HOUSE OF TEXTILES

Flagship Experience Center

made in beirut

Edda von Hodenberg

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HOUSE OF TEXTILES

complexprojects
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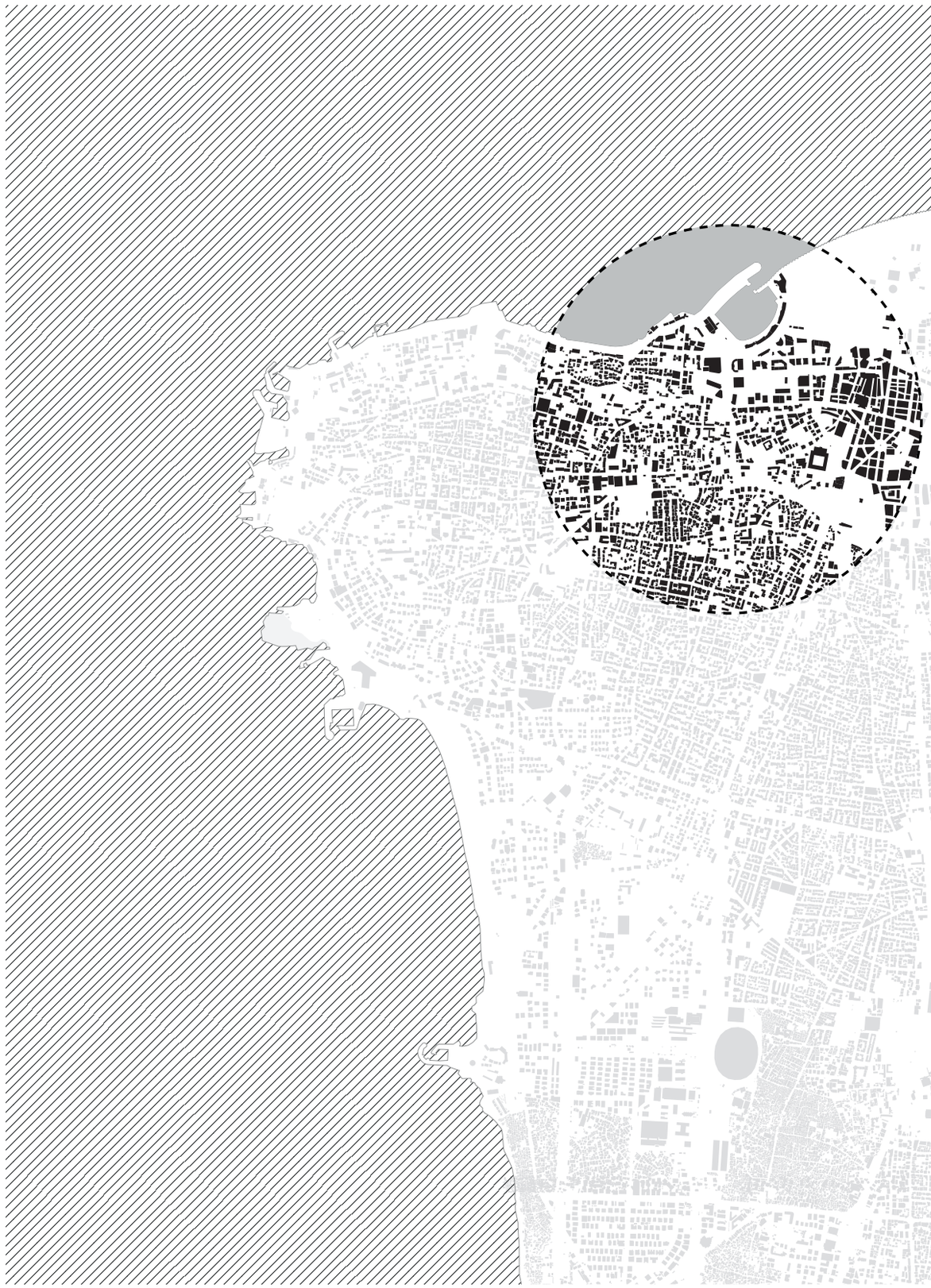

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INTRODUCTION

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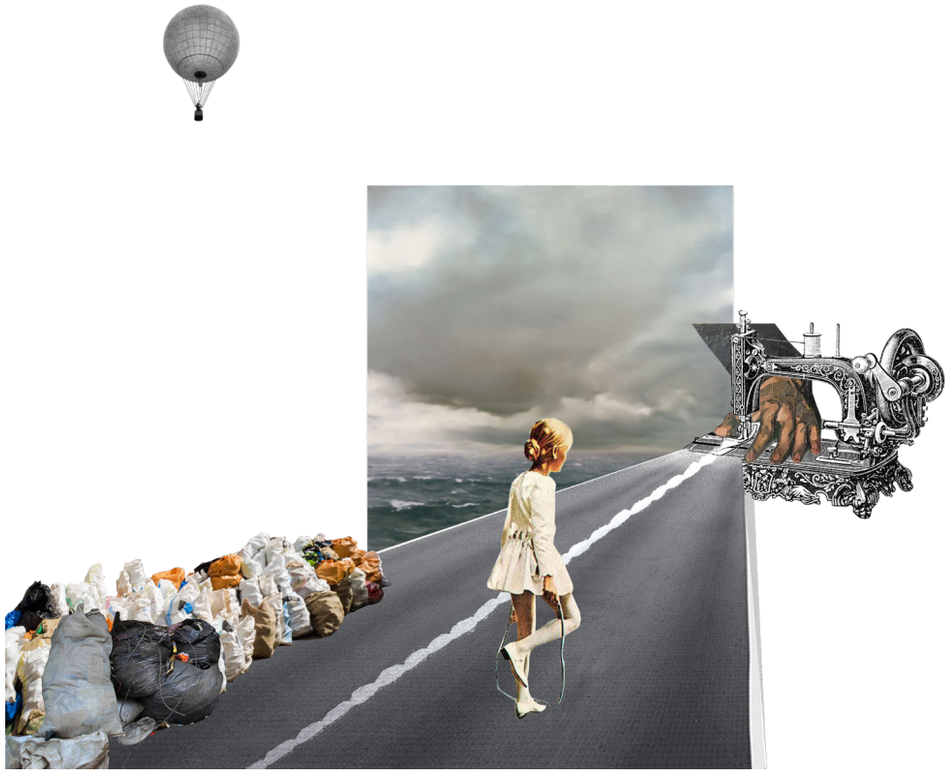

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This booklet acts as a written formulation of the work that has been followed throughout the graduation year at the Faculty of Architecture, TU Delft in the academic year of 2021-2022.

