

Territory

of

Between

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Methods of Analysis and Imagination
Matter of Scale Graduation Studio MSc3/4
2025-2026

Fear

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Safety

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Fear

Amidst increasing geopolitical instability along NATO's eastern border, questions of civilian safety and resilience have become more urgent architectural concerns. Estonia, which shares a long border with the Russian Federation, is especially exposed to potential security threats, yet remains insufficiently equipped with contemporary civilian defence infrastructure. At the same time, ethnic and social differences, generational gaps and individualistic urban lifestyles increase social fragmentation in Tallinn's neighbourhoods. Current urban planning does not encourage high-quality community gathering places, especially spaces that would function year-round. This hinders community ties, despite strong neighbourly ties being a critical component of resilient communities in times of crisis.

Safety

This thesis positions architecture as an active agent in addressing these intertwined challenges. Rather than treating civilian defence shelters as dormant emergency infrastructure, the project explores how spaces of safety can also function as cultural environments that foster everyday neighbour interactions and psychological resilience in times of quiet, while remaining fully operational during potential emergencies.

Grounded in the theoretical works of Jane Jacobs (1992), Gaston Bachelard (2014), and Sarah Robinson (2025), with particular focus on phenomenology and neurology, the project examines what safety means in contemporary contexts. Historically, bunkers – though structures of protection – have carried associations of dread. This project therefore aims to reframe the bunker as an environment that supports not only physical safety but psychological wellbeing, and in doing so, counterbalance the fear and anxiety present in this geopolitical moment.

Fear

Geopolitical Situation

The northern Baltic nation of Estonia, where the project is located, shares a 290-kilometre border with Russia, making the country one of the most exposed NATO members. Russia's invasion of Georgia in 2008, annexation of Crimea in 2014 and full-scale invasion of Ukraine in 2022 prove the nation's neo-imperialistic ambitions. In addition, recent security provocations such as Russian jets violating Estonia's airspace in September 2025 or a large group of armed Russian troops without insignia moving along the Estonian border in October 2025 demonstrate that the threat of potential intervention in Estonia is not merely speculative but tangible.

Despite these threats, Estonia is insufficiently prepared for large-scale emergencies. The small Baltic country, with just over 1.3 million citizens, has only 270 bomb shelters, which would accommodate around 230,000 people, or less than a fifth of the total population. However, even those that exist are either poorly located or outdated. This critical infrastructural gap informed the decision to incorporate a civilian defence shelter into the project's programme.



The Site

Kalaranna st. 28

The chosen site is located at the intersection of these two neighbourhoods and nestled between the Patarei Sea Fortress and the busy Kalaranna road.

Positioned along the edge of the Patarei Fortress, the site serves as a connection point between the Kalamaja neighbourhood and the sea. It contains three existing structures and a large gravel parking area, which presents an opportunity for transformation into green public space.

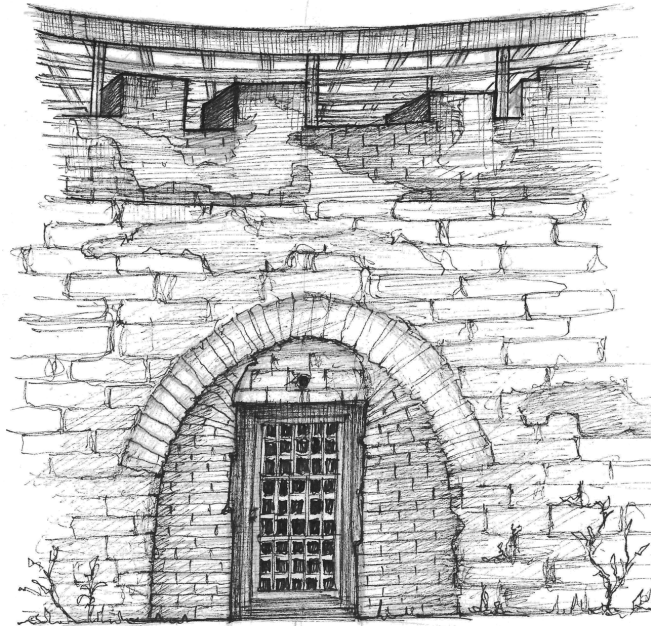
The site carries a long-standing historical association with security and containment. Originally constructed as the Patarei Sea Fortress, it was subsequently repurposed as a Soviet-era prison – each incarnation related to themes of protection and control. The introduction of a civil defence shelter continues this legacy, reaffirming the site's continuing relationship with safety and resilience, while preserving the layered urban memory that defines its identity.





Three pre-existing structures have been integrated into the project scope, allowing them to be reactivated and repurposed while retaining their heritage character.





Structure 01 - Artillery Battery

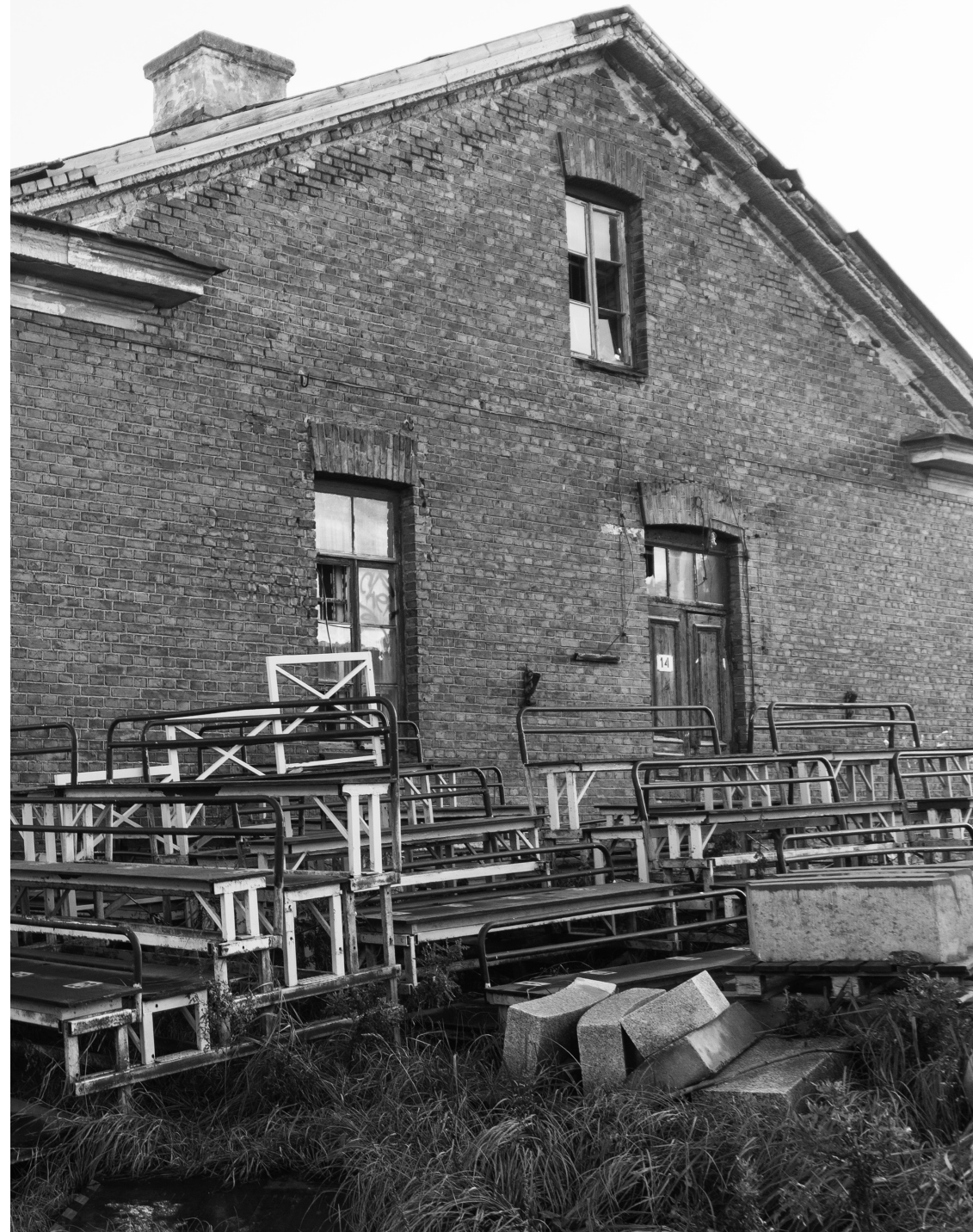
This curved limestone building was previously part of the Patarei Sea Fortress built in 1820s and the later established Patarei prison. Now it sits abandoned with a roof in poor condition.

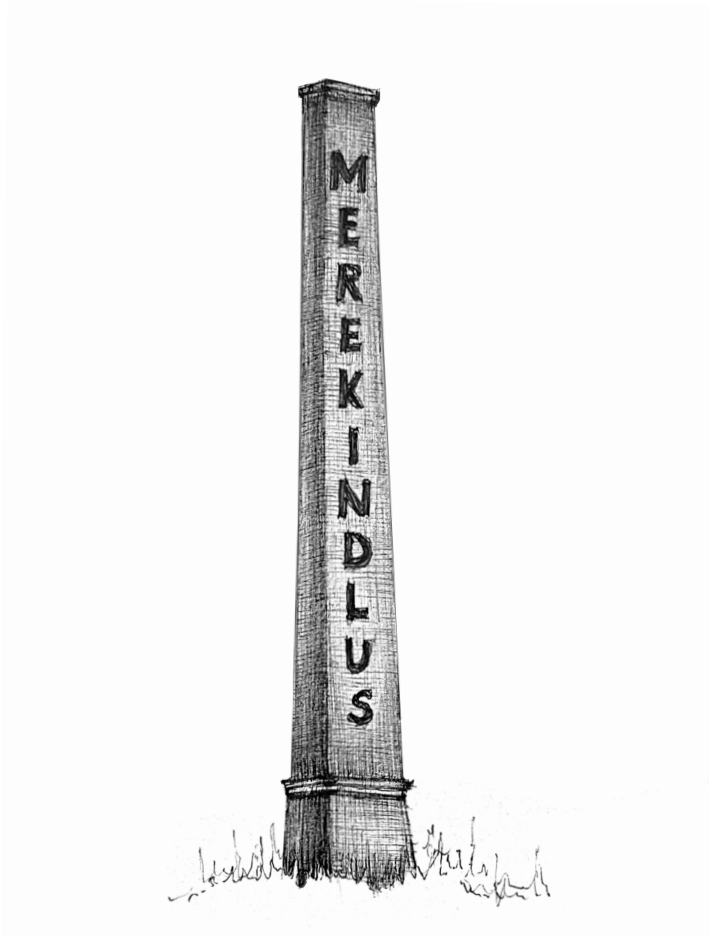




Structure 02 - Commander's House

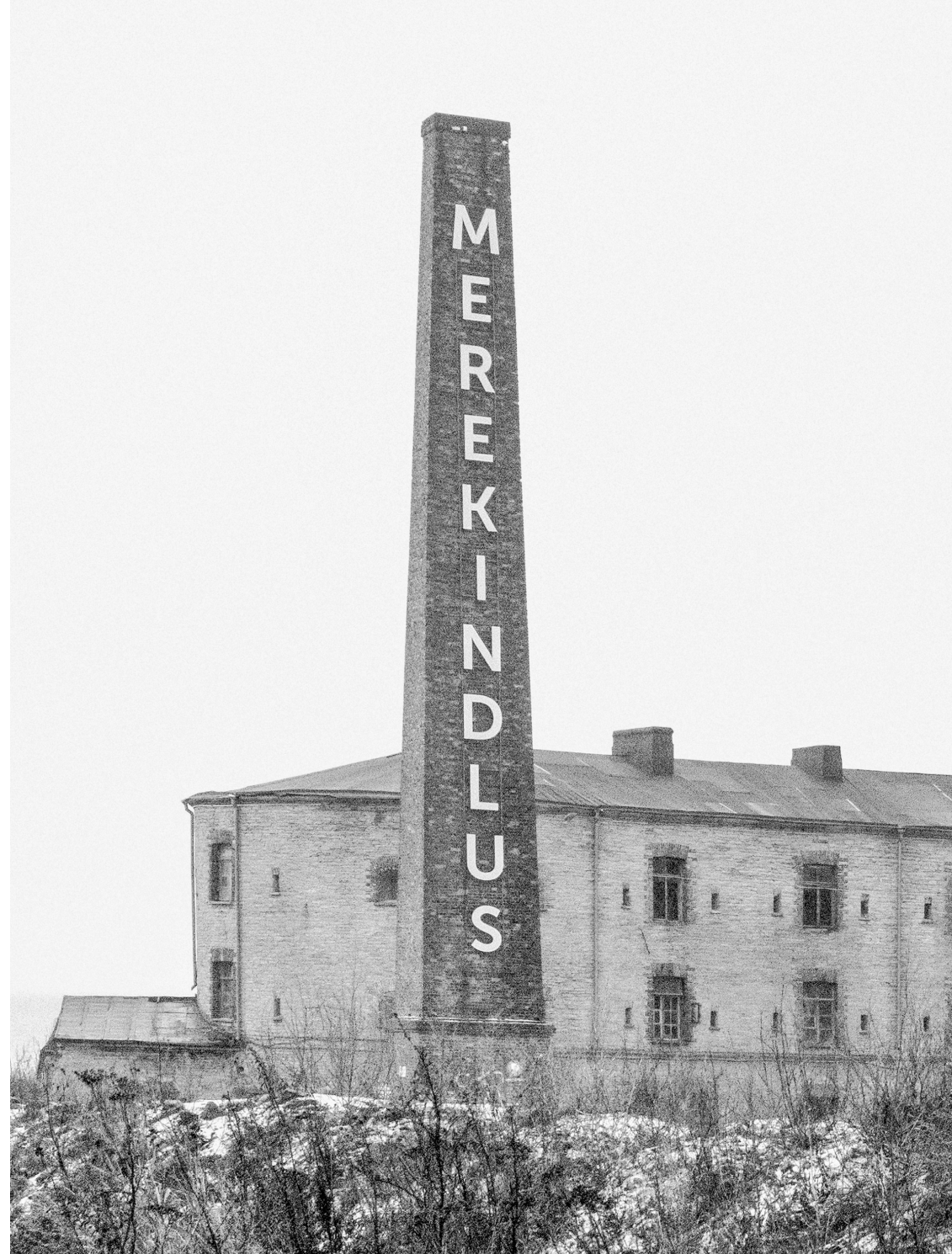
This rectangular red brick structure served as a commander's residence and dates from the early-to-mid twentieth century. The building retains its original roofing in sound condition, and its overall state of preservation is notably better than that of the adjacent curved building.





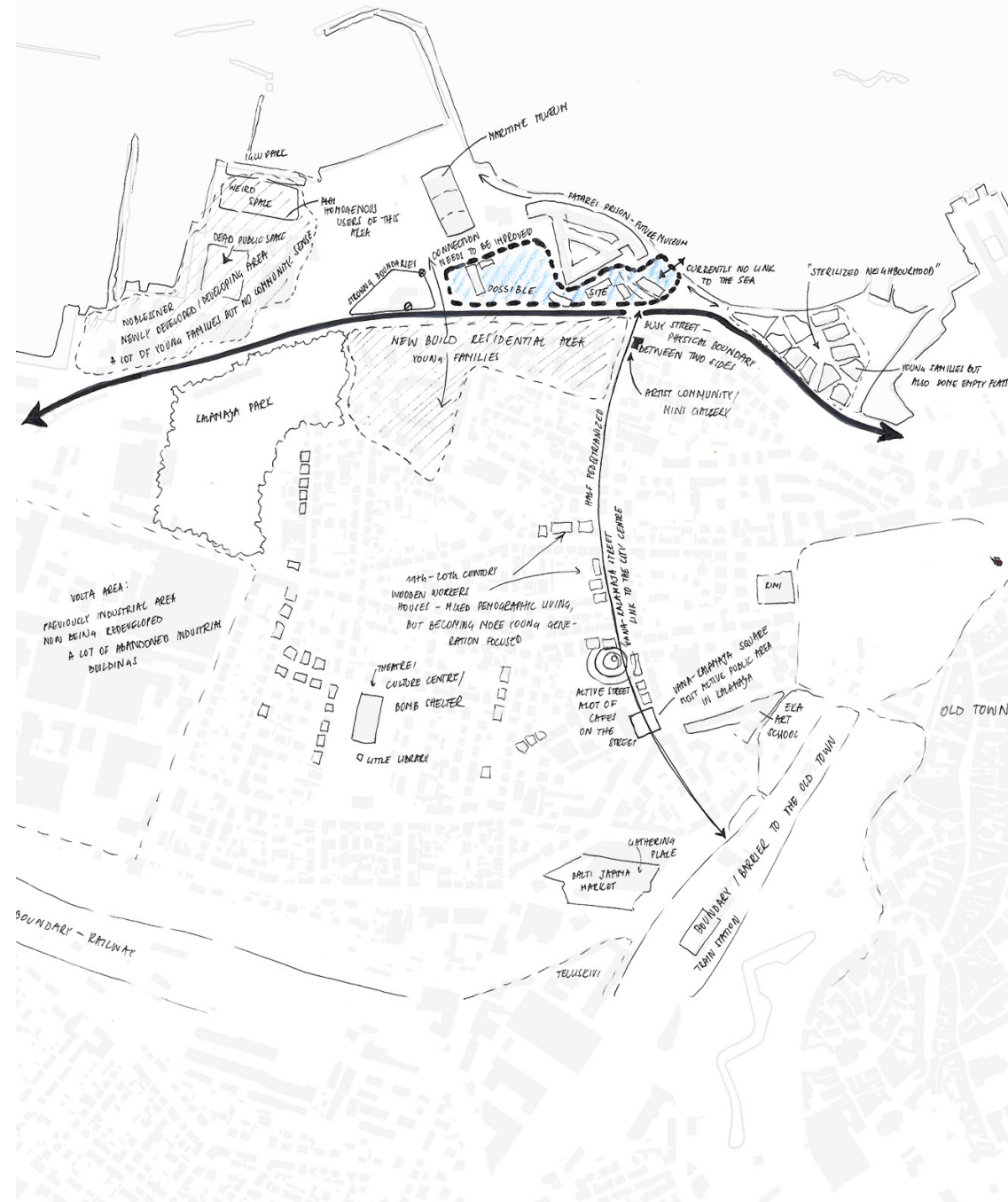
Structure 03 - Chimney Tower

This chimney tower was part of an industrial buildings constructed on the site during the twentieth century when Patarei fortress served as a prison. It is one of the few structures that remained after the complex was demolished.



