

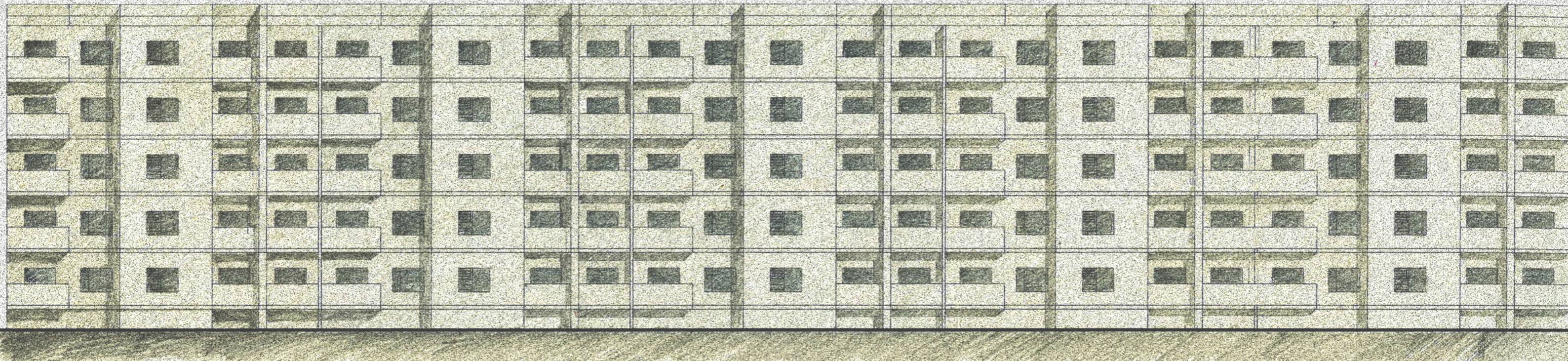
# PROTECT AND PREVENT

Adaptive Reuse of Soviet-Era Buildings for Civilian Protection in Lithuania

Graduation project of Maria-Iuliana Dragan, 6286747

Studio: Extreme Architecture, TU Delft

Supervisors: Freek Speksnijder, Ulrich Knaak



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## Abstract

This graduation project investigates how circularity can facilitate civilian protection and defence in times of hybrid warfare. In the context of increasing militarisation in Europe and the ongoing war in Ukraine, the project questions whether higher defence spending must automatically lead to large-scale new construction. Using Lithuania as a case study, it proposes that abandoned Soviet-era buildings can become part of a decentralised defence network based on adaptive reuse, preparedness, and continuity of life.

The project works across macro, meso, and micro scales. On the macro scale, vacant buildings across Lithuania are understood as a country-level defence network. On the meso scale, Soviet-era typologies are matched with new defence-related functions according to their spatial qualities. On the micro scale, two complementary routes are developed: a top-down approach of planned adaptive reuse and a bottom-up approach inspired by squatting and rapid inhabitation.

The project approaches Soviet-era heritage with historical sensitivity while recognising its spatial and typological potential. Through retrofit, kit-of-parts interventions, microgrids, emergency medical facilities, and communal shelter spaces, the project imagines defence infrastructure not as hostile enclosed structures, but as spaces of care, resilience, and collective protection.

Ultimately, the project argues that protection can be both planned and improvised. It seeks to oppose the narrative of aggression and militarisation by proposing an architecture that protects civilian life, supports continuity during crisis, and remains valuable beyond conflict.

## Foreword & Positionality

*When someone would ask me: “oh wow, what is the topic of your final thesis?” I would get all shy and awkward and mumble something about the military base task I chose. I have indeed dived into deep waters, feet not reaching the ground, lost in the vast ocean. At first I thought I made a mistake: “How can I take on an assignment like this, what am I going to say to my parents, what am I supporting, how does this connect to my values? Now I am stuck in the cycle of news and feeling we are doomed, how ridiculous, am I going to be depressed after my graduation? I should have never done this.”*

*My position of a Russian-speaking person coming from Moldova, a small country neighbouring Ukraine, made it both easier and harder to tackle the theme. My family lives both in Russia and Ukraine, which always made the war feel especially entangled. On one hand, the context was so familiar and close to the heart. On the other hand, it is precisely this closeness that made the topic emotionally charged. It forced me to face uncertainty and not look away but dive in, advocating for active human engagement. The reality is: even if we are all eventually doomed, it does not mean we should stop trying.*

*This project has been developed in solidarity with Ukraine, and is opposing Russian aggression. It also comes from a place of care for my Ukrainian and Russian friends, and refuses to assign collective responsibility based on where people come from.*

## Acknowledgements

Outside academia, I want to thank my parents, Inessa and Serghei Dragan, for raising me with values of care and love, which I used in my project deeply.

I am grateful to my partner, Nipun Kaushik for his patience and consistent support during my graduation, for shared memories and simply being the person he is — someone I deeply love and admire.

I want to thank my housemate Zuzia for the quality time after our stressful days, and her powerful pancakes sometimes out of almost nothing that somehow tasted incredible. Through her example, she has always inspired me to be a better friend. Thanks to Krishna Koushik for always lifting my mood, his help and presense. Our new friendship has been one of the gifts of this year.

Thanks to Rosanna, Aneta and Mathilde for the best ice cream, pancakes, and working sessions, to Marijn for good energy and cookies; and to Vlad, Dasha, Nicole, and the many other friends I cherish, who have remained in my life.

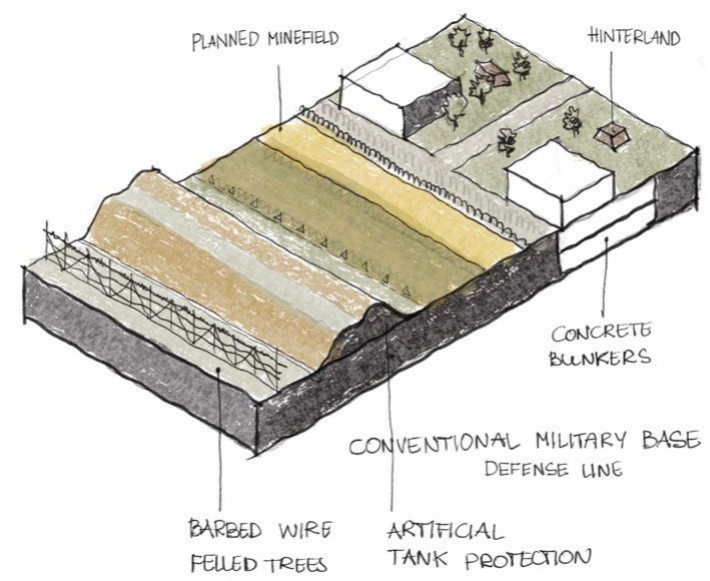
I am grateful to Freek Speksnijder for being such an engaged and caring supervisor. He would learn together with us, exploring the theme both during and outside of our tutoring sessions.

Thanks to Ulrich Knaak for critical feedback that gave the project more depth. Every conversation with Job Schroën made me smile, especially when he said I had figured out how to have fun while working — and I believe he has too. Meeting Tosin Oshinowo gave me a powerful boost, while feedback from Duzan Doepel helped shape the systematic approach that became central to the project.

Meeting my fellow students every Friday always offered fresh perspectives. Our trip to Lithuania was a wonderful experience, so here is to Bart, Aidan, Sophia, Silje, Marit and Nick — and to them introducing me to The Lord of the Rings.

Beautiful coincidences often guided my way. While Ula helped the project in Druskininkai find solid ground, conversations with James Lansbury about squatting helped complete the last piece of the puzzle. Finally, thanks to Svetlana Zozulya for her structural advice about the building in Druskininkai.

# INTRODUCTION



# Problem Statement: Crisis and Protection

## Nature of crisis in the world of today

Civilian protection is usually imagined through hostility: fences, walls, blast-proof structures, military bases. Yet, the goal of protection lies in the continuity of life and the prevention of conflict in the first place.

According to Global Humanitarian Overview 2026, over 239 million people are in urgent need of humanitarian assistance and protection due to conflicts (*Humanitarian Action, 2026*). International Humanitarian Law is often violated, raising levels of international crimes and negatively affecting protection of civilians everywhere.

Crisis is no longer only physical. It affects us all: from physical threats to blackouts and cyberattacks, from misinformation and artificial intelligence to propaganda. The trust has been broken. The narrative of us versus the enemy has been established. In this age of heightened vulnerability we are especially subject to uncertainty - a new reality we have to live in. All the above effects are worsened by the climate emergency we are facing, increasing the political weight of limited resources and changing warming climates.

## Environmental Impact of Defence

According to Scientists for Global Responsibility, Global Greenhouse Gas Emissions of the military account for approximately 5.5% of total GHG emissions, but this is limited to only peacetime operational and supply-chain emissions. Even with this number, if military GHG emissions were a country, it would have the fourth largest national carbon footprint in the world (*Parkinson et al., 2022*). Many of these emissions are included in civilian expenditures or much of it is not submitted at all, including the top three military spenders: US, China or Russia. It seriously undermines climate-related ambition and dealing with climate emergency (*ConEnvObs, 2025*). Data from 2025 indicates that over three years of war in Ukraine, more than 230 Mt CO<sub>2</sub> emissions were released (*Igini, 2025*). Furthermore, wars start a new chain of reconstruction and rebuilding that in turn releases even more carbon dioxide emissions.

Thus, the most sustainable form of defence is the prevention of conflict itself. When prevention is not enough, circularity becomes central to the discourse of protection — raising the questions of resilience, renewable resources, material reuse and continuity of life. In this project, circularity is not only environmental strategy, but a way to protect and prevent.



1. Painting resembling the state of the world; artwork by the author, March 2016

# Problem Statement: Lithuania



2. Lithuania Country Map

In February 2022, Russia started a full-scale invasion in Ukraine, bringing the war back to Europe. This conflict has intensified the tensions between Russia and North Atlantic Treaty Organisation (NATO), has threatened global economy and food security, caused more than a million casualties, death and wounded on both sides of the conflict (*Centre for Strategic and International Studies, 2026*).

Lithuania is a country located in Baltic region, bordering with Latvia, Poland, Belarus and Russia. Being a member of NATO, Lithuania is a border state that lies at the forefront of European security. Border with Belarus and Russia are considered a high-tension zone, especially including the Suwalki Gap, a 100-kilometer corridor between Poland and Lithuania, surrounded by the Russian Exclave Kaliningrad, and Belarus on the other side.

As of today, Lithuania dedicated 3% of GDP to Defence sector, that include expansion of the army and military conscription, construction of relevant military infrastructure, and increased training in civil

defence. Similarly to the other countries in the Baltic region, Lithuania adopted Total Defence approach, where everyone is prepared to resist aggression (*Lithuanian Ministry of National Defence, 2024*).

Multiple military bases are being built with the aim to host international NATO brigades on Lithuanian territory. The biggest one is a 170-hectare military base in Rūdninkai, designed to accommodate 4000 German troops on its territories, 20 km from Belarussian border, close to Vilnius (*European Investment Bank, 2025*). Other examples include new military developments in Kapčiamiestis, Pabradė Training Area, Rukla logistics hub and Kairiai Military Town. (CPVA, 2024)

In the meantime, Lithuania also faces a growing challenge of vacant and underused buildings, especially in rural areas, alongside population decline. Most of it belongs to the former buildings of USSR. That combined with the occurring militarization, offers opportunities for reuse, repurposing, and reviving of shrinking local economies.

# Relevance

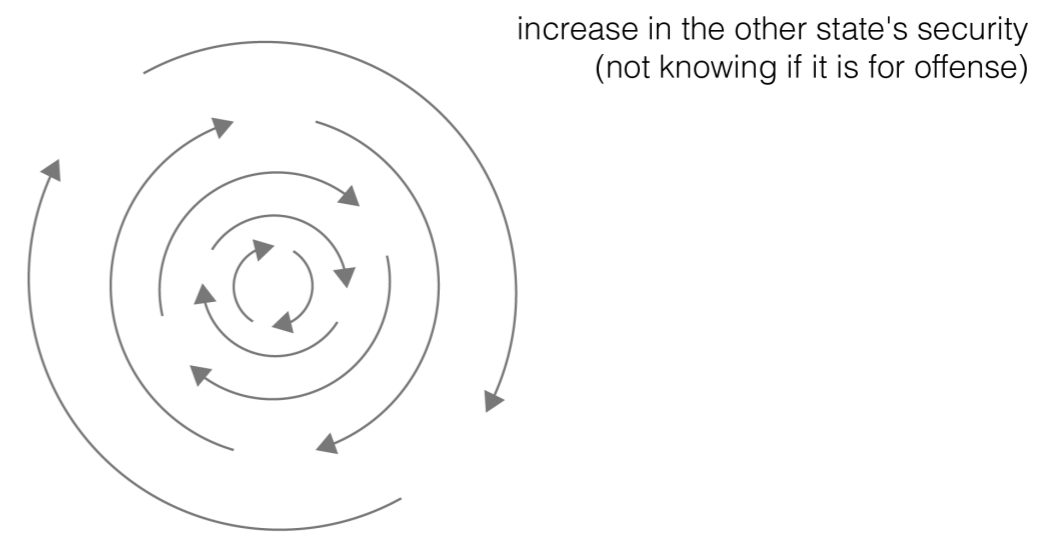
In the realm of increasing defence spending and militarization happening in Europe, sustainable development goals are often set aside and postponed, reaching back for damaging practices that led us to the state of planetary emergency. Europe responds to Russian threats by actively strengthening their defence, which Russian is using for propaganda. We entered a so-called security dilemma. (Fig.4)

Contribution of architects in the design of military bases is limited, and military engineers continue tackling the issues in familiar yet unsustainable ways: cutting down forests, disturbing landscapes, using materials with high carbon dioxide emissions, and building monofunctional structures that eventually lie abandoned. Design of military bases lies in the ethical grey zone of protection and is strongly stigmatized, meaning it rarely has enough attention and space for improvement. Current research and design project enters this uncomfortable grey zone, finding ways to reimagine defence solutions through circular practices instead of hostile enclosed structures.

With the full-scale war in Ukraine still ongoing, the battlefield comes to people's homes. Life has become uncertain: we are not at war but not in peace either (Fig.3). While architecture cannot fully prevent war, it can foster continuity of life and care, creating spaces of safety and dialogue. While research in the field of post-disaster reconstruction is prevalent, preventative action is an existing research gap. Thus, this graduation project deals with the preparedness and continuity of life and care in case of war.



3. Life Cycle of a Conflict. Lund, M. (1996)



4. Security Dilemma by John H. Herz and Herbert Butterfield

# Objective and Motivation

Architectural and technical ambitions of the project lie in applying circularity to some of the most extreme conditions of architecture: conflict and war. The project explores architecture as a means of civilian protection, resilience, and continuity of care during crisis. By preparing existing buildings for various scenarios, architecture can become not only a shelter, but a tool of adaptation and collective resilience.

This topic is especially close to my heart. As a Russian-speaking person from Moldova, a small country bordering Ukraine the ongoing war has always affected me closely. Having relatives in both countries, I see the devastating effects of the war on both sides. Propaganda became one of the main agents of the conflict, distorting the perception of reality, justifying aggression, blocking independent sources of information, and splitting families.

Therefore, I am especially aware of impact of polarization. In reality, it is never us or the enemy – it is people versus people, and people suffer the greatest losses in war. This personal connection to Russian language, culture and people that makes it essential to oppose the state, not the people.

Moreover, much like Moldova, Lithuania used to be a part of the USSR. This shared history gives me a special interest in addressing the abandoned remnants of the Soviet Union – a context I understand through my own homeland. By transforming these remnants through circular design, the project seeks to turn this taboo heritage into infrastructure of protection, care and resilience.

# Research and Design Questions

The topic was addressed both through research and design. Research question was as follows: How can circularity facilitate civilian protection and defence in times of hybrid warfare?

Circular and protective principles identified via research become design principles.

Design question is: how can vacant Soviet-era buildings in Lithuania be reused as a decentralized network of infrastructures for defence and civilian protection?

# Scope

Scope of the project lies in developing an approach to defence in Lithuania on a systematic level, establishing circular solutions for defence and civilian protection. With the use of Soviet-era vacant buildings, a typological approach is developed, with a proposed toolbox for transformation, ranging from macro to micro scales. The project includes both bottom-up and top-down approaches within the theme.

## Methodology: Research

Graduation project consisted of two parts, starting from theoretical research and continuing into the design phase. For the research paper, literature review and case studies serve as the main source of information.

Existing research was used to understand the themes of environmental impact of conventional military bases and identify issues with existing typologies that prevent future reuse. It drew on multiple aspects of protection, starting from conventional defence structures to cognitive protection.

Based on multiple research papers, several categories of circular interventions in built environment were identified. The overlap between protection requirements and circular principles defined in research paper formed design principles for the upcoming project.



5. Abandoned building in the centre of Druskininkai. Photo by author



6. Abandoned Palace of Sports, Vilnius. Photo by author

## Methodology: Design

Since many vacant buildings in Lithuania belong to the Soviet period, they can be understood through typologies allowing for a systematic design approach. The most prominent Soviet-era typologies were picked by the literature review. This ensures that the final principles developed through the design project can be applied beyond one specific site, using a toolbox rather than a specific design, activated in case of emergency. The results are thus relevant to other post-Soviet regions, especially Baltic region, where defence is currently being strengthened.

A site visit to Lithuania validated the typological research and allowed a first-hand exploration of abandoned buildings in different regions, from Vilnius to Druskininkai near the Belarusian border, and the coastal region of Klaipeda. Upon choosing a specific building to apply the tools established at a macro scale, design process continued in parallel, by contrasting the typological residential building – a so-called Khrusciovka – dominant in the entire country – to an abandoned swimming pool with the gym in the spa resort city of Druskininkai.

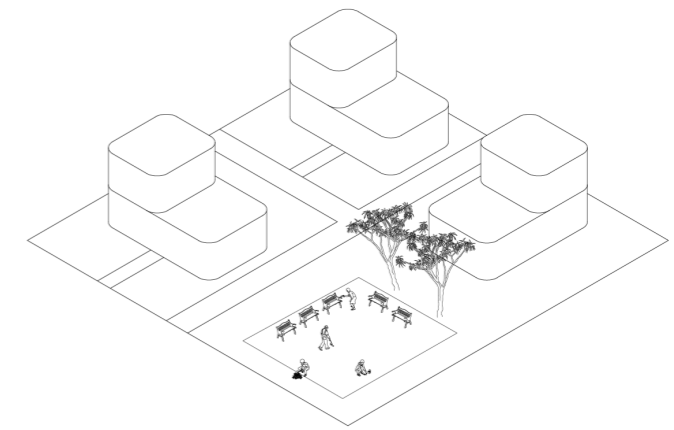
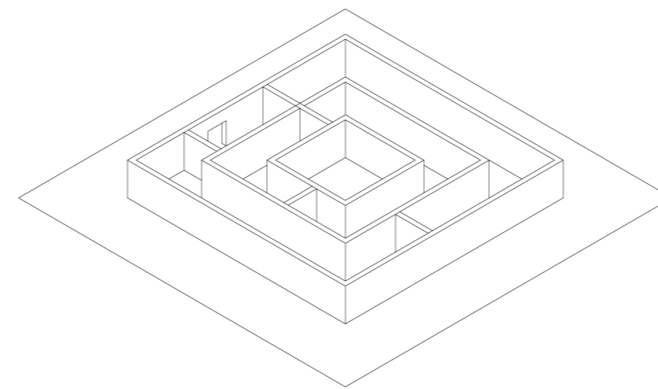
# Theoretical framework: Research Paper

The research paper investigated how circularity can facilitate civilian protection and defence in times of hybrid warfare. **Hybrid warfare** is a war fought by both conventional military methods and techniques such as cyberwarfare and cognitive warfare, another novel aspect of conflict, exploiting human cognition and manipulating perception and decision-making (NATO, 2026). Therefore, protection in the 21st century needs to be reinterpreted beyond conventional defence. (Fig. 7,8,9)

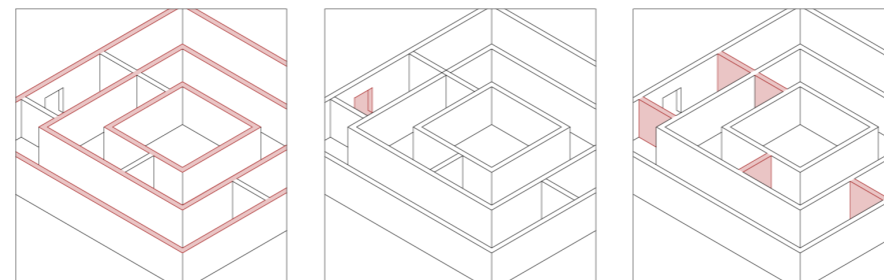
## Challenges Related to Conventional Defence

Protective structures are dealing with conflicting requirements: protection often sacrifices human comfort, cost and time sacrifice circularity. Redundancy required for systems resilience and protection means excessive use of materials. Daylight and fresh air that increase human comfort but also weaken protection (TNO, 2025). Additional coatings and reduce circular potential of construction. Moreover, retrofit is often being discarded due to strict requirements and regulations, which in turn provokes extraction of more virgin materials.

