

DEFENSIVE LANDSCAPES_

An abstract architectural drawing in shades of gray. The central focus is a defensive structure, possibly a bunker or a fortification, built on a hillside. The structure consists of several vertical, rectangular blocks of varying heights, with a central, taller section. The hillside is depicted with curved, concentric lines, suggesting a circular or semi-circular layout. The background is filled with a grid of thin lines and scattered small circles, creating a technical or architectural atmosphere. The overall style is minimalist and geometric.

Graduation Report

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EXTREME Graduation Studio
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FOREWORD_

The graduation project started from an interest in extreme architecture. With this assignment I saw a new opportunity to try something new. My interest of the topic came from the Dutch Waterline, a project that the Dutch used as a defence strategy during the world wars. From this strategy the interest in landscapes as defensive typologies came.

Recent tensions in the East have led to an increased military activity within Europe. As a result, a lot of Lithuanian landscapes, such as forests, have been destroyed to meet this new militarized European territory. Landscapes like these are often treated as obstacles within military and infrastructural planning. Detaching the users van its landscape.

This project seeks to understand defence as a spatial and ecological system, by looking at historical and biological models of landscape-based defence systems.

This report does not search for definitive answers, but to explore a position in design from which landscape can be read as an active typology in defence.

ABSTRACT_

This project investigates how landscape can be re-introduced as a defensive typology. Positioning landscape as a form of power and control rather than a passive background.

The theoretical framework, that goes in depth about defence theory, historical landscape-based defence strategies, and biological defence mechanisms, function as the backbone of this project. The research focuses on the Lithuanian landscape, where forests, wetlands, and water networks historically played an important role in territorial defence but are currently underused or treated as obstacles within contemporary military planning.

The project aims to develop a military base design that integrates landscape as defensive typology. The project positions architectural design as a mediator between landscape systems and contemporary defence needs, proposing an alternative approach to military architecture that is embedded within the landscape.

INTRODUCTION_

PROBLEM STATEMENT

Lithuania has always been a strategically important territory within the European landscape. Its geopolitical position in the east of Europe and its close proximity to Russia makes it a crucial location within the NATO borders. Recent tensions in the East have led to an increased military activity within Europe. As a result, a lot of Lithuanian landscapes, such as forests, have been reformed to meet this new militarized European territory (Jakucionis et al., 2019).

RELEVANCE

This is not something new, as Pearson et al. (2010) mentions in their book 'Militarized Landscapes', the destruction of farmland, forests, and villages is very common during conflict. They also mention that militarization is a process rather than an event. A process that leaves a mark on, societies, economies, cultures and political structures. They state: "Most military bases and ranges are marginalized, if not totally obscured, within national narratives. Yet the impact of bases and ranges on landscapes is arguably of longer duration and spread over much larger areas than that of many battlefields, where militarization is a relatively confined experience temporally and geographically." (Pearson et al., 2010).

This hints to the fact that landscapes are not just a setting for military activity, but also an operational medium. One that continues to perform long after conflict has passed. This perspective shows defence is not

only physical objects, but is also something embedded within the landscape itself.

A defensive landscape is understood through engineered infrastructures and constructions, while its defensive potential that is already present in the landscape is often overlooked. Throughout history, landscapes have long functioned as a meaning of defence. They have often been transformed to enhance their defensive capacities, like rivers and mountains as natural borders, or forests for movement and visual restrictions.

Lithuania's territory and its borders have been formed by these landscapes. The country is characterized by extensive forests, wetlands and river systems. Landscapes that historically also functioned as natural barriers. Yet their role as potential defensive typologies remains underexplored within the architectural and landscape scene.

OBJECTIVE AND MOTIVATION

The objective of this graduation project is to explore how architectural and landscape design can reinterpret defence as a spatial and ecological. My motivation mainly comes from the interests in natural defensive landscapes, particularly the Dutch Waterline.

RESEARCH AND DESIGN QUESTIONS

This research proposes to view the landscape as a defensive typology. And questions how existing ecological systems could be reinterpreted to perform defensive functions. The research will propose that defence can emerge from intelligent alignment of ecological processes

and spatial design. The question this research asks is: "How can landscape and ecological systems in Lithuania operate as defensive typologies, positioning nature itself as a form of protection?"

To answer this research question, this paper will be addressing three sub-questions:

1. What natural landscapes and ecological systems are present in Lithuania, (and how do they shape accessibility and territorial conditions?)
2. How have humans historically used natural landscapes and ecological systems for defence?
3. How do animals use landscape conditions as defensive strategies and how can these be understood through biomimicry?

SCOPE

The scope of this project is to design a military base that can accommodate and protect its users. While the project acknowledges the broader territorial and urban context of the site, the main focus remains architectural.

The project positions itself between architecture and landscape, exploring how buildings, landscape and environmental systems can operate together as part of a defensive typology. The design will stay architectural without aiming to resolve military or political strategies. The project will treat these conceptually, rather than in detail.

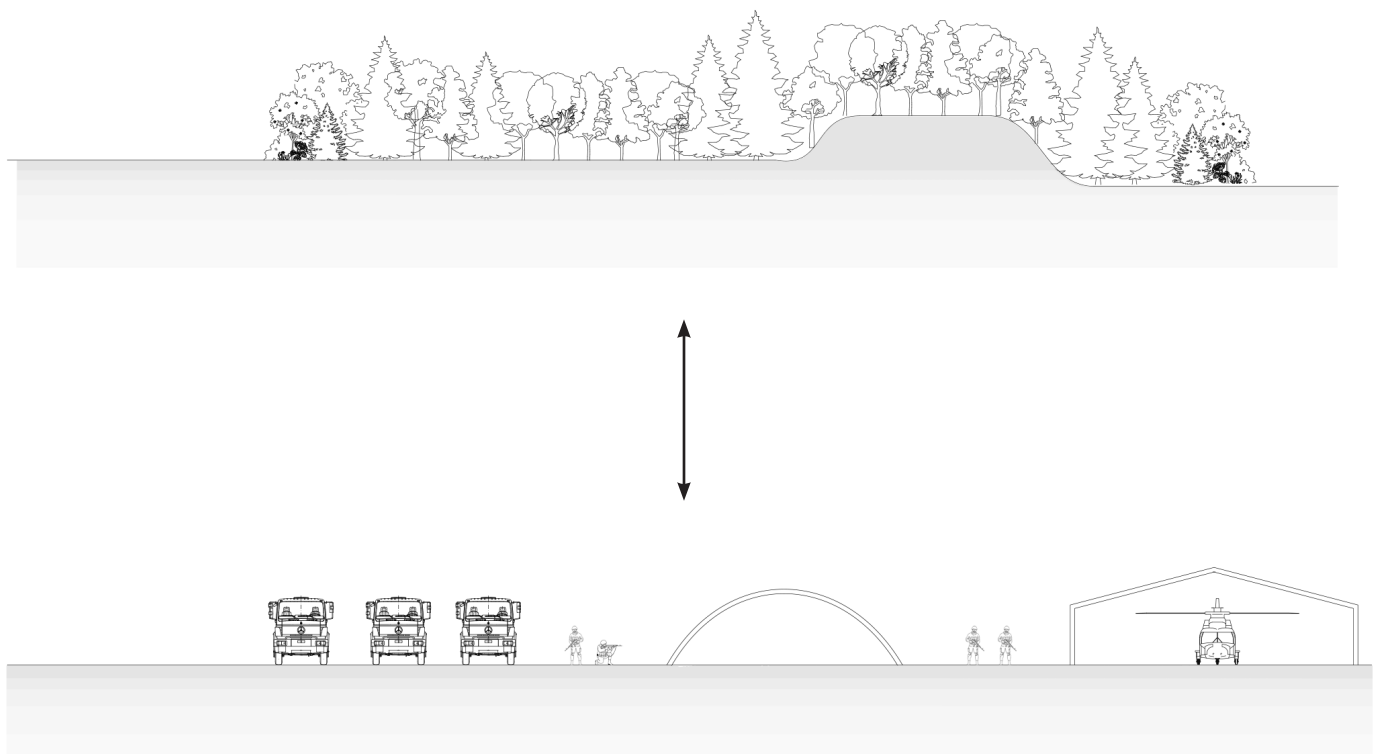


Figure 1: The detachment of the landscape by militarization.

APPROACH_

METHODS

This graduation project is structured by using theoretical framework and design to propose a project.

At the current stage of the project, the methodology focuses mainly on the theoretical framework. This framework forms the foundation for later design decisions and consists of three perspectives: theory, history, and biology. Together, these perspectives provide the information needed to form the project's synthesis and design brief.

Later-on the theoretical framework will be made site-specific. Design will then function as a research tool, transforming theory into design. These methodological components will be further developed and documented as the graduation project progresses.



Figure 2: Research and concept for design.

PLANNING

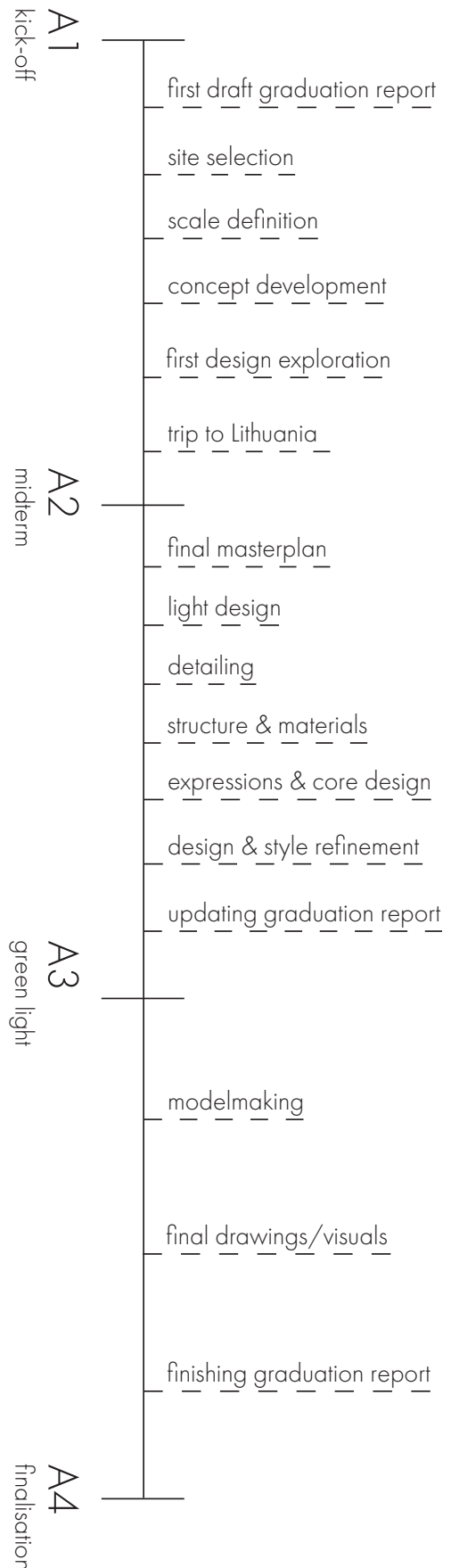


Figure 3: Diagram of planning.

THEORETICAL FRAMEWORK

The theoretical framework consists of theory and three main chapters which contribute towards the research question, each addressing one of the sub questions.

I. THEORY

In this chapter it is demonstrated how defence and power is understood as spatial and ecological processes rather than a military construction. Because in order to see landscape as a way for power and defence, they need to be seen as processes. It provides the basis for examining how natural landscapes and ecological systems can operate as defensive typologies.

Landscape is often understood as a setting in which political and military actions take place. However, within geographical and spatial theory, landscape can be seen as an active system composed of terrain, material conditions, and ecological processes that alter movement, visibility, and access (Woodward, 2004). Pearson et al. (2010) describe military landscapes shape depending on how conflict unfolds, meaning space is not neutral but structured and experienced differently depending on its organization.

In this research, landscape is understood as the spatial and material configuration of terrain, vegetation, water systems, and human intervention. Ecological systems are understood as the dynamic processes that operate within these landscapes. While landscape provides the spatial framework, ecological systems describe the

processes that continuously modify that framework.

Power is not always a physical force, it can also be a form of control. As described in The Handbook of Tyranny (2022), spatial arrangements can show control by limiting vision and directing behaviour. Power, in this sense, is created through the organization of space and its environmental condition. Landscapes can guide or limit movement, turning landscape and territory into a mechanism of control.

Defence is a form of power that can be created when landscapes are used as a defensive typology. These landscapes restrict movement or provide concealment, reducing exposure. Pearson et al. (2010) describes militarization as a process that reshapes landscapes over time, while Woodward (2004) argues that military activity operates through space. Defence therefore consists of spatial conditions produced through the interaction of power and landscape.

Understanding defence as a spatial and ecological outcome allows landscapes to be read as defensive typologies. Natural systems such as forests, wetlands, and water systems can function as protective mechanisms by shaping how force is applied, absorbed, or redirected over time.

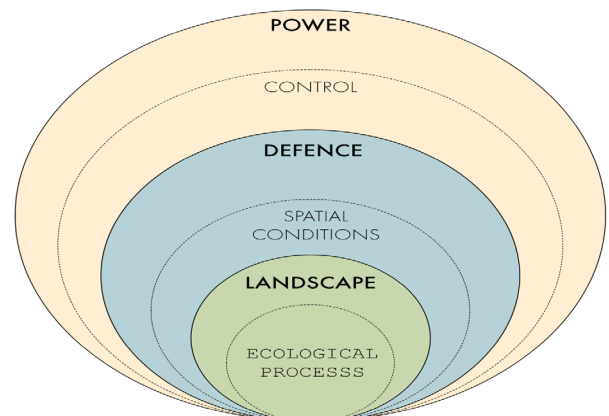


Figure 4: The theory of landscape as power.

II. CONTEXT

Lithuania is located in north-eastern Europe and covers an area of around 65,300 km². It shares borders with Latvia, Belarus, Poland, and Russia's Kaliningrad region and has a Baltic Sea coastline of approximately 90.7 kilometres. In 2019, Lithuania had a population of roughly 2.8 million people, with around 70% living in urban areas (Kalinauskas et al., 2021).

The landscape is largely characterized by flat clay plains, sandy lowlands, elevated plateaus, river valleys, moraine ridges, lakes, and coastal landscapes. Forests account for roughly one-third of the land area, while nearly 12% is designated as protected land (Kalinauskas et al., 2021). Urbanized zones represent only a small portion of the total area.

Lithuania's landscape was mainly formed during the last Ice Age. While elevation differences are limited, they strongly influence drainage patterns and soil conditions. Ivaviciute (2020) notes that these glacial landforms continue to structure ecological processes.

Forests cover around 33% of Lithuania's land area and represent one of its most persistent ecological systems (Ivaviciute, 2020). Kalinauskas et al. (2021) describes Lithuanian landscapes as characterized by varying degrees of openness and enclosure, influencing perception, orientation, and movement through space.

Lithuania is located within the Baltic Sea basin and includes rivers, lakes, a lagoon, and a coastline. Lakes occupy approximately 884.6 km², while rivers extend over 332

km². Large rivers such as the Nemunas divide the landscape into zones and influence settlement patterns and accessibility. The Curonian Lagoon covers approximately 1,580 km², of which about 413 km² lies within Lithuanian territory (Ivaviciute, 2020).

Most wetlands in Lithuania are former lake basins and are classified as low moors, transitional moors, and bogs. Low moors account for approximately 71% of the wetland area, bogs 22%, and transitional moors 7%. Between 2004 and 2019, 35% of wetlands disappeared due to natural processes, climate change, and human activity (Ivaviciute, 2020). From a territorial perspective, wetlands function as zones of resistance due to their limited accessibility.

Military practices have increasingly shaped the Lithuanian landscape following the shift toward NATO-integrated defence policy. Šlekys (2020) describes the development of training grounds and military bases involving forest clearance and land restructuring, producing landscapes aligned with national defence policies.

Throughout history, the Lithuanian landscape has continuously changed. Early changes were tied to survival and defence, while later transformations resulted from anthropogenic reforms such as collectivization and post-1990 restructuring (Ramanauskas, 2011). These processes continue to lead to the loss of ecologically rich landscapes (Ramanauskas, 2011).