Kalamaja, Noblessner

The chosen site is located at the intersection of two neighbourhoods - Noblessner and Kalamaja. This area has changed significantly in recent years, indicated by a number of new residential building constructions and an influx of new inhabitants. This has resulted in fragmented social structures, with resident interviews indicating little interaction between the neighbours. Noblessner, the most changed part of Kalamaja, that sits at the sea front, is dominated by new residential blocks and lacks a welcoming public space. Furthermore, the area only has two civilian defence shelters situated more than 15 minutes away from the site, highlighting the urgent need for both improved community safety infrastructure and strengthened community cohesion.



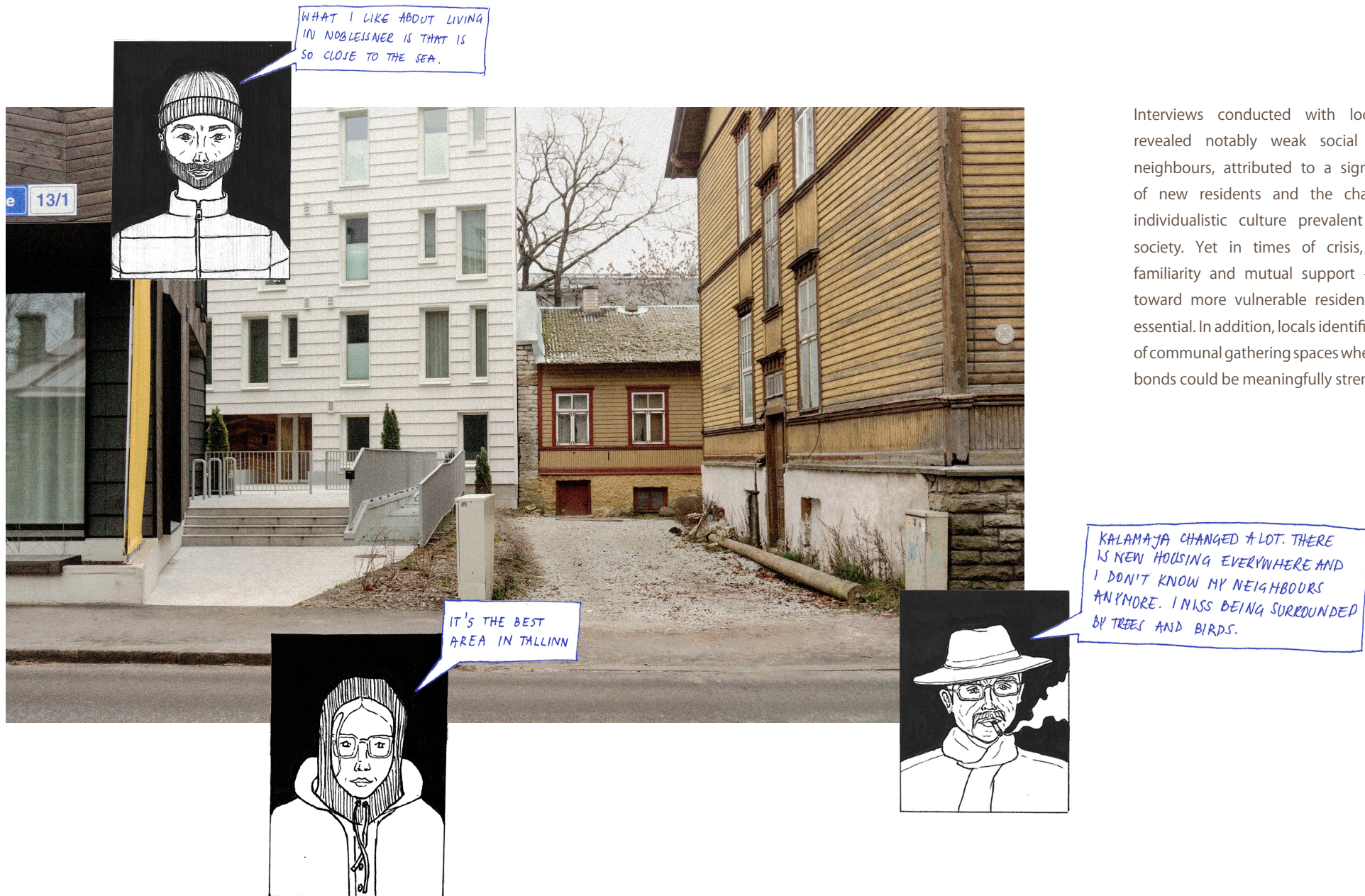


The Infrastructure

The nearest civil defence shelter is situated approximately 900 metres from the site, nearly double the maximum recommended walking distance of 500 metres required for civilian access. This underscores a critical gap in the area's civil defence infrastructure, reinforcing the need for a new shelter facility within the neighbourhood.

The Locals

Interviews conducted with local residents revealed notably weak social ties among neighbours, attributed to a significant influx of new residents and the characteristically individualistic culture prevalent in Estonian society. Yet in times of crisis, neighbourly familiarity and mutual support – particularly toward more vulnerable residents – become essential. In addition, locals identified a shortage of communal gathering spaces where such social bonds could be meaningfully strengthened.





Vana-Kalamaja street



Keskting in Keldrimäe

Where do people gather?



Basketball court in Kassisaba



Basketball court in Toompark

Markets, especially Keskting in Keldrimäe, seemed to be the most seasonal public space where people of different ages and social backgrounds gather.



Keskting in Keldrimäe

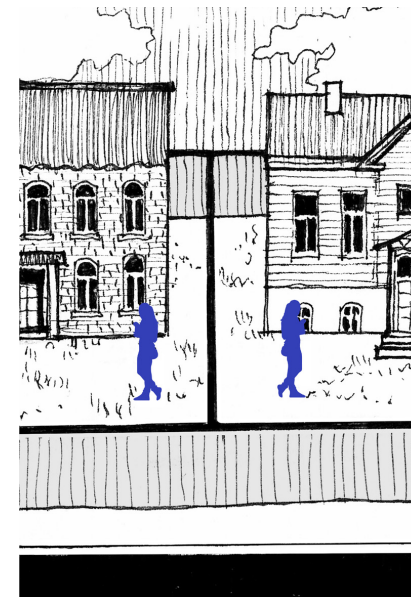
The Problems

Dual Problem Statement

The research identified two prevailing issues within the neighbourhood, making the design challenge twofold: first, to address the need for safety through the design of a civilian defence shelter; secondly, to foster neighbourhood resilience through the creation of a community gathering space which strengthens social ties.



*underdeveloped civilian defence
infrastructure*



irresilient neighbourhoods

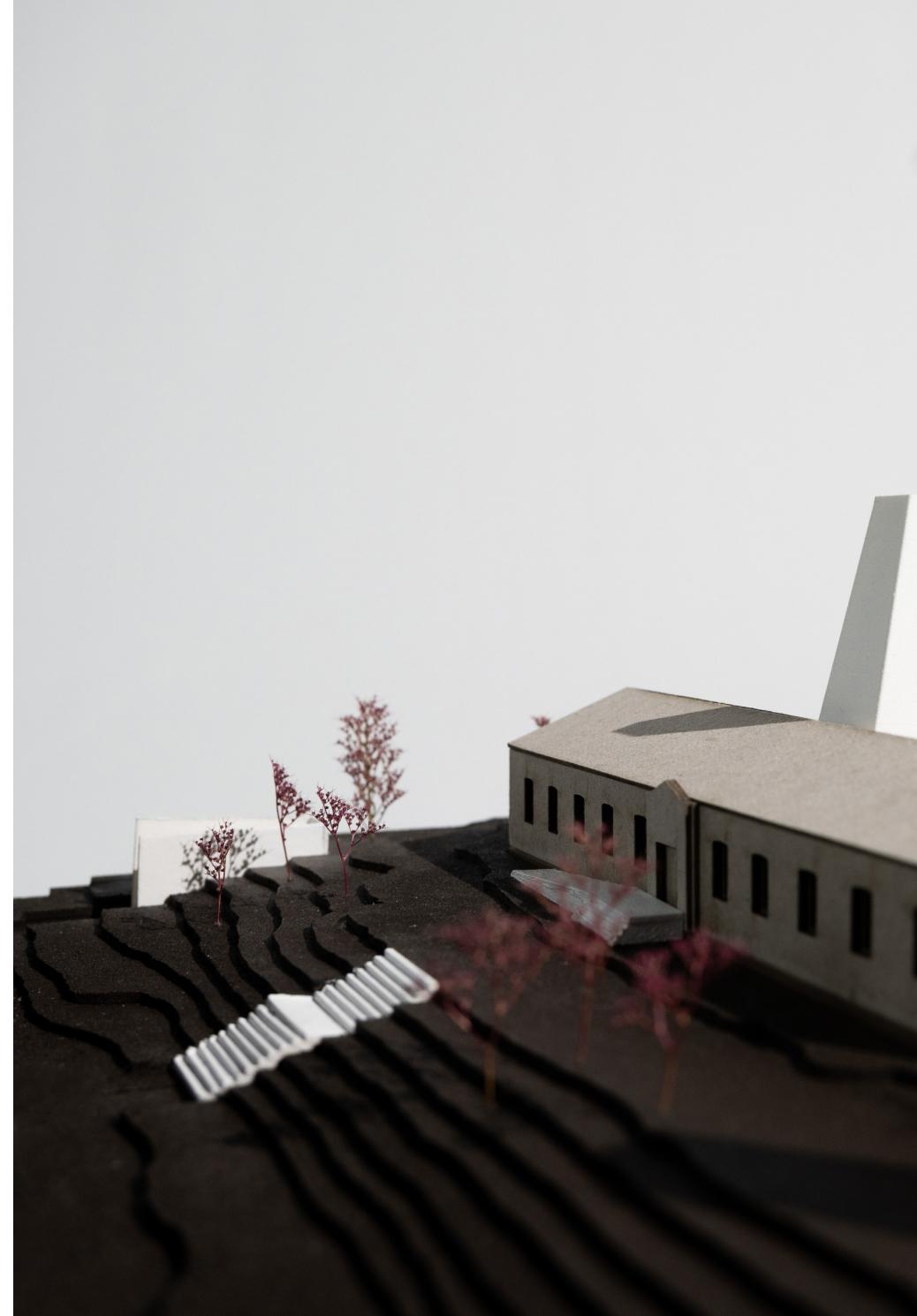
The Programme

Hybrid Brief

The programme responds to the dual problem statement by offering a hybrid programme - cultural community centre and a civilian defence shelter

While the neighbourhood research showcased the need for a community gathering space with a civilian defence shelter, the concept required further definition. I began this process by examining everyday life in Ukrainian shelters. The findings highlighted that these underground spaces function not as passive refuges but as active environments. Extended periods spent underground necessitate the continuation of daily and cultural activities, including singing, performing music, media broadcasting, education and mural painting. In Ukraine's case, these activities proved to encourage solidarity and act as psychological resilience mechanisms.

I also examined precedents from Finland, where a highly developed underground shelter system accommodates a range of programmes during times of peace.



Ukrainian civilian defence shelters



TV broadcasting



communal singing



educating children

Finland civilian defence shelters



Itäkeskus swimming hall



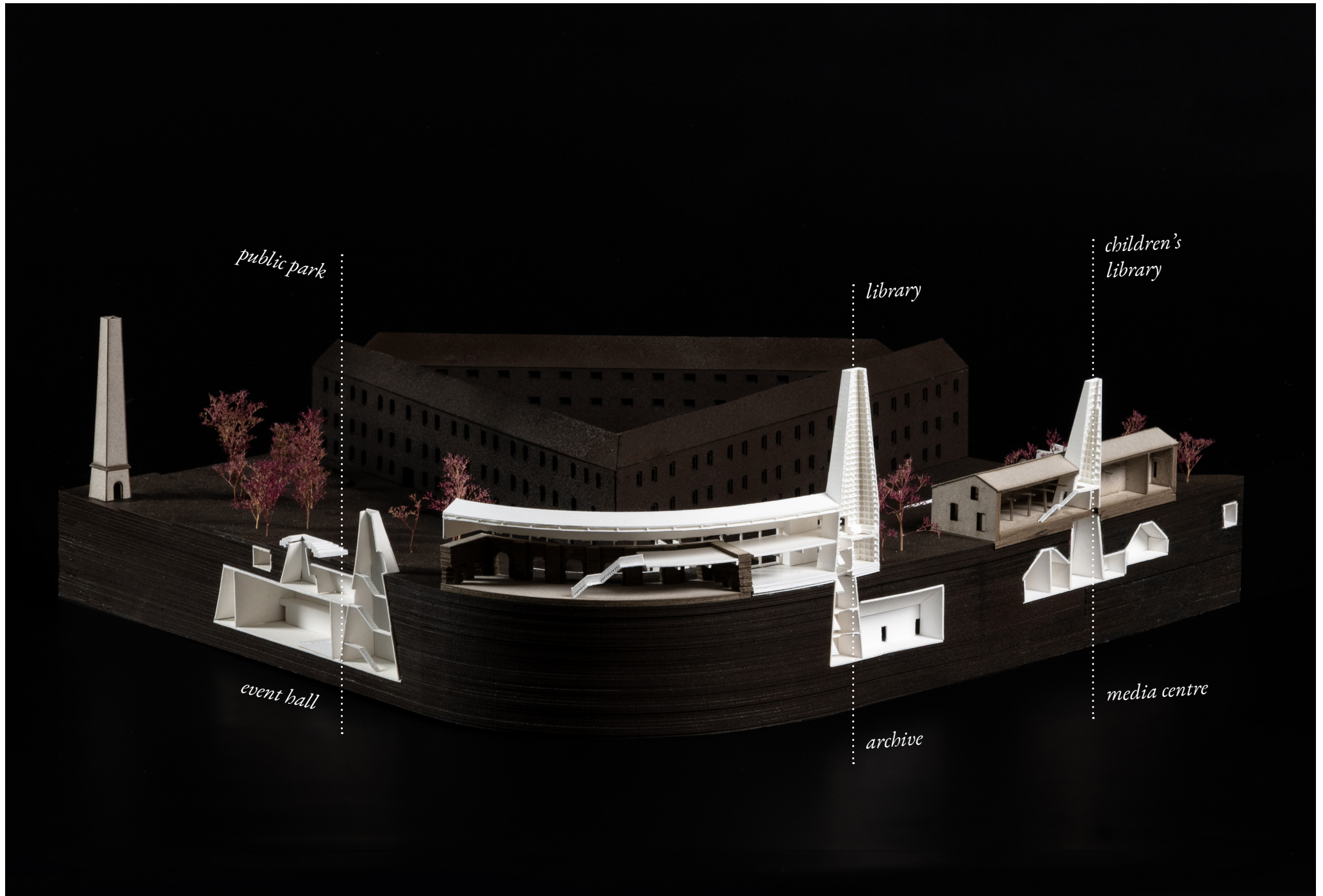
The Luuppi indoor skatepark



The Vapaan Taiteen Tila event space

hybrid programme: cultural community centre and
civilian defence shelter

In response, the project proposes a cultural community centre that integrates civil defence infrastructure with everyday cultural use. While the library space and communal gathering spaces will be located above the ground, creating a welcoming entrance to the building, below-ground facilities such as event hall, broadcasting and radio studios, and children's educational spaces will operate as fully functional shelters during emergencies, ensuring that cultural and social activities continue and become an integral component of collective resilience.



Safety

Reframing Bunker

While the construction of bunkers was a common practice in the 20th century, the typology of shelters seems to have largely remained confined to that historical context, which has not developed to meet contemporary needs.

Despite their protective intent, research reveals that shelters have historically heightened rather than alleviated anxiety in their occupants. This highlights a limitation of such structures, proving that physical protection alone is insufficient. Thus, any redefinition of shelter typology must address the psychological safety and well-being of its users. Grounded in the theoretical frameworks of phenomenology and neuroscience, this project seeks to reframe the shelter not as a place of fear and confinement, but as a comforting environment and an active community asset – one that serves its occupants in both crisis and everyday life.

~~Bunker - a shelter, usually underground, that has strong walls to protect the people inside it from bullets or bombs~~

From: Cambridge Dictionary

Shelter - a physical structure that protects people inside from harm while also providing a sense of psychological safety.

Above

With the programme split vertically across strata, the ground plane naturally divided the project into two dimensions – above and below.

Rather than forcing similarity between the two dimensions, their natural differences were embraced. Above ground, the existing masonry and limestone buildings are solid and heavy, yet open as large openings draw light deep into the spaces. New above-ground additions are timber frame structures, introducing a lightness to the structure. These additions aim to signal the buildings' new public programme while maintaining a human scale – expanding the existing footprint only modestly.

Below

Below ground, natural light is absent, artificial lighting replicates daylight in functional areas, while other spaces lean into the atmospheric qualities of shadow, rich colour, and contrast. Freed from the constraints of elevation and facade, the subterranean volumes allow greater spatial experimentation. Yet the lack of windows below also demands careful attention to navigability. To make the orientation more intuitive, the underground layout draws on urban analogies, offering familiar spatial cues that help occupants understand their location and movement through the space.

To maintain architectural continuity, select materials from above were carried below. Red brick and timber elements bring warmth and familiarity to the underground, ensuring a shared material language across both levels, but still allowing distinctiveness across.