As a conclusion of the research, circularity was identified as a crucial aspect of protection, providing resilience and continuity of life. It offers benefits both for energy-heavy operational flexibility, as well as for civilian protection (UK Ministry of Defence, 2025). By incorporating circularity in defence, a state increases readiness, resilience, and autonomy of its population. Main circular principles in defence are outlined in Figure 10.



### CYBER SECURITY

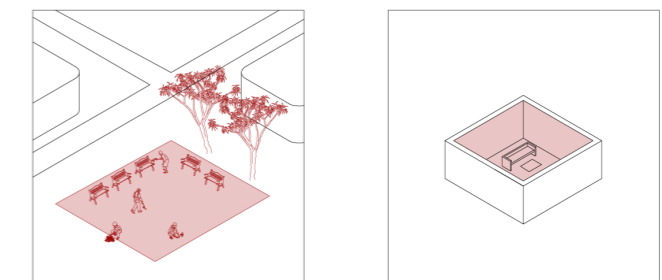


CONCENTRIC LAYERS

HIDDEN ENTRANCES

ZERO-TRUST POLICY

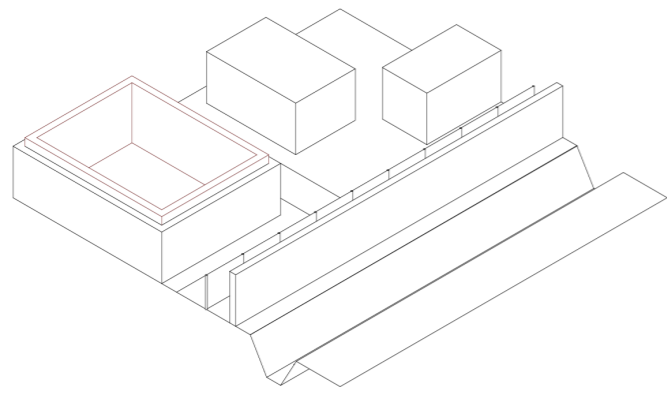
### COGNITIVE PROTECTION



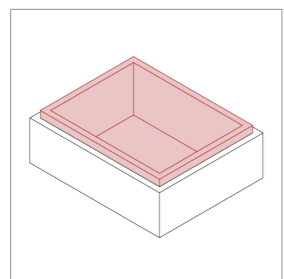
FOSTER SOCIAL COHESION

ENHANCE CONCENTRATION

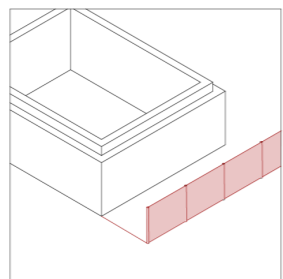
7. Protection against cyberattacks and cognitive warfare



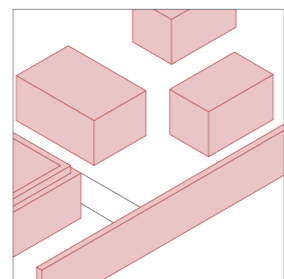
**CONVENTIONAL DEFENSE STRUCTURES**



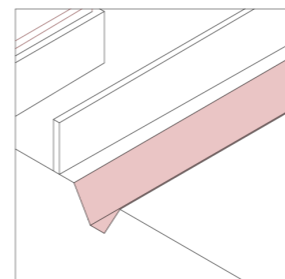
**REDUNDANCY**



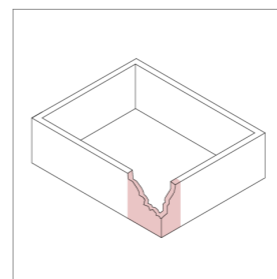
**STAND-OFF  
PRE-DETONATION SCREEN**



**COMPOUND LAYOUTS  
(FORTIFIED,  
SELF-CONTAINED,  
ENCLOSED)**



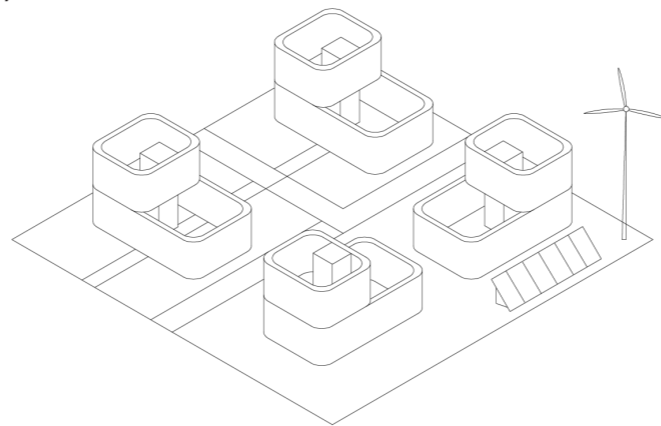
**USE OF TERRAIN**



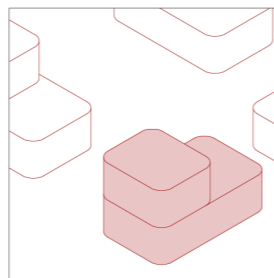
**ALLOW SOME DAMAGE**

8. Principles of Conventional Defence Structures (top)

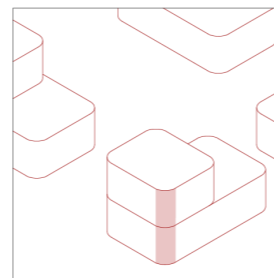
9. Principles of Civilian Protection (right)



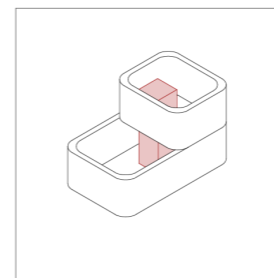
**CIVILIAN PROTECTION**



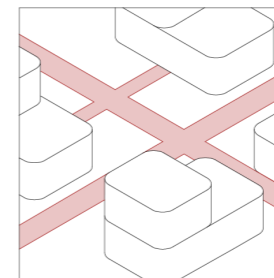
**LOW-RISE STEPPED  
BUILDINGS**



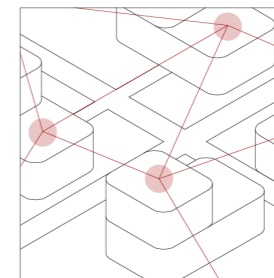
**ROUNDED CORNERS**



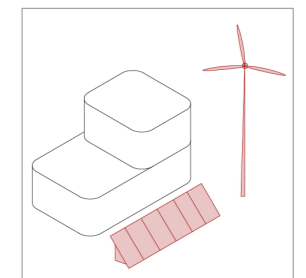
**HARD CORES**



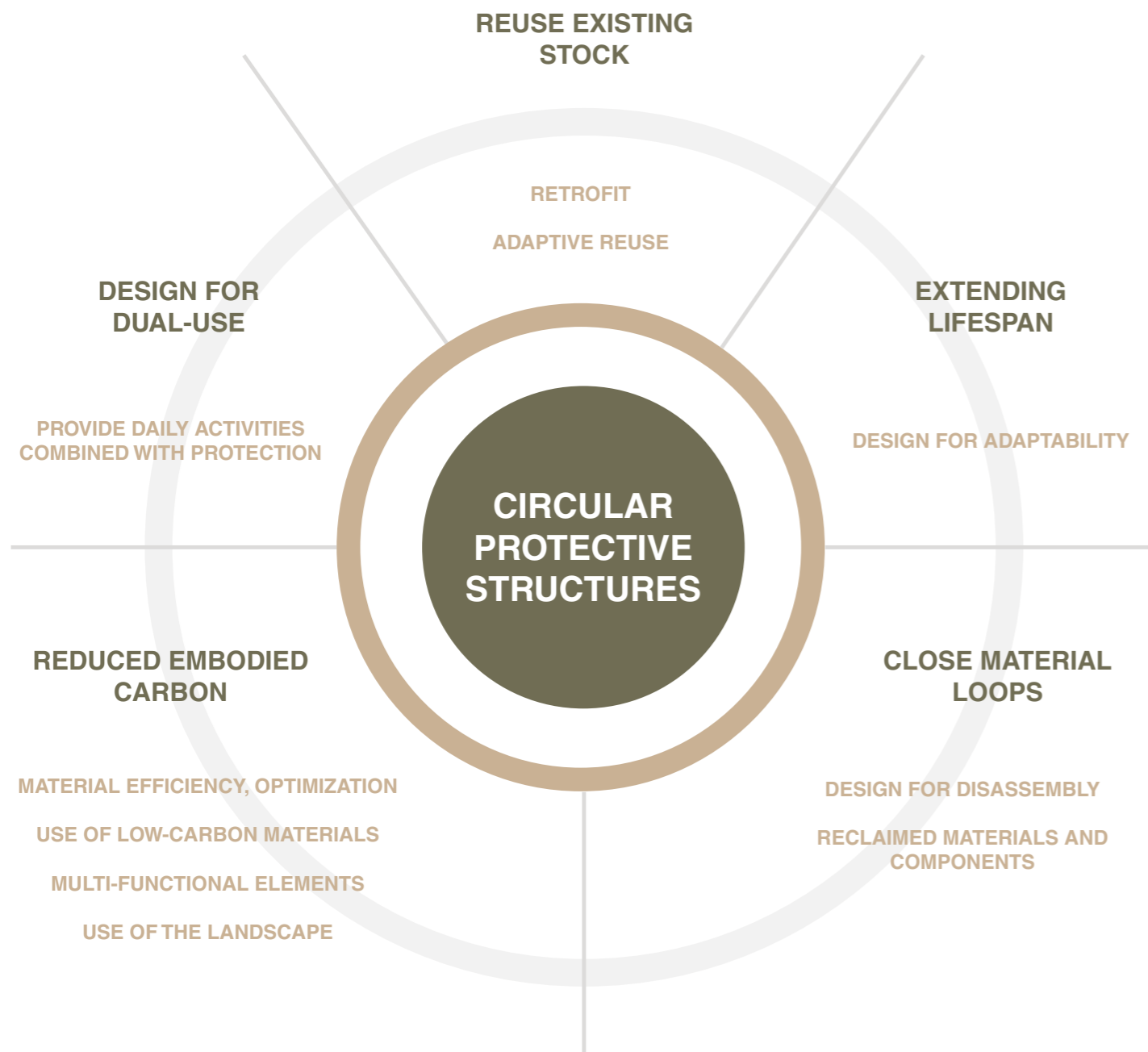
**MULTIPLE NETWORK  
PATTERNS**



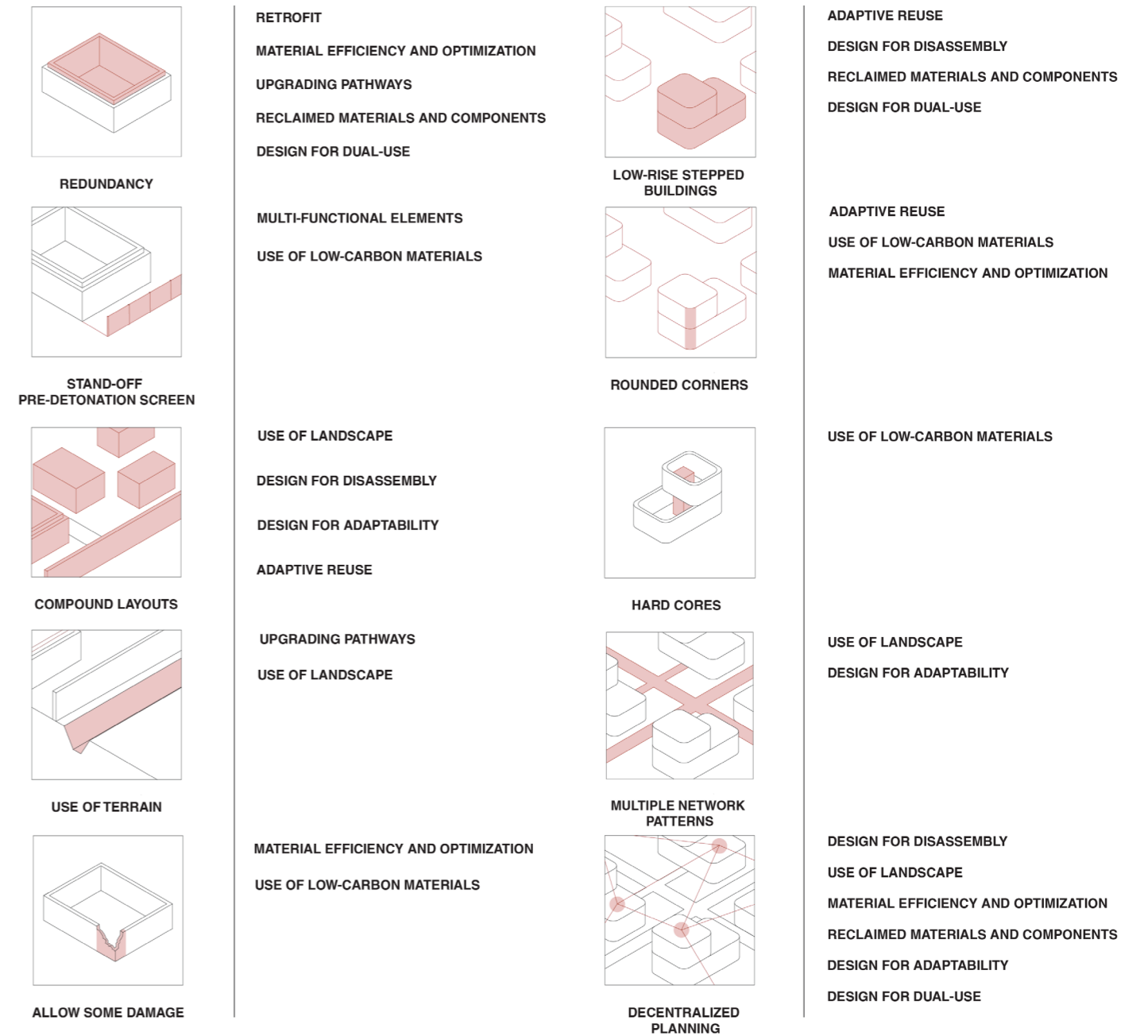
**DECENTRALIZED  
PLANNING**



**RENEWABLE ENERGY**



10. Circular Protective Principles



11. Circular Protective Principles overlapped with Protective Principles

## Theoretical Framework: Soviet Modernism



12. Soviet Modernist building in Tbilisi, Georgia



13. Bank of Georgia Headquarters, building from 1975

Dealing with architecture of the Soviet times requires understanding its historical and political context. With Stalin's death in 1953, the monumental language of Stalinist architecture was increasingly criticized. With a new era of Khrushchev Thaw, a new decree 'Of elimination of architectural excesses in design and construction' was released in 1955. Khrushchev harshly criticized architects for their "reckless use of state money on architectural excesses" (Bronovitskaya, Malinin, 2021) Since then, ornamentality and aesthetics were condemned, marking the transition from grandeur to functionality. Therefore, Soviet architects of the 1950-60s were primarily occupied with the development of typological projects that would speed-up construction by having an inventory of projects.

This era is referred to as *Soviet Modernism*, characterized by industrialization of architecture and its mass-production. A catalogue of projects served as a basis for architecture, each considering local climate and geography, functional zoning and requirements for prefabricated elements, primarily large-panel concrete construction. Such building catalogues allowed similar structures to be produced quickly across the entire country, repeating similar spatial conditions in very different regions.

While some typological solutions were dominant around the entire territory of the Soviet Union with little variation (such as residential panel construction, (Meuser, Zadorin, 2016)), each region was known

for a certain style of Soviet modernism. For instance, Georgian Soviet modernism had more freedom to experiment, which is also noticeable in its architecture (Figure 12, 13).

In case of the Baltic region, Soviet-era buildings cannot be seen as neutral modernist heritage alone. These buildings connect deeply to the history of occupation, centralized planning and cultural-political assimilation.

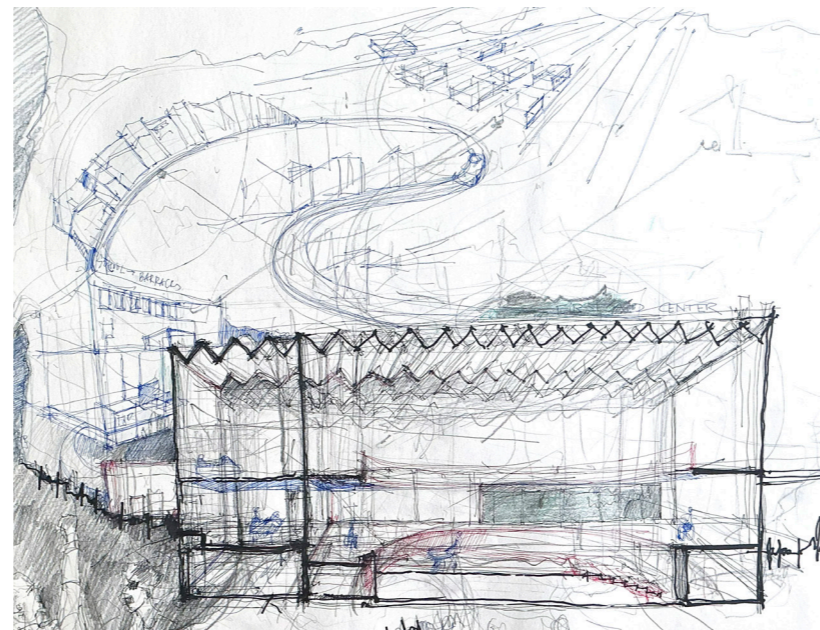
Within that realm, Baltic, and specifically Lithuanian, architects fought for its local identity, aiming to separate themselves from the rest of the USSR. (Drémaitė, 2017) Baltic architecture of Soviet modernism often had Nordic influences, especially Finnish, which is often seen in its use of timber and brick, compared to the prefabricated concrete panels (Drémaitė, 2017). Moreover, Baltic Soviet architecture often offered higher quality construction within typologies compared to other regions, often seen as 'The West of the USSR'. (Meuser, Zadorin, 2016)

Therefore, reusing Soviet-era buildings requires careful approach. It asks for sensitivity towards their relation with history of occupation and control, while also recognizing its spatial potential and typological properties, which can nowadays be used to the advantage of population.



# MACRO SCALE:

DECENTRALIZED Defence COUNTRY NETWORK IN THE ABANDONED BUILDINGS OF LITHUANIA



# Decentralized Defence

Soviet-era abandoned buildings are spread around the entire Lithuania, offering the potential to create a decentralized defence network on a country-level. As an advantage, such a system gives flexibility, additional protection, and opportunities for concealment, while minimizing chances of misinterpretation and reducing the symbolic target of one military base.

In this approach, infrastructure gains a primary role. Distances between the buildings and coordination between functions, accessibility to the roads and proximity to the border — all influence the choice and location of each function.

# Local Identities

In USSR, places often had attached local functional identities, which influenced the built environment of the area (*LRT, 2022*). This way, Alytus housed Cotton Textile Combine and has the identity of an industrial town clearly seen within its fabric (*Korobkiewicz, 2022*). Druskininkai was known for its medical treatment and abundant sanatoriums, and received up to 400 000 annual visitors from across the Soviet Union (*Atlas Obscura, 2019*). Klaipėda was a militarized border zone with a large port and maritime culture (*LRT, 2026*). Collective Farms were dominant across the entire rural territory, primarily in Central and Northern Lithuania.

