

MATERIAL VAULT

Library of Materials and
Construction Methods



complex projects

student

Kalina Matova
5673593

03/10/2024

Fall Semester

COMPLEX PROJECTS

Berlin studio
AR3CP100

Research Paper

AR3A010

chair

Kees Kaan

CP coordinator

Hrvoje Smidihen

group tutors

Edyta Milczarek
Jelmer van Zalingen

email

infocpstudios@gmail.com

Instagram

[https://www.instagram.com/
cp.complexprojects/](https://www.instagram.com/cp.complexprojects/)

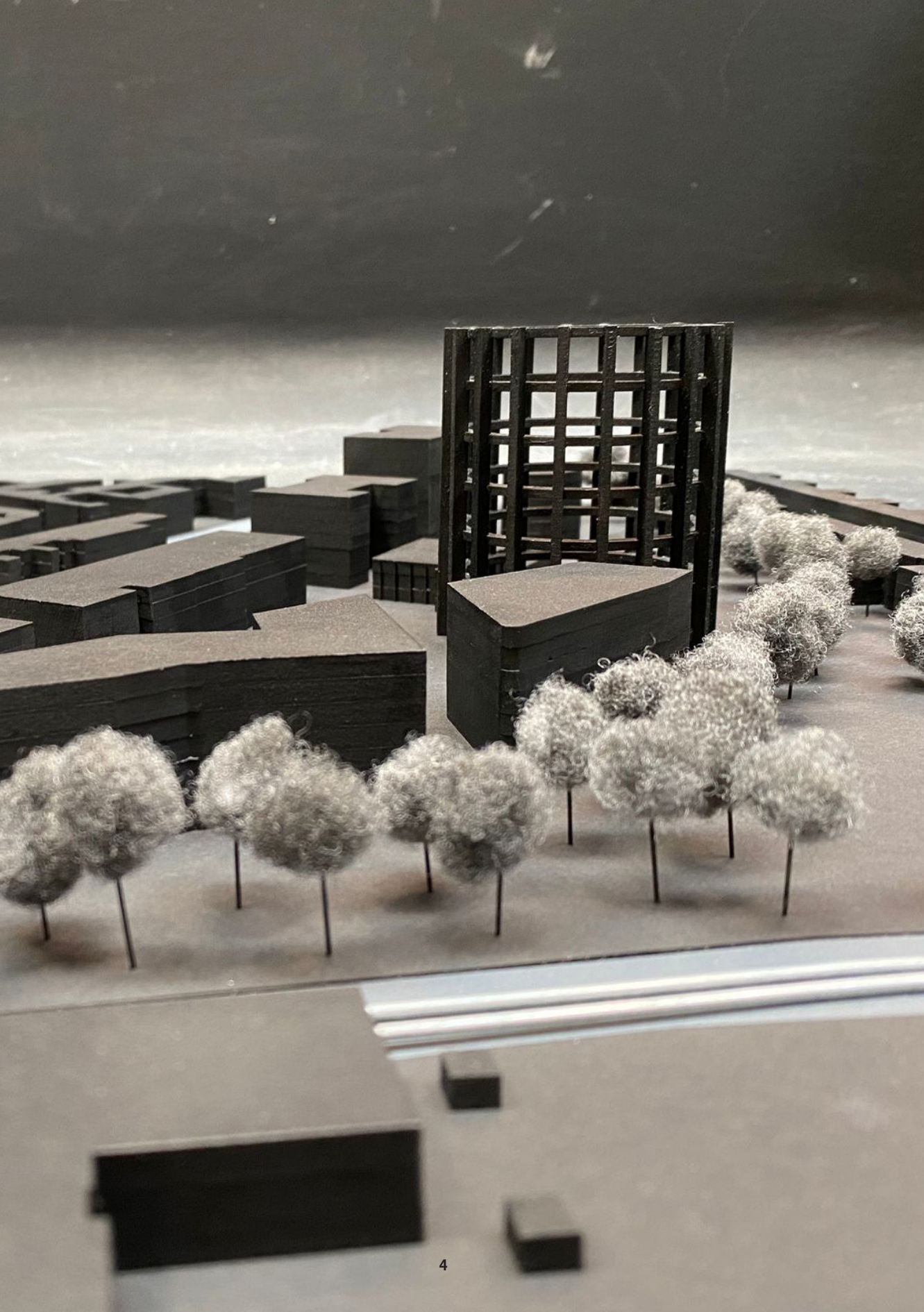
website

[https://www.tudelft.nl/bk/over-faculteit/
afdelingen/architecture/organisatie/disciplines/
complex-projects/](https://www.tudelft.nl/bk/over-faculteit/afdelingen/architecture/organisatie/disciplines/complex-projects/)

facebook

[https://www.facebook.com/CP_Complex-
Projects-422914291241447](https://www.facebook.com/CP_Complex-Projects-422914291241447)

