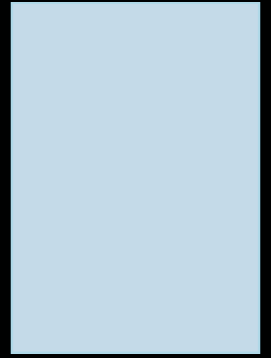


The transparent border as a continuous relation between inside and outside

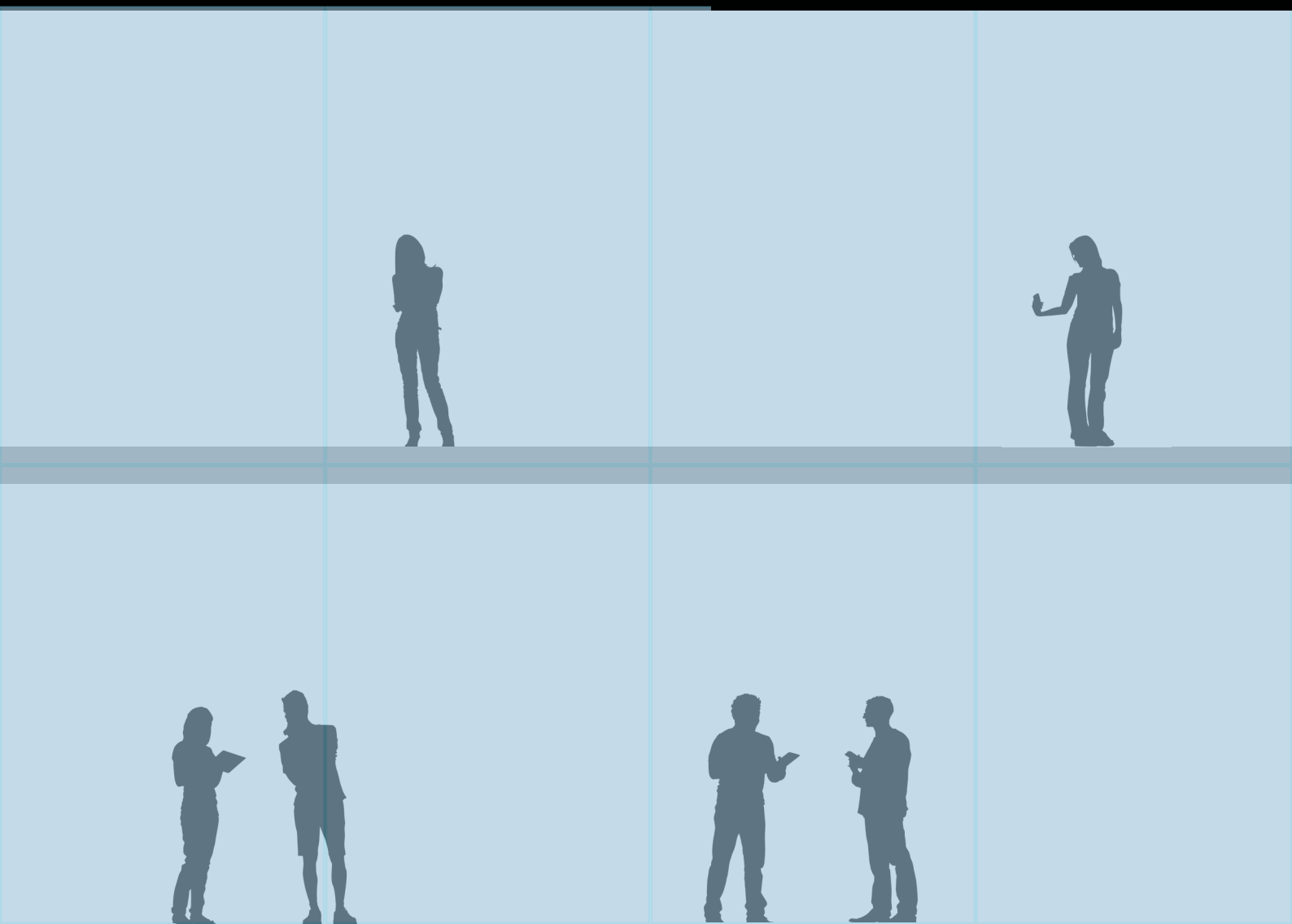
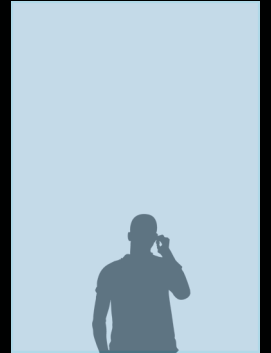