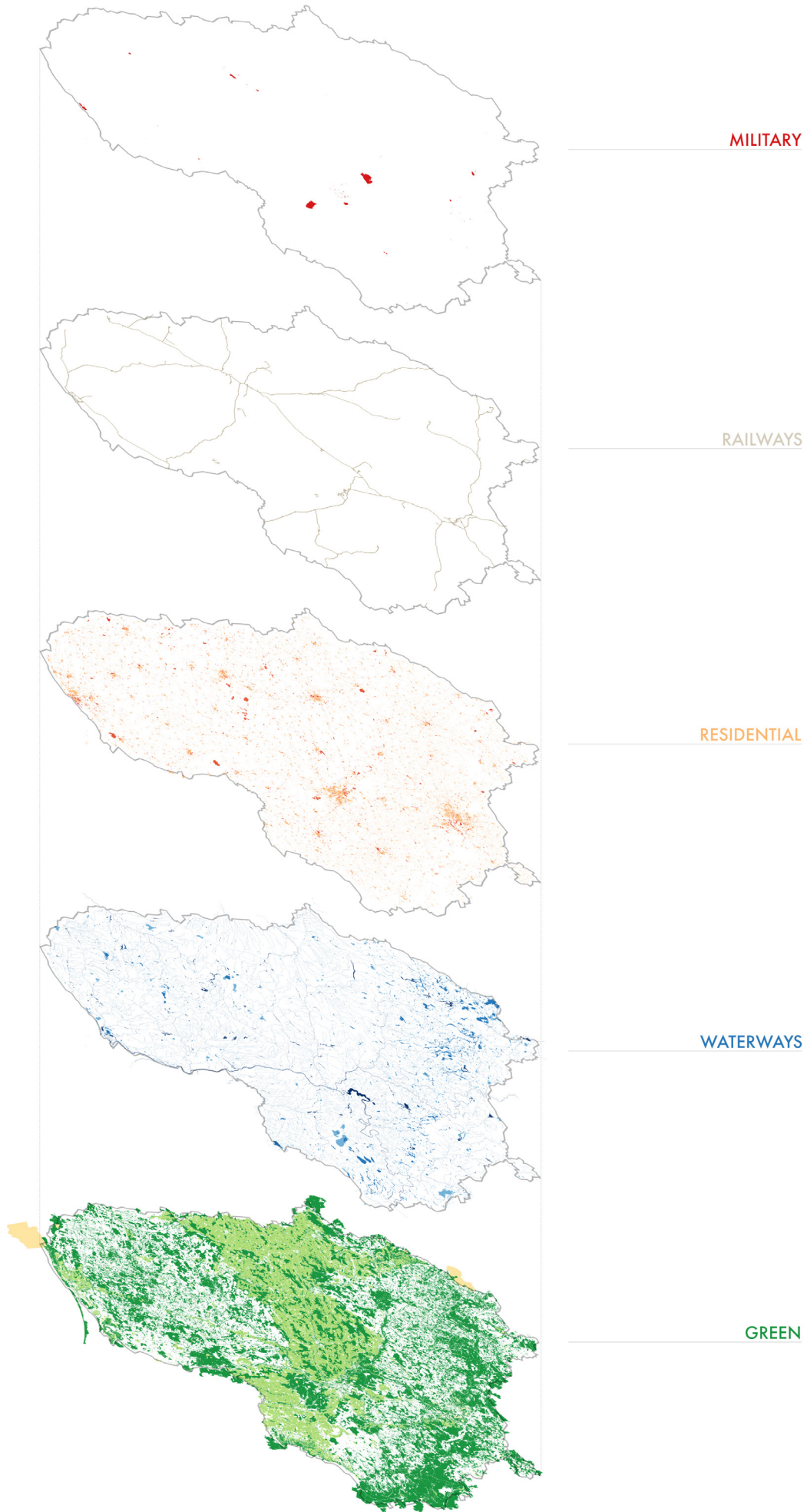


Figure 5: Category maps of Lithuania.

III. HISTORY

In most of human history, defence was inseparable from landscape. Humans relied on rivers, wetlands, forests, and elevation for protection (Baker et al., 2013). Before modern military technology, landscape functioned as an active defensive system capable of delaying or preventing attack. Defence operated through space and was shaped by landscape rather than existing independently from it (Woodward, 2004; Pearson et al., 2010).

Defence strategies were embedded within everyday landscapes and required environmental knowledge. As warfare became industrialized, a growing detachment between defence and terrain emerged (Keegan, 1993).

In medieval Europe, defence rarely relied solely on buildings. Defence strategies were distributed across the landscape and relied on rivers, wetlands, and forests. Settlements were positioned to limit access and maximize natural visibility

advantages (Baker et al., 2013). Wetlands and rivers were often modified, and in some cases deliberately flooded, transforming large territories into defensive barriers.

The Dutch Waterline demonstrates how controlled flooding transformed landscape into a defensive system. Defence was achieved by breaching dikes and regulating water levels, embedding defence within agriculture and water management (Brand & Brand, 1986).

Leonardo da Vinci's notebooks provide a theoretical record of landscape-based defence. He proposed redirecting rivers and designing fortifications responsive to topography, describing hydraulic systems capable of flooding enemy forces through coordinated releases of water (Da Vinci, 1490/1888; 1490/1955).

Over time, defence shifted toward technological weaponry and industrial warfare (Keegan, 1994). This reduced the role of geography in strategic thinking. Revisiting historical defence landscapes allows reconsideration of landscape systems as active defensive agents.



Figure 5: Collage of defensive water throughout history.

IV. BIOLOGY

Animals survive by adapting to their environment rather than confronting threats directly. Many defensive strategies emerge from interactions with landscape and material conditions.

Camouflage is a common defensive strategy that minimizes exposure through colour, pattern, and shape (Peplinski et al., 2021). It functions as a first line of defence and is energetically efficient. The European roe deer remains motionless to blend into its forest environment, while ground-nesting birds rely on concealment using local materials (Evans & Schmidt, 1990). Other species use resemblance to break up their outline, demonstrating how defence is produced through landscape conditions.

Some animals actively reshape their environment. Hansell (2005) describes these constructions as artefacts. Beavers manipulate water levels to create flooded zones that restrict access, embedding shelter within a maintained landscape system. Other species construct burrows or mound systems through collective activity, where defence emerges from spatial complexity rather than a single barrier (Hansell, 2005).

Many species distribute functions across space, reducing vulnerability through spaced-out organization (Evans & Schmidt, 1990). Biomimicry describes learning from such biological systems rather than replicating their appearance (Benyus, 1997). In the context of defence, this suggests systems based on concealment, terrain modification, and spatial distribution rather than physical or technological dominance.



Figure 7: Collage of landscape and ecological systems as defensive typology.

RESULTS_

RESEARCH

The natural landscapes of Lithuania are not used to their full potential. These natural systems and processes have historically functioned as defensive strategies, while now they are more seen as obstacles. This chapter reintroduces these strategies as actual defensive typologies and explores how they can be translated into design.

Water systems can be found all over the country. These waterbodies, like rivers and wetlands, act as natural barriers. These barriers can delay and redirect movement. Historically, this was also a common strategy and were even used as an active defensive typology, like the intentional flooding of wetlands. Even the local beavers provide a biomimicry example. They could construct dams that can alter the landscape and its accessibility (Hansell, 2005). By reintroducing these strategies into design, like controlled waterways and adaptive floodable zones, the landscape and ecological systems can play as an active defensive typology again.

Forests are one of the most common ecological systems in Lithuania and could be used, instead of removed. These forests create terrain that slows and redirects movement (Kalinauskas et al., 2021), a principle already demonstrated by animals for a long time (Evans & Schmidt, 1990; Hansell, 2005). Like forests, vegetation networks and elevation can be designed to serve as a spatial and visual control mechanism. This concealment shows how important visual complexity is and what role the ecological systems have within the landscape and can

serve as a defensive typology.

But these systems are not static. Seasonal changes create certain time-related conditions. For example, the wetlands will flood more during the spring because of rain, which can restrict access to certain areas. Or rivers that will freeze during winter, could now give access instead. Animals also synchronize their behaviours with these seasonal conditions, using time as part of their defensive strategy (Evans & Schmidt, 1990). Designing landscapes that respond to these conditions can introduce a layered defensive typology.

Current modern defence strategies increasingly divide the landscape. With the expansion of training areas and military bases, the landscape is often ignored or destroyed. Within the Lithuanian context, this often results in deforestation. This reflects the priorities of contemporary military policies (Šlekys, 2020). However, these policies clash with their historical use, because they are often necessary and show the relevance of landscape and its ecological systems for defence. Finding a balance between modern military requirements and natural systems allows for a modern take on an integrated defensive typology. This showcases that landscapes can retain both ecological and protective value while accommodating operational needs, like the military.

All these typologies and strategies show that Lithuanian landscapes can operate as a multi-layered defensive system. Each typology demonstrating how terrain, vegetation, water, and time can be a form of power and defence.



LANDSCAPE



SEASONAL



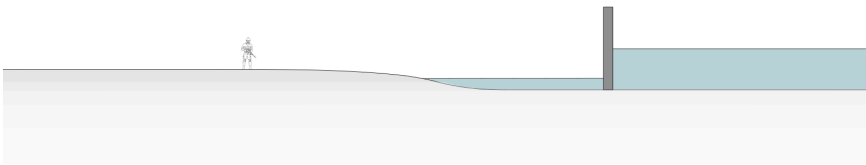
BIOMIMICRY



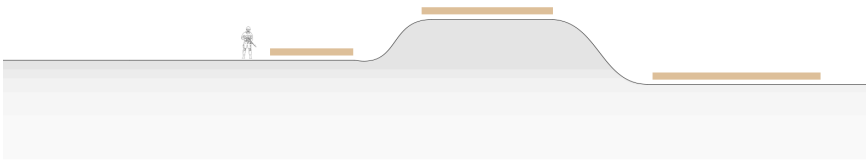
SPACED OUT



FOREST BARRIERS



CONTROLLED FLOODZONES



ELEVATED TERRAIN

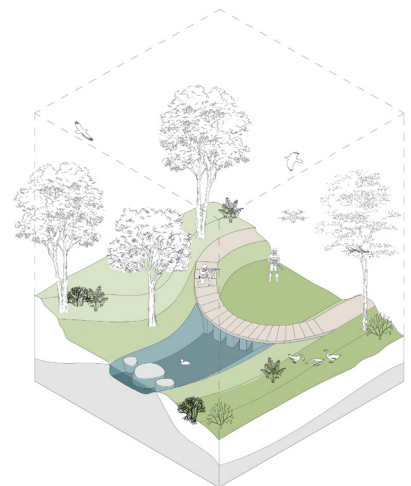
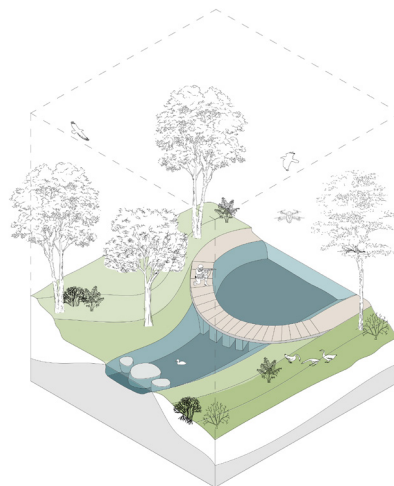
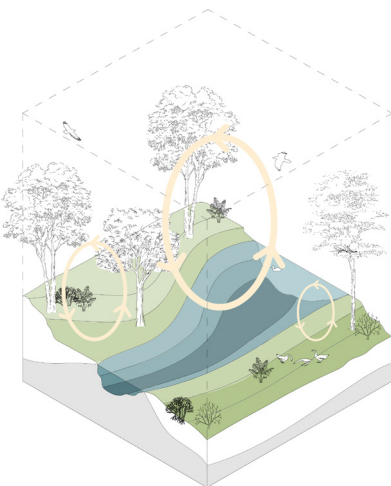


Figure 8: The 3 design principles.

DESIGN

After finishing the research phase, I started the design process by looking back at the photos I took during my site visit. From the research, I already knew that I wanted the landscape to play an active role within the project. The site itself is relatively flat, heavily forested, and intersected by a river with several open clearings.

At first glance the landscape almost feels quiet and empty, but it actually contains many of the qualities needed for territorial control. The forests limit visibility and movement, the river creates a natural barrier, and the few crossings through the area become extremely important.

Because of this, I did not want to place a military building onto the site as an isolated object. Instead, I wanted the architecture to grow out of the landscape and the defensive strategies already present within it.

The first sketches mainly explored underground and embedded structures with a few revealing structures. I was interested in the idea that some parts of the building could be hidden or protected by the terrain itself, while other parts could remain more visible or exposed. This also introduced the idea of hierarchy within the project. Certain structures could be more important and permanent, while others could become sacrificial if needed.

At the same time, I started experimenting with sightlines and visibility. Instead of designing a building that completely reveals itself, I became interested in the balance between showing and hiding.

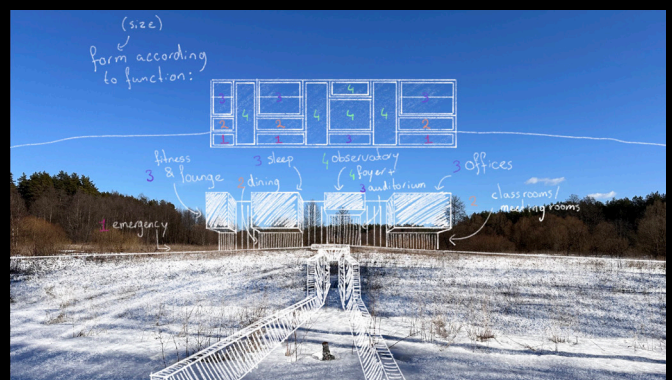
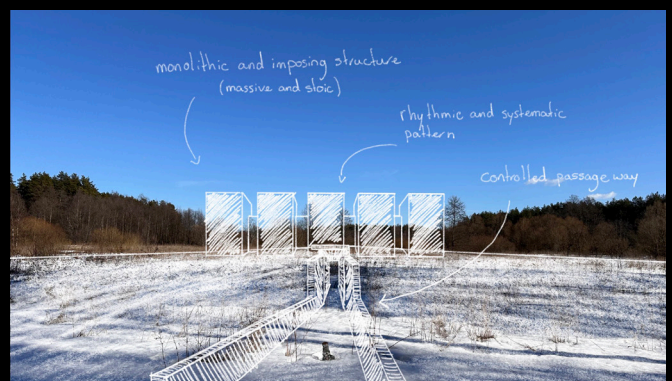
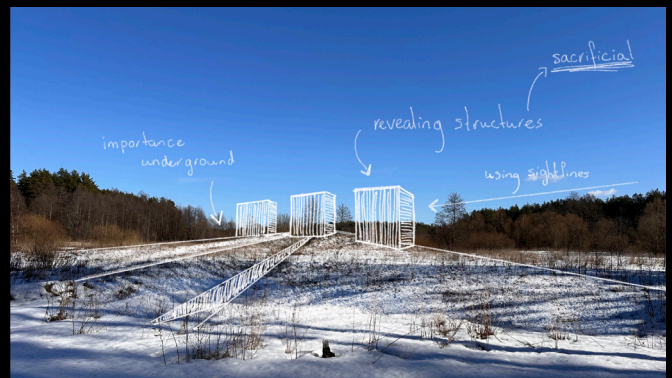


Figure 9: Photo of site and sketches of design and ideas.

