



# RECLAIMING LIFE IN KHERSON, UKRAINE

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Master Thesis in Architecture 2024

Title: **Post-war: Reclaiming life in Kherson, Ukraine**

Period: **January 2024 - May 2024**

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# ACKNOWLEDGEMENTS

Completing my master's thesis would not have been possible without the support and guidance of my tutor, Andreea Marcu. Your encouragement pushed my boundaries to explore architecture from diverse perspectives.

I am also deeply grateful to my examiner, Ivette Arroyo, whose expertise and insights enriched the depth of my thesis and broadened my understanding of the field.

My sincere appreciation to those mentioned above for their collective efforts and invaluable contributions to this project. Thank you for believing in me and helping me reach this milestone.

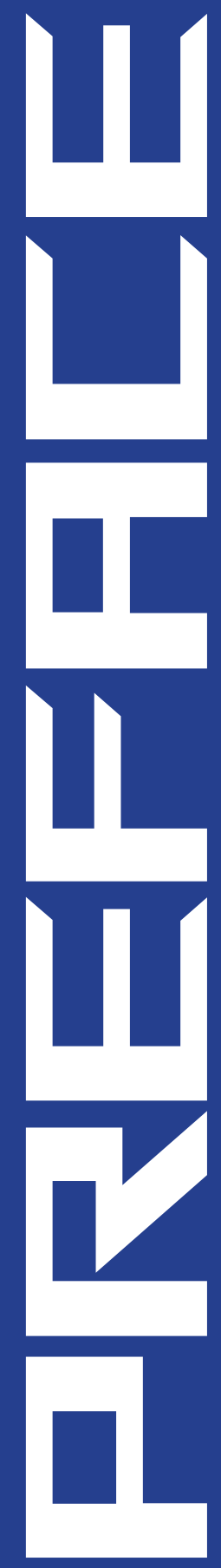
**“It was clear that architecture was part of the problem—the killing of thousands of innocent men, woman, and children—and I felt strongly that as long as the attacks continued architecture also had to be part of the solution.”**

-Lebbeus Woods

“WAR AND ARCHITECTURE: The Sarajevo window”



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The date is the 24<sup>th</sup> of February 2022, a day that will forever be remembered with sorrow. On this day, Russia launched a full-scale war in Ukraine.

It is difficult to articulate the emotions that arise when you find yourself on the side of the aggressor, overwhelmed with shame and fear as you read the news on your phone. Yet, this is not a narrative about myself or fellow Russians.

Instead, it is a story that highlights the irrepressible courage and determined commitment of the Ukrainian people, as they bravely defend their homeland and strive to rebuild a future marked by freedom and peace.

As we envision the future of the liberated nation, it is difficult to imagine the form it will take once it is finally free. However,

professionals in various fields have already begun contemplating this possibility. From the ashes and wreckage of a once bustling metropolis, the post-war city must now rise anew, undertaking the task of rebuilding and reinventing itself. As we embark on this journey, we are confronted with the city's wounds - a testament to its resilience and transformation.

Undoubtedly, there will be a long journey of healing and processing the losses that Ukraine has endured, as the scars from this war will forever remain imprinted into collective memory.

Amidst this chaos, I choose the life and peace rather than contributing to the destruction and misery - offering a humble contribution to the emergence of a new, liberated Ukraine.

# DISCLAIMER

During the war it is impossible to verify the accuracy of the information. All data are taken from official reports of the international and Ukrainian organizations and NGOs as of the January 2024.

## CONTEXT

In 2022, Europe experienced its largest war since World War II, resulting in a massive refugee crisis caused by Russia's aggression towards Ukraine. By the end of June 2023, the number of Ukrainians living abroad had reached an estimated 5.6 to 6.7 million individuals. This represents an increase of 300,500 people compared to the end of 2022. An additional 5.9 million Ukrainians were internally displaced within their own country. (UNDP, 2023)

**5.6-6.7 MIL. UKRAINIANS** living abroad (UNDP, 2023)

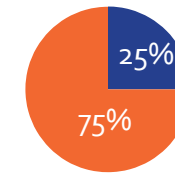
**5.9 MIL. UKRAINIANS** internally displaced within Ukraine (UNDP, 2023)

However, there is also some positive news, as during this same period, approximately 1.1 million internally displaced persons (IDPs) were able to return to original homes. Additionally, 197,000 refugees made the decision to return to Ukraine. (UNDP, 2023)

**197 THSD. REFUGEES** returned to Ukraine (UNDP, 2023)

The desire to return to their homeland is strong among the people of Ukraine. A significant 41% of respondents are certain about their intention to return, with an additional 22% considering it highly likely. It is anticipated that around 2.1 to 3 million Ukrainians will resume their lives once the Russian aggression comes to an end. (Kyiv International Institute of Sociology, 2023)

Despite these returns, the overall number of forcibly displaced Ukrainians remains high, with approximately 11 million people still displaced as of mid-2023. This figure accounts for over one-quarter of the country's population. (UNDP, 2023)



1 of 4 Ukrainians remains displaced (UNDP, 2023)

It is crucial to recognize that individuals who have been forced to flee or remained in their country cannot afford to wait for extended recovery periods. Those who stayed in conflict-affected areas frequently report feeling trapped.

In my master thesis, I address this extreme situation and explore potential solutions. Therefore, I have divided my work into five parts:

- 1. Introduction:** This section explores the context and theoretical works in the field of post-war recovery.
- 2. Peace Building:** Here, I examine actions to be taken not only in architecture but also in broader areas.
- 3. Design Process:** This part outlines the development and functionality of my project.
- 4. Design Proposal:** This chapter presents my vision of post-war architecture.
- 5. Conclusion:** This section synthesizes the findings and outlines the implications for future recovery efforts.



## PROBLEM STATEMENT

People are suffering, and actions must be taken. As architects, we can significantly contribute to revitalizing homes, communities, and ultimately, the lives of people.

This raises the question: how do we begin addressing such complex situations? The challenge extends beyond the realm of architecture alone. Post-war design is intricately connected with other fields of expertise and requires a holistic approach.

“Traditional” end-product designs or temporary solutions that tend to become permanent have often failed,

and these lessons have been learned the hard way. **We must place greater emphasis not only on construction but also on the development process itself.**

In theory, different guidelines and papers, this sounds valid, but implementing it in real life is challenging.

**Comprehensive frameworks for post-war recovery projects have been developed and need to be integrated into architectural practice.**

## AIM AND RESEARCH QUESTIONS

**My main aim is to use a theoretical basis and location-specific data to propose an efficient strategy that not only speeds up the building process but also fosters economic development in the chosen location.**

As architects, we have a vital role to play in facilitating the return of these displaced individuals. By actively involving impacted communities, advocating for their rights, and implementing creative design strategies, architects can significantly contribute in revitalizing homes, communities, and ultimately, the lives of people.

Understanding the context and requirements for the design is essential,

and the theoretical foundation of my thesis is crucial in achieving success.

Prior to the practical part, I need to conduct an analysis of current data pertaining to Ukraine as a whole and more precise region and city to gain insight into the extent of destruction and local challenges. It is important to consider how the chosen city can contribute to the overall benefit of the country and its residents.

By analysing location-based data, such as the current state of the city's infrastructure, housing, and employment opportunities, I aim to gain insights into the challenges and opportunities that exist.

**The practical aspect of my project will involve development strategy design. A key aspect will be the concept of incremental growth, ensuring flexibility and adaptability. By allowing for expansion and evolution, I plan to create spaces that can accommodate**

**the changing needs and aspirations of the returning population through time.**

In this context, several key questions emerge:

### What is the comprehensive strategy to develop a project in a post-war context?

Various reports on post-war reconstruction in other countries reveal which strategies have failed over time. By learning from these experiences, I can avoid similar mistakes in my approach.

### What to consider when working on post-war recovery?

Financial and physical resources, and time are the most critical challenges. It is important to address these issues effectively in my master's thesis.

### How to find a balance between long-term solutions and immediate help?

All the projects I reviewed were either temporary, focusing on humanitarian needs, or large-scale, expensive, and time-consuming. I believe more advantageous will be something in between combining both.

### What design features are important in post-war architecture?

Of course, post-war architecture will differ from architecture from peaceful periods. It is a reflection of the time. And since the situation and environment are highly unstable, design should respond accordingly.

### How can architecture foster recovery and healing process?

Environment we live in influence us in many ways. I suppose a man-made habitat can take part not only in physical but in societal and psychological recovery.

## WHO ARE UKRAINIAN REFUGEES?

The Russian invasion of Ukraine has unleashed a cascade of far-reaching social and economic consequences that continue to affect the nation. The aftermath of this full-scale invasion has resulted in widespread displacement, physical devastation of buildings and infrastructure, and a huge increase in civilian losses.

Disturbingly, it is projected that this war has the potential to leave 7.1 million Ukrainians below the poverty line, with an additional 3.7 million getting close to it. (IMPACT Initiatives, 2023)

**7.1 MILLION PEOPLE**  
below poverty line (IMPACT Initiatives, 2023)

**3.7 MILLION PEOPLE**  
near poverty line (IMPACT Initiatives, 2023)

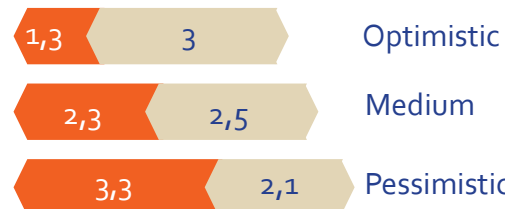
The enormous scale of these consequences is further underscored by the estimation that 17.6 million people now require urgent humanitarian assistance, with the most extreme conditions experienced in the Southeastern macro-region and Dnipropetrovska region in the Central macro-region. (IMPACT Initiatives, 2023)

**17.6 MIL. PEOPLE**  
in need of humanitarian assistance (IMPACT Initiatives, 2023)

Unquestionably, there is a strong desire among the people of Ukraine to return to their homeland. This suggests that once the Russian aggression ceases,

Ukrainians will reclaim their lives back in Ukraine. (Михайлишина, 2023)

**Number of Ukrainians who are abroad and will return, mil. ppl\*** (Михайлишина, 2023)



■ The number of Ukrainians who will remain abroad  
■ The number of Ukrainians who will return to Ukraine  
 \* as of the end of June 2023

Despite the hardship, the majority of Ukrainians, in and outside of the country, participate in collective activities like voting, charity work, and signing petitions. However, there is a lack of engagement in decision-making, with nearly 80% of people not taking part in such events. Lower income and lower education groups remain less engaged, highlighting the need to ensure their inclusion in civic life and prevent marginalization. (Kyiv International Institute of Sociology, 2023)

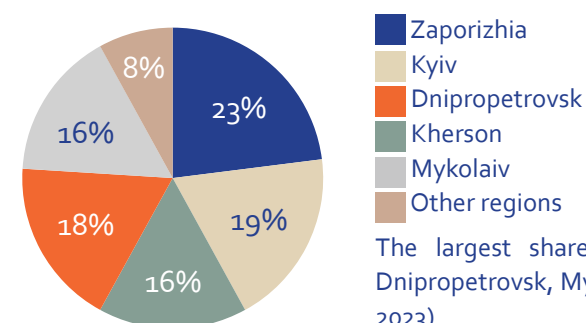
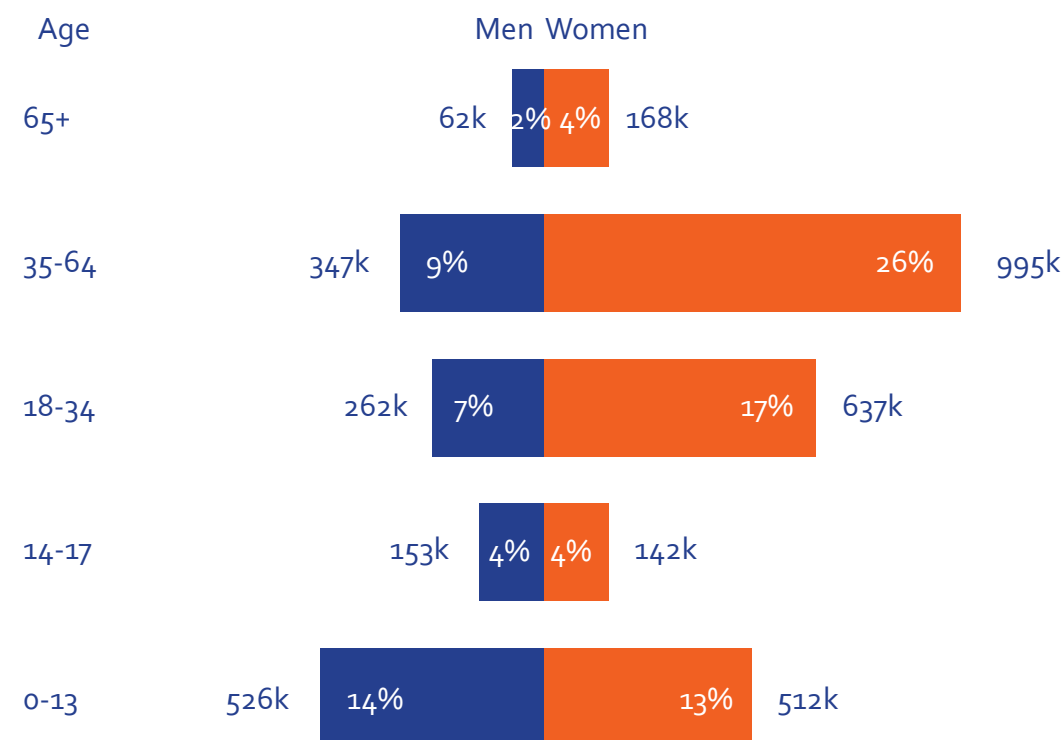
The most popular form of civic resistance is donating, followed by helping those in need, supporting the Ukrainian army and neighbourhood revitalization projects. (Kyiv International Institute of Sociology, 2023)

It demonstrates the strong commitment to rebuilding communities and contributing to the country's recovery.

A cluster analysis of Ukrainian refugees (Михайлишина, 2023)



Distribution of Ukrainian refugees by gender and age categories in the EU (Михайлишина, 2023)



The largest share of the population left Zaporizhia, Kyiv, Dnipropetrovsk, Mykolaiv and Kherson regions. (Михайлишина, 2023)

# IMPACT AND DEPRIVATIONS

The invasion of Ukraine by Russia has had disastrous impact on multiple fronts. The civilian casualties have been significant, with 22,209 recorded as of 20 March 2023, including deaths and injuries. (IMPACT Initiatives, 2023)

**13% OF HOUSEHOLDS** directly damaged by the war (IMPACT Initiatives, 2023)

## Economy

**18.3%**

predicted unemployment rate for 2023 (IMPACT Initiatives, 2023)

The economic impact has been severe as well, with Ukraine's GDP contracting by about 30% in 2022. The destruction of productive infrastructure, damage to arable land, and reduced labour supply have all contributed to this decline. (IMPACT Initiatives, 2023)

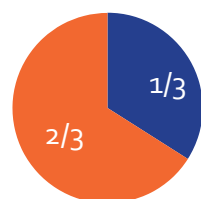
## Food consumption

Food security remains a challenge for households throughout Ukraine, with many struggling to meet their basic needs. In 2022, ongoing armed conflicts, lack of labour, high production costs, and low farm-gate prices, resulted in a significant 30 percent decrease in food production compared to the five-year average. (IMPACT Initiatives, 2023)

**30%**

decrease in food production compared to the five-year average (IMPACT Initiatives, 2023)

The South-eastern macro-region has faced the most severe disparities, with significant gaps persisting. Toward the end of 2022, the Central macro-region also witnessed an increase in food consumption gaps. It highlights the urgent need for interventions to address food insecurity in these regions.



One third of the population has inadequate food consumption. (IMPACT Initiatives, 2023)

## Coping strategies

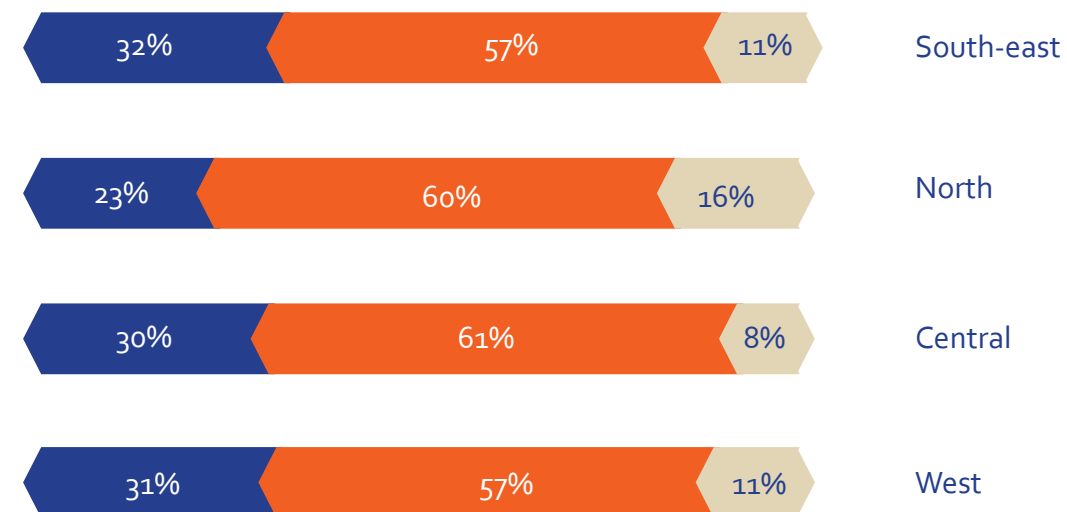
Although millions experiencing deteriorations in living conditions and livelihoods, the impact of the war on poverty has been partially relieved by households utilizing coping strategies. The most common are:

- **spending savings**
- **taking an additional job**
- **reducing health costs** (IMPACT Initiatives, 2023)

However, the survey indicated that most households were nearing the collapse of these strategies, which they had relied on since February 2022. The depletion of coping strategies can lead to contagion effects, such as savings depletion turning into borrowing and incurring debt, or reduced healthcare spending leading to increased health issues.

Humanitarian interventions initially supported households, but prolonged assistance must be distributed through the social protection system. (IMPACT Initiatives, 2023)

## Proportion of households reporting that use of coping strategies allowed them to meet their basic needs, by macro-region (IMPACT Initiatives, 2023)



■ able to meet basic needs  
 ■ able to meet some, but not all basic needs  
 ■ able to meet all basic needs

## Energy infrastructure

The damages inflicted upon energy infrastructure coupled with the loss of access to assets located in territories controlled by Russian forces. Over 12 million people have experienced disruptions in their energy supply with a disturbance of internet communications, water supply, and heating systems. It is particularly challenging as temperatures dropped below across much of the country. Based on Ukrenergo data, it is estimated that the average Ukrainian household sustained a five weeks without electricity. (IMPACT Initiatives, 2023)

**5 WEEKS**

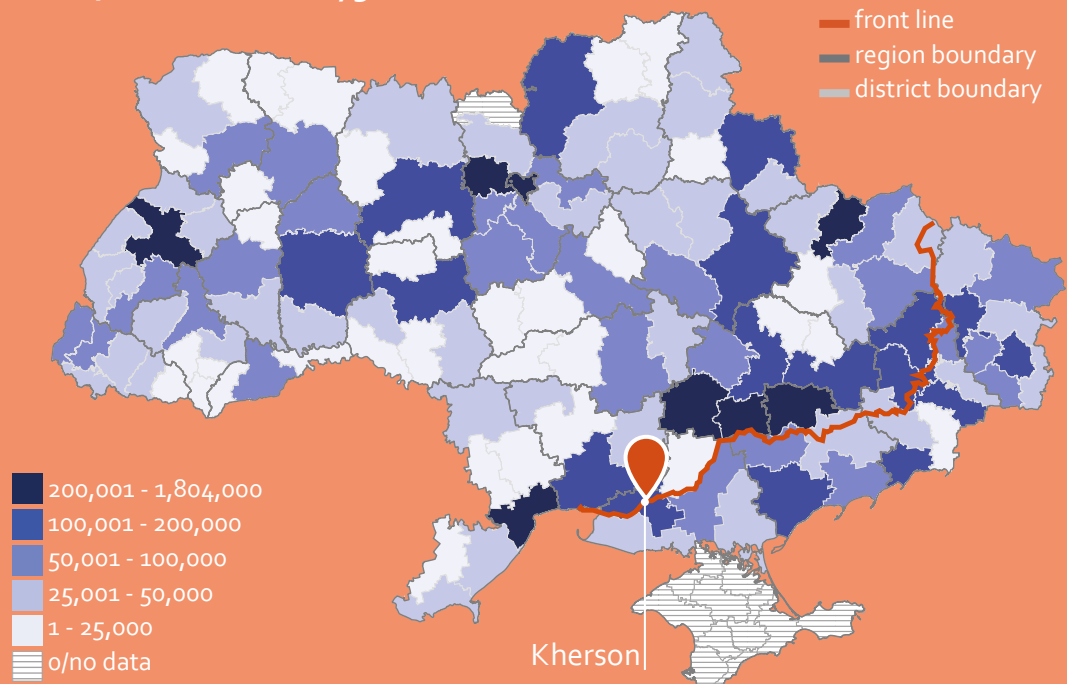
average household spent without

electricity (IMPACT Initiatives, 2023) Furthermore, the disruptions in gas and district heating networks have also significantly affected water delivery in major cities.

