 60: capillary non-woven fabric, 100% viscose, reinforced with an acrylate binding agent, 60 g/m².

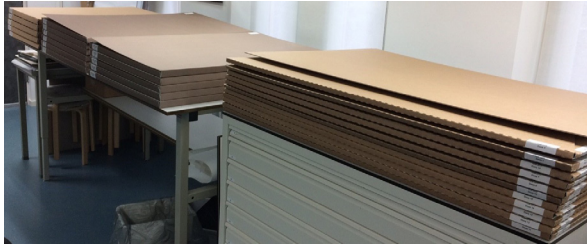


Fig. 6: The drawings in the new acid-free cardboard folders in different sizes

drawing did not exceed the size of the largest available folder. If a drawing were larger, it would be rolled on a cardboard tube together with a sheet of acid-free paper. This paper was longer and wider than the largest drawing to protect the drawings completely. This roll was placed in an acid-free box. Along the edge of the acid-free paper, labels with the individual inventory numbers were adhered. Next to these labels, the length of the paper sheet was noted in pencil, so it was clear before unrolling what size table would be needed. Depending on the thickness of the paper a maximum of ten drawings was rolled onto a tube. The drawings of several inventory numbers could be rolled together on one tube; they were physically separated by long strips of paper with inventory labels for identification.

All the flat drawings within the Van der Heijden collection had to be rehoused in acid-free cardboard folders. The maximum size of this new folder was dictated by the size of the shelves on which the former grey-board folders had been stored.

All the rolled-up drawings within the Van der Heijden collection were flattened and stored in different-sized cardboard folders.

If a flattened drawing was larger than the largest folder available, the drawing was folded and stored flat instead of rolled on cardboard tubes like in the case of the Jilleba drawings. Among several reasons, we chose this option primarily because the inventory numbers in this part of the collection consisted of many drawings, sometimes even up to 60.

Taking out one or two drawings and rolling them separately would produce too many exceptions in storage and secondly



Fig. 7: All the drawings of one inventory number

would become too difficult to administer for digitization and final storage. Most of these long drawings consisted of several smaller design drawings on just one very large sheet of paper: folding was easily done between two designs. The Jilleba design drawings also have a more artistic value compared to the more technical value of the van der Heijden drawings and, therefore, folding them was not an option.

There were three exceptions in the Van der Heijden collection: three drawings of complete building facades, filling the entire paper, were rolled together on one cardboard tube.

The old paper wrappers, with content information written on them, were re-used to keep the drawings of an inventory number bundled in their new paper folder. More than one inventory number could be placed in this folder, so the re-used wrappers also functioned as a separation between two

the drawings from both collections were already of interest to colleagues at Heritage Leiden.

Leiden has a historical inner city dating from the 1200s. In the 14th century, the inner city developed into the shape it has now, followed by a second period of growth in the 17th century.

Many of the buildings in the inner city have, of course, changed in appearance over time. The city council started a subsidy program in 2009 to offer owners of historic shop buildings a subsidy to reconstruct their shop facade to make the inner city a more attractive place to visit. A restoration architect working at Heritage Leiden advises on the possibilities of reconstruction. This advice is based on historical research done with the aid of technical architectural drawings, photographs and archival sources in the collections of Heritage Leiden. Some drawings found in the Van der Heijden collection are an excellent basis for this kind of reconstruction advice.

Researching the history of a building is not only done to advise on building permits or the shop facade program. Heritage Leiden also has two very passionate building archaeologists who document the history of the buildings in Leiden. Their research aims to capture the history and protect the physical remains of the historic inner city.⁴ This is not only done using written and photographic documentation, but also by collecting fragments, like beams, bricks, roof tiles, wall-paper fragments, wooden panels, and other elements during building demolitions.

Information concerning their research is shared with the public through our website in a weekly column called “Discovery of the week”, in which they reconstruct the history of an area, a building or a specific building element. Drawings like those in the Van der Heijden collection tell much about the technical elements and details of a building,



Fig. 9: Digital image of inventory number 385 Jilleba collection: a stained-glass window design by Pieter Geraedts Sr.

which is very interesting for restoration architects and building archaeologists.

André van Noort, a historian and architect at Heritage Leiden, wrote a book⁵ about the life and work of the artist Pieter Geraedts Senior. He was a painter of religious images and portraits, and he was a sculptor. He designed quite a lot of stained glass windows, mostly for churches.

Many of these designs were eventually made by the Jilleba firm. The book is filled with beautiful photographs of the work of Pieter Geraedts, but only five photos of design drawings can be found in the book. Those drawings were the only ones available in a good and flattened condition at the time of his research.

The book was published in 2015, and my colleague's interest and research is most likely the reason Heritage Leiden came across these beautiful design drawings: he

⁴ *Building archaeology in Leiden (NL): a practical approach*, De Vos, P.J. in: *Professionalism in the Built Heritage Sector*, K. van Balen & A. Vandensande (London, 2019), 27-36.

⁵ *Pieter Geraedts Sr. De kunstenaar die zichzelf bleef*, A. Van Noort (Warmond, Historisch Genootschap Warmel-da: 2015).

was able to convince the Jilleba family to give the collection to Heritage Leiden so it would become available for the public.

This example shows that if the collection had been treated and digitized before the publication of the book, my colleague's research on the stained-glass window designs by Pieter Geraedts could have probably been more elaborate and better illustrated.

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Conclusion

The first part of the project in December 2017 and January 2018 was quite chaotic; decisions were made on the go, short evaluations and changes were made quickly. The second part of the project in the second half of 2018 was well planned and designed beforehand; workstations for the different treatments were established. It was based on experience rather than on theory. We were able to experiment with the moisture sandwich, single or double layers of moisture and the effect it had on the different types of paper.

Of course, the demand to finish before the end of 2017 was not feasible. Perhaps the ignorance at that time turned out to be an advantage. If we had known the facts and figures in advance, we would probably not have started the project at all. Sometimes you just have to dive in and do the best you can, and we believe it turned out to be a successful project with an excellent result for both collections. We managed to treat and rehouse approximately 7,700 drawings in about 1,200 hours over 14 months, which means an average processing time of approximately 9.5 minutes per drawing.

What I also learned is that knowing the value your work has for other people, like colleagues and researchers, is very rewarding! Although conservation and digitization are time-consuming with related costs, they are also inevitable, not only for the safekeeping of heritage but also for the continuing use of the information embedded in these collections for research.