

A landscape photograph of a Dutch river. The river flows horizontally across the middle of the frame, with a grey, overcast sky above it. The banks are covered in vibrant green grass. In the foreground, a narrow grey path or road runs horizontally across the bottom of the image.

Sense of safety in Dutch river Landscapes

RESEARCH PLAN
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On the cover: Image 1 - Rhein II (Gursky, 1999)

1. Introduction: Safety in the Dutch river landscape

In his photograph *Rhein II*, Andreas Gursky (1999) depicts the river in such an abstract way so that it is reduced to horizontal lines. Half of the image is filled with overcast sky, half of it with a narrow strip of river lined with grassy dikes. How detached from nature this image might appear, to a Dutch person it is strangely familiar. This image shows how the Dutch have manipulated their rivers for centuries: directing it in defined waterways with strictly delineating dikes, all to prevent the low lands from inundation in case the water level rises.

This strategy of building protective dikes has been successful, and the river regions have been saved from floods many times. However, with changing climate conditions this strategy is under pressure. The sea level is rising, the soil in polders is sinking and heavy rainfall is becoming more frequent.

Heavy floods hit Limburg in July 2021. After days of rainfall in south-west Germany, the Ardennes in Belgium and southern Limburg, the creeks and rivers couldn't discharge the large amounts of water and many parts of these regions flooded. Rivers like the Geul, the Roer and the Maas no longer fitted the abstract lines of Gursky. In fact, large areas were flooded and many residents were evacuated from their homes.

Metz and Van den Heuvel (2012) come to the conclusion that after centuries of cultivating the landscape and constructing water works, the Dutch have outsourced their water safety to engineers and water boards. Taking primary defence structures like dikes for granted, the relationship with the landscape has changed. As water safety is primarily the concern of professionals, people themselves are decreasingly aware of their dependence on these defence structures.

Bobbink and Loen (2020) acknowledge that due to centralized supervision, local communities are cut-off from their water system and they are changing from active workers to passive users. Ultimately, their knowledge of the water systems is forgotten (p. 5). With these developments, people no longer gain a sense of safety from dikes and other defence systems, but simply perceive them as elements in the landscape (Metz & Van den Heuvel, 2012, p. 79).

2. Understanding and establishing sense of safety in the Dutch river landscape

The Dutch defence mechanisms are objects of engineering and architectural design, with a clear functional relationship to, and position in, the landscape. In relation to the decreasing awareness and perception of river safety, this led to the main research question:

What is the role of architecture in perceiving a sense of safety in Dutch river landscapes?

This question requires inquiry into perception of the Dutch river landscape and into the sense of safety. Because of the recent events in Limburg, this area makes an interesting case study. With the floods of last summer fresh in memory, this landscape and its residents will be studied to understand the sense of safety that they perceive from the landscape and architecture. This is what the first sub-question addresses:

(1) How are the characteristics of the Limburg river landscape perceived?

Choosing Limburg as a case study sets clear limits to this research. The focus lies on rain-fed rivers in the Dutch landscape. The Dutch strategies to manage water are unique and define the relationship between residents and rivers. As such, the research will not investigate the relation to the sea, the polder landscape, or other types of river.

The residents' perception of the Limburg rivers has been affected after the floods. People have seen where dike breaches and weaknesses occurred, and this has changed their idea of safety in this landscape. Therefore the second sub-question is:

(2) How do people gain a sense of safety from the landscape?

Architecture plays a role in shaping the defence elements in the Dutch landscape. This means that the research questions will not only be answered by the aforementioned inquiries, but also by the design assignment following this research project. Therefore, preliminary design requirements are already enclosed in the research question: architecture is rooted in the Dutch river landscape and stimulates a sense of safety for its users. The final sub-question unites the first two in this design inquiry:

(3) What is the role of architecture in establishing a sense of safety?

