

The Transparent Journey

Spatial and façade transparency in heritage redesign projects

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Abstract. Spatial planning and façade design in relation to public or private functions are factors that are considered within every design project. While this applies for newly constructed building projects, it can pose a significant challenge in redesign projects, especially when heritage values and a potential shift from an originally private function to a public function are considered. This study focusses on the approach of spatial planning and façade design by delving deeper into the topic of transparency which herein relates to openness, visibility, proportion, connection and materiality. By conducting a spatial analysis following the space syntax framework of Bill Hillier (2007) and by looking at several literary sources regarding the psychological aspects of façade transparency and transparent materials, the study concluded with an optimization diagram. By looking at the case study of the redevelopment of the Koudenhorn police station, the study shows how several interventions can be made based on an optimization of spatial relations, façade transparency and conserving heritage values.

1. Introduction

The relation between public and private spaces is a topic that is considered within every design project. The public or private function of a building will largely determine how the interior spaces within a building are related to each other and in turn, how these spaces are related to the surrounding exterior. This relation is further influenced by how the border or transition from inside to outside between these spaces is shaped, both in its form and materiality. The façade of a building can thus be seen as a tool which relates the interior functions to the exterior functions.

Shaping spatial relations and a façade that is appropriate for these relations and therein indicating whether a building is public or private can be a challenge when the redesign of a heritage building where the original private function is changed into a public function - or vice versa – is considered. In the design of newly constructed buildings an architect has relatively more freedom in shaping spaces and facades according to their intended functions. Although an architect will always have to take into account the existing site and context,

aesthetics and programming of an existing building do not have to be considered in these design projects.

This relation between public and private is firstly determined by how borders are shaped considering the proportion openness and pellucidity of a façade. This will henceforth be referred to as the transparency of the border. Secondly, this relation is determined by the proportion of spaces and the way spaces are sequenced. From this point forward, this will be referred to as the transparency of syntax.

1.1. Transparency of the border

Borders within buildings are characterized by facades (considering the relation between inside and outside) and walls, floors and ceilings (considering internal relations). The openness, rhythm and materiality of these borders express the architectural language of the building. They can indicate what type of space is present behind the border and they can invite one to enter that space or ward people off. Especially when facades are considered, the border further serves a technical purpose. If a space has to fulfil its functional requirements regarding shelter and climate regulation on the one hand, but on the other hand has to provide a certain degree of openness or clear visibility to create a relation between inside and outside or inside and inside, then the choice of materials of the border is crucial.

1.2. Transparency of syntax

The sequencing of spaces and the proportion of spaces establish a certain hierarchy within a building. In partnership with the borders, they indicate what the purpose of space is: whether it is a space for circulation, a space for reception, a connecting space or a space for a specific public or private activity. Furthermore, the way spaces are positioned and visible in relation to each other can – much alike the language of the border – invite or prevent people from exploring this space. This relation of hierarchy and sequencing of spaces is a fundamental component in the research field of space syntax. This field will be further explored within this study

1.3. Research question

Thus far, the challenge for architects of designing a public, private or semi-public building when the redesign of an existing heritage building - especially when there is a shift from private to public or vice versa - is considered, is discussed. Additionally, the influence of the transparency of the border and the transparency of syntax on the relation between public and private are introduced. This research will investigate how spatial relations and the border between inside and outside can be (re)shaped to appropriate a new public or private function and new relations between public and private within the redesign of existing heritage buildings.

The research will hence revolve around the following main question:

How can the transparency of the border and the transparency of syntax be used within the redesign of heritage buildings to establish preferred user movement patterns between spaces in relation to public and private functions?

To answer this main question this paper is divided in four sections. First, a literature study on the concept of space syntax as introduced by Bill Hillier is conducted to identify the characteristics of spaces and spatial relations. Subsequently the characteristics of the borders between spaces will be discussed in relation to the topics of proportion, openness and materiality, which will form the basis for several options of façade interventions. To better relate these spatial and border interventions to possible functions, it will be discussed how users can be attracted towards spaces via the implementation of activities nodes following the work of Jan Gehl. These options for façade interventions and the implementation of activity nodes will lastly be tested in a case study of a heritage redesign project.

Since this research is part of a larger graduation project in the context of the master studio Heritage and architecture: vacant police heritage at the Delft University of Technology, The Koudenhorn Police building in the city of Haarlem is chosen as a case study. This building now accommodates the private function of a police office and will be transformed to accommodate both private housing and several public functions.

2. Space syntax.

2.1. spatial relations

The notion of what space is and what the role of space is in architecture has been a frequent topic of debate since the late 19th century. Up until then, the field of architecture was dominated by the concepts of proportion, style and ornamentation (Stanek, 2012). While a clear consensus on the importance and the concept of space in architecture has not been reached yet, the topic of space as a driving element in architectural design was extensively researched in the 20th century.