MSc 3: graduation studio Heritage & Architecture:
MSc Architecture, Urbanism and Building Sciences
Delft University of Technology

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29-11-2021



Preface

The Dutch Police currently have 700.000 square meters of real estate in their portfolio from which 30% is selected to be redeveloped in the future (Meijers et al., 2021). As part of my master graduation, I will explore a scenario for the redevelopment of one building that is currently part of the real estate portfolio of the Dutch Police within the graduation studio of Heritage and Architecture: vacant heritage | Politie Bouwmeester. The vacant heritage studio focusses on the revitalisation of heritage as a sustainable approach for dealing with vacant buildings. The real estate portfolio of the Dutch Police consists of a range of buildings that differ in age, style, typology, the original function and context. Because of these differences, they cannot be generally approached as police buildings. Various values are imbedded within each individual building which will largely

impact the redevelopment potential of these buildings.

Within the studio, a selection of ten police buildings was made. In the graduation studio, I chose to specifically research and redesign the Koudenhorn police station in Haarlem (Figure 1) which was originally constructed as a deacon house in 1769 (Roos, 2005). My choice for this particular building originated from my personal fascination with renaissance and neoclassical architecture and the courtyard typology. This neoclassical aesthetic can still be observed in the facades of the building. However the interior was completely altered during the transformation into a police station during the 1970s and a new concrete volume was connected to the original building (Figure 2).



Figure 1: Koudenhorn 2, Haarlem, Own Image

I chose to conduct my research within the touch and feel line of the vacant heritage studio. This research and design line specifically focusses on the values of material attributes and the perception of materiality (Meijers et al., 2021). Over the last couple of years I started to explore the use and effect of glass spaces within my designs. I became fascinated with unmaterialised and transparent border spaces since I often perceived them as both an inside and outside space. Especially within the courtyard typology, I noticed that courtyard spaces were often transformed from a pure outdoor space to an indoor space by creating glass roof or glass greenhouse structure in order to accommodate new functions without compromising the character of the outdoor space. During the Vacant heritage graduation studio, I will further explore the effect of glass providing a physical border between inside and outside on the one hand, and on the other hand a seemingly uninterrupted visual connection.

Introduction

Donald Appleyard (1970) states that a space can be perceived from an operational, a responsive and an inferential perspective. It is this inferential perspective that allows us to identify an object when seeing it for the first time and from this perception we will identify the building in relation to a function or a social pattern.

At the same time one space cannot be defined or identified on its own but is always part of a spatial configuration (Hillier, 2007). This notion of spatial configuration, which is referred to as space syntax, describes the relation between outdoor to outdoor spaces, outdoor to indoor spaces, and indoor to indoor spaces. Regarding a building object, one could argue that the inferential perception of the outdoor space as described by Appleyard (1970) might not resonate with the perception of the indoor space when the relation between indoor and outdoor spaces is not apparent.

When the borders of a space consist



Figure 2: 1970s addition, Own Image captured with Apple maps

of a transparent glass surface, the border is physically there, but psychologically it can be perceived as being not there as one can freely observe what is happening on the other side of the surface (Marquardt et al., 2015). Hence glass can be seen as a physical border between indoor and outdoor, while it is at the same time not psychologically perceived as such.

Both the relation between indoor, outdoor and transition spaces and the perception of glass as a transparent material have been widely researched. The relation of the ambiguity of the perception on glass and the transition between indoor and outdoor spaces is however a topic that is left mostly untouched.

In the case of the Koudenhorn police station, the exterior will be perceived as a neoclassical building form the 18th century. However, after visiting the interior of the building and looking at the archival and present day drawings (image 3 & 4), the interior resonates with that of the 1970s transformation to a

police building, rather than that of an 18th century deacon house. Without taking into account if this is intentional, positive or negative, it becomes apparent that there is a dichotomy between the external and internal perception of the building. Considering that the Koudenhorn building is once more selected for redevelopment, this dichotomy will have to be reviewed to weigh whether it suits future use(s). Subsequently, it is valuable to study how this contrast could be altered or mitigated by applying specific materials. During my graduation, I will focus on transparent materials such as glass as a border material.