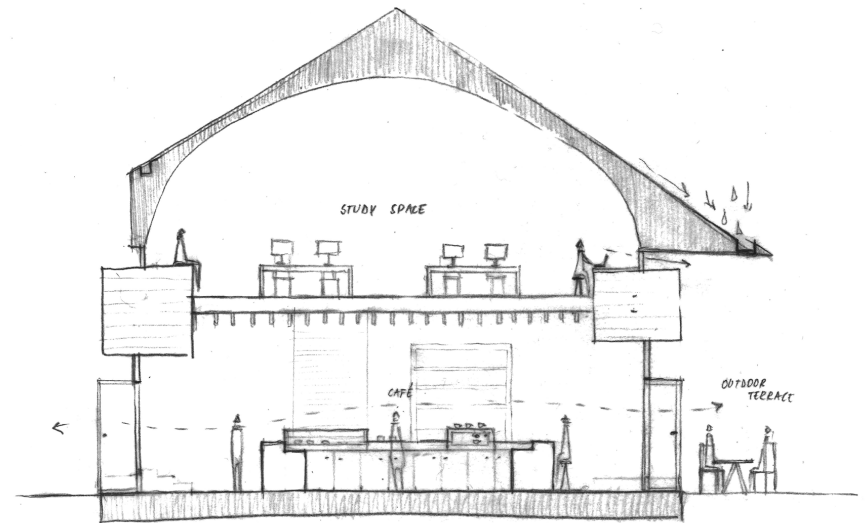
Above

Design

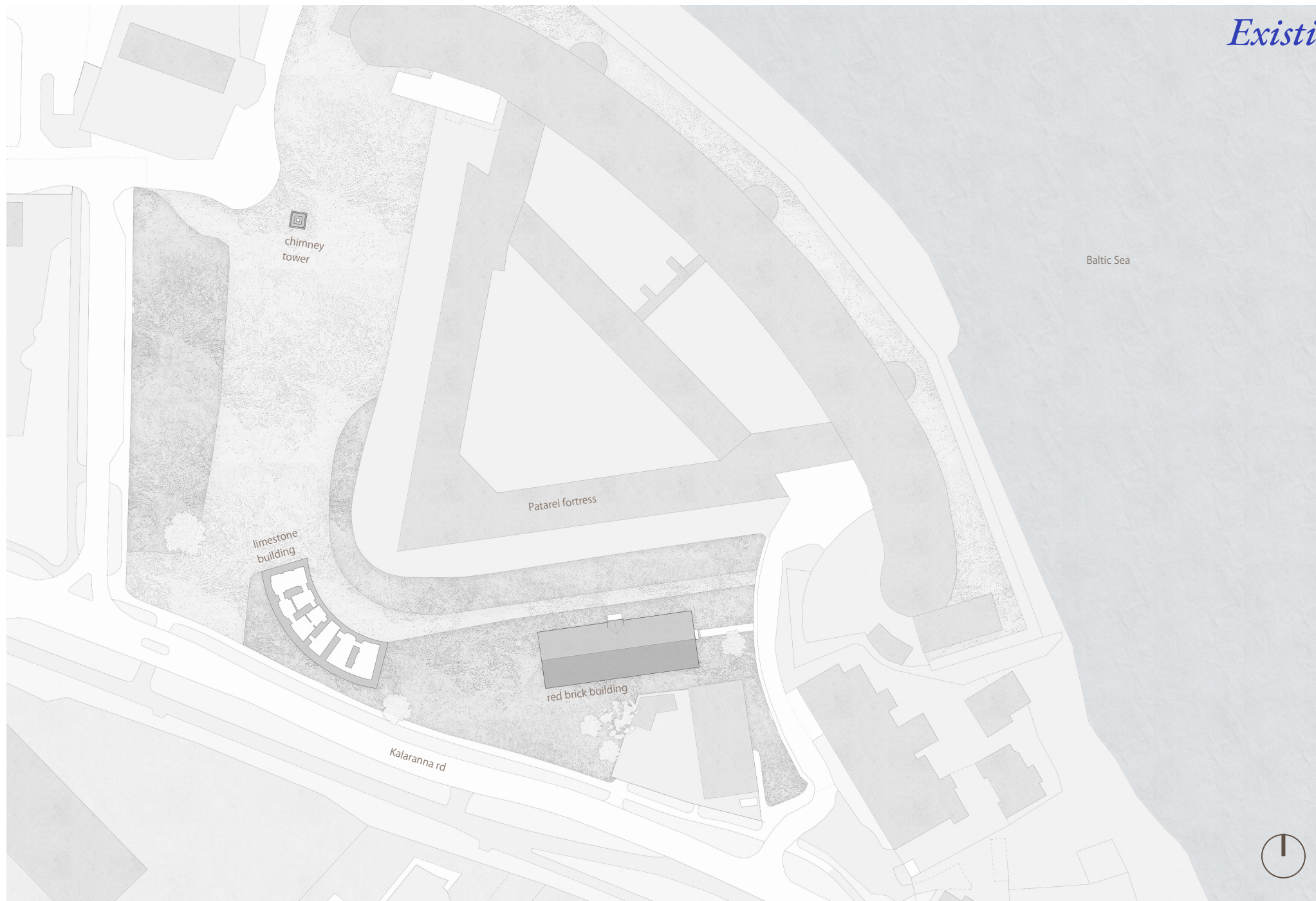
The existing above-ground structures carry a distinct material identity – one built from limestone, the other a red brick building with a timber supporting structure. It was important for me that any new addition would sensitively complement what is already there.

To inform this approach, I examined precedents from Tallinn itself, looking at how new additions have been integrated into existing limestone buildings. The prevailing trend pointed toward bold, contemporary insertions of glass and metal volumes, such as the Rotermann Carpenter's Workshop by KOKO architects in the Rotermann quarter. However, this stark contrast felt out of place given the character and context of my site, and ultimately guided me toward a more materially coherent and grounded response.

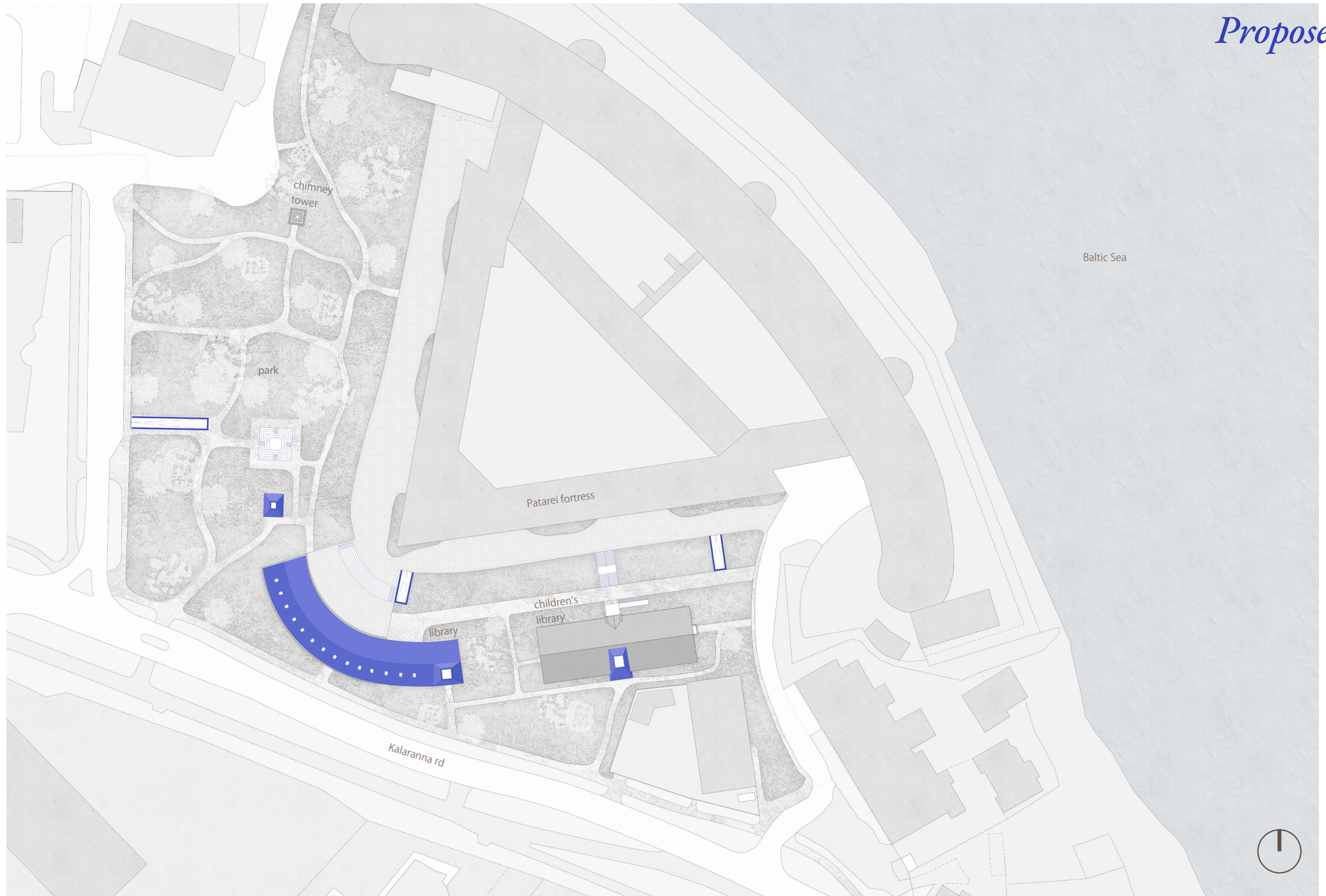
With this in mind, I chose to limit new material interventions to natural materials that echo the existing palette in terms of colour, texture, and expression. The new additions, therefore, are essentially timber structures clad in wooden shingles in a warm reddish brown tone.