A pioneer in the exploration of space and spatial relations as a concept was Bill Hillier who introduced the concept of space syntax in the 1970s (Hillier, 2007). Space syntax considers the relation between spaces. However, within the space syntax framework, a singular space is not substantiated on its own, the relation between the spaces determines how a space is perceived and what its functions are within a sequence of spaces (Hillier, 2007). This relation between spaces is best described by Hillier himself (2007): "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." According to Donald Appleyard (1970) spaces can be perceived from three different perspectives: an operational perspective, a responsive perspective and an inferential perspective. The inferential perspective is specifically interesting when the identity of a space is considered. It is the inferential perspective on spaces that determines how we identify spaces, what function we associate with the space and how we perceive a space in relation to its larger context of being part of a building or urban environment.

This is often how spaces are analysed: as being part of a building or urban context. However, the space syntax framework delves deeper into this spatial relation and explores the way the relation between indoor and outdoor spaces manifests itself. Within this relation the sequencing of indoor and outdoor spaces can be expressed in depth. The depth of an indoor space is determined by its connection to the outdoor space. If an indoor space is directly connected to an outdoor space the depth is assigned a numeric value of 1, if the indoor and outdoor space are divided by another

indoor space the depth will have a value of 2 and so on. By analysing these depth values of every space within a building, it can be made clear how spaces in a building are sequenced, what their functional configuration could be and how the circulation within a building is planned (Hillier, 2007). Such an analyses can be used on existing buildings from which an argument could be made that the spatial relations within one building can be more appropriate than the relations within another building or that one manner of sequencing spaces is better suited for a public function while another manner is preferable for accommodating a private function. Thus, such an analyses can largely assist in consciously designing the spatial relation in buildings. Figure 1 shows an example of an analysis that expresses the sequencing of spaces in a value of depth.