By leaning into these characteristics, the choice of the defence function connects to the existing traces of Soviet built environment. Therefore, chosen identities for the network are as follows:

Kaunas = central evacuation and coordination hub

Alytus = industry/storage/repair

Klaipėda = maritime logistics/evacuation

Druskininkai = health/care/rehabilitation

Collective farm regions = administration/food/shelter



LATVIA

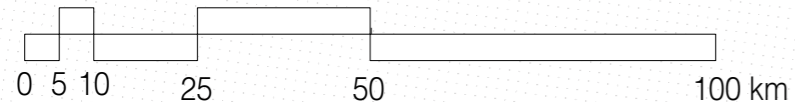
LITHUANIA

RUSSIA

BELARUS

POLAND

LITHUANIA COUNTRY MAP



**LEGEND**

- MOTORWAY
- PRIMARY HIGHWAY
- RAILWAY
- SELECTED TOWN
- COUNTRY BORDERS

LATVIA

**PIONEER CAMP**  
 SPORTS & TRAINING

KLAIPEDA

**COLLECTIVE FARM**  
 AGRICULTURE + ADMINISTRATION

**HOUSING**  
 ACCOMMODATION

ISAGINAS

ARTOJAS

**AIR BASE**  
 UNDERGROUND  
 TRAINING AREA

**MIXED**  
 SHELTER  
 CIVILIAN PROTECTION

RUSSIA  
KALININGRAD OBLAST

KAZLU RŪDA

KAUNAS

VILNIUS

**INDUSTRY**

BELARUS

**SCHOOL**  
 FIRST RESPONSE HUB

ALYTUS

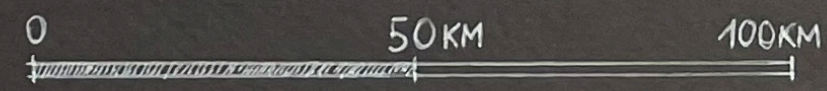
**SANATORIUM**  
 MEDICAL

DIEVENIŠKĖS

POLAND

KAPČIAMIEŠTIS

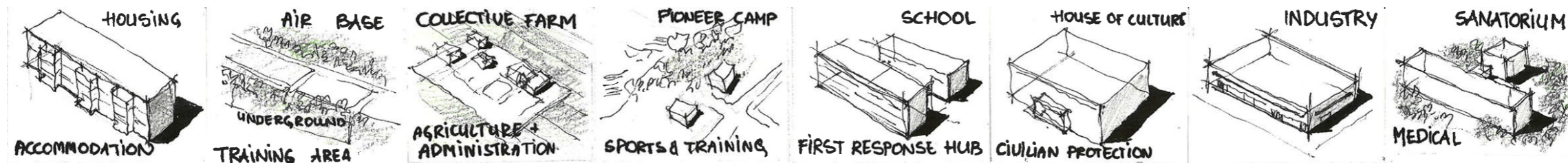
DRUSKININKAI



# MESO SCALE:

TYPOLOGICAL TRANSFORMATIONS

REDEFINING EACH SOVIET TYPOLOGY INTO A Defence-RELATED FUNCTION



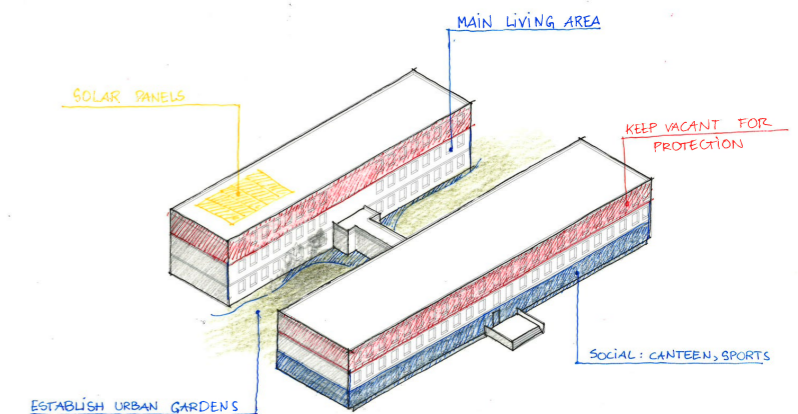
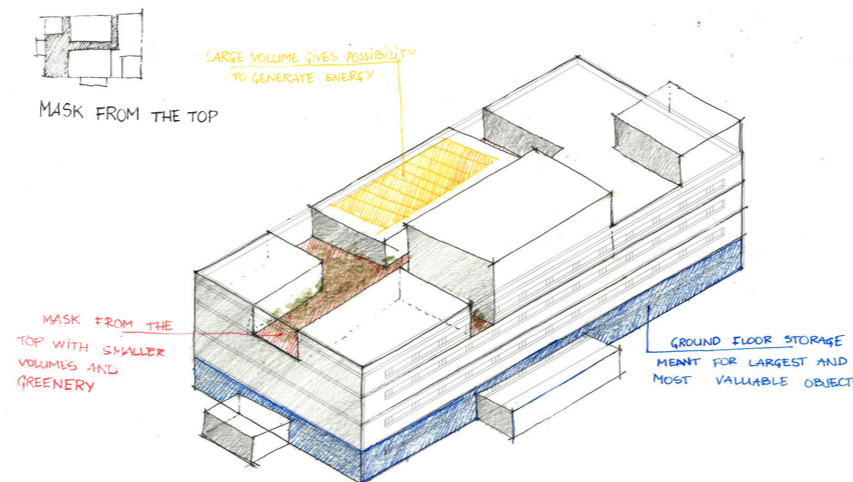
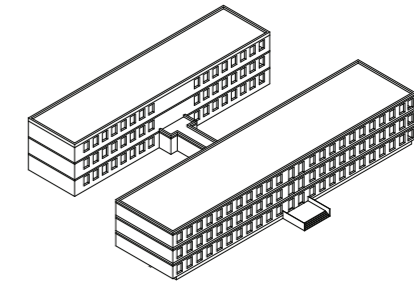
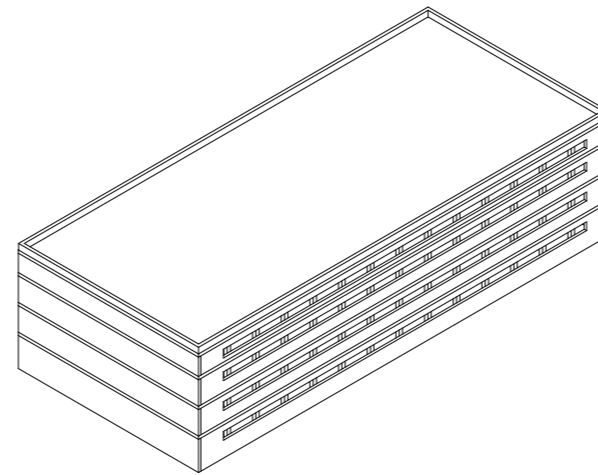
# Introduction: typologies

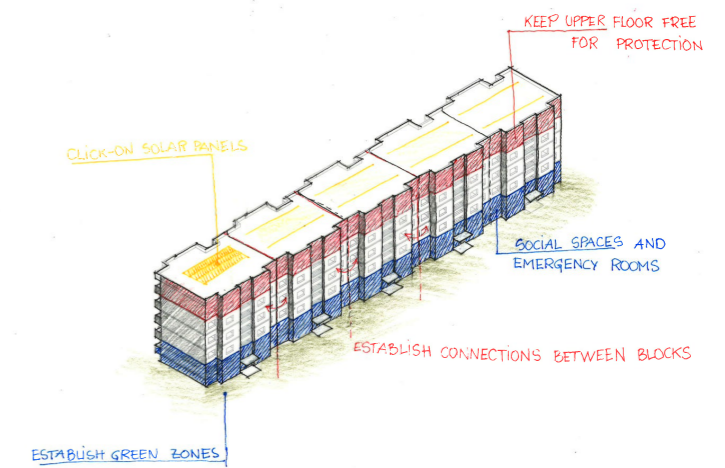
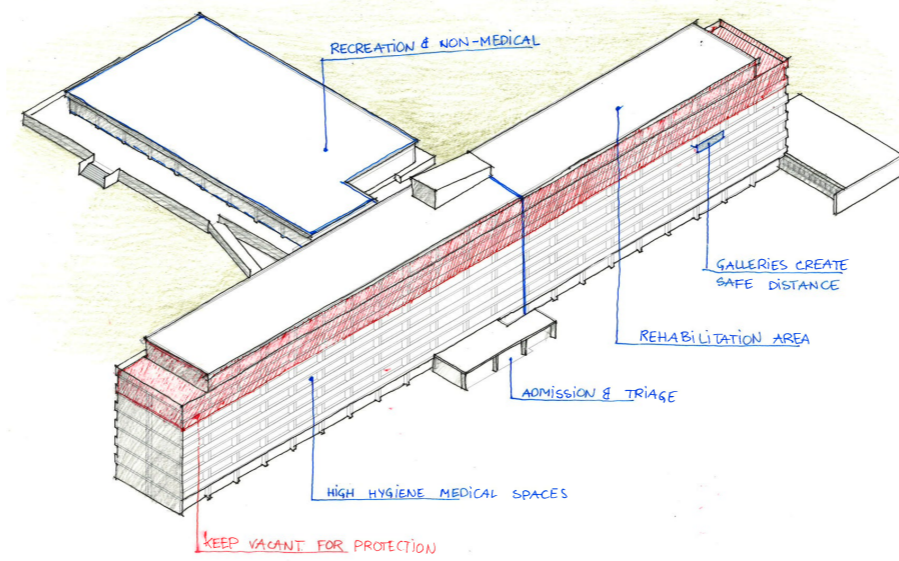
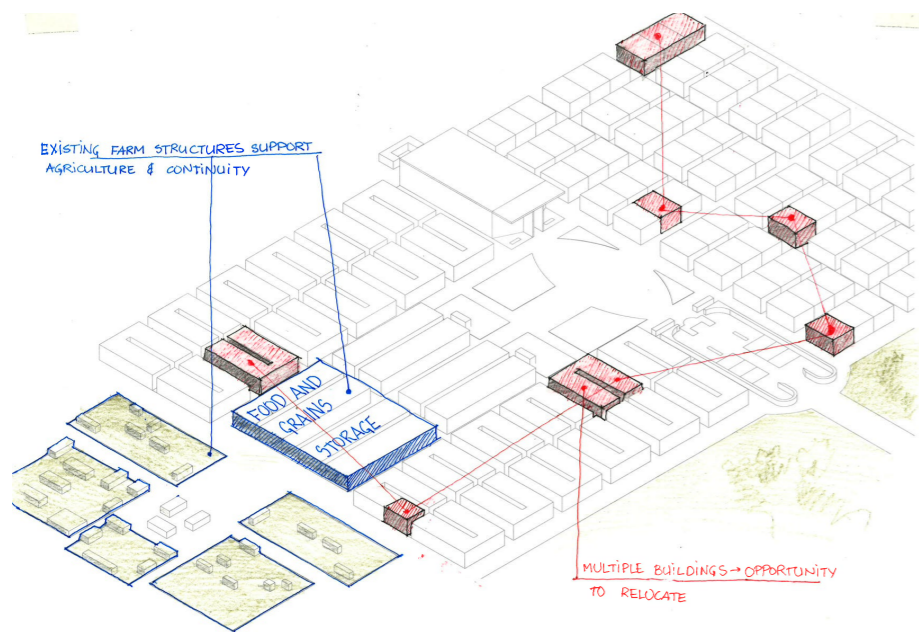
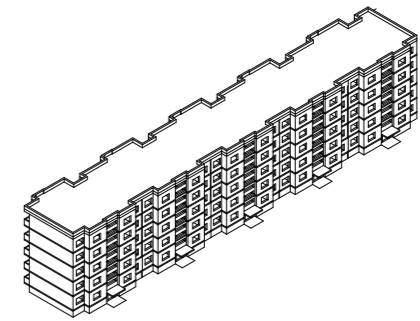
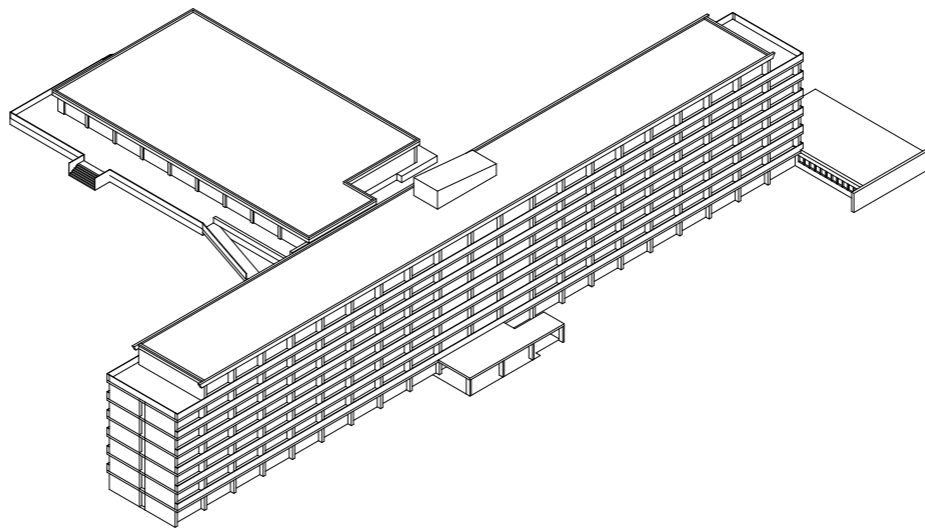
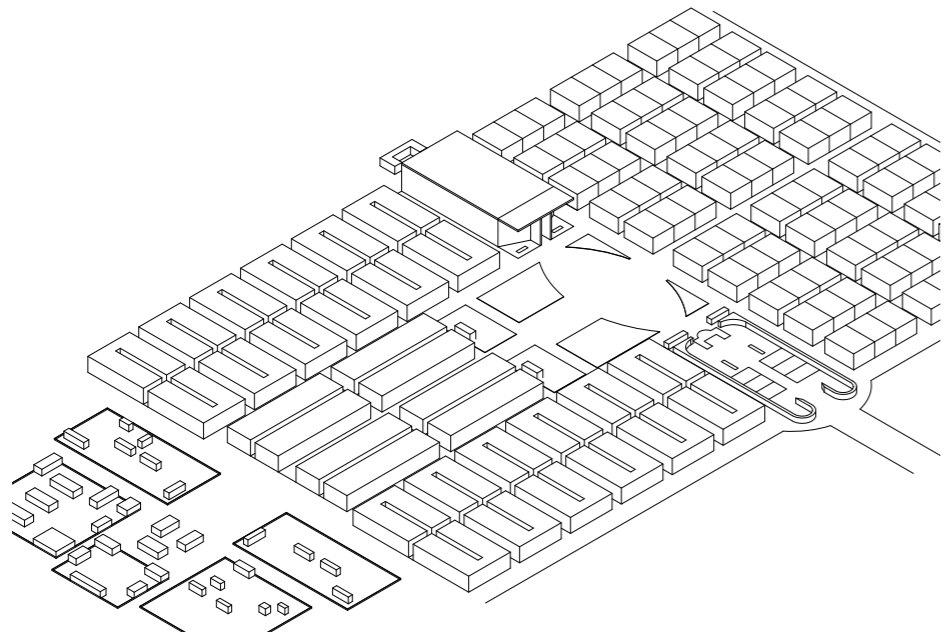
While regional identities suggest where functions go, each building typology is better suited to certain functions than others. Therefore, on a meso scale the proposal consists of a system that can adapt selected typologies to their new function, making the decision-making quicker, as demanded by the urgent context.

Soviet-era buildings that lie vacant after the fall of the USSR are often connected to industry that no longer takes place, or the migration from rural and semi-urban areas to the capital and abroad (*French Fries, 2021*).

The selected vacant typologies and transformations proposed on a meso scale therefore are:

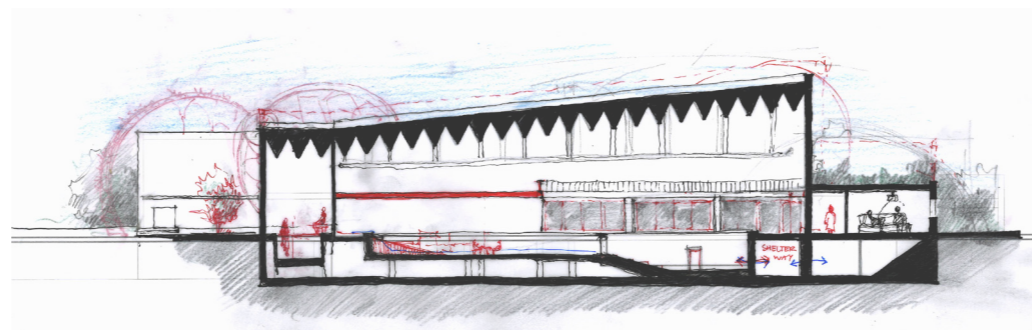
1. Factories into military warehouse, spaces of storage and repair. Allow quick reuse, little additional work required.
2. Collective farms complexes into the command and coordination hub since they do not demand direct connection to the network, and are often times located in detached, rural areas. It makes quick change of the building and relocation possible within each collective farm.
3. Medical and sports facilities (sanatoriums) into emergency medical and rehabilitation centres.
4. Schools (rural and semi-urban areas) into barracks.
5. Underoccupied residential apartment blocks (so called Khrushchevka) into civilian shelters while accommodating families of military personnel arriving into the country.





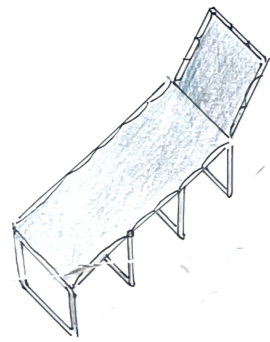
## **MICRO SCALE:**

EMERGENCY OCCUPATION VERSUS PLANNED ADAPTIVE REUSE

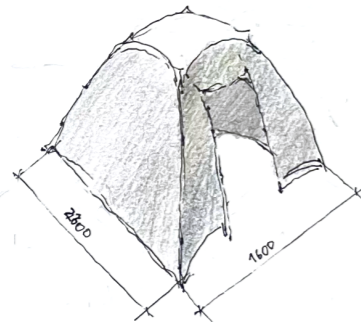


# BOTTOM-UP APPROACH: EMERGENCY OCCUPATION

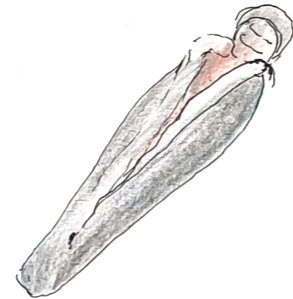
## STEP 1: ESTABLISH A SLEEPING PLACE



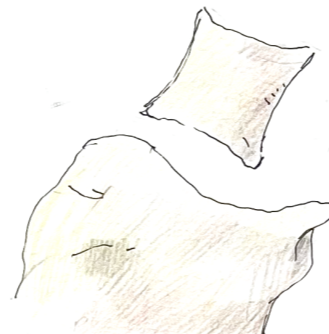
FOLDABLE BED



BIO-BASED/USED TENT



SLEEPING BAG



PILLOW AND BLANKET

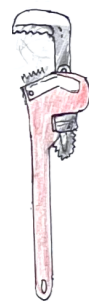
CARRIED IN HANDS



In case of emergency, ~~break glass~~ occupy a vacant building. Learning from experience of squatters', little is required to inhabit a space: water, sanitation, electricity and a place to sleep. A foldable bed can quickly turn an unused building into a shelter. Much like squatters expecting eviction, war demands preparedness to flee without a backward glance.

Here, squatting becomes a spatial strategy of rapid inhabitation. Unlike informal squatting, this defensive occupation can be organised by the state. For Soviet-era buildings, the short term route uses a kit of parts (*fig*) with the elements that are easy to transport, install, dismantle, and reuse. Steps are as follows:

## STEP 2: CHECK AND CONNECT PLUMBING



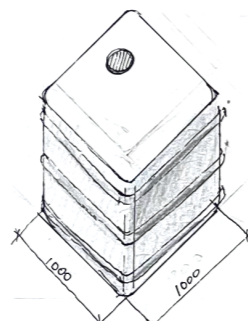
PE WRENCH



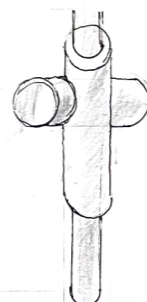
WASTE PIPE



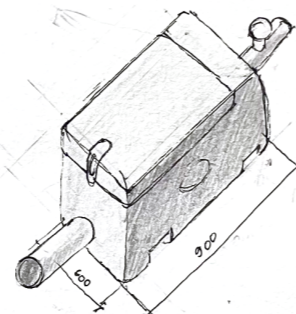
CAPS & REDUCERS



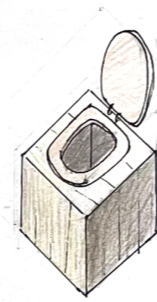
WATER TANK 1000L



DOWNPIPE DIVERGER



GREY WATER FILTER

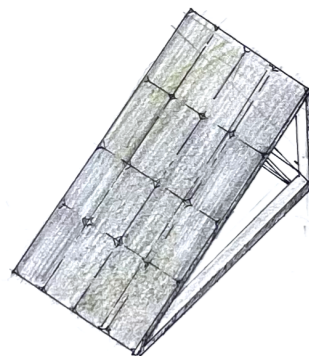


COMPOST TOILET

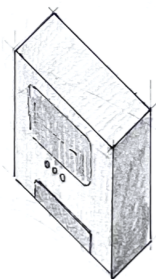


WATER PUMP

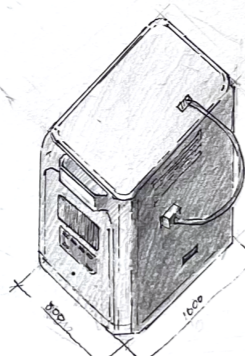
## STEP 3: CONNECT ENERGY SYSTEMS



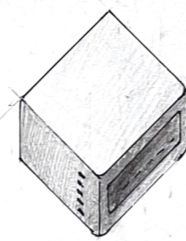
CLICK-ON SOLAR PANELS



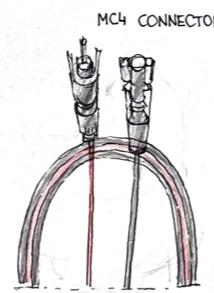
CHARGE CONTROLLER



BATTERY ENERGY STORAGE



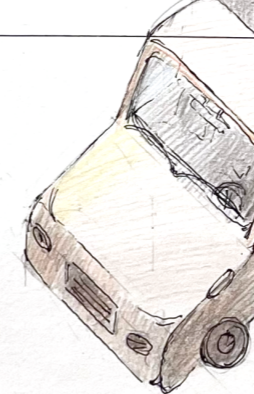
DC-AC INVERTER



SOLAR PANEL CABLES



CABLE CUTTER



TRANSPORTED IN A TRUCK

1. A vacant building is occupied with a tent or a foldable bed on the lower floors for safety.
3. Energy is provided through click-on photovoltaic panels and compact battery storage, connecting the wires to the appliances used.
4. Water and sewage are connected to existing infrastructure where possible. Because old pipes might be damaged, new visible routes are added. Rainwater and greywater tanks provide backup water storage in case of failed public infrastructure.