The three sub-questions have a clear sequence of investigation, the third question can only be answered after answering the first and the second consecutively. On the other hand, the questions form a clear counter-sequence when dealing with the design assignment: starting with the role of architecture and ending with the goal of creating a sense of safety in Limburg. This means that the design assignment is not only a spatial answer to the main research question, it also offers an architectural lens to investigate the landscape in relation to the sense of safety of its residents.

3. The relation between humans and river: a relationship of power

To understand sense of safety, in relation to architecture and perception of landscape, we need to understand the relationship between the Dutch and the river. This can be seen as a relationship of power. Through elaborate defence mechanisms and centralized governance, the Dutch feel in control over the rivers (Metz & Van den Heuvel, 2012). The Dutch have forced their power on rivers by directing it with dikes and channels. However, in flood events, the river is in control, causing evacuation and displacement of residents. Mathur and Da Cunha (n.d.) state that the relationship between land and water is unequal, in which (from a human perspective) water is inferior to land. Water is to serve land, and when it crosses the lines drawn by man-made defence mechanisms, this is seen as a violation, a disaster. However, they advocate a different perspective, one in which water in its different forms (precipitation, river, monsoon) is not seen as an unwelcome visitor but rather a permanent actor (par. 7). This relationship of power is what I call the power balance between water and humans. The balance is formed by tangible components that help understanding the sense of safety and the perception of it in the landscape.

Strategies

The research method is based on three strategies. On the one hand, literature research is carried out to understand how a sense of safety is established for residents of the Limburg river landscape, and how that relates to the relationship of power. Secondly, through field work this theoretical understanding is investigated in Limburg. The field work contains interviews with human residents and interviews with non-human residents, which is carried out during a cycling trip along the river Maas, starting in Delft and ending in Maastricht. The pace of the cyclist, as well as the perspective in the landscape alongside the river will give particular inspirations and embodied experiences that contribute to understanding and experiencing the landscape. Lastly, the findings of the literature research, interviews and experiences and observations of the cycling trip will be combined and integrated in (visual) documentation. These three strategies address all sub-questions but in a different manner. The answers to the questions will be formed by integrating the findings of all strategies.

Qualitative research

This research deals with a recent, large-scale event that relates to human experiences and emotions. Because this is investigated in a specific time and context, this research is characterized as qualitative research (Wang & Groat, 2002 p. 176-180). The field work investigates elements in their natural setting in



Image 2 - Map of cycling route, with daily segments indicated

Limburg. The interviews are informal, respondents are asked for their personal interpretation of the landscape and their experience of the disastrous events. Also, I as a researcher have a personal position in this research. In addition, as the research progresses, obtained information will inform the further course of the research; the first interview may give insights that can be discussed in the next.

Because the research strategies apply to all three sub-questions, they will be introduced in the following section in relation to those sub-questions.

(1) How are the characteristics of the Limburg river landscape perceived?

Literature serves as the background knowledge to answer this question. Two topics are discussed: the Limburg river landscape (Renes, 1988; Renes, 1999) and the sense of landscape (Jackson, 1994).

Cycling is the mode of travelling through the landscape, from one location and one interview to the next. This means that the whole body of field work is experienced as a coherent, uninterrupted sequence. The pace and labour of cycling give a profound perception of travelled distance and time.

In relation to this first sub-question particular attention will be given to the morphology of landscape characteristics, such as vantage points, scale and vegetation. Especially relief will play an important part, since Limburg is the region in the Netherlands most famous for its hills and creeks. Through visual documentation, these observations will be externalized, as described further.

A road lapse will be made during the entire cycling trip. This road lapse will be a series of photos shot after every kilometer travelled along the route, from a camera fixated on the handlebar of the bicycle. This results in approximately 250 photos in total. The sequence will display gradual changes in the landscape from Delft to Maastricht. The work of Hans-Peter Feldmann serves as an inspiration. In one of his Time Series, he shows a sequence of 36 photos taken from a fixed position in a driving car, while passing a bridge (1970a). In another Time Series sequence, he photographs a passing cargo ship on the Rhine from a static position, rotating the camera to follow the ship (1970b).