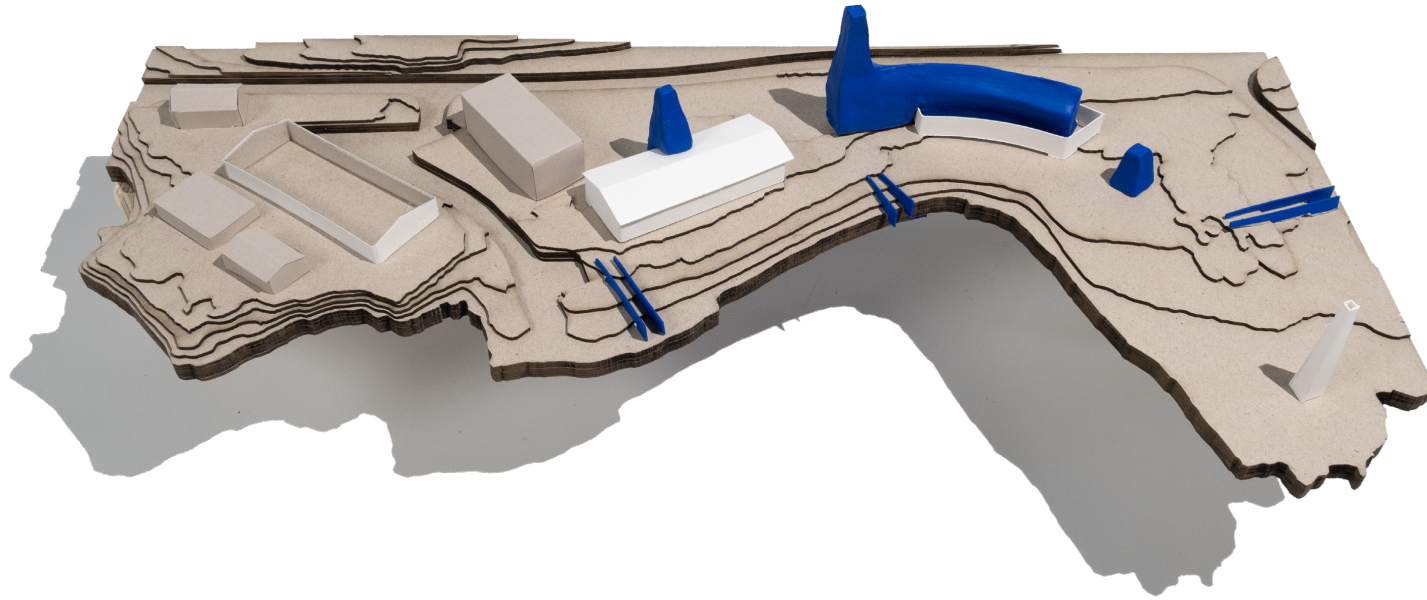


Existing

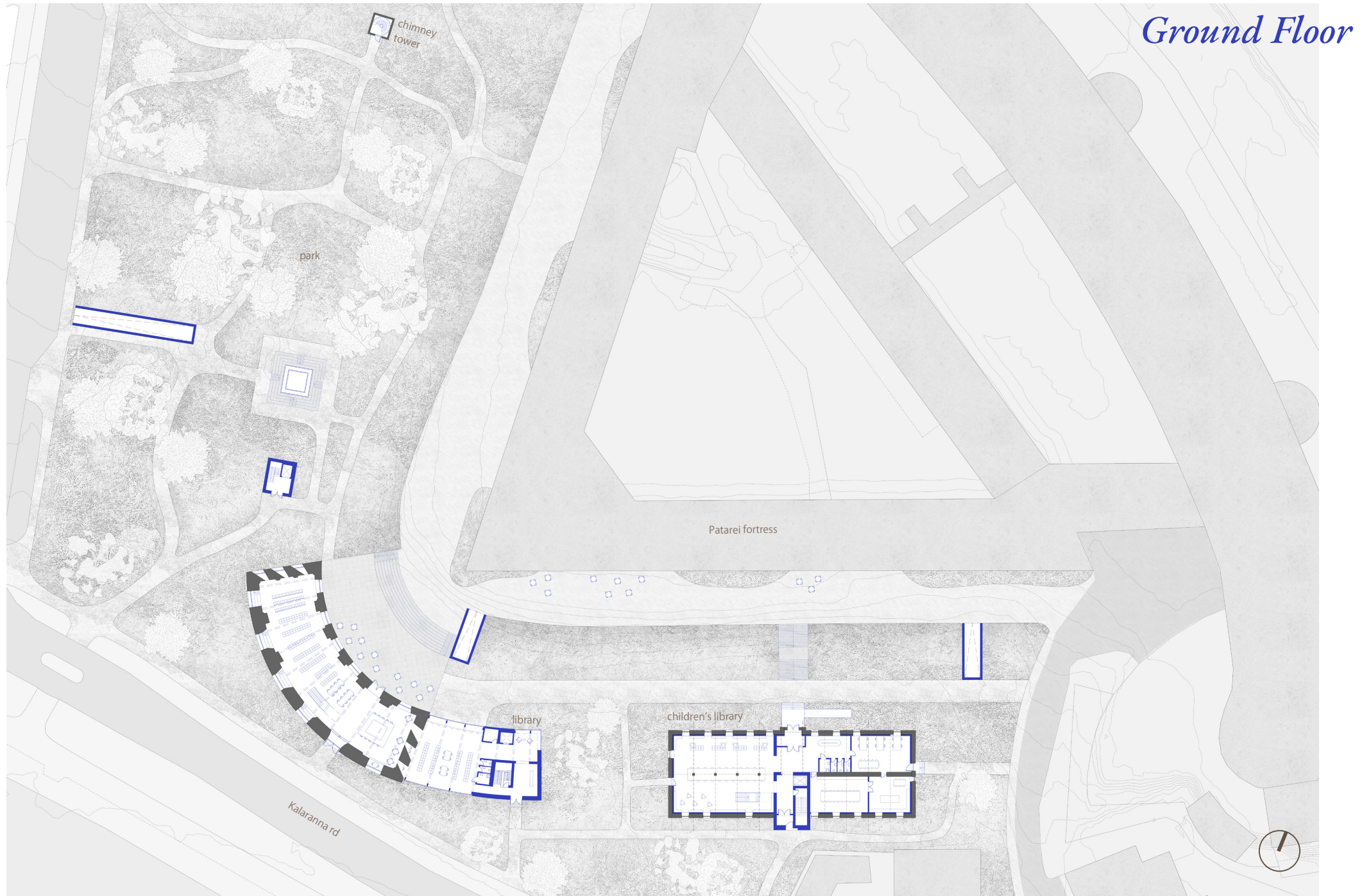


Proposed

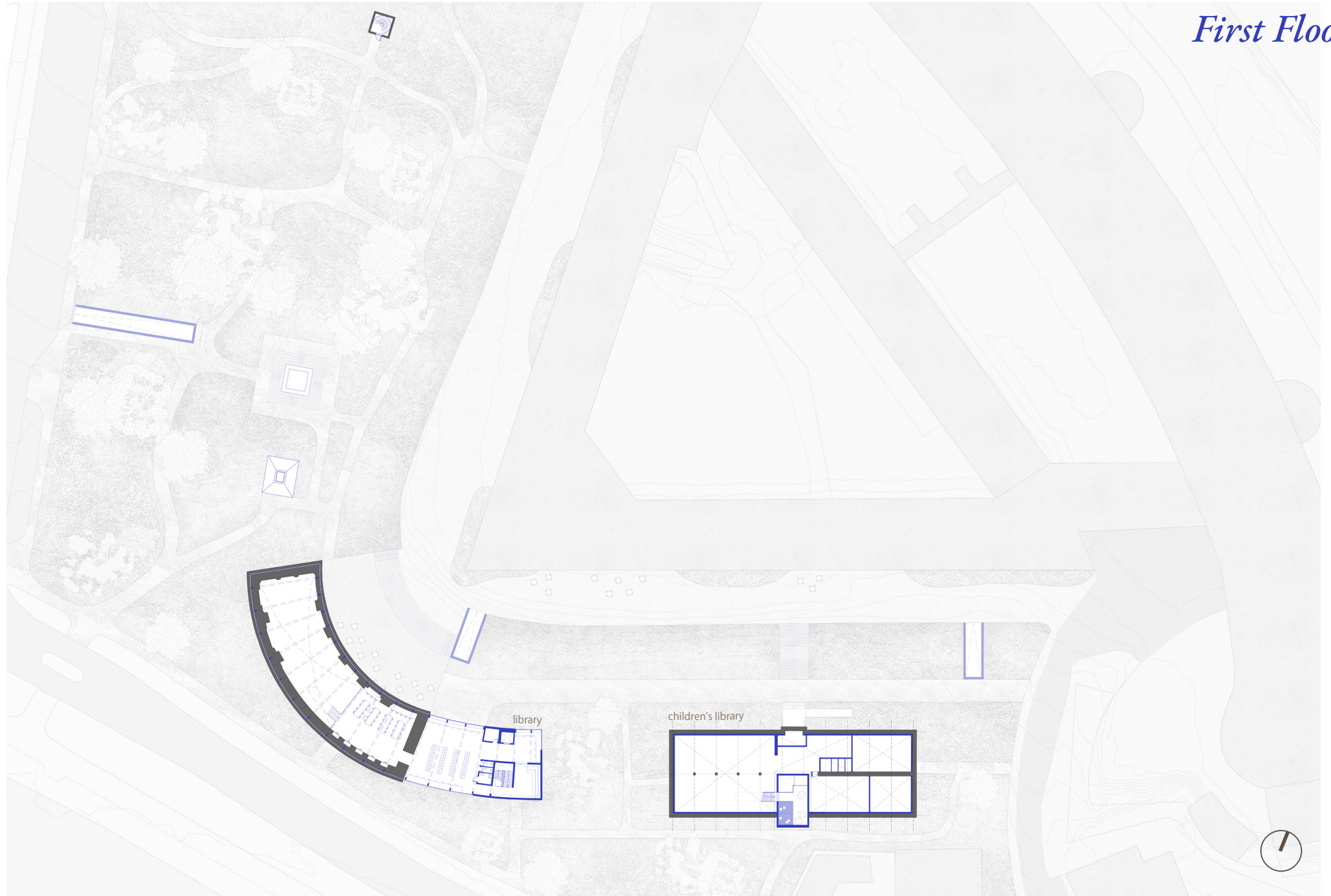




1:500 site model with new interventions highlighted in blue

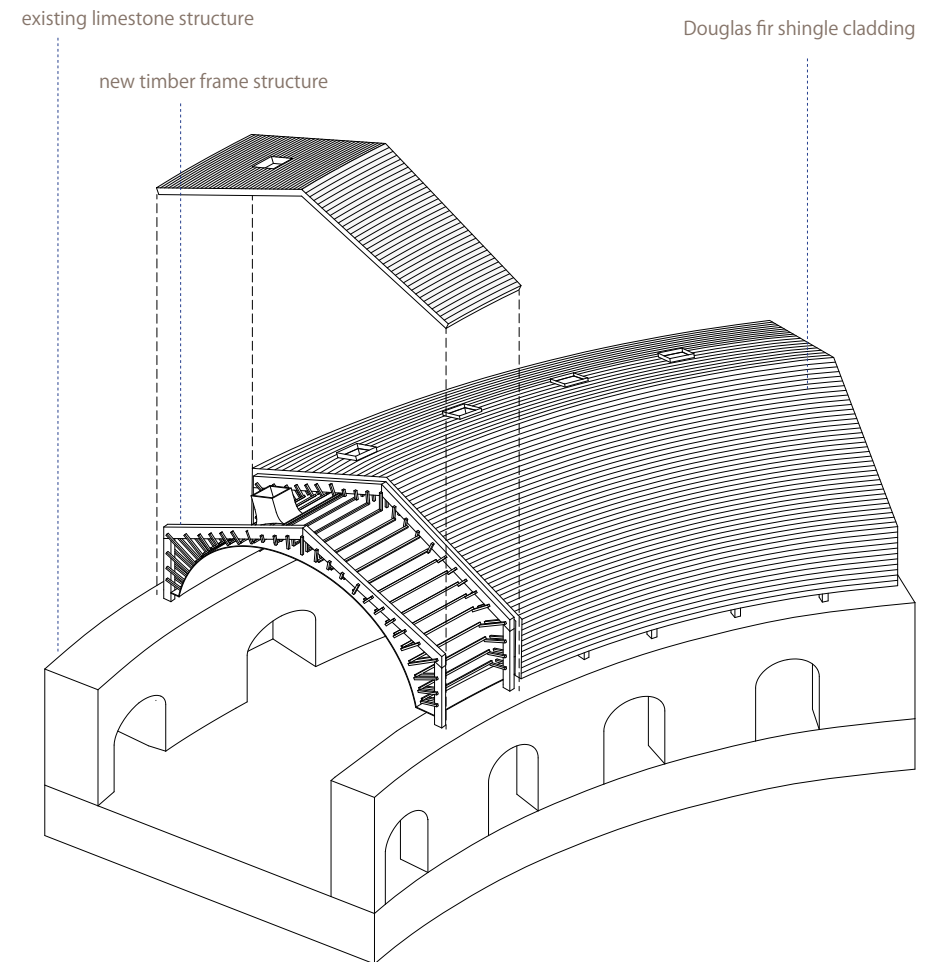


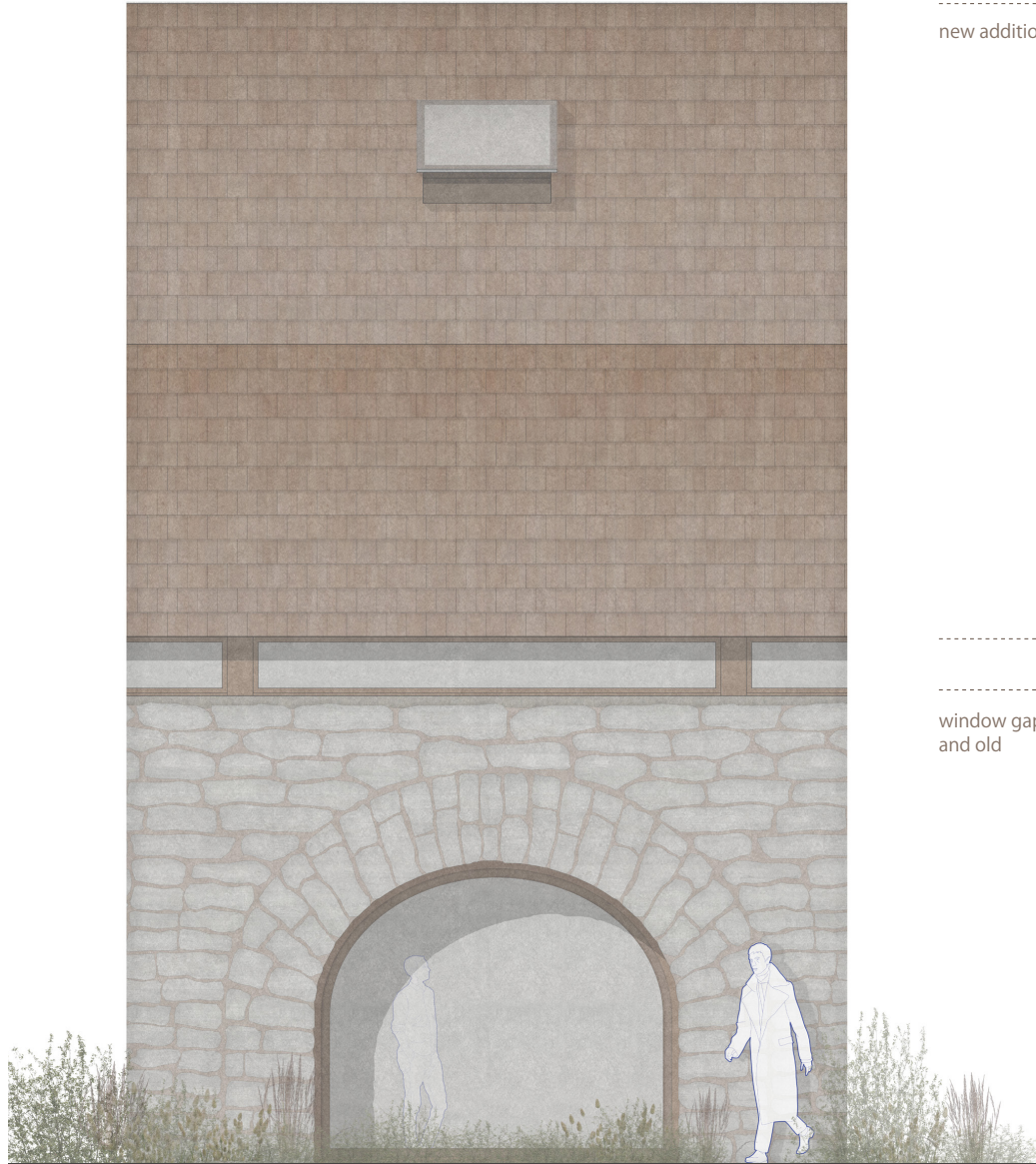
First Floor





The Library



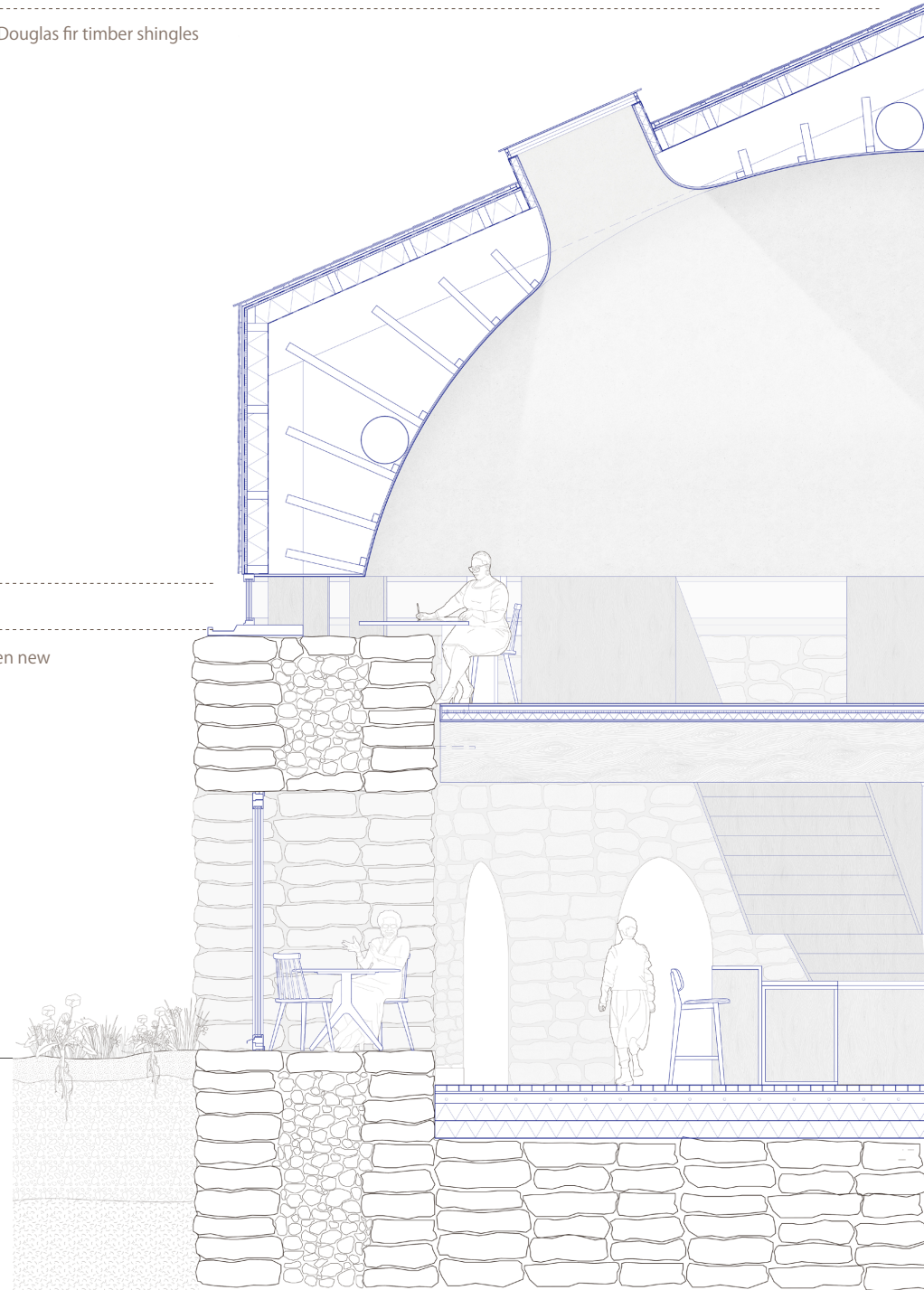


1:20 elevation and section fragments

new addition - clad in Douglas fir timber shingles

window gap in between new and old

existing limestone structure



The Towers



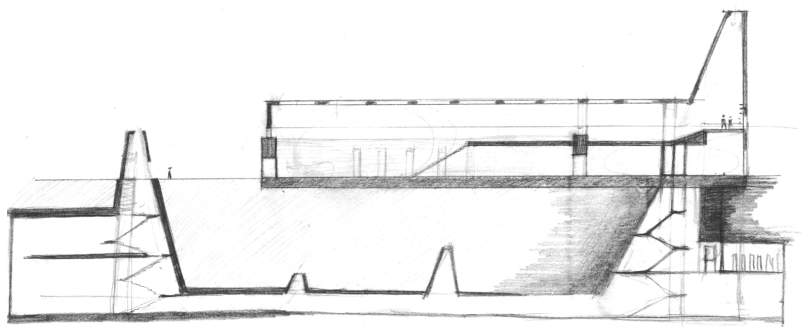
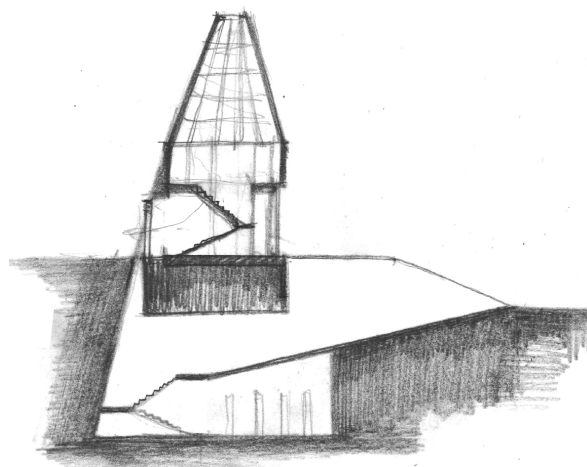
existing chimney
tower

park

public library

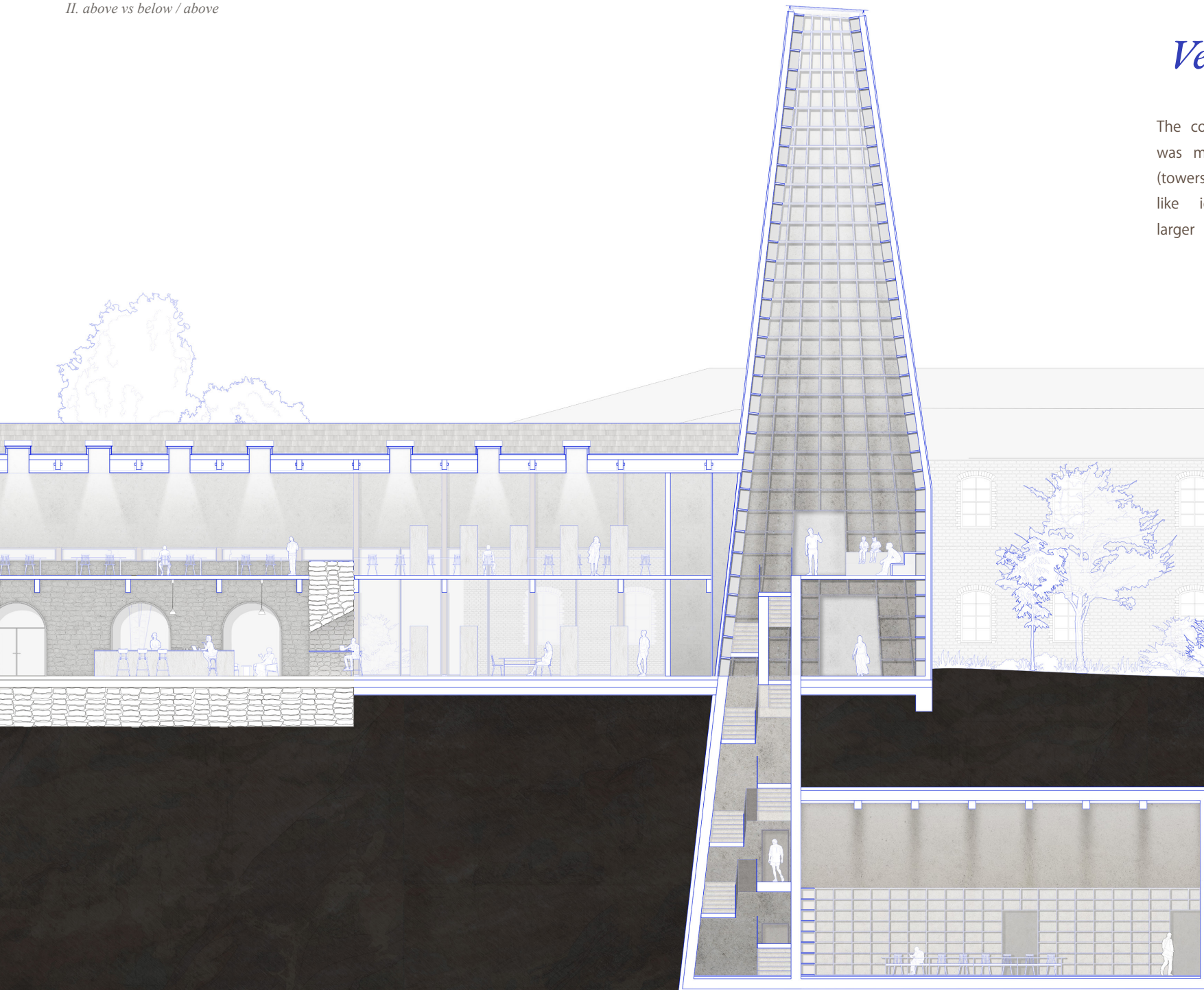
children's library

Through different volumetric studies, both physical models and sketches, as well as digital modelling, the design also developed a series of vertical elements inspired by the existing chimney tower on the site. These new tower-like structures reinterpret the chimney typology. They are distributed across the site, either as integrated components of the building or as stand-alone objects marking entrances to the underground. The existing chimney, similarly, becomes one of these entrances. Together with the project's overall spatial configuration, which surrounds the Patarei prison, these interventions aim to soften the complex's dominant presence in the surrounding area



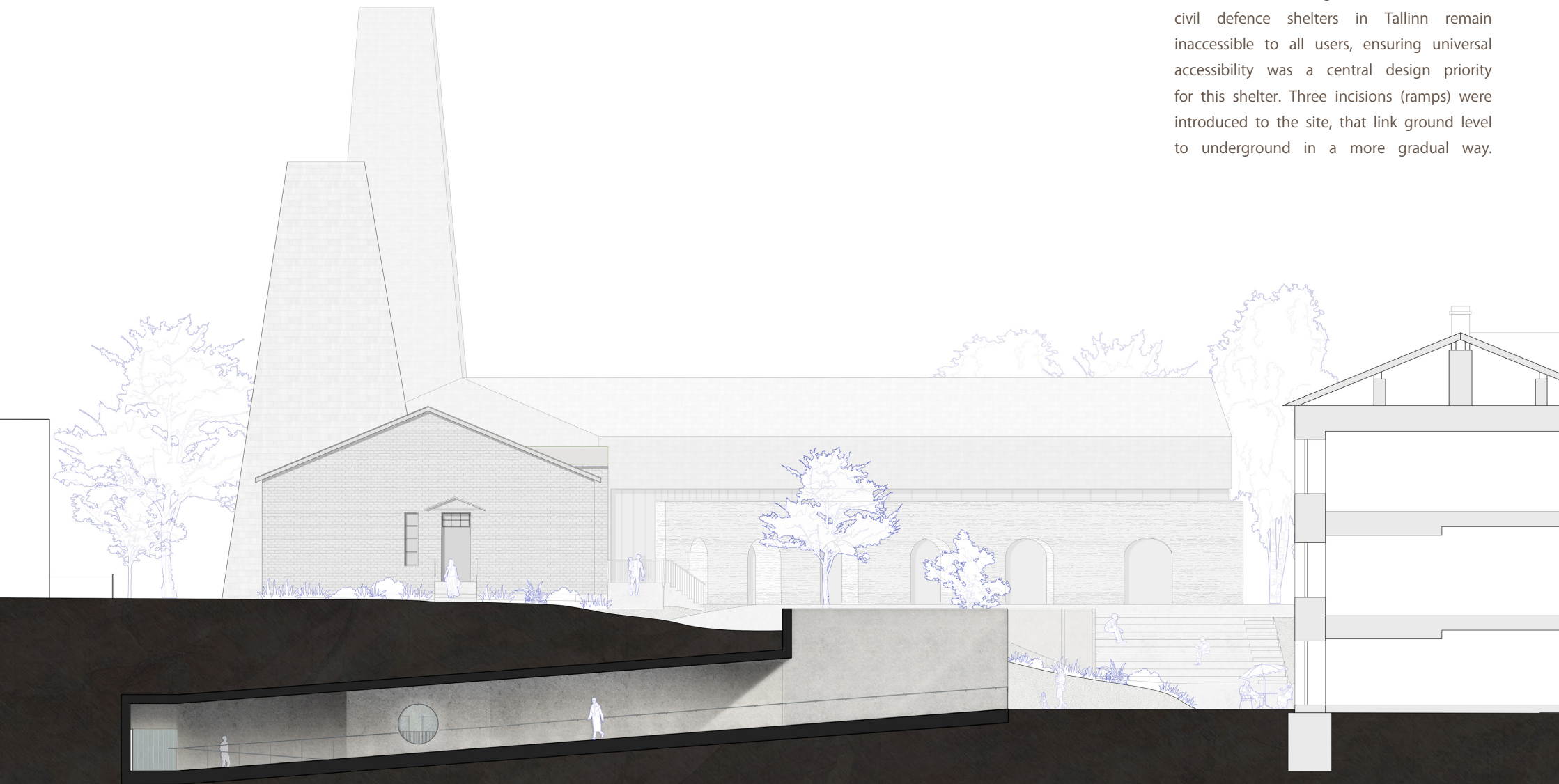
Vertical Connections

The connection between above and below was made tangible through vertical shafts (towers). The towers extend downward like icebergs, their forms creating a larger body below than is visible above.