From this moment, the space becomes inhabitable. Comfort can be gradually improved through airtight windows, insulation, and new interior partitions. This way, short-term emergency occupation transforms into a long-term space of care and resilience.

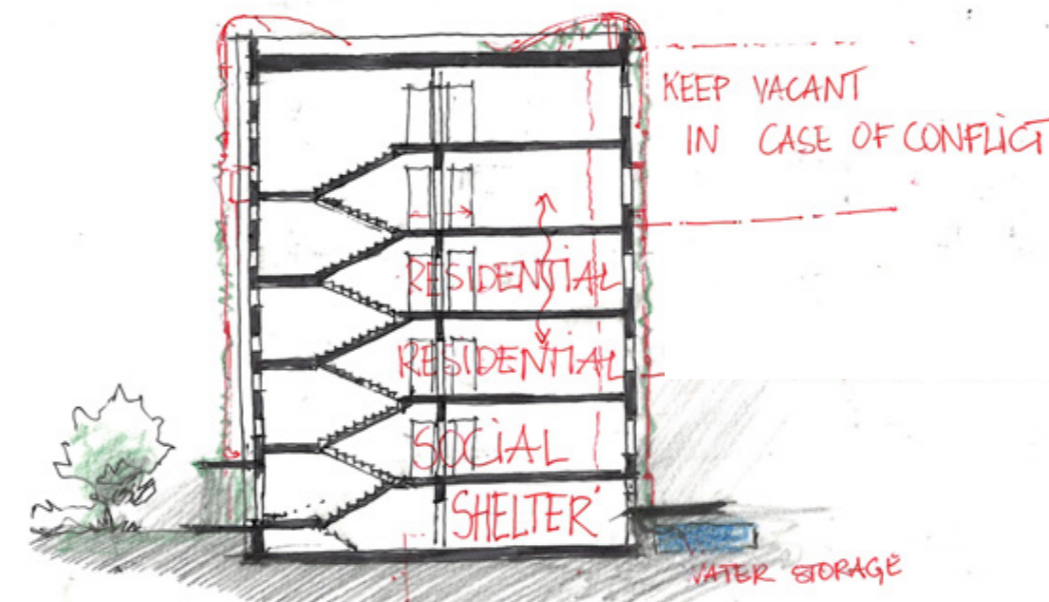
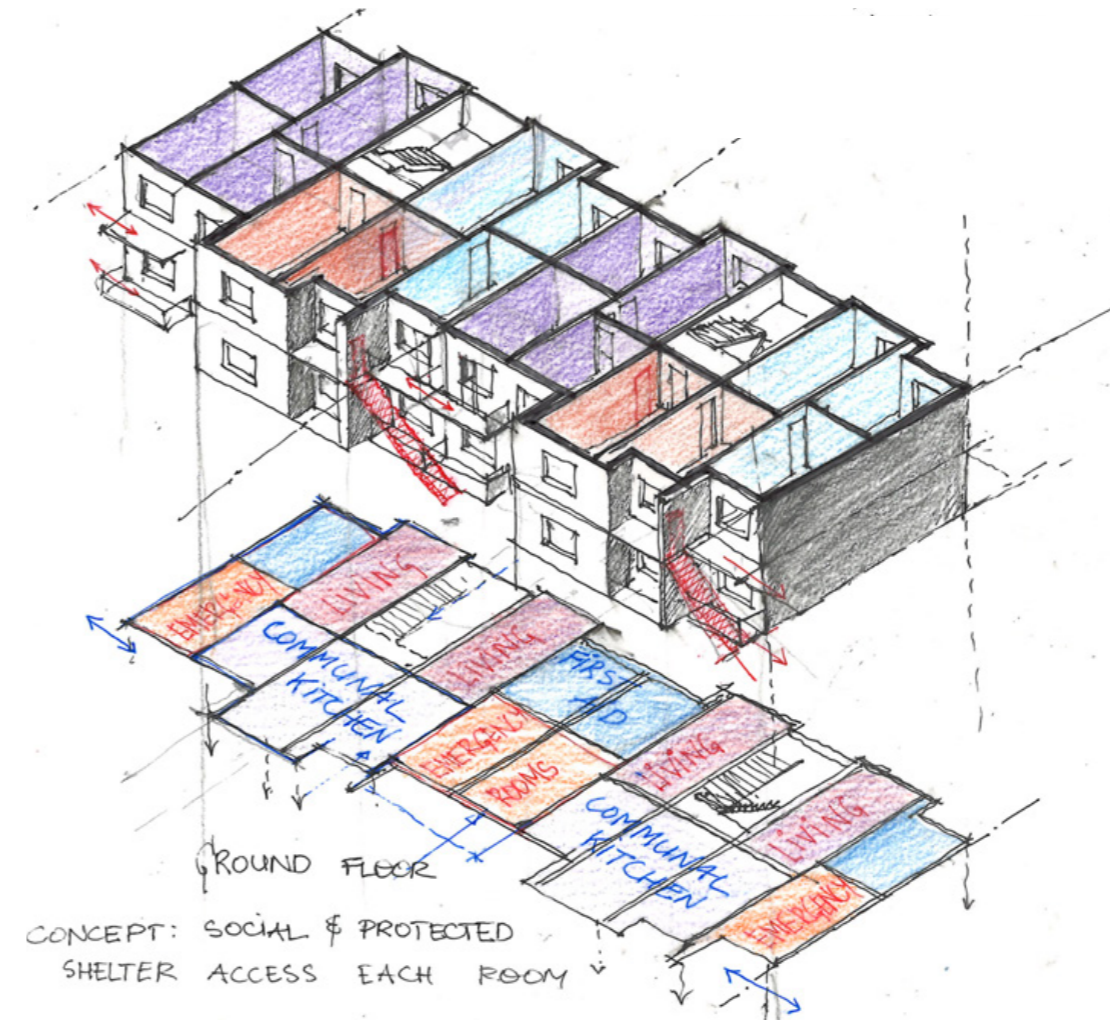
# KHRUSHCHEVKA

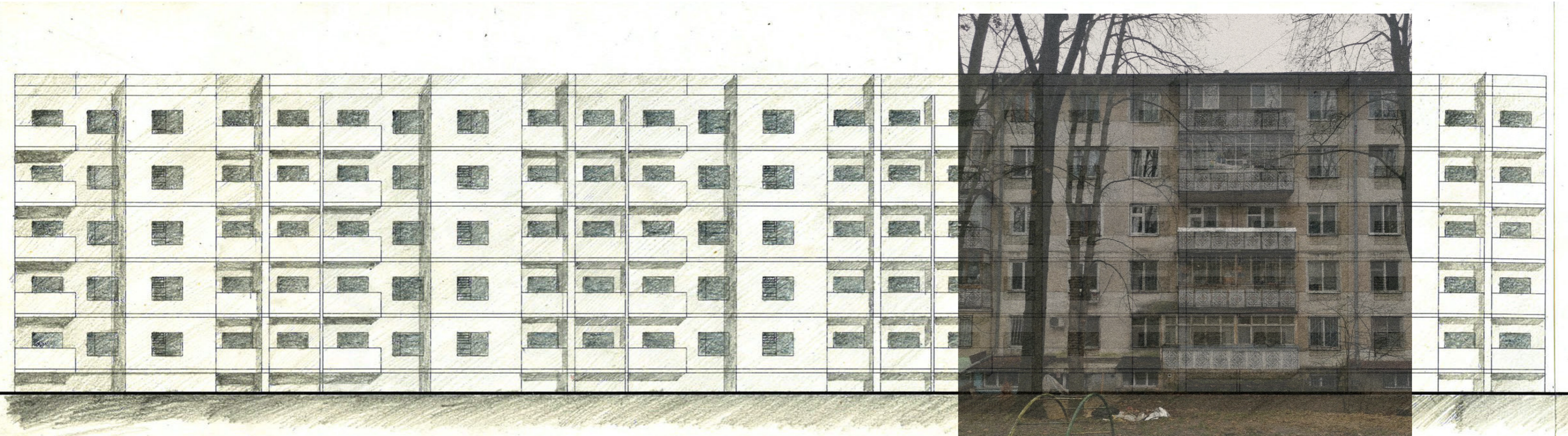
## TYOLOGY I-464-LI-A16

Khrushchevka refers to the most common residential typology in the USSR; apartment blocks often built with prefabricated concrete panels. Originated in 1957 with a new experimental district in Moscow ((Meuser, Zadorin, 2016), these apartment blocks quickly dominated Soviet architecture. Khrushchevkas were built quickly to cover the vast housing demands, with some erected within ten days.

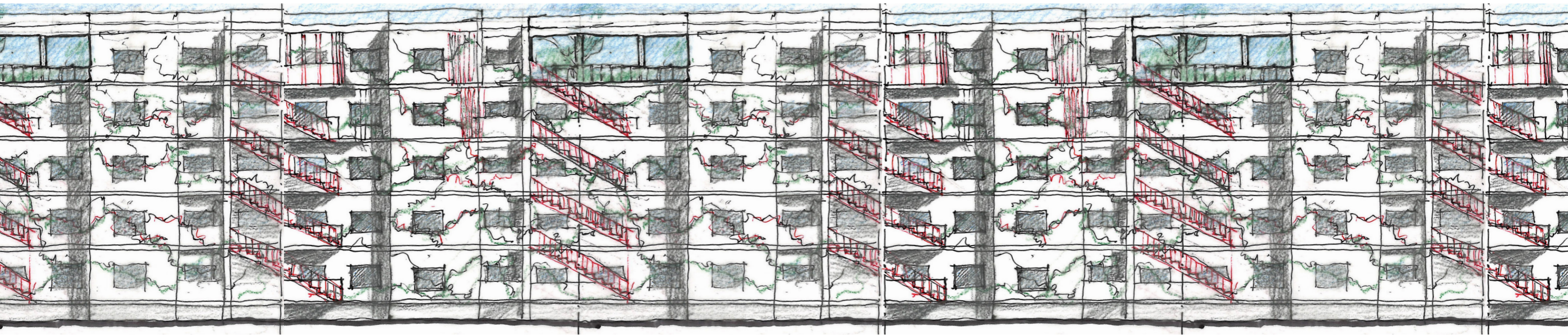
Almost a million of currently available apartments in Lithuania were built between 1940 and 1990s (LRT, 2023). While these buildings are never fully vacant, many face decline in semi-urban areas due to migration to the capital or abroad. Structurally well-kept, their main weaknesses are small room sizes, weak panel joints, poor acoustic and thermal insulation. They rely on central heating and the main grid, thus being vulnerable in blackouts or attacks on infrastructure, especially noticeable during the last winter in Ukraine.

In this bottom-up proposal, the importance lies in rapidly moving khrushchevkas to microgrids, transforming the ground floor into a communal space and social hub, prioritizing bottom floors for safety. Khrushchevkas become resilient shelters and offer continuity during crisis, bringing the communities closer.

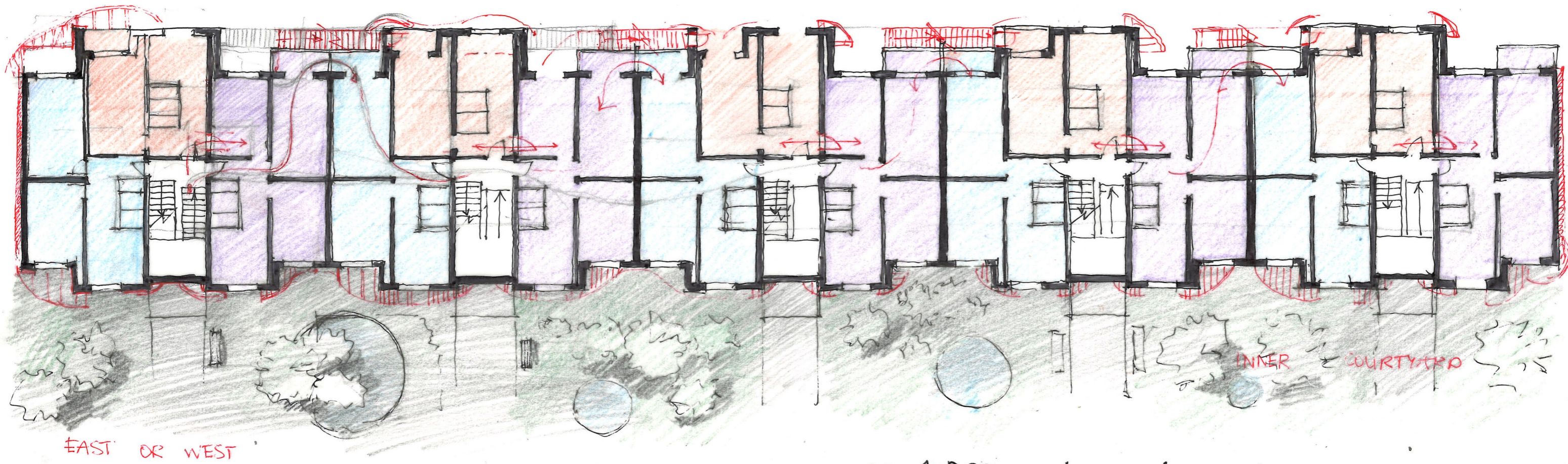




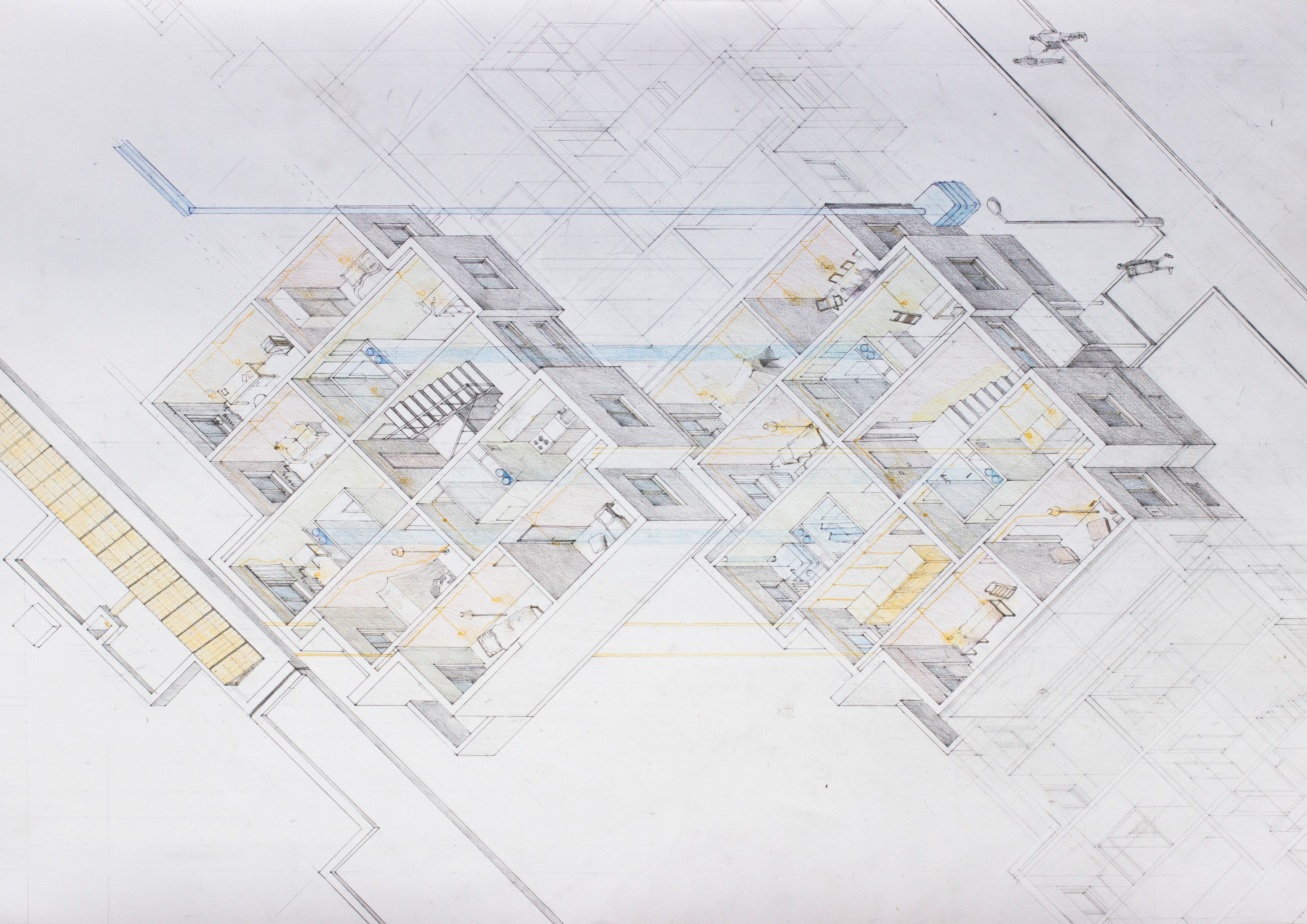
Elevation Khrushchevka 1:200



Elevation Khrushchevka 1:200



Typical Floorplan Khrushchevka 1:200



## TOP-DOWN APPROACH: PLANNED ADAPTIVE REUSE

Top-down approach is a long-term route that allows to deal with reuse in a controlled and structured environment. By following up on typological approach, spatial demands of the new defence-related function correspond better to specific typologies. However, this approach still requires resolving each building individually, with higher level of precision, allowing for more consideration towards long-term, post-conflict scenarios.

Therefore, the method is more conventional in adaptive reuse. Starting from site assessment and structural analysis, design process follows the traditional path of design and collaboration.

In this route, defence infrastructure is a carefully planned transformation instead of temporary emergency occupation. Buildings developed in this manner offer high potential for reuse after the conflict has come to an end. In this way, the building is not designed only for the times of war, but for the continuation of life after.

Nonetheless, in the context of war the steps in a top-down approach have to be clearly prioritized and implemented incrementally instead of a massive reconstruction, thus allowing a building to be used right away.



# DRUSKININKAI: MEDICAL FUNCTION



Druskininkai is a well-known Lithuanian spa town located 10 km from the Belarusian border, close to Suwalki gap. It is known for its mineral springs year-round recreation, and multiple sanatoriums in the Soviet times. Hence, Druskininkai is chosen for its potential for emergency medical aid to the people from both sides of the border.

## SELECTED BUILDING

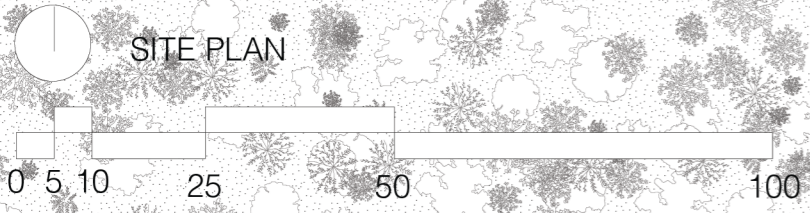
During the site visit in Lithuania, Druskininkai became a special destination, where we found a spacious abandoned building near the lakefront park. Clearly belonging to the USSR, it kept the Soviet bas-relief indicating its function: sports, swimming and dancing. The site was well-connected to the road leading to the border.

