INVESTIGATING INDUSTRIAL HERITAGE
A case study with a focus on material culture and material practice

Juliëtte Zegers (4281683)
Chair of Heritage & Architecture, “Revitalising Heritage, Winterswijk”
Thesis “Timber Town: The transformation of an industrial ensemble in Winterswijk into an inclusive mixed-use area, built for and out of wood.”

I INTRODUCTION

"Question and answer is a fundamental issue that stand at the forefront of research activities in other disciplines but that is are all too often ignored in areas of creative practice."

- Biggs & Buchler, 2008[1]

As the quote above states, the use of question and answer in research is sometimes overlooked in creative practices like the architectural practice. Nevertheless, it is inevitable for research and can generously benefit both research and its outcomes.[2] So, it is important to start thinking about architecture and research as two aspects that are intertwined. Research in architecture is as multifaceted as architecture itself and should be structured by asking questions. It is important to ask the right questions and use an appropriate research method to ensure that the results are relevant and original.[3]

In his talk about heuristics, Jorge Mejía[4] explains how questions form the process of architectural design in a conceptual way. In the first place he distinguishes four different stages in the design process: research, design, technical aspects and presentation. All of these stages are guided by questions. As for research, the question is the purpose: the reason why you do something. For design, the question is the form: how you can shape something. Technical aspects embody the technique: how something should be made. Lastly, presentation: how you can communicate the design. All of these words 'why', 'how' etc., they embody the fact that research exists throughout the whole design process. This very much helped me to be more conscious about research and its relation to architectural design.

In order to conduct the research in the stages Mejía points out, particular research method(s) can be used. The Lecture Series on Research Methods focuses on methodology with the aim to learn students to consciously reflect on their design process and related research methods. Before this reflection can be done, it is important to understand the meaning of methodology. Clough and Nutbrown describe it as follows: "We suggest that, at its simplest, this distinction [between methods and methodology] can be seen in terms of *methods* as being some of the ingredients of research, while *methodology* provides the *reasons* for using a particular research 'recipe'."[5] This paper will focus on methodology and research methods within the research for my Graduation Studio: Heritage & Architecture (H&A), Winterswijk.

The first phase of the H&A studio consisted of multiple researches. In the first place the heritage project in Winterswijk was researched, based on a framework provided by the studio. The chosen project is an industrial ensemble which used to be a complex of textile factories, but now lays partly unused and deteriorated. An additional research was conducted to determine the new programme for the transformation of this ensemble. The chosen programme is mixed-use, with a focus on timber craftmanship. How to implement this into a former industrial ensemble was researched through a case study, where to goal was to look for a solution where transformation emphasizes the functionality of the building. With researching how functionality can be expressed and a building can be made readable, a focus on materiality and use of material is obvious. This paper will focus on the methodological approach of that research. For that reason, the guiding research question will be:

What research methodology helps to formulate conditions on making functionality visible through architecture, for the purpose of transforming an industrial building ensemble?

1 Michael Biggs and Daniela Buchler, "Eight criteria for practice-based research in the creative and cultural industries *Art, Design & Communication in Higher Education* 7, no.1 (2008): 7
2 Ibid, 5-18
3 Ray Lucas. *Research methods for Architecture*. (London: Laurence King Publishing Ltd., 2015), 21
4 Jorge Mejía, *Heuristics*. Lecture, Delft, September 19, 2019
5 Peter Clough and Cathy Nutbrown. *A Students Guide to Methodology*. (London: SAGE publications, 2012).

II RESEARCH-METHODOLOGICAL DISCUSSION

As for heritage architecture design, a project is not based on a future programme or by the artistic intuition of the designer. Instead it is inspired by cultural value, the social reality and the 'spirit of place'.[6] Consequently, preparatory research takes up a large portion within heritage design research. This consists of historic research and building surveys which shape the design starting points. Moreover, functional qualities belonging to the building typologies will have to be translated into a new function and brief. It is an example of the heritage related methodology which is called 'research-based design'.[7]

2.1 Winterswijk

"Industrial buildings often become obsolete because they were designed and constructed for a very specific purpose, technology or technological process, which means that it can be difficult to adjust them or re-tool them as technologies evolve"

- Michael Louw[8]

Functionality has always been key in designing industrial buildings, they were built for a very specific reason. Within researching the industrial ensemble of textile factories in Winterswijk, the analysis concluded that the main driver of the development and architectural appearance of the ensemble were the production process and contemporary technology.[9] Whenever former industrial buildings have become abandoned, adaptive reuse can be the way for heritage conservation and neighbourhood revitalization.[10] As for part of the industrial ensemble in Winterswijk, the function of a shared timber workshop and related programme had been determined by the data gained by the 'research-based-design' analysis as structured by the department of H&A combined with additional research on actualities of Winterswijk. Afterwards, a research had to be conducted on the topic of implementation of such a programme within the ensemble in Winterswijk. What is the relation between the new production process related to the timber workshop and the 'new' architecture of the building?