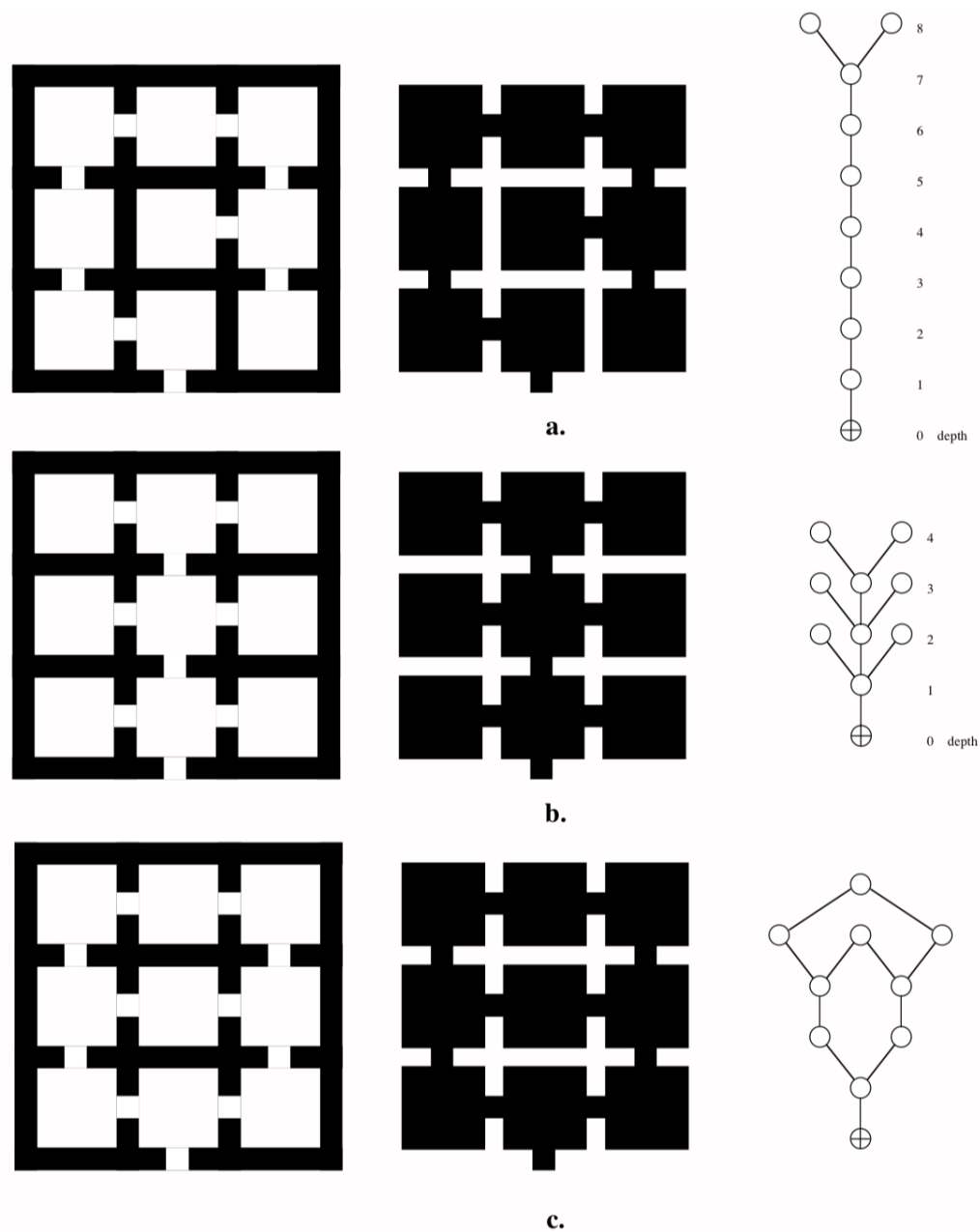


Figure 1: *Influence of configuration on spatial perception.* (Hillier, B. 2007, p 21.)

2.2. Visibility and space syntax

Thus far, this analysis already provides an analytic view on the sequencing of spaces albeit in a very schematic way. To further elaborate the concept of space syntax when not looking at schemes but at actual building plans, Hillier adds another perspective to the space syntax framework. Namely the influence of visibility on the frequency of use of a space. Hillier (2006) argues that even though space syntax shows the sequencing of spaces and therefor analyses circulation to a certain extent, the visibility from one space to another is equally important if one wants to fully understand how often a space is used and in which spaces the most activities will likely take place. The influence of visibility on space syntax is further illustrated in figure 2.

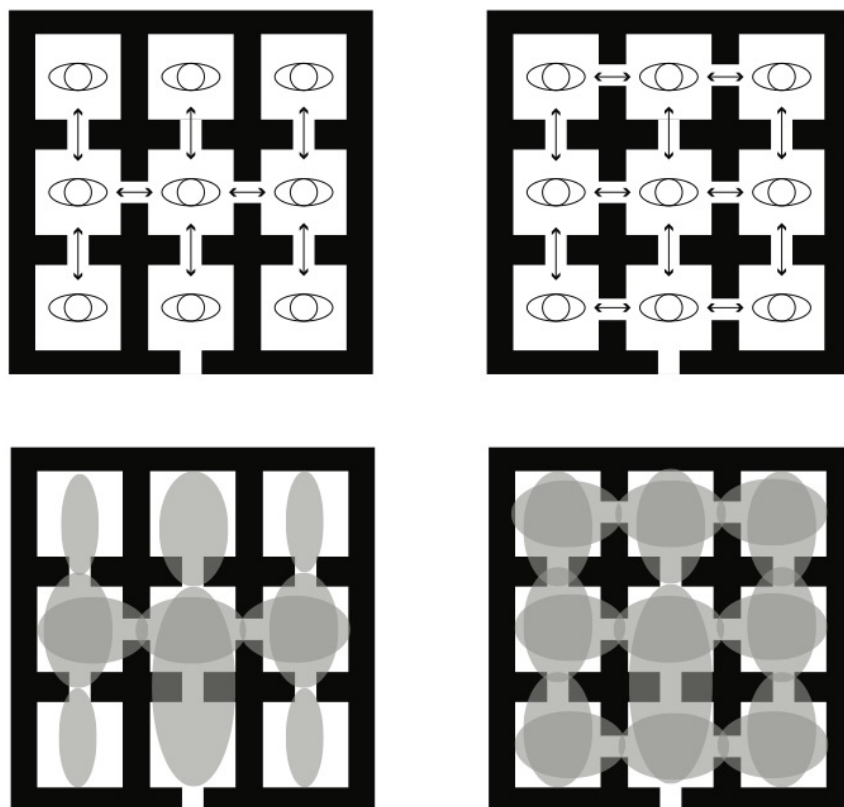


Figure 2: Relation between spatial configuration and visibility of space. Adapted from: Hillier, B. (2007, p 21.)

The visibility and perception of spaces is different for indoor and outdoor spaces. This difference between indoor and outdoor spaces is explained by Kray et al. (2013). They argue that indoor and outdoor spaces are differentiated based on three criteria: the criterium of scale, the criterium of dimensionality and the criterium of wayfinding. The criterium of scale is intrinsically related to the difference in context between indoor and outdoor spaces. Indoor spaces are often observed within the scale of a building while outdoor spaces can be observed on an urban scale which often simply means that an outdoor space is considerably larger in scale than an indoor space. Even though outdoor spaces can be observed in a larger context than indoor spaces, Kray et al. (2013) argue that indoor spaces can be perceived in a three-dimensional way while outdoor spaces are mostly observed on a two-dimensional level. This is explained by the fact that indoor spaces are not only sequenced horizontally (only on the ground floor) but also vertically. The last criterium of way finding mostly relates to the openness of outdoor spaces which allows for a free overview of the space. Individuals will therefor mostly find their way based on landmarks within the urban context. On the other hand, indoor spaces are more clearly sequenced. The way to the next space is clearly indicated by an opening or hallway within the space. These differences between indoor and outdoor spaces are important to consider when looking at transition spaces (meaning the spaces where indoor and outdoor meet each other). Although these spaces share characteristics with both indoor and outdoor spaces, this also implies that they cannot be clearly classified as either (Kray et al., 2013).