Research questions

Using the value assessment framework of Ana Pereira Roders and Loes Veldpaus (2014), it was analysed that the character of the building was predominantly defined by the neoclassical aesthetic, which can be seen in the order and the ornamentation in the façade, and the

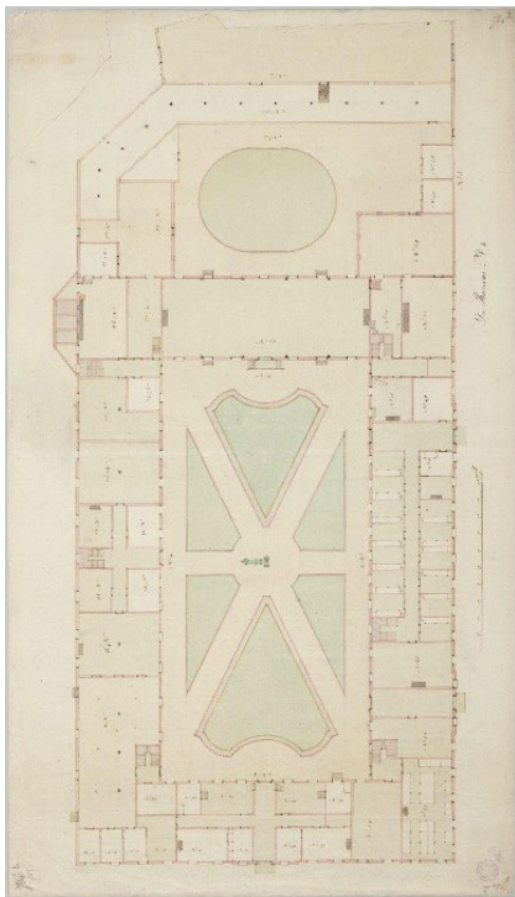


Figure 3: Koudenhorn ground floor plan 1768, Noord Hollands Archief (1768)

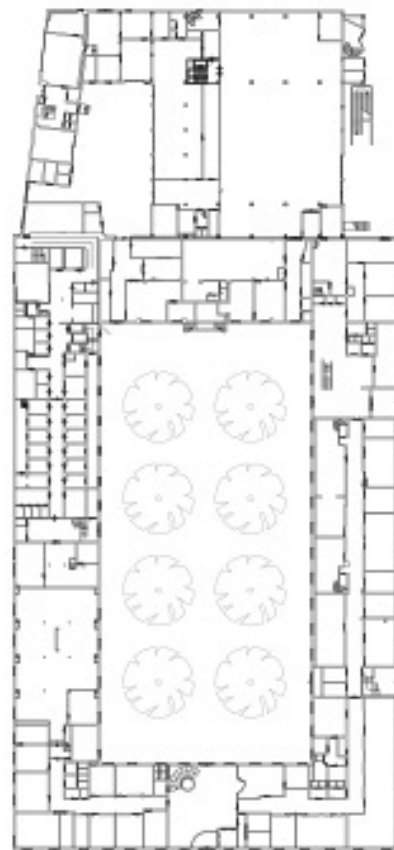


Figure 4: Koudenhorn ground floor Current situation, Noord Hollands Archief (1971)

connection to the historic city centre of Haarlem. As mentioned before, the Koudenhorn building underwent a complete transformation into a police building during the 1970s which discarded the original interior to suit the needs of a police building. This resulted in a duality between the perception of the exterior. It could be argued that the main valued character of the building is largely determined by the exterior of the building and its relation to outdoor spaces and that therefore, the relation between the indoor and outdoor spaces is devoid.

The aim of these research is to focus on the relation of indoor and outdoor spaces within the Koudenhorn building by looking at the principle of space syntax. Following the duality that transparent glass can be perceived as material that can form a border for space that is both there and not there at the same time, it is further researched how glass can influence the relation of indoor and outdoor spaces. This research will therefore revolve around the following research question:

How can the use of glass in the redesign of the Koudenhorn police station help to establish a symbiotic transition between indoor and outdoor spaces?