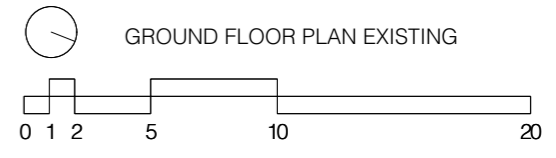
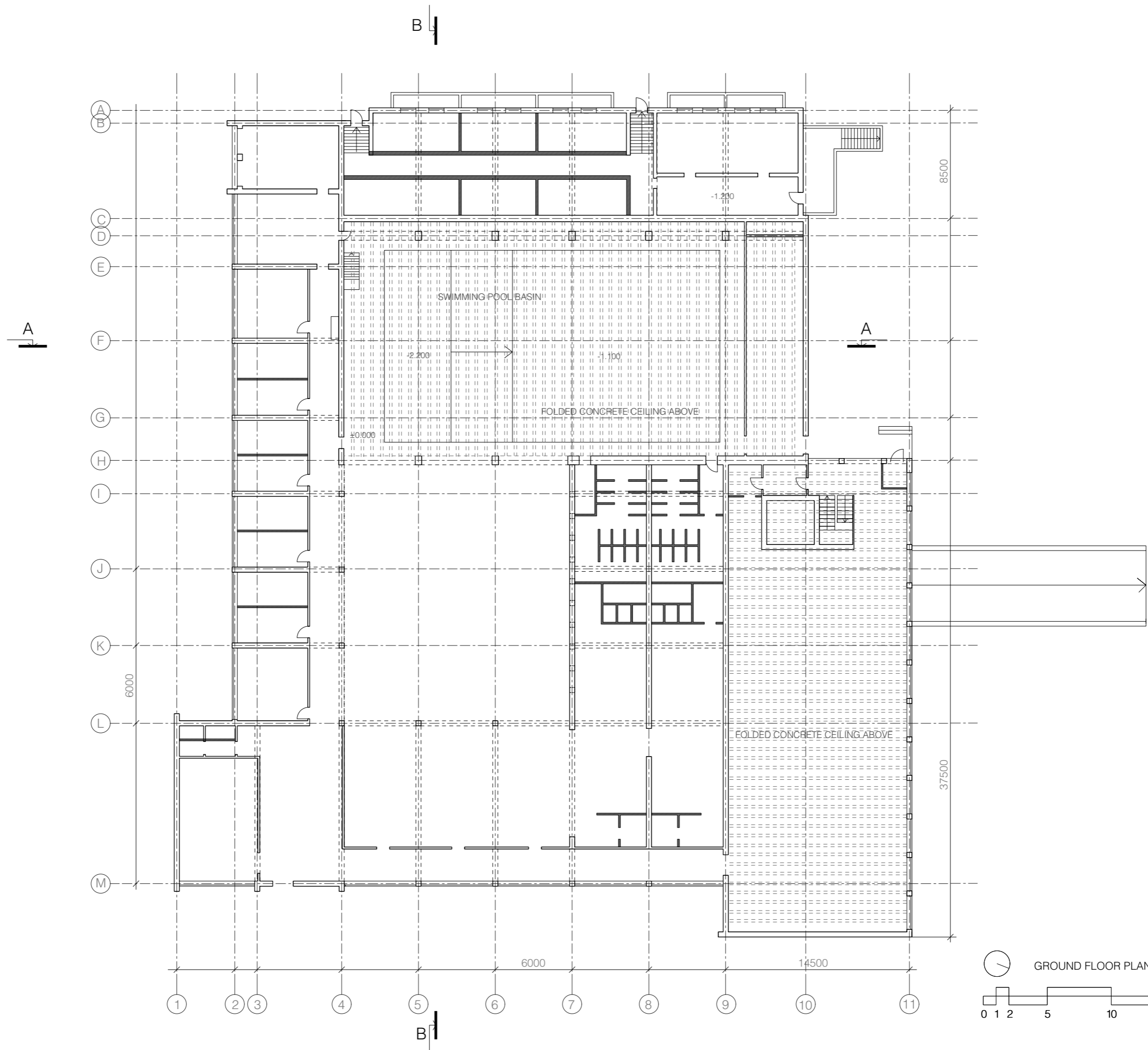
The building was a part of the sanatorium located nearby, and was an abandoned swimming pool and a sports hall. While it fit into previously selected typology, the building still had special characteristic features: a large-span folded concrete structure, multiple volumes and an inner courtyard.

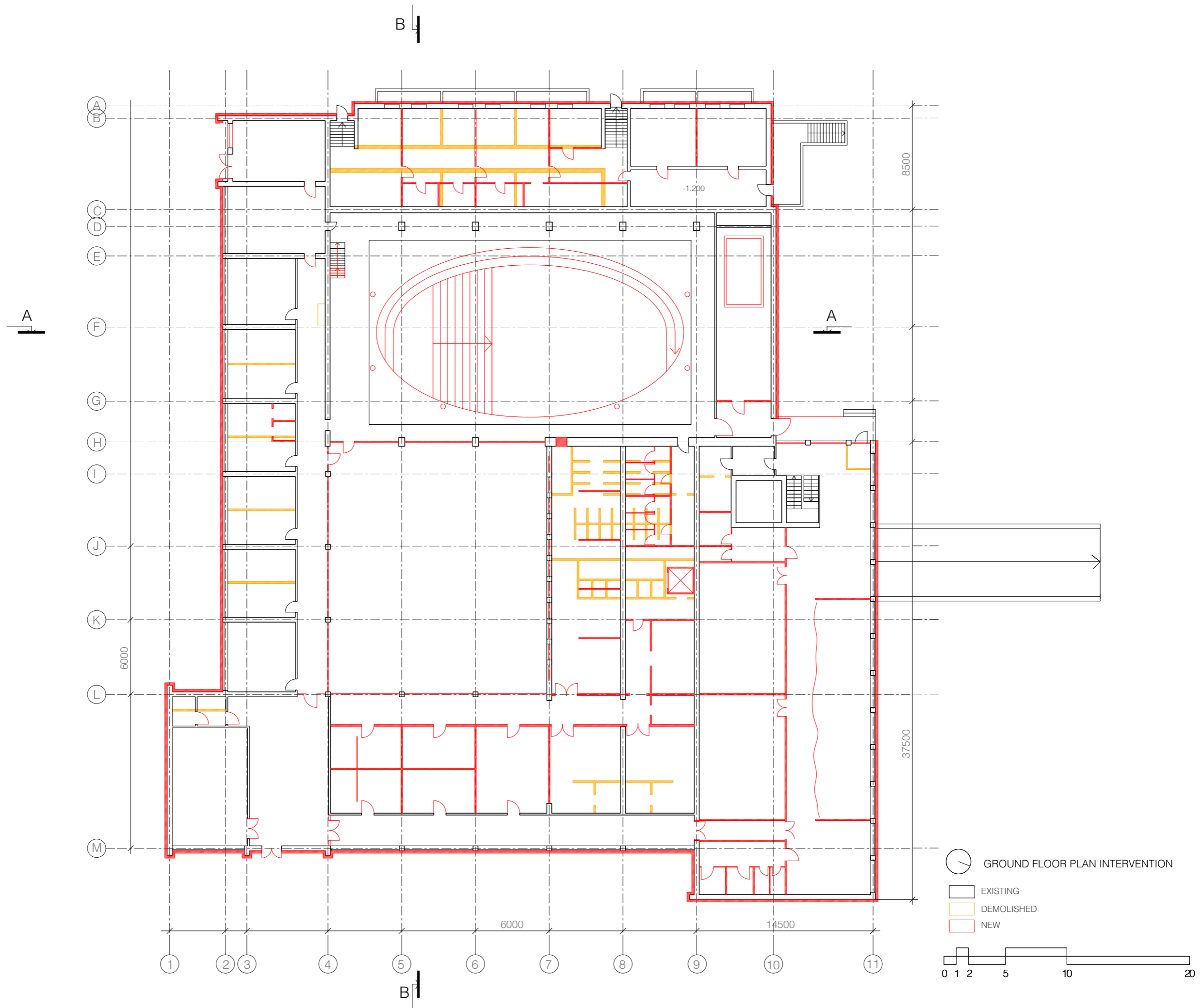
After more in-depth research and assistance from my Lithuanian friends, we found that the building was on sale for € 1 900 000 (Newsec, 2025), and the auction failed, presumably due to big discrepancy between the price and the condition in which the building was in.

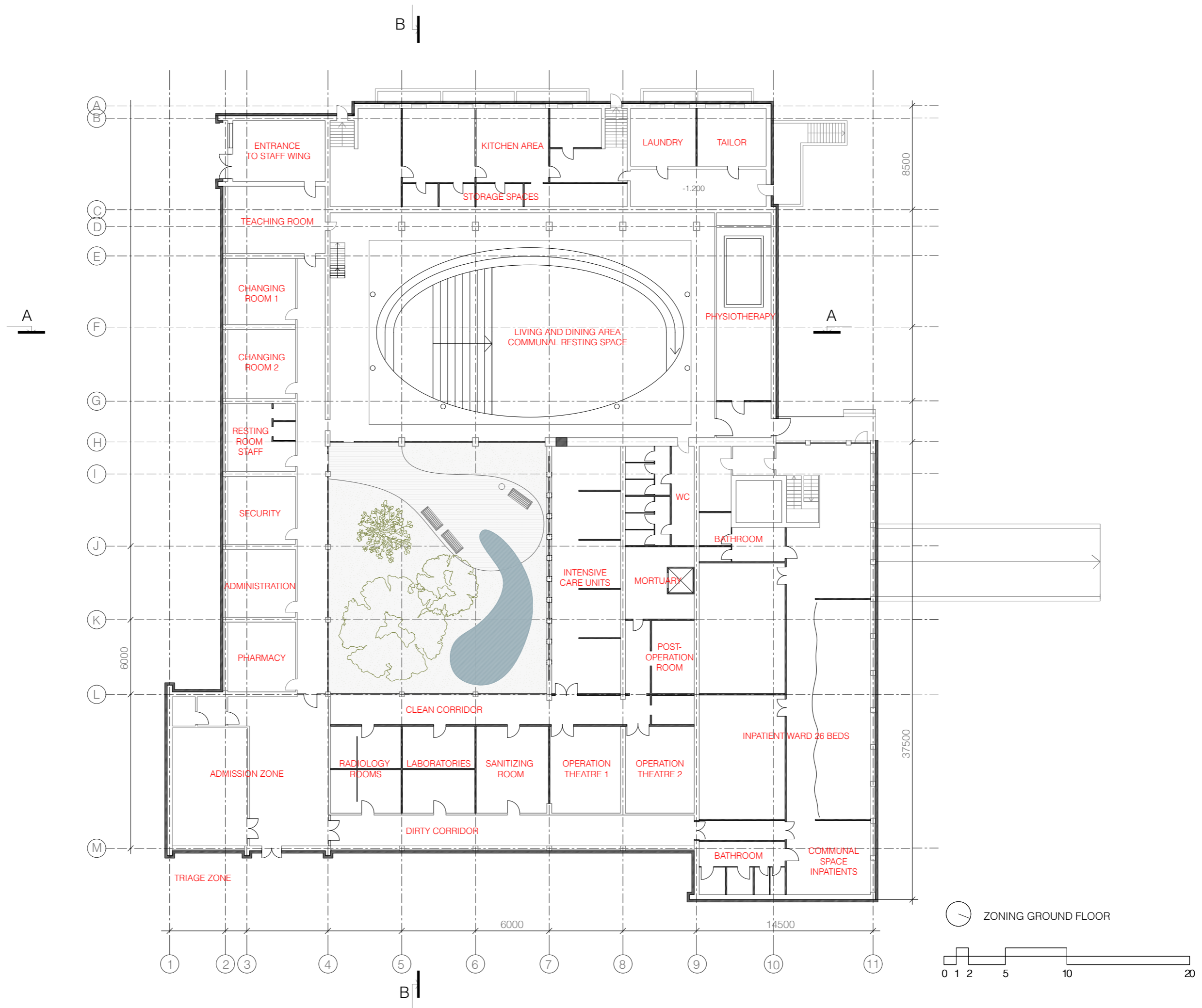
The abandoned swimming pool was another valuable addition to the research. It showed that even if a building fits a certain typology, there would always be differences and exceptions, each of them requiring special treatment within the proposed system. As a result, this top-down intervention includes transformation of the building into a medical facility during crisis, and return to civic healthcare and rehabilitation in peacetime.