When we relate this to the influence of visibility on space syntax as explained by Hillier (2007), it can be argued that we cannot only look at this visibility on a two-dimensional level as is shown in figure 2, but also on a three-dimensional level. More specifically, one has to consider the transition from the two-dimensional outdoor space to the three-dimensional indoor space. This raises questions on the relation to private and public functions and it urges designers to think about the way people move through or should move through buildings and especially heritage buildings. Within heritage buildings a transition between in- and outside is already present which can have either a public or private character. When this private character is for instance changed to a public character, one should consider what new

interventions are necessary in the redesign of the building and if these interventions are justifiable in relation to the embedded values of the heritage building.

3. Shaping the border

3.1. Materiality of the border: the duality of transparent materials, “there and not there”

The most used transparent material in the field of architecture is glass. Therefore most studies that are referred to in this research consider the characteristics of glass as a material, however these characteristics often apply for all types of transparent materials.

Rowe and Slutzky (1963) describe a dualistic nature of transparent materials which concerns the characteristic of transparent materials providing a physical border but not a psychological one. They concluded that transparent materials were physically perceivable but psychologically, they could trigger both positive and negative emotions. Rowe and Slutzky (1963) stated that this was caused by the fact that psychologically a person does not observe transparent materials to as a border since a visible connection between spaces is still present. This psychological effect can be a positive notion for designers because it allows them to create physical borders that meet the technical requirements of a façade while at the same creating unhindered visibility. On the other hand, this can be considered to result in negative effects if the user of a space wants to perceive a border regardless of the space being public or private (Rowe and Slutzky, 1963). Marquardt et al. (2015) further discuss that due to this duality, borders consisting of transparent materials can confine spaces while the clear visibility in the sequencing of spaces is still present. It is however imperative to consider the negative consequences mentioned by Rowe and Slutzky (1963) that can occur by applying transparent material in borders since they are deeply related to the function of a space and how it is connected to other spaces in the building. Within architectural design this concerns the notion of privacy, but even in spaces where privacy is not necessarily a requirement, it must be considered whether a constant visible connection is desirable.

3.2. Transparent materials in relation to private and public functions

Marquardt et al. (2015) go deeper into the application of transparent materials in relation to public and private and define several elements that need to be considered. First, they mention the evident factor whether space accommodates a public or private function.

Additionally, they state that even if a space accommodates a public function, it should still be considered whether a visible connection is desirable since it can cause unwanted interactions between spaces or distractions from adjacent spaces. Lastly, it is stated that the user should be considered as well. Full transparent facades can create an effect where an individual might feel as if he or she is put on display which could be undesirable. McQuire (2013) largely agrees with the effect of transparent materials not allowing for privacy; however, he adds that transparent materials in a public relation do not merely create an unhindered visual connection between sequenced spaces but moreover, they invite the user to enter a space and can thus be used as an element to nudge people into a building.

These notions imply that a façade that fully consists of transparent materials cannot simply be applied for public functions nor for private functions. One should thoroughly consider which effect is desired within the design: can users be distracted by activities from other spaces? Is a direct relation with adjacent spaces preferred? And should a space have an inviting or a more secluded character? How the desired effects can be achieved largely depends on the manifestation of the transparent façade, both in new buildings and when intervening in existing buildings.

3.3. Openings within borders and their practical and psychological effects.

The possibilities of the application of transparent materials have exceedingly grown since the beginning of the industrial revolution since it allowed for large glass surfaces to be created (Richards et al., 2006). These glass surfaces made it possible to create a direct visual relation between interior and exterior where prior to this era, glass was mainly used in the form of smaller windows. Richards et al. (2006) argue that these windows provided the basic needs for daylight but only created small portals within the facade which

resulted in spaces that were still very confined by perceivable physical borders. Thus, the application of windows did not result in a clear transition between inside and outside but were still perceived as a hard border. An attempt to create a relation between inside and outside was made by the appearance of the bay window. By extending the bay windows into the outdoor space an effect was created wherein the small extension of the interior space was surrounded by the exterior space and provided a direct visual connection. This extension of the indoor space, however, did not result in a continuous relation of the interior and exterior space, it merely extended the interior spaces into the exterior space. Richards et al. (2006) further discuss how several new design options were made possible due to the invention of large glass surfaces, and how they can result in different effects. Their main argument can be related back to the two-dimensionality as discussed by Kray et al. (2013) and states that the continuous relation between indoor and outdoor can be achieved when an opening in the façade is directly connected to the ground floor level and is proportioned in such a way that a visual relation is also created at an eye level.