In order to acquire an answer for this main research question, the research is structured by following four sub questions:

- *What is the current relation between indoor and outdoor spaces in the Koudenhorn police station?*
- *What applications of glass within building spaces exist?*
- *How do these applications influence both the users and visitors perception of a space?*
- *What effect do these glass applications have on the spatial relation between indoor and outdoor spaces?*

The introduction and research questions introduce several concepts. Some of these concepts need to be specified because they are ambiguous. Others are

Theoretic framework

unambiguous but need to be further explained since only specific elements of the concept are discussed in the research. These concepts are: The differences between indoor, outdoor and transition spaces, The concept of space syntax, the perception of transparent materials and transparency as a material property.

The aim to improve the transition between indoor and outdoor spaces implies that there is a difference between the manifestation and the perception of indoor and outdoor spaces. Kray et al. (2013) divided the main differences between indoor and outdoor space in the criteria of: scale, dimensionality and wayfinding. Indoor spaces are mostly associated with the building scale while outdoor spaces can be associated to both the urban and the geographical scale. Outdoor spaces are therefore considered to be marginally larger than indoor spaces. While outdoor spaces are considerably larger, Kray et al. argue that indoor spaces more often physically operate on a three dimensional level rather than solely on a two dimensional level. This can be illustrated by looking at floor plans. Buildings often consist of multiple floor plans and can therefore be perceived from different altitudes while outdoor space is generally perceived from the ground level. This three dimensionality in indoor spaces by the division in floors combined with the two dimensional division of spaces within indoor environments results in a difference in wayfinding between indoor and outdoor spaces. Within indoor spaces views are limited and movement is restricted while in outdoor spaces people can freely move around and wayfinding relies more on identifying landmarks. According to Kray et al., transition spaces share similarities with both indoor and outdoor spaces which can confuse the user of these spaces since the clear distinguishment between inside and outside is no longer present within these spaces. This classification of indoor and outdoor will help assess the Koudenhorn

building's spatial properties of the interior, the exterior and the exterior courtyard.

The notions of indoor and outdoor space or space in general, are still defined by looking at tangible aspects. Bill Hillier (2007) acknowledges that space can be defined by looking at the dimensions of height, length and width. However, he argues that space is not an independent object on its own. The way the tangible dimensions of space are determined depends on the function the space accommodates, it depends on objects that are placed within and on the human perception of space. Hillier (2007) illustrates this in the following way: "Human behaviour does not simply happen in space. It has its own spatial forms. Encountering, congregating, avoiding, interacting, dwelling, teaching, eating, conferring are not just activities that happen in space. In themselves they constitute spatial patterns." These patterns are not confined by one space but largely depend on the configuration of spaces in relation to permeability which can be defined as space syntax. The way this configuration defines spatial pattern can be seen in illustration 1. While the proportion of spaces is the same for example a, b and c, the configuration differs and can therefore influence the way the building functions and is perceived. Hillier's space syntax framework will provide a better understanding of the configuration of- and relation between indoor and outdoor spaces within the Koudenhorn building.

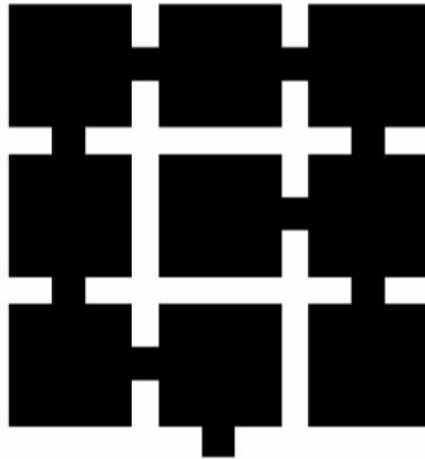
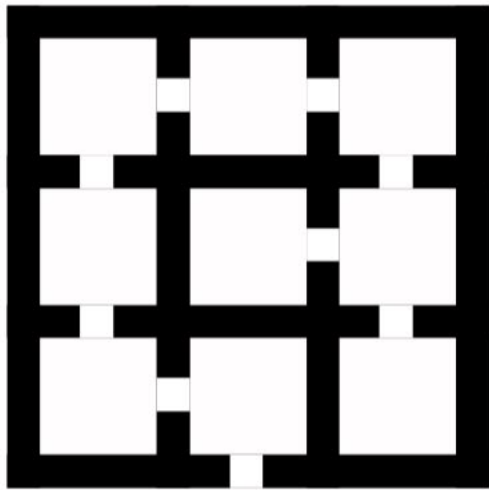
Within Hillier's space syntax framework, space is still formed by clear borders and spatial configuration and permeability is made possible by creating connections – more specifically openings – between these spaces. Where these borders clearly obstruct visibility, the openings allow for visibility which in turn affects the frequency of use as was shown in illustration 2.