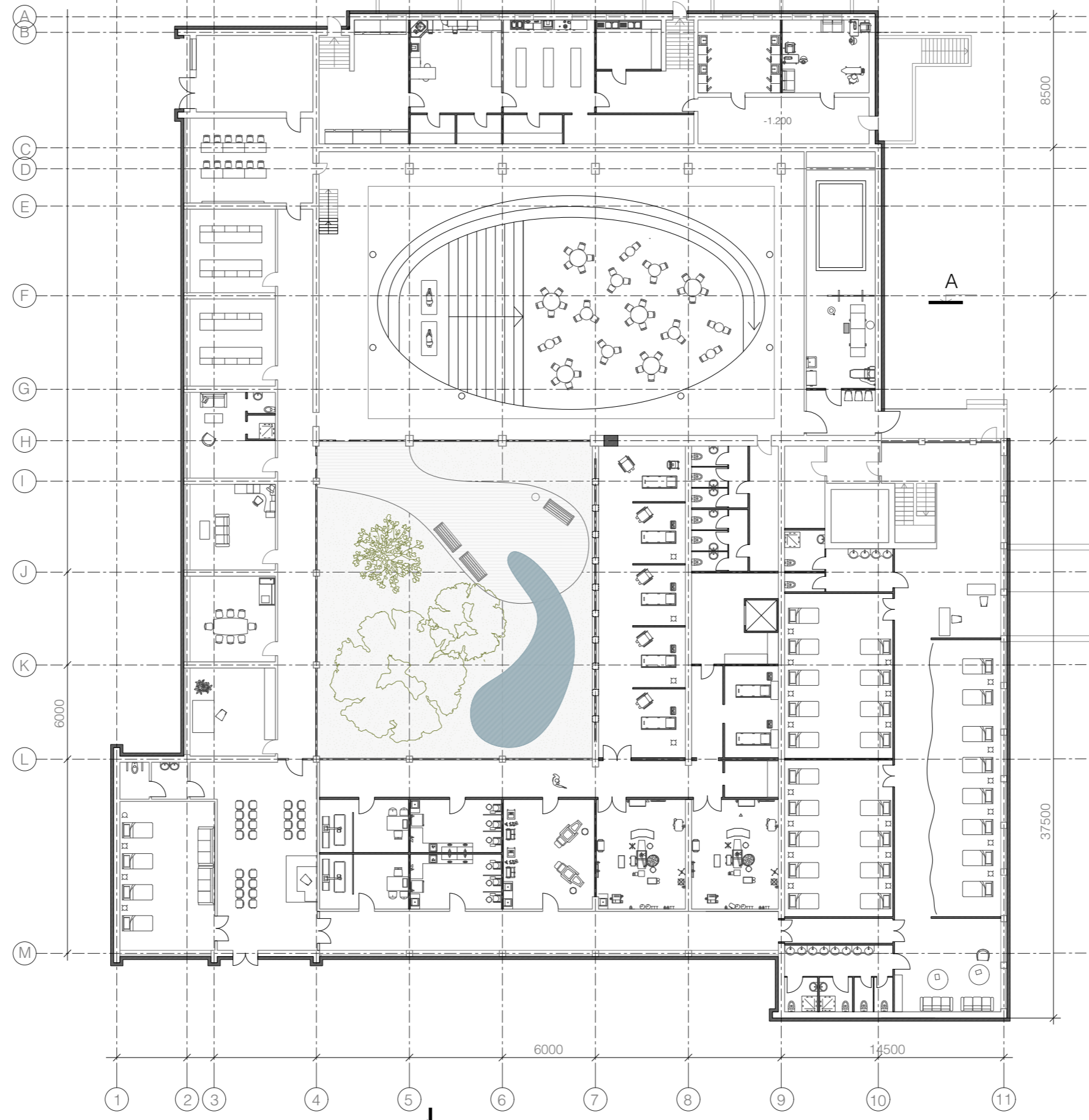







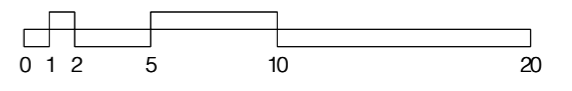


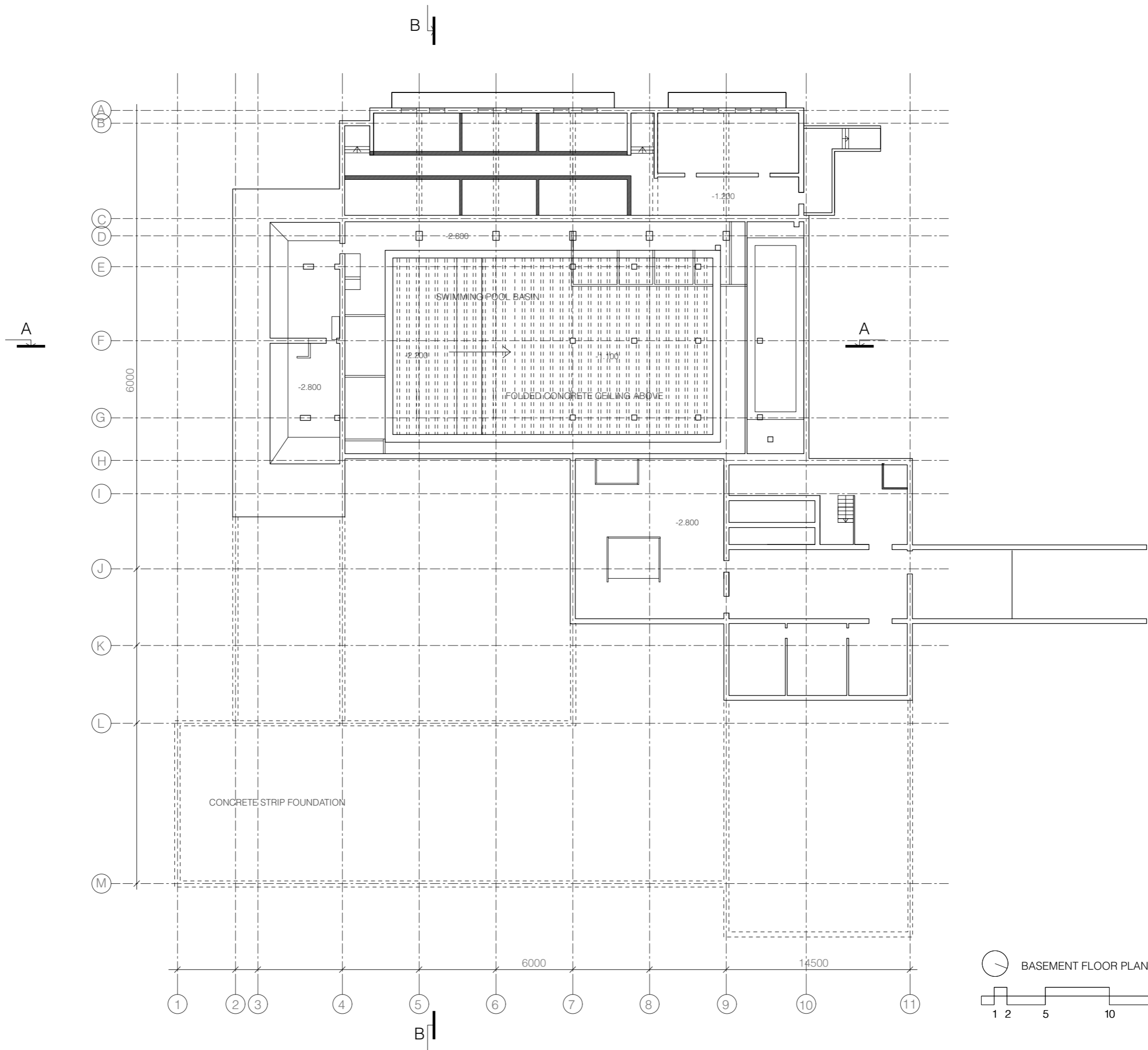
A


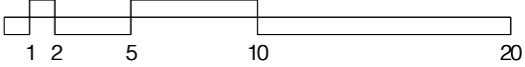
B

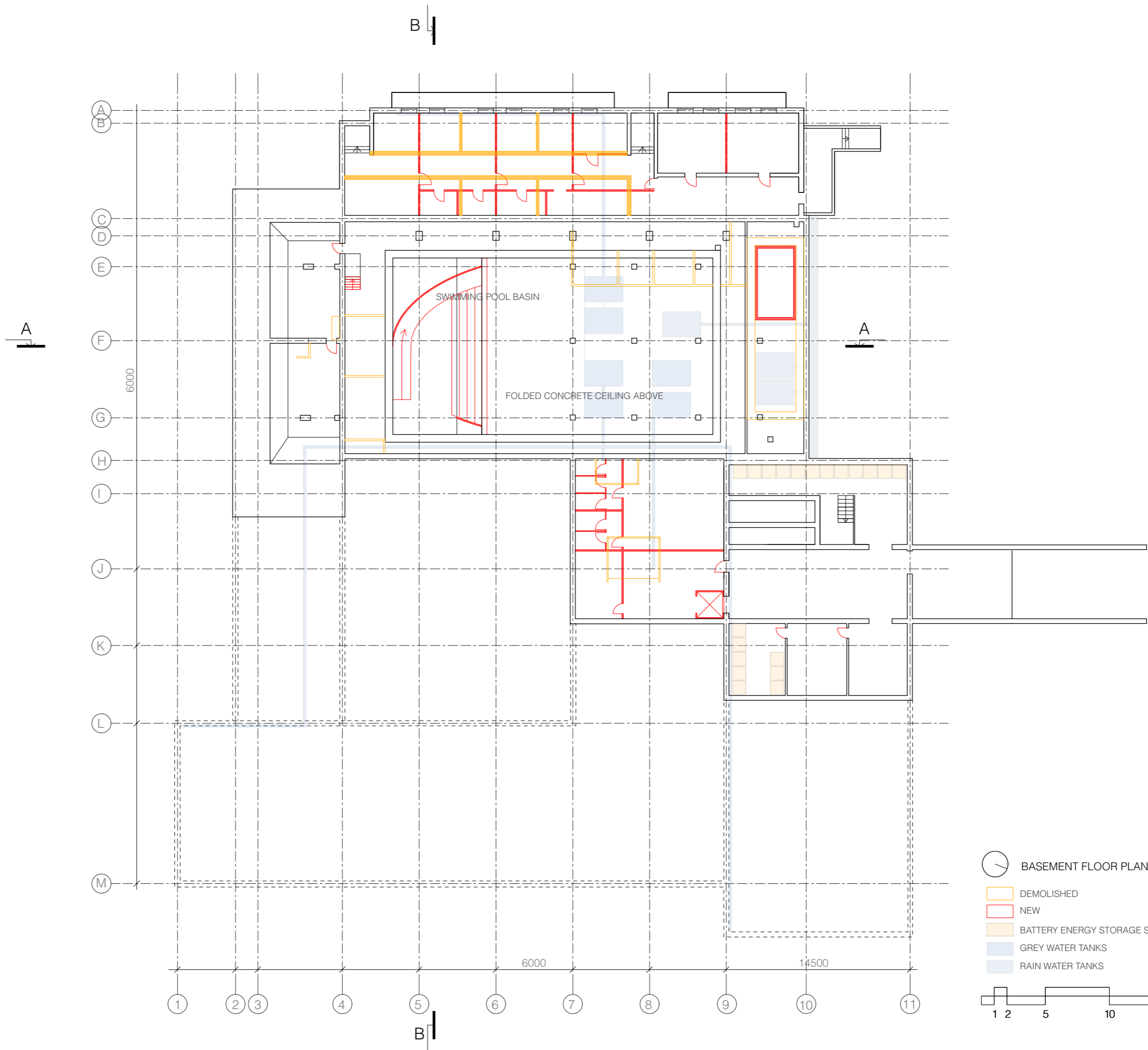








 GROUND FLOOR PLAN NEW  
 EXISTING  
 NEW

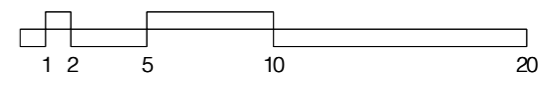











 BASEMENT FLOOR PLAN EXISTING  


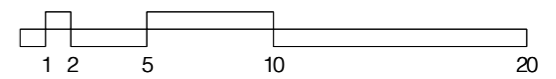


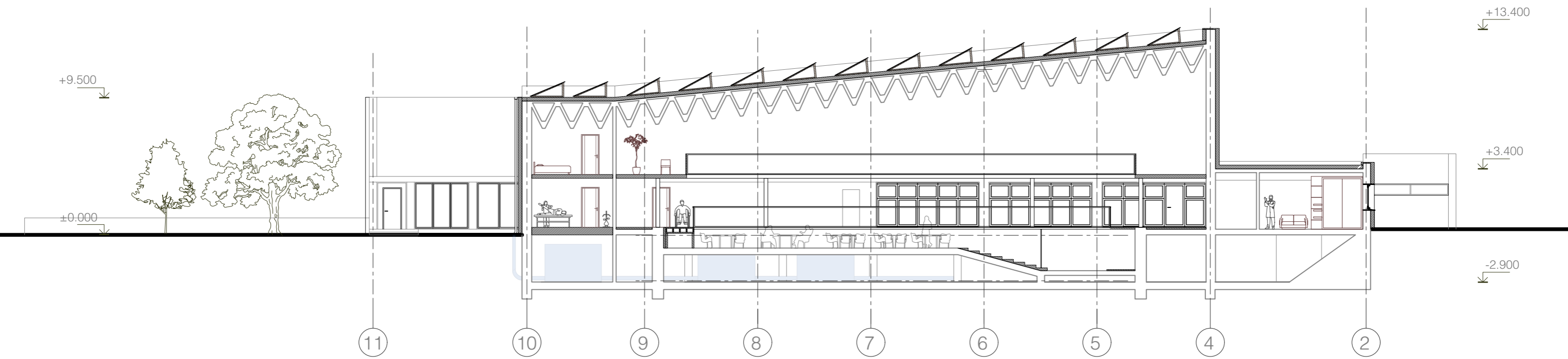
-  BASEMENT FLOOR PLAN INTERVENTION
-  DEMOLISHED
-  NEW
-  BATTERY ENERGY STORAGE SYSTEM
-  GREY WATER TANKS
-  RAIN WATER TANKS





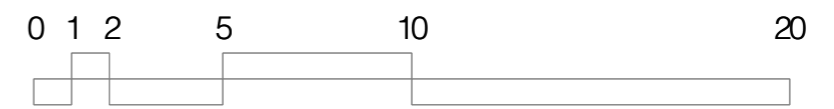
-  BASEMENT FLOOR PLAN NEW
-  EXISTING
-  NEW
-  BATTERY ENERGY STORAGE SYSTEM
-  GREY WATER TANKS
-  RAIN WATER TANKS

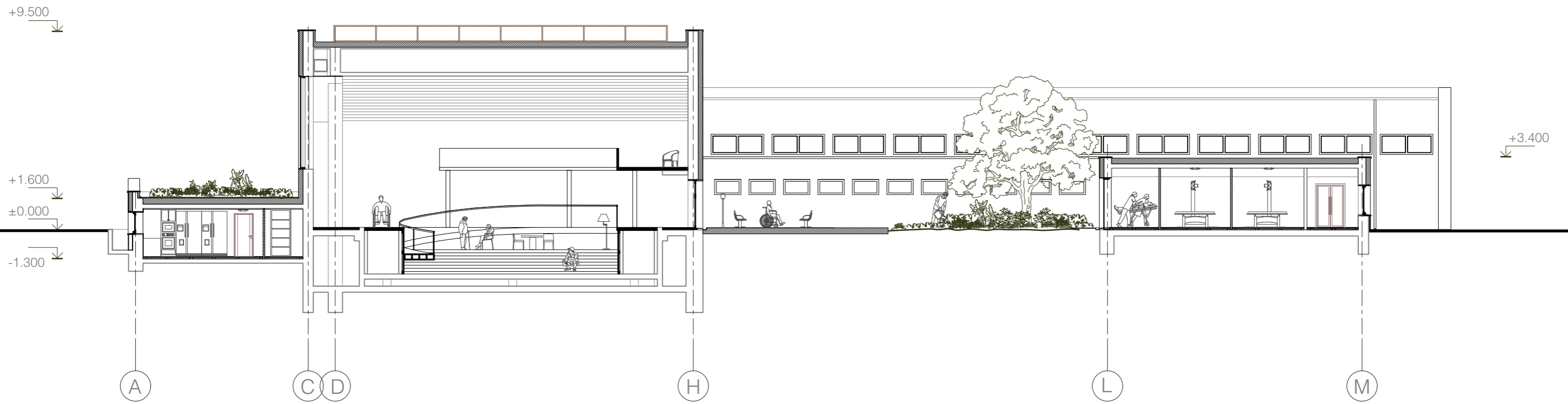




SECTION A-A 1:200

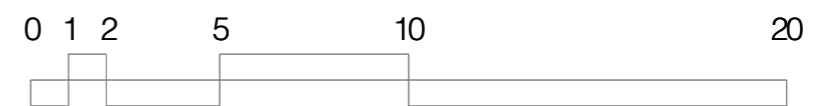
EXISTING
  NEW
  WATER TANKS

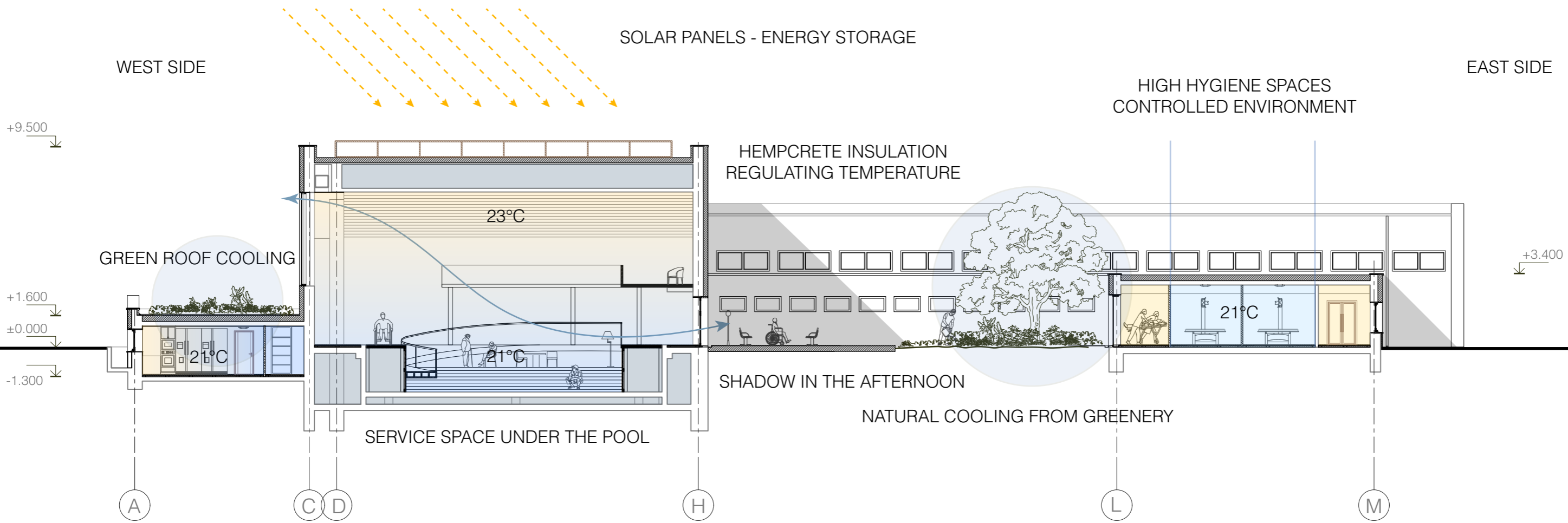




SECTION B-B 1:200

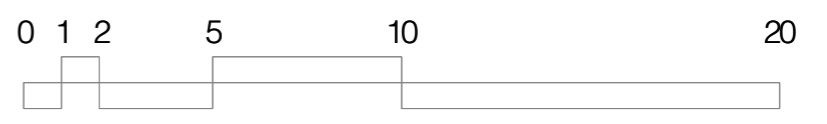
EXISTING NEW

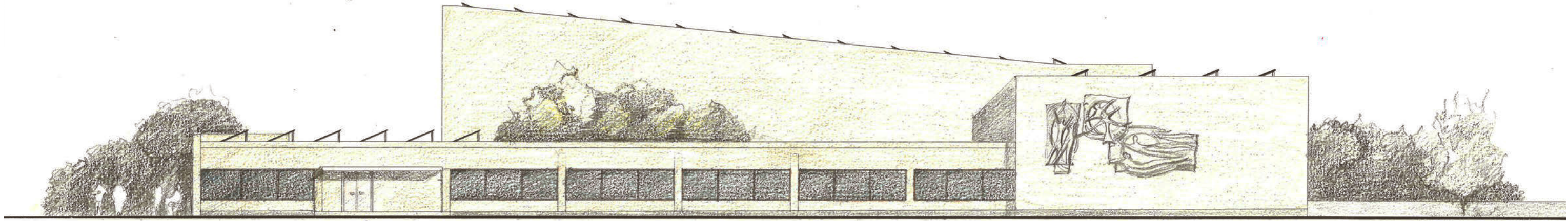




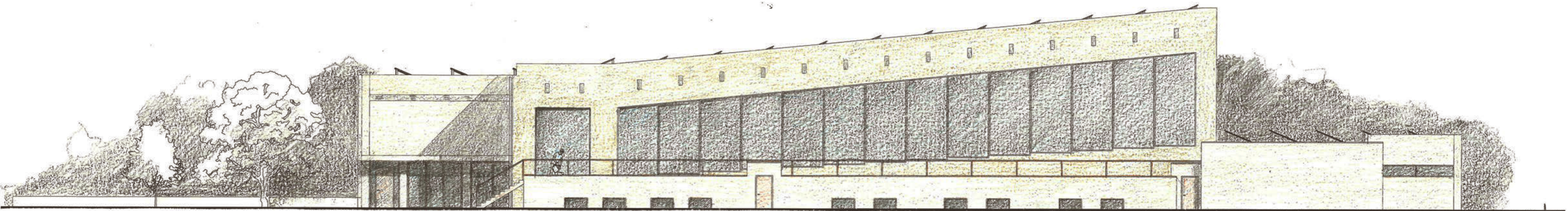
CLIMATE DIAGRAM SUMMER AFTERNOON 1:200

EXISTING NEW





East Elevation 1:200



West Elevation 1:200

## RENEWABLE ENERGY

PV-panels with battery storage support energy autonomy

## NEW WALL THICKNESS: 710 MM

increased protective mass and improved thermal performance

## HEMPCRETE INSULATION BLOCKS

bio-based insulation improves thermal comfort, buffers humidity and upgrades the existing envelope

## FOSTERING SOCIAL COHESION

creating space for healing and dialogue between people

## RETAINING EXISTING STRUCTURE

preserving existing masonry and concrete frame  
reducing environmental impact

## DESIGN FOR DISASSEMBLY

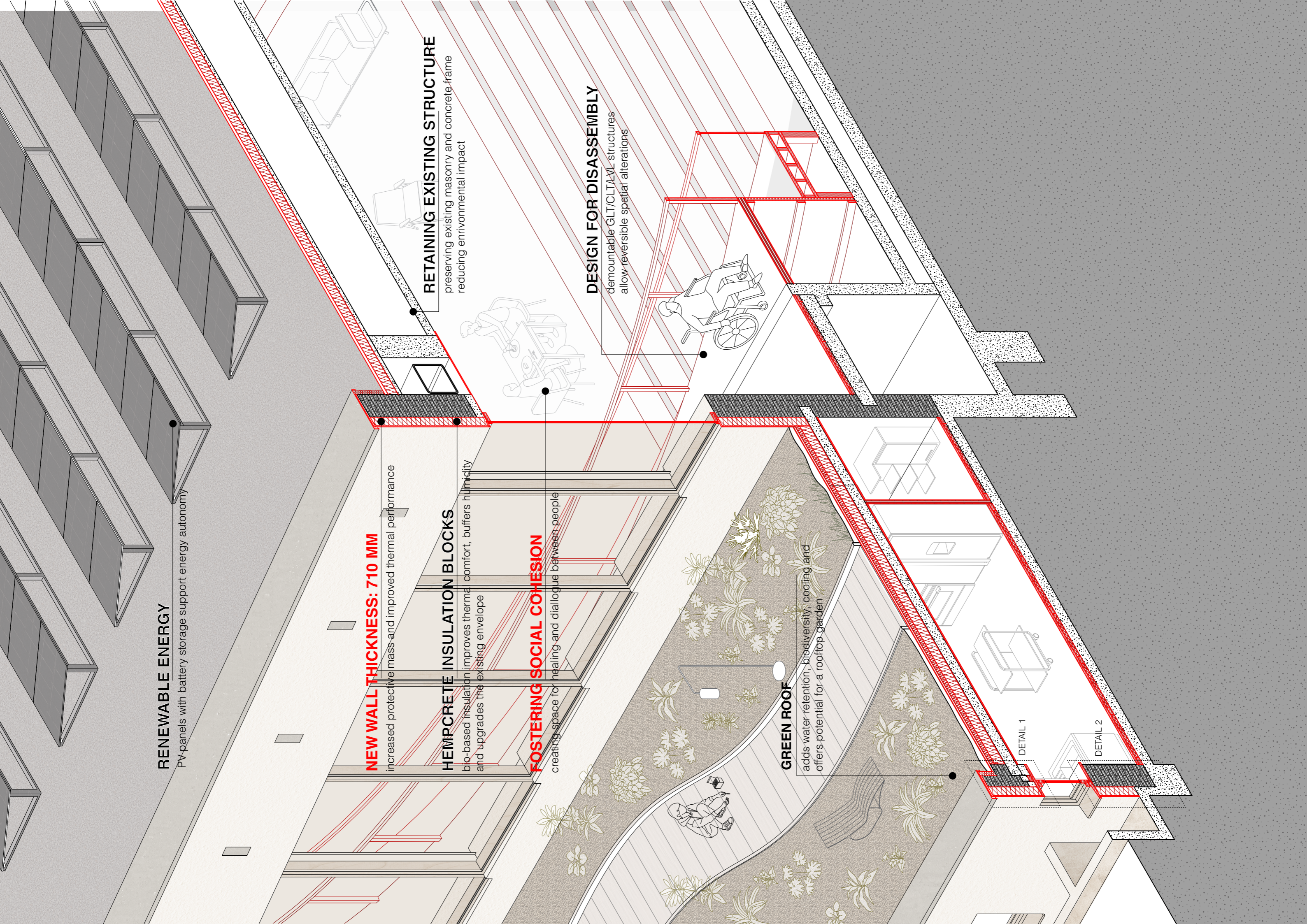
dismountable GLT/CLT/LVL structures  
allow reversible spatial alterations

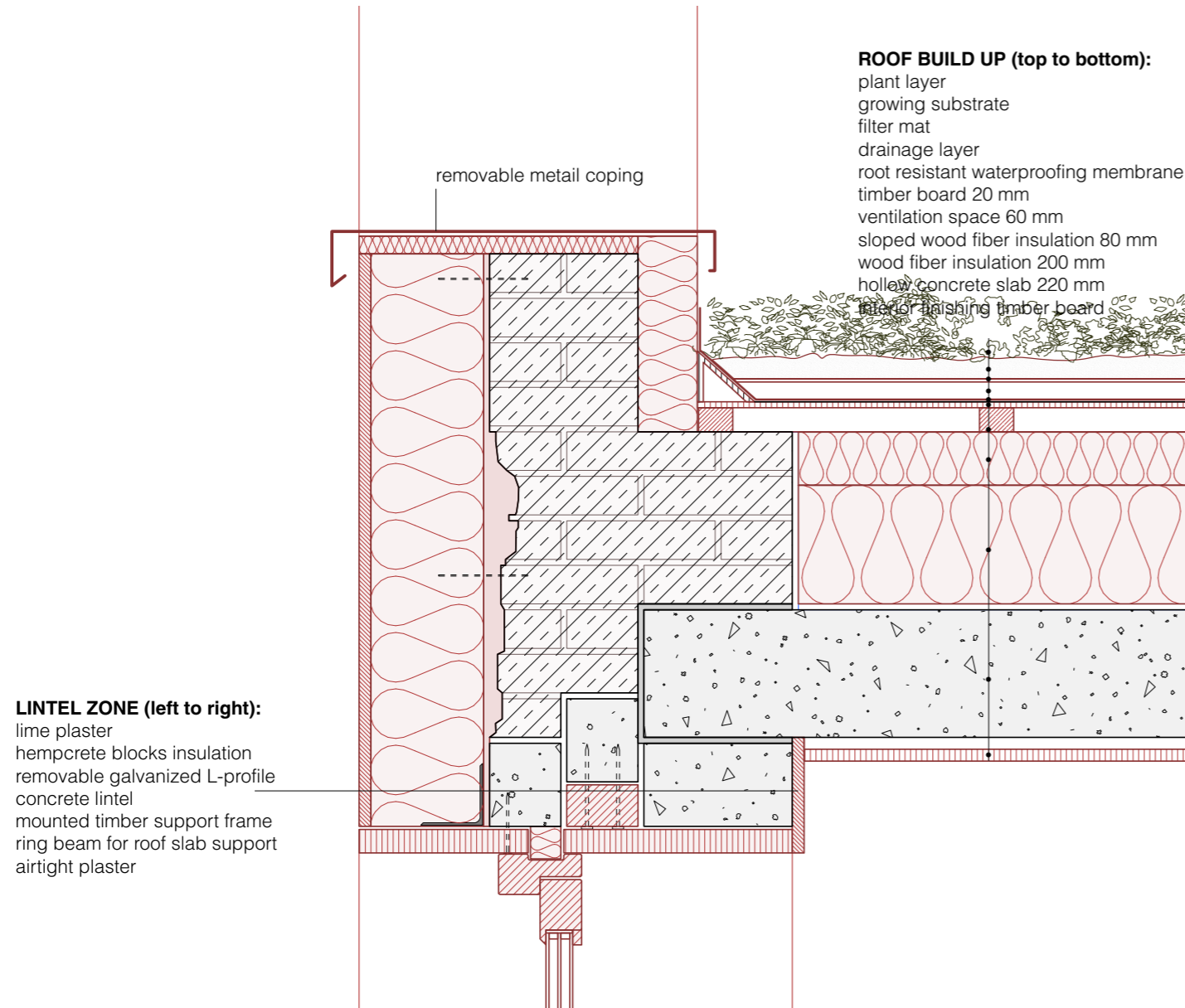
## GREEN ROOF

adds water retention, biodiversity, cooling and offers potential for a rooftop garden