Apart from the proportion of the height and width of openings, Ziff (2004) further discusses the characteristics transparent materials themselves, namely the material characteristics of opaqueness, translucency and transparency. It is evident that only fully transparent materials provide an unhindered visual connection. It is however noteworthy that both transparent and translucent materials provide the basic need of an adequate amount of daylight while also providing privacy to a lesser extent than a fully closed border. This can be a relevant factor when connected to the earlier conclusion that even a public space might require some visual obstruction in the borders of the space since interaction between spaces are undesirable. The effects of the size of openings and the material characteristics of these openings are summarized in figure 3:

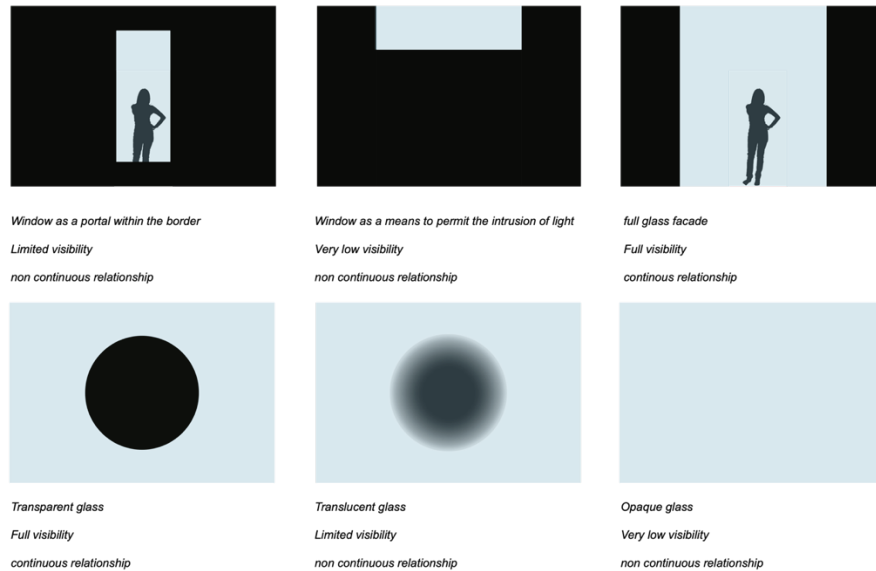


Figure 3: Different manifestations of openings and transparent materials and the effects on spatial relations.

4. Activities in spaces and attraction towards spaces.

4.1 the necessity of activities

It was concluded earlier in the research that the frequency of the use of a space was influenced by the visibility of one space from another. While Hillier and Tzortzi (2007) conclude that visibility influences the way people move from one space to another and therefore the effectiveness of the space syntax, Jan Gehl (2010) argues that visibility on its own is not sufficient to attract users towards a space. According to Gehl the activity that takes place within the space is equally as important if not more important for inviting or attracting users. If the spatial sequencing is adequate and clear and unhindered visibility between spaces is established but at the same time, the activity that takes place within the space is unsatisfactory, people will simply neglect the space entirely and therefore the overall quality of the space is considered as poor.

4.2 different types of activities

To illustrate the effect of activities that take place in a space, Gehl (2011) defines three categories of activities: necessary activities, optional activities and social activities.

Gehl herein states that the quality of the outdoor space determines which types of activities can occur. He concludes that spaces that only allow for necessary activities to take place, are often of poor quality while spaces that also allow for optional or social activities to occur are more likely to be of a higher quality.

The reason why Gehl states that the quality of spaces with only necessary activities are poor is because people in general are not attracted to these spaces. The space for the necessary activity simply exists since it is mandatory for a user to partake in the activity. An individual will for instance only visit a bank to deal with financial matters. The space often lack elements that allow for an activity to spontaneously or coincidentally occur, something that is present within spaces that on top of necessary activities also allow for optional and social activities.

This incentive to go towards a space is precisely what is crucial according to Gehl (2011). While individuals will often purposefully come to a space to partake in an optional or social activity, the optional activity also allows for the spontaneous participation of passers-by or people that initially came to that space for another reason than to partake in that optional activity. There is no precise indication on what these elements that allow for optional activities are and how they draw people towards a space, but by some examples on a smaller scale that are given by Gehl, a general idea of what these elements might be, can be formed. This can be as simple as a bench that is placed within a space where people can sit and meet each other. An example is the coffee corner that can be found in the middle of grocery stores, which is a place where the necessary activity of getting groceries takes place and at the same time people can spontaneously meet each other. Within a design process, a designer should thus not only consider how the proportion and transparency of a space manifests itself. The space is merely appropriated for a function, but additional elements need to be added as nudges to draw people towards an activity and to initiate the activity.

4.3 Circumstances for different activities.

So how can a space be appropriated for a certain activity and its corresponding nudge elements? Gehl concludes that optional activities will only occur under the right circumstances, while necessary activities will always occur regardless of the circumstances (e.g., the weather condition). Nevertheless, undesirable circumstances will evidently weaken the incentive for people to move towards a space.