Marquardt et al. (2015) argue that glass can form such a physical border as it can obstruct permeability but at the same

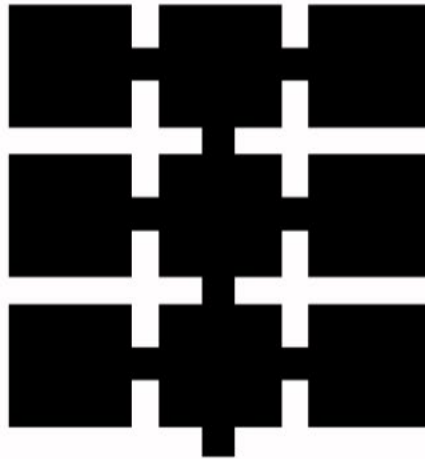
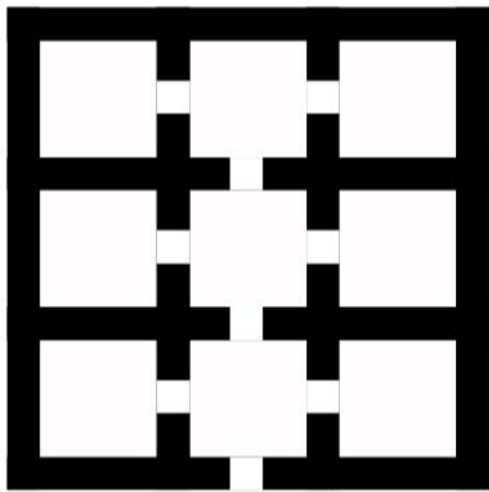
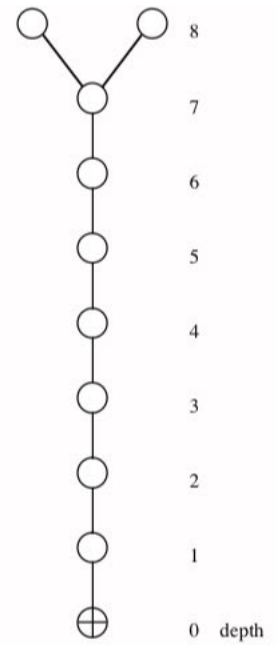
time is not necessarily a psychological border due to its transparent properties which allow a visual connection between spaces. Glass can therefore be perceived as a border that is both "there and not there" at the same time. They further elaborate this by discussing how an activity that takes place in one space can trigger an effect when it is perceived from another space. But even non-physical contact can be perceived as physical contact according to Marquardt et al. (2015). When two individuals both position their hands on opposite sides of a glass surface, they can still perceive this as if they were touching each other while this is in fact not the case.

The theory of Marquardt et al. and the practice of Hillier and Tzortzi will further aid in investigating the influence of glass as a transparent material on the relation of spaces.