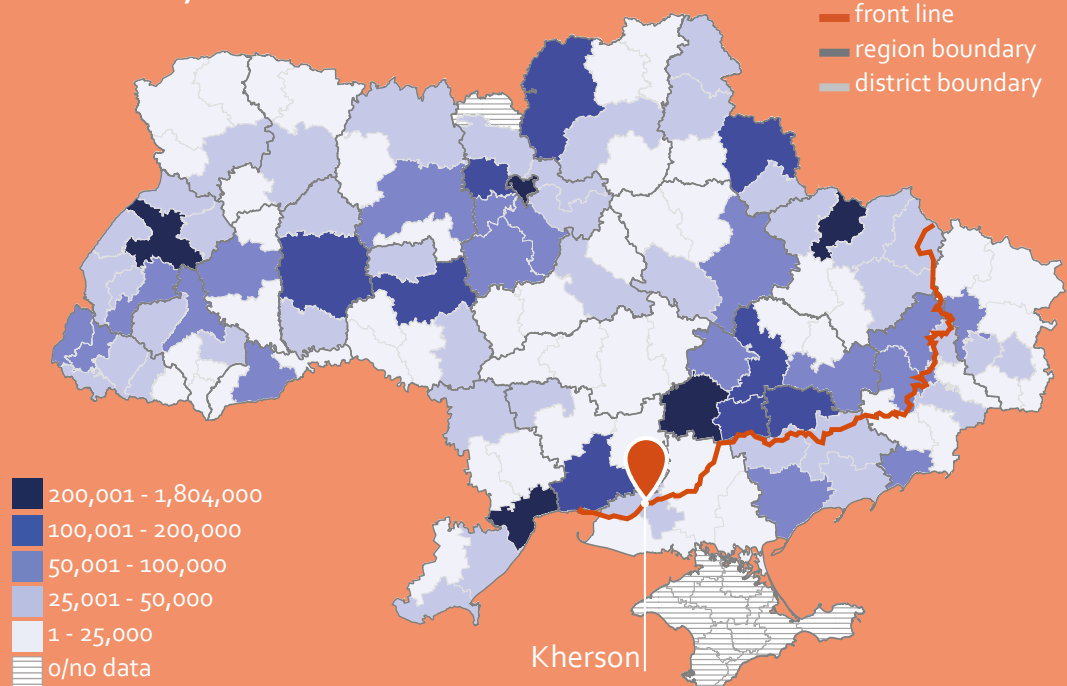
Reconstruction efforts must ensure that systems and solutions are implemented and pursued in a dedicated, coordinated, and integrated manner. The goal is to enable a sustainable transition from humanitarian support to a government-led response, ensuring long-term stability and development. (IMPACT Initiatives, 2023)

# HUMANITARIAN NEEDS\* (United Nations Office, 2023)

## Water, sanitation and hygiene

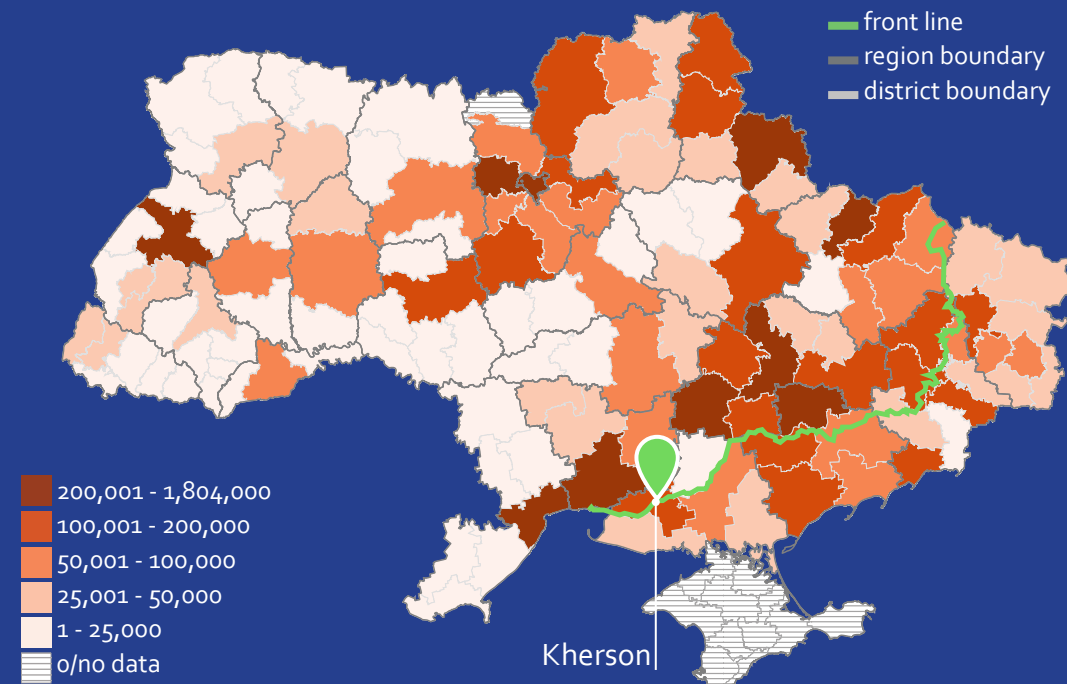


## Food security and livelihoods

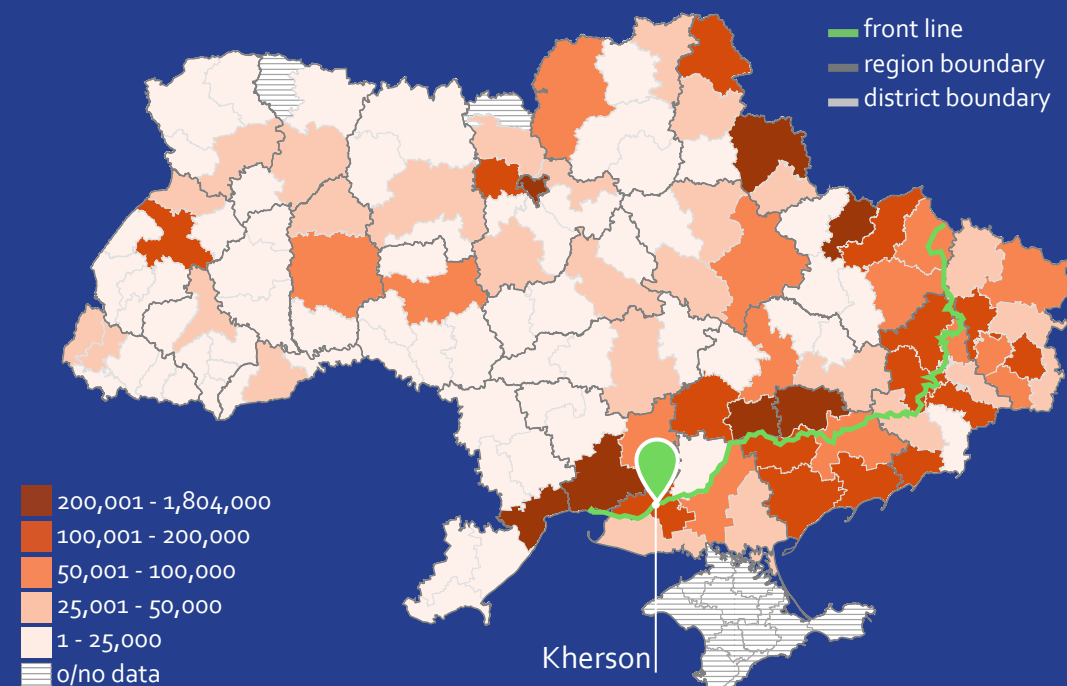


\*The dataset is produced by the United Nations Office for the Coordination of Humanitarian Affairs (OCHA) in collaboration with humanitarian partners. It presents the number of people in need in Ukraine under the 2024 response plan.

## Protection



## Shelter and non-food items



## HOW TO START A PROJECT?

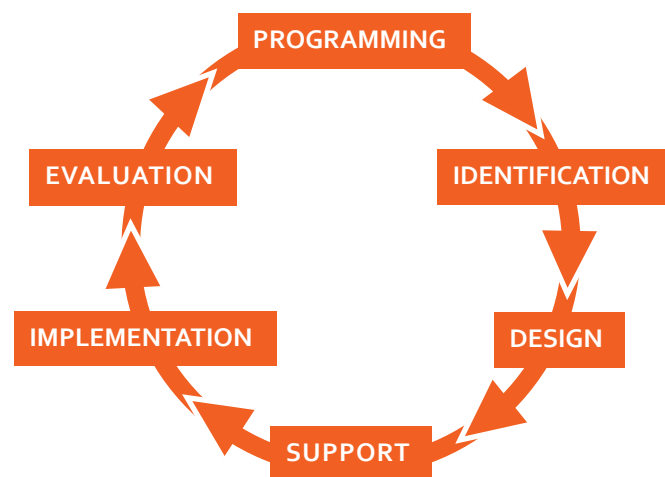
When discussing the process of rebuilding after a war, I perceive that the term “peace building” describes it very accurate. It is crucial to emphasise the importance of addressing not only the physical destruction but also the underlying cultural and structural factors that contributed to the conflict. (Llamazares, 2003)

In such projects, it is crucial to engage in careful long-term planning to ensure the effectiveness of the initiatives. Regrettably, the majority of support provided typically ceases after a mere two years, often offering only temporary solutions. (O’Driscoll, 2018) In the past, the fields of reconstruction and displacement have developed independently, with little collaboration or exchange of ideas. Reconstruction has primarily focused on the physical aspects of rebuilding, while displacement has been concerned with the human experiences and broader social and temporal dimensions of migration. It is not sufficient in a post-conflict

scenario. A key priority is to re-frame the experience of forced migration within a contextual framework to effectively address these issues. To overcome the challenges and shortcomings in creating sustainable communities, a comprehensive approach is needed that goes beyond simply providing shelter. This approach involves integrating social, economic, and psychological support systems. (Jabarren, 2013)

The project cycle was introduced by the World Bank as a rational approach to conceptualize and manage projects. It consists of several stages that follow each other, starting with identifying needs and objectives. Activities are then planned and executed to address those needs and objectives, followed by an evaluation to assess the outcomes. **This framework provides structure and guidance, ensuring that important objectives and concerns remain at the forefront throughout the process.** (Jabarren, 2013)

**World Bank project life cycle** (Biggs & Smith, 2003)



**Programming:** A plan is created that takes into account the local, national, and international situations. It includes setting general goals for a specific country, area, or industry, within which specific projects can be planned and accomplished.

**Identification:** The issues and requirements of a specific group of people are evaluated, and solutions are proposed and examined. The strategy may be influenced by pressures from political, social, cultural, ethnic, or other groups.

**Design:** Project concepts are transformed into tangible operational strategies, which are then evaluated based on various criteria, such as feasibility, environmental impact, gender considerations, sustainability, and more. The specific criteria considered will largely depend on the source and nature of the support needed for the project.

**Support:** Different forms of assistance are sought, including financial, political support, and support from partner organizations. This often involves extensive negotiation and may even lead to modifications in the project design to meet the requirements for obtaining the necessary support.

**Implementation:** The planned activities are implemented while continuously monitoring progress towards the project objectives. It is common to make adjustments to the original plans in response to unexpected situations or outcomes.

**Evaluation:** The success or failure of the project is assessed by considering its impact on stakeholders and whether it achieved its objectives. This information is then used to inform the planning of future activities during the programming phase. (Jabarren, 2013)

**The project life cycle is not limited to start and finish dates; it is a systematic and rational approach to planning and managing development throughout the entire process.** (Jabarren, 2013)

### Conceptual framework

The conceptual framework for post-war recovery embodies an interconnected set of ideas that collectively provide a comprehensive understanding of the situation. It consists of cohesive concepts, each serving an essential role and intertwined with one another.

**The methodology involves a series of steps in constructing this conceptual network:**

- identification and labelling of key concepts
- breaking down and organizing these concepts into categories
- incorporating the concepts into the overall design
- validating the conceptual framework (Jabarren, 2013)

The initial development of the framework and the identification of major concepts aim to ensure that the resulting design is relevant across various disciplines. (Jabarren, 2013)

## Concepts and attributes of the conceptual framework of post-conflict reconstruction relevant to architects (Jabarren, 2013)

### EXOGENOUS INTERVENTION

Before initiating reconstruction efforts, certain preconditions must be met. Rebuilding and reconstructing failed states are imperative for global stability. "Coalitions of the willing" bear both a "strategic" and "moral" obligation to intervene on behalf of the citizens of these states.

### SEQUENCING

The process of post-war reconstruction should follow a specific sequence. Typically, priority is given to establishing security and order initially, followed by fostering economic development, and only then focusing on democratization efforts. Attempting to democratize in the wrong order not only risks further violence but also enables the emergence of illiberal forces.

### SECURITY

There can be no development without security, but there can be no security without development either". (Franz Josef Jung, German Defence Minister)

### RECONSTRUCTION REDUCES CONFLICT

Assistance plays a crucial role in mitigating the risk of conflict by boosting the growth rate. Development efforts are notably more effective at reducing the risk of conflict during the first decade after a conflict compared to less focused situations of conflict prevention.

### MULTI-LEVEL ACTORS

International actors, including the UN, the World Bank, and the UNDP, alongside donor governments and various NGOs, are dedicating more attention to the challenge of post-war reconstruction. The UNDP underscores the significance of a collective approach to addressing the needs of post-conflict nations and providing support to facilitate sustainable peace.

### INCLUSIVE THEMES AND A HOLISTIC APPROACH

Post-conflict reconstruction ought to adopt a comprehensive approach, promoting inclusivity and principles aimed at rebuilding nations ravaged by war. This entails addressing not only physical infrastructure but also social, economic, and political structures, ensuring that all segments of society are included in the rebuilding process.

## WHAT TO CONSIDER?

The rehabilitation and reconstruction in post-conflict environments represent complex and long-standing challenges in development cooperation. In post-conflict scenarios, there is often a deepening of chaos and disorder across social, economic, and political spheres. Consequently, serious developmental challenges persist, with insufficient attention directed towards addressing them effectively.

Initially, it is imperative to outline the distinction between emergency aid and reconstruction and explicate their interconnectedness. Emergency aid refers to the immediate provision of necessities to affected populations, often reliant on international assistance. Once basic needs are met, the transition to long-term reconstruction efforts occur. (Mossberg et al., 1994)

**Stages of disaster relief** (Mossberg et al., 1994)

### POST-DISASTER RELIEF

#### Emergency aid

provided immediately to prevent further material and human losses

#### Reconstruction

thoroughly planned and focused on sustainability and long-term development

Post-war relief depends on these two indispensable components, which may unfold sequentially or concurrently. At first, there is the urgent impulse

from the international community to ease the immediate burdens faced by affected populations. While noble, this initial assistance is often insufficient, as the willingness to aid decreases over time, leaving communities dealing with enduring challenges. Hence, it becomes imperative to assist post-war societies in achieving sustainability and regaining independence, ensuring their long-term resilience and self-sufficiency. (Earnest, 2015)

In times marked by increasing uncertainty, it becomes crucial to increase the effectiveness of post-conflict societies to uplift the physical and economic well-being of people. Apart from reconstruction funding and efforts, the post-conflict scenario necessitates a broader strategy involving community engagement and empowerment to effectively tackle the challenges. (O'Driscoll, 2018)

A participatory approach can alleviate future issues and imbalance in resource distribution. It involves the active participation of local communities in shaping the reconstruction plans, determining the relevant knowledge, skills, tools, and techniques needed. This ensures the identification of existing territorial conflicts and facilitates finding compromises.

By adopting a participatory approach to reconstruction, the focus shifts from project-centric to people-centric development. The objective is to create spaces that foster unity and aid the

community members. Strengthening community relations occurs not only through involvement in decision-making but also through physical involvement in the restoration efforts within their city.

Therefore, such interventions are crucial for ensuring people's safety, boosting economic growth, raising income levels, and fostering development. Conflict prevention and the strengthening of democracy and the economy are considered central to rebuilding peace after conflicts. (O'Driscoll, 2018)

Nevertheless, post-war states often lack the institutional capacity to carry out reconstruction independently. The involvement of the international community is necessary to prevent potential future political and economic crises. However, various studies highlight several shortcomings of foreign intervention in the current context, such as the inability to maintain a consistent flow of aid and the imposition of donor conditionality driven by foreign agendas. (Sakalasuriya et al., 2018)

Countries affected by conflict often struggle to attract private investment due to the associated high risks. (Sakalasuriya et al., 2018). While these nations may experience notable growth in the aftermath of conflict, sustaining this growth over the long term proves challenging for many. Despite substantial aid being allocated in the initial two years following the end of conflict, experts concur that the host country's capacity to effectively

utilize and maximize aid peaks around the midpoint of the first decade post-conflict. In response to such challenges, donors should prioritize flexibility and readiness to provide aid over an extended period to effectively address ongoing needs. (Earnest, 2015)

The Rapid Damage and Needs Assessment provides a detailed analysis of the current estimated total needs, amounting to a staggering \$411 billion. The value linked to the return to pre-war normalcy involves activities like repair and restoration, which also include an improvement of what was before the war. This includes energy efficiency, modernization efforts, and sustainability standards. (The World Bank et al., 2023)

A substantial portion of this, totalling \$92 billion, is earmarked for rebuilding and enhancing transportation infrastructure. Addressing housing needs requires a significant investment of \$69 billion, making it the second-largest expenditure. (The World Bank et al., 2023)

**\$ 69 BILLION**  
investment in housing needs (The World Bank et al., 2023)

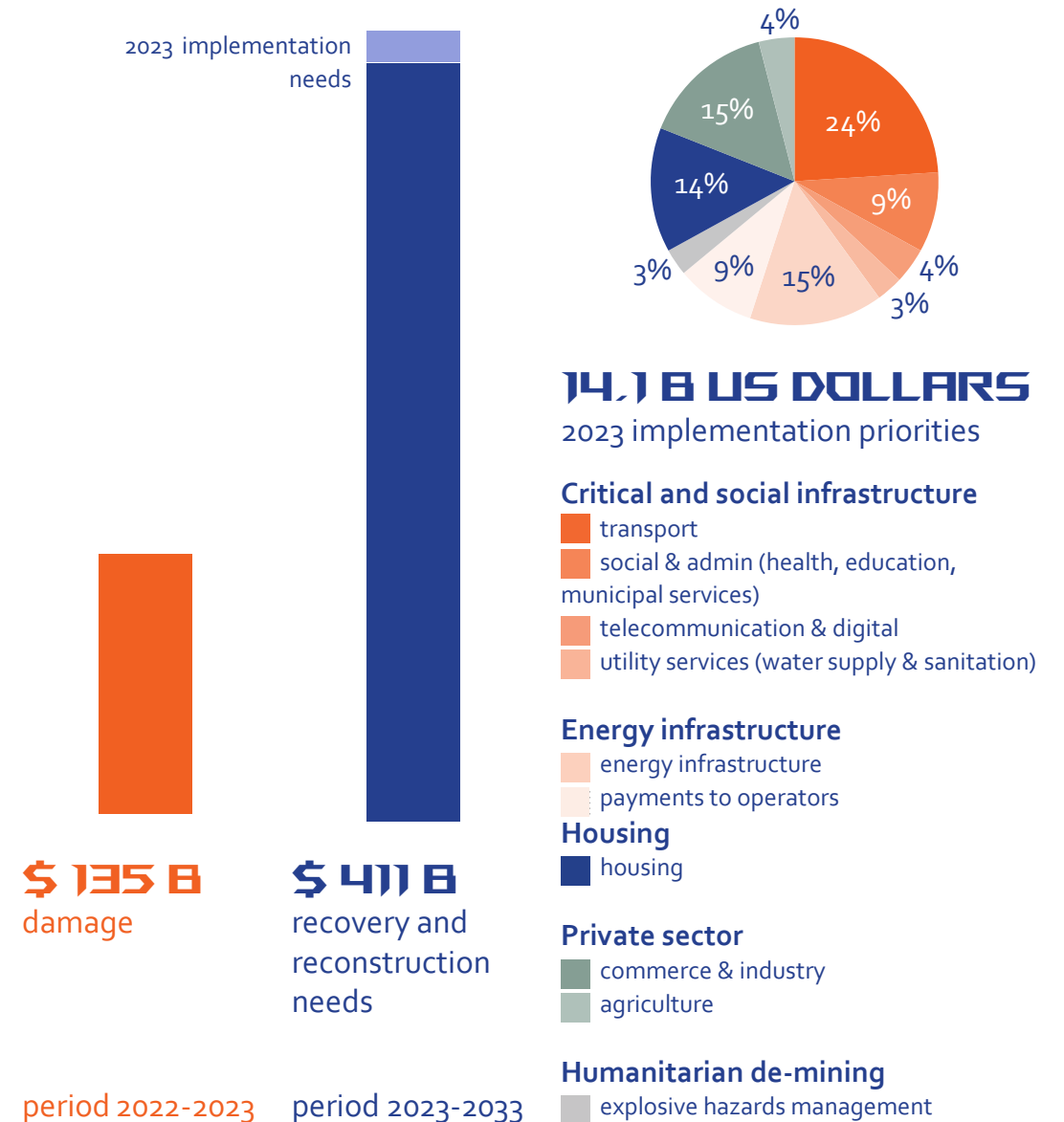
The geographic scope encompasses all regions under government control as of February 1, 2022. Funds are distributed relatively evenly over the years, aligning with recommendations from experts. These financial projections extend for a period of ten years, concluding in 2033. (The World Bank et al., 2023)

It's vital to stress the urgency of the situation. Prolonged waiting is not viable for vulnerable populations. Hence, immediate action must be initiated as soon as Ukraine regains control over its territories, including those currently under occupation. This underscores the critical need for swift and decisive intervention to relieve suffering and

meet the urgent needs of those affected by the conflict as well long-term plans for reconstruction.

