

Graduation Plan

Master of Science Architecture, Urbanism & Building Sciences



Graduation Plan: All tracks

Submit your Graduation Plan to the Board of Examiners (Examencommissie-BK@tudelft.nl), Mentors and Delegate of the Board of Examiners one week before P2 at the latest.

The graduation plan consists of at least the following data/segments:

Personal information		
Name	Daphne Willemijn Fahrner	
Student number	4478002	

Studio		
Name / Theme	Heritage & Architecture: Adapting 20 th century heritage Vacant Police Real Estate	
Main mentor	Joana Dos Santos Gonçalves	Architecture mentor
Second mentor	Frank Koopman	Building technology mentor
Third mentor	Wido Quist	Research mentor
Argumentation of choice of the studio	<p>After finishing my bachelor at the faculty of Industrial Design Engineering, including some minor courses at the Erasmus University of Rotterdam in Psychology, I started the (pre-)master Architecture. The reason for this switch was the fact that during the last couple of years I had found out that I am definitely more passionate about cultural heritage than about household products. As a result, I became eager to learn about architecture, and heritage in particular. In the beginning, especially old temples, churches and monasteries caught my attention. But many other beautiful buildings have aroused my interest as well. Generally, it is my opinion that quite old architectural objects are more appealing than most of the newer and/or contemporary designs. One of the main reasons is the fact that heritage buildings tend to have a higher level of detail and craftsmanship. As an example, I like to think of buildings that use a specific brick bond in combination with, for example, natural stones or some kind of ornamentation.</p> <p>In order to work with heritage and to research the possibilities of re-designing vacant buildings, I chose the Adapting 20th century heritage studio about Vacant Police Real Estate. In addition, I chose the Touch and Feel research line to learn more about the material attributes en the subsequent perception.</p>	

Graduation project	
Title of the graduation project	Defining and designing the borders of the in-between space of the Rotterdam Harbour Police Station.
Goal	
Location:	Harbour Police Station, at Sint-Jobsweg 6 in Rotterdam.
The posed problem,	<p>Some spaces in and around buildings are difficult to define, since they symbolize the edge and intercommunication between two opposites. These spaces are called <i>in-between spaces</i> and represent a continuous shift between access and disclosure, inside and outside, private and public, or building and space (Can & Heath, 2016). The differentiation in such situations is defined by human perception (Shahlaei & Mohajeri, 2015). Namely, people tend to have the same attitude towards several similar situations, as a result of previous experiences and habits (Kahneman & Tversky, 1974). Thus, since the human perception is linked to associations, it will influence the assumption of its function and consequent use. Furthermore, the sum of sensorial, physical, and material properties are essential for the observation and experience of the built environment (Canepa et al., 2019). Among other things, the materiality includes colour, texture, pattern, temperature, weathering et cetera. Since these material properties affect how people observe and interpret a building, variety in these attributes lead to different perceptions. Subsequently, the materiality turns out to be an important factor to fit the perceived image of a building to its functional character.</p> <p>At this moment, the in-between spaces of the three buildings of the Rotterdam Harbour Police station are in particular defined by fences, because the police needs a safe and secure environment. The materialization thus refers to the current function and usage of the buildings. In line with this, Venturi (1977) points out this common desire for continuity between exterior appearance and interior function by stating that "the inside should be expressed on the outside" (p. 70). As the building of the Harbour Police no longer fits its current function, the buildings should be redesigned. As mentioned before, the in-between space forms a threshold between the space and the building, and the materialization of this space is responsible for evoking a feeling of either access or disclosure. Despite the fact that there are multiple literature studies on the in-between space, there is lack of information about the human perception and the material attributes that reflect either a gradual transition (and connection) or a hard boundary. Therefore, it will be valuable to research this relation and take into account the perception of the materiality of the borders of the in-between spaces in order to accommodate future usage.</p>