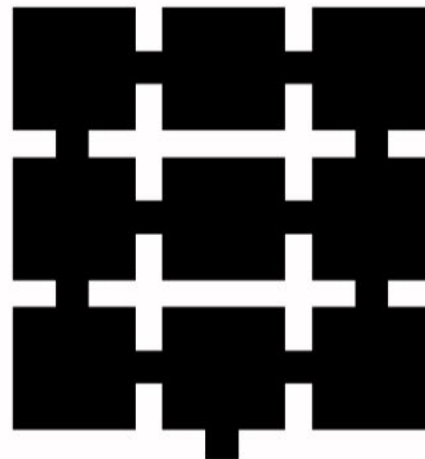
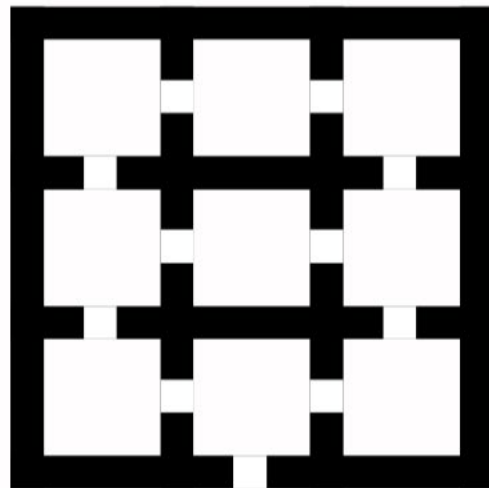
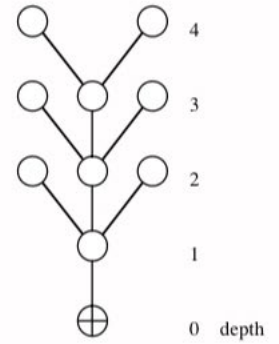
Regarding the concept of transparency, Rowe and Slutzky (1963) state that this can be defined by its literal meaning of permitting light or air to freely move through a surface or its phenomenal meaning (for example: transparency of information sharing within an organization). While phenomenal transparency is a widely researched topic within architecture, the concept of transparency as it is positioned in this research will always refer to the literal meaning of transparency. Transparency is further specified by Matthew Ziff (2004), who makes a clear distinction between transparency, translucency and opacity. Transparency and translucency share similar properties. Both properties allow light to pass through a surface. Translucency however, can distort the light which can alter what is perceived by looking through a translucent surface. Transparency on the other hand is clear and in its optimal form can make it appear as if a surface is not present at all. This notion of transparency as is described by Matthew Ziff (2004) allows the duality of a surface being "there and not there" at the same time as was described by Marquardt et al. (2015). This duality does



a.



b.



c.

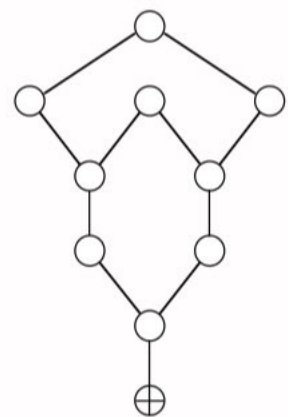


Illustration 1: *Influence of configuration on spatial perception.* Hillier, B. (2007, P. 21).