Francis (1988) goes deeper into this aspect of circumstances. He concludes that a proper space should provide comfort (proper shelter, social security and adequate sunlight), that space needs to be suitable for different groups of users to also establish interactions between these groups, that spaces should not only be visible but also easily accessible from multiple directions and that spaces should allow for discovery to create an interesting and meaningful user experience. This adds another layer to how a nudge element should be shaped. Not only should it be related to a desired function, but also to a specific target group. Furthermore the element should provide adequate comfort and accessibility.

5. Transparency of the border and transparency of syntax in a heritage redesign: the Koudenhorn building.

Thus far, the way spaces should be shaped and related to each other and the way borders should be shaped accordingly were discussed. Additionally, the effect of nudge elements within these spaces were emphasized. This section of the research will provide a reference on how these results can be used in the redesign of a heritage building and what kind of challenges and opportunities will occur in such a process.

5.1. Context the Koudenhorn police station

The Koudenhorn building in Haarlem is currently used as a police office and can therefore be considered as a private building. The building is located in the city centre of Haarlem and was constructed in 1769 as a deacon house. It was built in a neoclassical style and as a courtyard building. Figure 4 shows that the contemporary interior is entirely different than it was in its original state and the neoclassical character of the building can only be seen in the symmetry, order and ornamentation of the façade. The windows in the façade are relatively large with a height of almost 3 meters, yet one cannot easily look inside due to the height of the windowsill

of roughly 1.5 meters. The façade therefor communicates the private function of the building and does not appear to be inviting for passers-by. From the exterior the courtyard is not perceived, one might only know that it is present because of its comparability with other buildings in the Netherlands from the same time period.

While this research will not discuss the specific design choices in depth but instead, will mainly focus on the application of the interventions that were previously discussed, it is noteworthy that the redesign intended to integrate private functions on the ground level of the building and create a clear connection from the exterior to the courtyard.

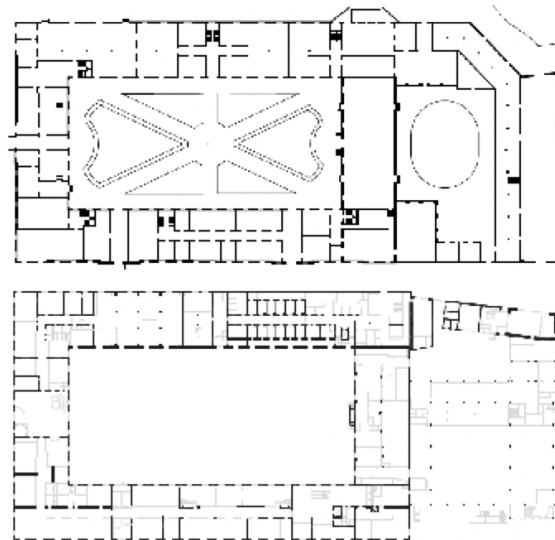


Figure 4: *contemporary (bottom) and original (top) interior of the Koudenhorn building.* (own image)

5.2. Redesigning the Koudenhorn building: methodology

To realize an appropriate transition from a private function to a function that is both public and private, the literature that has been discussed in section 2, 3 and 4 of this study has been used to create a framework. The research from section 2 was used to systemically identify spatial relations within the existing building. Furthermore, the researched tools from section 3 and 4 were used to either change or maintain this relation according to the desired functions within the redesign.

5.3. A spatial analysis of the Koudenhorn building.

The space syntax framework was used to map the depth of all the spaces within the Koudenhorn building. The result of this spatial analysis can be seen in figure 5. While the depth of every space has been considered within the redesign of the Koudenhorn building, not every aspect of the design is highlighted within this research. It is noteworthy that the depth values that are shown within the analysis, do not indicate whether the quality of a space or the relation between spaces are “good” or “bad”. They merely provide an insight in the way spatial relations are currently formed. The designer should always assess whether this spatial relation is appropriate or desirable for the new function of the building and can then consider whether an intervention is needed on a spatial level.

2 interventions have been chosen as a basis to illustrate how the methods that were discussed can be applied. One considers a new passageway that is created as a spatial relation between the exterior and the courtyard of the building. the other discusses an intervention in the spatial typology of the interior that was heavily influenced by the existing proportions and ornamentation of the facades which are highlighted in the floorplan and section in figure 6. The first interventions was made due to a desire to further use the courtyard as a public space rather than a private enclosed space. the spatial mapping showed that the courtyard had no connection to the exterior and that many spaces that were adjacent to the courtyard did not have access to the courtyard. Therefor a spatial intervention was required to integrate the new public character of the courtyard into the redesign.