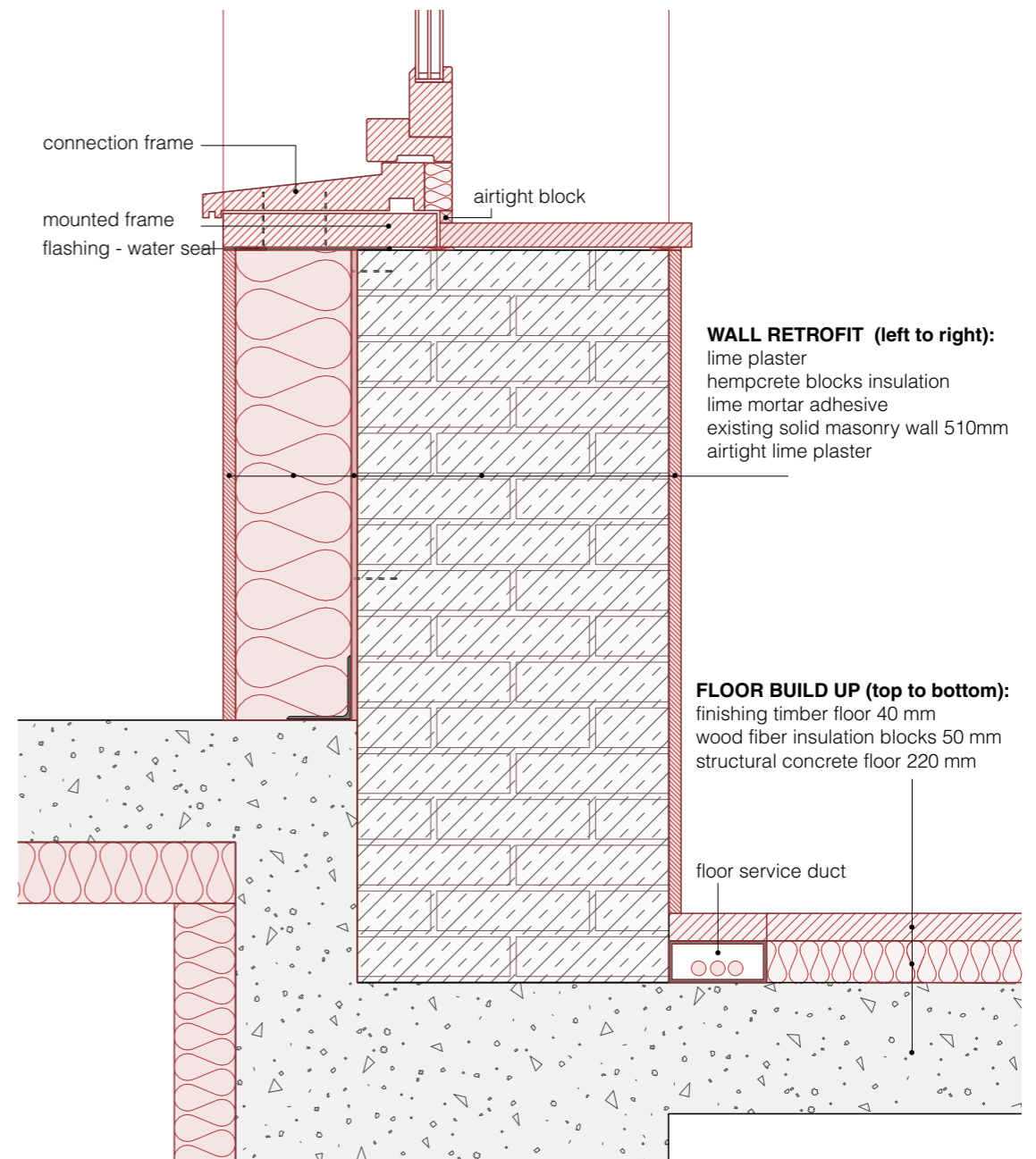
DETAIL 1

DETAIL 2





Detail 1 Sc 1:10



Detail 2 Sc 1:10



View into the courtyard



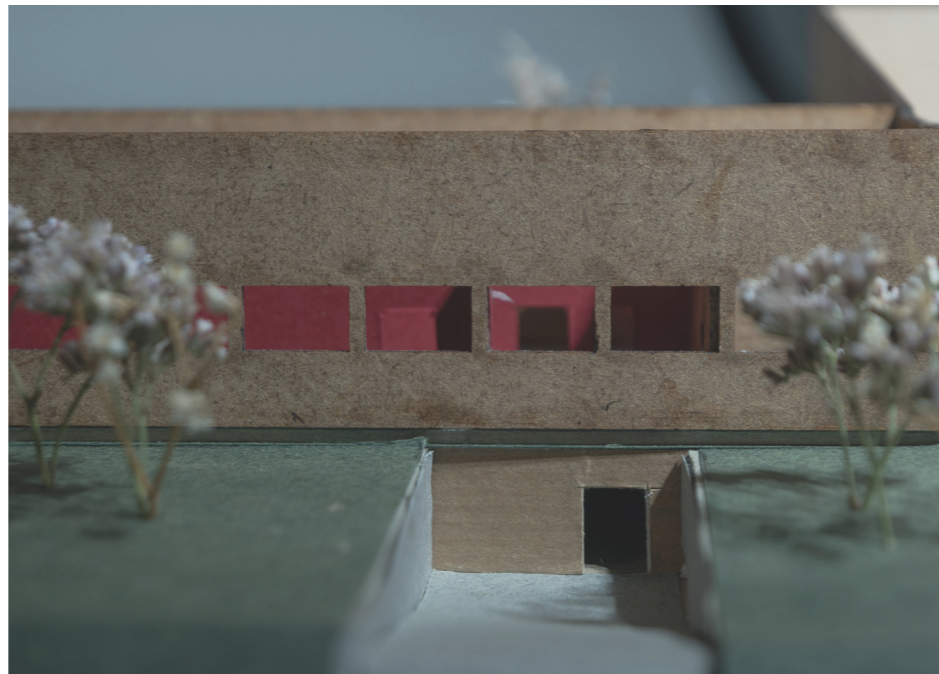
Entrance into the kitchen and laundry area



Entrance into the kitchen and laundry area



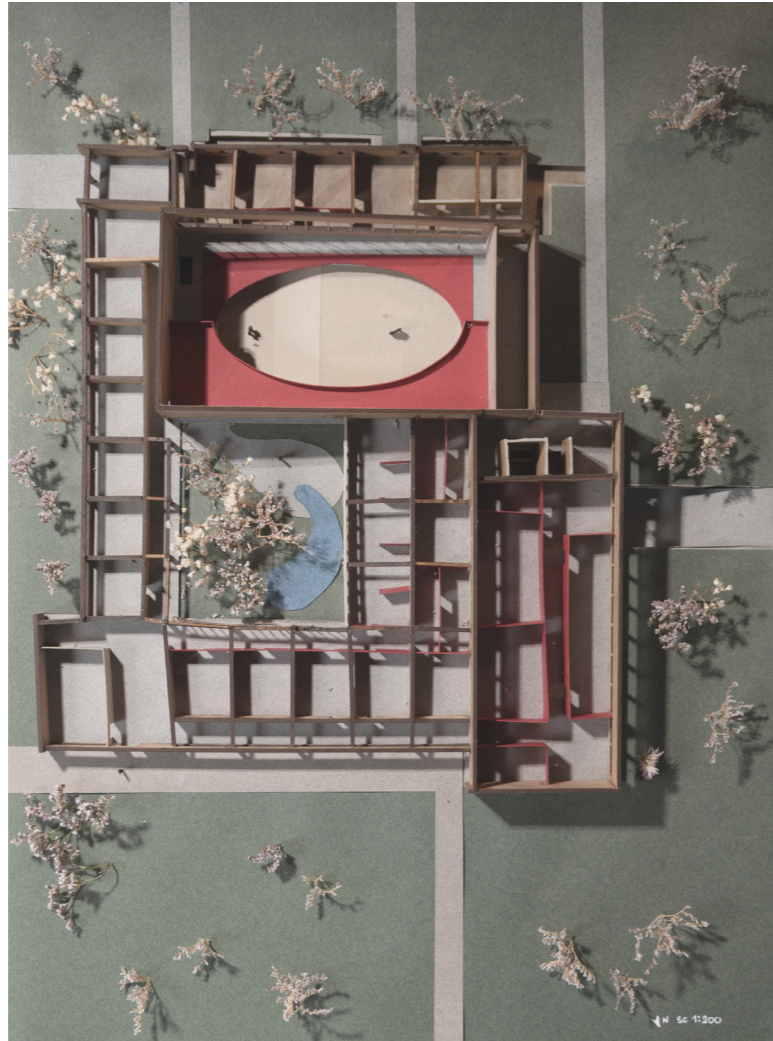
Entrance into admission area



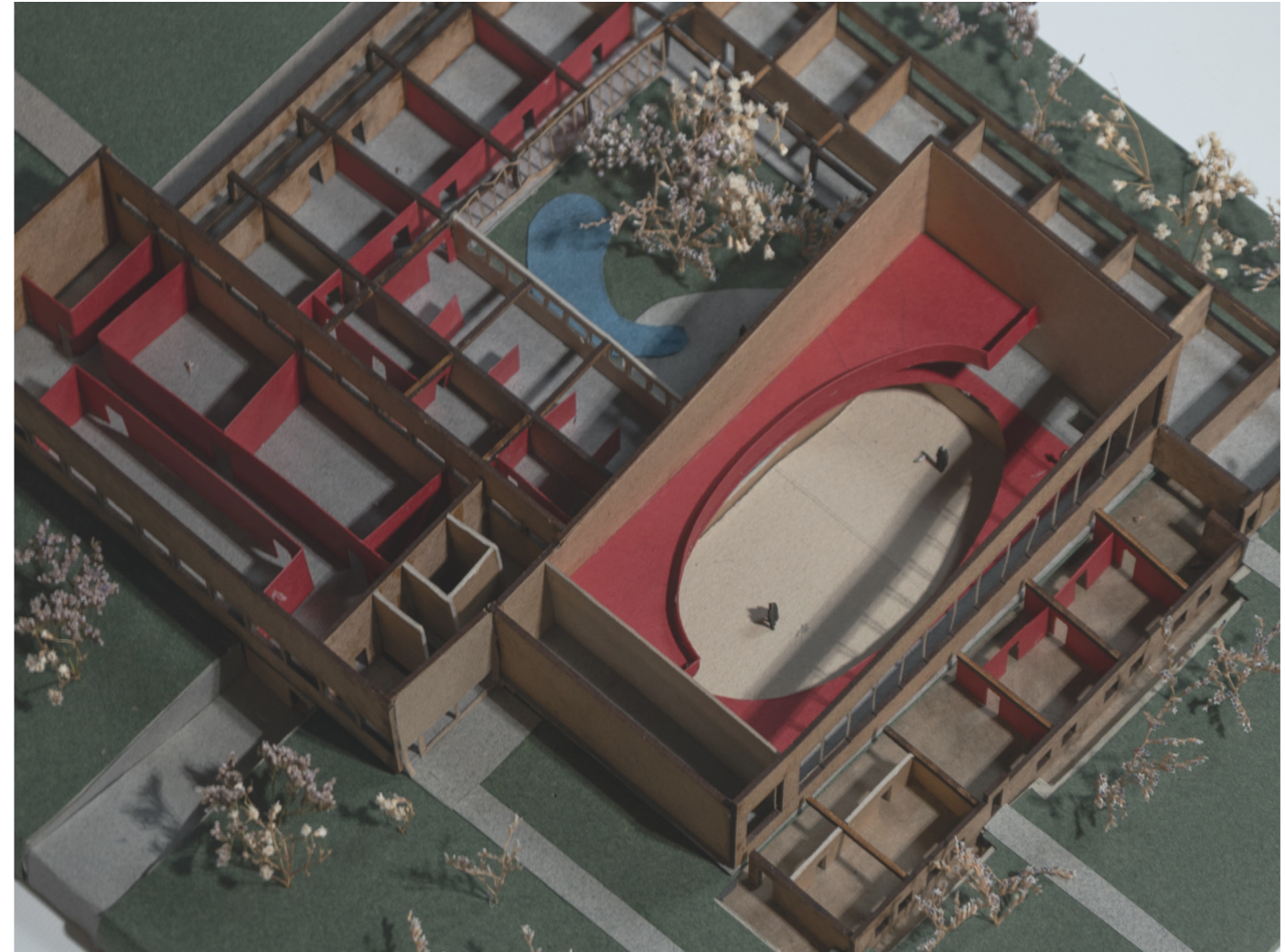
Entrance into the basement and shelter



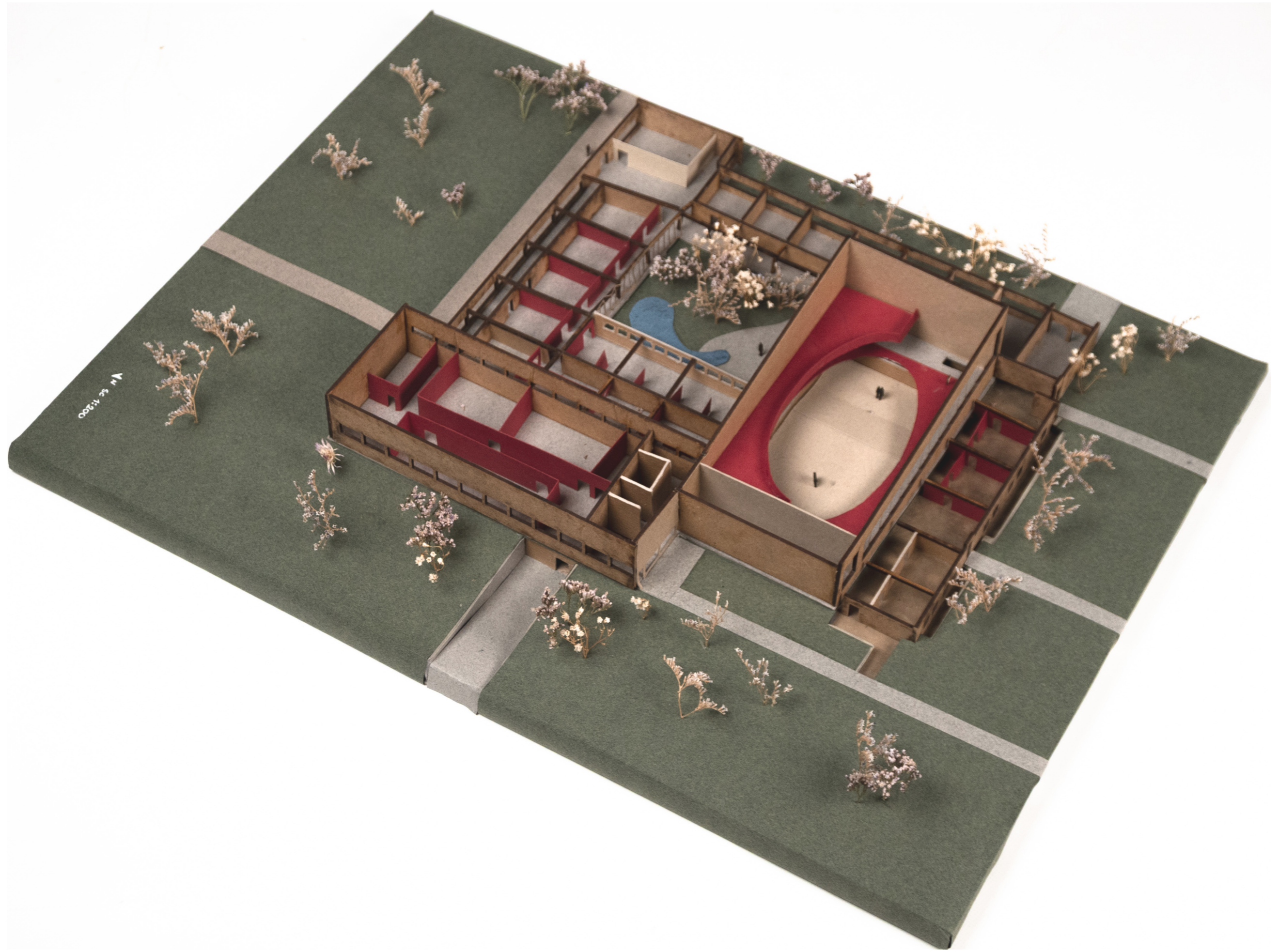
Entrance into the inpatient ward



Model of the building: Top View



Intervention Model



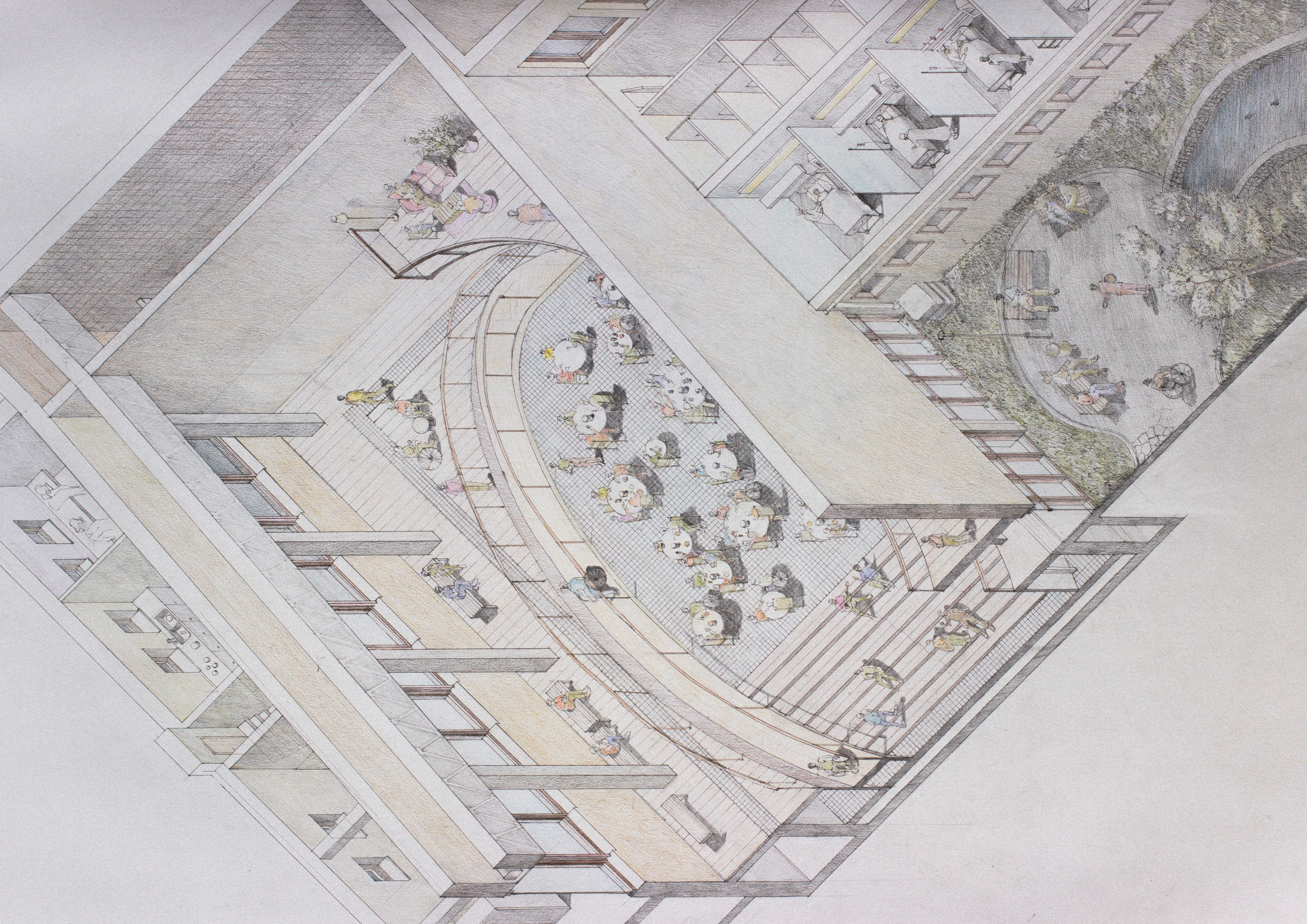
1/4" = 1'-0"