Within the chair of Complex Projects, the thesis has been focusing on the city of Beirut, and has been aiming to explore potentials for future development in its urban context. The process of the graduation started with an extensive, general research on the city, its culture, historical background, current challenges, as well as its urban setting. In order to be able work in a context with such a high level of complexity, the topic of research intended to be specified further. The particular theme of research that was chosen deals two urgent challenges. On the one hand, it confronts the issue of the waste crisis that Lebanon has been facing for multiple years now, without any future prospects. On the other hand, the thesis is also dealing with the decay and disappearance of the country's precious textile heritage which holds an essential cultural value for Lebanon.

Thorough investigations on these two topics, in combination with an extensive site analysis have finally led to an architectural design proposal for Beirut's coastline, which aims to encourage hope for its future development. A flagship experience center, advertising the innovation of up-cycling plastic waste into textile threads intends to become a new symbol for the city. The proposed intervention aims to promote and stimulate change through the example of Lebanon's revived textile industry.

The scope of research, as well as the final outcome of the design process that have been followed throughout the past year are described in this booklet.

RESEARCH PAPER

TRASH TO TREASURE

An investigation into how Beirut's waste can be turned into a valuable resource.

01

01 ABSTRACT

This research paper investigates how Beirut's unused waste can be turned into a valuable resource through the activation of Lebanon's heritage in textile making. Thus, the hypothesis of turning the country's plastic waste into textile threads in order to feed the sector with innovation and competitive qualities will be the key provider for this research.
This hypothesis is to be seen against the background of today's fragmented production network which is globally separated in time and space. The flagship store occupies a central position in this system. It embodies inspiration, encourages participation, and carries the responsibility to promote the company's identity. Therefore the extent to which a flagship store can perform in a social, cultural as well as an economical way in the center of Beirut shall be examined throughout the research and design process.

The conceptual framework is based on different theories that support the research in its different layers. Methods such as fieldwork, explorative interviews and case studies will expand the hypothesis with diverse knowledge.

Resulting, the research shall lead to outcomes which will be supportive in following design choices. The investigation into different layers of research intends to encourage design questions regarding urban positioning, materialization, concept, and desired image.

Key words:

- Waste Crisis
- Textile manufacturing
- Cultural Heritage
- Technological Innovation
- Fragmented Production
- Education
- Participation
- Flagship Store
- Circular Materials

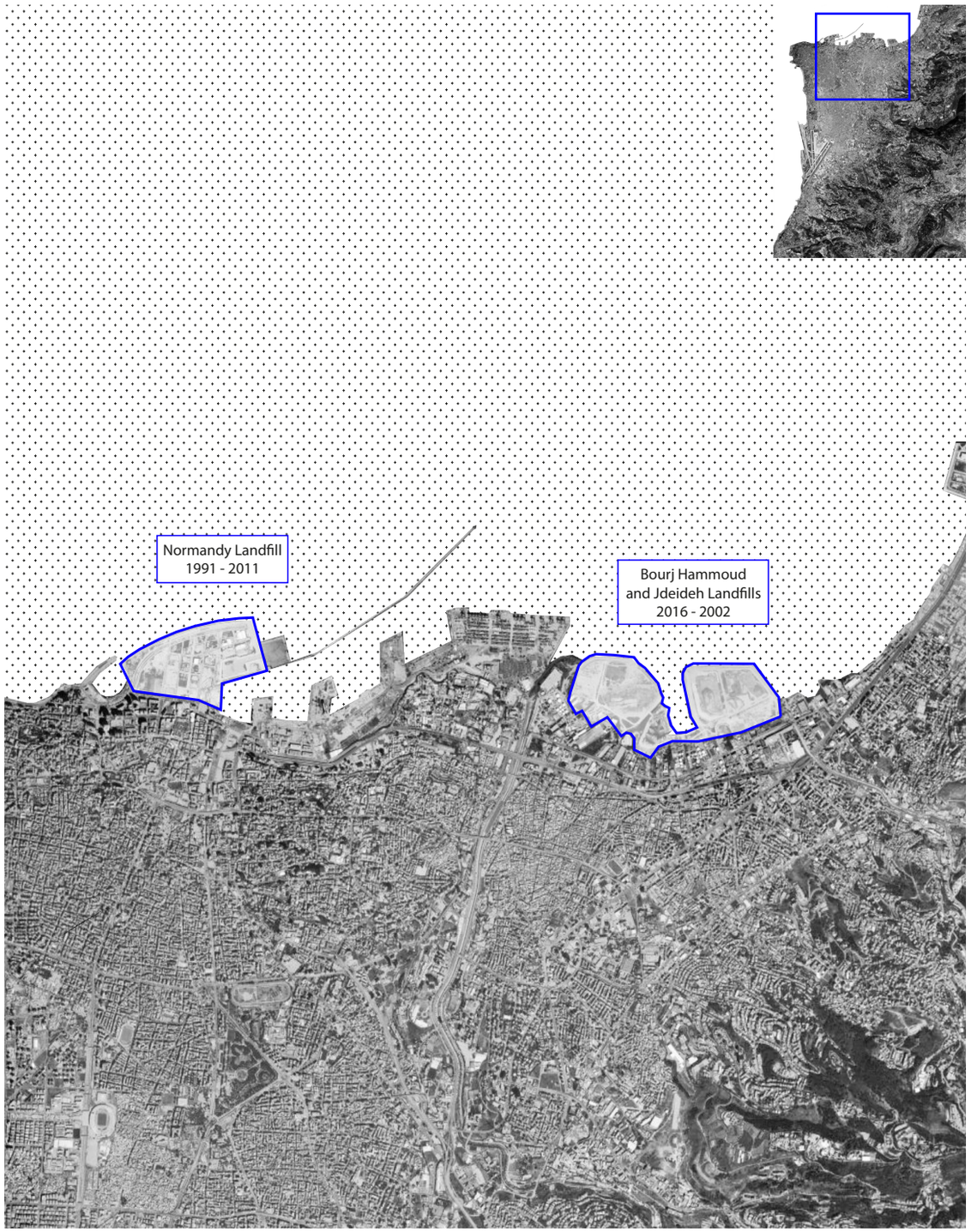

Figure 1. Map illustrating the location of two former landfills within the city of Beirut.