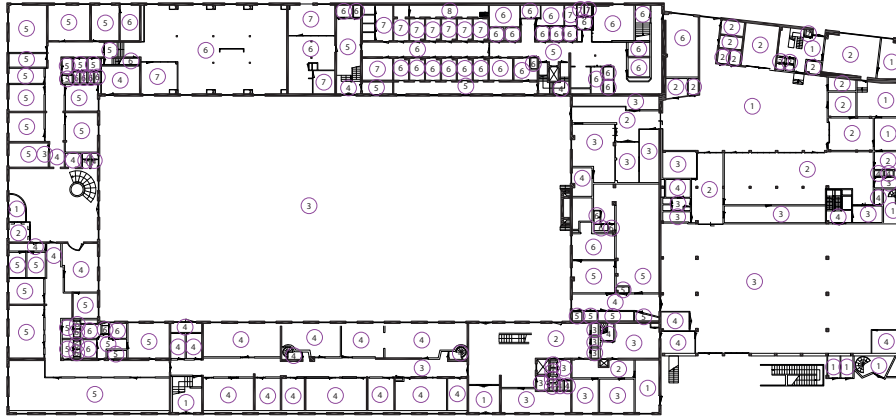


Figure 5: Space syntax analysis of the Koudenhorn building, applying the method of Hillier (Own image).



Figure 6: Intervention 1 (right) and Intervention 2 (left) Own image.

The resulting intervention was a direct passageway from the exterior towards the courtyard. In the floorplan in figure 6, it can be seen how the street pattern is dispersed Infront of this entrance to create a new nudging

element following the literature of bill hillier. This pattern was applied to indicate that there is an entrance that can be used in this part of the façade. These nudging elements continue in the courtyard. What can be seen in figure 7 is how the new public space in the courtyard is divided by different pavements with different activities happening within the designated areas. By creating direct accesses from the new public interior spaces to the courtyard, people are now nudged to explore these public spaces when entering the courtyard via the new passageways.

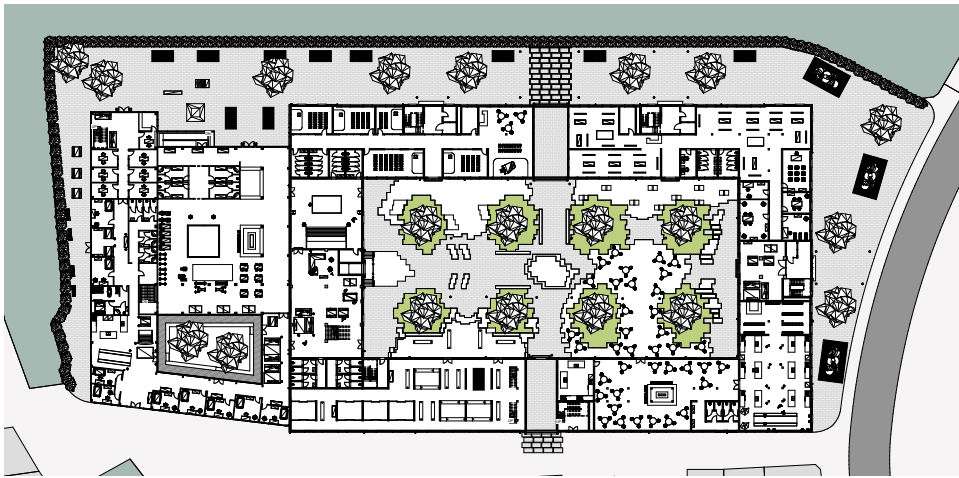


Figure 7: New ground floor plan of the courtyard (own image)

The passageways were a clear intervention to appropriate the new spatial relations for the public function of the redesign, but their proportion and placement were highly influenced by the existing appearance of the façade and its heritage values regarding the symmetry ornamentation and proportion of the façade. Figure 8 shows the new aesthetic of the façade and illustrates how this opening of the passageway was shaped according to this symmetry.



Figure 8: proportion of the passageways within the *northern façade* of the building. (own image)

This example indicates that a certain balance or optimization needs to be reached between the desired spatial relations, the desired form of the façade and the existing heritage values that influence how they are shaped.

To better illustrate this balance, the influence and optimization diagrams were introduced within the methodology (figure 9). They serve as a tool to indicate how the aspects of the spatial relationship; the façade and the heritage values can influence the final manifestation of an intervention before it is done, and as a tool to show how these aspects were represented within the final intervention.

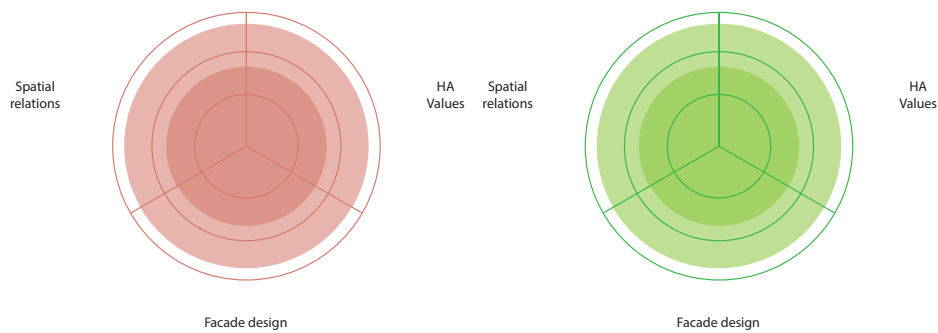


Figure 9: *Influence and optimization diagrams (own image).*

In figure 9 an example is shown where all three of the aspects have a high influence and as a result, all three aspects were highly optimized within the design. In case of the passageway, it was mentioned that the new spatial relation was the main goal of the intervention, and that the location of the passageway was heavily determined by the heritage values of symmetry in the building and the ornamentation of the façade. Therefore, all aspects had a high influence in the shape the intervention would take. The influence and balance diagram of this intervention would thus look the same as the ones shown in figure 9.