Peace is a mandatory for development, and sustainable peace cannot be achieved without implementing suitable policies for economic, political and social development. (Jabarren, 2013)

**World Bank damage and needs assessment (March 2023)** (The World Bank et al., 2023)

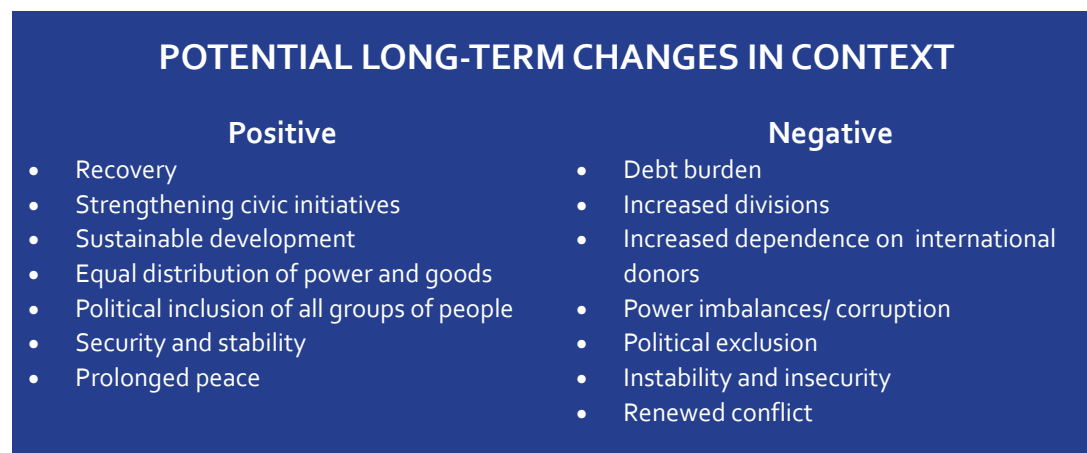


# INTERVENTION CONSEQUENCES

Intervening in a conflict situation carries a dual potential: it can either generate positive outcomes, such as preventing further conflicts, or give rise to negative consequences, possibly escalating tensions and sparking new conflicts. Thus, it's paramount to accurately evaluate the potential impacts—both beneficial and disadvantageous—before initiating any intervention project. The far-reaching

effects of wars, including economic, environmental, social, and political devastation, cast a long shadow over affected communities. For survivors of conflict, the path to recovery is filled with challenges as they confront the colossal task of rebuilding their lives among the lasting trauma and loss, all while striving to maintain a relentless resilience. (Sakalasuriya et al., 2018)

Conceptual framework for impact assessment (Sakalasuriya et al., 2018)



# WHY KHERSON?

into account, as it is essential for successful revitalization efforts.

## South-eastern macro-region

The burden of the war have been felt across the entire country, but the Northern and South-eastern macro-regions have been hit the hardest. The South-eastern region has been particularly affected by the war, with households facing various difficulties such as safety concerns, limited job opportunities, increased reliance on humanitarian assistance as their main source of income, decreased incomes, and a reliance on survival strategies. The living conditions in this region have significantly declined, as utility infrastructure, residential units, and health and education facilities have suffered damage, resulting in a decline in the overall quality of life. Additionally, the South-eastern region has witnessed the highest number of civilian casualties. (IMPACT Initiatives, 2023)

The war has had a significant repercussion on industries. Aerial freight operations have been shut down, and supply chains have been disrupted, further exaggerating the economic challenges. (IMPACT Initiatives, 2023)



Analysis of current data referring to Ukraine as a whole gives insight into the extent of destruction and the displaced population. Nevertheless, it is crucial to consider location-specific data and the role of a city of further design in its revitalization efforts, as this can greatly contribute to the overall benefit of the country and its residents.

To choose a specific design site, several parameters have been considered:

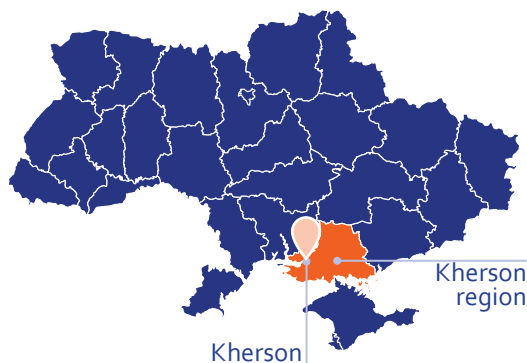
- **Availability of publicly accessible data with trustworthy sources:** This ensures informed decision-making.
- **Current demolition:** The extent of existing destruction in the chosen site determines the strategy of revitalization.
- **Threat of further destruction:** Assessing the potential risk of additional damage is crucial in selecting a site that can be adequately protected.
- **Infrastructure:** The condition of infrastructure, including transportation networks, and utilities, is assessed to determine the importance of the site for the region's overall development.
- **Connection within and outside the country:** The connectivity of the chosen city, in terms of transportation links impacts the ease of access for both residents and external stakeholders.
- **Significance for the citizens:** The importance and historical, cultural, or sentimental value of the site to the local population are taken



The situation for households has shown some stability since February 2022. However, the country is still confronting a economic downturn. Livelihoods emerge as a critical concern, as the majority of Ukrainian households face difficulties meeting essential needs due to financial constraints (IMPACT Initiatives, 2023)

Nevertheless, despite these hardships, Ukraine has demonstrated remarkable resilience in the face of this large-scale shock. Major cities continue to provide essential goods and services, and production has continued in areas where it is still possible.

Therefore, Kherson has been selected as the location for implementing the concept of urban recovery.



It is a port city in the South of Ukraine that holds the title of being the administrative hub of Kherson region. Situated in the Black Sea Lowland, the region is geographically split by the Dnieper River, which serves as the largest waterway in the country and the third largest river in Europe. It is surrounded by various bodies of water,

including the Black Sea, the Sea of Azov, and man-made features like Kakhovka's sea and salt lake Siwash. (Kherson Chamber of Commerce and Industry)

Kherson region is rich in natural resources, particularly deposits of non-metallic construction materials that are essential for various industries. These resources include cement, brick, tile clay, limestone, and mortar sand. (Kherson Chamber of Commerce and Industry)

Kherson experienced continuous growth throughout the 19th century, primarily due to its flourishing shipping and shipbuilding sectors. This prominence in ship construction continued well into the 21st century, solidifying the city's status as a significant shipbuilding hub. It excels in shipbuilding, offering a comprehensive range of services from the production of series-built vessels to their maintenance and repair. The region is also recognized for its expertise in foundry production of both ferrous and non-ferrous metals, including aluminium recycling. Kherson-based companies engage in diverse manufacturing activities, including construction metal structures, hardware, heaters, boilers, tools, chains, springs, and roadway markers. (Kherson Chamber of Commerce and Industry)

Machine engineering is a crucial sector, with local enterprises specializing in high-capacity electric machines, agricultural machinery, graders, lift-trucks, aircraft, hydraulic structures,

pumping equipment, and hunting ammunition. Additionally, the region produces dry building mixes, construction materials. (Kherson Chamber of Commerce and Industry)

Kherson's strategic location between the Azov-Black Sea and Dnieper River basin offers key access to two seas, fostering a robust transit hub with a comprehensive transportation network including railways, seaways, river transit, and roads. It also holds potential for air travel development, strengthening its role in international and interregional connectivity. The region hosts several significant international transport corridors, notably the Black Sea Economic Cooperation (BSEC) corridor, facilitating movement between the Middle East, Balkans, and local cities like Mariupol and Novoazovsk.

With commercial sea ports, river ports, and an extensive network of railways and roads, Kherson region is well-connected to other regions in Ukraine, Southeast Europe, the Caucasus, and the Middle East. These transportation links facilitates efficient trade and transportation between these regions.

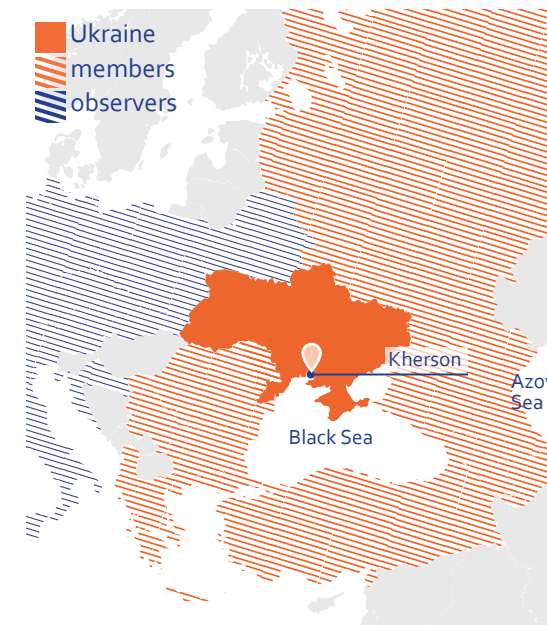
To sum up, main reason to choose Kherson as a pilot city for my master thesis are:

**It is an important connection hub, by river, sea and on land, which makes city's recovery beneficial for the whole region.**

**Kherson was under occupation, which requires design interventions to be more sentimental and intensifies people's longing for "reclaiming the city."**

**City was damaged both physically and psychologically not only by occupation but also by severe flooding which came after liberation.**

## Black Sea Economic Cooperation



## The Black Sea ring highway



# KAKHOVKA DAM DESTRUCTION

During the period between the 2nd of March and the 11th of November 2022, Kherson fell under Russian occupation. Ukrainian forces successfully regained control. In June 2023, Kherson faced yet another crisis. In the early hours of the 6th of June, a massive explosion tore through the dam and hydroelectric power plant on the Dnipro River.

The concrete walls of the dam, reaching a height of 30 meters, have crumbled, unleashing 18 billion cubic meters of water. (Carpenter, 2023)

**18 MIL. M<sup>3</sup> OF WATER** were unleashed (Carpenter, 2023)

It surged downstream, flooding an extensive area of over 600 square kilometres, which was densely populated. The floodwaters, averaging over 3 meters in depth, are expected to cause significant damage to more than 2,500 homes. At present, over 200 houses have already been confirmed destroyed. (United Nations Ukraine, 2023)

**Flood spread** Map produced by Ukrainian Research Institute of Water Resource Ecological Problems, 2023



## > 2500 HOUSES

affected by flooding (United Nations Ukraine, 2023)

More than 80 settlements now find themselves directly in the path of the flood waters. There is a possibility that these communities may face a lack of access to safe drinking water in the near future. (Carpenter, 2023)

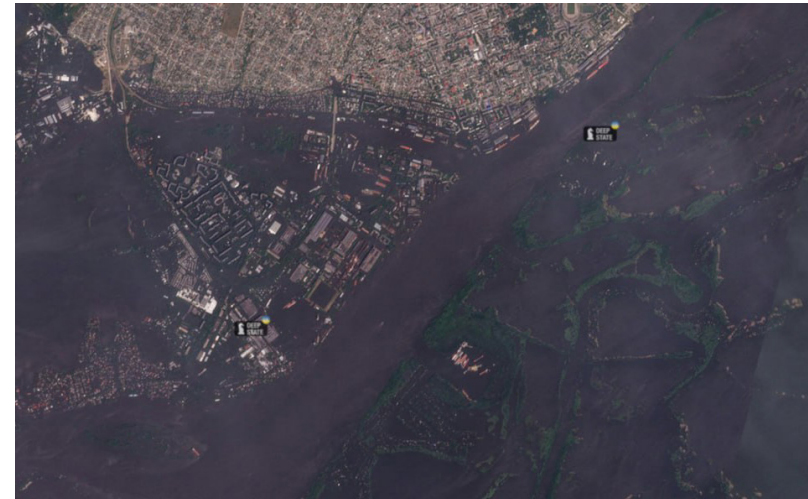
As a result of the dam breach at the Kakhovka Dam, Greenpeace reports that approximately 32 facilities, including factories, petrol stations, thermal power plants were destroyed. An estimated 150 tonnes of engine grease leaked into the water. There is a high likelihood of significant pollution from the oil refining industry. (United Nations Ukraine, 2023)

Furthermore, the repercussions of the Kakhovka Dam's devastation will extend upstream, requiring monitoring in the days ahead, particularly concerning the safety of the Zaporizhzhia Nuclear Power Plant. (United Nations Ukraine, 2023)

Satellite images Deep State UA (telegram channel)



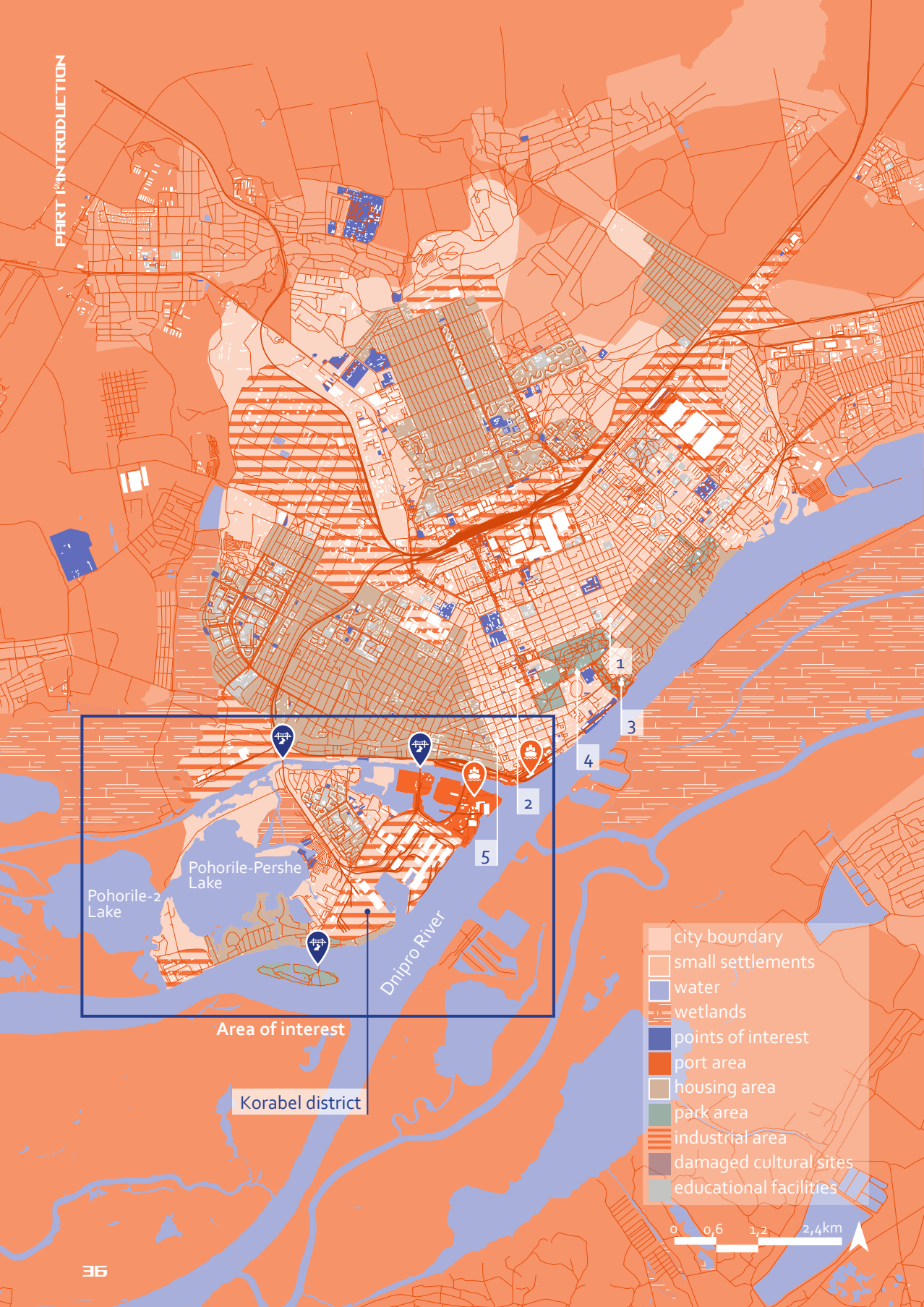
Kherson before the explosion at the Kakhovka dam and HPP (5<sup>th</sup> June)



The third day after the blast (9<sup>th</sup> June)



The tenth day after the blast (16<sup>th</sup> June).



## CHERSONESUS (ancient Greek Χερσόνησος - "peninsula", "cape")

The name Kherson is derived from the ancient Greek term Chersonesos, which referred to peninsulas, capes, settlements, towns, harbours, and surrounding regions. This name was chosen purely for its fashionable appeal and did not hold any true geographical significance, as there was no actual peninsula.

Being strategically located with access to the river and the sea, being Important economic, industrial and cultural centre this city has become a target in the current war. The city was shelled numerous times and occupied for over 8 months. People were killed, buildings and infrastructure were destroyed. UNESCO has verified damage to 5 cultural sites in Kherson :

1. Academic Regional Puppet Theatre
2. State Archive of Kherson Region (branch)
3. Kherson Regional Universal Scientific Library
4. St. Catherine's Cathedral
5. Kherson State house of Art (Gate of the "Labour Reserves" club, 1950) (UNESCO, 2024)

The central district and Shipbuilder (Korabel) district are the most heavily impacted areas of the city. Of particular concern to me is the Korabel district,

which is an island connected to the mainland by two bridges and one bridge to the smaller island. As the name suggests, ship industry are concentrated in the area. The Korabel neighbourhood is home to mainly machine-building enterprises:

- Shipbuilding factory
- "Komintern" Shipyard
- "Pallada" Dockyard
- Kuibyshev plant

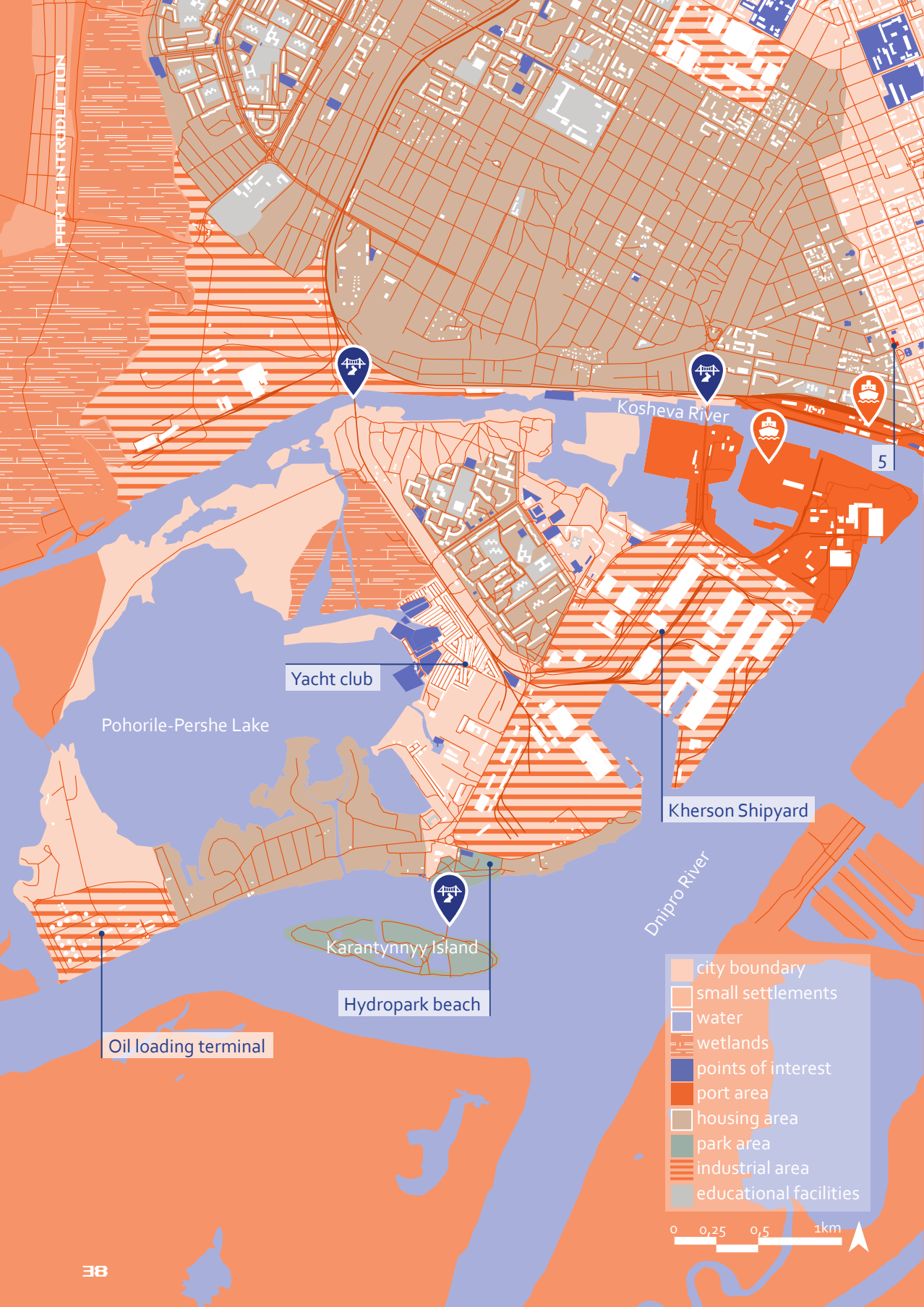
The district has is seen as the primary industrial hub of the city. It is notable for housing the Kherson River Port, a key economic entity that faced disruptions in its operations during the war.