02 INTRODUCTION

Beirut has constantly been facing disastrous consequences of a collapsing waste management system, dating back to the beginning of the civil war in Lebanon (1975-1990). With most of the country's infrastructure damaged and a government unable to supply public services due to difficult socio-economic and political conditions, Beirut and many other areas in Lebanon have been left without waste management facilities for years (Boswall, 2019). With this volatile and unreliable system not seeing any development throughout the past decades, Lebanon's waste catastrophe has turned into an unheard call for help (HRW, 2017). Unauthorized landfills and incineration sites have become a common phenomenon near inhabited areas and are further adding to the gravity of the situation (K2P, 2015). The country is facing a severe waste crisis without prospects.

Within the context of the 2030 Agenda for Sustainable Development, waste management is becoming an increasingly important topic on a global scale (UN, 2015). Multiple countries have adopted alternative, environmental friendly waste management procedures such as source reduction, collection, recycling or composting, there is still no serious attempt for change visible in the case of Lebanon. Japan e.g. achieved a 84 percent decrease in landfills of industrial waste, while the resource productivity rate between 2000 and 2010 increased by 51 per cent, mainly due to political regulations, voluntary measures for industries and awareness-raising programs (UNEP, 2013).

In Israel, the closure of hundreds of unregulated garbage dumps and the following establishment of a small number of sanitary landfills made the amount of landfill waste drop 17 percent. Moreover, the introduction of recycling centers and a law mandating a deposit/refund on beverage containers supported the shift towards a more sustainable strategy and have turned into economic drivers (Di Maria, 2017).
A 2004 World Bank study on Lebanon showed that improved waste management practices, such as recycling and composting, could not only reduce ecological and health risks, but also save the State $74 million a year (HRW, 2020).

Plastic, making up for 11,5 percent of Lebanon's waste, illustrates one of the most environmentally harmful contributors and is yet the share with the biggest potential in economical value (GIZ 2014). By acknowledging this potential and understanding waste as a rich resource instead of a purposeless polluter, a new perspective for Lebanon can open up.

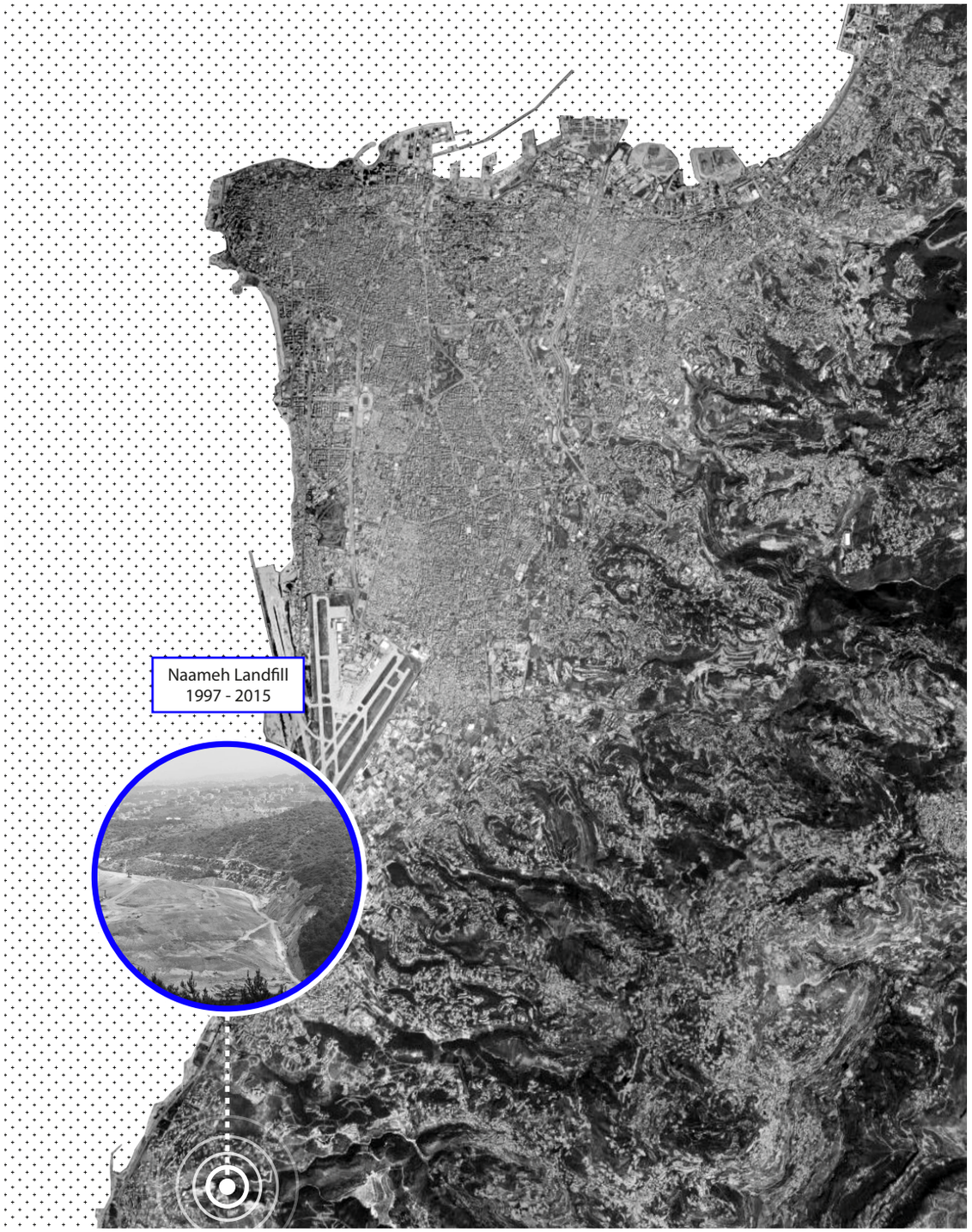

Figure 2. Map showing the proximate location of the Normandy Landfill to the city of Beirut.