Berlin Studio
Material group



INTRODUCTION

Materiality and tactility play vital roles in shaping our physical world. The materials chosen in design impact an object's appearance, its functionality and the user's sensory experience. In architecture, materials are used not only to protect buildings from the elements but also to define their presence within an urban landscape. Architects often select materials excessively for aesthetic reasons, but this approach faces challenges due to the growing issue of resource depletion. Currently, humans consume 73% more resources than the Earth can regenerate, equivalent to using 1.7 Earths per year. This pressing issue calls for rethinking how we use resources and innovating material application in construction. As part of a material group in a complex project studio, we committed to sourcing one-third of our building materials from local construction waste to reduce the environmental impact of new developments.

Digital catalogs have emerged as valuable tools for cataloging materials, offering designers and engineers resources for conscious material choices. While these platforms aid the design process, they fall short in conveying material properties like reflectivity and texture, which are best experienced physically. A tangible catalog, therefore, is essential for fully engaging with materials.

A building that could house such a physical catalog is a library. But why do we need to rethink the library's typology? The traditional library model is in decline. Modern libraries often serve as repositories for specialized collections, archives, and historical materials, embracing their role as cultural heritage institutions. However, libraries weren't always just that. Historically, libraries served as spaces for scholars and aristocrats to collect, produce, and share knowledge, though it was largely inaccessible to the public.

Today, libraries are public, but digitalization poses a significant threat. With books available as PDFs and resources accessible from home, library visits, already affected by the pandemic, are still in decline. Some

modern libraries, like the Oodi Library in Helsinki, have attempted to redefine their role as active spaces for knowledge production, while projects like OMA's Jussieu in Paris reimagine the library as part of an urban landscape.

The next evolution of the library's function should focus on knowledge collaboration rather than mere collection. Imagine a traditional library: static, quiet, and, frankly, quite dull. Now, envision a library of materials—dynamic, loud, and collaborative. This space would prioritize innovation, with showrooms and archives as secondary functions. My research question for the project is: Can libraries be reimaged as future-proof institutions that foster knowledge creation through material curation and adaptive reuse?

REFLECTION PAPER

THE RELATIONSHIP BETWEEN RESEARCH AND DESIGN

The Complex Projects studio fosters a collaborative, interdisciplinary environment for design and research, emphasizing the integration of different perspectives, typologies, and site selections to ensure that projects are both specific and relevant. This approach, enhanced by thematic investigations and an office-like structure, deepens the research and design processes.

The relationship between research and design in this project was both intricate and evolving. While theoretical research offered a comprehensive understanding and contextual framework, practical design choices were frequently influenced by speculative and experimental ideas. This approach demanded a careful balance between historical knowledge and innovative thinking to craft a library that is not only functional and inviting but also forward-thinking in its vision.

The research methodology is built on two key components: design brief and case studies. The design brief includes a thorough analysis of clients, program requirements, and site selection, drawing insights from relevant precedents. The selection of the site is based on a value assessment matrix that examines

historical, cultural, and contextual factors. Clients such as the State Museums of Berlin, the Federal Institute for Materials Research and Testing (BAM), and the EUREF campus are evaluated to ensure that their objectives align with the project's goals. While other courses from the Architecture track at TU Delft focus on theoretical, ethnographic and/or conceptual investigations, the research required by Complex projects was more grounded in reality.

The research yielded specific program, site and client requirements that are easily translated to the design process. The case studies of other library typologies provided framework for specific design considerations such as GFA, access, circulation, open/closed, daylight and others. The Material Library reimagines the role of libraries as active centers for knowledge production and public engagement, offering a fresh perspective on the continued relevance and impact of the library typology.

Some of the requirements created during the research phase weren't met, due to the evolution of the project, like the height consideration and activation of the square in front of the gasholder.