Residential areas are represented by high-rise buildings and private houses. There are three secondary schools and five kindergartens in the neighbourhood. There are practically no public spaces apart from the small beach.

Unfortunately, this area has experienced the most significant consequences from the flooding as well as bombardment. People became basically homeless, without access to basic facilities like water, gas and electricity. In June 2023, a curfew was imposed in the area for mine clearance and situation management. (Ukrainska pravda, 2023)

### Baseline population (United Nations Office, 2023)

	Internally displaced	Returnees	Non-displaced	Non-displaced Conflict-affected	Inter-sectoral, Overall
Khersonskiyi district	14273	39249	90193	90193	143715



Ukrainian servicemen ride by boat through a flooded neighbourhood in Kherson on the 8<sup>th</sup> June. (Evgeniy Maloletka/AP)



Local resident Tetiana holds her pets, Tsatsa and Chunya, as she stands inside her flooded house after the destruction of the dam. (Evgeniy Maloletka, AP)



Houses in a flooded Kherson neighborhood on the 7<sup>th</sup> of June. (Evgeniy Maloletka, AP)

# SITE SELECTION

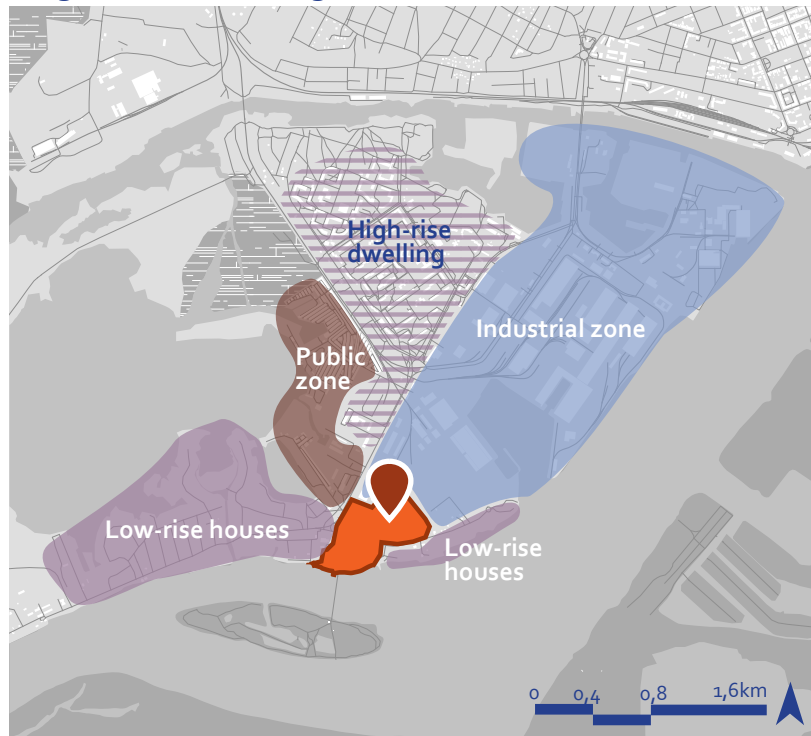
## Green carcass



- site
- green zones
- ➔ greenery spreading direction

Upon observing the neighbourhood, green spaces are noticeable, often taking on a linear form along the main avenues. While beach and park areas are present, it would be advantageous to enhance these areas and establish connection with the existing green framework.

## Neighbourhood zoning



The selected site is strategically positioned at the intersection of various zones, including industrial, public, and residential areas. Its location offers excellent accessibility and the potential to attract a diverse range of users from different parts of the community.

# ROADS SYSTEM

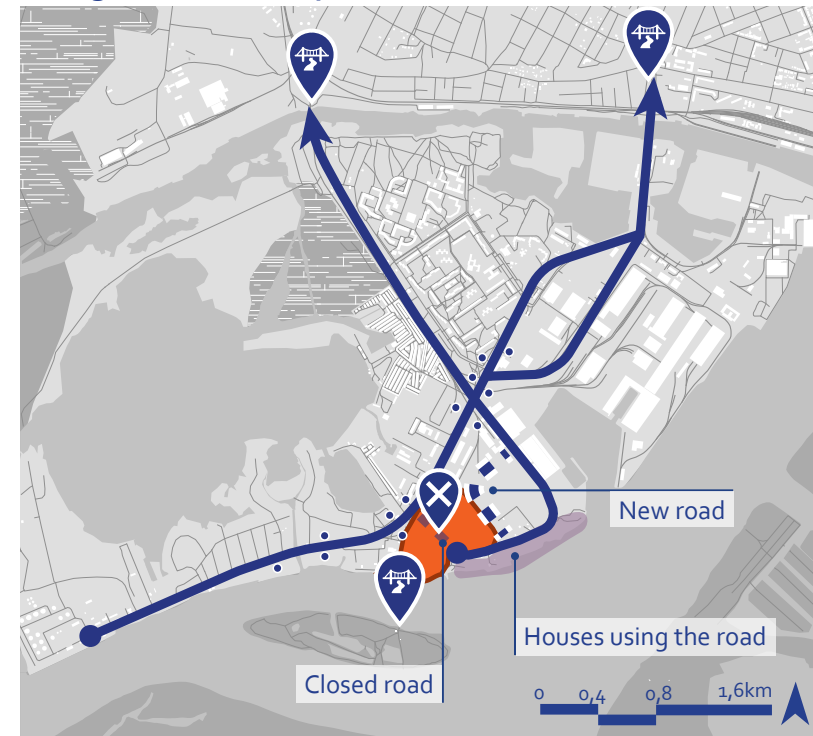
## Current situation



- site
- main roads
- ➔ roads continuation
- dead end
- public transport stop

The primary roads go through the centre of the island, providing connectivity to the mainland. The longest road runs alongside the selected site, while another one servicing the shipyard divides the chosen area into two halves.

## Changes in the road system



- site
- main roads
- ➔ roads continuation
- dead end
- public transport stop

To prevent site division, my proposal is to close the separating section of the road. Reinforcing the existing minor road will ensure sufficient access for the industrial zone and residents living along the coastline.

**SITE SURROUNDINGS**



- site
- green zones
- industrial zones
- dwelling zones
- beach zones
- educational facilities
- wasteland

My proposal is to merge the beach, park, and wasteland into a single area. This approach enhances existing points of interest while integrating newly developed areas. This unified space will serve as a vibrant hub for social interaction, leisure activities, and cultural events.



Bridge to the island with the zoo



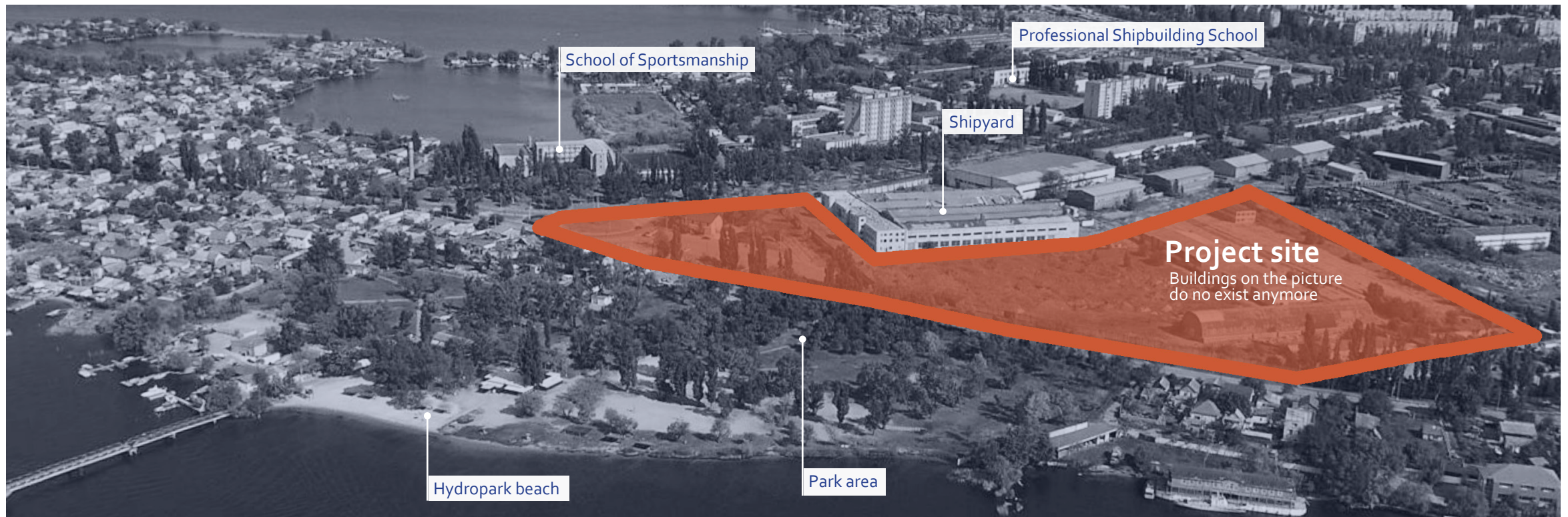
Private houses



Hydropark beach



Shipyard



# PART III: PEACE BUILDING

“Defining a programme or a project as peace building implies that it promotes positive peace in three dimensions: the activities undertaken, the process of implementation, and the impact or outcomes.”

-Monica Llamazares and Laina Reynolds Levy  
“NGOs and peace building in Kosovo”

## APPROACHES

Once the theoretical framework is established, it is time to apply it. Several design approaches and ideas I find particularly useful for my master thesis

I believe John Turner's experience with informal settlements in Latin America is highly relevant to the situation in Ukraine. **Turner's notion of "housing as a verb" emphasizes the dynamic and evolving nature of architecture, highlighting the importance of adaptability and incremental development.** (Turner, 1972) This approach aligns well with the needs of post-war reconstruction, where flexibility and gradual improvement are crucial. **In another words, I treat this project as an ongoing process rather than a fixed product.**

This perspective is particularly valuable in the context of Ukraine, where rebuilding efforts must accommodate both immediate needs and long-term development goals.

Post-war architecture is an ongoing process of development aligned with needs and functions and not an end product.

Design can change according to the situation and place, but the approach remains consistent and universal.

Incremental development arises from limited resources and ensures the possibility for future expansion.

A holistic attitude implies considering how the design will affect the environment and society ecologically, aesthetically, and functionally.

This vision is closely tied to the concept of community regeneration. Turner emphasizes the importance of "person-to-person relationships, strengthening neighbourhoods and societies through these personal and local relationships, and contributing to the community of all life on Earth." (Turner, 1976)

Architecture does not exist in isolation. Following a comprehensive analysis, I aim to consider as many factors as possible. For a project to be successful and liveable, it is crucial to understand how architecture impacts the environment and society, and vice versa. This is what can be described as a holistic approach.

I believe that these design methods are essential for making well-informed and thoughtful decisions. In the following chapters, I will outline the decisions made prior to the design phase. Following the project life cycle, I will start with programming.

Programming and design begins with establishing a time frame within which predictions and plans can be formulated. Recognizing that the recovery process can vary in duration and form, I have outlined my perspective on this process and identified critical crossroads. This approach is based on guidance from international organizations and specific recommendations outlined in reports, particularly those from the World Bank. The key focal points in my development proposal include:

## PRESENT TIME (JANUARY 2024)

Now people are the most in need of immediate assistance. Humanitarian aid becomes a priority, with a particular focus on ensuring the protection of individuals in proximity to the front line and internally displaced persons (IDPs). Given the ongoing risk of further destruction, large-scale efforts are postponed.

At this point architects face limitations in terms of permanent construction. However, there is still valuable work that can be accomplished through design and planning. When it comes to immediate relief, the world have seen a wide range of proposal of temporary structures for accommodation and other demands. But practice shows that temporary has a tendency of becoming permanent, although it does not possess the required quality. Hence, in such projects funding and material must be used wisely,

## PROGRAMMING

involving permanent elements in temporally-used building, so it can be re-purposed in the future. Small-scale interventions are also available such as repairing and maintaining existing structures.

## THE END OF THE WAR

The establishment of peace represent a dual challenge: while immediate relief remains necessary, post-war recovery efforts must initiate simultaneously. Failing this risks creating a dangerous dependency on external humanitarian aid. Therefore, it is imperative to take all possible measures to prevent such a scenario from happening. It is crucial to integrate reconstruction with economic development for sustainable peace. It should align with local perspectives and culture, ensuring growth extends beyond immediate aid.

Although restoring the economy immediately after the war may not be feasible, we can start by reintegrating people and initiating basic construction projects. Providing shelter for more people and creating opportunities for employment are paramount. When peace is restored it becomes possible to lay permanent foundations for renovated urban fabric. Stakeholders can already actively engage residents. Local community possess valuable knowledge and skills that



enable them to actively participate as labour forces, effectively rebuilding their surroundings. They aspire to regain autonomy, reclaim their rightful place in society, and establish a sense of self-sufficiency.

## 2 YEARS FROM THE END OF THE WAR

After two years, a significant portion of investments typically diminishes, despite it being just the initial phase of the recovery process. (O'Driscoll, 2018) During this phase, immediate needs are fulfilled, and the restoration of essential facilities are done. The focus transitions from temporary fixes to more permanent solutions in terms of construction and development. However, the consequences of the war continue to impact the society.

At this point, efforts should be directed towards deeper societal restoration. With people no longer in survival mode, it becomes crucial to undertake comprehensive actions for physical reconstruction as well as the less tangible yet equally important mental and social aspects. Both individuals and the nation must undergo a process of healing.

Addressing post-traumatic stress disorder (PTSD) becomes crucial, not only for veterans but also for their families and witnesses affected by it.

History has shown that addressing PTSD is particularly important for ensuring security and fostering long-term prosperity and well-being. By providing support and resources for mental health and trauma recovery, communities mitigate the long-term effects of war. Architects can play a role in this by creating healing spaces, providing environments conducive to recovery and renewal.

## 10 YEARS FROM THE END OF THE WAR

As investments become consumed, reconstruction efforts must transition to a self-sustainable model to foster continued growth. While international actors prioritize macroeconomic stabilization, this may hinder local business and industry development, impeding organic growth. Significant opportunities emerge for businesses to flourish on newly liberated land. With a sustained period of peace established and major reconstruction efforts completed, the stage is set for an expansion of development and an enhancement of living conditions.

While the progress made is expected to have a lasting and positive impact on the community, driving economic growth, and improving overall quality of life, it's important to recognize that the long process of reflection and mental recovery continues. Despite the visible

improvements in infrastructure and livelihoods, individuals and communities may still wrestle with the deep-rooted effects of trauma and psychological distress. Therefore, ongoing support for mental health and well-being remains essential to ensure a comprehensive and sustainable recovery.

## 20 YEARS FROM THE END OF THE WAR

Experts estimate that it takes approximately 20 years for generational changes to occur. This time frame holds significant importance for the well-being of children who have endured and survived the trauma of war. With appropriate psychological support, these children can overcome potential issues such as post-traumatic stress disorder (PTSD) as they transition into adulthood.

By providing ongoing support and resources, communities can ensure that the next generation grows up with resilience and the ability to thrive.

The space and environment play a significant role in this process. Hence, designing inclusive and accessible environments ensures that all members of the community, regardless of background or ability, have equal opportunities to thrive and succeed. Investing in the creation of supportive

spaces and environments is essential for building a brighter and more resilient future for generations to come.

## FUTURE GENERATIONS

Architecture and designed landscapes function as powerful mnemonic devices, preserving and conveying crucial elements of culture and history. Through their form, materials, and spatial arrangements, they encapsulate the values, traditions, and narratives of societies, serving as manifestations of collective memory. This plays a vital role in shaping collective consciousness.

After many years and healing from trauma, it becomes imperative to transform the connotation and image associated with the post-war space. While the scars of loss are still felt, the reconstructed environment ought to stand as a testament to the resilience and determination of the community.

This revitalized space not only honours the past but also embodies the spirit of courage that brought the community to this moment, fostering hope for the future.

To sum up, on the following pages, I present a visual interpretation of processes described above. It is a starting point of my design proposal to help me see the whole development process and transformation over time.

# THE END OF THE WAR

YEARS AFTER THE END OF THE WAR

# FUTURE GENERATIONS



PRESENT  
MOMENT  
(JANUARY 2024)



# 20

YEARS AFTER THE END OF THE WAR



10  
YEARS AFTER THE END OF THE WAR

# FUNCTIONALITY : WHAT?

The most important aspect in my design is adaptability. Recognizing that these needs will evolve over time, the building must be flexible enough to accommodate these changes effectively. By ensuring adaptability, the structure remains relevant and useful for an extended time frame, serving the community's evolving requirements.

These ideas were described by John Habraken as **Open Building**. (Habraken, 1980s) His concept of Open Building encompasses several key ideas about the creation of environments:

- **User Participation:** Users and inhabitants should have a role in making design decisions. This involvement empowers them to shape their living or working spaces according to their needs and preferences.
- **Collaborative Design Process:** It emphasizes that designing is not solely the domain of architects or designers but involves multiple participants, including various professionals and stakeholders. This collaborative approach ensures that

the resulting environment reflects diverse perspectives and expertise.

- **Interchangeable Systems:** The interface between technical systems allows for the replacement of one system with another performing the same function. For example, different fit-out systems can be applied within the same base building, providing flexibility.
- **Dynamic Environment:** It acknowledges that the built environment is in a constant state of transformation. Changes in technology, social dynamics, and user needs necessitate a flexible approach to design that accommodates evolving requirements over time.
- **Continuous Design Process:** Open Building views the built environment as the product of an ongoing, never-ending design process. Rather than a static entity, the environment evolves incrementally, with each transformation contributing to its overall development. (Habraken, 1980s)

In my design, I place a strong emphasis on facilities dedicated to supporting individuals in their journey of mental recovery and processing their war experiences. While this aspect is often overlooked, particularly in post-Soviet contexts where there may be skepticism surrounding mental therapy, I strongly believe it is crucial for post-war reconstruction efforts. Prioritizing mental health support not only benefits individuals' well-being but also contributes to the overall welfare of the nation.

As individuals progress along their process of recovery, their needs evolve as well. Beyond the initial focus on security and stability, they seek opportunities for personal growth and self-expression. This may involve engaging in creative pursuits, participating in community activities, or pursuing education and career opportunities. By creating an environment that supports these efforts, I aim to empower individuals to rebuild their lives and make positive contributions to their communities.

In my master thesis, I present a more detailed design proposal for the 3rd

stage of development, where the needs are becoming more predictable. With much of the construction completed, the focus shifts towards adapting and expanding the existing space to meet evolving requirements. At the 4th stage and beyond, I outline two major pathways for future development at later stages.

**Certainly, it is impossible to cover every potential direction in a single project, exploring these pathways provides a framework for the continued development and evolution of the built environment. This ensures that it remains responsive to the evolving needs and aspirations of the community over time.**

Following pages present list of functions potentially needed at the considered area.



**PHASE 1:** present moment (January 2024)

- **Centre for humanitarian aid distribution**

This serves as a hub, providing relief to displaced individuals and offering a sense of stability.

- **Housing for professionals/ volunteers**

To accommodate essential specialists and volunteers, temporary, quickly constructed housing units are erected initially.

- **Garage and equipment warehouse**

A space for storing machinery and equipment essential for construction activities is established. It ensures that all necessary tools are available on-site.

- **Laying the permanent structure for future construction**

This phase sets the stage for future development.

**PHASE 2:** the end of the war

- **Centre for distribution of humanitarian aid**

Right after the peace is restored, need for external help still remains.

- **Centre for rehabilitation and reintegration of IDP**

The subsequent stage involves the establishment of fundamental infrastructure and public amenities, thereby facilitating the re-population of the region.

- **Housing for professionals/ volunteers**

As the construction continues more workers and volunteers are required.

- **Greenhouse**

A greenhouse serves not only as a means of providing food but also as a form of therapeutic activity

- **Continuation of construction**

**PHASE 3:** 2 years after the end of the war

- **Housing for professionals/ volunteers**

- **Centre for PTSD therapy**

It is time to start the process of dealing with this trauma, having potentially bad effects in the future.

- **Centre for art therapy**

It is a part of therapy with good impact on society.