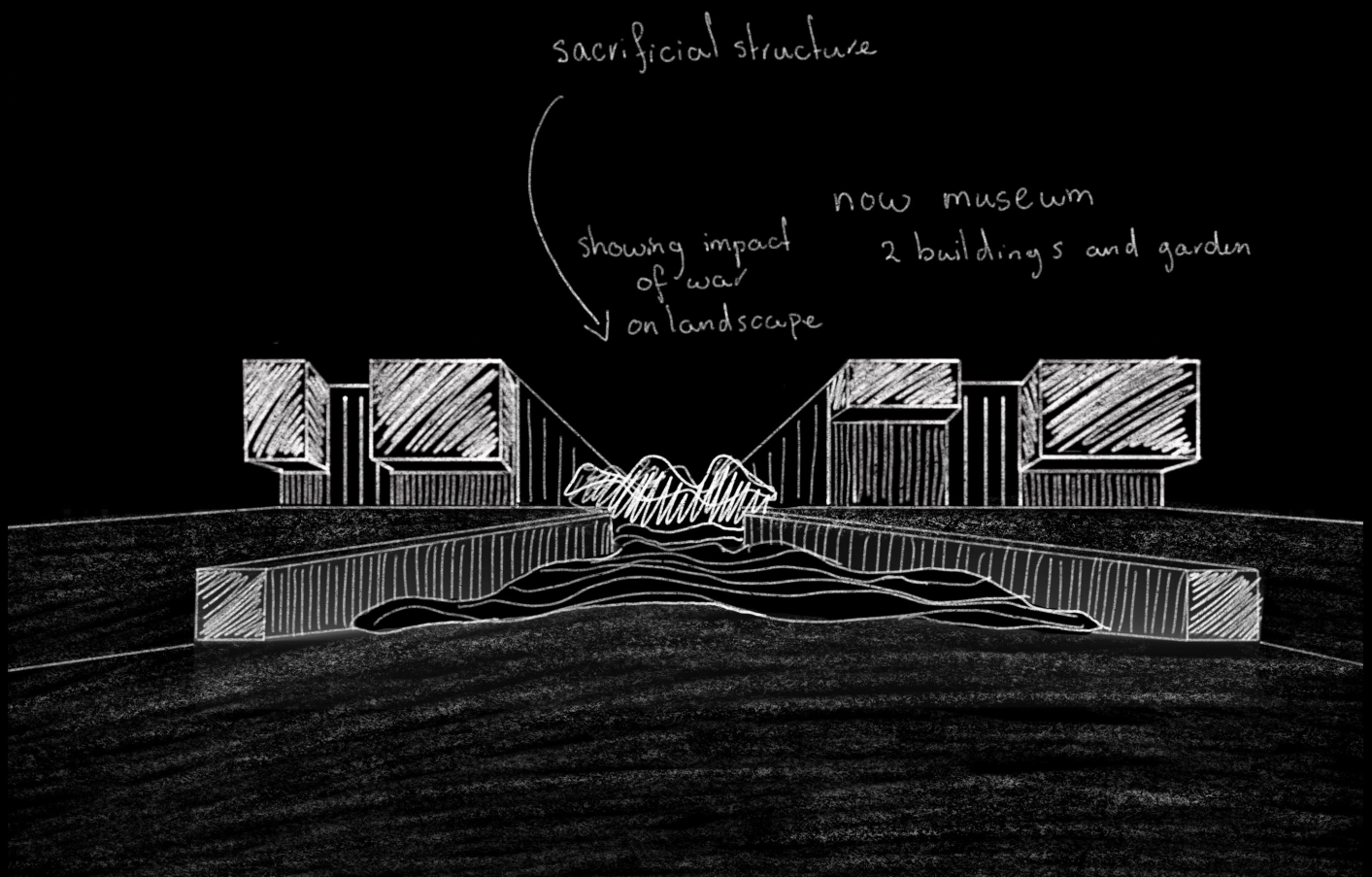
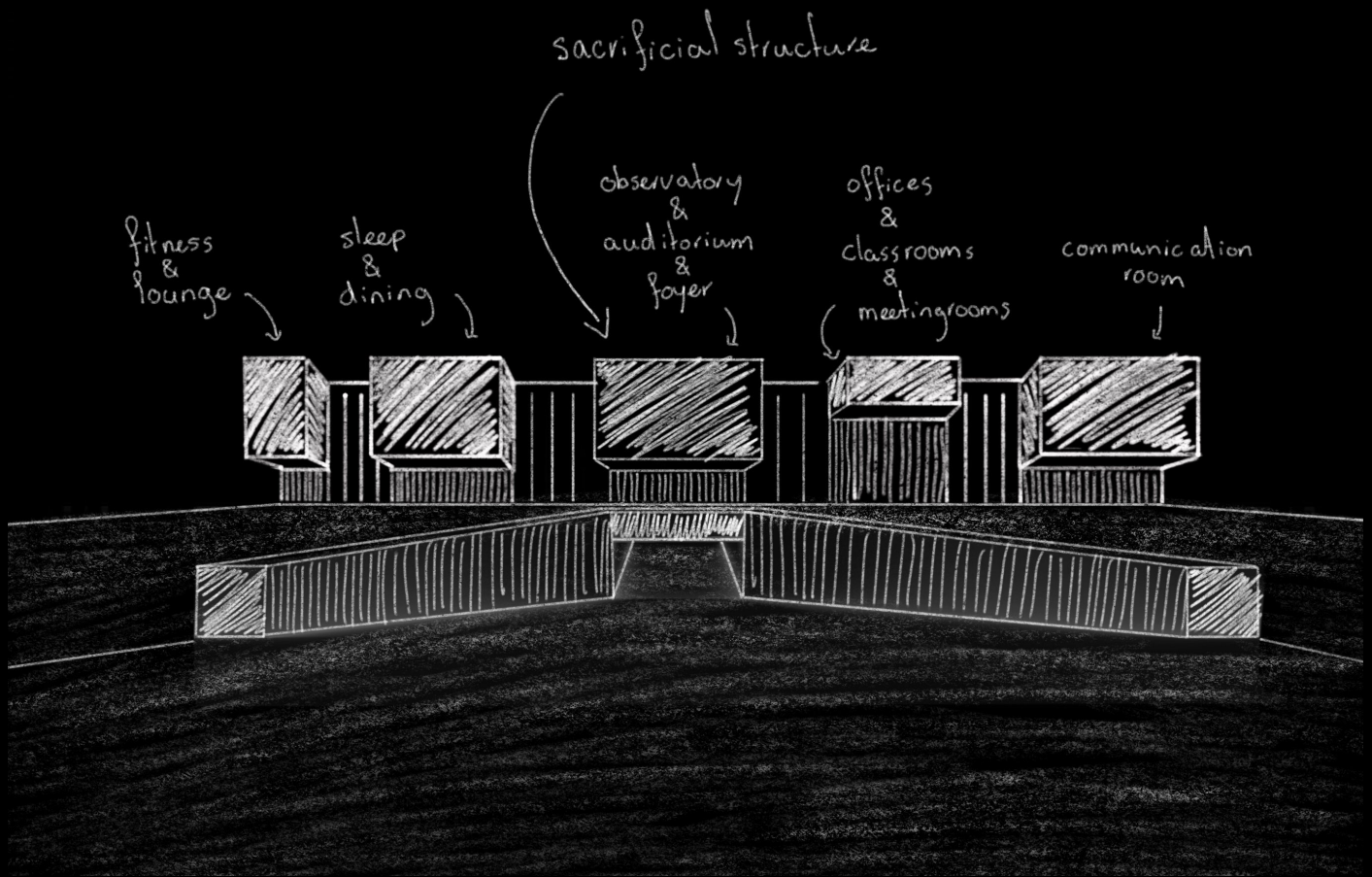


Figure 10: Sketch of a sacrificial structure

The project slowly developed into something that controls the area without fully exposing how it operates.

As the design became more architectural, I started focusing more on the atmosphere and expression of the building. I wanted the architecture to feel monolithic, massive, and stoic, inspired by bunkers, waterworks, and brutalist structures. At the same time, I also wanted the building to feel rhythmic and systematic rather than purely heavy. This balance between monumentality and order became important throughout the project.

The location of the project also strongly influenced the final design. The site is positioned between the Belarusian border and the Lithuanian military base at Rudnikai Military Training Area. During the site analysis, I found that several areas already contained the defensive landscape principles identified in my research, such as forests, water systems, and open terrain. However, this specific location became the most interesting because of the road crossing over the river. Within a large radius, this is one of the only crossings available, with the next crossing located around twelve kilometres away. This makes the route extremely important for movement through the territory.

From this point, the project developed around two major landscape interventions. The first was the floodable tunnel and aqueduct system underneath the road crossing. The second was the introduction of a three-metre-high dike running alongside the river.

The main intervention is the tunnel. Since the site is located relatively close to the Belarusian border, it

was important that access through this crossing could be restricted very quickly. The tunnel can therefore be flooded within minutes through a pumping system located in the basement underneath the river. This transforms the crossing into an active defensive barrier rather than just simply infrastructure.

The dike became equally important within the project. Besides adding protection and elevation, it also allows the floodplains to be controlled more strategically. On the Northside of the river, the dike creates more stable and usable terrain for training grounds and operational areas, which would otherwise remain partially flooded. On the opposite side, the river is allowed to broaden into the landscape, strengthening its role as a natural barrier. In this way, the landscape itself becomes part of the defensive system.

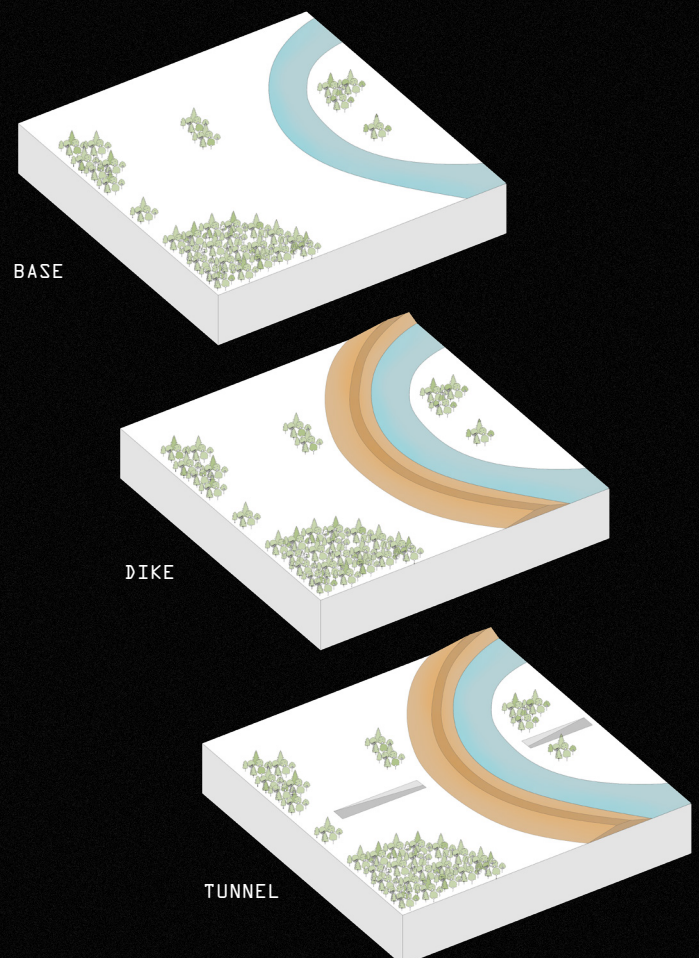


Figure 11: Landscape interventions.

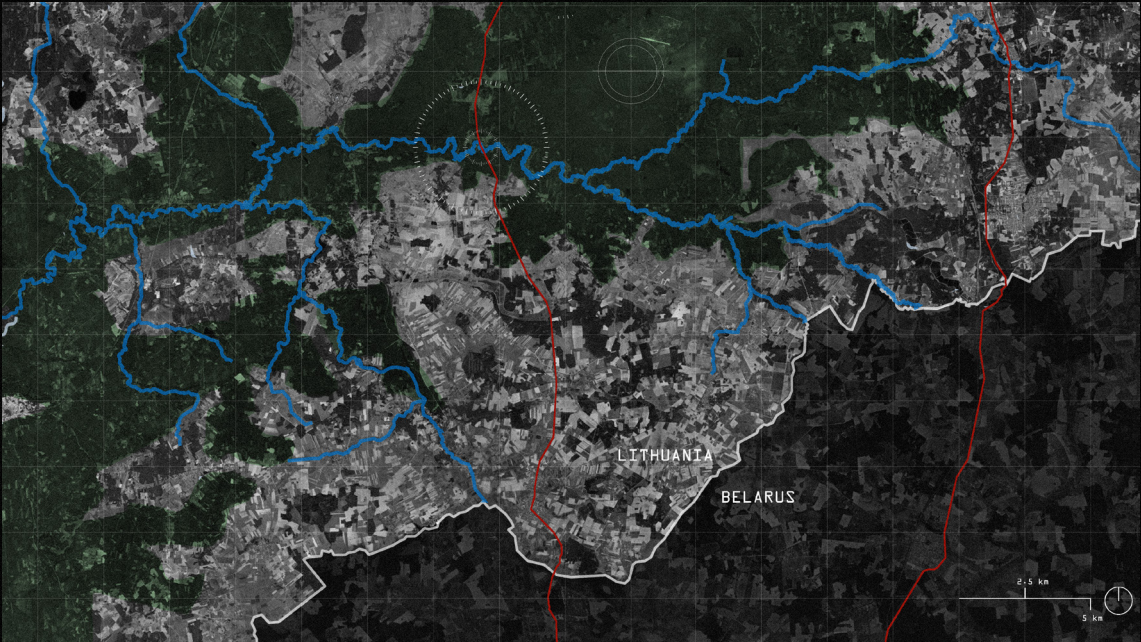


Figure 12: Map showing main roads, waterways and forests.

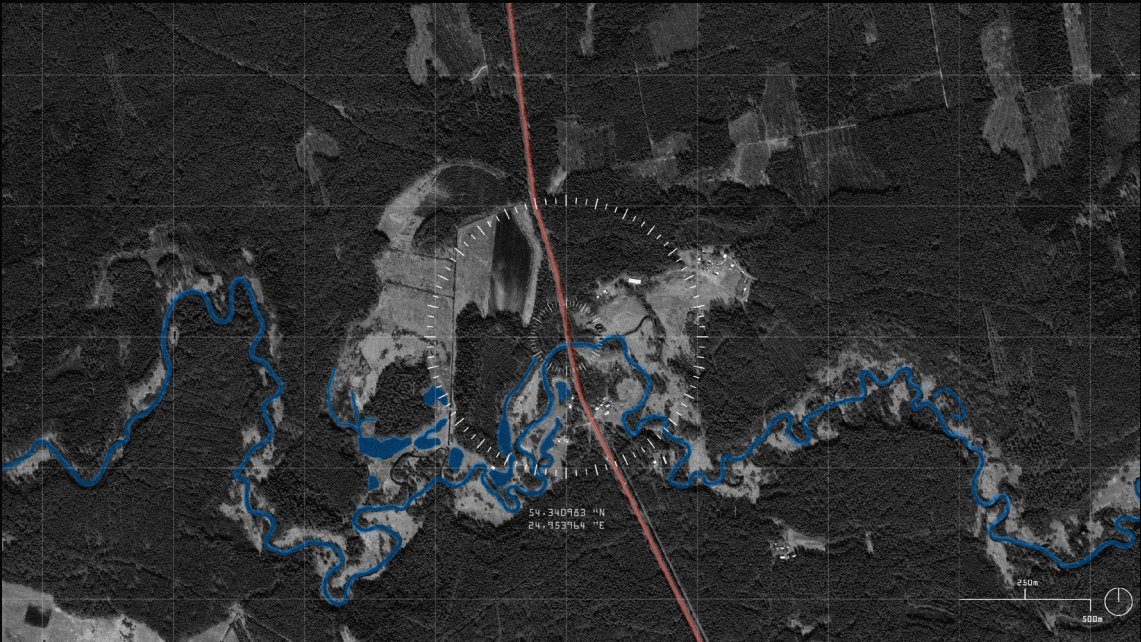


Figure 13: Map of site. Showing the main road and river.