THE RELATIONSHIP BETWEEN GRADUATION AND STUDIO TOPICS

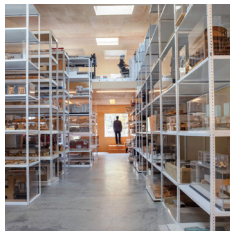
As a member of both the Material Studio group and the Library and Space seminar group, the Library of Materials project is deeply intertwined with both themes. However, it stands out as a unique typology within the broader context of 45 other buildings in the Bodies and Buildings Berlin studio. The problem statement requires the development of an imaginative program, along with a thorough analysis of both the site and client—essential steps in any architectural design project. This approach ensures that the resulting design is not only innovative but also contextually and functionally relevant.

The project integrates technological, social, and creative aspects, making it highly relevant in addressing complex, contemporary issues. It prepares participants to navigate these challenges while honing their design and creative skills within a specific urban context. This integration ensures that the design responds not only to aesthetic and functional needs but also to the broader social and technological

dynamics of modern cities. On a societal level, addressing the challenges posed by the saturation of existing building stock through adaptive reuse and refurbishment aligns with the growing focus on responsible resource management. The field of adaptive reuse is gaining prominence, and I would argue that working with existing structures is often more complex than designing from scratch. The unique challenges of integrating old and new elements can result in innovative projects that blend history with modernity.

By reimagining libraries in a digital society, not as static archives but as dynamic hubs for producing new knowledge, the typology has an opportunity for renewal. Engaging the public with pressing issues like resource scarcity, building stock, and sustainability can foster a shift in societal attitudes. The creation of new materials, traditionally confined to research labs, can be transformed into a public, hands-on experience in workshops. The outcome of this research and design will establish a scientific framework that can be used as a reference for future projects.

XS



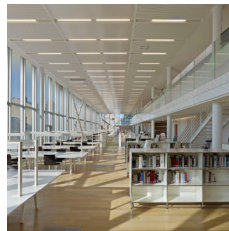
**Architectural
Archive**

Steven Holl 2014
New York, USA

250 m²

- 3,700 volumes
- 1,200 architectural models

S



**Nievre's
Departmental
Archives**

Patrick Mauger, 2012
Nevers, FR

8 850 m²

- heritage library focused on local and general history

M



**Oodi Helsinki
Central Library**

ALA Architects 2018
Helsingfors, FL

17 250 m²

- 100,000 items

L



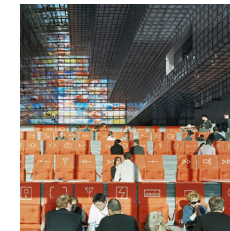
**The Royal
Library**

Schmidt Hammer Lassen
Architects, 1999
Copenhagen, DK

21 000 m²

- 200,000 books
- 600-seat hall

XL



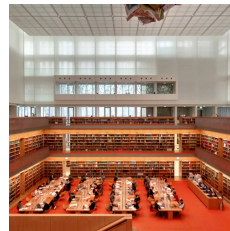
**Institute for
Sound and
Vision**

Neutelings Riedijk
Architects, 2006
Hilversum, NL

45 000 m²

- 800,000 hours of audiovisual productions

XXL



**Staatsbibliothek
Unter den
Linden**

Ernst von Ihne, 1661
BAL, 2019
Berlin, DE

107 000 m²

- 12 million inventory of books, newspapers and periodicals

RESEARCH METHOD AND APPROACH IN RELATION TO CP

It is crucial to grasp the trends in the reform of the library typology. This effort required a multidisciplinary approach, incorporating social, architectural, and technological perspectives. The research strategy involved analysing the program, client, and site. This acquired knowledge was then integrated to create a design that merges academic functions with exhibition and collection spaces, resulting in a dynamic intersection between knowledge production and public engagement.

CASE STUDIES

Curatorial design:

- Depot Boijmans van Beuningen, Rotterdam, NL
- Bouwcentrum, Rotterdam, NL
- Material ConneXion library, Bilbao, ES

Library as a workshop:

- Oodi Helsinki library, FI
- Dokk1, Aarhus, DK
- Turanga Central Library, Christchurch, NZ
- The Edge, State Library of Queensland, AU
- Halifax Central Library, Halifax, CA
- Urban Workshop, Costa Mesa, CA

Adaptive reuse:

- Bunker 599, RAAAF + Atelier Lyon, NL
- Kolumba Museum, Peter Zumthor, Cologne, DE
- Palais de Tokyo Expansion, Lacaton & Vassal, Paris, FR
- Gashouder Amsterdam, NL

LITERATURE

Brian Graham, "Heritage as Knowledge: Capital or Culture?," *Urban Studies* 39, no. 5-6 (May 2002): 1004.