2.2 Approach

In the first place this research was done through a case study on Strijp-R (Productie van Piet Hein Eek) in Eindhoven, which is also an industrial transformation project with a timber workshop and related programme. This particular case study shows through materiality and tectonics the functionality of the building (a timber workshop) and therefore was a logical choice for investigation. Within adaptive reuse practice, "case studies can be used to create awareness of the inherent potential of former industrial buildings and serve as a record of contemporary adaptive reuse practice".[11] A case study researches a setting or phenomenon and therefore is of empirical nature. It can be a quantitative inquiry when for example theory on a specific case is researched, or qualitative when the approach of observing the phenomenon is abducted.[12] The approach of the research described in this paper is of qualitative nature, where the case study was done by observing the particular buildings and their properties. This investigation of the structures itself and their relation to 'production process' was done with a focus on the methodological approach of material culture and material practices.

2.3 Material culture and material practice

Eireen Schreurs explained in her lecture about material culture: "The study of material culture centres upon objects, their properties, and the materials that they are made of, and the ways in which these material facets are central to an understanding of culture and social relations."[13] It is logical to engage

6 Paul Meurs, *Heritage-based design* (Delft: TU Delft – Heritage & Architecture, 2016), 33
7 Marieke Kuipers and Wessel de Jonge. *Designing from Heritage: Strategies for Conservation and Conversion (*Delft: TU Delft – Heritage & Architecture, 2016), 27
8 Michael Louw. *Industrial Heritage Protection and Redevelopment*. (Australia: The Image Publishing Group, 2018), 5
9 Joost Joosse, Juliëtte Zegers and Chen Zhu. *Analysis report Heritage & Architecture.* (2019)
10 Liliane Wong. *Adaptive reuse: extending the lives of buildings.* (Basel: Birkhäuser, 2017), 13
11 Michael Louw. *Industrial Heritage Protection and Redevelopment*. (Australia: The Image Publishing Group Pty Ltd, 2018), 4
12 Linda Groat and David Wang. *Architectural Research Methods* (New Jersey: John Wiley & Sons, Inc., 2013), 418-419
13 Eireen Schreurs. *Material culture*. Lecture, Delft, October 24, 2019

this with architecture, since architecture is one of the most relevant ways of social enquiry.[14] This made me realize the relation between (object) materials, their meaning and reasoning. To be more precise, as for the reuse of industrial heritage this is highly evident, where the structures and their materials tell the story of their purpose and (former) use and where the existing material fabric has to be redesigned.

2.4 Research at Strijp-R

As explained before, the industrial processes highly influenced the architecture of industrial heritage buildings. For this in particular the structure, façades, positioning of architectural elements and their materials play a significant role in carrying out the culture of industry and its processes. With transforming these buildings, the function of the buildings can change. Thus, it is important to again research the relation between a proposed function and adjusted structure/façade/elements/materials. For that reason, the focus was on the investigation of the timber workshop in Eindhoven in order to find ways to treat the structure, façades and materials according to the new 'production process' of timber manufacturing and related functions in the building ensemble of Winterswijk. Also, the positioning of architectural elements and their properties was researched, since they are the result of a certain use of the building. The plan (configuration) tells a lot about the production process and plays a big role in the shape of the building. The research was done through a site visit case study and the heuristic technique of on-site observing and sketching and comparing these sketches to the Winterswijk factory situation. The following page shows these sketches and findings.