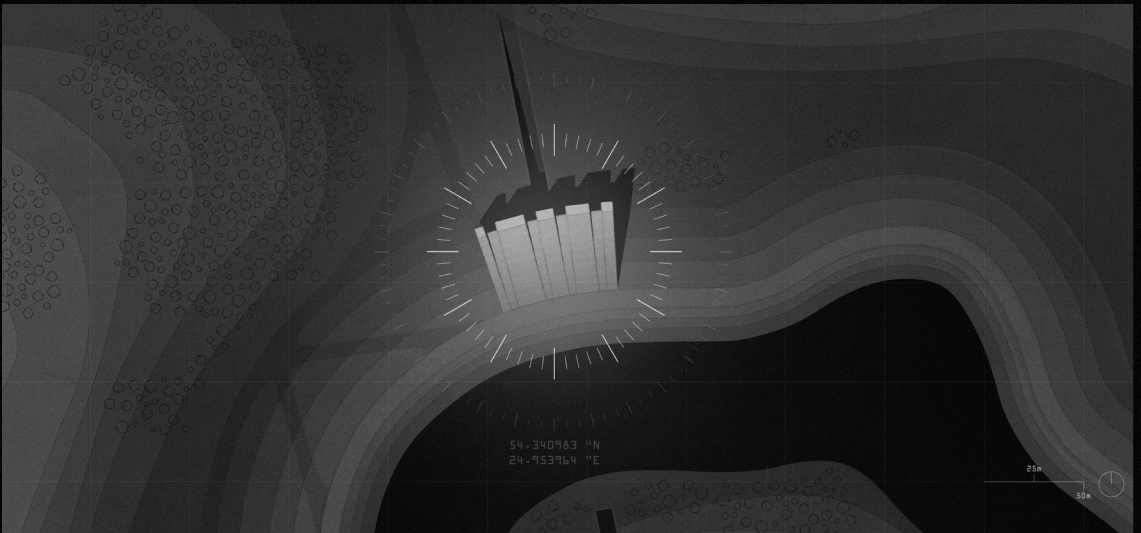


Figure 14: Site plan.

These two interventions eventually shaped the architecture itself. The long linear form of the tunnel extending into the landscape became the basis for the form of the building. The architecture follows these elongated box-like volumes emerging from the landscape. Their dimensions are based on the scale of the tunnel system and follow a proportional rhythm of three metres. Each volume changes size depending on the function it contains. For example, the office space needs a lot of space to host all the people, while the communication spaces can be smaller.

The central volume, which contains the foyer and observatory, breaks this rhythm slightly by starting at 6 metres instead of 3. I wanted this space to feel more open and I wanted the entrance to be visible. The observatory also directly overlooks the road crossing and tunnel entrance, reinforcing the overall idea of territorial control and surveillance.

The orientation of these volumes follows the curvature of the river and the dike. Making sure the building is connected to the landscape. This also became important for the sightline strategy. From the southern side, closer to the Belarusian border, the building becomes more difficult to fully read because the long sides of the volumes remain partially hidden through their positioning. The project is therefore not necessarily invisible, but it avoids fully revealing itself.

This idea also influenced the frontality (eerlijkheid in Dutch) of the architecture. Towards the "allied" side, the building appears more monumental and open, expressing strength and presence. Towards the opposing side, the

architecture becomes more defensive and protected. The dike extends into the roofscape, embedding much of the building into the terrain itself. The architecture therefore changes character depending on where it is viewed from.

As the project developed further, layering became one of the main principles throughout the design. This happens on multiple scales: within the landscape, within the structure, within the programme, and materiality.



Figure 1b: Isometric view of site, pre-conflict.

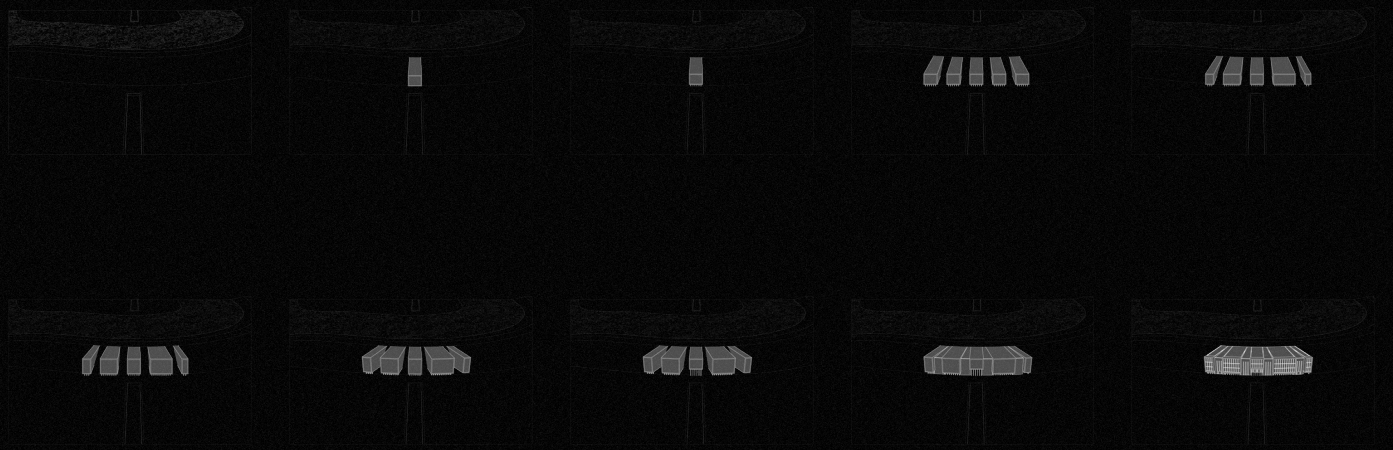


Figure 15: Formstudy of building.



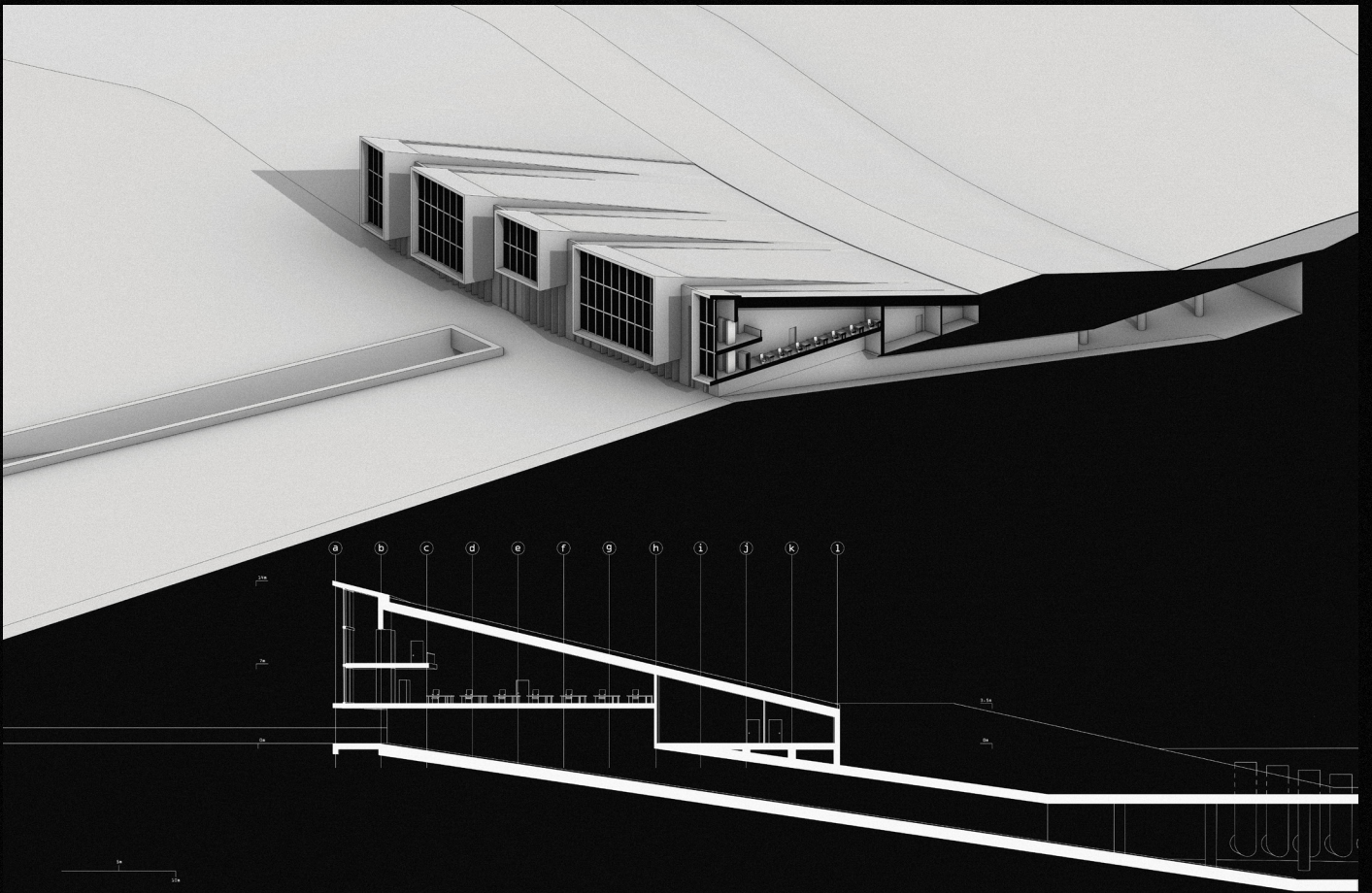


Figure 16: Section A, pre- conflict. 1:200

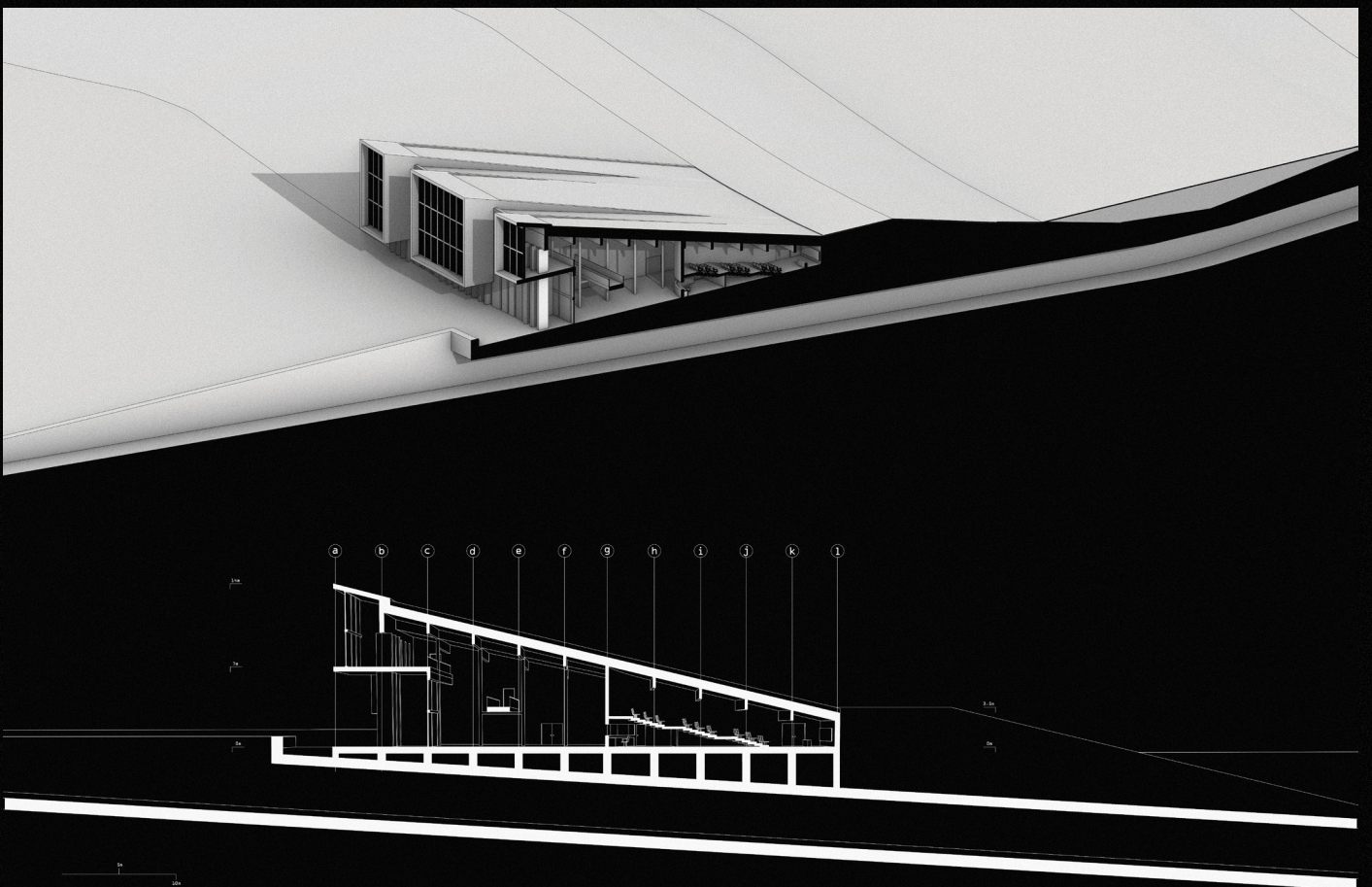


Figure 17: Section B, pre- conflict. 1:200

The programme of the building is organised through public and private layers. The central foyer acts as the public heart of the project and connects to spaces such as classrooms, the dining hall, and the auditorium. From this central space, visitors can only access the more public functions. The more restricted areas, such as offices and communication rooms, are positioned deeper within the structure behind secured access points.

I also wanted this difference between public and private spaces to become visible through the materials. Because the foyer mainly uses wood, the doors leading towards public rooms are also wooden. The secured doors leading towards private spaces are instead expressed as heavy concrete elements. This creates a subtle but clear distinction between accessible and controlled areas.

The organisation of the programme also reflects the surrounding site conditions. The western side of the building mainly contains the more operational and strategic functions, such as offices and communication spaces, corresponding with the training grounds outside. The eastern side contains more domestic functions, including sleeping areas, fitness spaces, lounges, and dining areas. This side also faces nearby farmhouses and

therefore relates more closely to everyday life rather than military operation.

One of the most important ideas within the project is the sacrificial structure located in the middle part of the building. The foyer, auditorium, and observatory are positioned directly above the tunnel and aquaduct system. If the tunnel ever needs to be destroyed to prevent movement through the area, this central structure would collapse with it. Instead of avoiding destruction completely, the project accepts it as part of the architecture itself.

This idea later led to the post-conflict scenario of the project. Once the tunnel is destroyed, the building loses its original purpose as a military control point. The architecture can then allow the transformation into a museum, focused on the relationship between war, landscape, ecology, and destruction. The damaged structure itself becomes evidence of these themes and becomes part of this garden of remembrance. In this sense, the building physically carries the consequences of its own purpose.