- **Community centre/ sharing hub**

Centre is needed for people to gather and feel connection as well as help each other and share goods. Children need space to develop and socialize while their parents work.

- **Greenhouse**

- **Completion of the main construction phase**

**PHASE 4:** 10 years after the end of the war

- **Living environments**

Accommodation for professionals and volunteers can be used as a temporal housing for people who needs it. For example, students or ship workers who visit the city

- **Community centre**

- **Centre for art therapy**

- **Centre for PTSD therapy**

- **Greenhouse**

- **Management of the site**

As the amount of services grows, the more amount of employees and management are required.

- **Local business ventures/ local crafts centre**

When people gain some stability, they can involve more effort in economical boost of local businesses.

- **Art space**

Allocating space for artists not only brings attention to the territory but also celebrates local culture.

**PHASE 5:** 20 years after the end of the war

- **Living environments**

- **Community centre**

- **Centre for art therapy**

- **Centre for PTSD therapy**

- **Greenhouse**

- **Management of the site**

- **Local business ventures/ local crafts centre**

- **Art gallery**

- **Local history centre**

It is important to commemorate and reflect the history of the region, city and this particular island and site.

**PHASE 6:** future generations

- **Living environments**

- **Community centre**

- **Monument**

- **Museum**

- **Market**

- **Business/production hub**

By prioritizing flexibility and adaptability in the design of these spaces, we can ensure that they evolve and thrive alongside the changing needs and aspirations of the community, empowering future generations to shape their own destiny. Maintaining flexibility in our environment and space is key to adapting to whatever the future may hold.



## ACTORS AND STAKEHOLDERS: WHO?

Such massive development initiatives highlight the importance of leverage both financial and managerial capacities. It is paramount to effectively delegate responsibilities across multiple actors and stakeholders to streamline resource allocation and coordination for the smooth execution of projects.

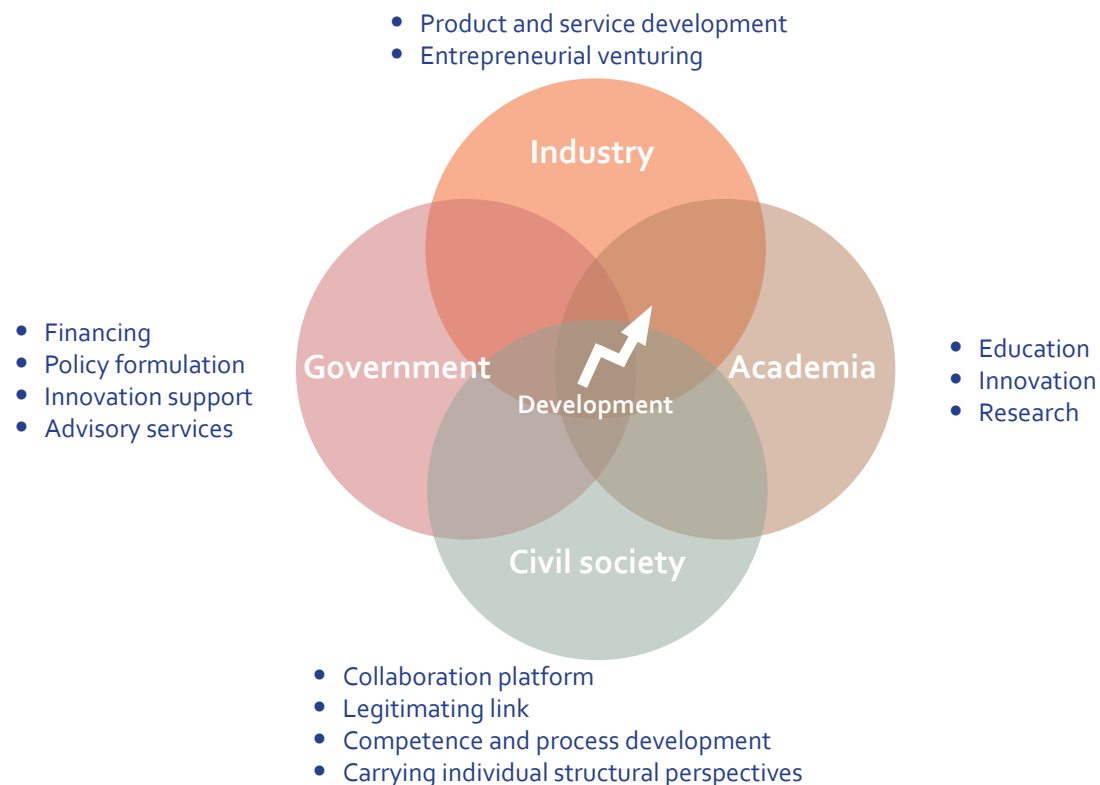
By actively involving local communities, organizations, and experts, these development projects can integrate culturally sensitive design principles, sustainable building practices, and appropriate technological innovations. This holistic approach ensures that the resulting design solutions are aligned with the unique cultural, environmental,

and social contexts of the communities involved. Distinguishing authority among different actors often relies on defining clear roles and responsibilities.

This process are illustrated clearly by **the quadruple helix framework** developed by Etzkowitz and Leydesdorff (co-developed with Carayannis and Campbellin) in 2009. It visualizes the dynamic interaction and exchange of innovation and knowledge within a state through four subsystems: academia, industry, government, public.

Following chapter discusses tasks and responsibilities of each member of post-war recovery.

### Developed notion of Quadruple Helix innovation system (Lindberg et al., 2014)



### Government and policymakers

Government bear a significant responsibility in the allocation of financial resources as well as facilitating international collaboration. Although specifics regarding land ownership are lacking, it is presumed to be under government jurisdiction. It falls on them to engage industry representatives and mandate the involvement of local labor. For example, imposing that 20-30% of the workforce must be sourced locally can be integrated into contracts between the government and construction firms.

### Industry

Industries play a central role in generating both direct and indirect monetary value, utilising funds allocated by the government. In the context of post-war construction, it becomes imperative to cultivate this economic value locally, given the limitations on international support. By fostering industrial growth and productivity, communities can harness their own resources to fuel

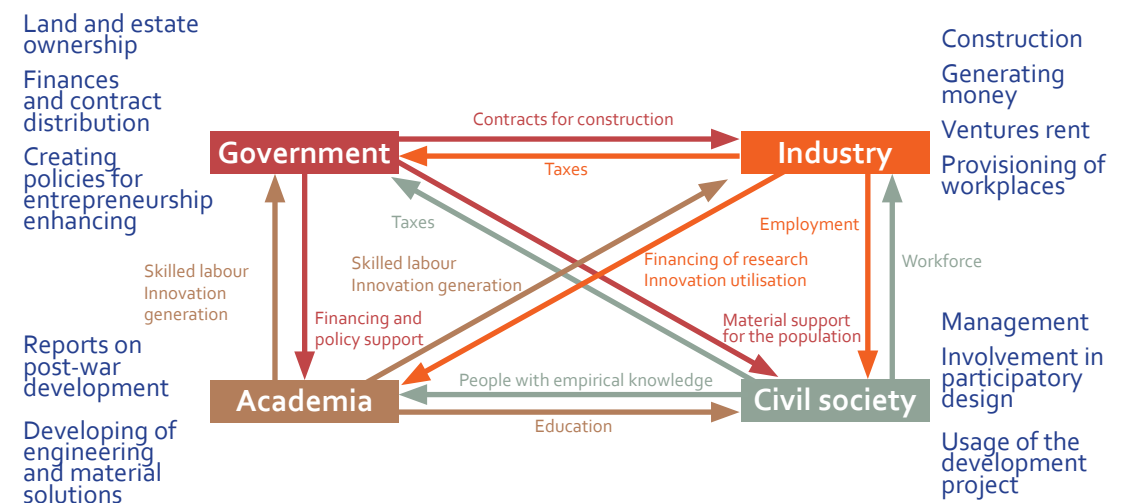
reconstruction efforts, thereby reducing reliance on external aid.

### NGOs and civil society

Non-governmental organizations (NGOs) possess experience in managing projects that incorporate the active participation of individuals. NGOs' horizontal organization and distribution of responsibilities enable them to operate faster and more efficiently when engaging with local communities on the ground.

### Academia

Investments directed towards the education leads to increased innovation in scientific research and academia. Additionally, teaching and training programs become more effective, enhancing the overall output of knowledge and skills. Consequently, the human capital developed through education becomes a valuable input for the economic, driving further growth and development.



## PART II: PEACE BUILDING MATERIALITY: HOW?

When selecting materials and structural systems for post-war reconstruction, several factors must be considered, including accessibility, affordability, transportation efficiency, and ease of assembly. In the case of Kherson, reinforced concrete emerges as the optimal choice. The city boasts several plants producing reinforced concrete and building elements. Indeed, utilizing reinforced concrete for post-war reconstruction offers several advantages, such as:

- **Strength and durability:** high strength and ability to withstand various environmental conditions make it suitable for long-lasting structures.
- **Versatility:** It can be moulded into different shapes and sizes, allowing for flexibility in design and construction.
- **Fire resistance:** Reinforced concrete offers good resistance to fire, enhancing the safety of structures.
- **Radiation resistance**
- **Metal saving**
- **Low maintenance costs**
- **Availability**

However, there are also some disadvantages to consider:

- **Heavy dead weight:** Reinforced concrete is relatively heavy, requiring strong foundations and support structures, which can increase construction costs.
- **Environmental impact:** The production of concrete involves

the emission of greenhouse gases, contributing to environmental concerns such as carbon footprint and pollution.

- **Design limitations:** Concrete structures may have limitations in terms of architectural aesthetics compared to other building materials, which can affect the overall visual appeal of the reconstructed area.
- **Cracking**
- **High thermal and acoustic conductivity**

Prefabricated concrete elements allow swift assembly, while modular dimensions offer the flexibility for future adaptability, reuse, and recycling.

Advantages:

- **Automation:** Prefabricated components allow for automated processes in factories, increasing efficiency and consistency in production.
- **Construction in adverse weather:** Prefabricated structures can be assembled in winter periods.
- **Easy modification and re purposing of structures over time**

Disadvantages:

- **Additional transport costs**
- **Higher costs for embedded parts**
- **Reduced structural rigidity:** Prefabricated structures may exhibit less structural rigidity compared to traditional construction methods, requiring additional reinforcement measures.

- **Reduced labour intensity:** With prefabrication, much of the construction work is completed in controlled factory settings, reducing labour intensity and potential on-site risks.

(My lecture notes for the course on the design of reinforced concrete structures, 2018)

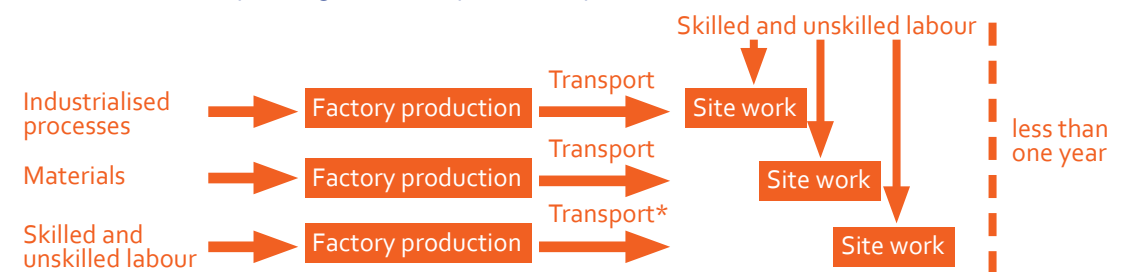
While the use of skilled labour reduces the overall workforce intensity, it is important to note that this approach opens up opportunities for unskilled labour to be employed under supervision of professional constructors and site managers. This not only diversifies the workforce but also provides employment to wider range of individuals affected by the war.

### Comparison of pre-industrial and industrial organisational concepts (Knaack et al., 2012)

Alternative (pre-industrial) concept involves traditional materials and methods that would have required a building time of three years.



In the industrial organizational concept the flow of materials, production of systems and subsystems, labour and assembly are organised as a planned sequence of events.



\* It can be avoided if accommodation is provided within the site.

Beside saving resources and speeding up construction; it also supports local industry. Kherson has many producers of reinforced concrete elements, and it should be honoured. **In my design, I utilized structural elements from the range provided by these local producers.**

Choosing prefabricated concrete presents an opportunity to challenge

my perceptions of this material. Coming from a post-Soviet environment, I have often associated it with banal architecture with low quality.

By selecting prefabricated concrete for my project, I aim to explore its potential and push its boundaries, demonstrating that my preconceptions are outdated and that it can be used to create inspiring and high-quality architecture.

# PART III: DESIGN PROCESS

“How can I design if I do not know what the end result will be like? is a frequent complaint.” “Why would you need to design if you already knew? is my response.”

-John Habraken  
“Control of complexity”

## SHELL - INFILL

In choosing a structural system, I opt for what John Habraken referred to as a **shell - infill house**. This approach views the building as comprised of subsystems that interact in a hierarchical order. (Habraken,1987)

### Shell (skeletal framework)

Columns, beams, slabs, foundation

### Stairs

### Façade elements

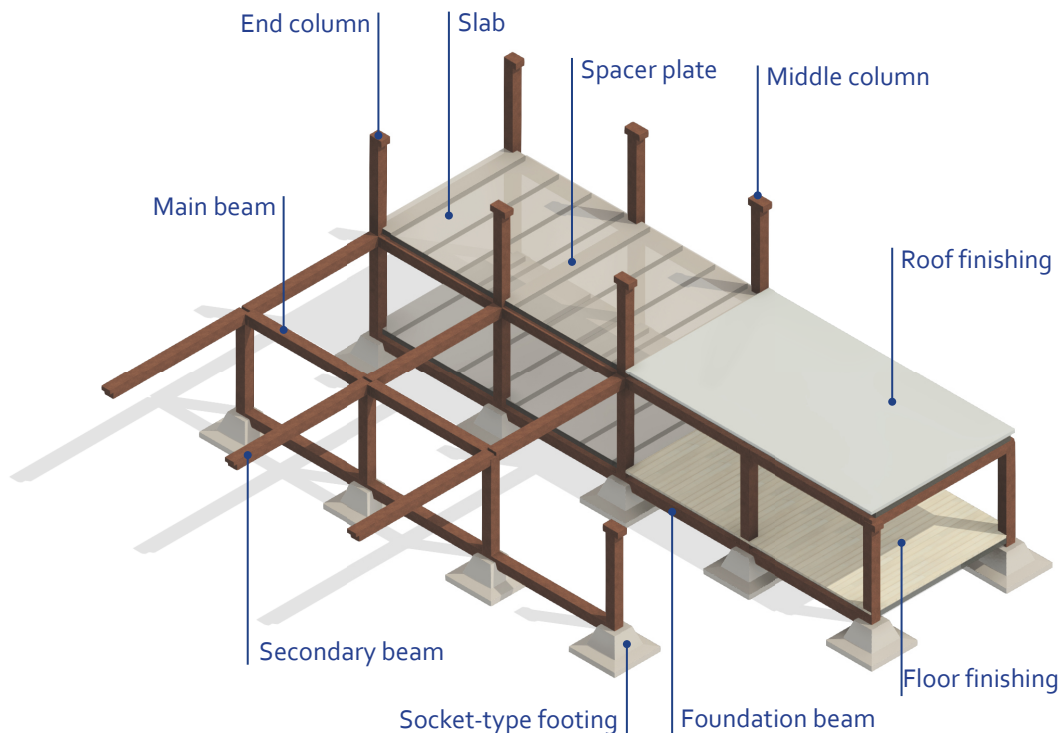
Façade panels, windows, doors

### Infill wall system

### Kitchen and bathroom equipment

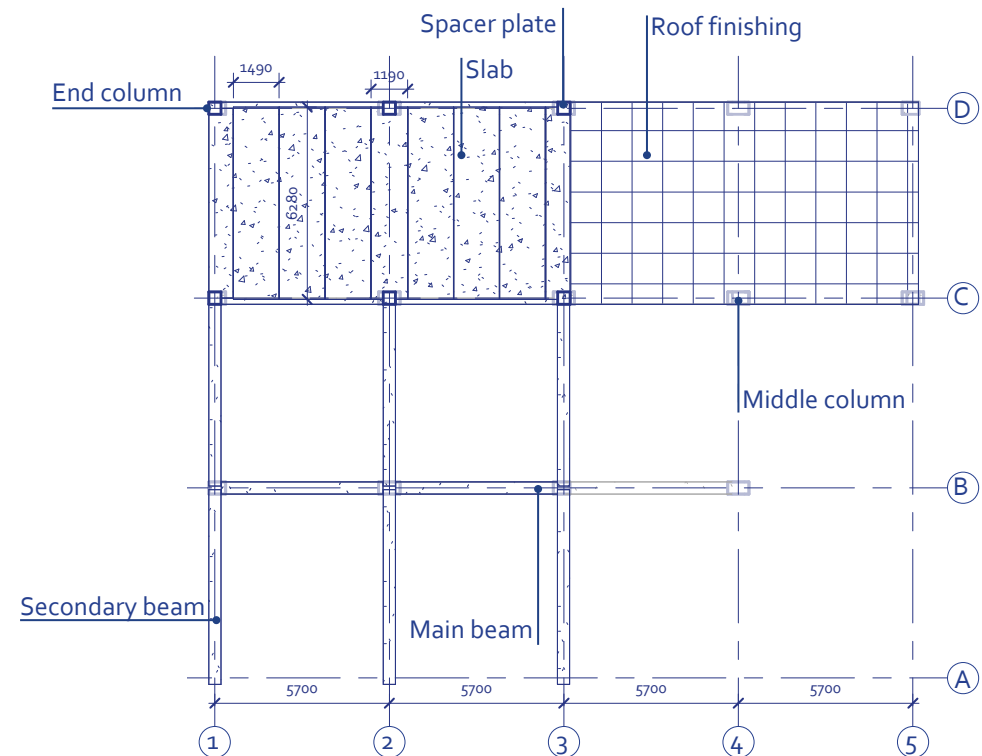
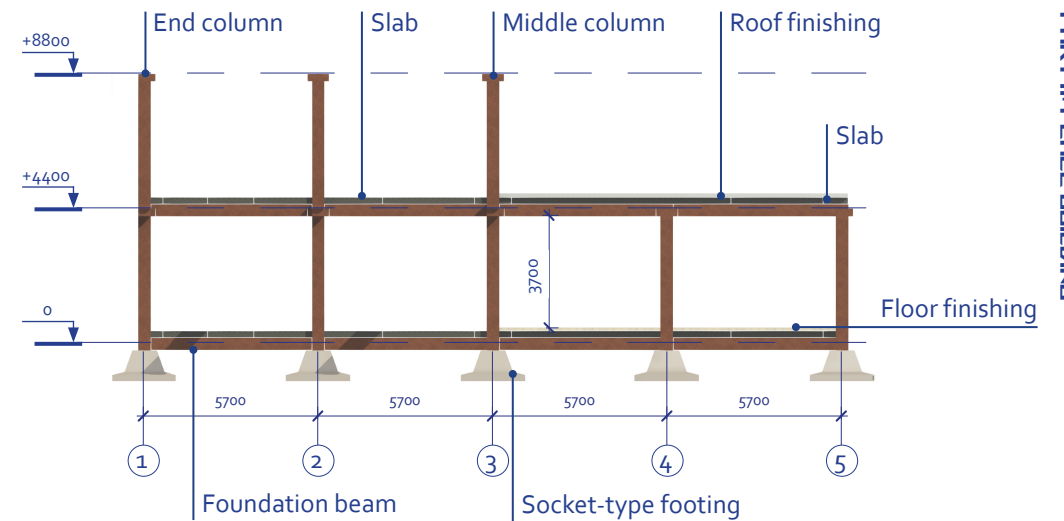
### Furniture

### Prefabricated concrete framework



It typically involves a robust skeletal framework. The application of infill panels serves to enclose the space within the framework.