02 2.1 PROBLEM STATEMENT

In Lebanon, waste is still considered as a dead-end scenario of a linear process. The preferred waste management method of landfills and dumpsites, accounting for 85 percent, reflects the country's perspective on waste solely seen as a valueless substance (HRW, 2020). It seems that even though landfilling is scientifically proven to be associated with serious human health risks as well as severe threats for the ecological system, Lebanon's government does neither realize the urgency, nor the opportunity of the situation (K2P, 2015).

Beirut has dumped its waste on landfills near the port before the country's civil war (1975-1990) already (Figure 1). Since then, the governmental failure for alternative long-lasting, environmental-friendly solutions has only exacerbated the situation and turned into a country-wide disaster.

The peak of Beirut's solid waste crisis was triggered by the closure of Naameh, the capital's main landfill, in July 2015, after years of protests by local residents (Figure 2). While government authorities refused to introduce any alternative waste disposal plan, Naameh's waste started to pile up in streets of Beirut - uncollected for weeks, festering in the summer heat for months. Protestors subsequently started a movement called #you stink which targeted the corrupt and dysfunctional political system for its failure to address the crisis - yet without any success (Pandey, 2020).

Despite the ongoing political and economic problems in the country, the wide-spread awareness across Beirut's population shown through the protests can be seen as a symbolic will for change. Altering the country's perspective on waste from a burden into a resource must be the first step towards exploiting the unused potential of Lebanon's huge amounts of waste. The shift towards alternative waste treatment methods through the activation of Lebanon's heritage and tradition in craft making can generate progress within the threatened manufacturing production sector.
Plastic, which embodies the most harmful proportion of all sorts of wastes, can offer a great opportunity for up-cycling into long-lasting, sustainable products. Therefore the association of waste with production can enable Lebanon's industrial sector to compete on a global level.

Since Lebanon's treasure of its local craft making tradition has been weakened significantly due to industrialization shifting its focus towards mass-production and the simultaneous rise of the global market, the sector is in urgent need for innovation in order to compete in today's world (FNS & TSF 2020). The textile industry, one of the oldest parts of the craft sector, is still greatly embedded in the collective memory. However, with the discovery of low-cost fabrics, Lebanon's silk enterprise became obsolete. This disappearance is not only a danger to a treasure of Lebanon's heritage, but also an underestimated and unexploited potential for its economical development. Thus, the hypothesis of turning the country's plastic waste into textile materials in order to feed the sector with innovation and competitive qualities will be the key provider for this research.

02 2.2 RESEARCH QUESTIONS

Lebanon's textile industry is one of the country's most precious crafts and is today still seen as an important part of the national cultural heritage. Even though the enterprise has become obsolete since the 1980s, Lebanon had enjoyed 2000 continuous years of prosperous silk production, being the most important economic driver during the Ottoman Empire (Mahdaw 2010). Hence, the history of Lebanon's textile industry does not only have a socio-cultural association, but also an economic tie. Feeding the threatened sector with the innovation of up-cycling plastic waste as a resource for textile threads can enhance Lebanon's competitiveness on the international market. The revolutionized sector aims to respond to global questions on ethics, sustainability and empowerment within the context of a knowledge based economy.

On a global scale, waves of technological innovation have constantly been changing the situation of production mechanisms and networks within the creative and cultural industries. These innovations are not only causing an expansion of the demand possibilities, but also an expansion of the production ones (Sacco, 2011). Thus, this transformation of audiences into practitioners can be seen as a huge potential in the context of Beirut's craft making sector as well. Open innovation as a catalyst for the revival of Lebanon's textile industry can further strengthen the relationship between cultural activity and the generation of economic and social value added.

In addition to the change of roles, today's modern industry is clearly fragmented in time and space. Production supply chains are distributed in many different locations, both on a national, as well as an international scale. Processes are simultaneously taking place in many locations, creating a metaphysical network across the whole country and further. Besides its industrial production sites, the specific case of recycling as an innovative implementation requests educational and informative institutions. These follow the purpose of educating the public, creating interest and transferring knowledge. The resulting participation and curiosity within the topic can positively affect the future of the industry. Since the city's waste crisis, as well as Lebanon's textile heritage is already closely linked to Beirut's local residents, public engagement offers a lot of possibilities in flourishing the sector.

Waste collection can locally be done as a means of bringing the active production closer to the public. However in order to sustain an efficient system, a strategic waste collection plan is required. This is asking for a fragmented spatial, as well as temporal distribution within the network.

A central role in this framentated network is occupied by the flagship store. By representing a universal power of inspiration for the public, it engages people and encourages active participation. The role as a physical display of possiblities, aspirations and ambitions turn the flagship store into an incentive institution. Furthermore, a flagship store has the role and responsibility to glocally promote its corporate identity and the cultural, ethical and local values of its enterprise. As a result of these key characteristics, flagship stores are usually located in prime urban places, which enable them to gain the most attention from the public.

Characteristic attributes such as the architectural representation, scale and operational feature of a flagship store are all important aspects that need to be determined. Therefore the investigation into the functionalism and philosophical concept of a flagship store in regard to Lebanon's modernized textile industry shall be examined. Can such a store act in an educational, communal, as well as a commercial way?

How can it encourage innovation, social cohesion, new entrepreneurship and local identity? How can the transformation process of turning waste into a resource be inspirational for design and possibly be incorporated and eventually reflected in the building?
The project aims to represent an inspiring example which is able to start a movement not only for Lebanon's textile industry, but also for many other cultural fields.