Horizontal Incisions

Given that a significant number of civil defence shelters in Tallinn remain inaccessible to all users, ensuring universal accessibility was a central design priority for this shelter. Three incisions (ramps) were introduced to the site, that link ground level to underground in a more gradual way.

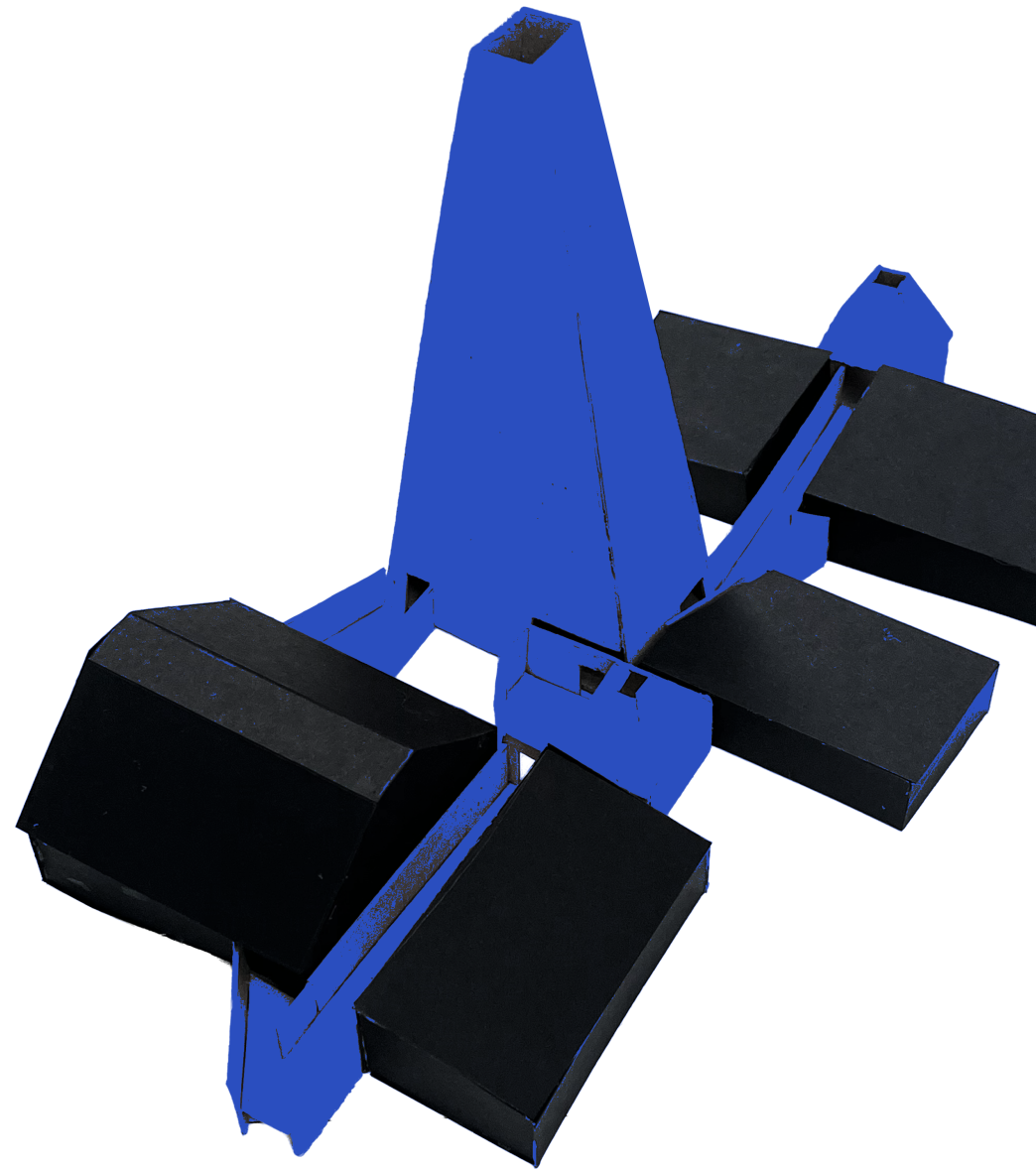


Below

Design

Phenomenological research highlighted the tendency for underground spaces to be perceived as negative and anxiety-inducing environments. This prompted further inquiry into spatial perception and neuroscience, from which three key design strategies were identified to transform the subterranean into a positive and engaging environment.

The first draws on Gaston Bachelard's concept of *intimate immensity*, whereby the deliberate alternation between vast and intimate spaces stimulates the imagination and enriches the spatial experience. The second employs the *miegakure* principle, as described by Sarah Robinson in *Architecture of Resonance*, to craft a spatial sequence that gradually reveals itself, sustaining curiosity and engagement as occupants move through the space. The third addresses colour as a significant determinant of how positively spaces are perceived – geologically inspired colours are applied to select underground volumes, lending each a distinct identity and contributing to an overall sense of warmth and orientation.



Intimate Immensity

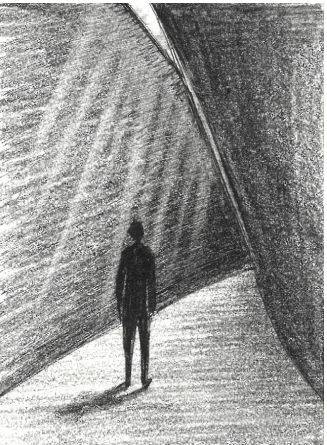


vastness

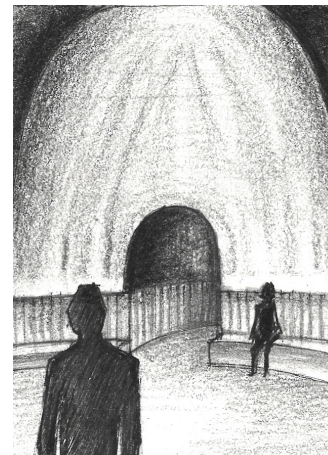


intimacy

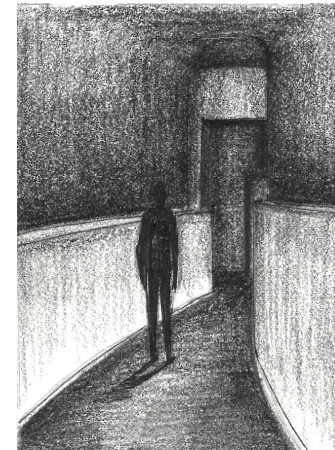
Spatial Sequence



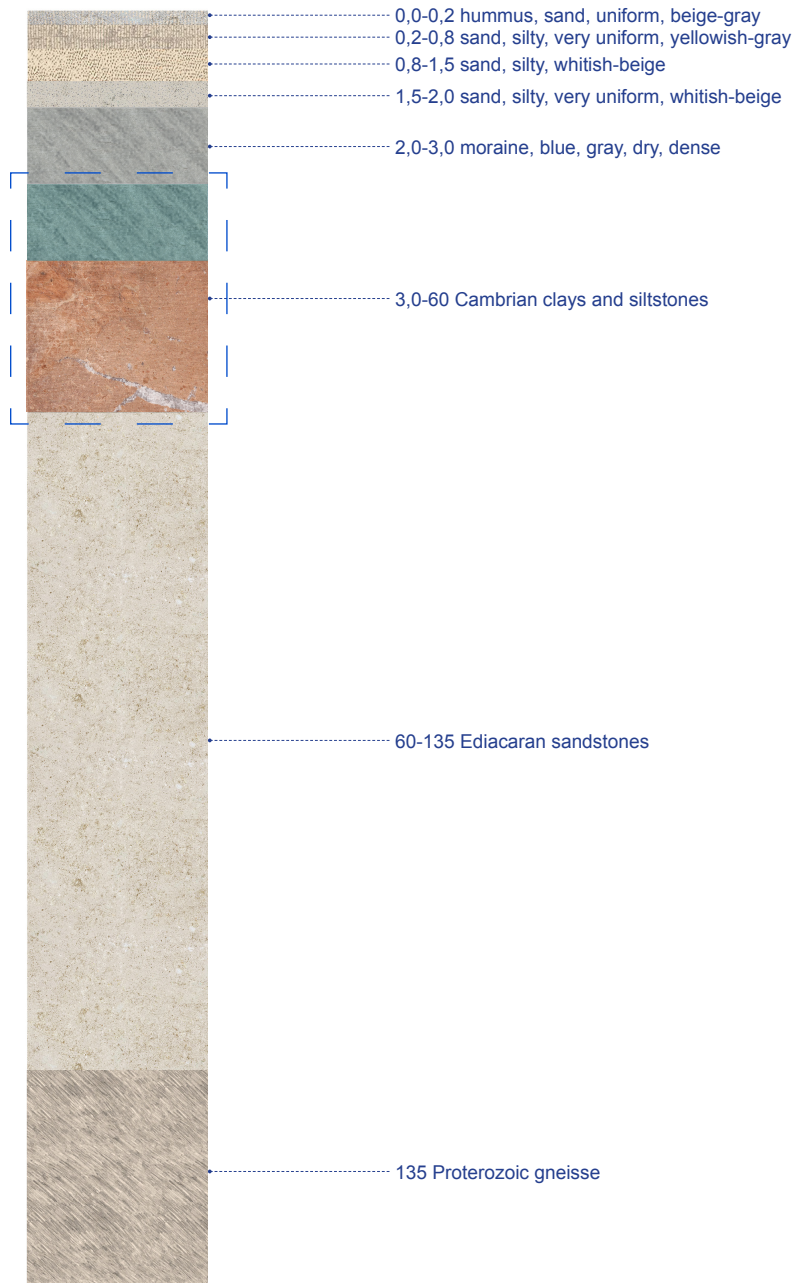
compress release



compress release



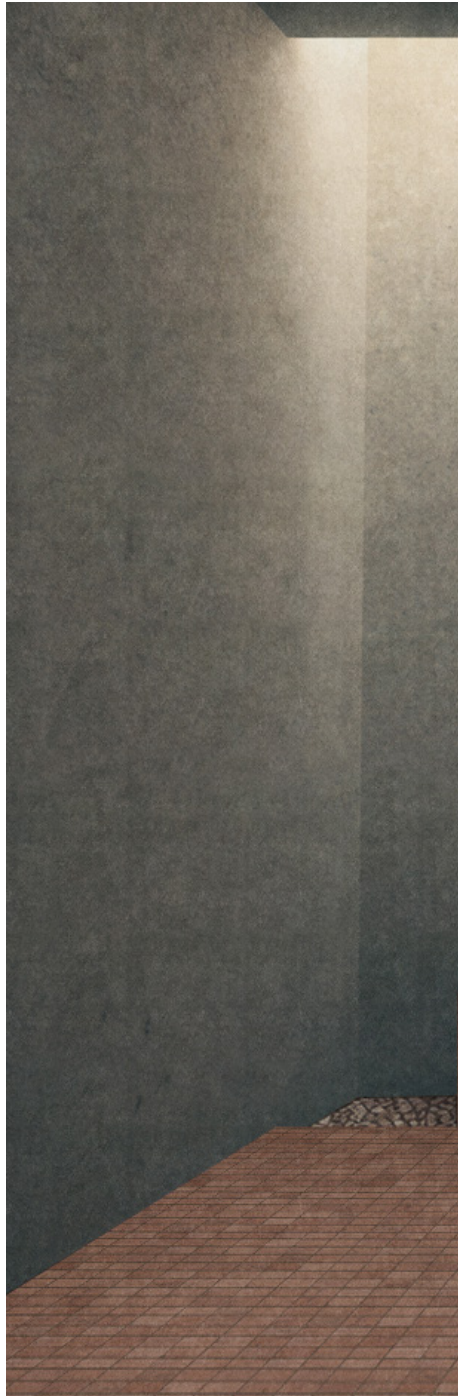
compress release



Geological analysis revealed that the proposed underground volumes would primarily be excavated through strata of siltstone and Cambrian clay, two materials characterised by distinctly vivid natural pigmentation, notably warm orange and deep blue, respectively.

The intention for this was to create the impression that the underground spaces exist in continuity with the surrounding earth, rather than hermetically enclosed volumes separated from the surrounding ground conditions.

Given that the structural requirements of the civilian defence shelters necessitated the use of reinforced concrete, the incorporation of geological pigments – either through pigmented concrete or through other interior elements – offered a possibility to reconcile these technical constraints with this ambition. Furthermore, the application of these colours to different underground spaces served a dual function: it reinforced spatial differentiation and allowed for intuitive navigation within an environment that might otherwise be difficult to understand.