The structure and surface are assessed independently, providing flexibility in selecting panel materials and adjusting module variations. These panels can vary in size and accommodate openings of different sizes as required. Since the infill panels primarily support their own weight, it is afforded the freedom to choose different materials. This incorporates options with diverse colours and textures, such as brick skins, aluminium panels, stone cladding, or wood, among others, thereby facilitating the creation of ornamental, exquisite and visually appealing designs. (Habraken,1987)



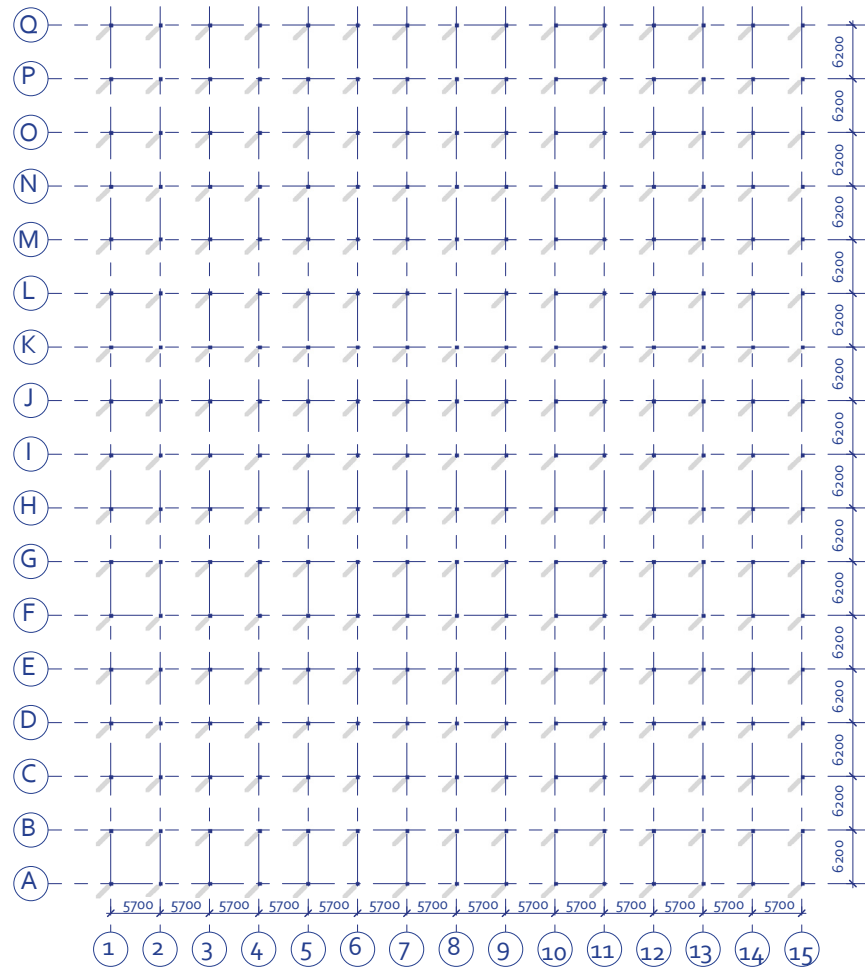
Ensuring adaptability is crucial, and the height of the columns plays a significant role as it determines the vertical space available. To accommodate various equipment needs, I've selected a height of 3.7 meters from floor to ceiling as the optimal dimension.

The prefabricated elements, are not only intended to conserve resources and expedite construction but also to support the local producers of reinforced concrete elements —a vital industry in Kherson. Consideration of dimensions was made to align with their range of structural elements.



# 255 COLUMNS

## 255 DAYS OF OCCUPATION



Grid size **6,2x5,7 m**  
Grid area **35,34 m<sup>2</sup>**

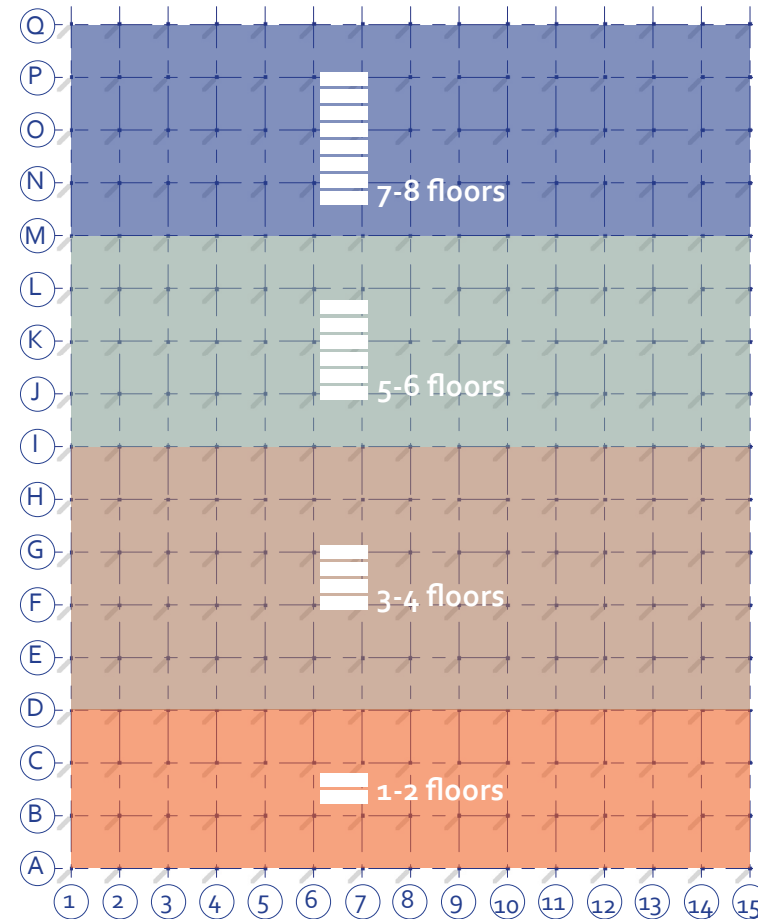
Site size **99,2x79,8 m**  
Site area **0,79 ha**

It is paramount for me to infuse the architecture with symbolism, serving as a testament to the resilience and

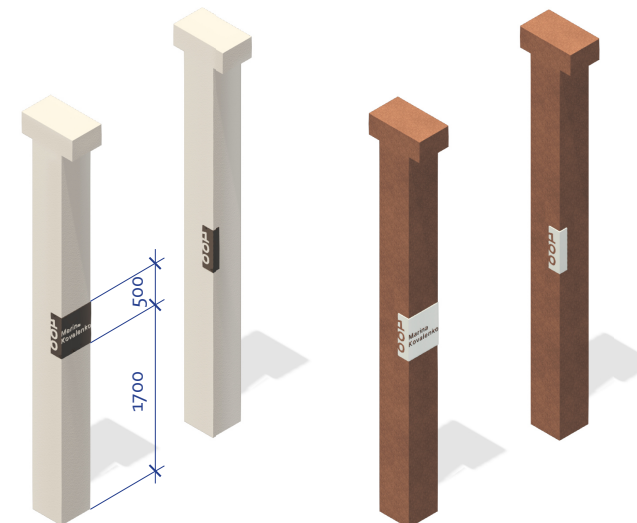
determination of the people. Hence, the design concept begins with 255 columns, representing the duration of Kherson's occupation by Russian forces.

In addition to their symbolic significance, these columns serve a functional role in the overall design.

### Height zones



### Column types

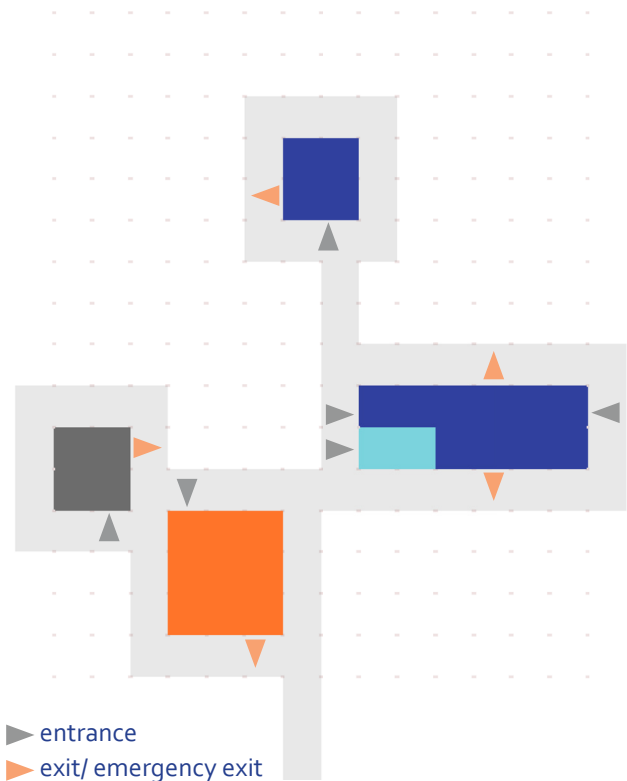
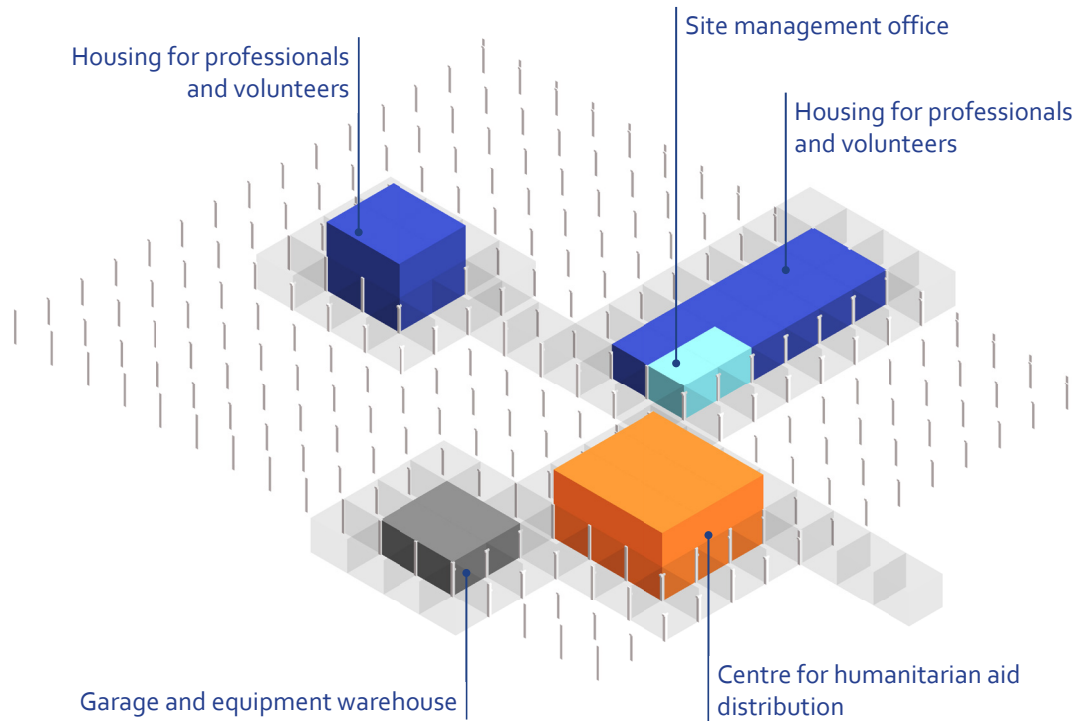


To optimize material usage and cost efficiency, I divided the site into distinct zones, each supported by columns and foundations specifically designed to bear different loads. This approach ensures that materials are allocated efficiently based on the structural requirements of each zone, resulting in savings and maximizing resources.

Additionally, this zoning strategy provides guidance for the allocation of various functions within the design, helping to organize spaces according to their intended uses.

There are two types of columns: standard ones in concrete white and others in terracotta for design accents. Each column features metal planks displaying numbering. Some are enhanced with the names of individuals who have contributed to the project, serving as a commemorative element and honouring their involvement.

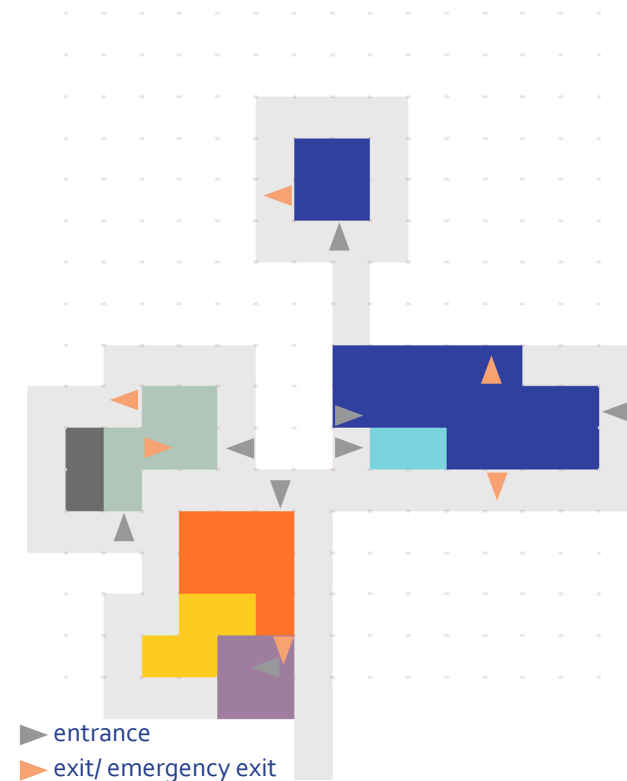
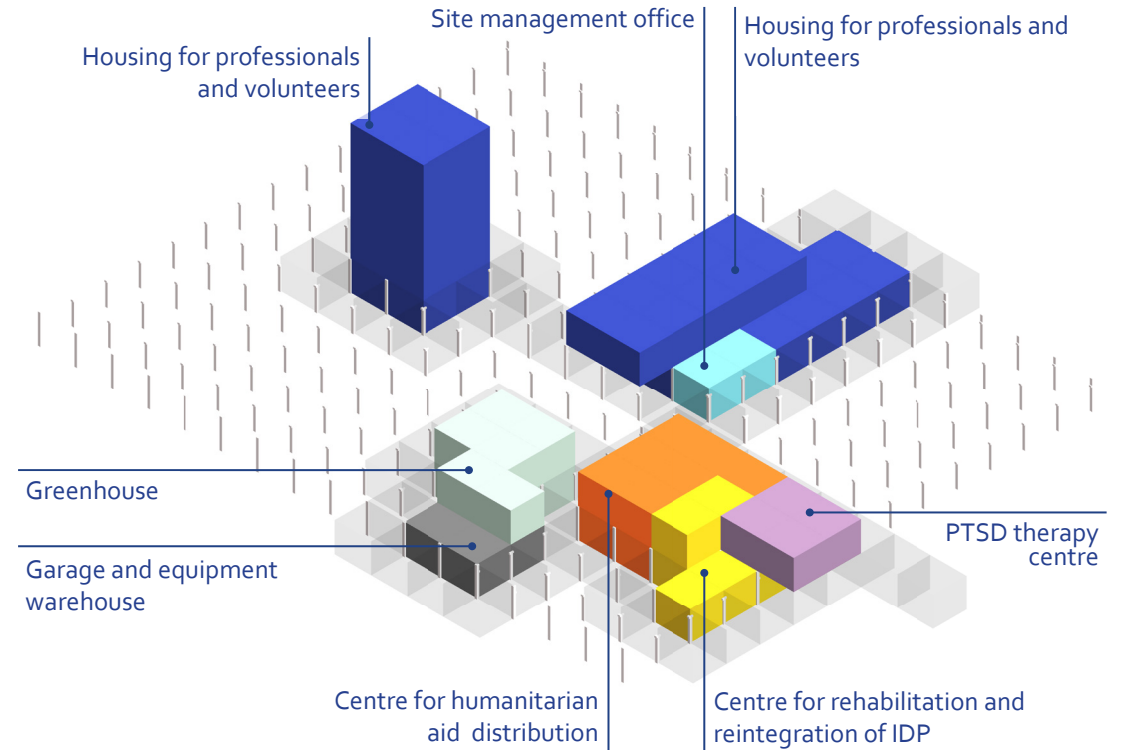
# PHASE 1



Net lettable area  
**1166,22 m<sup>2</sup>**  
 Passages area **2120,4 m<sup>2</sup>**  
 Footprint **0,31 ha**  
**39%** of the site

Initially, one and two-storey buildings will be constructed. They will serve both neighbourhood needs and provide temporary housing (up to two years) for individuals involved in building, managing, or maintaining. The large spaces between buildings ensure easy access for machines and equipment. **The government and international contributors should take basic role in initiating construction and hiring companies and people.**

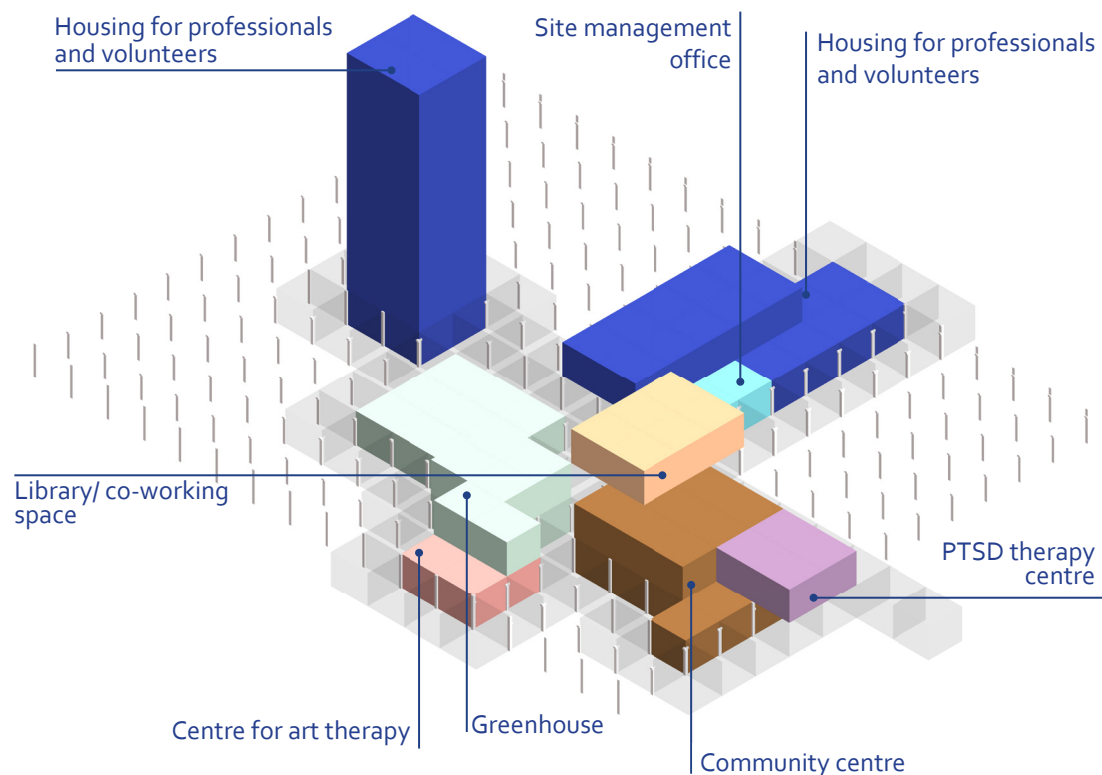
# PHASE 2



Net lettable area  
**2191,08 m<sup>2</sup>**  
 Passages area **2579,8 m<sup>2</sup>**  
 Footprint **0,38 ha**  
**48%** of the site

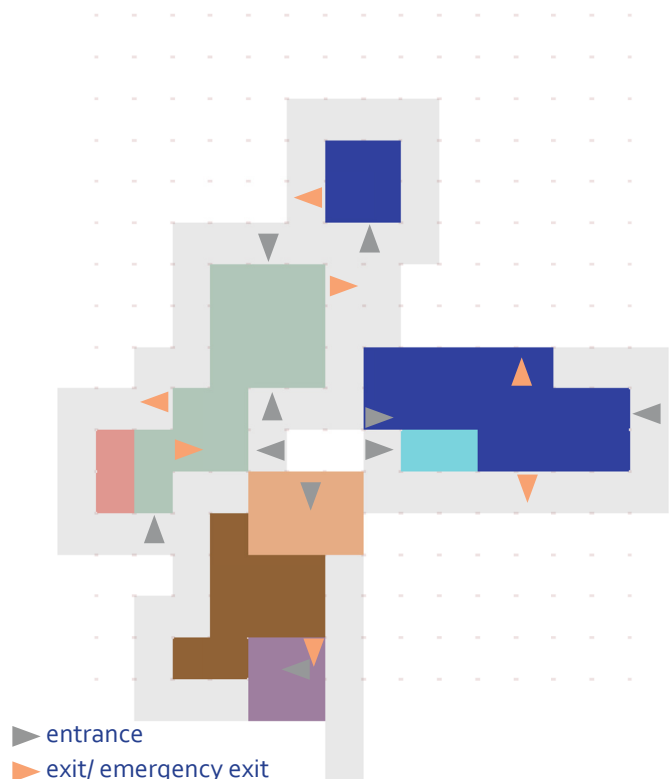
The development expands vertically and horizontally inside the site. The distribution centre serves as a warehouse and gathering place. The reintegration centre assists IDPs with documentation and employment. Both IDPs and city residents can use the therapy centre for group and private sessions. **People now can be more involved in construction as well as administrating and decision making in terms of development and future functions.**