research questions and	<p>In this Graduation Project, the main question that will be researched is: "What is the influence of the materiality on the perception of the in-between spaces of the Rotterdam Harbour Police Station and how can this be used as input for the redesign?"</p> <p>To structure this research and to be able to find an answer to this question, some subquestions need to be studied first. These questions are devoted to the topics of materials and details, the in-between space and the relation between the materiality and its functions. They include the following:</p> <ul style="list-style-type: none"> - What materials and details were used in the design of the Rotterdam Harbour Police station? - How can the borders of the in-between spaces be defined? - What is the relation between the materiality of the Rotterdam Harbour Police station and its functions? - How can the borders of the in-between space of the Rotterdam Harbour Police station be redesigned in order to fit the future usage?
design assignment in which these result.	<p>The Harbour Police Station is divided into three separate and distinct buildings, which have their own entrances as well as shared transition zones. Therefore, the in-between spaces play an important part in the design and the human perception of the buildings. The design assignment involves the redesign of the entire Rotterdam Harbour Police Station. At first, the research is focussed on learning about the used materials and the detailing. These material attributes will be explored in relation to the atmospheres that it creates. In addition, the borders of the in-between space will be defined. This include research into the original design as well as into the current building block, since the police expanded over the years. Thereafter, the aim is to define possible redesign solutions that fit the new function, based on the human perception of the materiality of this border. In this phase, different designs will be tested on the basis of interviews in regard to the level of access and disclosure that is perceived.</p>

Process

Method description

The research consists of a combination of methods. First of all, an archival research at the Stadsarchief Rotterdam is done. Here, the original drawings, indexes and pictures are analysed to define the used materials and techniques. In order to support this, personal field observations of the building are used to validate these findings in relation to the current state. In addition, literature is found on Scopus and in the TU Delft library to build on to the findings and to provide more in-depth information about the questions relating to where, by whom and how the materials and details were used. As an example, the book *Conservation of Brick* provided extra information in regard to the evolution of brick, the manufacturing and

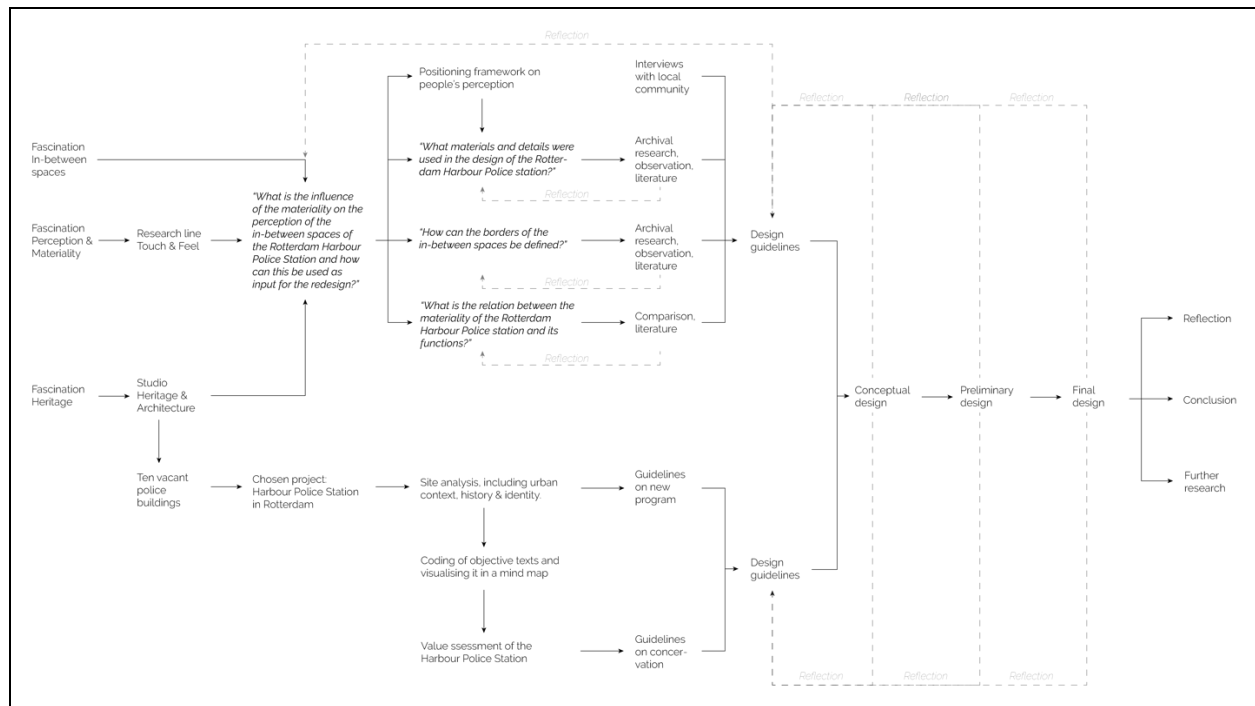
possible ways of protection and repair. On a larger scale, Hegger et al. (2020) divided materials into groups with similar characteristics and technical properties. As well as in the book of Mulder (2016), the pattern of joints and the contribution to the rhythm of the building is highlighted. The research of Chan (2012) is in line with these notions. According to him, the rhythm can be defined by the harmonious pattern or sequence of two alternating elements. The main takeaways of these literature studies are used to ensure that these perception-related aspects are emphasized in the analysis of the materiality of the Rotterdam Harbour Police Station.