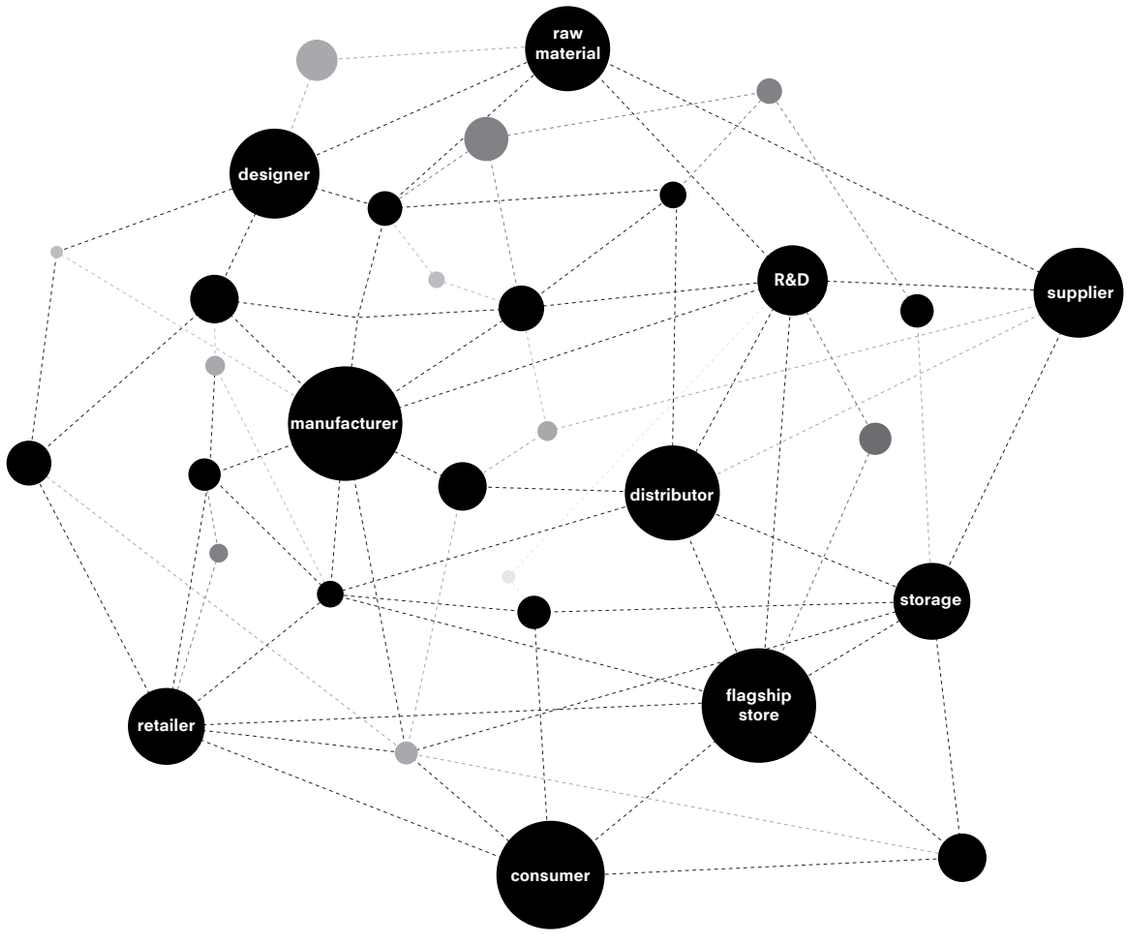

Figure 3. Interconnected stakeholders of a framentated modern Industry.

03 THEORETICAL FRAMEWORK

The conceptual framework is based on different theories that support the approach of a metabolic cycle and a flow model of goods and resources. Moreover, it includes theories about metaphysical heritage conservation in a modern world and Venturi's theory of complexity and contradiction in architecture.

The theory of Karma Konsa "Time and Space of Heritage Preservation: Conservation Theoretical Perspective" supports the concept of temporal values which are in the context of this research represented by the craft of textile making. According to Konsa, to build bridges between tradition and innovation is a method which enforces heritage. The preservation of non-material culture, which is made up of values and beliefs, social norms, and all kinds of symbolic systems (language, numbers, art), encompasses people's thoughts and behavior, their ideas, and all sorts of abstract entities, is the key guideline cultural and collective memory. It reflects on memory's relation to history and its social, cultural and political roles. Questions of history, memory and identity shall be risen and potentially be answered throughout the design process.

Following the theoretical approach of Hebel, Wisniewska and Heise in their publication "Building From Waste", there are two possible readings of waste: either to see it as the biggest polluter, following the traditional understanding of waste; or to see it as an enormous richness of resources. The latter perspective requires a different view of garbage production and is the one that will be followed throughout this research paper. By acknowledging the huge potential of waste and understanding waste as part of societies' wealth, a new scope of possibilities can open up. Once we start seeing waste as a gift, rather than a burden, it will start to be freed from its "pejorative stigma" and exploit its potential (Hebel, Wisniewska, Heise, 2014).

The theoretical position of relationships between industry (economy) and culture in a glocal world of empowered individuals is described by P. L. Sacco in his paper "Culture 3.0: A new perspective for the EU 2014-2020 structural funds programming" (Sacco, 2011). He describes the persisting gap in the conceptualization of the role of culture in an advanced, knowledge based economy. Sacco claims that we have entered an active cultural participation today, which is eventually reshaping our own social identity. Globalization has driven many enterprises towards change in their strategies. Not only the decentralized geographical distribution of manufacturing has altered but also the general approach and attitude towards a modern sector. There is a universal trend towards the creation of desire including principles such as ethics, hybridity, glocal, show-case, active participation, local making and empowerment. These values have gained more and more importance throughout the years and are becoming the manifesto of modern production.

In his book "Complexity and Contradiction in Architecture", Robert Venturi states his theoretical approach of complexity and contradiction in architecture based on the richness and ability of modern experience (Venturi, 1966). He encourages to welcome problems and further exploit uncertainties. This approach is aiming for a messy vitality as well as validity and duality.
"In an inclusive, rather than an exclusive kind of architecture there is room for the fragment, for contradiction, for improvisation, and for the tensions these produce (Venturi, 1966)".
In an attempt to translate this theory to today's context, the framework asks for the embrace of a multiplicity of problems, rather than focusing on a singular one.