To further illustrate the use of these diagrams and show how the optimization diagram might take a different shape when some aspects are less influential, the second intervention will now be discussed. Figure 10 shows the eastern façade of the courtyard. This façade had a very prominent elevated doorway that was already present in the existing building, and which could not be ignored. One of the goals within the design was create better connections between the courtyard and the spaces that surround it. A new public entrance within this façade would have to have a clear open character and would have to be quite prominent within the façade. Since the order of this façade was currently heavily influenced by the symmetry of the building with the elevated door as its vocal centre point, such a new entrance could not simply be made on the ground level.

The intervention that was desired - a new public space around the courtyard – was thus influenced by the existing shape of the façade and the heritage values of its symmetry and the resulting spatial relation was subordinal. Within the intervention the public spaces were therefore located on an elevated entresol level and the existing doorway was used as a main entry port. To better suit the public connection, the tools from Marquardt et al. were used and it was decided to replace the existing door panels with transparent panels. This example shows how different influences from the aspects also result in different interventions and optimizations. The diagrams for this intervention can be seen in figure 11.



Figure 10: *Courtyard eastern façade (own image)*

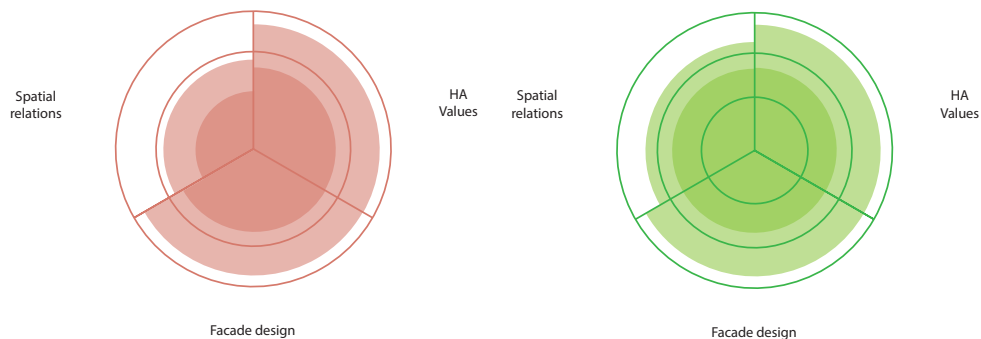


Figure 11: *Balance diagrams of the second intervention (own image).*

6. Conclusion

This research investigated how spatial relations and the borders between spaces can be (re)shaped to fit a new public or private function in the redesign of an existing heritage building. The study discussed the transparency of syntax and of the border and used the work of Bill Hillier, Marquardt et al., and Jan Gehl to seek a new methodology to effectively

analyse spatial relations and use the appropriate means to intervene in these relations and therein find an answer to the main research question:

How can the transparency of the border and the transparency of syntax be used within the redesign of heritage buildings to establish preferred user movement patterns between spaces in relation to public and private functions?

This study showed that the space syntax framework can be used to identify spatial relations by assigning a depth value to them. This depth value didn't rate the quality of a space, but it does show how spaces are sequenced in relation to a public or private function.

From this spatial analysis designers can identify whether it is required to intervene in certain parts of a building to better suit a new private or public function. By using the new balance diagrams that were introduced, one can determine for each intervention: what aspects need to be considered, how much they influence a possible outcome of an intervention and finally, they can be used to assess the representation of the aspects in the final intervention. Thus, they not only serve as a tool for designers to be conscious about their own design choices, but they can also be used to reiterate this thought process to peers.

The tools that were further discussed in section 3 and 4 of the paper can further be used to strengthen these aspects within these interventions. And create a preferred use of the spaces and patterns between these spaces within the building.

6.1. Reflection

The conclusion of the research resulted in a framework wherein spatial relations could be identified, interventions could be done consciously, and a toolbox could be used to properly achieve these interventions.

It is noteworthy that this new framework has only been tested on one specific heritage building. While the example project that was used within the study shows an appropriate application of the framework, it should be mentioned that in this case, the heritage values were predominately tangible. This study can therefore not conclude with certainty how the framework would function in the redesign of a building where the identified value were mainly considered to be intangible. It would therefore be highly valuable to use the methodology presented in this study in a redesign project of a building where intangible heritage values are present and to compare the results of this process with the results presented in this study. This could then be used to further adjust or strengthen the framework.

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