[14] Ray Lucas. *Research methods for Architecture*. (London: Laurence King Publishing Ltd., 2015), 103

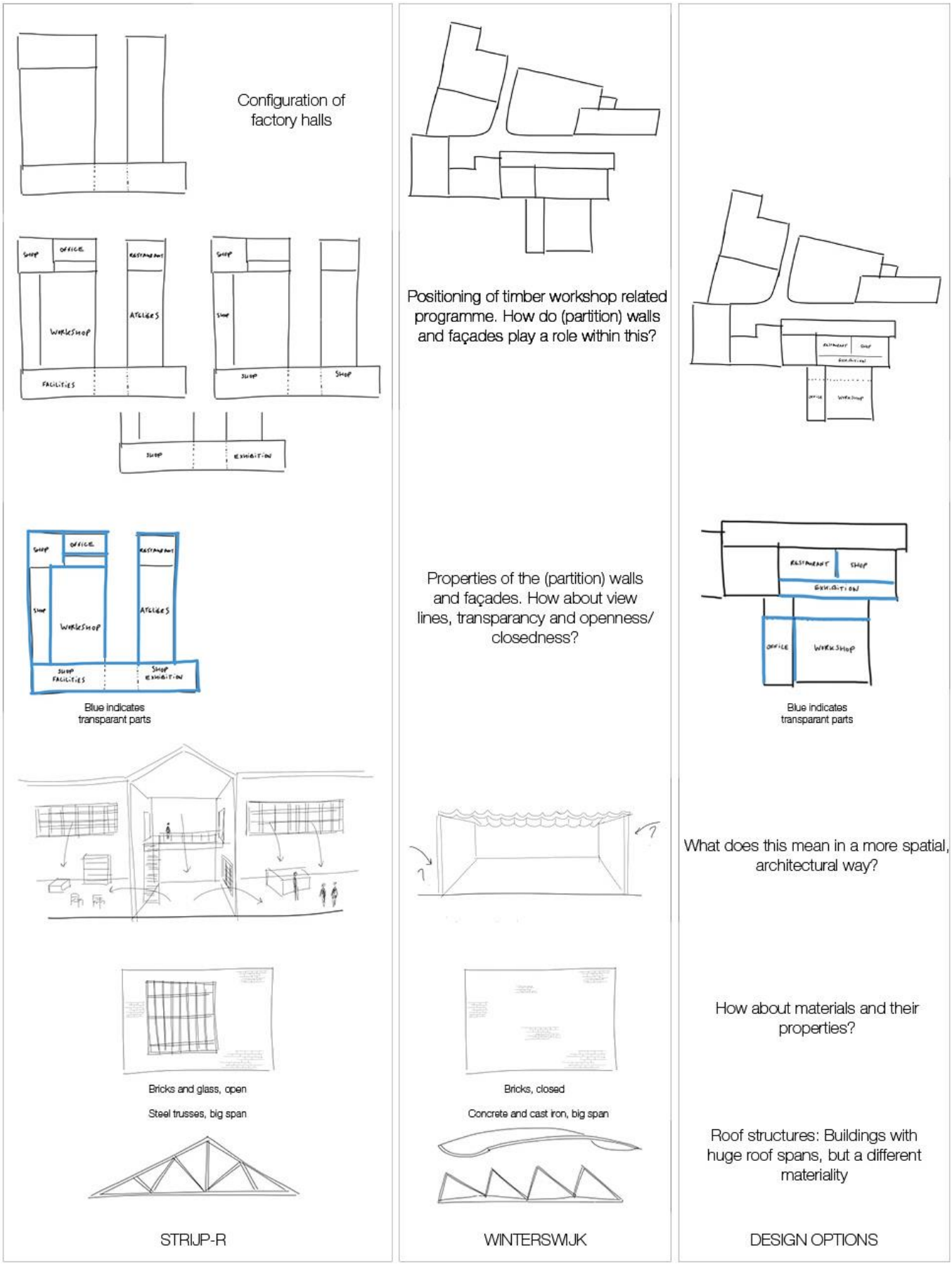

Figure 2.1 On-site case study sketches and comparative sketches (Own images)

III RESEARCH-METHODOLOGICAL REFLECTION

3.1 Gottfried Semper, material culture and material practice

One of the most important German architects of the 19th Century was Gottfried Semper. He elaborated on tectonics and the relation between architecture, structures, function and materials and their properties in his work: 'Der Stil in den technischen und tektonischen Kunsten'. The book brought forward the practical aesthetics of architecture and the notion of style. He stressed that not history of style, but technical development should be central to the design. With this the structure is elementary and determines with the properties of the materials the shape of the architecture.[15] In 1851, Semper saw the primitive Caribbean hut at an exhibition which took place in the Crystal Palace in London. From this he derived four stages of building: "first, marking the ground and constructing the foundation; second, making the hearth; third, erecting the structural frame; and fourth, cladding the frame with a woven fabric to enclose the walls and roof."[16] His phenomenological observations on this particular case study explain about the role of the skin, the structure and the relation with stuff inside the structure and that this is all closely related to nature. Architecture is achieved by the function of the building; the shape is a result of structure and material. The maker is subordinate to a higher, universal order which is always and everywhere the same and is translated through the norms and values of contemporary times and with this is turned into a suitable shape.[17]