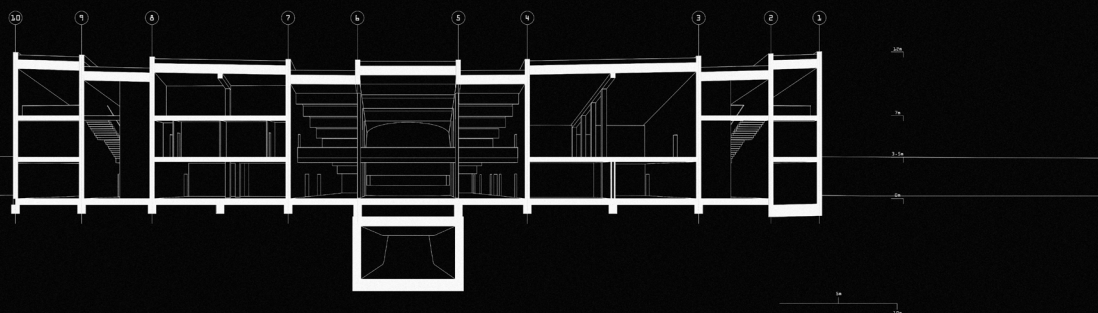


Figure 18: Perspective section C, pre-conflict. 1:200

PRE-

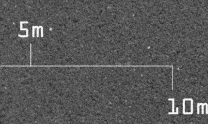
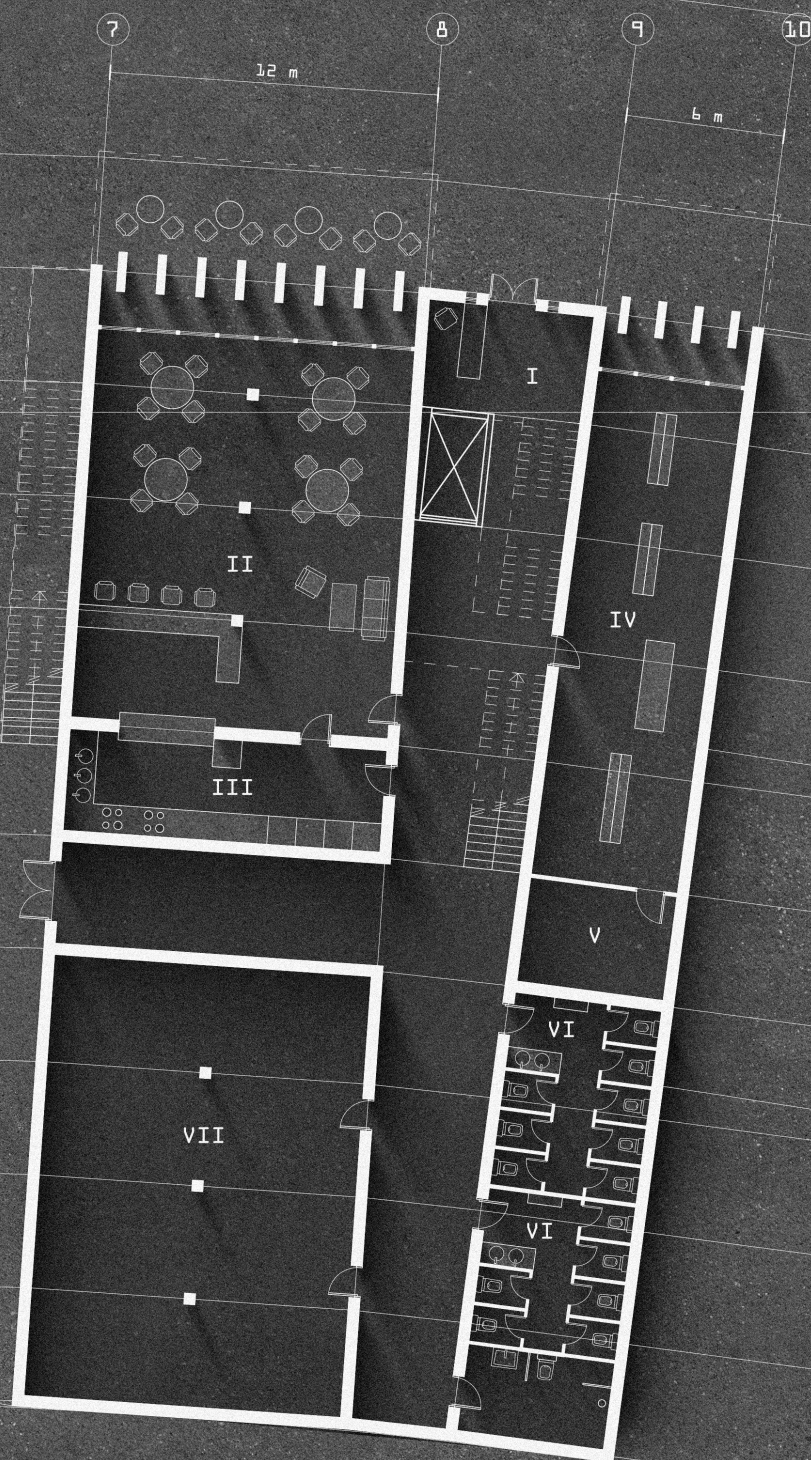
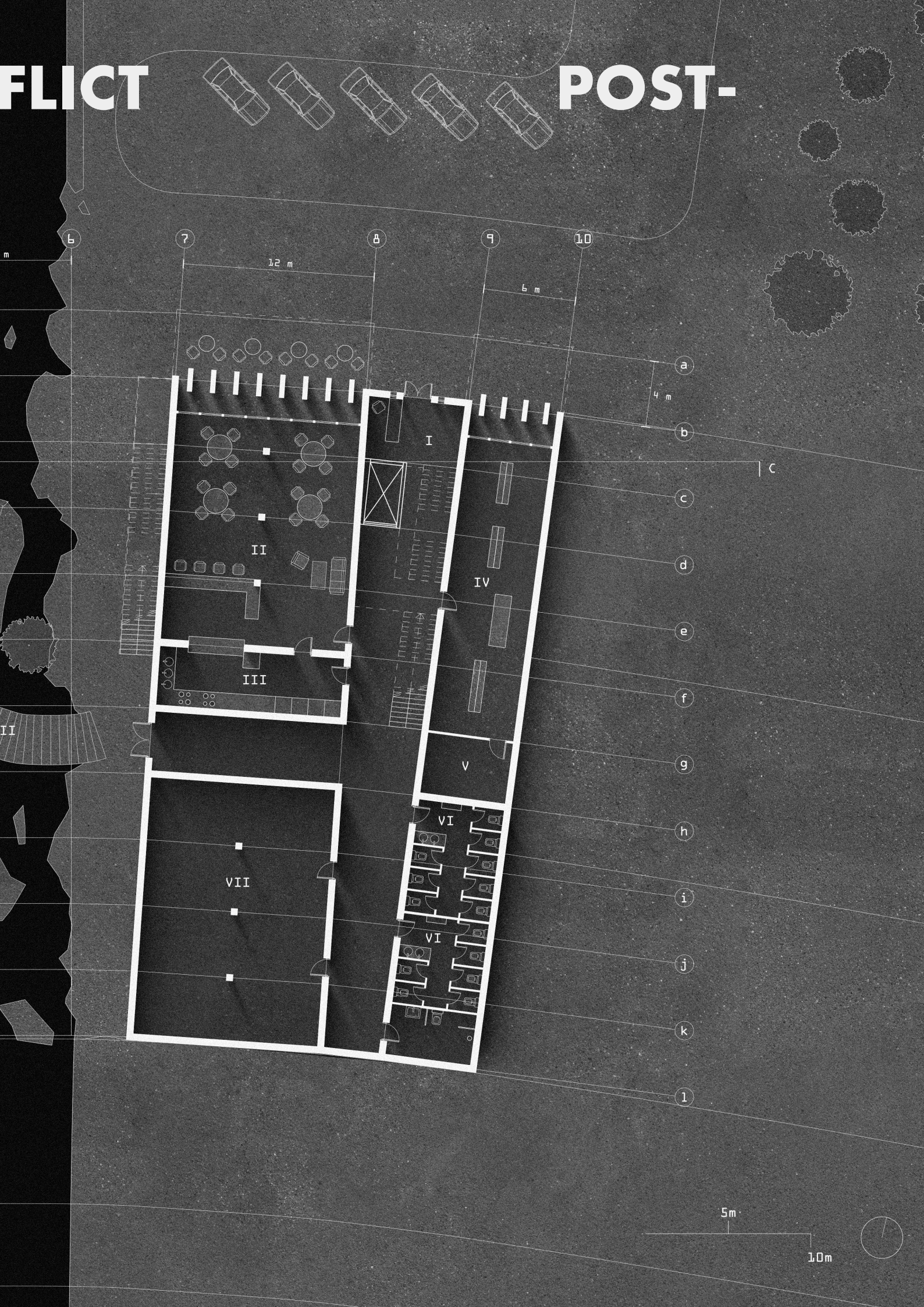
CON



Figure 19: Floorplan ground floor pre- and post conflict. 1:100

FLICT

POST-



PRE- CONFLICT

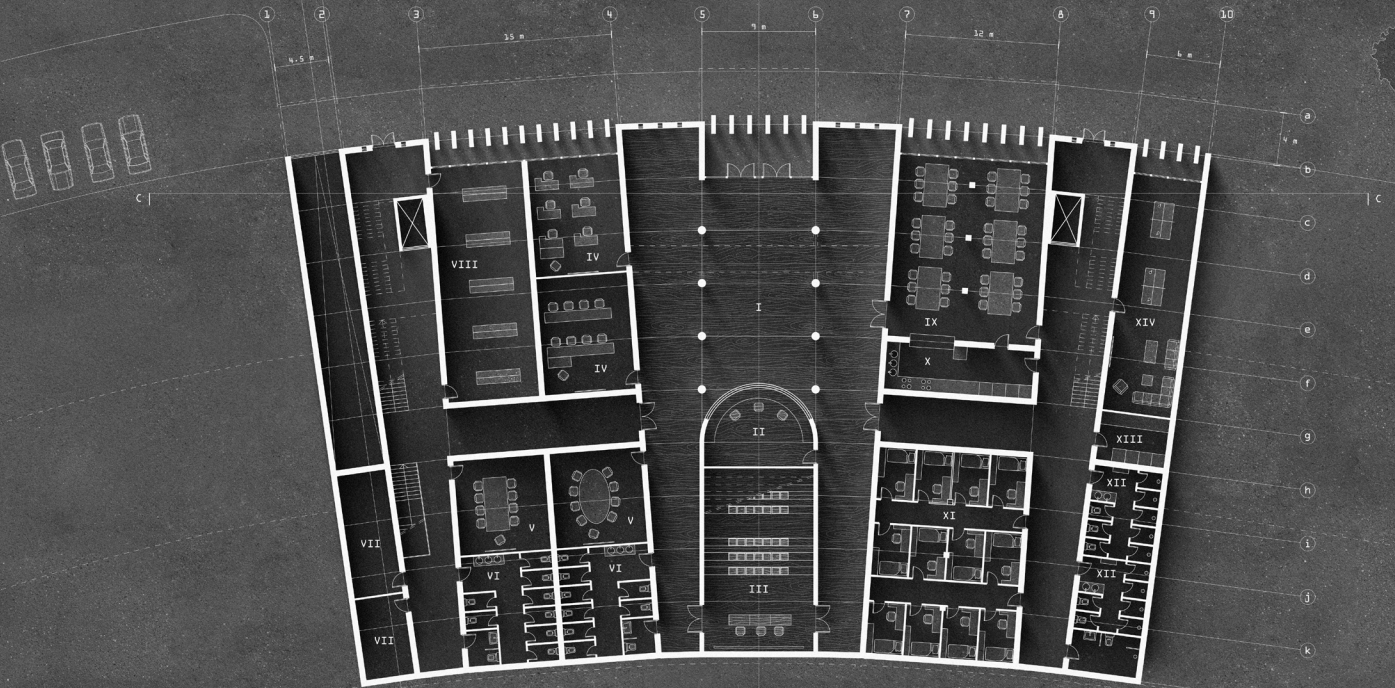


Figure 20: Floorplan ground floor, pre- conflict. 1:200

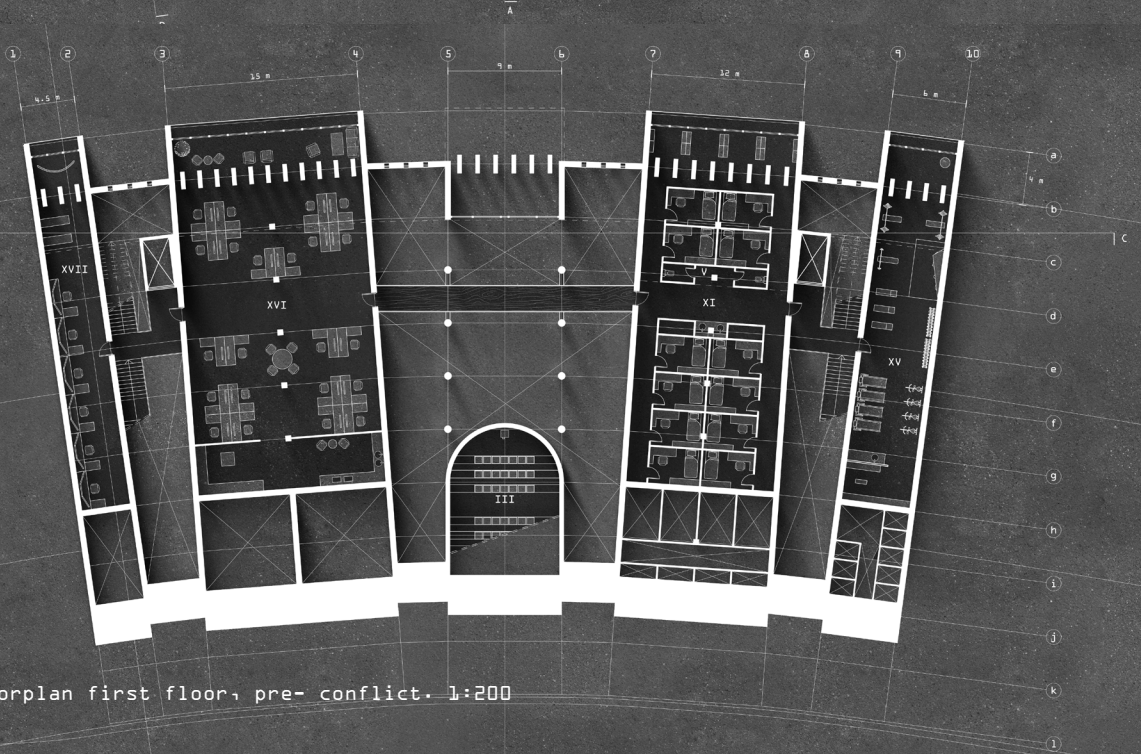
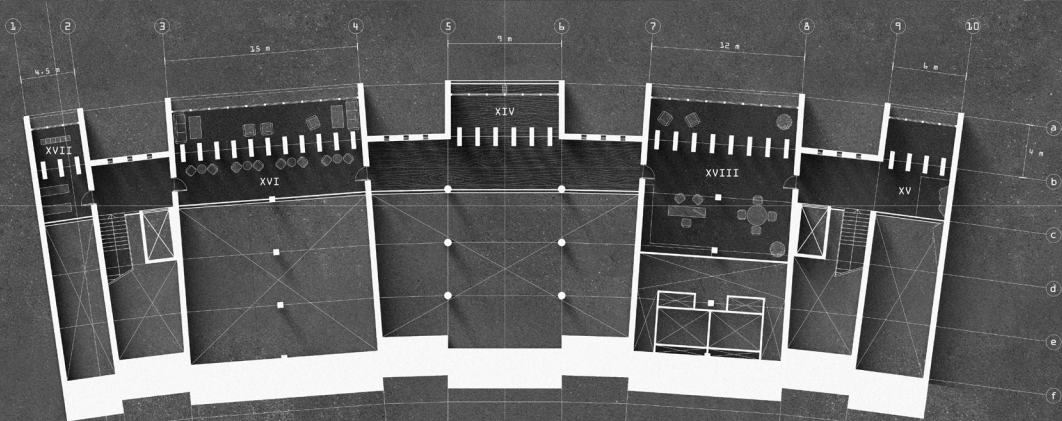


Figure 21: Floorplan first floor, pre- conflict. 1:200



- I. Foyer
- II. Reception
- III. Auditorium
- IV. Classrooms
- V. Meetingrooms
- VI. Toilets
- VII. Storage
- VIII. Gearroom
- IX. Dininghall
- X. Kitchen
- XI. Bedrooms
- XII. Bathrooms
- XIII. Laundry
- XIV. Lounge
- XV. Fitness
- XVI. Offices
- XVII. Communication
- XVIII. Director

