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TECHNICAL DRAWINGS: CONSERVATION TREATMENTS

Zusammenfassung

Technische Zeichnungen liefern wichtige Erkenntnisse über den kreativen Entstehungsprozess, sagen aber auch viel über den Zeitgeist ihrer Entstehung aus. Oftmals sind sie auch die einzigen Dokumente bezüglich Bauten und Landschaften, die nicht mehr existieren oder nicht mehr so erhalten

sind. Einige technische Zeichnungen in unserer Sammlung sind aufgrund der schlechten Materialqualität sowie unsachgemäßer Hantierung und Lagerung beschädigt. Konservatorische Maßnahmen wurden für einzelne Objekte individuell erstellt, dabei wurden ästhetische Anforderungen sowie praktische Nutzungsbedingungen für die wissenschaftliche Bearbeitung berücksichtigt.

Keywords: technical drawings, tracing paper, damage, conservation and restoration

Introduction

Technical drawings provide an essential insight into the creative process involved in their making, both in terms of materials used and content described and, furthermore, are often all that we are left with to remind us of man-made and natural landscapes that have ceased to exist.

In its collection SI AS 50-Ljubljana Building Directorate, the Archives of the Republic of Slovenia keeps a collection of graphic documents, the majority of which date back to the 19th century. They were commissioned by the state for the purpose of regulating and maintaining the Sava River basin. Today, they are regarded as one of the first proper urban planning drawings in the Slovenian territory.

Apart from being rich and detailed in the technical aspect, the drawings are also

meticulous in terms of graphic techniques. By using shading, colouring, and drawing of imaginary decorative items of greenery and other aesthetic additions, such graphic illustrations sometimes became true works of art.

As far as the material aspect is concerned, our paper heritage consists of paper support, which acts as a message carrier, and of records, which can be written, drawn, painted, or printed.

Unfortunately, some of these documents in our collection are now severely damaged due to the poor quality of paper support and their frequent and inexpert use.

Conservation-restoration treatment is adjusted to each drawing separately and depends on several aesthetic and practical requirements.

Tracing paper

The technical drawings discussed here are drawn on tracing paper. Transparency of paper can be achieved with several different processes, whose sole purpose is to fill in the space between fibres and so prevent the light from dispersing when being transmitted through paper. By creating a more homogenous medium, the refractive index of paper comes closer to that of the air, which is why paper becomes more transparent.

Transparency of paper can be achieved through several different procedures, which have changed and interacted with each other from the 15th century to the present day:¹

- by coating paper with oil, resin or wax,
- by the intensive beating of paper pulp (parchment substitute),
- by immersing paper in sulphuric acid (vegetable parchment),
- by calendering paper made of heavily beaten fibre suspension (tracing paper and pergamine paper)

Such processes, employed to achieve the desired transparency, produced many shortcomings and harmful effects for the permanence and durability of paper. Heavy beating of cellulose pulp and chemical processing causes changes in paper colour, causing breaks and tears and making the paper less flexible and highly sensitive to humidity.

One of the main characteristics of tracing papers is their high sensitivity to humidity. Such papers do not have characteristic interspaces, which causes them to swell when in touch with humidity. As fibres cannot spread on the inside into air interspaces, since the paper has none due to all the air being excluded from the internal structure of the paper to achieve transparency, they spread on the outside and cause the paper to distort and change its dimensions.

Changes in the scale in technical and architectural drawings, caused by inappropriate climate, storage conditions or incorrect

conservation-restoration interventions, can have consequences for any study or reconstruction of architectural dimensions and proportions.²

During the mid-19th century, when the two restored technical drawings presented here were created, a new procedure to make the so-called vegetable parchment was invented. Vegetable parchment was made by immersing absorbent paper in sulphuric acid. Cellulose fibres were dissolved into a gelatinous mass, which, once dried, resembled parchment. At first, mainly cotton fibre was used for the production of vegetable parchment.³

It is sometimes difficult to identify the exact type of tracing paper, since they are often the product of the combinations of many different manufacturing processes.

Conservation and restoration of two technical drawings

During usage and storage of records on tracing paper, numerous different types of damage may occur, caused by interacting external and internal factors. Such paper may be damaged by light, humidity, temperature, inappropriate use, and the natural ageing process.

In the conservation and restoration treatment of tracing paper, we apply the same principles as in the conservation of all other documents (cultural monuments) on paper, but they are somewhat adjusted to the characteristics of tracing paper. The sensitivity of such paper to humidity requires the careful use of glues that include water, and we also need to make sure to retain the characteristic transparency of a document.

In addition to being fragile, stained and highly sensitive to humidity, as well as having numerous tears and missing parts, the two technical drawings discussed here were also heavily wrinkled (Fig.1, Fig. 2.). Before dry cleaning, we thus needed to flatten wrinkled areas by applying controlled humidity in a

1 C. LAROQUE, *The Paper Conservator: History and analysis of transparent papers* (2004), 18-24.

2 T. RAHOVSKY ŠULIGOJ, 'Gradivo na prosojnih papirjih', v: *Pol stoletja* (Ljubljana: Arhiv Republike Slovenije, 2006), 62.

3 LAROQUE, note 1, 19.



Fig. 1: Plan of regulating and maintaining the Sava River (18/45/1) before the conservation treatment (photo by Lucija Planinc)



Fig. 2: Plan of regulating and maintaining the Sava River (18/45/1) before the conservation treatment - detail of damaged segment (photo by Lucija Planinc)



Fig. 3: Plan of regulating and maintaining the Sava River (18/45/1) after the conservation treatment (photo by Lucija Planinc)

humidity chamber. After the drawings had been flattened, they were dry cleaned with an eraser. Missing parts were then inserted with strips of Japanese paper and starch paste on the verso side. We controlled the item's sensitivity to water by working on smaller areas. After the object was restored, it was placed in a folder made of archival paper, which serves as a support and protection (Fig. 3.).

In the restoration of documents on tracing paper, it is essential to preserve their transparency, avoid any changes in their dimensions, provide support and facilitate handling during storage and use. They need to be used and kept in an environment in which climatic conditions are strictly controlled. Storage equipment has to be dimensionally adjusted to accommodate large-formats of such records so that originals can be stored without being folded or rolled. Such documents have to be kept in folders made of permanent paper and, if possible, digitized and made available for the public on digital media.

When originals are made available for viewing, it is important to inform and educate those who will be handling such records (technical staff, archivists, users in

archival reading rooms, and people involved in digitization), about the importance of the proper handling of such records, so as to justify their time-consuming and expensive conservation-restoration treatments.⁴

Archivists at the Archives of the Republic of Slovenia (those in charge of the archival fonds SI AS 50 - Ljubljana Building Directorate) follow the instructions provided by conservation-restoration experts on how to protect and store collections of technical drawings. They systematically appraise such documentation, take care of its conservation and restoration, and its placement in folders made of permanent paper. Currently in progress is also the digitization of the fonds SI AS 50 - Ljubljana Building Directorate, from which the two technical drawings presented here were selected.

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⁴ RAHOVSKY ŠULIGOJ, note 2, 66.