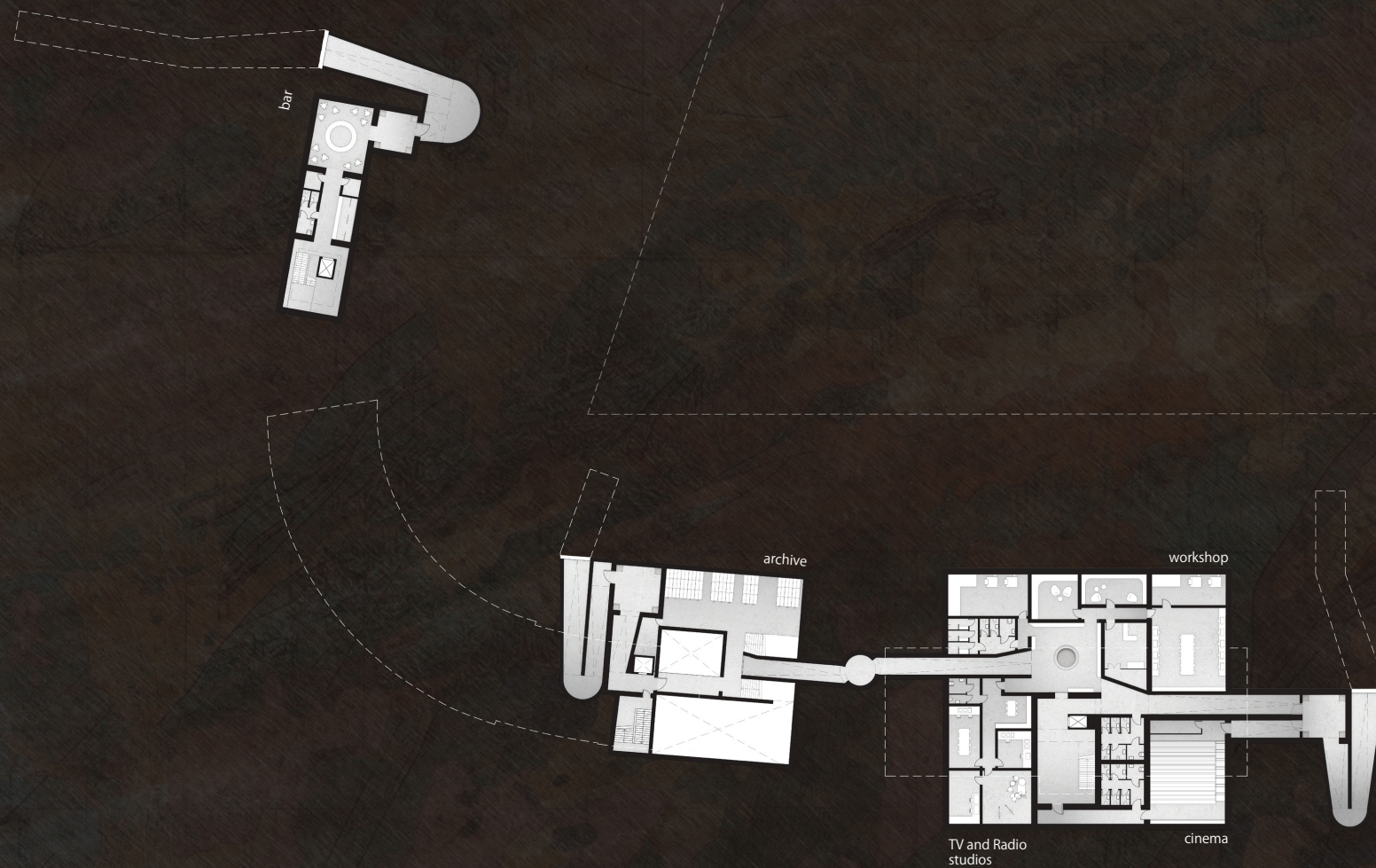
moraine clay

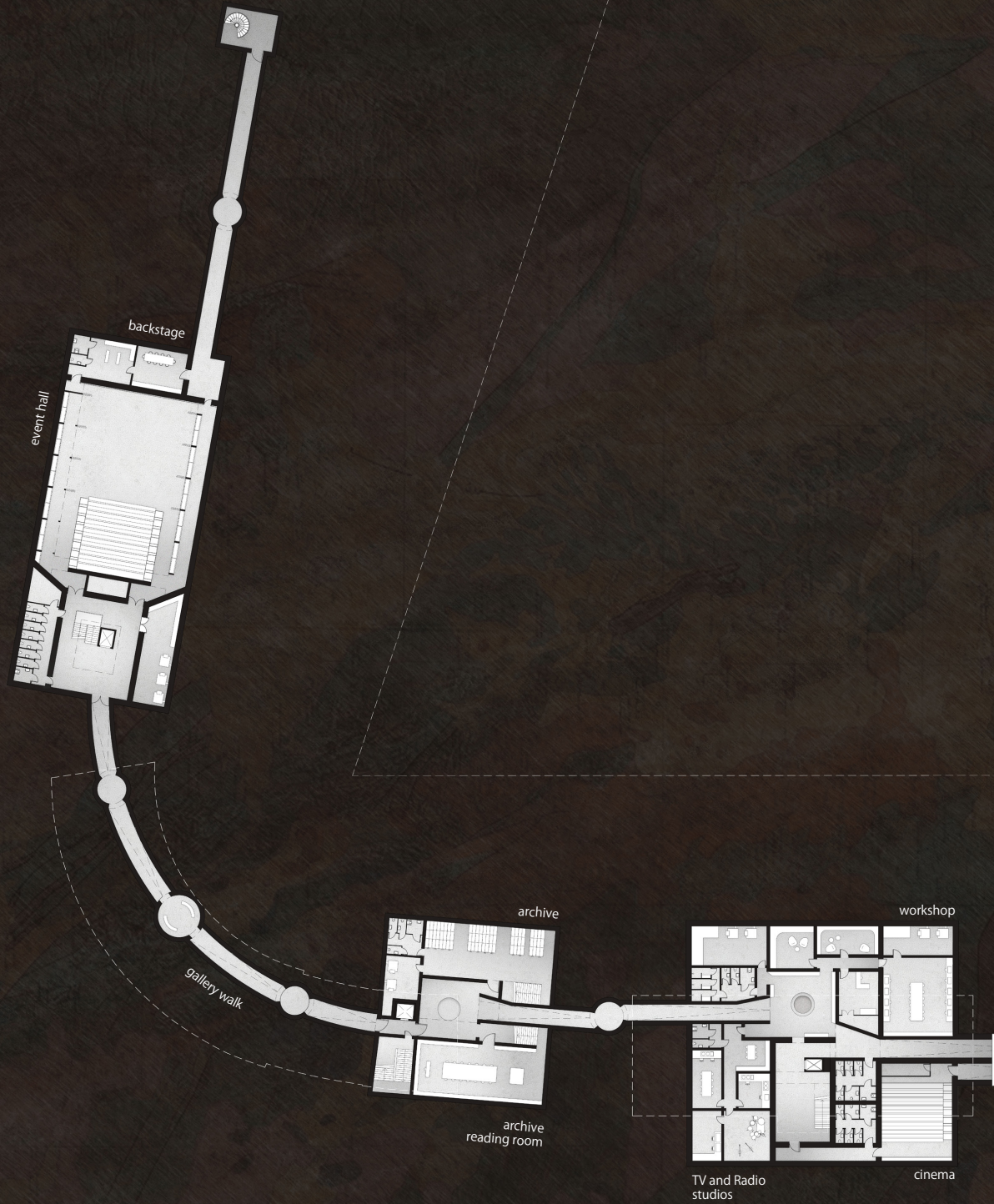
blue

siltstone

orange







Everyday

Given that the project operates across two distinct scenarios – everyday use and emergency – ensuring spatial adaptability was critical to the design. Spaces are conceived to transition seamlessly between conditions, serving different functions depending on the circumstances. In its everyday use, the project functions as a vibrant cultural community centre, offering locals the opportunity to attend concerts, visit the cinema, browse the archive room, or participate in workshops. The event hall is particularly flexible, equipped with several rows of curtains that allow the space to be subdivided as needed to suit a variety of events and group sizes. By programming a diverse range of activities, the project seeks to draw together people of different ages and social backgrounds – fostering the neighbourly connections that, in turn, strengthen the wider resilience of the community.

Emergency

During emergencies, it was important that the building could shift quickly to this new condition. This project specifically focused on how the event hall – the biggest volume of the project – can transform into a sleeping zone during emergencies. The volume of the hall can be compartmentalised to balance communal areas with spaces for individual rest, accommodating the social and psychological needs of sheltering occupants.

Circulation was an equally critical consideration, particularly for managing the movement of large groups during an emergency. Seven entrances to the underground – four staircases and lift shafts, and three accessible ramps – were distributed across the site to ensure that if one or more access points are compromised, safe evacuation remains possible.

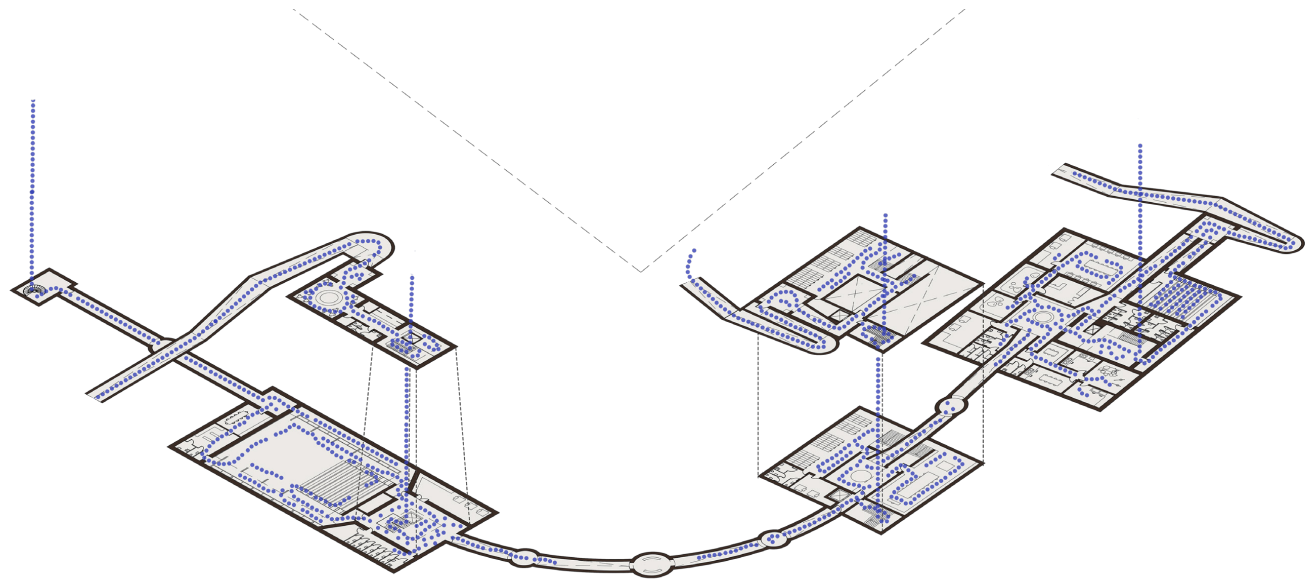
Navigation

Underground

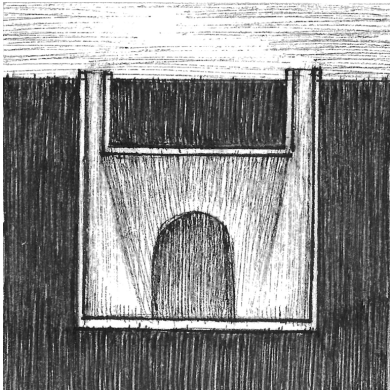
In an emergency, the ability to orientate quickly underground is critical. The layout is therefore designed for legibility, with each space assigned a clear and specific purpose.

Conceptually, the underground functions as a small-scale city. The spatial configuration and the used architectural typologies within it draw inspiration from the fortified city of Tallinn. Corridors function as streets; larger central spaces serve as squares or points of navigation; and different programmatic volumes resemble buildings. Transitional spaces positioned along the corridors just before entering the main subterranean volumes operate as city gates, while the vertical shafts connecting above-ground and underground levels function as towers.

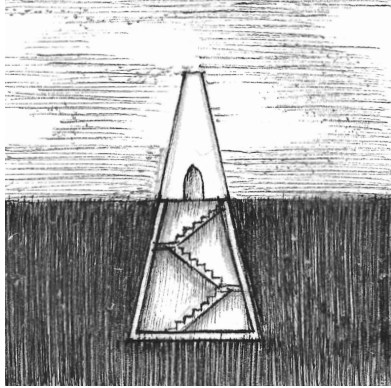
Using this urban analogy allows the creation of an environment that is more legible and navigable, thereby reinforcing a sense of orientation and spatial identity.



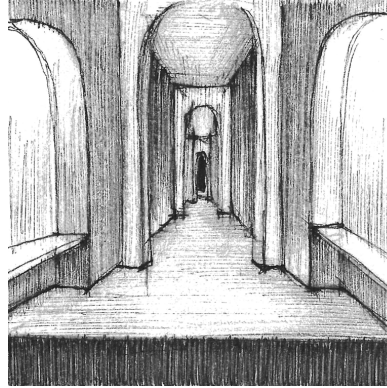
Underground City



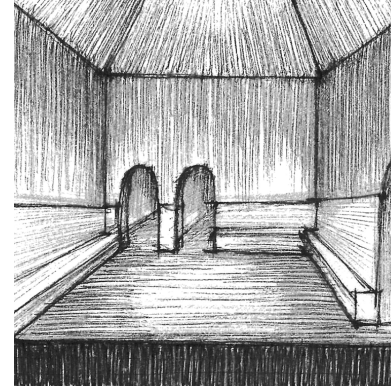
the city gates



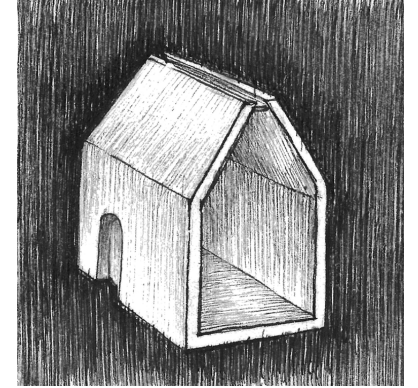
the tower



the street



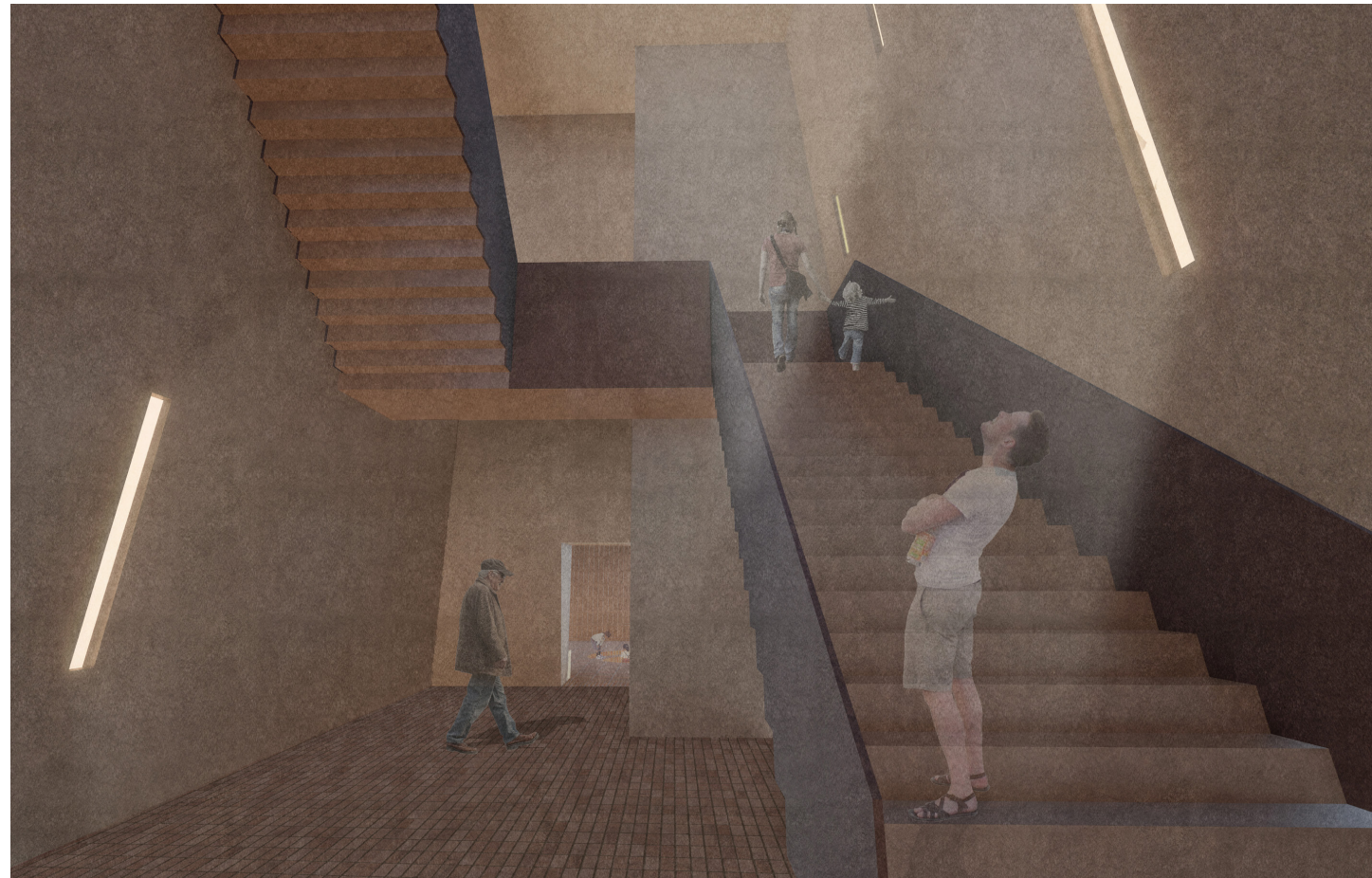
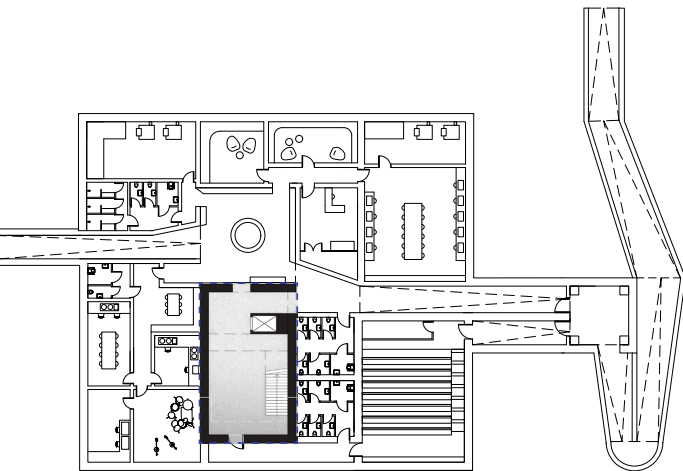
the square



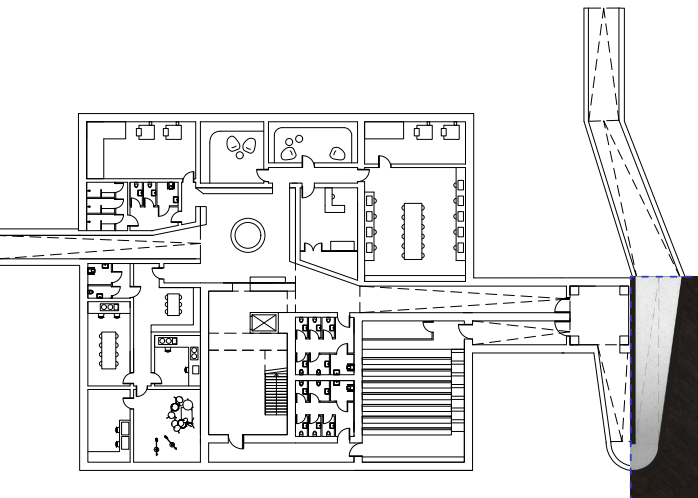
the building

The Tower

The tower is the vertical connection between above and below. It is a more vast space containing a staircase and a lift that allows people a quick and direct access to the underground. Narrow cuts in the walls, illuminated from within, reference the arrow slits and cannon ports characteristic of historic defensive towers.



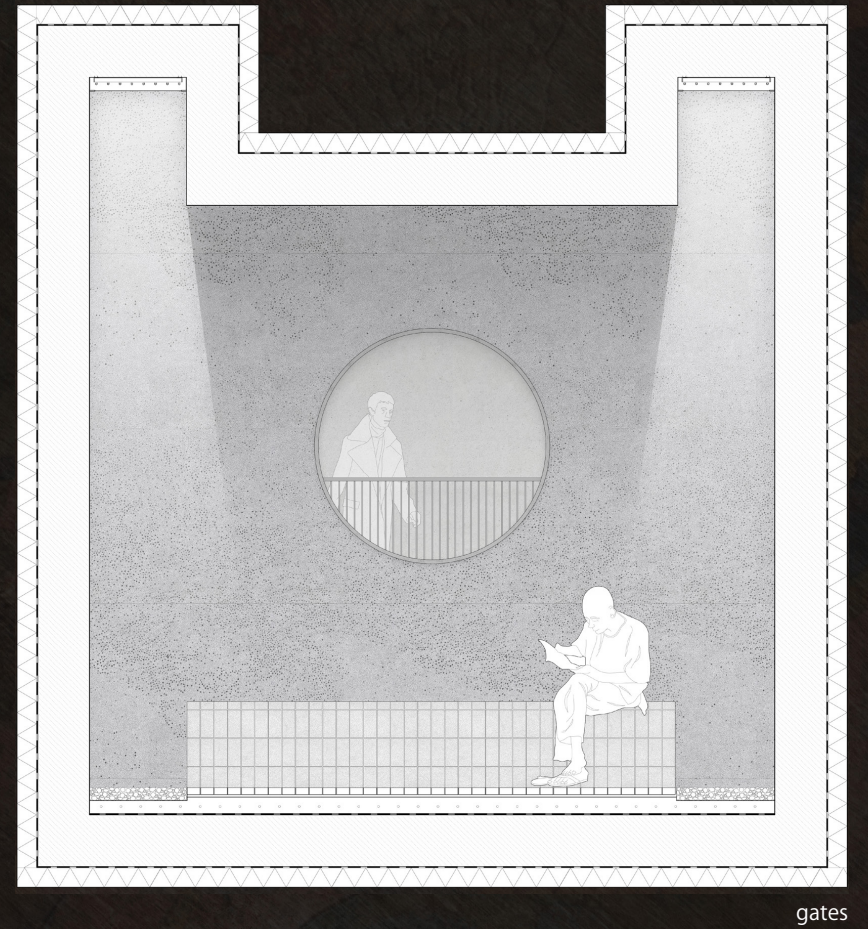
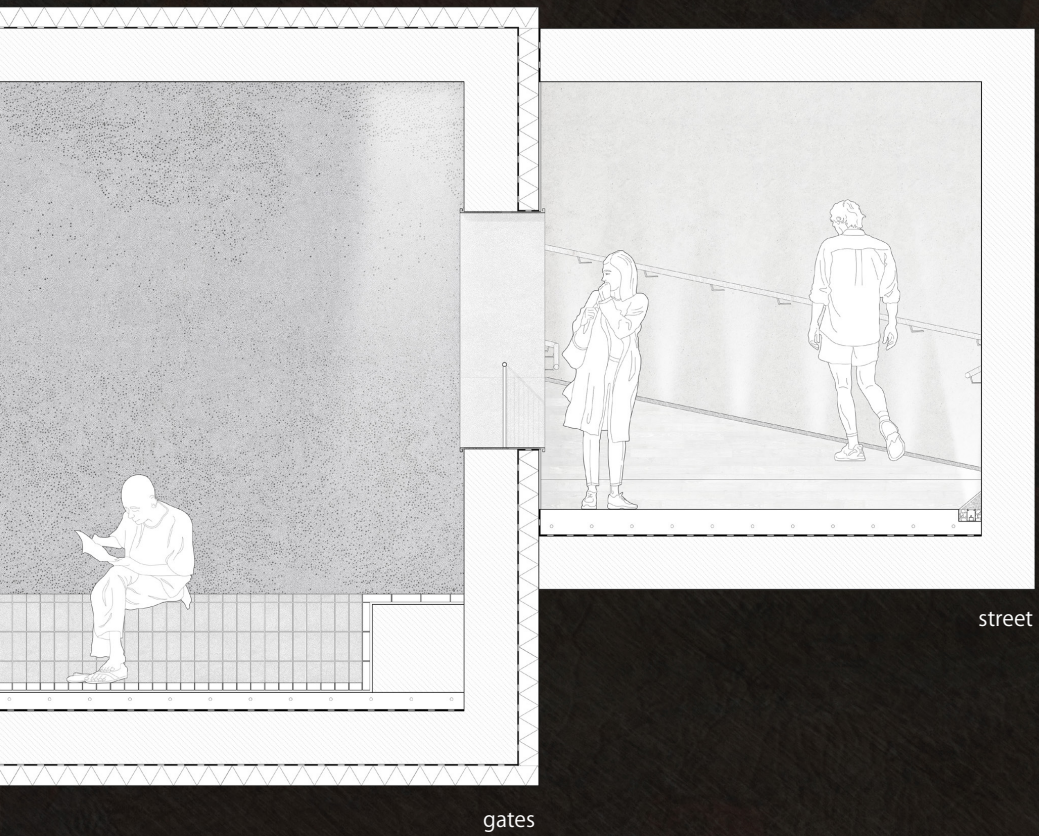
Should lifts be unavailable during an emergency, the underground remains accessible via the streets – the ramped incisions that descend gradually from ground level. Rather than purely functional corridors, these routes are designed to offer a varied and engaging journey downward, each possessing its own distinct atmosphere. Drawing inspiration from Aldo van Eyck's street typology in the Pastoor van Arskerk, circular alcoves are positioned along the way, offering moments to pause, rest, or engage with artwork displayed along the gallery walk.