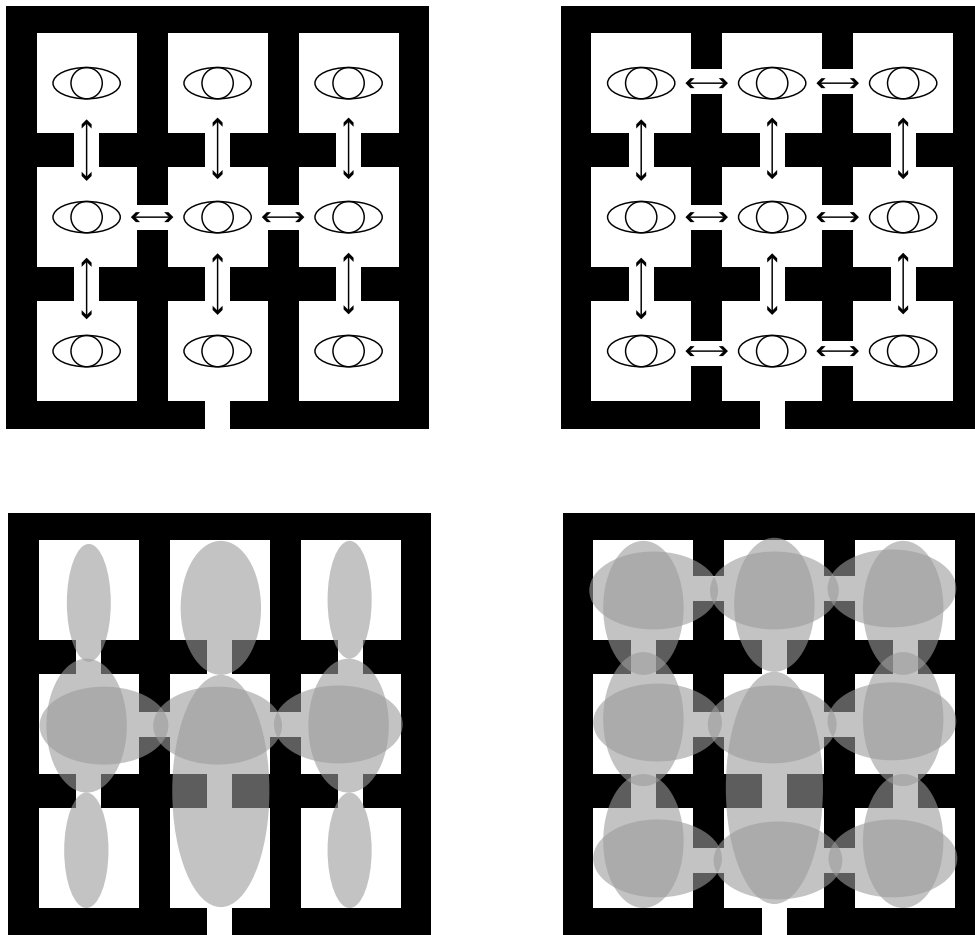


Illustration 2: *Relation between spatial configuration and visibility of a space.* Adpated from Hillier, B. (2007, P. 21).

not occur with opacity which does not allow an unhindered permission of light. An opaque serves can be physically observed and shares similarities with a clear tangible border of a space as is illustrated within the space syntax framework of Hillier. This distinguishment between transparency, translucency and opacity is relevant since it further specifies how different applications of glass can influence spatial relations in various ways.

Methodology

For this research, various methods were used to research each individual sub question and later aid the design. First of all, an inventory is made of the space layout of the current situation of the Koudenhorn building by looking at the archival drawings of the 1970s that are obtained from the Noord Hollands Archief (1971) and that were provided by the Atelier of the Politie Bouwmeester. Subsequently, the spatial relation within these floorplans are mapped using the

space syntax framework of Hillier (2007) to provide a better understanding of the spatial relation between inside and outside within the Koudenhorn Building.

Simultaneously, applications of transparent glass in architecture are researched through a literary study. The literature is provided by searching through google scholar, the Tu Delft library and Scopus. Within this research the work of Richards et al. (2006) will be used as the main starting point for the inventory of applications of glass architecture and will later be extended by complementary literature

Subsequently, these applications will be reflected upon by looking at the perception of transparent glass. Herein the work of Marquardt et al. (2015), Ziff (2004), McQuire (2013) and Rowe & Slutzky (1963) will be reviewed.

When an inventory is made of glass applications and there perception, the effect of these applications will be integrated into the framework of Hillier (2007) to asses there influence on

space syntax. The clear distinguishment between borders and openings between spaces will herein be substituted by the ambiguity of glass as both a physical border and a psychological opening. From this analyses an argument will be made about the general influence of glass on the relation between inside and outside.

Subsequently this influence will be tested by integrating the individual applications and/or a combination of various applications into design options for the Koudenhorn building. The results of these design experiments will then be analysed by redrawing the spatial configuration using the framework of Hillier (2007) which will in turn be compared to the mapped spatial relations of the current situation. The findings of this comparison will then be used to further improve the final design of the Koudenhorn building and to conclude with an argument about the main influence of glass on the relation between indoor and outdoor spaces in the Koudenhorn building. This methodology is visualised in illustration 3.

Relevance

It was mentioned before that extensive research has been conducted on both the relation between indoor, outdoor and transition spaces as well as the perception of glass as a transparent material within spaces but that the ambiguity of glass a border material in relation to the transition between indoor and outdoor is a topic that is left untouched.

This research will therefore further contribute to general research on the transition between indoor and outdoor spaces. Furthermore, the research positions itself within the reference frame of heritage buildings. Hence the research can aid with the future developments of adaptive reuse projects wherein there is a dichotomy between in- and exterior that needs to be either: preserved, strengthened, mitigated or eliminated.