Venturi's framework shall be a guidance for the following design in terms of it aiming for complexity and a need for a variety in visual, as well as conceptual experience. The urban positioning within the context of Beirut's city center, as well as the building program both ask for a richness of meaning and expression, and an architecture which includes "both-and" rather than exclude "either-or". The historical tradition of craft making, as well as a future oriented innovation ought to both give character and meaning to the building.

The "cradle to cradle" principle by William McDonough is another key guidance for this research. The framework was developed to introduce the idea that all materials used in the industrial and commercial production processes should be acknowledged as constituents of a continual circular growing process (McDonough & Braungart, 1958). It is explained how products can be designed so that, after their useful lives, they will provide nourishment for something new.
In addition to this theory, case studies will be analyzed in regard to their choice of materials and their origin. Which lifecycle have they gone through? Where do they come from? How is the ecological footprint defined?

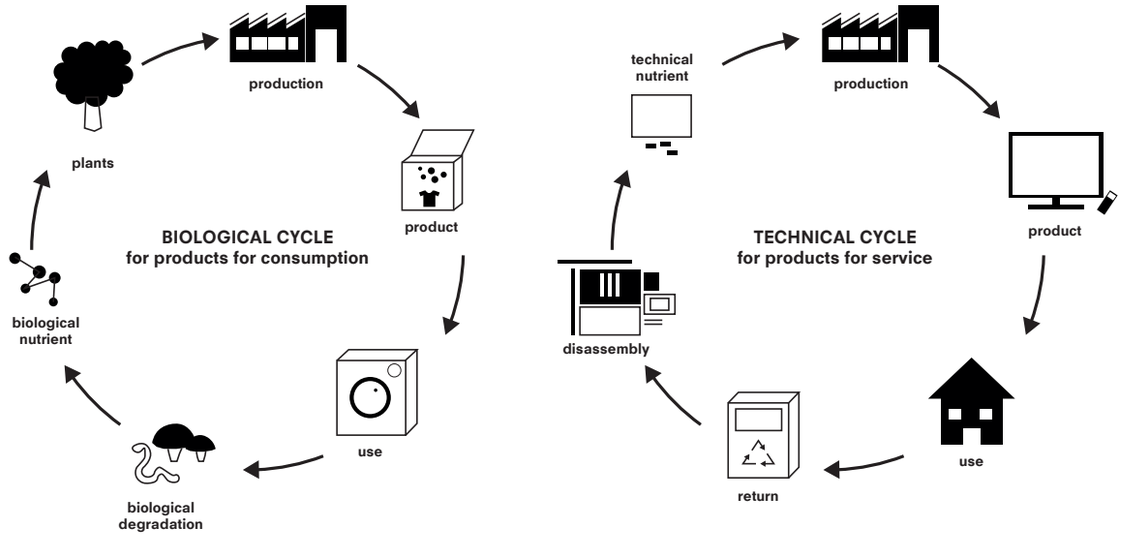

Figure 4. Cradle to Cradle Diagram showing the biological & technical cycle.

04 METHODOLOGICAL POSITIONING

Fieldwork
The fieldwork methodology for this thesis is oriented towards complementing the theoretical framework and answering the posed research questions. The research follows a qualitative approach to data collection, mainly based on non-participant observations, mapping, field documentation, collection of previously published research, (archival) literature review, online resources, image analysis and the analysis of relevant precedents and practices. Literature and online resources will support further investigations on an urban, as well as a historical layer.

Field research will limit itself to the site of Beirut's corniche and its proximate surrounding area. It will therefore represent information on a site layer. Traces of waste will be mapped along the corniche of Beirut, according to their age, their type, their size and their condition. This will make the project closely related to its context and shall furthermore lead to plausible assumptions on how these specific kinds of waste can be used for the upcycling process, (what is the percentage of plastic waste) and what type of end-product they can potentially embody as building materials. This process shall then be linked back to the theoretical framework of the "cradle-to-cradle" principle.

In addition to this, old silk industries in the closer context of Beirut will be analyzed and re-drawn in order to understand their functionalism. They shall support the following design decisions in terms of strategic production layouts, as well as their representation of a collective memory.

Explorative Interviews
Explorative interviews will help to close the gap between the designers' perception and the inhabitants', users' perception. They shall elaborate on personal concerns of Beirut's residents regarding the waste crisis. What are conceivable solutions that can be approached even without governmental support? What are the desires of the local public? These interviews aim to be conducive for the assessment on the current attitude of Beirut's residents towards a modern shift within the heritage craft sector. Is there a common sense on need for innovation?
A supplementary elaboration on the site's historical importance, its character, its specific cultural and social activities shall point out possible potentials that it carries.
Further on, interviews with textile company owners will assess the current situation of textile production in Lebanon. Is there a will for change? What are main values to keep and revive?

Case studies
Case studies will support the research through a comparison of strategies. This will serve two separate goals. One is the analysis of materials and their use in relation to their location. The other goal represents the strategy of the plan layout of projects representing similarity in relation to function, program and contextual location. Through the methods of re-drawing, re-modeling and abstracting existing plans, a better understanding of those concepts shall be achieved. Moreover, the production process of upcycling from plastic to threads will be further assessed through the investigation of pilot projects. Which machines are needed? What is the scale? What is the duration of the process?

05 PURSUED OUTCOMES

This research plan aims to investigate new ways of how to modernize Lebanon's endangered textile industry as well as setting new milestones of innovative building materials by raising awareness. Both goals are linked to the same strategy: Creating value from unused waste for „new" materials. Innovation within Lebanon's textile manufacturing will work against the industry's decline. The underestimated and unexploited potential for its economical development, as well as its importance for Lebanon's heritage could both be positively influenced by progressive thinking and attempts for innovation. Opening up towards modern ways of production and adapting to the global trend of fair trade, ethical consumption, sustainability, handicraft and products that carry a story can be supported through the use of recycled materials and therefore representing a completely different approach.

The long standing history of the textile manufacturing, its collective memory, skillful labors and its sentimental connection to Lebanon's population paired with the innovation of up-cycling can serve as a catalyst to revitalize Lebanon's textile industry. The project shall exemplify a pilot project that acts as an inspiration and encouragement for others.