Interview with humans: each interviewee is a resident of the Limburg landscape. Although the interviews are informal and there is room for open ended discussion, the following questions will be addressed in each interview:

- Where are we, how do you live here and what do we see?
- What typically characterizes the river landscape of Limburg?
- What is the height of the residence in relation to the nearby river?

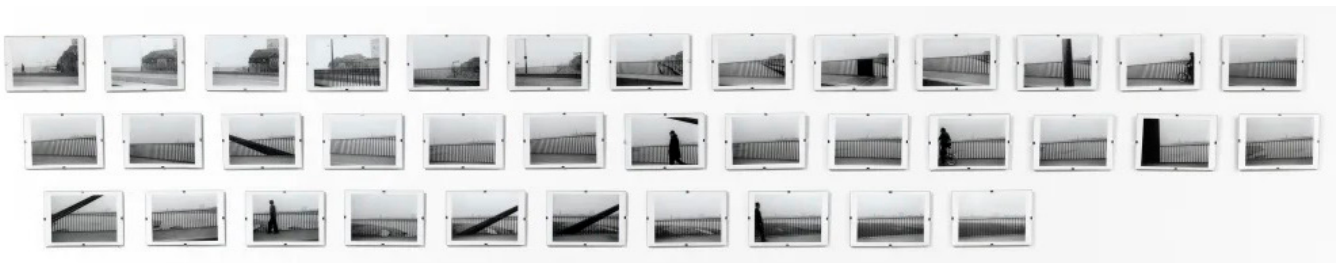


Image 3 - Time Series – Bridge, 1970 (Feldmann, 1970a).

In total, 4 to 6 interviews will be carried out. Because the stories of residents are the main topic, the goal is not to conduct statistical research. Therefore it is not necessary that the interviewees are chosen by random sample and the interviews are not necessarily structured to be comparable.

Interview with non-humans: to fully understand the relation between humans and river, using the perspective of non-human elements, such as the river, river banks, dikes, water mills, is essential. Each interviewee will be studied systematically to understand its situation and experiences. To give these non-human elements a voice equal to the human interviewees, prescriptive writing as discussed by Havik in her book *Urban Literacy* (2014) will be used to create personalities out of these elements, that tell their story in a human way. The podcasts of Mills & Chillag (2018-present) and Van Tol (2020-2021) will be used as an inspiration. In these podcasts, inanimate objects (Mills & Chillag, 2018-present) and animals, plants and trees (Van Tol, 2020-2021) are impersonated by actors, telling their stories in an active manner.

To answer this first sub-question, questions similar to the interviews with human residents are discussed. Each interviewee will address the location and landscape where it resides, how long it has been there, and what its spatial relation to the nearby river is. Different from the interview with humans, the interviewees are asked what their relation is to the human residents of the river landscape.

Documenting: Following the above strategies, certain characteristics of the Limburg landscape come to the fore. These characteristics will be visited during the field work. Photographs will serve as the straightforward documenting technique. Furthermore, through analytical drawing these characteristics will be imaged as seen through the eyes of the interviewed humans and non-humans. As such the images will be informed by the interviews, displaying conclusions and findings from those interviews. Lastly, descriptive writing will be used as a method for systematic observation (Havik, 2014).

(2) How do people gain a sense of safety from the landscape?

Literature: sense of safety has a number of aspects that will be addressed in the literature research. Dutch river management and water safety in a technical sense serves as the basic concepts for understanding flood risks (Metz & Van den Heuvel, 2012; Bobbink & Loen, 2020). Next, how people understand the landscape and gain a sense of control from that will be addressed by introducing environmental psychology (Sijmons & Van Dorst, 2012), and literature on the power balance between humans and water (Mathur et al., 2014). Finally, the local community, such as neighbours, the mayor and municipality, play an important role in sharing solidarity and this helps people to remain safe during floods and to recover afterwards (Schreuder, 2021).