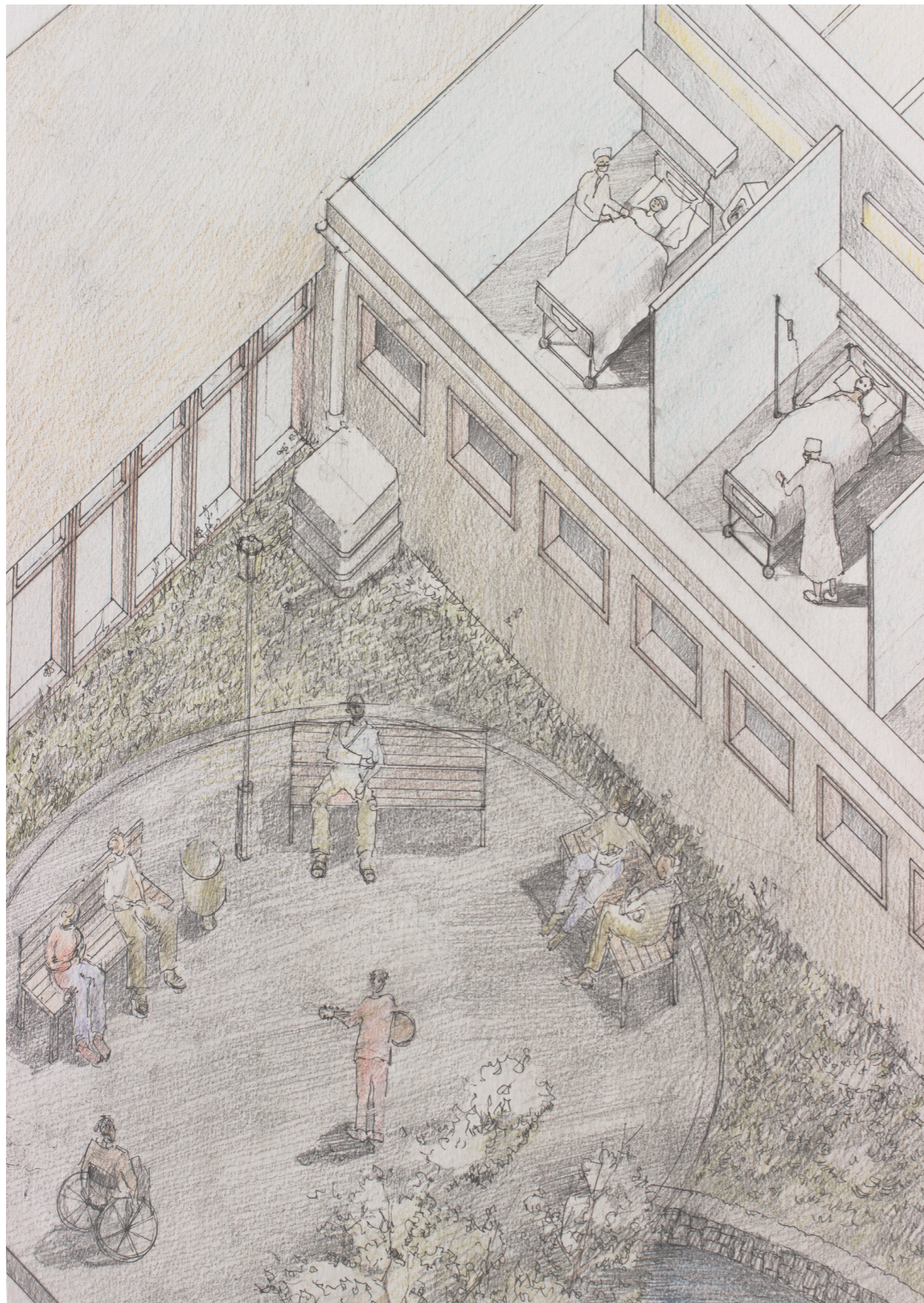


Pivoting walls that open and close depending on the need; when closed - fully sealed

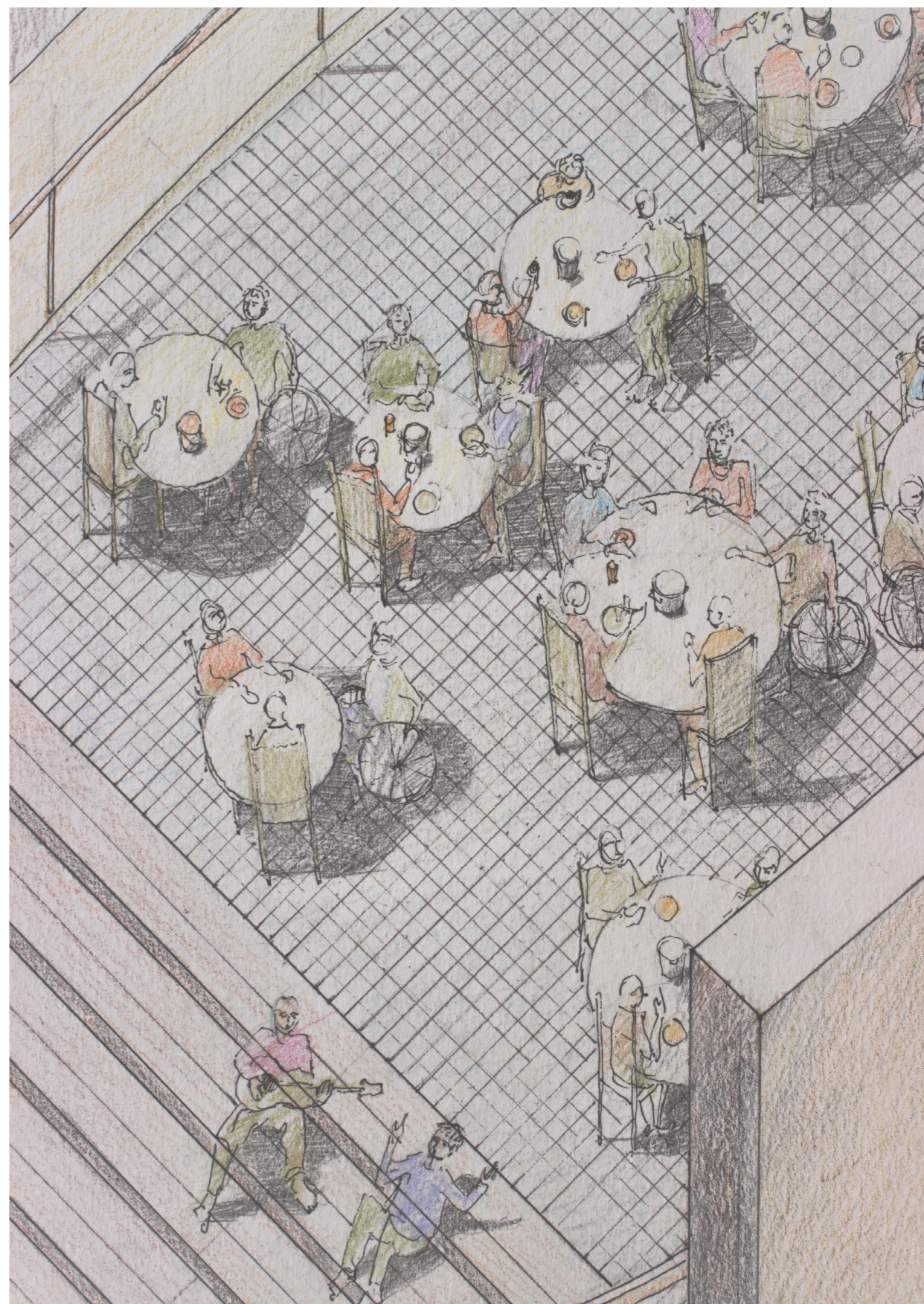


Easy to assemble wall panel system



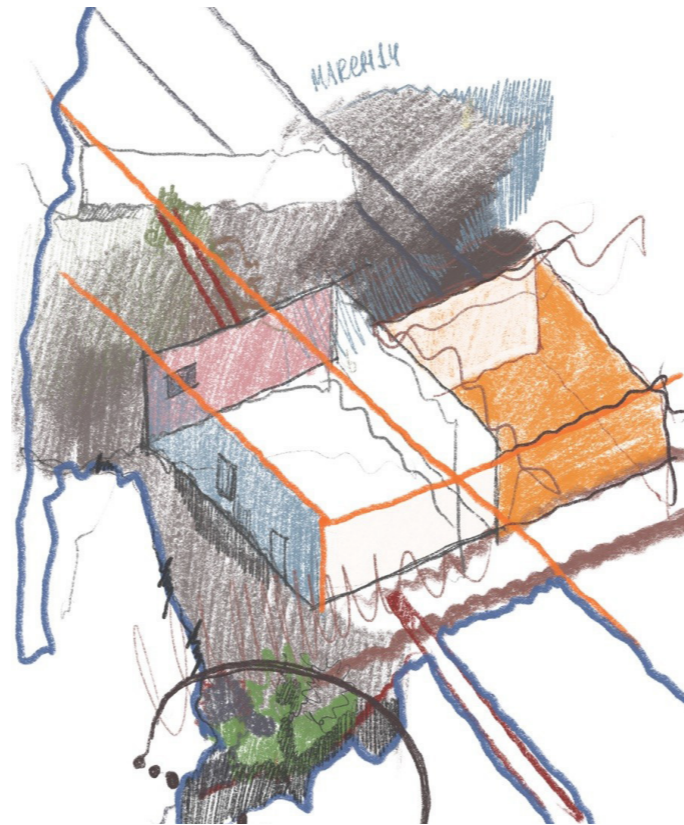


Central inner courtyard



Canteen, space for dialogue and healing

# CONCLUSION



## Discussion & Conclusion

Throughout this graduation project, the link was made between circular and protective principles. On the example of Lithuania that is currently adopting the Total Defence approach, it was shown that increased defence spendings do not have to mean large-scale new construction. Instead, retrofit and adaptive reuse offer promising solutions that would benefit both civilian protection and the environment. Dealing with the Soviet-era heritage allows for a powerful decentralized typological system to be developed.

The project focused on two complementary routes. Top-down route follows conventional adaptive reuse process, requiring time and precision. Bottom-up approach gains inspiration from squatting, allowing for quick inhabitation of vacant buildings. Together, these routes suggest that protection can be both planned and improvised.

Limitations of the research include lack of a centralized database that would offer more insights on the vacant buildings in Lithuania. Furthermore, the graduation project uses optimistic assumptions about protection, while reality is more complex. No matter what spatial strategies are used for protection, little can withstand powerful attacks and explosions. For further research, more attention needs to be dedicated to each typology, going in-depth with the kit-of-parts identified per function, as well as testing several buildings within each typology.

When geopolitical instability meets the climate emergency, defence and sustainability are treated as opposing priorities. This project argues otherwise. Despite the efforts of the world to mitigate climate change, the progress is hindered by wars. Powerful military states have repeatedly used military force to assert geopolitical authority with devastating consequences. Not only does it significantly damage economies, but it also costs lives and destroys ecosystems.

This graduation project was a search for a personal architectural position that I tried to establish through my values of care, resilience and collectivity. I aimed to oppose the narrative of aggression and militarization, while reminding that protection is always about people. Dealing with this topic was hard; however, it is through this project I wanted to find and express hope as an architect.



14. Nida, Lithuania. Artwork by the author

# Bibliography

Bronovitskaya, A., Malinin, N., & Kazakova, O. (2018). *Moscow: A Guide to Soviet Modernist architecture 1955-1991*. Garage Museum of Contemporary Art.

Cavalcanti, D. M., De Oliveira Ferreira De Sales, L., Da Silva, A. F., Basterra, E. L., Pena, D., Monti, C., Barreix, G., Silva, N. J., Vaz, P., Saute, F., Fanjul, G., Bassat, Q., Naniche, D., Macinko, J., & Rasella, D. (2025). Evaluating the impact of two decades of USAID interventions and projecting the effects of defunding on mortality up to 2030: a retrospective impact evaluation and forecasting analysis. *The Lancet*, 406(10500), 283–294. [https://doi.org/10.1016/s0140-6736\(25\)01186-9](https://doi.org/10.1016/s0140-6736(25)01186-9)

Command, S. (2025, February 24). Sustainable circular economics for Defence concept note. GOV.UK. <https://www.gov.uk/government/publications/sustainable-circular-economics-for-defence-concept-note>

ConEnvObs, B. (2025, June 20). CONENVOBs, author at CEOBS - Page 5 of 74. CEOBS. <https://ceobs.org/author/conenvobs/page/5/>

Countering hybrid threats. (n.d.). Site Name Seo. <https://www.nato.int/en/what-we-do/deterrence-and-defence/countering-hybrid-threats>

Dremaite, M. (2017). *Baltic modernism: Architecture and Housing in Soviet Lithuania*. Dom Publishers.

Defence, safety and security | TNO. (n.d.). [tno.nl/en](https://www.tno.nl/en). <https://www.tno.nl/en/about-tno/organisation/units/defence-safety-security/>

Eib. (2025, November 24). EIB backs new military base in Lithuania with €540 million loan. European Investment Bank. <https://www.eib.org/en/press/all/2025-249-eib-backs-new-military-base-in-lithuania-with-eur540-million-loan>

Igini, M. (2026, February 3). 3 years on, war is largest source of carbon emissions in Ukraine. Earth.Org. [https://earth.org/warfare-now-largest-source-of-ukraines-annual-carbon-emissions-report-warns-on-third-anniversary-of-russias-invasion/?utm\\_source=chatgpt.com](https://earth.org/warfare-now-largest-source-of-ukraines-annual-carbon-emissions-report-warns-on-third-anniversary-of-russias-invasion/?utm_source=chatgpt.com)

Jones, S. G., & McCabe, R. (2026). *Russia's grinding war in Ukraine*. <https://www.csis.org/analysis/russias-grinding-war-ukraine>

Kriaučūnas, E., Burneika, D., Ubarevičienė, R., & Baranauskienė, V. (2025). Lithuanian rural settlements: The legacy of Soviet rural planning and current challenges. *Quaestiones Geographicae*, 44(2), 5–17. <https://doi.org/10.14746/quageo-2025-0013>

LrtLt, J. G. L. T., & Museum, L. M. H. (2026a, January 17). Lithuania celebrates 103rd anniversary of taking Klaipėda. *Lrt.lt*. <https://www.lrt.lt/en/news-in-english/19/2808193/lithuania-celebrates-103rd-anniversary-of-taking-klaipeda>

LrtLt, J. G. L. T., & Museum, L. M. H. (2026b, January 17). Lithuania celebrates 103rd anniversary of taking Klaipėda. *Lrt.lt*. <https://www.lrt.lt/en/news-in-english/19/2808193/lithuania-celebrates-103rd-anniversary-of-taking-klaipeda>

LrtLt, R. K. L. R., & Nuotr, D. U. / . L. (2023, September 30). How Soviet utopia of free housing failed Lithuania. *Lrt.lt*. <https://www.lrt.lt/en/news-in-english/19/2086930/how-soviet-utopia-of-free-housing-failed-lithuania>

Magazine, F. (2025, June 11). Reshaping Soviet heritage in Vilnius: Top repurposed industrial sites to visit — French Fries Magazine — FF. *French Fries Magazine* — FF. <https://frenchfries-mag.com/archives/2021/5/10/reshaping-soviet-heritage-in-vilnius-top-repurposed-industrial-sites-to-visit>

Ministry of National Defence of the Republic of Lithuania. (n.d.). Ministry of National Defence. <https://kam.lt/en/>

Newsec auctions. (n.d.). <https://www.newsec.lt/nt/en/building-auction-druskininkai-66165-k-dineikos-g-4-1425#property>

Parkinson, S. (2025). *Military spending rises and greenhouse gas emissions*. [https://www.sgr.org.uk/sites/default/files/2025-09/SGR\\_MilEx\\_GHG\\_s\\_WEB.pdf](https://www.sgr.org.uk/sites/default/files/2025-09/SGR_MilEx_GHG_s_WEB.pdf)

Rūta. (2025, January 29). The largest military infrastructure projects in Lithuanian history: two new military towns to be developed through PPP. CPVA. <https://cpva.lt/en/news/the-largest-military-infrastructure-projects-in-lithuanian-history-two-new-military-towns-to-be-developed-through-ppp>

Slakaityte, V., & Surwillo, I. (2025). North-eastern flank: Militarisation of the Baltic frontier. In *Econstor (Econstor)*. <https://hdl.handle.net/10419/322177>

Tarnyba, L. T. N., Lrt.Lt, & Nuotr, S. (2021, October 12). Building cities in middle of nowhere – Lithuania's utopian planning heritage. *Lrt.lt*. <https://www.lrt.lt/en/news-in-english/19/1518620/building-cities-in-middle-of-nowhere-lithuania-s-utopian-planning-heritage>

UDARNY TRUD (2018-20) — PAULINA KOROBKIEWICZ. (n.d.). PAULINA KOROBKIEWICZ. <https://www.paulinakorobkiewicz.com/udarny-trud>

Welle, D. (2024, August 20). Lithuania begins construction of Germany's military base. *dw.com*. <https://www.dw.com/en/lithuania-germany-nato-military-belarus/a-69984777>

# Reflection

Looking at my boards standing in the studio, I think I have done a good job.

My process was tied to intuition and emotion. By choosing a project outside of my comfort zone, I am proud that I stepped into this unsettling topic. At first, I had especially strong opinions. The process was a complex journey, I believe I reached a low point at A1. It seemed that the world is doomed, and I immersed myself too deeply into the topic of war. However, it is through this project I developed thicker skin, and tackled the tabooed topics. Now, I strongly believe that only by active action guided by care, we can change small parts of the world. Tiny, if you may. But a million of tiny good things together form one big better world.

Somehow, working on the project also made me nostalgic. By reading into the Soviet architecture, digging into my own identity, I thought back to the times when the war in Ukraine was not happening. The change is felt through music, people, and the entire digital world. As I am writing this, I miss the days from early 2022, when both Russian, Ukrainian and Latvian friends of mine were dancing with the together in a big apartment in Spain. Just two weeks later, we would spend time discussing how the families of our Ukrainian friends had to leave their homes - or chose to stay regardless.

For the project itself, following intuition instead of deliberate planning was the approach that worked best for me. Starting from emotion - deep dissatisfaction with the world and desire to act, I went on with a journey where the process led me. It was somehow full of coincidences that I chose to listen and follow. The project ended up to be a coherent story with a well-established concept.

However, while on conceptual level my project is well-established and coherent, having extra time would allow for each aspect to gain additional depth. To continue, I would like to get into more technical implementation of kit of parts, as well as bring in the concept of Cradle-to-Cradle deeply ingrained into each scale in more detail. This being said, the project that I have now is well-rounded for the time given. While it was a challenge, it was also a big joy to tap into my passion for hand-drawing and find the ways to incorporate it in analog ways of producing, where making becomes a way of thinking.



## Afterword: No More Student

Eight years ago, I was standing on the footsteps of another typical Soviet-era building: my school. We were launching red balloons into the sky, fresh high-school graduates. The only thing I knew was that I wanted to study architecture, and I did not know how many kilometers and years this journey would eventually take.

High-school me was happy and sad, nostalgic on the last school days. The only thing that the high-school me wished for was to sing this one song, which the principal did not allow. Coming back to it now, eight years later, with new eyes and reflection.

*Brainstorm, also known as Prāta Vētra, is a Latvian rock band fronted by Renārs Kaupers. In 2008 they collaborated with Russian writer and playwright Evgeny Grishkovets and his band Bigudi on a cover of "Na zare" — originally recorded by Soviet group Alyans in 1987. Adaptive reuse if you ask me. Grey - existing. Black - new.*

### **Brainstorm (Prāta Vētra) & Гришковец — «На заре» / “At the Dawn”, adaptation by Yulia**

Нет-нет, я уже знаю,  
Я знаю, что юность закончилась.  
Теперь я могу только вспоминать.  
И я помню, тогда, в юности,  
Я уже чувствовала себя счастливой.  
Но мне казалось, что все сложно,  
И дальше может быть только хуже,  
Но теперь-то я знаю, что здесь и сейчас — и  
есть счастье.

А тогда я ничего не знала.  
Тогда так всего хотела!  
Как же я ждала тогда чего-то!  
И мне казалось, я слышу, что меня зовут...

На заре голоса зовут меня!  
На заре голоса зовут меня!

А чего я ждала тогда?  
Я ждала себе удивительной судьбы,  
неповторимой жизни.  
Как я хотела все почувствовать,  
Все попробовать и как можно скорее.

А еще я могла до утра  
Сладко думать и с трепетом чувствовать,  
Что вот-вот, уже этим утром,  
Уже скоро, уже скоро...

На заре голоса зовут меня!  
На заре голоса зовут меня!

And there, in my youth,  
When I would watch the morning mist above the  
river,  
Or was coming back home in a still dormant city  
It always seemed to me  
Or rather, I was so convinced  
That they were calling just for me...  
just for me...

At the dawn voices calling me...  
At the dawn voices calling me...  
At the dawn voices calling me...  
At the dawn voices calling me...

And now, six years far from home,  
This never-ending game of lost & found.  
My stride is firmer, I am not alone;  
And holding hands keeps me on solid ground.

This journey, which is full of hills and valleys  
Will now continue on these flatter lands.  
My gaze is open; this was just a premise.  
A glimpse of journey that now still lies ahead.

Delft, June 2026