The Street

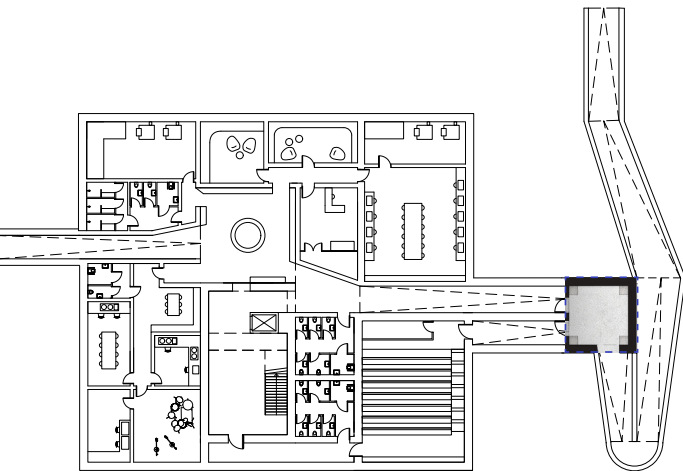


gradual descent / visual connection



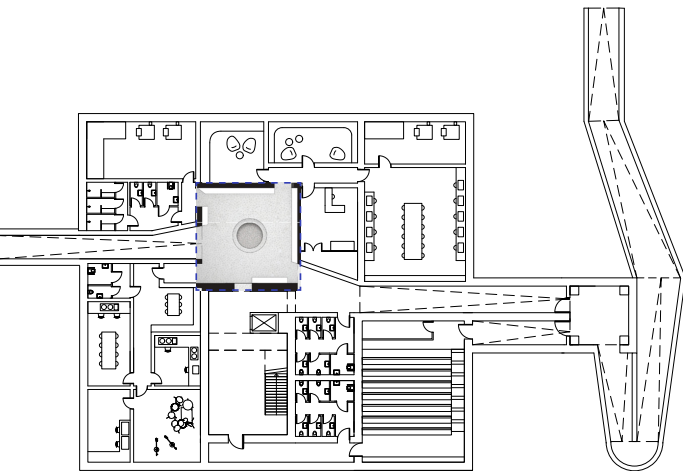
The Gates

The gate marks the threshold to the underground. It functions as a sealing space with blast-resistant doors, closeable in emergency. Moraine clay pigment gives it a distinct spatial character, and light entering from the corners of the space references the form of a gate tower.



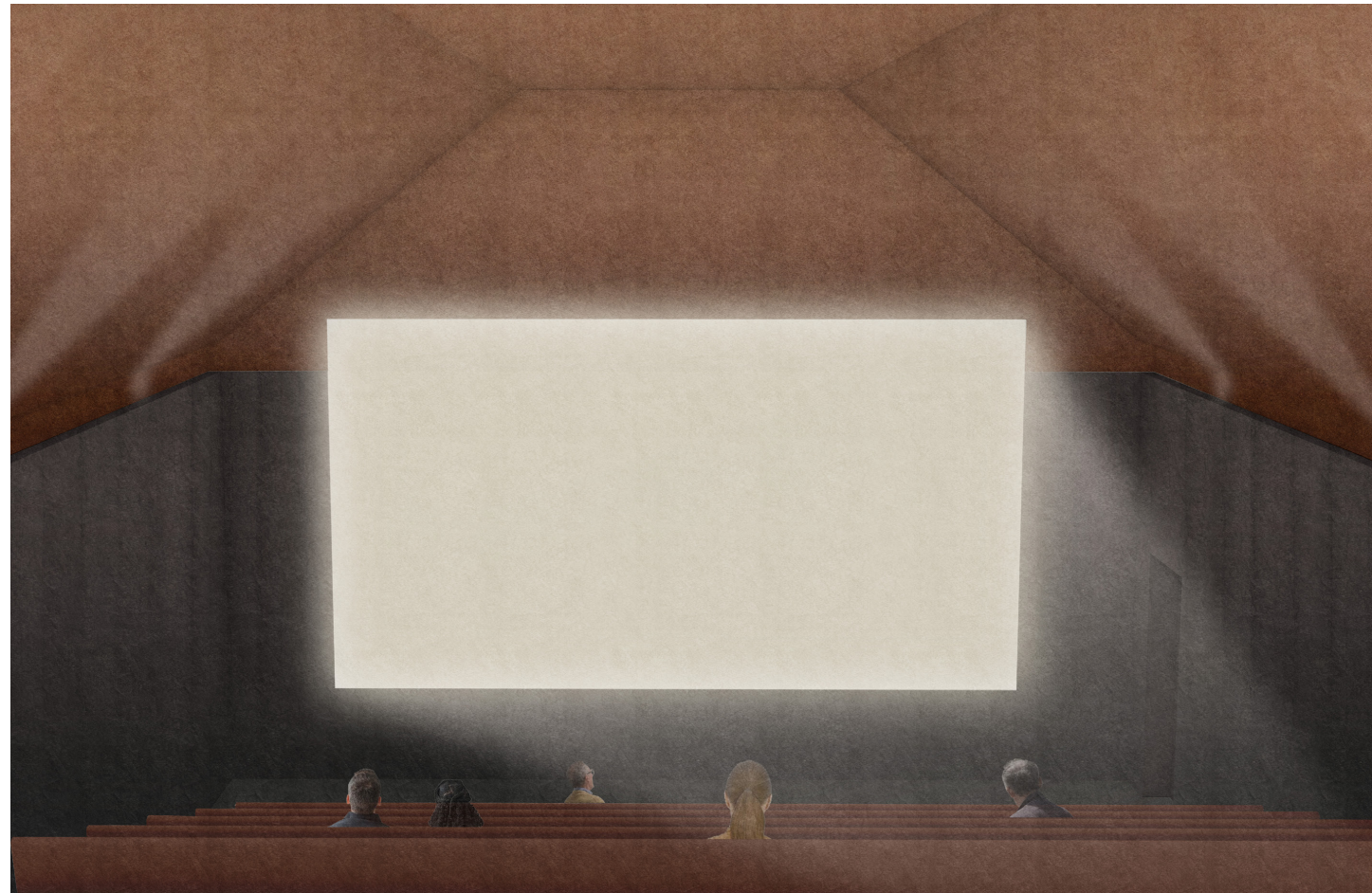
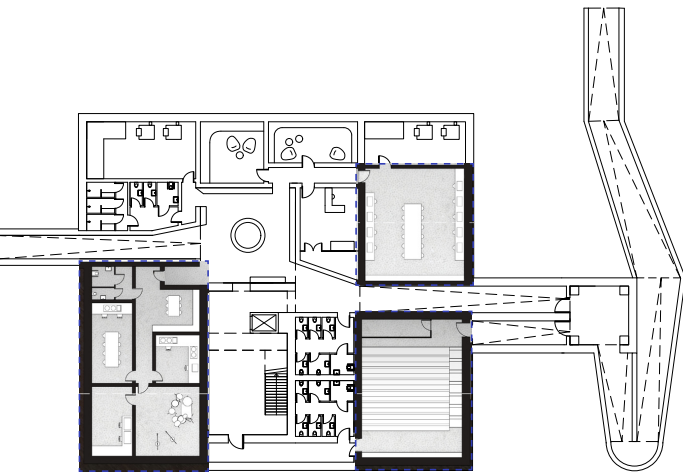
The Square

Beyond the gate, streets lead to the square – the central node of each neighbourhood. It acts as an orientation point and waiting zone. A central gravel pit references the urban analogy, while orange tones reference the siltstone geological layer.



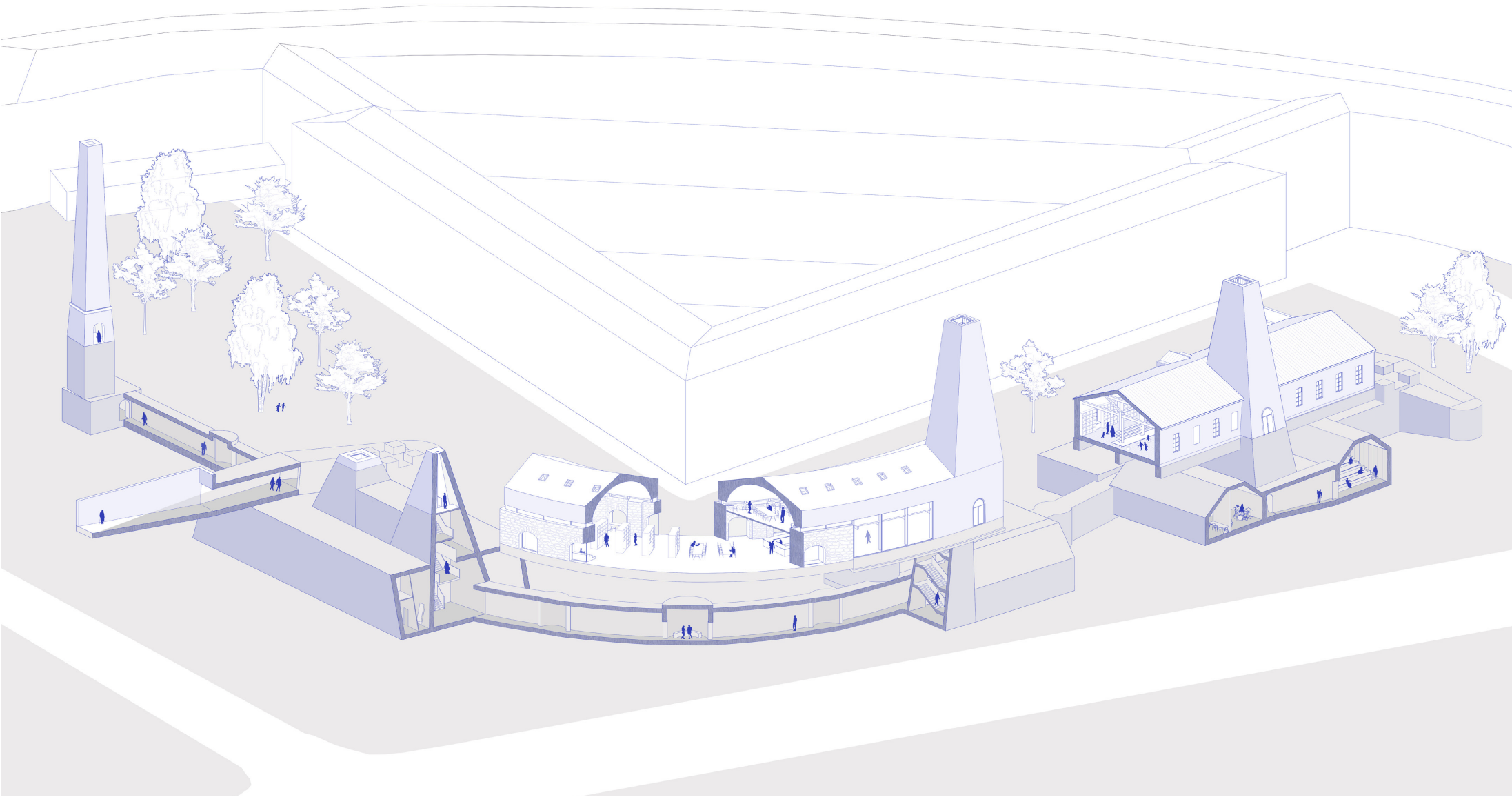
The Building

From the square, users are directed toward the different programme spaces by the secondary streets. Each of these volumes – the ‘buildings’ of the underground city – possesses its own distinct spatial qualities, designed to suit the nature of the programme it houses.



The Neighbourhoods

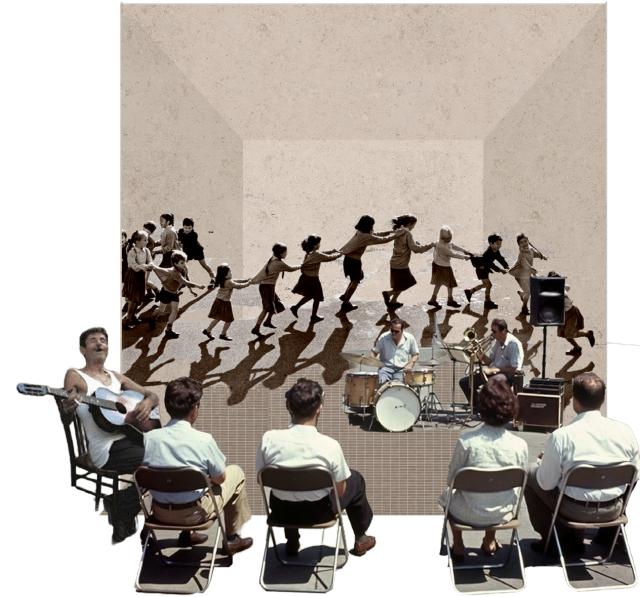
The underground city is organised into three distinct neighbourhood clusters, each structured around its own urban analogies. These clusters are linked by corridors that allow people move swiftly accross spaces both during emergencies and every day use.



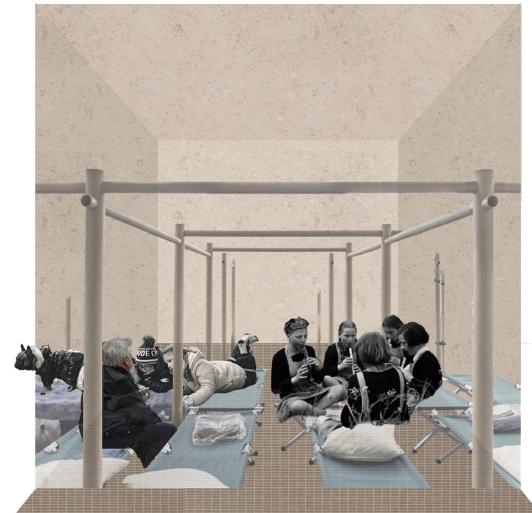
Dual Scenario

Event Hall

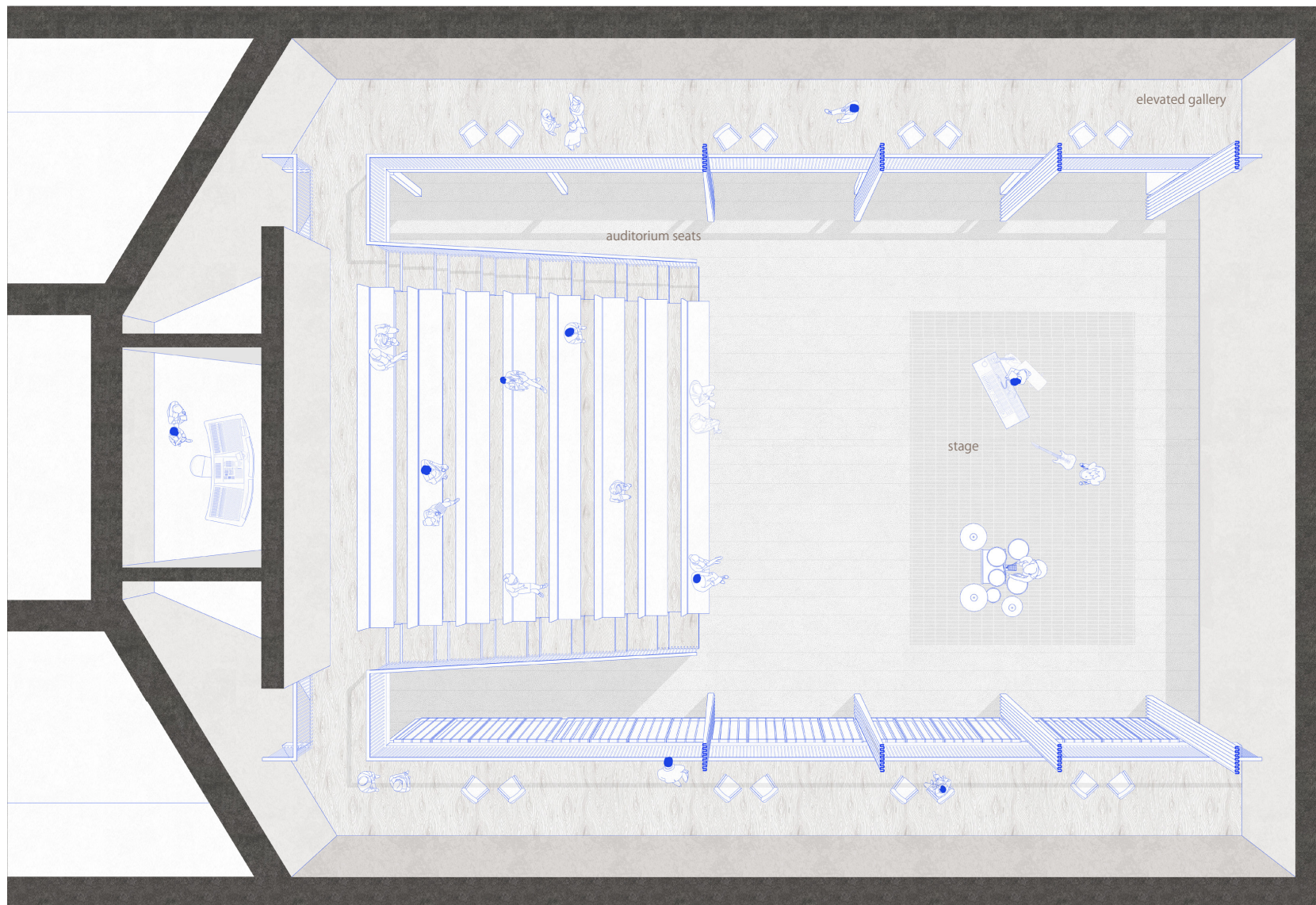
Emergency adaptation is perhaps most clearly illustrated in the event hall. In everyday use, it operates as a cultural venue with an elevated gallery. In emergency, it transforms into a resting space. Integrated shelving units along its walls can be opened to create more private niches, while also providing storage for personal belongings and emergency essentials, such as beds and blankets. The addition of several layers of curtains similarly provides separation of this large space into smaller compartments. Moreover, reclining soft benches provide further sleeping spaces. Overall, these decisions not only increase spatial flexibility during emergencies but also enhance the hall's everyday use by allowing the stage area to be reduced or reconfigured according to different needs.