Figure 22: Floorplan second floor, pre- conflict. 1:200

POST- CONFLICT

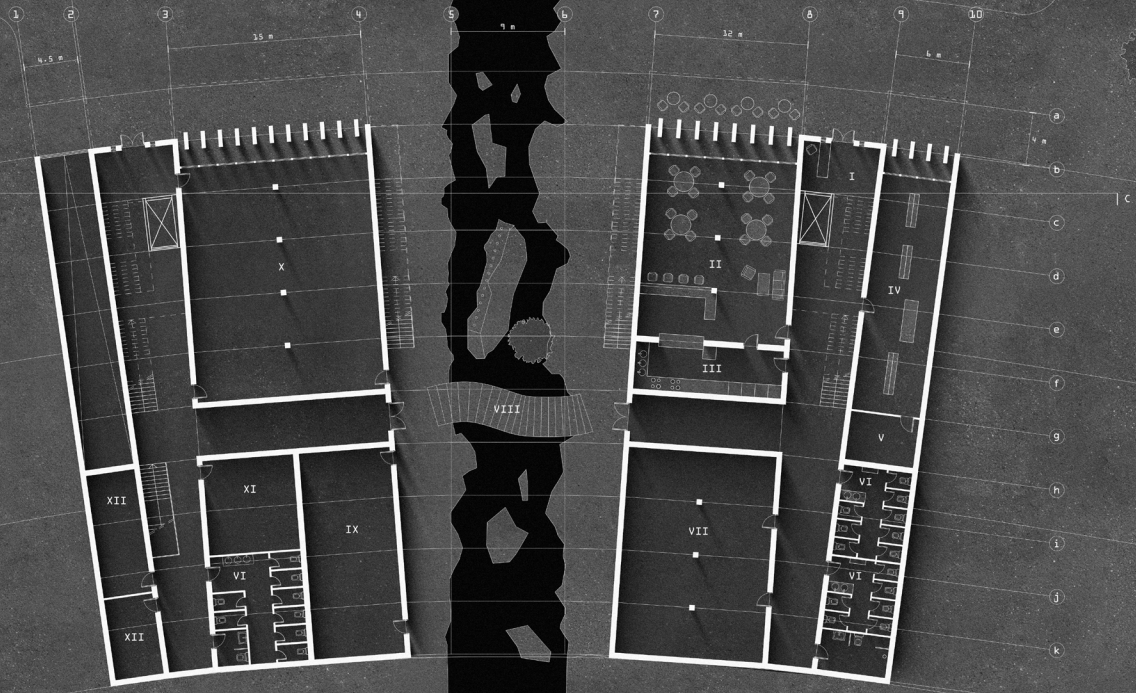


Figure 23: Floorplan ground floor, post- conflict. 1:200

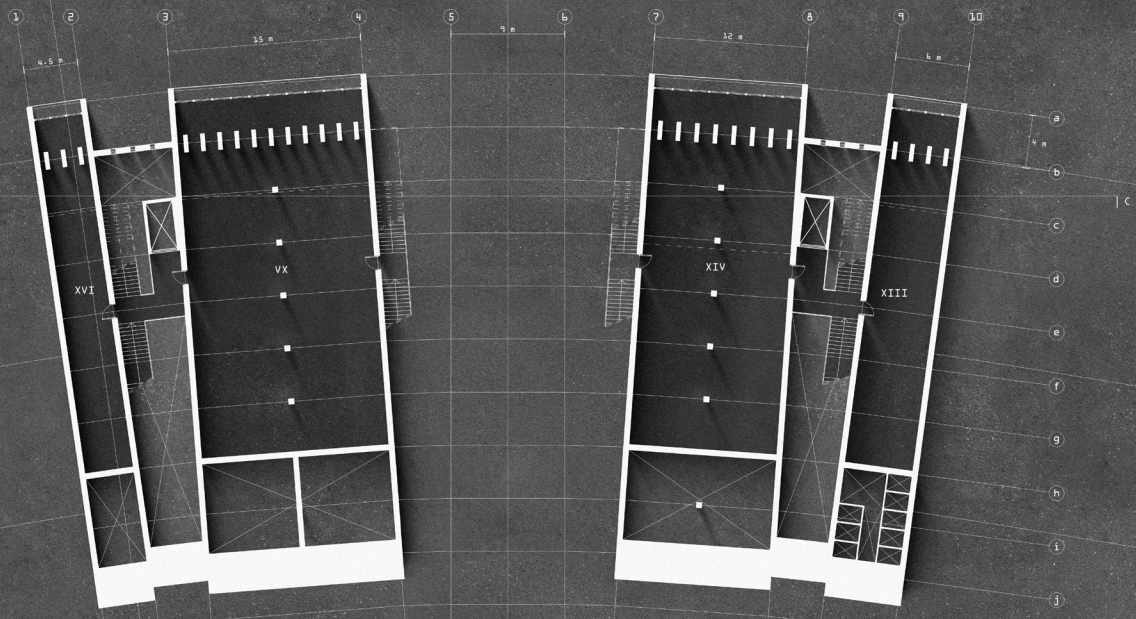


Figure 24: Floorplan first floor, post- conflict. 1:200

- I. Foyer
- II. Cafeteria
- III. Kitchen
- IV. Shop
- V. Storage
- VI. Bathrooms
- VII. Local exhibition
- VIII. Ruin Garden
- IX. Storage
- X. Exhibition space 1
- XI. Restoration
- XII. Archive
- XIII. Exhibition space 2
- XIV. Exhibition space 3
- XV. Exhibition space 4
- XVI. Exhibition space 5
- XVII. Exhibition space 6
- XVIII. Exhibition space 7

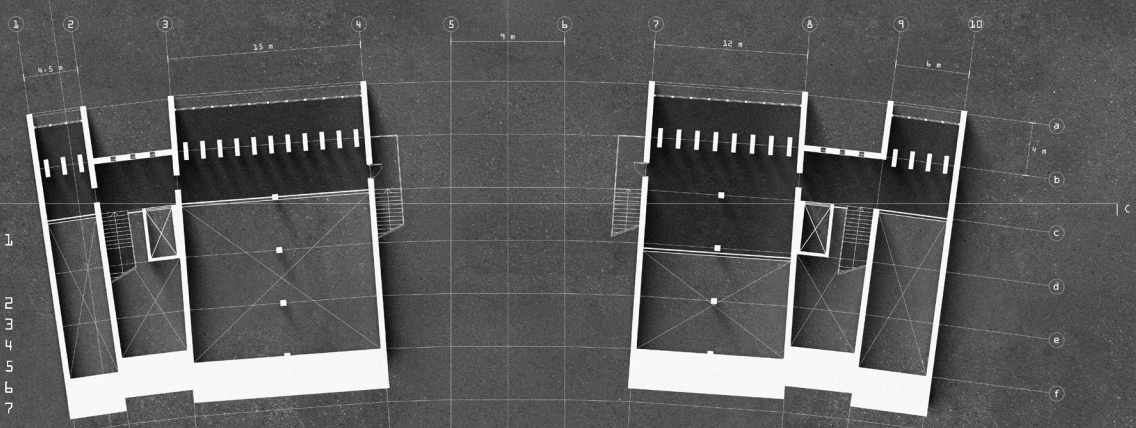


Figure 25: Floorplan second floor, post- conflict. 1:200

The architectural language and materiality reinforce these ideas further. Initially, the entire building was designed as exposed concrete inspired by Dutch bunkers and waterworks. Later in the process, I started differentiating the sacrificial middle structure from the rest of the building. While the outer structures remain mostly concrete, the central volume became primarily timber construction with a concrete exterior finish.

From the outside, the building still reads as one monolithic concrete structure. Internally, however, the timber becomes visible and introduces a completely different atmosphere. The concrete represents protection, heaviness, and permanence, while the wood introduces warmth, fragility, and temporality. This contrast became important within the overall narrative of the project.

The forest context also influenced the material expression. Timber formwork is used to leave wooden textures within the concrete surfaces, and actual tree trunks are used as structural columns within the central space. This creates the feeling that the forest continues into the building itself.

The defensive systems of the project continue this layered architectural way of thinking. The box structures that stick out of the building have glazed facades, constructed of reinforced protective glass. Behind this layer, large rotating concrete shell doors can seal the building during emergency conditions. These pivoting defensive elements transform the architecture from an open institutional structure into a protected fortress. Between the glass facade and the inner protective walls, these smaller intermediate spaces accommodate temporary and supportive functions

PRE- CONFLICT

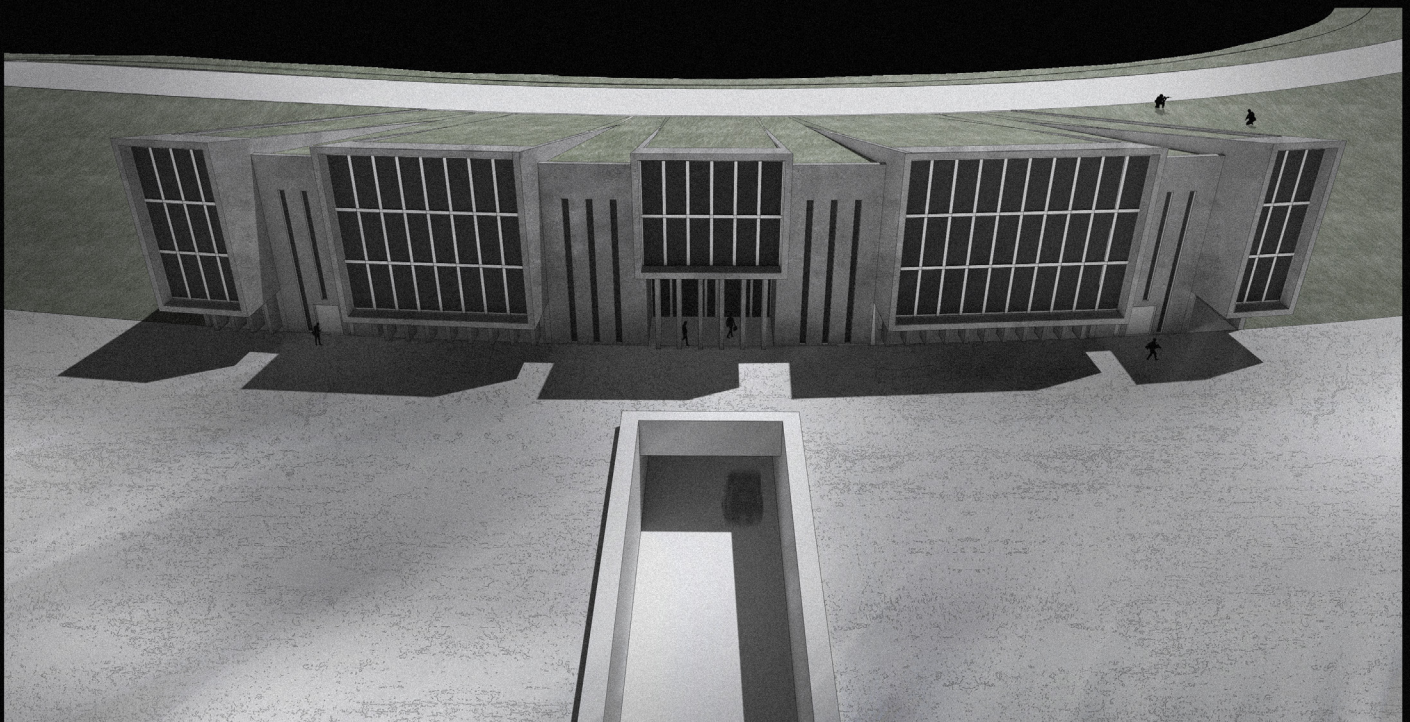


Figure 26: Perspective view, pre- conflict.

such as informal meeting areas and break spaces. These areas also improve environmental buffering, creating thermal transitions between exterior and interior.

This layered strategy is also visible within the environmental and constructional systems of the building. Protection forms the primary continuous layer throughout the structure, while insulation and climate control are integrated behind it. The project prioritises defensive performance without abandoning inhabitable comfort.

The project is mainly designed for a pre-conflict scenario. During the pre-conflict scenario, the architecture primarily functions as a controlled territorial passage and operational base. While during conflict, the defensive systems and sacrificial structures become active protective mechanisms.

In post-conflict scenarios, the architecture transforms into a museum and memorial landscape reflecting on war and environmental impact. The project can be seen as an evolving territorial system capable of adapting alongside changing political and environmental situations.

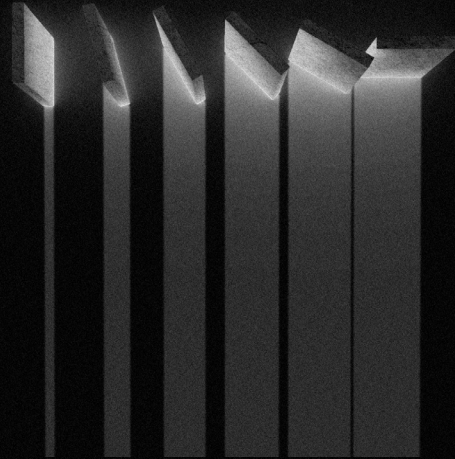


Figure 27: Rotating concrete pivot doors.

POST- CONFLICT

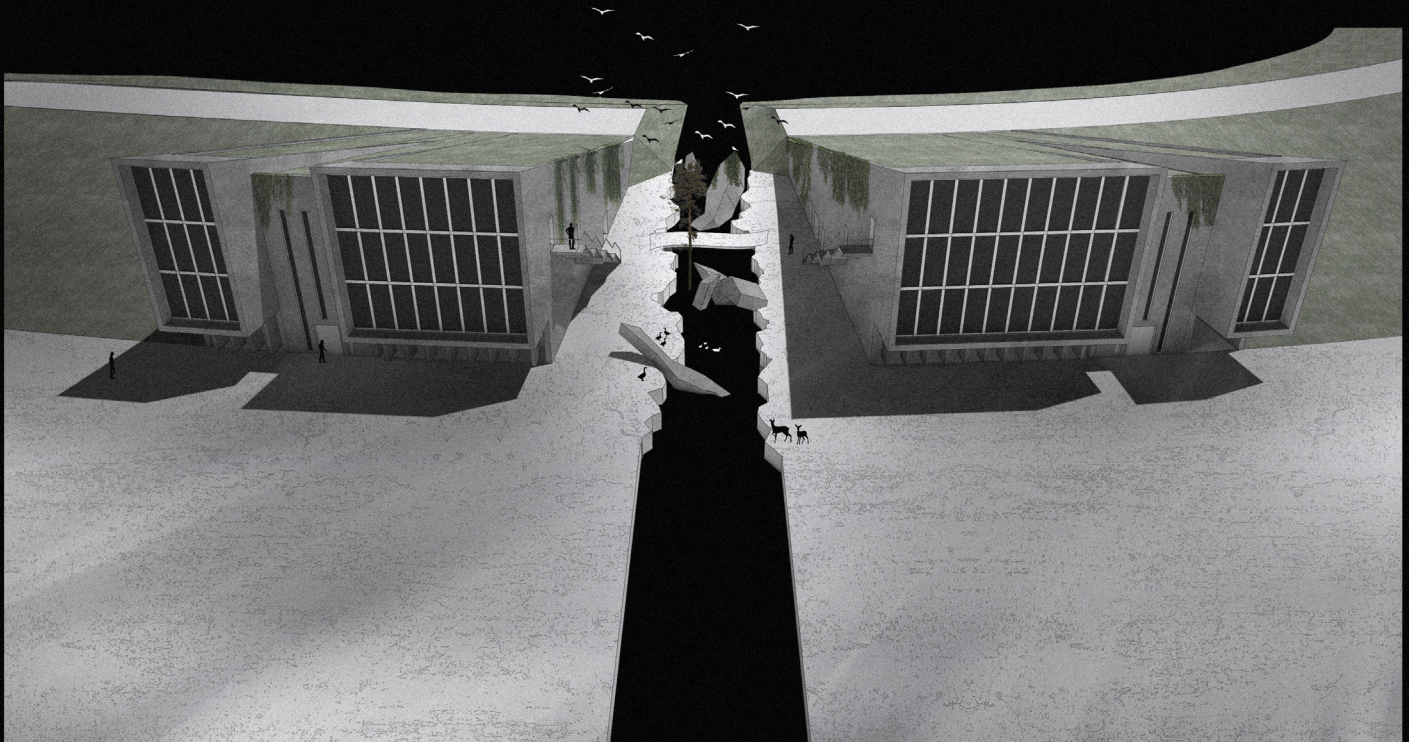


Figure 28: Perspective view, post- conflict.