Cycling: the position of the cyclist in relation to the river will be documented in schematic sections. These sections help express the understanding a cyclist gains from its position and vantage point. Where this position is significant or changing, for example when crossing a bridge or when climbing a dike, a section will be drawn.

Interview with humans: after addressing the first sub-question in the interviews, in this section the relation to sense of safety is addressed. This will be done specifically in the context of last year's floods. The following questions will lead the interview:

- How did the interviewee experience the floods of July 2021?
- Before the floods of July 2021, to what extent did the interviewee feel safe in their place of residence? And why?
- How is this sense of safety affected by the floods of July 2021?
- Now, one year later, does the interviewee feel safe in their landscape? How come?
- What was the role of the neighbourhood, community and/or a feeling of solidarity in the experience of the floods? Did that have an effect on how safe the interviewee felt?

Interview with non-humans: in the research method, theory and field work are equal in answering the sub-questions. The only exception is this second sub-question. From the field work approach, only the interviews with humans addresses this question. This is because the sense of safety is a concept that can only be understood from a human perspective. Non-human perspectives can deal with the matter of safety and protection, but they cannot clarify a *sense* of safety, as it is connected to human perception and emotions.

Documenting: Similar to the first sub-question, a number of spatial elements can be identified that contribute (positively or negatively) to the perception of safety in the Dutch river landscape and management context. In a similar way, photographs will serve as the documenting technique, analytical drawing will show the spatial elements as seen through the eyes of the interviewed humans and non-humans, and descriptive writing will be used for systematic observation (Havik, 2014). Jan Rothuizen (2011) uses a combination of writing and drawing