The study on case studies can act as a 'library' of possibilities in terms of circular architecture. (What) are the(re) limitations to reused/recycled building materials? What are the possibilities? But also, what is the architectural expression of such materials, what atmosphere is hereby created, how do they interact with their natural/urban surroundings. Therefore, the research shall underpin the architectural articulation of circularity in terms of materialization.

The reference of case studies will furthermore help to develop a building program and to understand scales and proportions of functions and spatial organization. Comparisons will lead to a better understanding of needs and demands for the specific case of Beirut.

Thorough research on the location at the Corniche of Beirut aims to investigate context-specific characteristics in terms of social, historical, as well as cultural values. These will form a base for the following design decisions.
Analyzing the different urban layers of Beirut's waterfront with its strengths, as well as its weaknesses shall help to find the correct positioning and architectural expression within the urban context.
Evaluating the historical evolution of the location will further guide the understanding of urban patterns, social ties and ecological changes.

The research shall eventually support the design process for a project which responds to its genius loci in a sensitive, respectful and appropriate way. The project shall further represent the values of Lebanon's heritage and culture of craft making, while simultaneously reflecting its potential for change in a modern way of industry.
The project design needs to reflect an equivalent of the modern production network and shall therefore carry the same values, such as transparency, participation, encouragement, inspiration and innovation.

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6.1 FIGURES

Figure 1: created by author
Figure 2: Adapted from: https://massispost. com/2020/06/bourj-hammoudslandfill-crises/ 2020 June 12].
Figure 3: created by author
Figure 4: Adapted from: https://epea.com/nl/en/about-us/cradle-to-cradle

PROJECT INTRODUCTION

HOUSE OF TEXTILES

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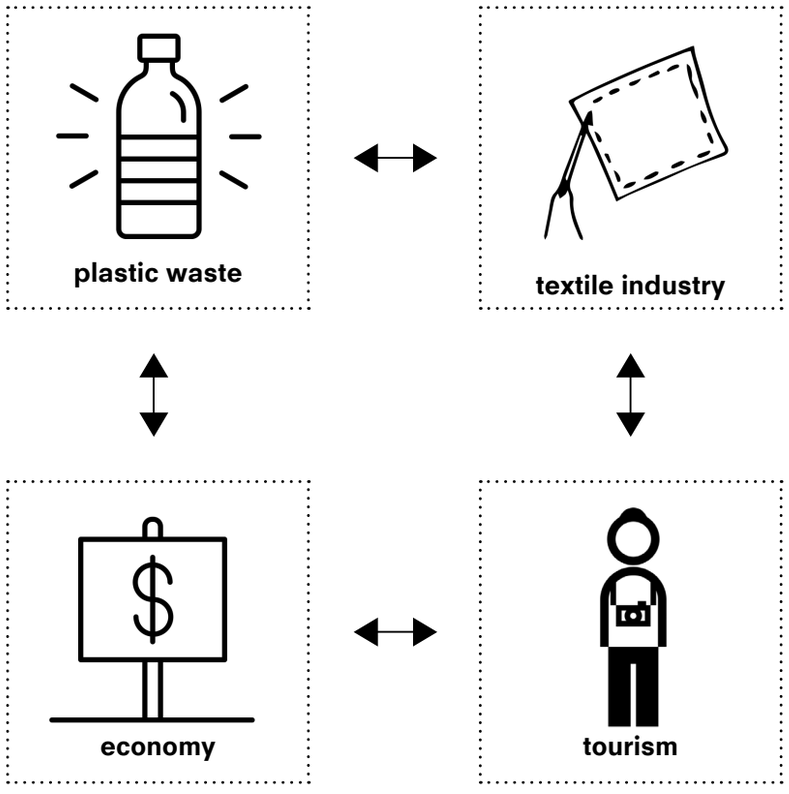


02 2.0 RESEARCH SUMMARY

Beirut has constantly been facing disastrous consequences of a collapsing waste management system, dating back to the beginning of the civil war in Lebanon (1975-1990). The country has been left without waste management facilities for years, leading to a severe waste crisis without prospects. While multiple countries have adopted alternative, environmental friendly waste management procedures such as source reduction, collection, recycling or composting, there is still no serious attempt for change visible in the case of Lebanon. A 2004 World Bank study on Lebanon showed that improved waste management practices, such as recycling and composting, could not only reduce ecological and health risks, but also save the State $74 million a year (HRW, 2020).

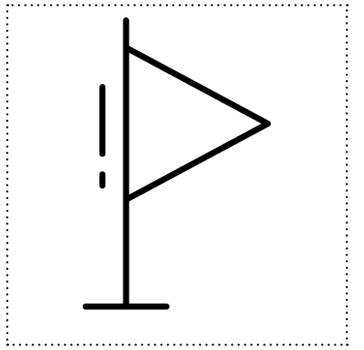
Plastic, making up for 11,5 percent of Lebanon's waste, illustrates one of the most environmentally harmful contributors and is yet the share with the biggest potential in economical value (GIZ 2014). By acknowledging this potential and understanding waste as a rich resource instead of a purposeless polluter, a new perspective for Lebanon can open up. However at this moment, waste is still considered as a dead-end scenario of a linear process in Lebanon. The preferred waste management method of landfills and dumpsites reflects the country's perspective on waste solely seen as a valueless substance (HRW, 2020).

Despite the ongoing political and economic problems in the country, the wide-spread awareness across Beirut's population shown through many protests can be seen as a symbolic will for change. Altering the country's perspective on waste from a burden into a resource must be the first step towards exploiting the unused potential of Lebanon's huge amounts of waste.

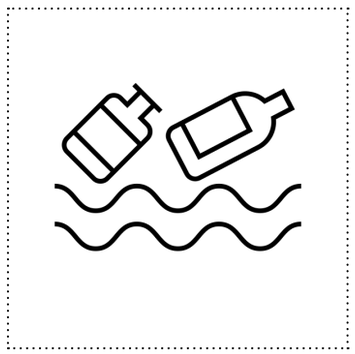
Plastic, which embodies the most harmful proportion of all sorts of wastes, can offer a great opportunity for up-cycling into long-lasting, sustainable products. Therefore the association of waste with production can enable Lebanon's industrial sector to compete on a global level.