3.2 Louis Sullivan and Frank Lloyd Wright

Around 1900, both the architects Louis Sullivan and Frank Lloyd Wright elaborated on the thoughts of Semper, where they oppose the way architecture was presented through the education of the Beaux-Arts. Here architects were given free design choices based on precedents and their own imagination, leaving the materials of which the architecture is made completely out of designing.[18] Louis Sullivan introduced 'Form follows function'. The façades of his designs inform on the processes inside the building. So, what is happening inside, is also visible from his architecture, where for example the lowest floors of his skyscrapers and the top floor had a different architectural appearance then the office floors in between.[19]

3.3 Reflection on the approaches

Research within (industrial) heritage design predominantly takes on a typological approach, as mentioned in II. In 'The Nizhny Tagil Charter for the industrial heritage', the TICCIH (world organization representing industrial heritage) and ICOMOS elaborate more on this: "Surveys of areas and of different industrial typologies should identify the extent of the industrial heritage". They mention multiple methods to record as photographs, video film, drawings, descriptions and peoples' memories.[20] Indeed, as for my own research on the Winterswijk factory this type of research was obtained in order to get grip on the situation of the factories and together with additional research on the actualities of Winterswijk a suitable brief could be determined. But, how about further research on finished adaptive re-use projects in order to define architectural design starting points?

Case studies are often only used to research finished industrial heritage projects as form of inspiration and in a more descriptive way with accompanying photos of projects and their outcome. In the case of Winterswijk, industrial heritage with a similar adaptive re-use programme was chosen as subject of research in order to provide more insight in how to treat the structures and façades within a new design in relation to a new function. Semper approached the primitive hut as a case study where he sketched the four principles of architecture and derived his own architectural idea on skin, structure, stuff etc., where for me in particular these last two principles 'structure' and 'cladding' are of interest. It gave me

15 Gottfried Semper. *Style in the technical and tectonic arts*. (Los Angeles: Getty Research Institute, 2004)
16 Robert McCarter. *Frank Lloyd Wright.* (London: Reaktion Books Ltd., 2006)
17 Gottfried Semper. *Style in the technical and tectonic arts*. (Los Angeles: Getty Research Institute, 2004)
18 Robert McCarter. *Frank Lloyd Wright.* (London: Reaktion Books Ltd., 2006)
19 Richard Nickel and Aaron Siskind. *The complete architecture of Adler & Sullivan*. (Illinois: Richard Nickel Committee, 2010)
20 ICOMOS. The Nizhny Tagil Charter for the industrial heritage. (2003)

insight on the properties of cladding in the Strijp-R project and also made me think of new possibilities where technologies of my time can be an inspiration for creating structure and façade (interventions). ‘Form follows function’ as Sullivan put forward is becoming an interesting topic when a structure is already there, regarding heritage architecture. Although it still is important to pay attention to facilitating the processes happening inside the building and to adapt the building to this, especially in the case of designing a timber workshop and related programme. A focus on material culture and materiality for this reason can be a good approach, and as learned from this paper: it is about the synergy between functionality and materials.

IV POSITIONING

As explained in part II, usually the brief and new function of transformation projects have not been set beforehand but are guided by characteristics of heritage (buildings), where typological research comes in place. However, recently also a different trend is noticeable. Whereas Paul Meurs stresses that on the one hand a big part of heritage transformation is based on cultural value, the social reality and the ‘spirit of place’ as explained before,[21] he also writes: “In the case of transformation and redevelopment, the design sometimes hardly matters anymore, because the development is focused on the initiative, the social arrangement (grouping of users), the programmatic design (co-existence and synergy), the technique (construction, installations and sustainability), finances (viability) and process design (get a grip on the complex regulations and the need for phasing).”[22] These different scopes and focus points for adaptive reuse can blur the focus and therefore deny to attach a suitable brief and architectural implementation to a heritage building structure itself, because it denies its actual potential.