Subsequently, theoretical research exemplified the notions of the public, private and in-between spaces. This is based on the theory of Van Eyck (1959), but also the more recent work of Blaisse (2009; 2016) and Jürgehake (2016) are taken into account to describe their meaning. Furthermore, archival research provided insight in the original drawings, which are mapped. This means that they are reduced into a more comprehensible and useful drawing. In addition, personal field observations were used to fill the gaps and see whether or not things have changed over time. Additionally, a combination of the mapped original drawings and own observations are used to analyze the building. As a result, the borders of the in-between space are defined.

Subsequently, the materiality is analysed on the basis of its functions. Concerning these functions, a distinction is made between the absolute and figurative functions. The current absolute functions of the buildings of the Rotterdam Harbour Police Station are defined on the basis of the Dutch *Bouwbesluit 2012* (Stb. 2021, 146). They include cell functions, office functions and other usage functions. Furthermore, the public, private and in-between spaces are treated as figurative functions. As a result, the relation between the functions and the materiality are compared and analysed. This means that the outcomes of the first subquestion (i.e. the materiality) are placed next to the conclusion of the second subquestion (i.e. the private, public and in-between spaces), as well as to the absolute functions. As a result, it is examined whether there is a correlation between the materiality and functions.

To be able to answer the main research question, the results of the subquestions are brought together. The human perception of the in-between spaces of the Rotterdam Harbour Police Station is therefore analyzed. Moreover, this is where the perception of the local community comes into play through qualitative research. An interview is set up and - in order to succeed - the bridge next to the police buildings is used as a location to address people. Namely, when the bridge is open, people have to wait for a few minutes and take the time to look at the buildings. During the time that the bridge is open, they are able to answer questions related to their perception of the in-between spaces. After all, the interviews are combined and lead to answers on the influence of the materiality on the perception of the in-between spaces of the Rotterdam Harbour Police Station. To conclude, this information can be used to create a coherent redesign that connects to the desired image of the future-use of the building. This is also shown in the integrated research and design scheme on the next page.

More in-depth, the answers of the individual questions will be put together into design solutions. In this case study, the future function of the building block is more publicly oriented than the currently fenced Harbour Police Station. So, the material attributes that are likely to influence the human perception need to be incorporated in such a way that they evoke a feeling of access and invitation rather than obstruction. Subsequently, the created atmosphere of different design solutions are validated by interviews within the research. As a conclusion, the research and design processes are integrated and they enhance each other by testing the outcomes of the other discipline.



Process

Literature and general practical preference

Materiality related references

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Reflection

Within the field of Architecture, heritage plays an important role in the wider social framework. Namely, the (Dutch) housing shortage is larger than ever. One of the reason is the increasing world population. Furthermore, there is a trend visible where people tend to live in smaller households than before. And to make matters worse, contractors are struggling with legislation and regulations that slow down construction processes. Therefore, the housing shortage will not decrease in the near future. On the contrary, the emerging trend of digitalization and flexible working means that large offices are less needed. This results in vacant office buildings. In the Architecture graduation studio of Adapting 20th Century Heritage, the emphasis is on the adaptation of vacant police office buildings.

In my personal graduation project I am focusing on the borders of the in-between space of the Rotterdam Harbour Police Station. The research focuses on the perception on materiality in vacant police stations in order to create input for future adaptive reuse. It is about giving a new function - and thus a new life - to buildings that no longer fit their current function. Currently, the user is often overlooked in this field of architecture, while the same user actually should be the one to be attracted to the building. Therefore, the research seeks to connect the human perception of the in-between space to the functional character. In other words, this research investigates how the redesign is able to accommodate the new function and it looks for (im)possibilities in regard to the used materials and details.

Moreover, the research forms an addition to the general architectural and technical analysis. It contributes to the broader perception on materiality, since it takes the psychological aspect into account - while the user tends to be structurally overlooked in the field of architecture. So in the end, the aim of this research is to connect the field of architecture and psychology into design possibilities, where the users and passersby play an important part. To conclude, it is my aim to define and design the borders of the in-between space in such a way that they fit their new usage.