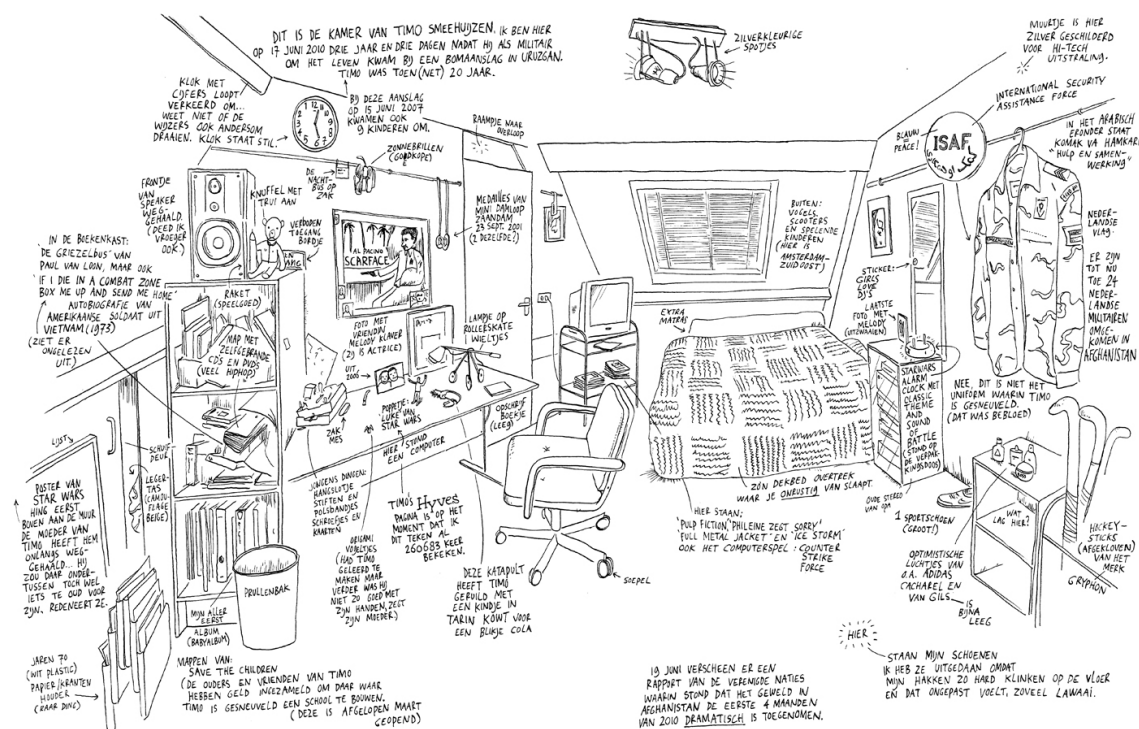


Image 4 - The Soft Atlas of the Netherlands (Rothuizen, 2011)

to illustrate interviews and observations made in cities. This combination shows a visual representation of the surroundings where the interviews or observations took place, combined with writings that relate to the discussion and his own thoughts and experiences on the conversation.

(3) What is the role of architecture in establishing a sense of safety?

Literature: in conclusion of the above two sub-questions, a number of tangible (architectural) elements in the landscape are distilled from the literature, of which design principles and characteristics will be investigated.

Cycling: Routes towards architectural objects, and the embodied experience of traveling there will be taken as information to address in analytical drawings. When cycling, relief and road texture are significant in experiencing the labour needed to arrive at a place and determine how easily accessible they are.

Furthermore, after cycling for four days, a profound multi-sensorial experience is established that helps me as a designer to gain an understanding of the design location and the characteristics of the landscape in which the design will be rooted.

Interview with humans: the questions discussed in the interviews are closely linked to the previous sub-question. These questions will serve to conclude on a more general note and will directly link the experiences of landscape and of the floods to architecture:

- What landscape and architectural elements does the interviewee understand to be protecting humans from floods? What characterizes them?
- What elements relate to safety and a sense of safety from extreme precipitation and floods?

Interview with non-humans: Sluices, bridges, dikes and similar objects are engineered and designed by humans. In order to question the role of architecture, the interviews will address how architectural design shaped these objects and how that relates to flood protection and sense of safety. Furthermore, it is questioned how design could improve the object in such a way so that it contributes to the perception of landscape and flood safety.

In addition to the cycling investigation of routes and accessibility, the final interview with a non-human subject will be an interview with my bike at the end of the trip. This interview will serve as a reflection on the mode of cycling as a research method and how I reflect on the trip as a whole.

Documenting: the documented spatial elements in relation to the first two sub-questions will again be documented through analytical drawings and descriptive writing (Havik, 2014) but from a different angle. This angle takes a designerly point of view, with the goal of indicating design principles and qualities that contribute to establishing a sense of safety.