As Liliane Wong also explains, evidently those different scopes come with certain consequences. She writes about subconscious dislocated interventions within heritage architecture and that it can be “a product of economics that does not necessarily account for architectural principles and can easily fall prey to an incompatibility between the existing and the new”: the ‘Frankenstein-syndrom’.[23] For me this stresses even more the need to look at the intrinsic qualities of (industrial) heritage buildings and their original function and implications on the built structures, where afterwards a research focus on material culture and practice could enrich the transformation of the buildings. In this way ‘Frankenstein’ solutions in adaptive reuse architecture can be avoided.

What also opened up my eyes was Semper’s theory on tectonics and materials and a piece by Katie Lloyd Thomas on architecture and the material practice. She explains how the general vision on architecture is led by the conceptual (form), instead of focusing on material and its properties. She stresses that this focus is remarkable since it is the materials that have intrinsic value. Within these materials lays a certain history of development, technology, transportation etc. Multiple actors have contributed to the materials and the product.[24] So, as for my own design within the heritage architecture studio, I would like to adopt this approach. With adding a new layer of time (which can be an approach in heritage architecture) it is interesting to work with a material which is ultimately linked to our time and recent shifts in the field of architecture, for example cross laminated timber elements for (partition) walls, façades and other architectural elements and make this the dominant factor for the architectural expression.

To conclude this paper, I would like to get back to the posed research question:

What research methodology helps to formulate conditions on making functionality visible through architecture, for the purpose of transforming an industrial building ensemble?

21 Paul Meurs. *Heritage-based design* (Delft: TU Delft – Heritage & Architecture, 2016), 33
22 Ibid, 29
23 Liliane Wong. *Adaptive reuse: extending the lives of buildings.* (Basel: Birkhäuser, 2017), 13
24 Katie Lloyd Thomas. *Material Matters* (Abingdon: Routledge, 2007), 2

It appears to be important to be conscious about what methodology and methods to choose for a certain desired research (outcome). A focus on material culture and practice appeared to be fruitful for me, because the research focus on structure, its properties and materiality within the Strijp-R case study provided insights in the architectural transformation of industrial heritage and provided the data which could be turned into design starting points for my own project. Especially because within industrial heritage, historically the production process has been driving the shape and materiality of the building. Similarly, as for the case of the Winterswijk research, the processes of production of the timber workshop and related programme can be addressed well when researching design options with a focus on material culture and practice.

As for future heritage projects I will always have to pay close attention to material culture and practices of the certain project in addition to the typological research, to find architectural re-use intervention options. This should be done with respect to the building, its properties, its materiality and its former connected function, but at the same time transform the building into a new design which reminds of the past but also is ready for the future.

V BIBLIOGRAPHY

Biggs, Michael and Diana Buchler. “Eight criteria for practice-based research in the creative and cultural industries” *Art, Design & Communication in Higher Education* 7, no.1 (2008)

Clough, Peter and Cathy Nutbrown. *A Students Guide to Methodology.* London: SAGE publications, 2012

Collis, Jill and Roger Husse. *Business Research: A Practical Guide for Undergraduate and Postgraduate Students.* Hampshire: Palgrave Macmillan, 2014

Groat, Linda and David Wang. *Architectural Research Methods*. New Jersey: John Wiley & Sons, Inc., 2013

ICOMOS. “The Nizhmy Tagil Charter for the industrial heritage*”.* (2003)

Joosse, Joost, Juliëtte Zegers and Chen Zhu. *Analysis report Heritage & Architecture*. 2019

Kuipers, Marieke and Wessel de Jonge. *Designing from Heritage: Strategies for Conservation and Conversion.* Delft: Heritage & Architectcure, 2016

Louw, Michael. *Industrial Heritage Protection and Redevelopment.* Australia: The Image Publishing Group, 2018

Lucas, Ray. *Research methods for Architecture*. London: Laurence King Publishing Ltd., 2015

McCarter, Robert. *Frank Lloyd Wright.* London: Reaktion Books Ltd., 2006

Mejía, Jorge. “Heuristics” Lecture, Delft, September 19, 2019

Meurs, Paul. *Heritage-based design*. Delft: TU Delft – Heritage & Architecture, 2016

Nickel, Richard and Aaron Siskind. *The complete architecture of Adler & Sullivan.* Illinois: Richard Nickel Committee, 2010

Schreurs, Eireen. “Material culture” Lecture, Delft, October 24, 2019

Semper, Gottfried. *Style in the technical and tectonic arts*. Los Angeles: Getty Research Institute, 2004

Thomas, Katie Lloyd. *Material Matters.* Abingdon: Routledge, 2007

Wong, Liliane. *Adaptive reuse: extending the lives of buildings.* Basel: Birkhäuser, 2017