PRE- CONFLICT



Figure 29: North facade view, pre- conflict. 1:200

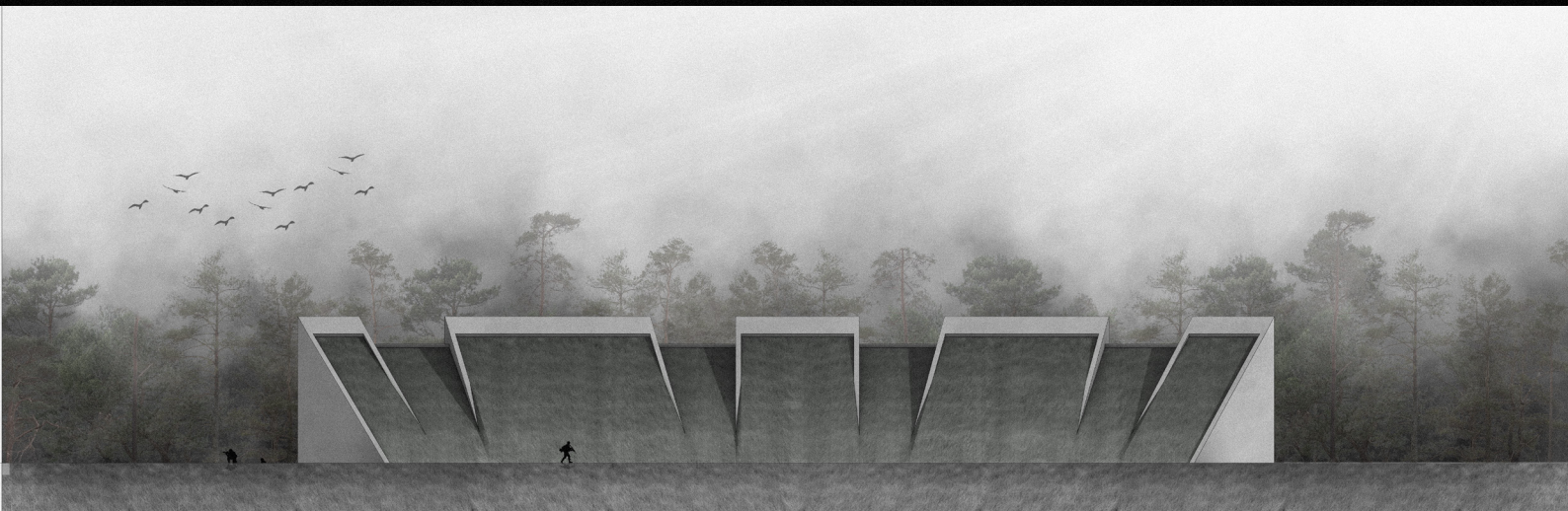


Figure 30: South facade view, pre- conflict. 1:200



Figure 31: East and West facade view, pre- conflict. 1:200

POST- CONFLICT



Figure 32: North facade view, post- conflict. 1:200



Figure 33: South facade view, post- conflict. 1:200



Figure 34: East and West facade view, post- conflict. 1:200

CONCRETE STRUCTURE

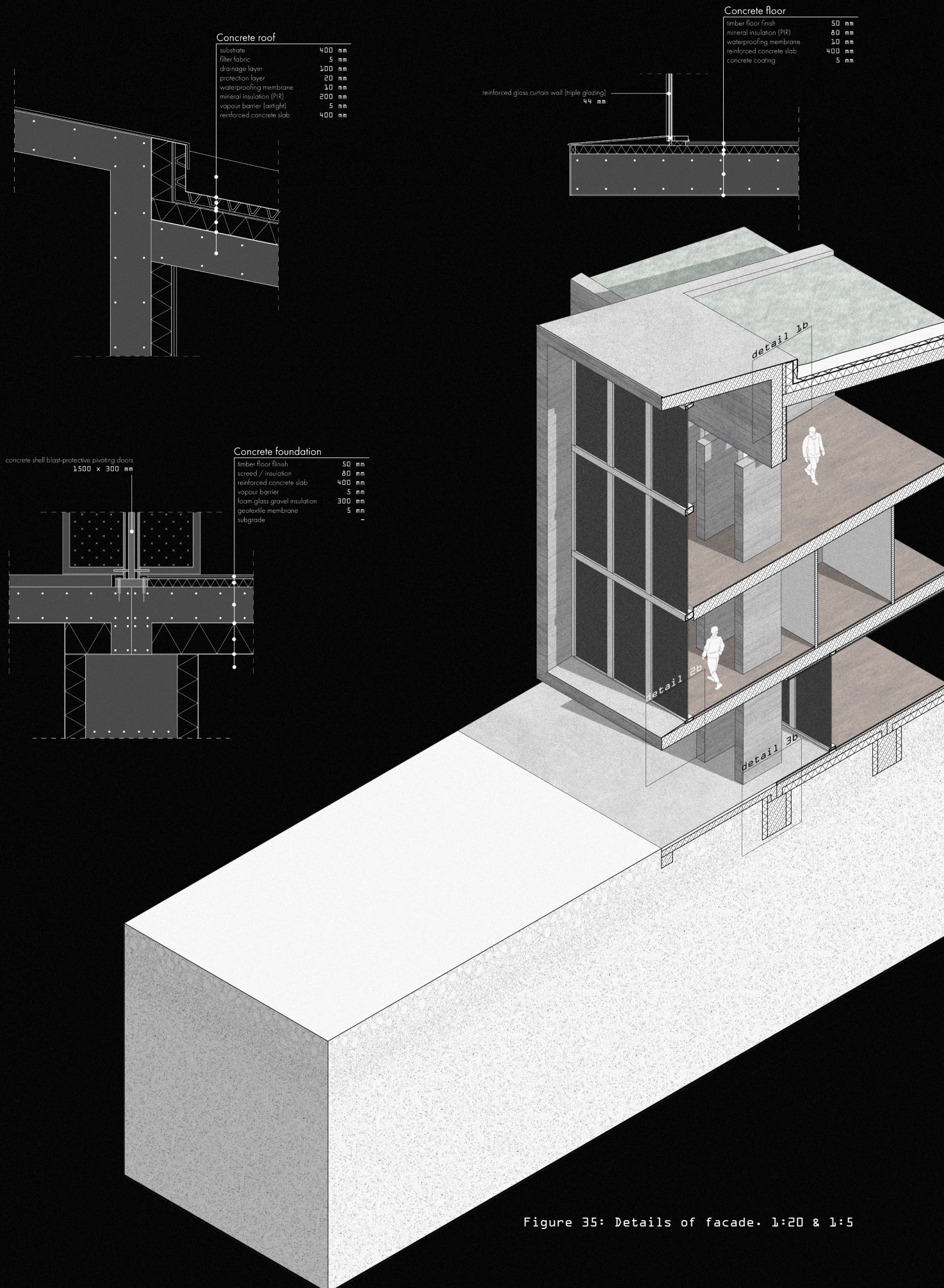


Figure 35: Details of facade. 1:20 & 1:5

TIMBER STRUCTURE

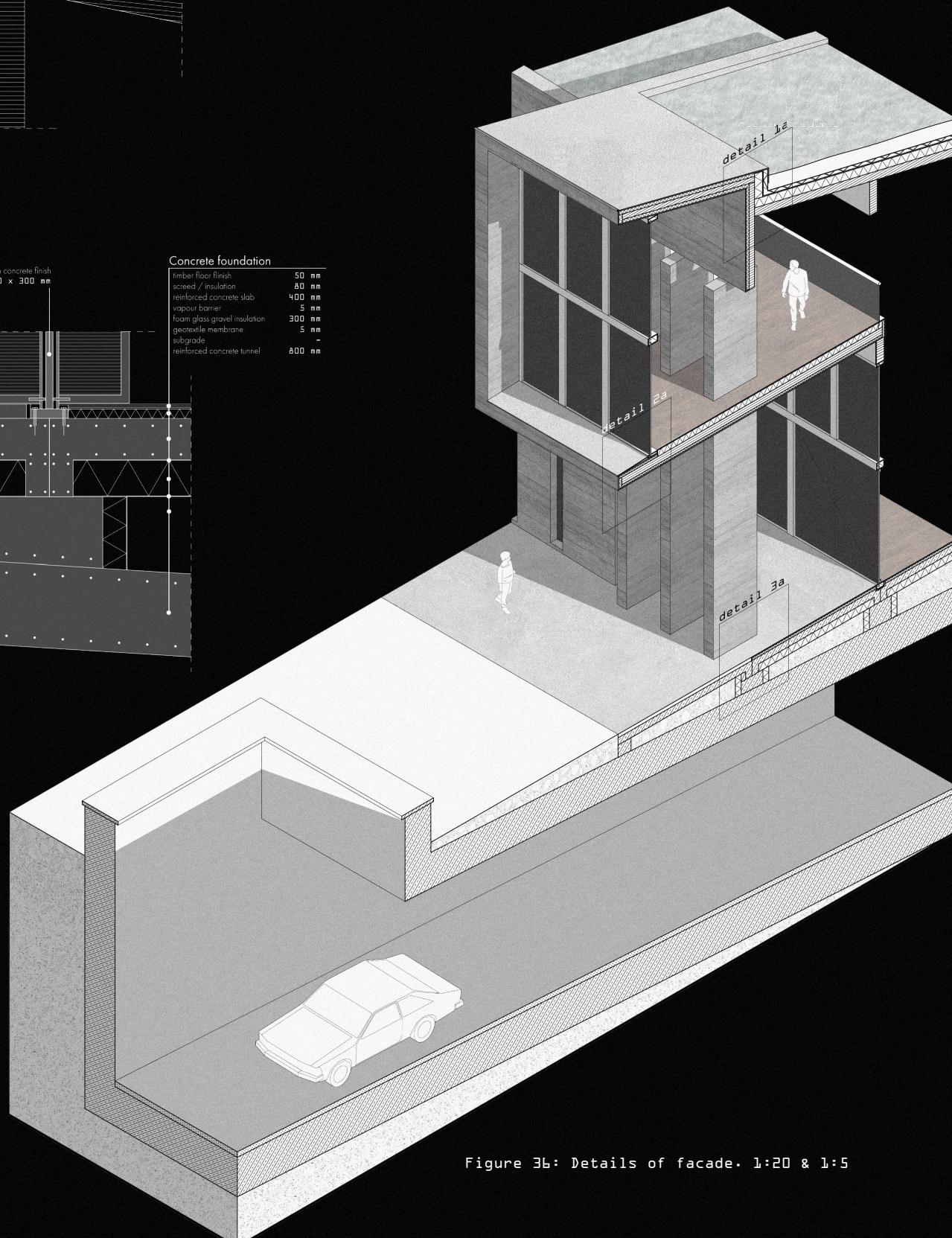
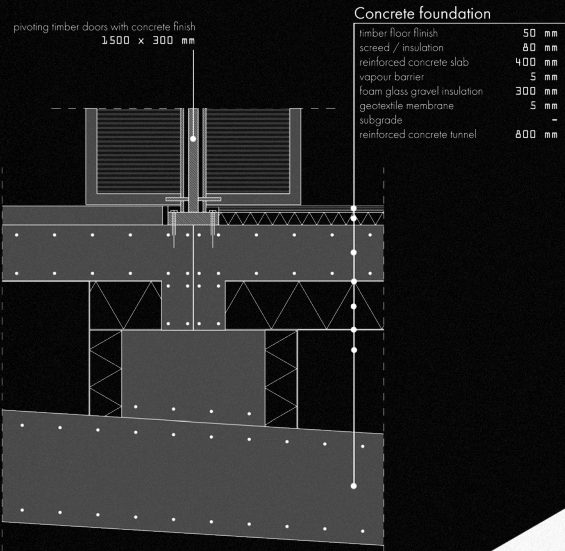
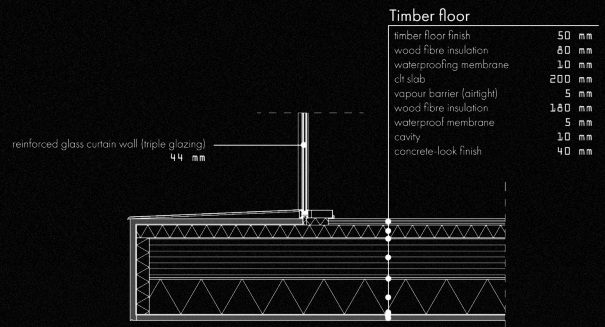
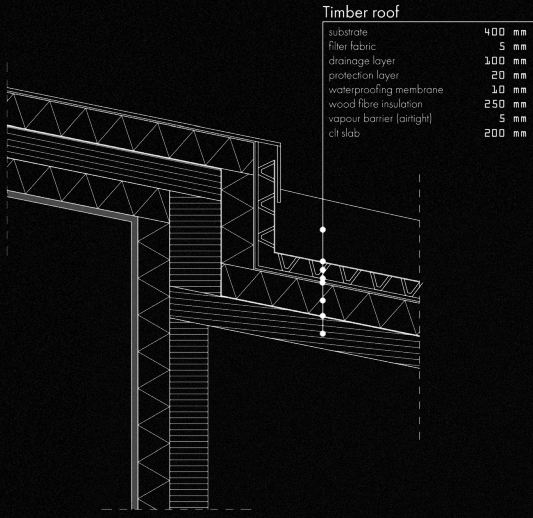


Figure 3b: Details of facade. 1:20 & 1:5

CONCRETE STRUCTURE

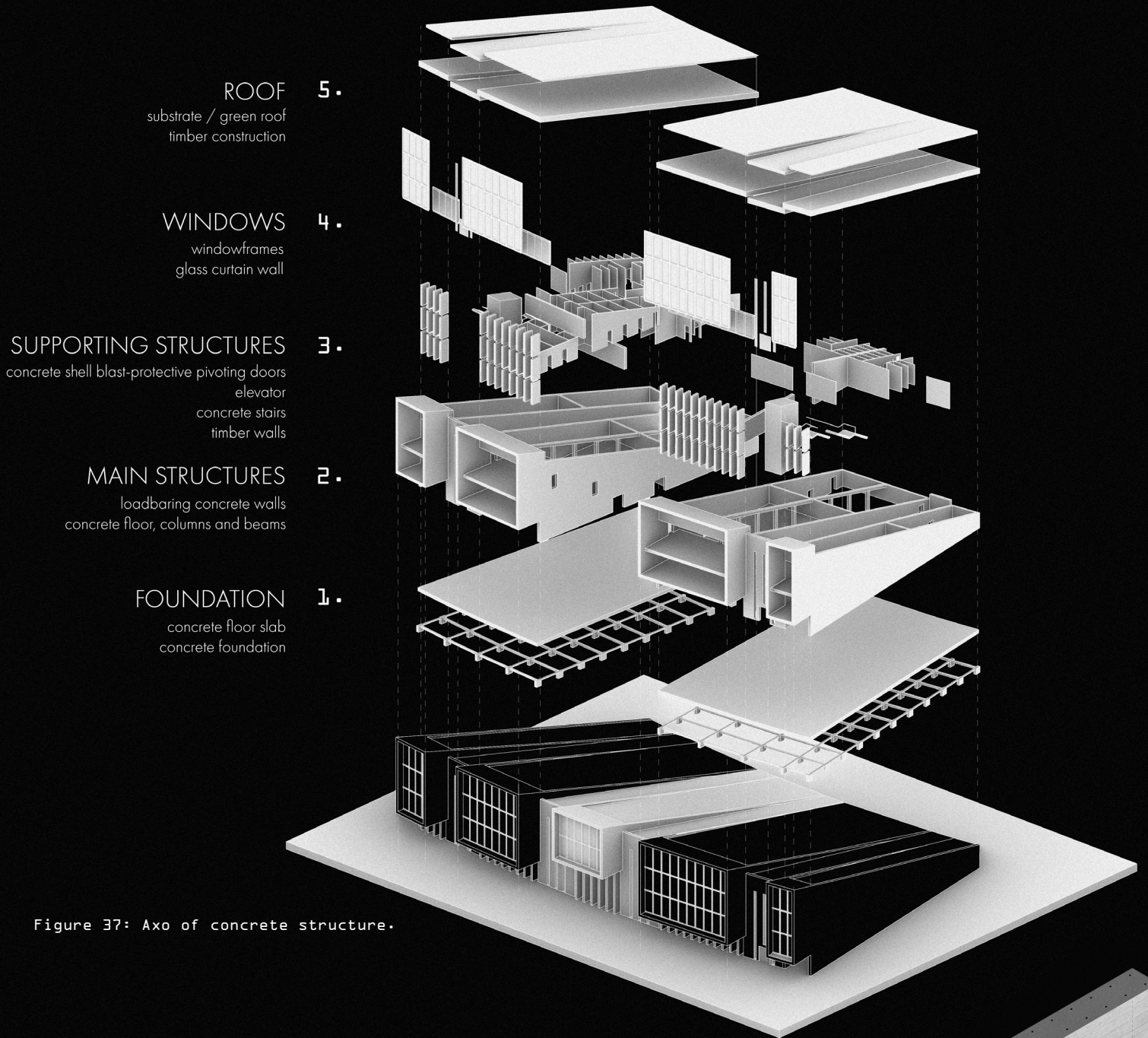


Figure 37: Axo of concrete structure.