# PHASE 3

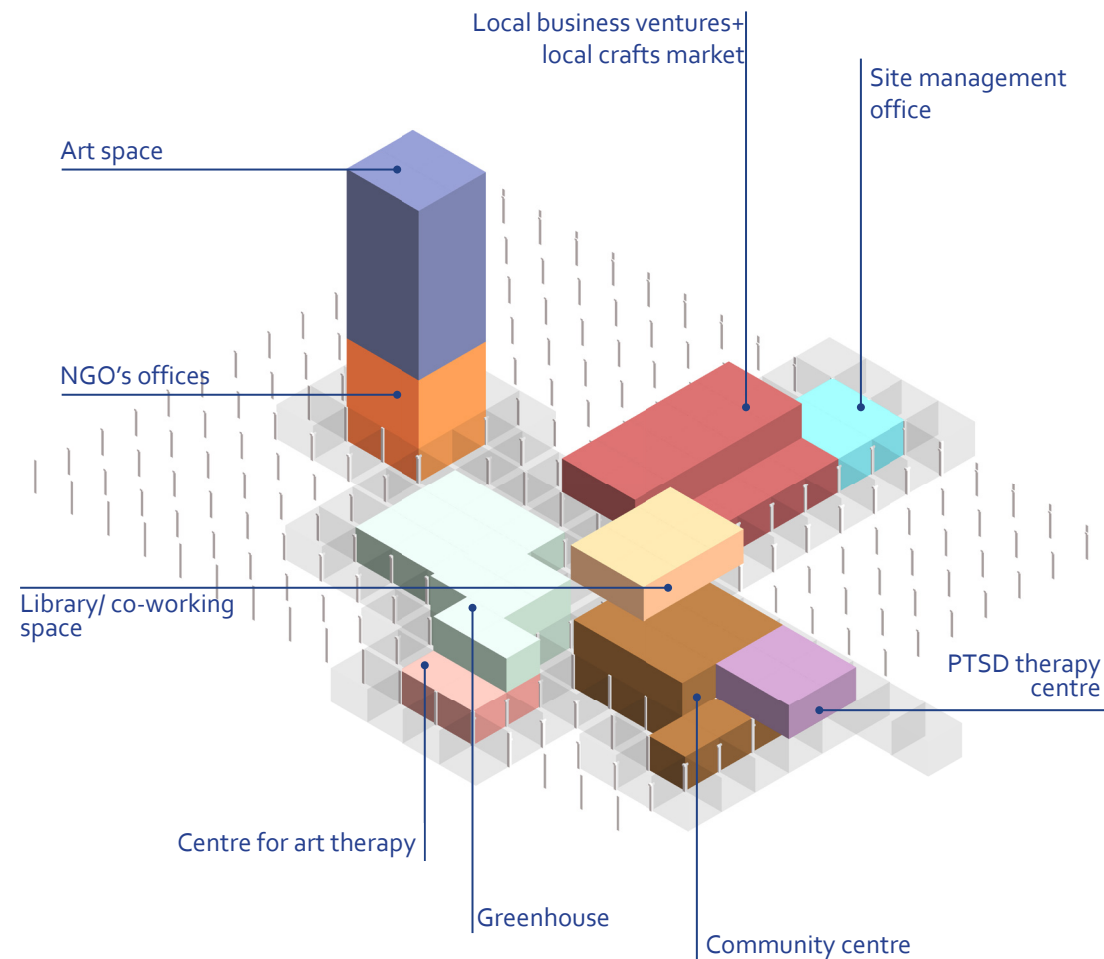


Net lettable area  
**2827,2 m<sup>2</sup>**  
 Passages area **2933,2 m<sup>2</sup>**  
 Footprint **0,42 ha**  
**53% of the site**

The Centre for Rehabilitation and Reintegration of IDPs and the Centre for Humanitarian Aid Distribution have been merged into a community centre. While its focus evolves, the centre remains dedicated to serving the needs of the people. Additionally, a library and co-working space have been incorporated. **At this stage, local community take over the responsibility for the space, as government and international stakeholder involvement typically diminishes.**



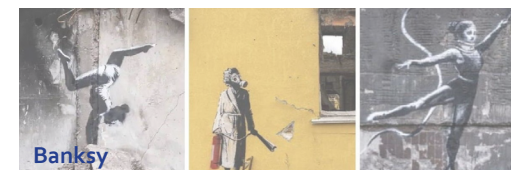
# PHASE 4: SCENARIO 1



If there is a period when temporary housing is not in demand, the tower can be repurposed into a space for modern art. The north wall was intentionally left without windows to provide a large surface for murals. This presents a valuable opportunity for self-expression and recognition of Ukrainian artists. By inviting various artists, including international ones, the site's recognisability and appeal can be significantly enhanced. Possible artists presented should be chosen by citizens.

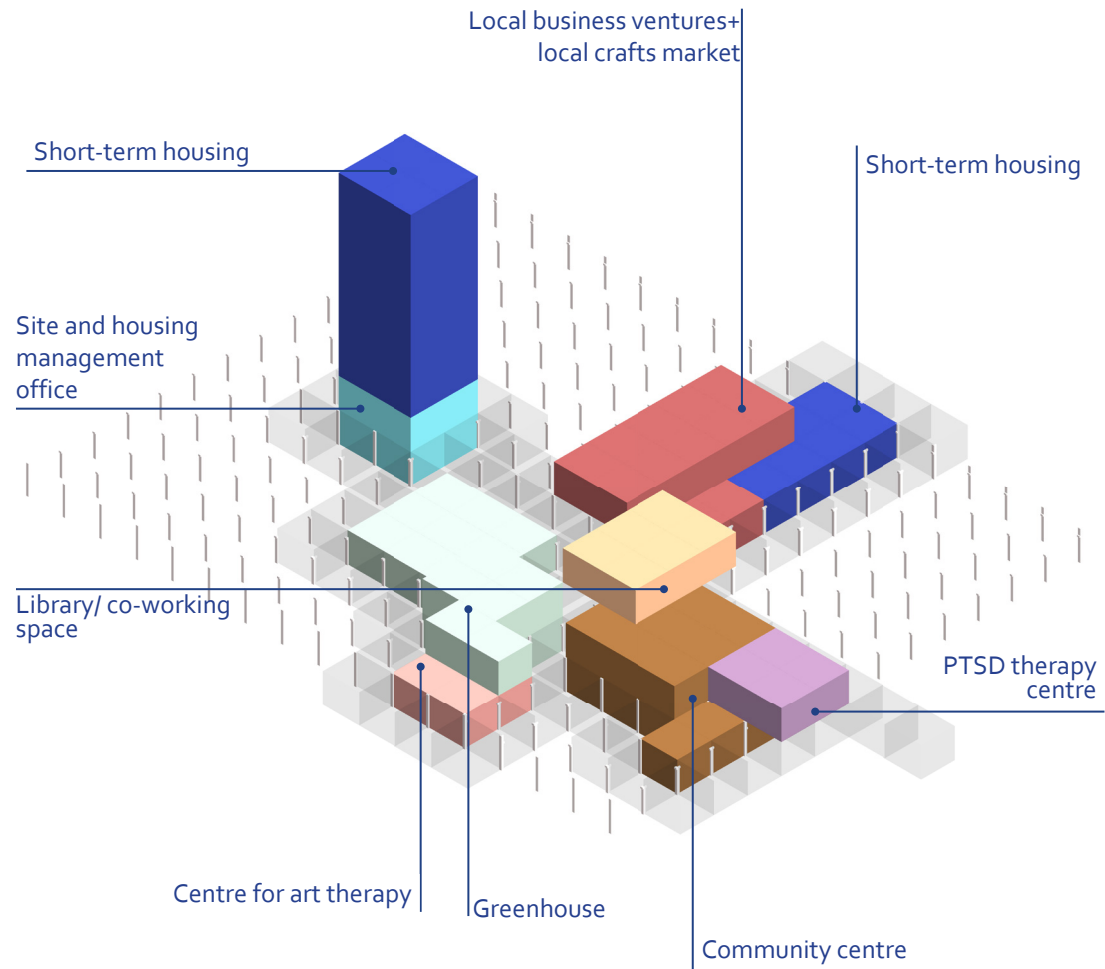
Transforming housing into local business ventures presents an opportunity for businesses to generate revenue and

**foster greater independence within the community. Additionally, academia can observe initial outcomes and conduct research across various fields.**



PART III: DESIGN PROCESS

## PHASE 4: SCENARIO 2



An alternative scenario is to maintain the dwelling space. Given that the main construction work is complete, the primary users can shift. I believe it would be a good fit for student housing.

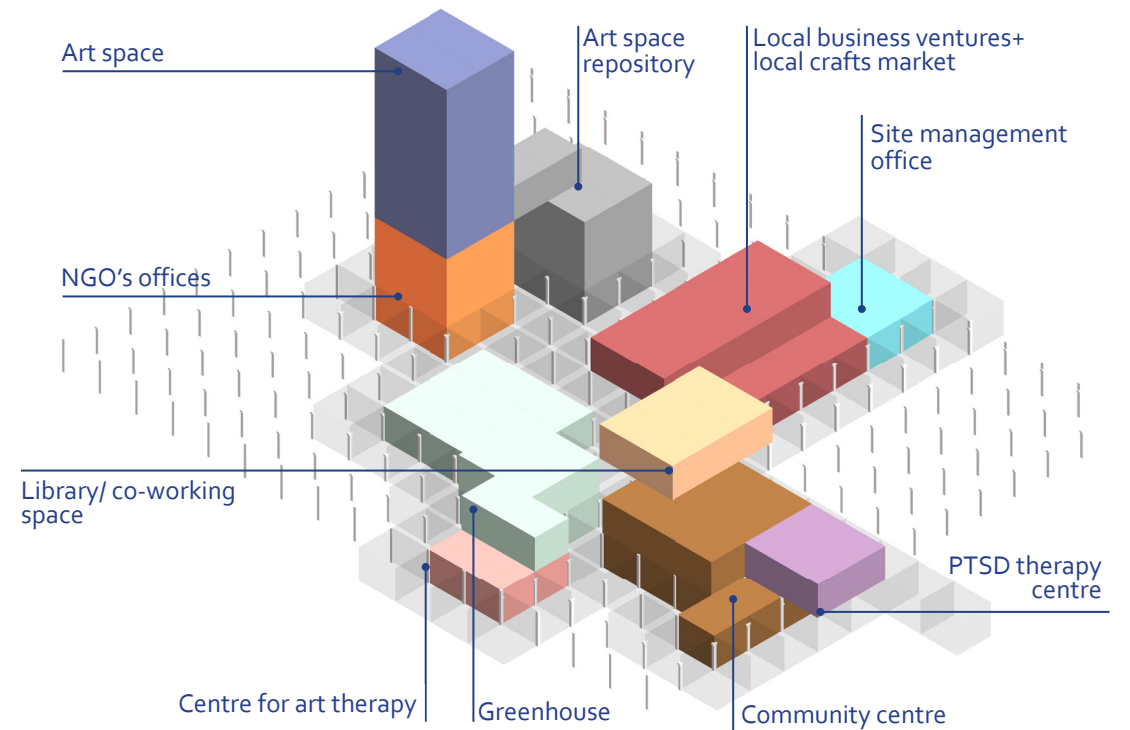
The city's higher education institutions train specialists in various areas of maritime science, including ship navigation, electromechanics, engineering mechanics, welding, and ships and ocean engineering. Housing students together can create a vibrant community, encouraging collaboration and networking among future maritime professionals. The site is already equipped

with facilities tailored to student needs, such as study rooms and recreational areas.

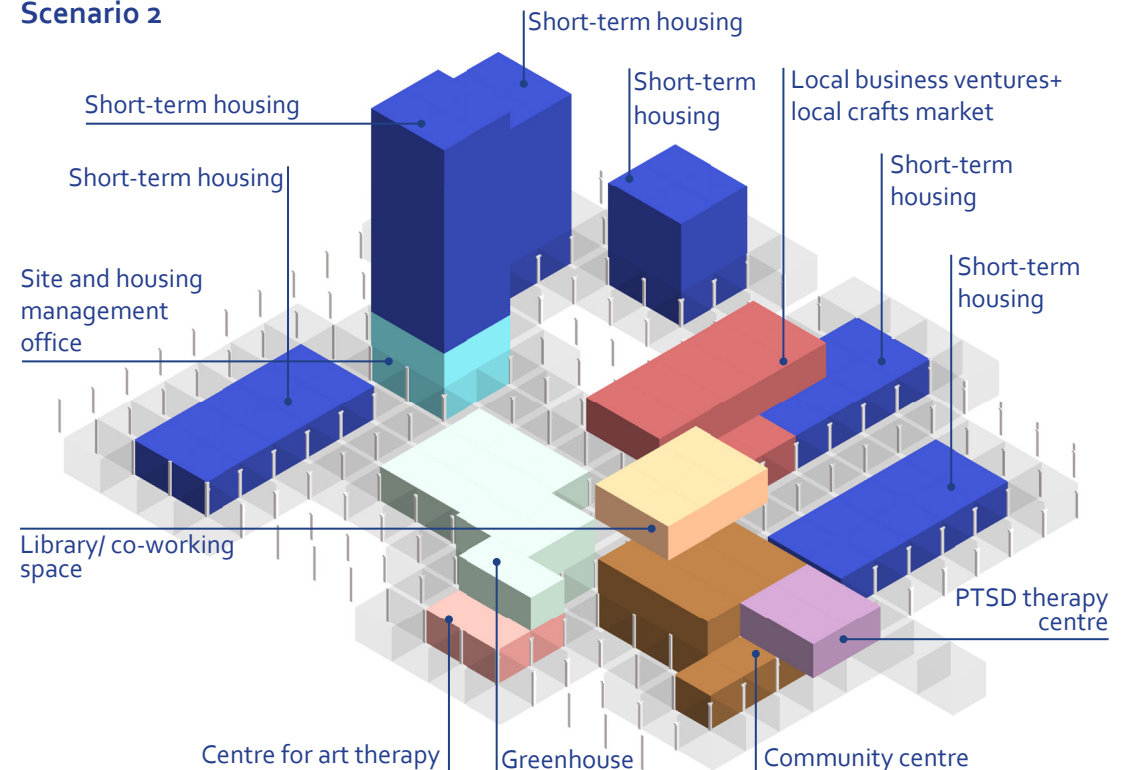
**Decisions about which scenarios to implement should emerge from a bottom-up approach rather than being dictated from the top down. In this phase, the government no longer plays a central role in administration and financing. Instead, the local community, businesses, and other stakeholders take the lead, ensuring that the development aligns more closely with the actual needs and preferences of the people directly affected. This shift empowers local entities and fosters a sense of ownership.**

## PHASE 5: 2 SCENARIOS

### Scenario 1



### Scenario 2



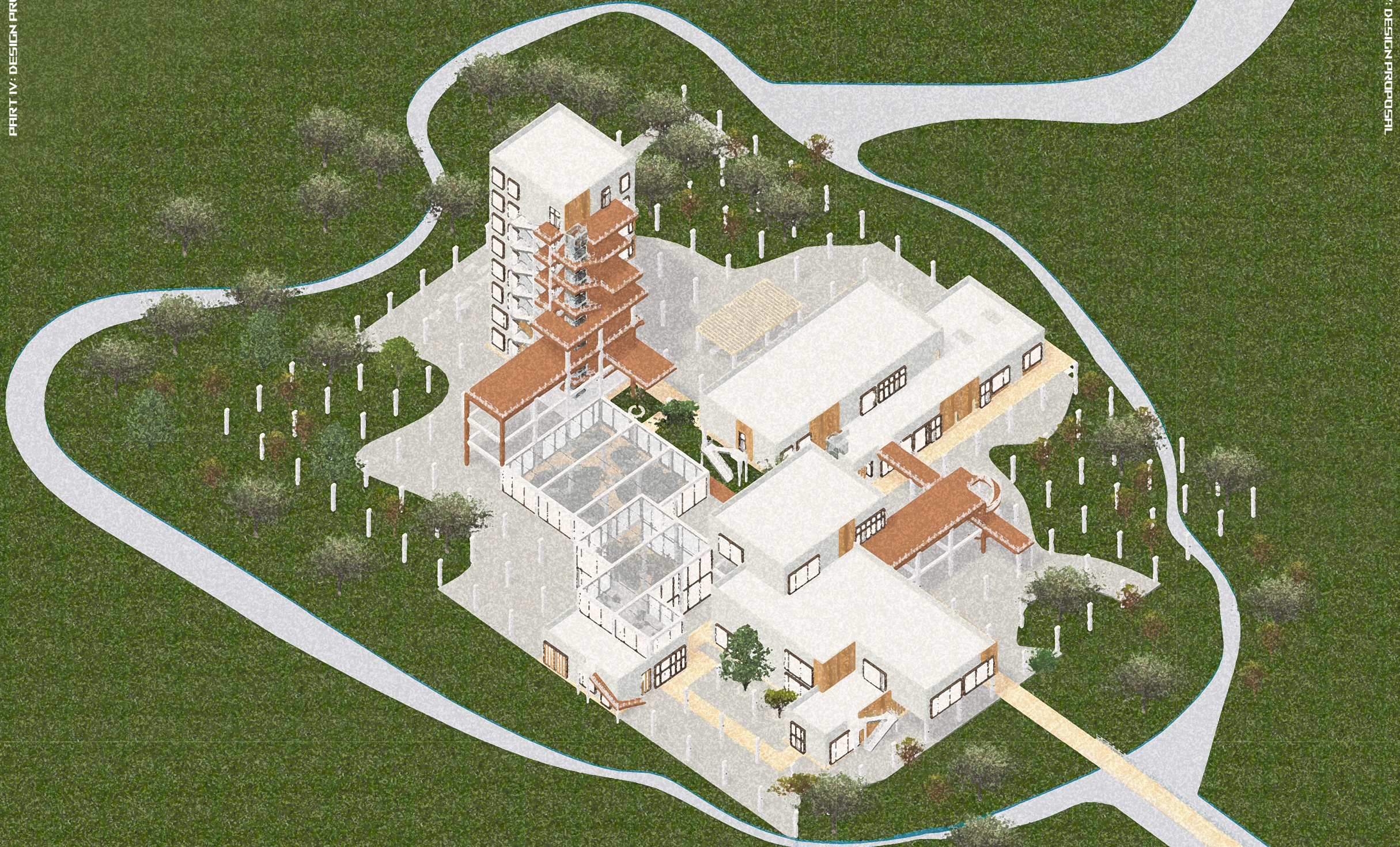
# PART IV: DESIGN PROPOSAL

It is important to note that my proposal is not intended to be a final product but rather an experiment and my personal reflection.

My work does not aim to solve the entire problem of post-war reconstruction. I understand that it is a complex and lengthy process that cannot be fully addressed in a single master thesis. However, my intention is to provide aid and comfort to those who need it. Initially, this project will serve the local community, but as the area develops, it can expand to benefit the entire city of Kherson.

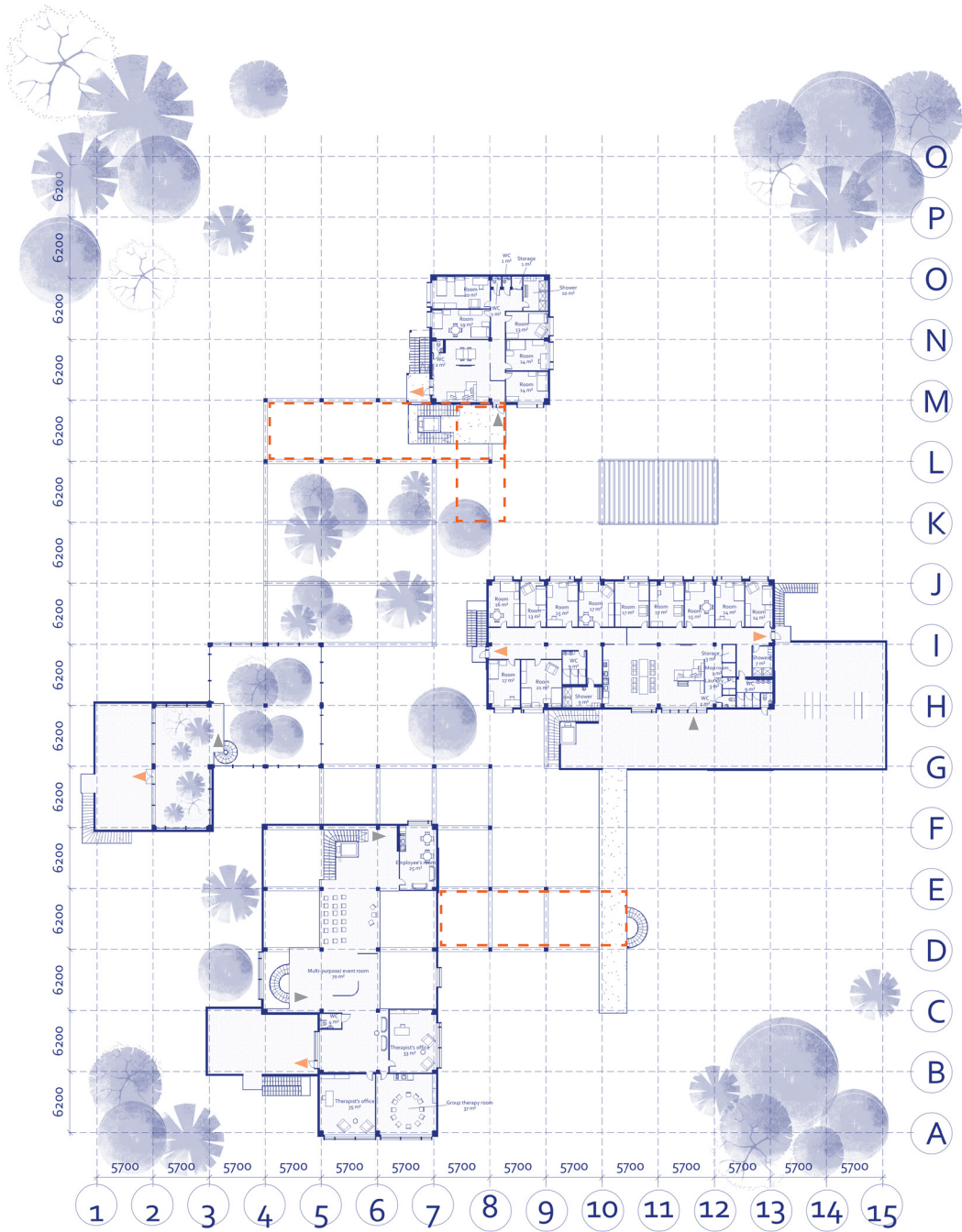
Successful implementation of this project can demonstrate the viability of this design approach, potentially serving as a model for other post-war environments, adapting to their unique contexts and needs. Over time, the scale of construction can be expanded, and building parts can be easily repurposed or even demolished, thanks to the flexibility of the framework system and the materials used. For instance, concrete can be recycled for use in pavement and other construction elements.