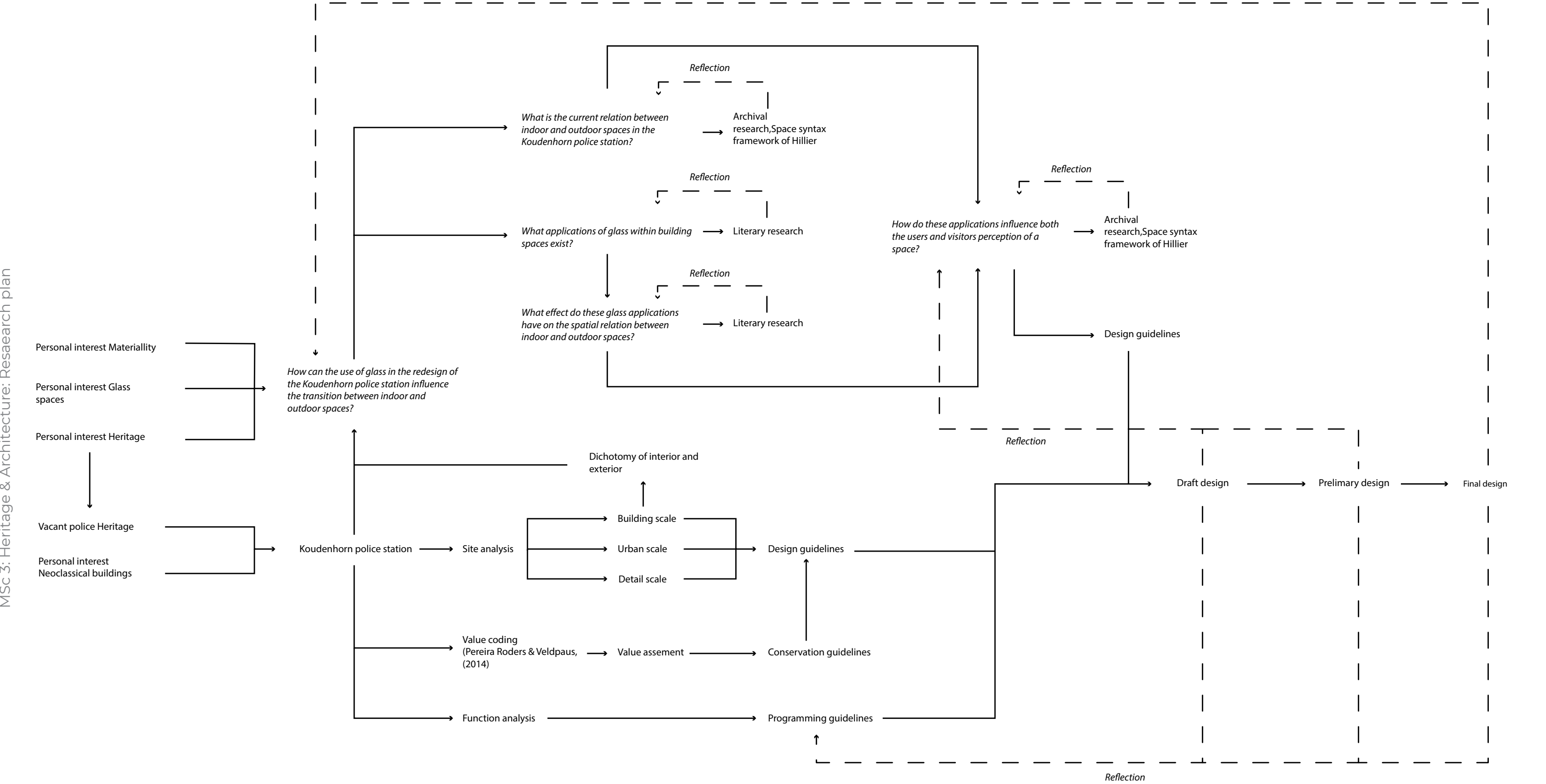


Illustration 3: Research methodology scheme. Own image

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Images

- Illustration 1:
Hillier, B. (2007). Space is the machine: a configurational theory of architecture, p 21.
- Illustration 2: own image adapted from:
Hillier, B. (2007). Space is the machine: a configurational theory of architecture, p 21.
- Image 3:
Haarlem, Noord Hollands Archief, invt nr NL-HlMnHA_51000760_01 : Jan Smit,
Haarlem, Ontwerpen voor het nieuwe Diaconiehuis, het tegenwoordige
Politiebureau aan de Koudehorn, (1768).
- Image 4: adapted from:
Haarlem, Noord Hollands Archief, toegang 2269: Openbare werken Haarlem,
Bestektekeningen Koudenhorn Kazerne Verbouwing Koudenhornkazerne tot
politiebureau fase 2, (1971), invt nr 304-306