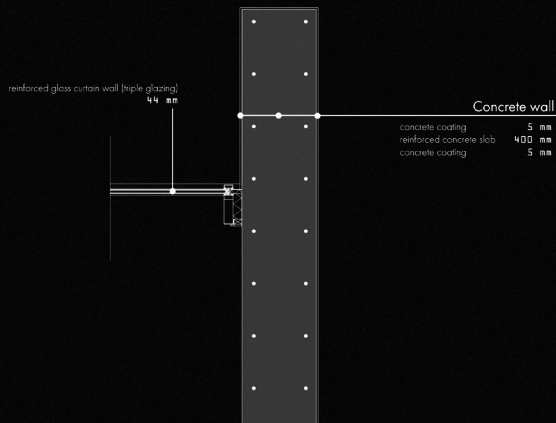


Figure 39: Horizontal details of walls. 1:5

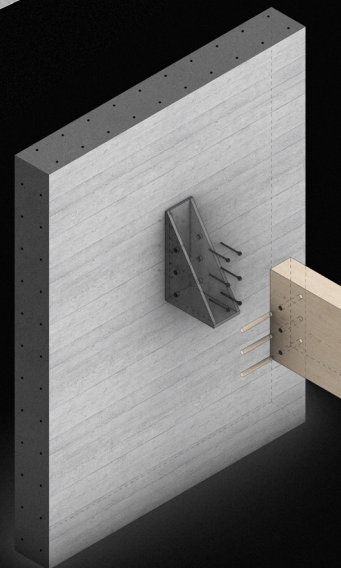


Figure 40: Connection detail.

TIMBER STRUCTURE

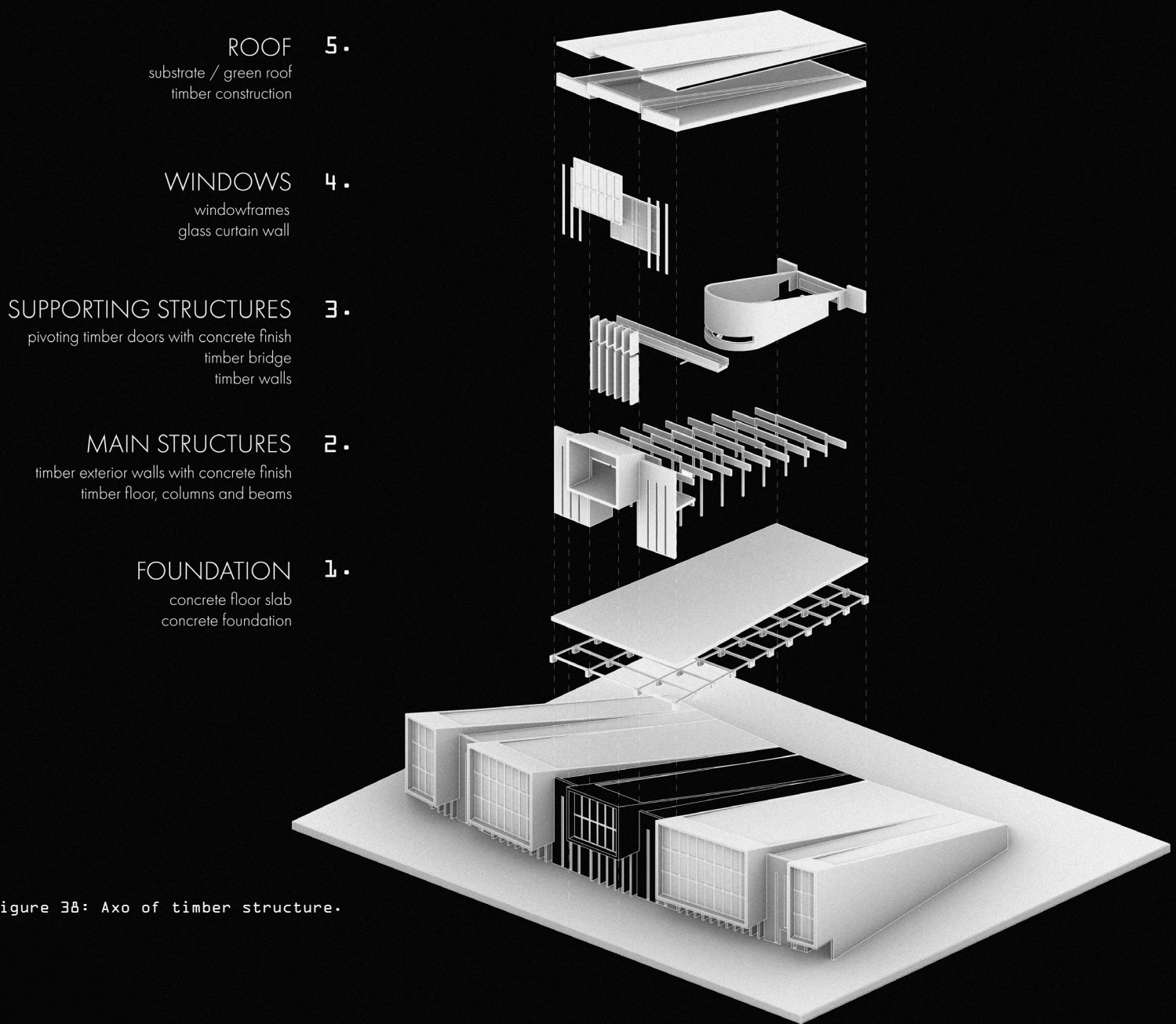


Figure 3B: Axo of timber structure.

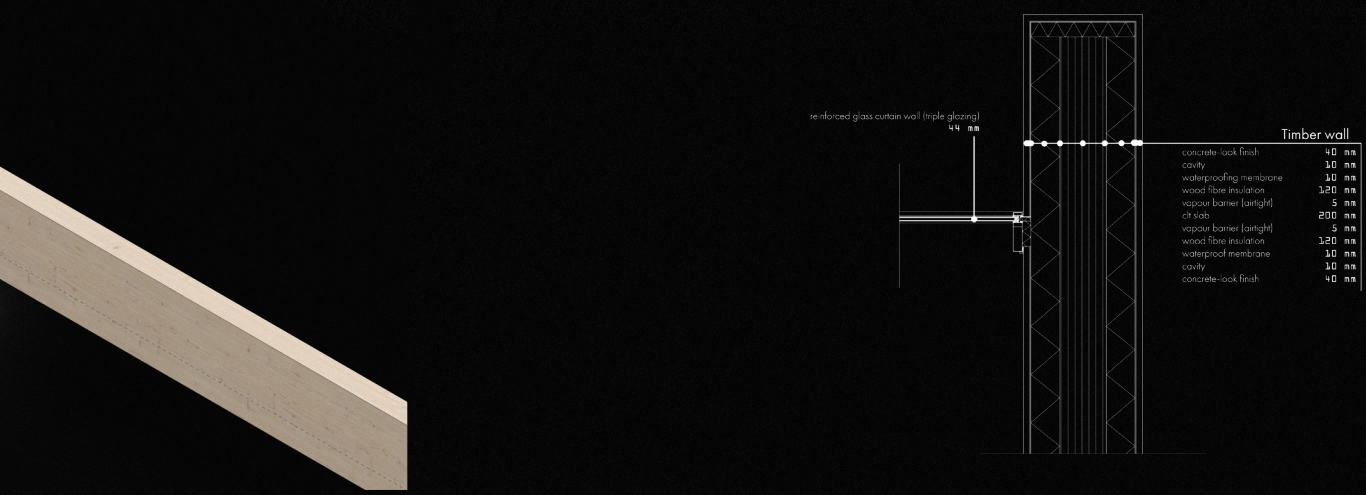


Figure 41: Horizontal details of walls. 1:5

CONCLUSION AND DISCUSSION_

This project started with the idea that modern military landscapes have become increasingly detached from the natural systems around them. In many cases, landscapes are treated as obstacles. Within the Lithuanian context, this often results in deforestation. During my research, I saw how different this approach is from historical defensive strategies, where landscapes themselves played an active role in protection, control, and survival.

Looking into both historical examples and biological systems made it clear that water, forests and elevation can operate as defensive typologies. Rivers can slow movement, forests can reduce visibility and redirect routes, and wetlands can completely change accessibility depending on the season. Even animals use these same principles by adapting their behaviour to the terrain around them. This research became the foundation of the project and strongly influenced the way I approached the design and how I designed.

I wanted the project to grow from the landscape itself. The architecture therefore was not about creating a static defensive object, but more about creating a layered territorial system. The river, dike, forests, floodplains, tunnel, and architecture all working together to control movement through the area. The project does not try to stop an entire army through one monumental gesture, but it focuses on controlling its movement. This became one of the main conclusions of the project. The value of the

landscape lies in how they can become part of a broader layered strategy.

This layered strategy became central throughout my entire project. What started as a landscape strategy eventually continued into the architecture, programme, structure, materiality, and detailing. The landscape forms the first defensive layer through forests, elevation, and controlled flooding. The tunnel and dike create another infrastructural layer. The architecture itself then introduces further layers through public and private zones, and sacrificial structures.

These layers contribute also to the spatial and atmospheric scenery. The building changes its presence depending on where you are and how far you move into it. Some spaces feel open and public, while others protected and controlled. The architecture reveals its hierarchy and levels of protection over time. This gradual transition became important because I did not want the building to only feel like a stereotypical fortress, but also something else, something more.

This playfulness between visibility and concealment was also one of my principles that came from my research. Throughout the design process, I became increasingly interested in the idea that the building should not fully reveal or hide itself from every angle. Towards the North side, the architecture appears monolithic and imposing, but to the other side it becomes more hidden within the dike and landscape. This was not necessarily about making the building invisible, but rather about controlling what is revealed and what remains unclear.

Within this project I mainly focused on the pre-conflict scenario. The building functions as a military outpost, training facility, and controlled passageway that monitors movement through the territory. The classrooms, offices, observatory, and communication spaces all support this role. During conflict situations, the defensive aspects of the architecture become more active. This happens through multiple levels, like the rotating protective doors, or the embedded positioning within the landscape. The building can transform into a fortress-like structure when necessary, while still remaining primarily defensive and protective in nature.

The post-conflict scenario became one of the most meaningful parts of the project for me. The sacrificial structure in the centre of the building allows the architecture to physically embody the consequences of conflict. If the tunnel underneath the building is destroyed, the central structure collapses with it. This means the building permanently carries the impact of its own defensive purpose.

Besides it bringing my research into practice it was also a way I tried to contribute back to the landscape. Instead of treating this destruction as the end of the project, I wanted it to become the beginning of a new phase. Once the crossing and tunnel lose their military function, the building can transform into a museum dedicated to the impact of war on the landscape, environment and biodiversity. The damaged architecture itself becomes part of the exhibition. This way the building not only survives conflict, but it also records- and shows it.

This also made me reflect on military

architecture more generally. Many defensive structures throughout history eventually become ruins, monuments, or reminders of earlier conflicts. I found it interesting to design a building that already anticipates this future condition instead of pretending it will remain permanent forever.

Materiality played an important role within this narrative. The contrast between concrete and timber reflects the balance between permanence and fragility within the project. Concrete represents protection, heaviness, and institutional presence, while timber introduces warmth, vulnerability, and temporality. This difference becomes especially visible within the sacrificial middle structure, where the timber construction remains hidden behind a concrete exterior shell.

I also found it important that the building maintained a strong relationship with the forest surrounding it. Through timber textures in the concrete, exposed wooden structures, and tree-like columns within the interior, the project continuously references the ecological systems it originated from. Even though the architecture is heavy and defensive, traces of the surrounding landscape remain visible throughout the building, giving you a sense of being protected by the landscape.

The project actually also raised important questions about the ethics of military architecture. Designing defensive infrastructure inevitably means working within a tension between protection and violence. Throughout the process, I tried to approach this critically rather than romantically. With this project I tried to not glorify war or militarisation too much, but

instead tries to realize the long-term consequences that conflict has on landscapes and environments.

One of the most valuable things I learned during this project was how strong an architectural concept can become when it operates consistently across different scales and drawings. The same principles that began within the territorial research: layering, control, concealment, adaptation, and landscape integration, eventually appeared within the structure, programme, materiality and details of the building itself.

But besides that it also taught me that military infrastructure does not necessarily have to exist separately from ecology and landscape. Which also is the answer to my research question. Landscape can still play an active role within defence strategies.

To conclude, the project became a test of how architecture can respond to conflict without becoming completely detached from the environment around it. By allowing the landscape to remain active within the defensive strategy, the project introduces a design that operates somewhere between architecture, infrastructure, landscape, and defence.

APPENDIX_

DATA MANAGEMENT CHECKLIST

Instruction

This checklist is relevant for all graduation projects of the Master AUBS. The form is intended to highlight common aspects of graduation projects that require particular attention with regard to planning the research and data management. Relevant information and supplementary sources regarding each question are provided below each question.

With this checklist, the faculty wants to avoid that students unexpectedly find themselves in complex and stressful situations, in which ethical or privacy matters and/or other laws and regulations become an issue. In projects involving humans, certain types of data processing increase the risks to the human participants: planning such projects requires additional evaluations and advice from university staff before ethical approval can be received and the project can begin. In the case of a graduation project, obtaining additional advice or permits may delay the project with an extra education period or semester. To avoid this, it is recommended that students set up a graduation project with a low level of risk. Therefore, all students have to check their risk, by completing this checklist before their A1.

The first section of the checklist (A) should be completed by all students, together with their supervisor, during the planning of the graduation project, before the A1. It does not need to be submitted to anyone for review or approval. Please consider questions 1 to 3 carefully in relation to the intended graduation project, and answer with 'yes' or 'no'.

The second section of the checklist (B) should only be completed if the graduation project involves working with data from human participants. In that case, the student and their supervisor must apply for and receive ethical approval from the [Human Research Ethics Committee \(HREC\)](#) before the project can begin (see the paragraph 'Explanation and follow-up' after the questions). The student can submit the application to the HREC, but the supervisor is responsible for making sure that the project is compliant with relevant privacy regulations and ethical policies.

Section A. General considerations	yes	no
<p>1. Is the graduation project conducted as part of an internship (at a company), or as part of a research project at TU Delft?</p> <p>If a student's graduation project is conducted at a company or as part of a research project at the university, questions of data ownership and intellectual property rights need to be addressed in a written graduation or internship agreement before the project begins. Students and their supervisor should consult the Intellectual Property Rights of Students webpage. Additional information can also be found in the Extended Personal Research Data Workflow.</p>		✓
<p>2. Does the project involve conducting (part of) the research outside the Netherlands?</p> <p>Students who intend to travel abroad (even to other EU countries) for study, exchange, research, internship, or graduation project purposes need to follow the Travel Safety Protocol. This includes attending a mandatory Travel Safety Training Session: see the Disclaimer.</p>	✓	
<p>3. Will the research involve processing data from humans, such as running a survey, conducting interviews or workshops, collecting data through social media or internet forums, or re-using existing datasets about humans provided by a third party? (If 'yes', see follow-up questions 4 to 13 in Checklist B.)</p> <p>Students who work with data from human participants must complete the next section and apply for and receive ethical approval from the Human Research Ethics Committee (HREC) before conducting the research.</p>		✓

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