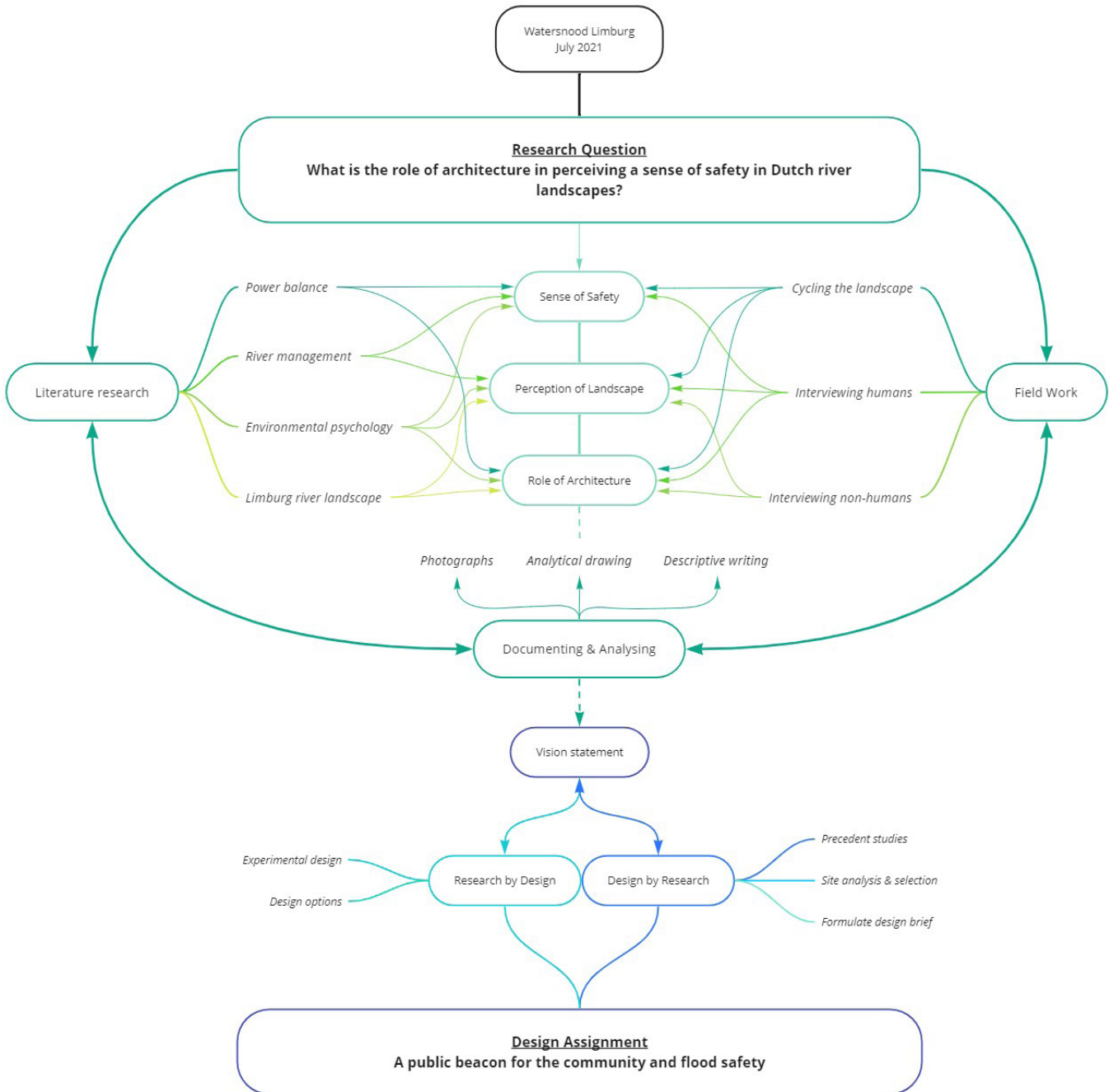


Image 5 - Scheme of research and design projects

In conclusion, the above scheme demonstrates how both the research and design projects address the same questions. Literature research and field work are equal research strategies in answering the sub-questions. It also demonstrates how the design assignment adds to the research question through various techniques of research by design, and how it uses the research outcome through design by research.

4. Retracing the 2021 flood: a travel journal

As the research scheme shows, there is no clear separation between literature research and field work, and the research and design projects are not hierarchically divided. The sub-questions are the leading structure of both the research and design projects. Because literature and field work are closely related, they will be presented as an integrated whole through the documentation and analysis, rather than as a separated research paper and field work report.

The cycling trip, through the days and the route, will be used as the structure for the research outcome which will be presented as a travel journal, displaying the findings of the field work integrated with the findings of the theoretical research, and not as distinctly separated results. The time lapse of the full cycling trip will serve as the guiding visual connection throughout the travel journal.

The interviews with humans will be presented as written accounts of the dialogue, elaborated with direct quotes and supported with findings from literature research. The interviews with non-humans will be presented as written diary entries. Lastly, visual documentation is added along the texts to illustrate the interviews and to extract conclusions from all research strategies.