Concrete Utopia: Everyday Life and Socialism in Berlin-Marzahn, Eli Rubin

Degen, Monica Montserrat and Rose, Gillian (2012). The sensory experiencing of urban design: the role of walking and perceptual memory. *Urban Studies*, 3269–3285.

Designing from Heritage: Strategies for Conservation and Conversion, Marieke Kuipers and Wessel de Jonge

Eugène-Emmanuel Viollet-le-Duc, "Restoration," from the *Dictionnaire raisonné de l'architecture française du XIe au XVIe siècle (1854-1868)*. English edition *On Restoration* (London, 1875), 9-17.

Katharina Schramm, "Heritage, Power and Ideology," in *The Palgrave Handbook of Contemporary Heritage Research*, ed. Emma Waterton and Steve Watson (Houndmills: Palgrave Macmillan, 2015), 445.

Marieke Kuipers and Wessel de Jonge, *Designing from Heritage: Strategies for Conservation and Conversion* (Delft: TU Delft - Heritage & Architecture, 2017), 87.

Nicholas Stanley Price, M. Kirby Talley Jr. and Alessandra Melucco Vaccaro, ed., *Historical and Philosophical Issues on the Conservation of Cultural Heritage* (Los Angeles: The Getty Conservation Institute, 1996), 308-321.

Nine Points on Monumentality, J. L. Sert, F. Léger, S. Giedion, 1943

Present Pasts: Urban Palimpsests and the Politics of Memory: Cultural Memory in the Present, Andreas Huyssen

Robert Twombly: Louis Kahn: Essential Texts. Paul Zucker's New Architecture and City Planning. A Symposium.

Walker J. (2022). *Berlin contemporary : architecture and politics after 1990*. Bloomsbury Visual Arts Bloomsbury Publishing.

The focus of the mass studies was the relation between the existing structure and the additional massing, the entrance, and the crowning of the building.

While some alterations were very visionary and breaking the boundary of the existing structure, the final design is respectful, polite and fitting. This has multiple reasons, one being the already eclectic character of the existing buildings on campus. The building needs to fit in the context of the campus and the existing gasholder without clashing with different styles. The simplicity and restraint

of a polite design create a striking contrast against the more complex and varied styles of surrounding buildings. This contrast can draw attention and highlight the unique qualities of the simpler structure. A simple design often embodies timeless architectural principles, allowing it to feel more enduring amidst rapidly changing trends. This can make it feel more relatable and accessible compared to more extravagant designs. It allows for a more contemplative atmosphere that invites engagement without overwhelming visitors with visual complexity.



ETHICAL ISSUES AND DILEMMAS

Preservation vs. Innovation

When designing a library in a historic context, designers face a significant ethical dilemma: how to balance the preservation of historical elements with the incorporation of modern designs and technologies. Preserving historical elements involves maintaining the architectural and cultural significance of the existing structure. On the other hand, integrating modern designs and technologies is essential to meet contemporary needs and expectations.

Accessibility vs. Security

The entrance of Material Vault was a big headache in the design process. It needs to be open and inviting, ensuring that the library is accessible. Nevertheless, libraries need secure environments to protect their collections while allowing users to access materials freely. This can involve designing spaces that deter theft and vandalism without making users feel restricted. The design should incorporate safety features like proper lighting, clear sightlines, and visible staff areas to create a welcoming atmosphere. This ensures users feel secure while browsing or studying. Balancing safety with accessibility means creating a warm and inviting environment that encourages users to explore the space and engage with the materials there.

Energy Efficiency vs. Technological Demands

As part of the material group, the library building was designed to meet high standards of material use, serving as a model for sustainable architecture. It incorporates a timber-based main construction with concrete structural cores for stability, as well as shading and water management systems to minimize the building's carbon footprint. However, the infrastructure required to support advanced technological systems often demands significant energy resources. Balancing the power and cooling requirements of high-performance computing systems with sustainability objectives has posed a challenge, necessitating innovative solutions to harmonize these competing needs.