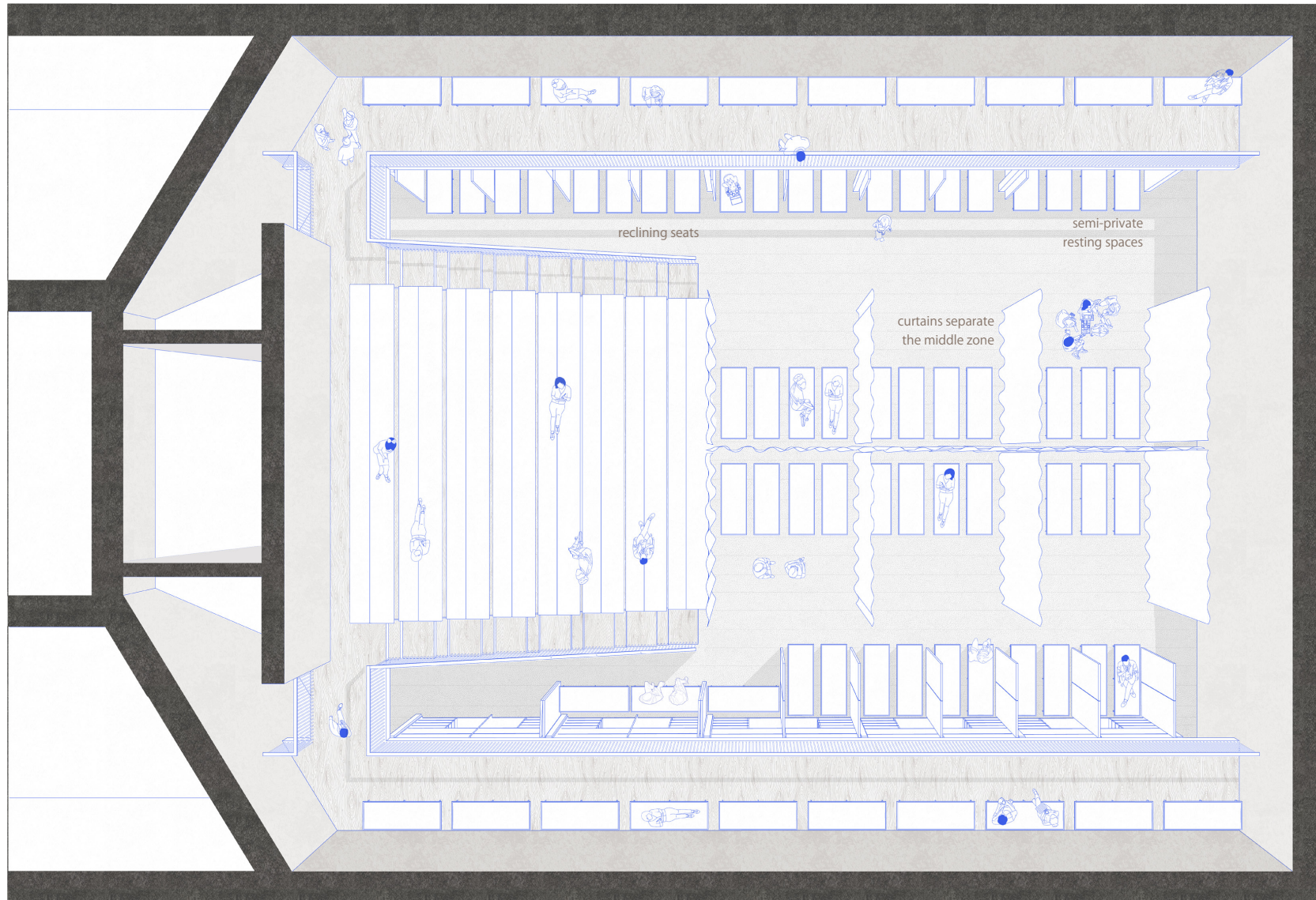


everyday



emergency





everyday scenario - cultural activities



The event hall incorporates four rows of curtains that allow the space to be reconfigured for different types of events. By adjusting the curtains, the stage area can be reduced in size or enclosed to create a more intimate setting for smaller gatherings and performances.

emergency scenario - resting space



Along the sides of the hall, operable shelving units open to create semi-private compartments where users can rest and store personal belongings during emergencies. Each compartment accommodates approximately four people, making them suitable for families or small groups.

Summer

The last duality emerged from a clear lack of public spaces that function all year round in Tallinn. In summer, the project creates a much-needed green park that acts as a connector to the seaside. The street running between the Patarei fortress and the project is simultaneously activated, transformed into a commercial zone offering cafes, restaurants, and resting places.

Environmentally, the thermal stability of the underground is harnessed to cool the overheated interiors of the above-ground buildings. Ground source heat pumps assist in this process, with cooler air rising naturally through the tower shafts to moderate temperatures above – creating a more comfortable environment while reducing reliance on conventional cooling systems.

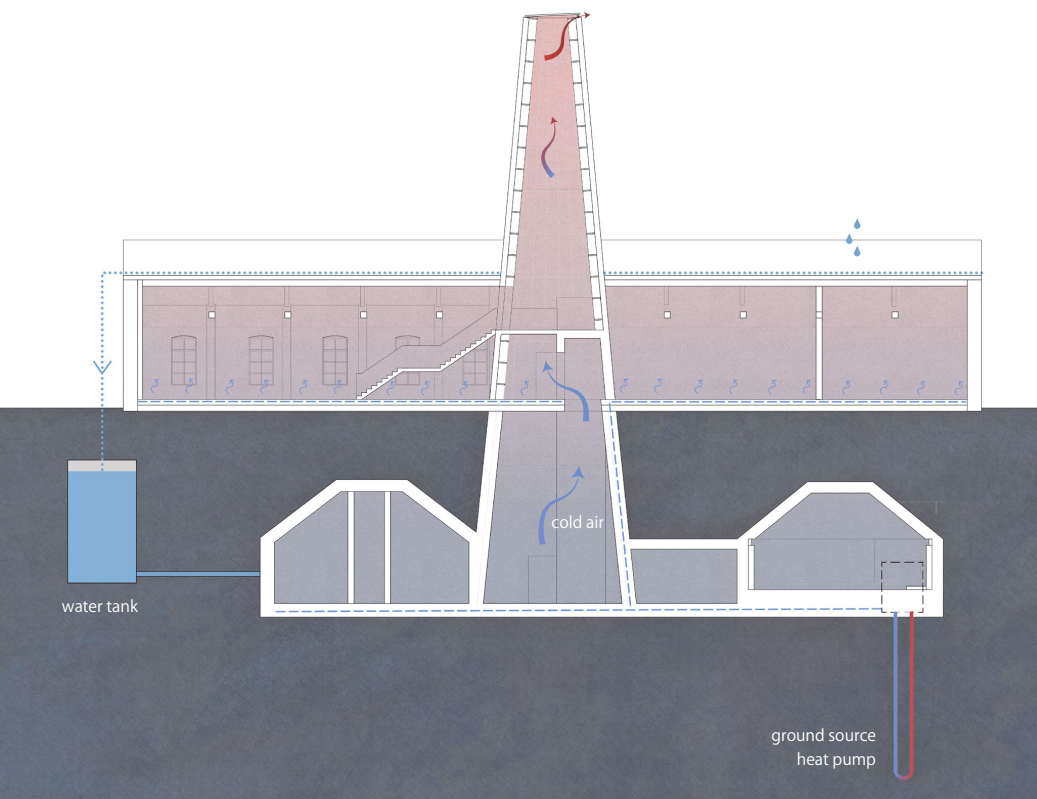
Winter

Responding to a clear shortage of warm, inclusive interior spaces free from commercial expectation, a library is introduced at ground level. Inherently accessible by nature, it offers a space where people of all ages and backgrounds are welcome without obligation – whether to study, socialise, or simply read.

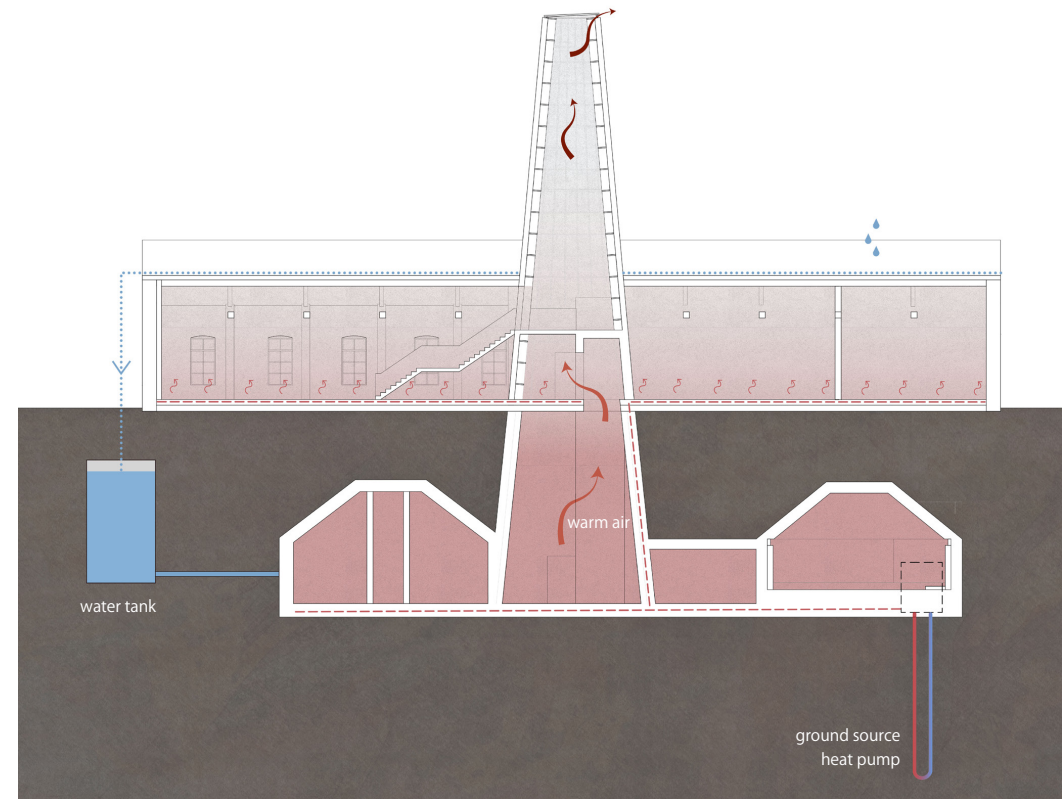
Environmentally, the thermal relationship between above and below is reversed in winter. Warmer air from the underground rises naturally through the tower shafts, passively heating the cooler spaces above and reducing the demand for conventional heating systems.

In addition, rainwater harvested via roof gutters is stored in an underground tank and recirculated for toilet flushing throughout the building, reducing overall water consumption. In an emergency scenario, this reserve equally serves as a potable water supply, provided the tank remains uncompromised.

Environmental Strategy



summer



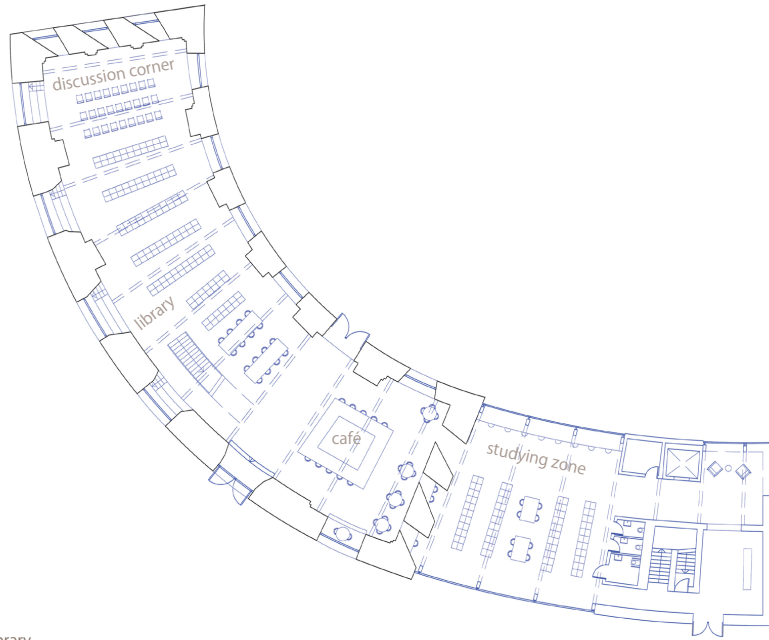
winter



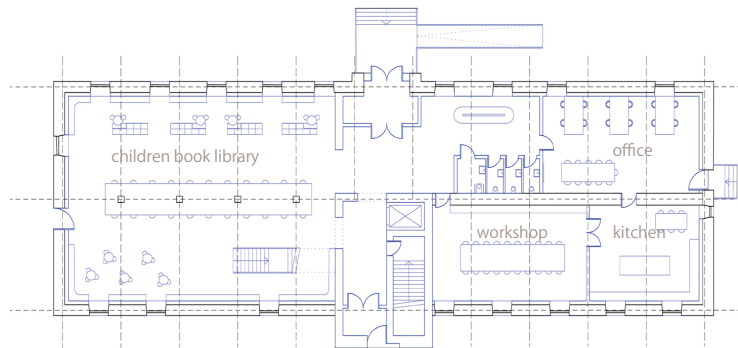
Tallinn in Winter



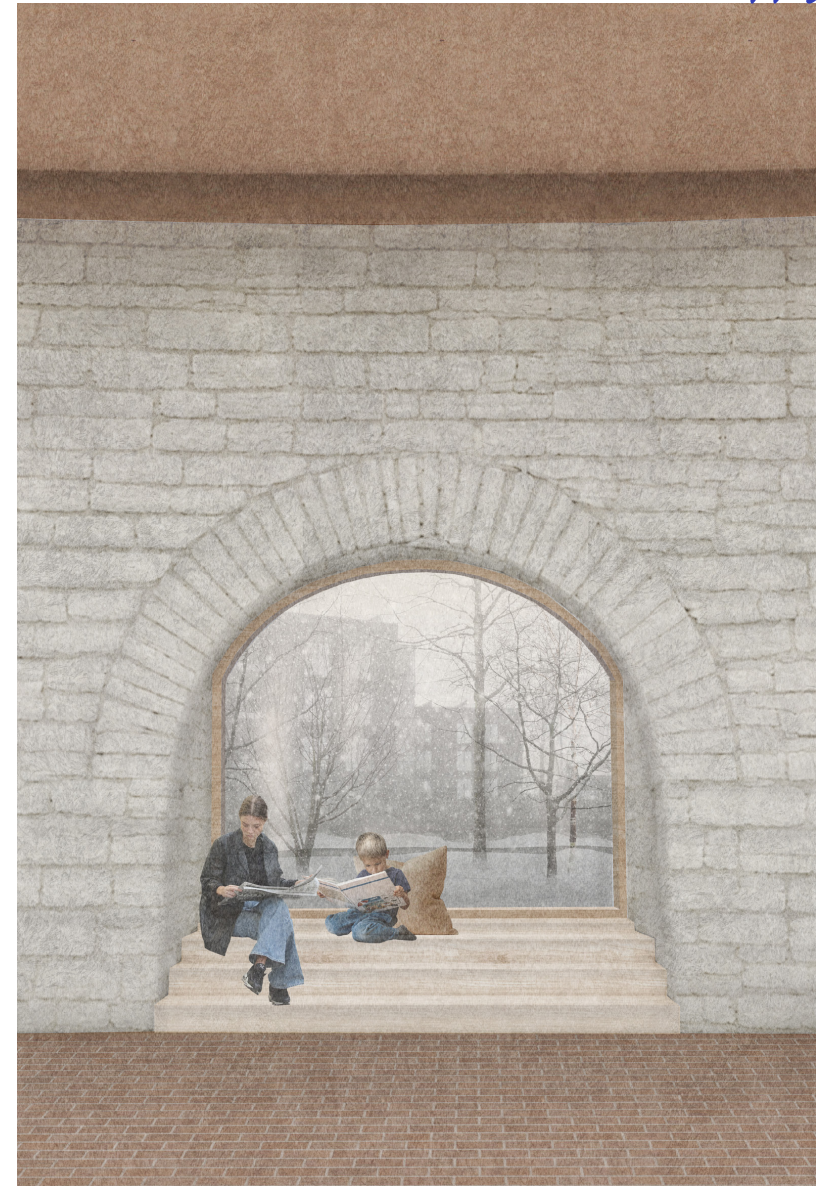
Shopping centres near the Old Town have become the primary indoor meeting places in the city, however these commercial environments are of poor spatial quality and do not support meaningful social interaction. Meanwhile, other public spaces – green areas and library pavilions alike – remain largely limited to summer due to Tallinn’s harsh winter conditions. This leaves the city without a dependable, high-quality public interior that serves its residents throughout the year.



Public library



Children's library



Beyond its summer role, the library provides a warm and welcoming space free from commercial expectation during the winter months, while also addressing the current shortage of library provision across the city.





project booklet