5. Design assignment: a public beacon for the community and flood safety

Similar to the research project, the design assignment addresses the same question: *'What is the role of architecture in perceiving a sense of safety in Dutch river landscapes?'* but approaches it from a different angle, starting with the role of architecture. The research outcomes firstly lead to design requirements formulated in the design brief (architecture should establish a sense of safety), secondly to the selection of the design location (it is located in the Limburg river landscape), and thirdly provides a lens through which we understand the relation between users, landscape and sense of safety.

Following the problem statement, the relationship between individuals and the landscape is lost due to centralized water management. A social scale between the individual and the government is the community. Therefore the design will be a public building that reinstalls the relation with the landscape. It should do so by providing a sense of safety in daily life, and actual safety in times of disaster. This means that in safe times, the building is actively used by the community and stimulates awareness about the river conditions and risks in the landscape. The daily function of the building might be the city hall, a library or a local school. In times of disaster, the building functions as a safe haven where people can flee to and where they find and support each other physically and emotionally.

Furthermore, to understand the role of architecture in perceiving and establishing a sense of safety, the design is required to not only address the building but also work on its territory. In unison, building and territory are serving together in providing the sense of safety. The architecture serves as the lens through which one perceives a sense of safety from the landscape, and the landscape in turn serves to articulate the role of architecture in creating this sense of safety.

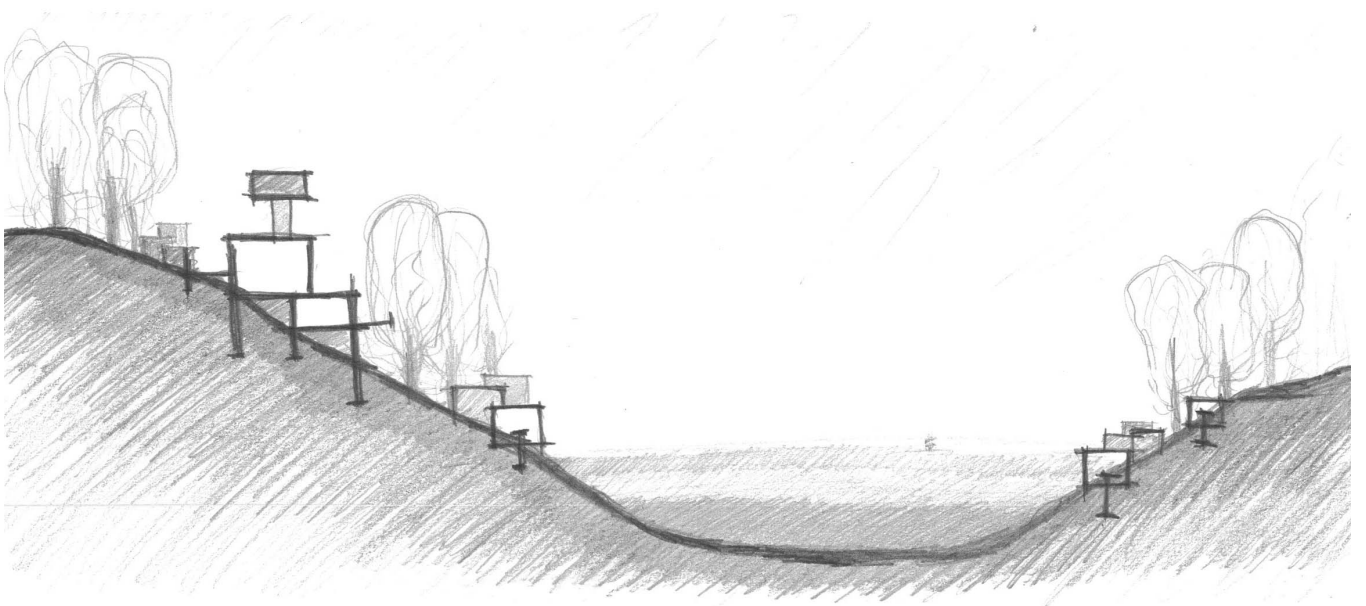


Image 6 - Sketch of preliminary design vision. The section shows the significance of height in relation to the river.

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