The following chapter offers a detailed representation of the third stage of development, two years after the end of the war.





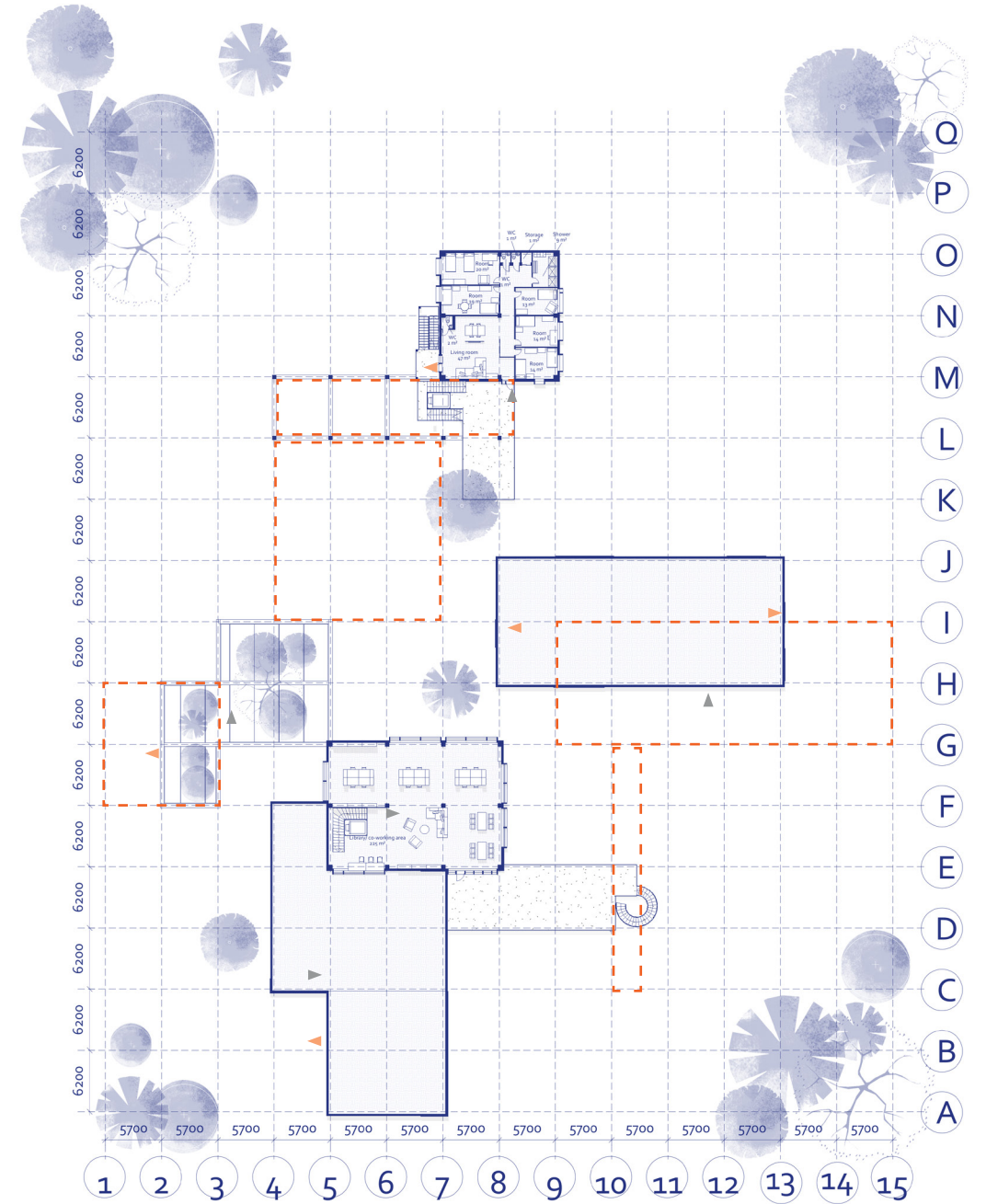
# 2ND FLOOR (STAGE 3)



- ▶ entrance
- ▶ exit/ emergency exit
- ▭ footprint



# 3RD FLOOR (STAGE 3)



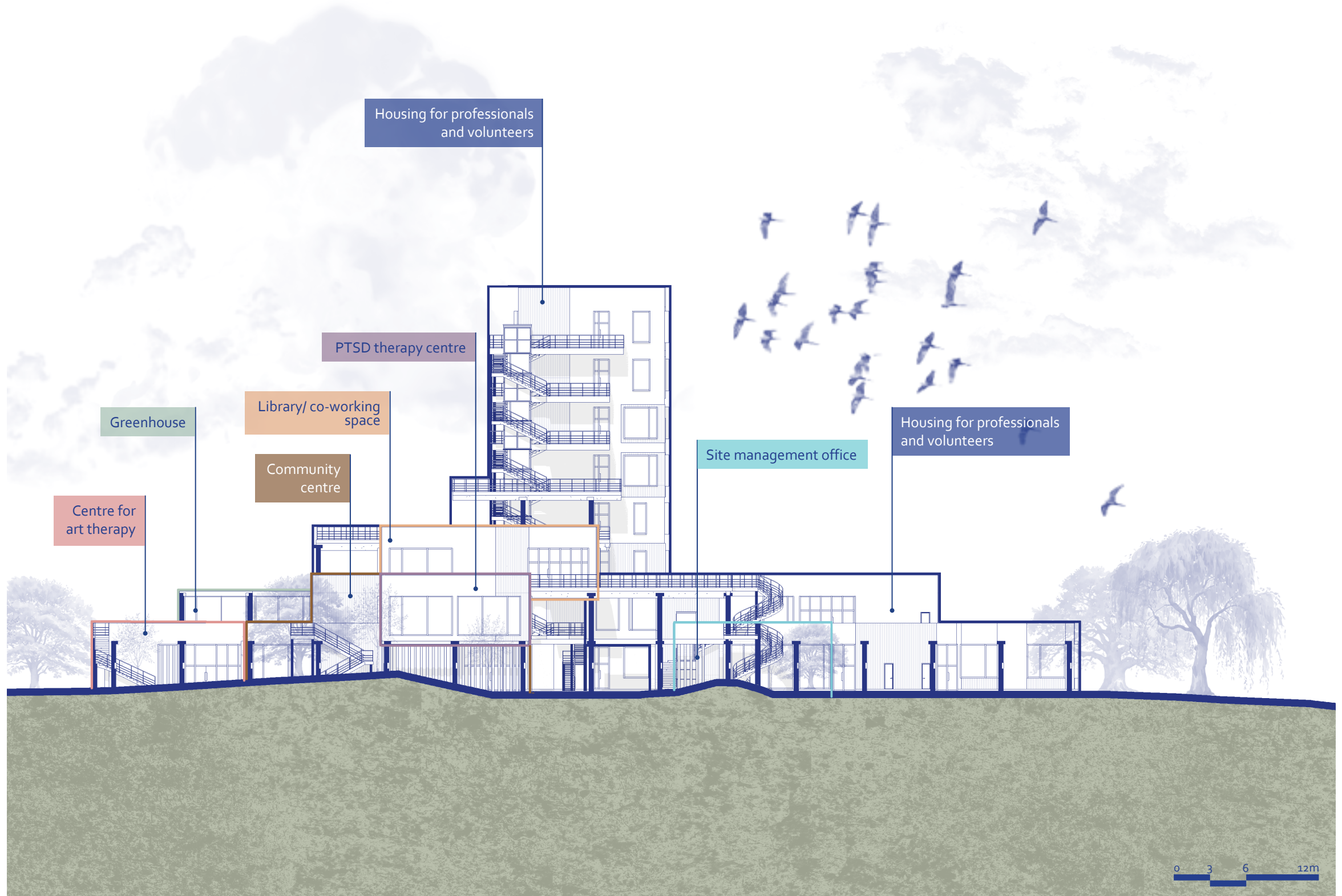
- ▶ entrance
- ▶ exit/ emergency exit
- ▭ footprint



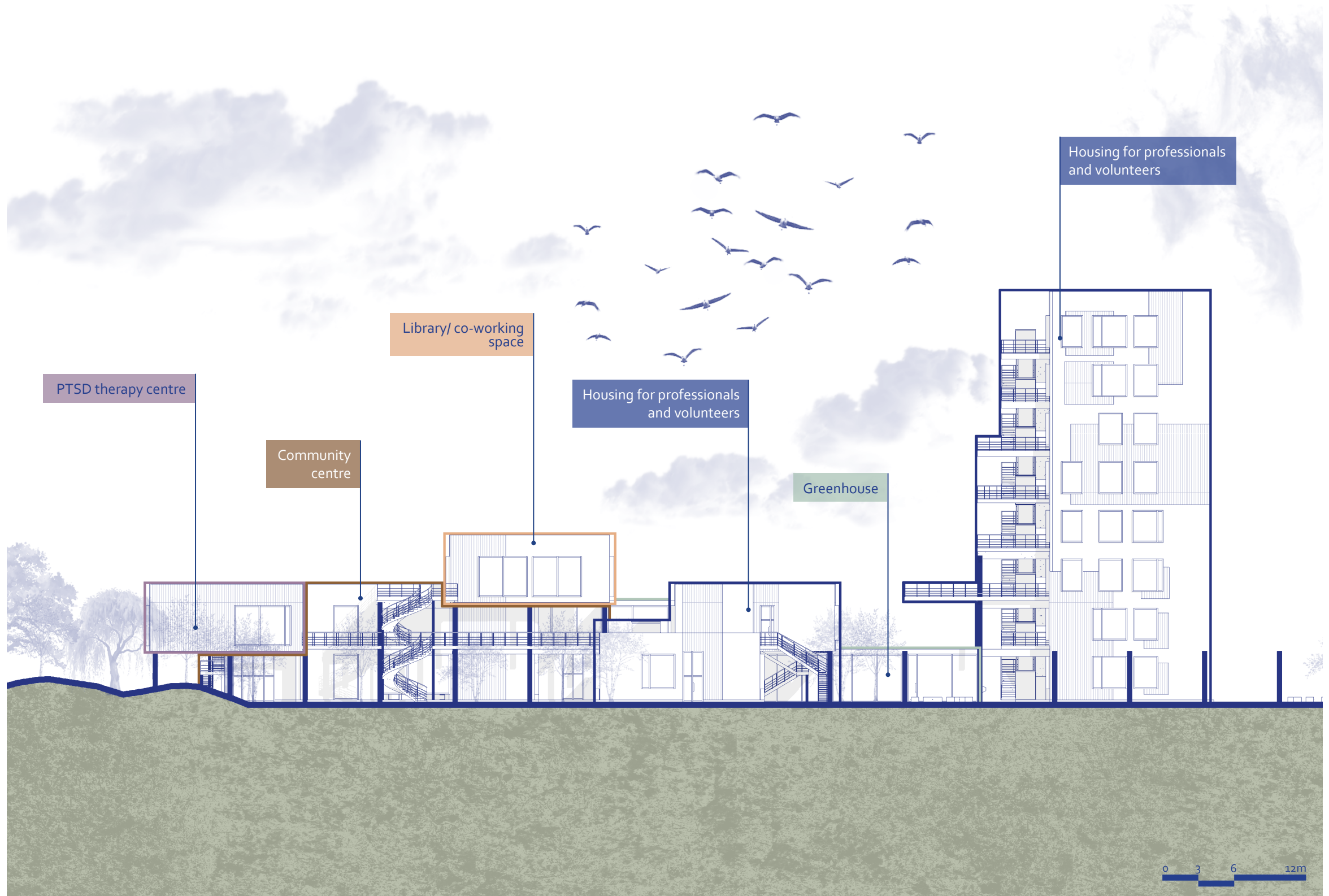




# ELEVATION 1-15



# ELEVATION A-Q



# COMMUNITY CENTRE

Elevation 1-11



Elevation A-L

Plan. 1<sup>st</sup> floor

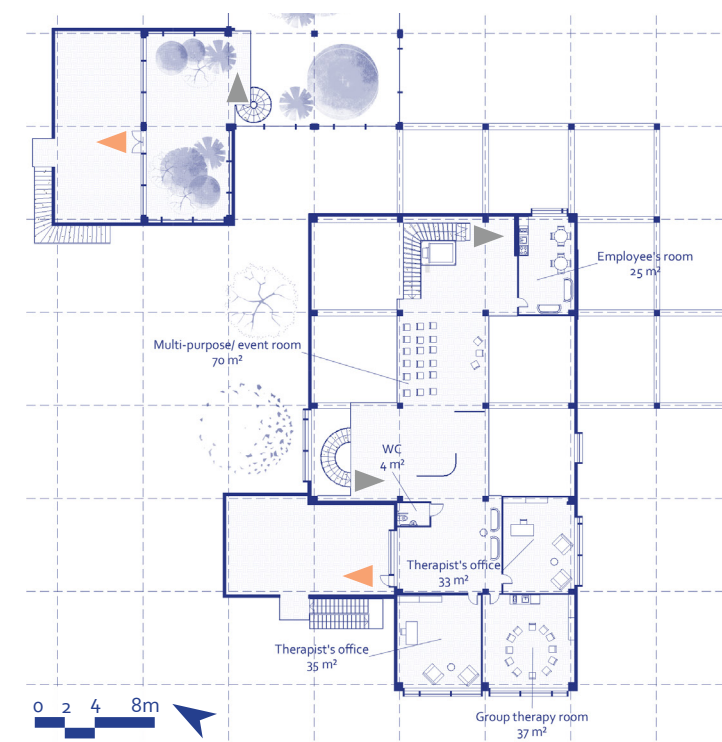
▶ entrance

▶ exit/emergency exit

The community centre serves multiple purposes at different times to accommodate people's needs. However, its most important function is to provide a space for people to come together and feel a sense of belonging.

Spaces are designed to be as flexible as possible to maximize the building's usability. This flexibility allows the community centre to adapt to a wide range of activities and functions. For instance, open areas can be easily reconfigured for different purposes, such as hosting community meetings, social events, educational workshops, or recreational activities.

The inclusion of multi-purpose rooms that can be equipped for different uses, such as art classes, fitness sessions, or childcare, adds to the centre's versatility.

Plan. 2<sup>nd</sup> floor

# HOUSING

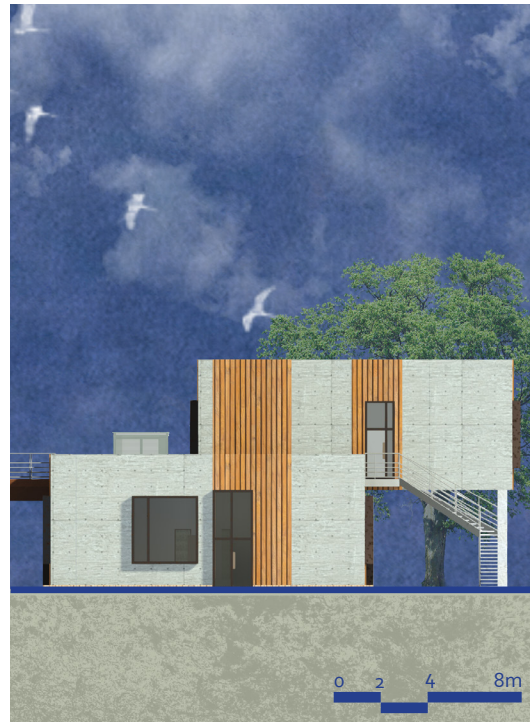
Elevation 8-15



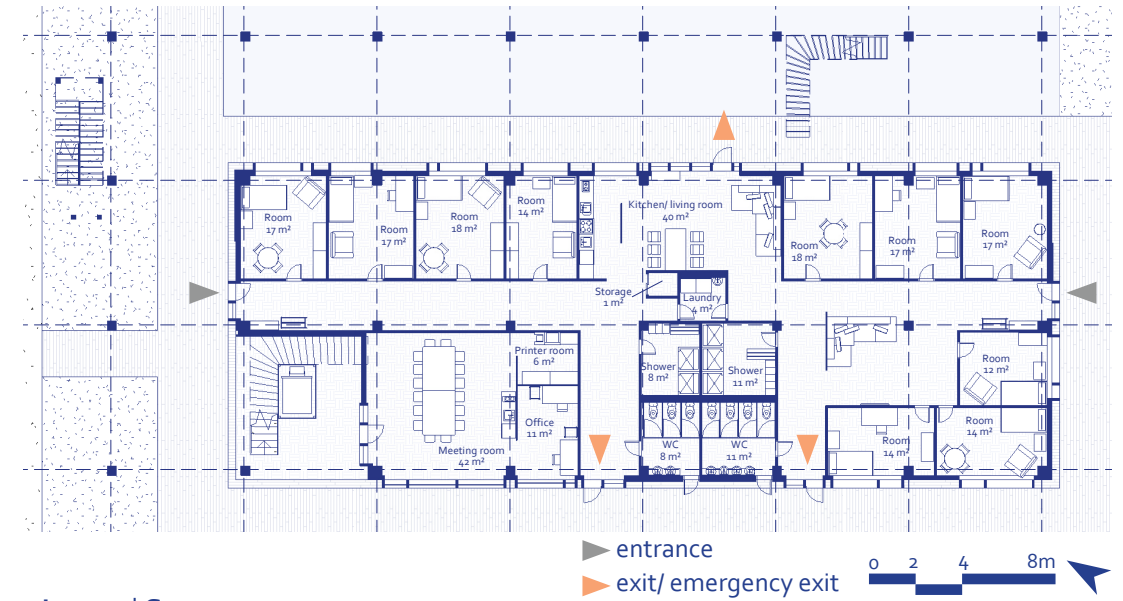
Elevation J-G



Elevation G-J



Plan. 1<sup>st</sup> floor



Plan. 2<sup>nd</sup> floor



Capacity of the 1st floor **10 persons**  
 Capacity of the 2nd floor **12 persons**  
 Total capacity **24 persons**

facilities are shared among all residents. Shower rooms and toilets are designated separately for men and women, with bathrooms also accessible from outside. This arrangement ensures both privacy and convenience while fostering a sense of community.

The private area is divided into two sections, each with its own entrance. The kitchen, living room, and laundry

# TOWER

## Elevation 7-9



### Plan. 1<sup>st</sup> floor



Capacity of 1 floor **7 persons**  
 Total capacity **56 persons**

To enrich social interactions, each floor includes either a kitchen or a living room, fostering communal activities and connections among residents. These communal areas provide opportunities for residents to cook together, share meals, or relax and socialize, thereby enhancing the sense of community and belonging. Laundry facilities are strategically placed every three floors, ensuring that they are accessible while avoiding congestion.

Common and private areas are divided with partition walls, offering a balance between shared spaces and privacy.

### Plan. 2<sup>nd</sup> floor



To further enhance comfort and safety, floors are designated exclusively for either women or men. This segregation allows for shared shower rooms while maintaining privacy and security.

Floor with living room	Stage 3
Floor with kitchen	
Floor with living room	
Floor with living room	Stage 2
Floor with kitchen	
Floor with living room	Stage 1
Floor with living room	
Floor with kitchen	

# PART V: CONCLUSION AND RECOMMENDATIONS

Post-war recovery is a multifaceted challenge that demands consideration of numerous aspects. Architects encounter various constraints that need to be addressed. In my master thesis, I explored only some of these aspects. This work represents one of many attempts to apply theoretical knowledge to a real-world situation.

Working on this master thesis, I learned several key lessons:

- **In the post-war reconstruction, development process plays a vital role in achieving success.**
- **Environment after war is still very unstable, so architecture should reflect it and be flexible and adaptable.**
- **Recovery is a lengthy process, and an incremental approach is often the most realistic in a post-war environment.**
- **With limited resources, there is an opportunity to collaborate with local producers, materials, and technologies.**

- **No single social institution can handle this alone. Collaboration, both top-down and bottom-up, is essential for success.**
- **We build for people, and therefore, they should be key actors in post-war reconstruction.**
- **War imposes severe stress on a country, which cannot be overlooked. To prevent future conflicts and ensure stability and security, psychological aspects must be integrated alongside physical reconstruction efforts.**

I am deeply grateful to Lund University and my mentors for the freedom they granted me to explore this theme. This exploration is important not only in a universal sense but also for me personally. Promoting life and development, rather than pain and destruction, is profoundly meaningful to me, especially given the suffering my country has endured.

There is still much to learn, but I sincerely hope that in the future, as a global community, we will no longer need this knowledge as we will achieve lasting peace.

For my master thesis, I utilized books, articles, reports and websites. These sources provided valuable information, statistics, and figures.

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These works are not cited in my master thesis but they served as a important source of inspiration for me.

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Peace to Ukraine