Since Lebanon's treasure of its local craft making tradition has been weakened significantly due to industrialization shifting its focus towards mass-production and the simultaneous rise of the global market, the sector is in urgent need for innovation in order to compete in today's world (FNS & TSF 2020). The textile industry, one of the oldest parts of the craft sector, is still greatly embedded in the collective memory. However, with the discovery of low-cost fabrics, Lebanon's silk enterprise became obsolete. This disappearance is not only a danger to a treasure of Lebanon's heritage, but also an underestimated and unexploited potential for its economical development. Thus, the hypothesis of turning the country's plastic waste into textile materials in order to feed the sector with innovation and competitive qualities has been the key provider for the thesis' research.

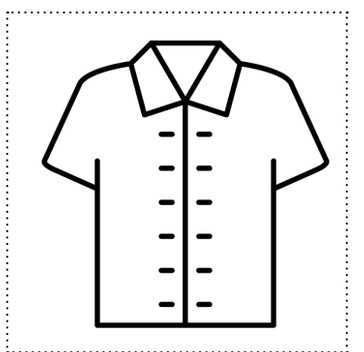
Ill. 1 Symbiotic Cycle of Benefits



FLAGSHIP EXPERIENCE CENTER



WASTE AS A RESOURCE



TEXTILE INDUSTRY

02 2.1 AMBITIONS

The project 'House of Textiles' investigates the extent to which an architectural intervention is capable of giving hope, inspiration and encouraging innovation to a challenged place like Beirut. The project explores different ways of representing these assets through its architectural language and expression. Its significance for Lebanon's textile production, the country's waste crisis, as well as social and economic prospects is asking for an iconic landmark, which represents the building's identity. The resulting building type of a flagship experience center is the only one which can fulfill all those demands as it represents the most important, symbolic and evocative actor of today's production network.

The formulation of these aspects in an architectural way is explored through spatial concepts that support their requirements. Strong visibility, accessibility, representation and adaptability are being tested in different layers. These aspects form the most important ingredients of the project. The question of how a building can represent the same level of innovation and development, as the proposed change in Lebanon's textile industry has guided the design process. Therefore the project itself aims to integrate innovative, smart solutions in the building design.

The main ambition of the project is to design a flagship experience center for the city of Beirut, which advertises the perception on waste as a resource through the reactivation of Lebanon's textile industry.
Advertising the process of upcycling plastic waste into threads shall not only help to raise people's awareness on the unexploited value of waste, but also re-establish the importance, presence, and value of Lebanon's textile heritage. This will offer an alternative to Lebanon's currently preferred waste management strategy of landfilling, as well as simultaneously open up new potentials for the revival of Lebanon's textile industry in the future. Thus, the project intends to propose a solution, which turns both challenges into one opportunity by providing a symbiotic cycle of benefits (Ill.1).

As a flagship experience center, the project holds a key role as the most representative actor within a fragmented production network, where many processes are happening simultaneously. It is the only fragment which has the opportunity to provide hope for future developments in Beirut, to encourage inspiration in an educative way, which can motivate other similar movements and innovations, and to serve as a new attraction node for the city, while simultaneously acting as an economic driver due to its touristic aspects.

Therefore, the following design aims to illustrate an architectural language which expresses and symbolizes innovation, education, participation, as well as traditional values of Lebanon's textile industry.

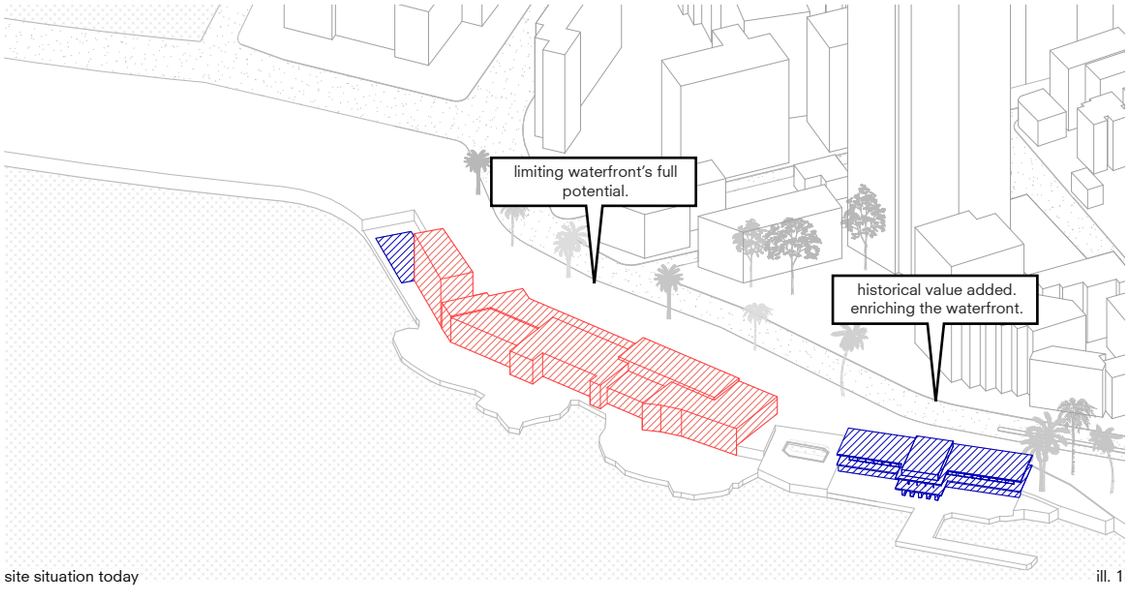
02

Since the project should embody an exemplary intervention which could possibly also function in other countries that find themselves in similar situations compared to Lebanon, The United Nations Industrial Development Organization proves as a potential client. The organization has funded Lebanon's textile industry in earlier years already, represents an alignment with its goals and is strongly supporting innovation within industrial development on a global scale.
The flagship experience center will eventually be used by a collaboration of several different parties that are only together able to provide the required know-how for textile making, recycling production as well as Research & Design aspects.

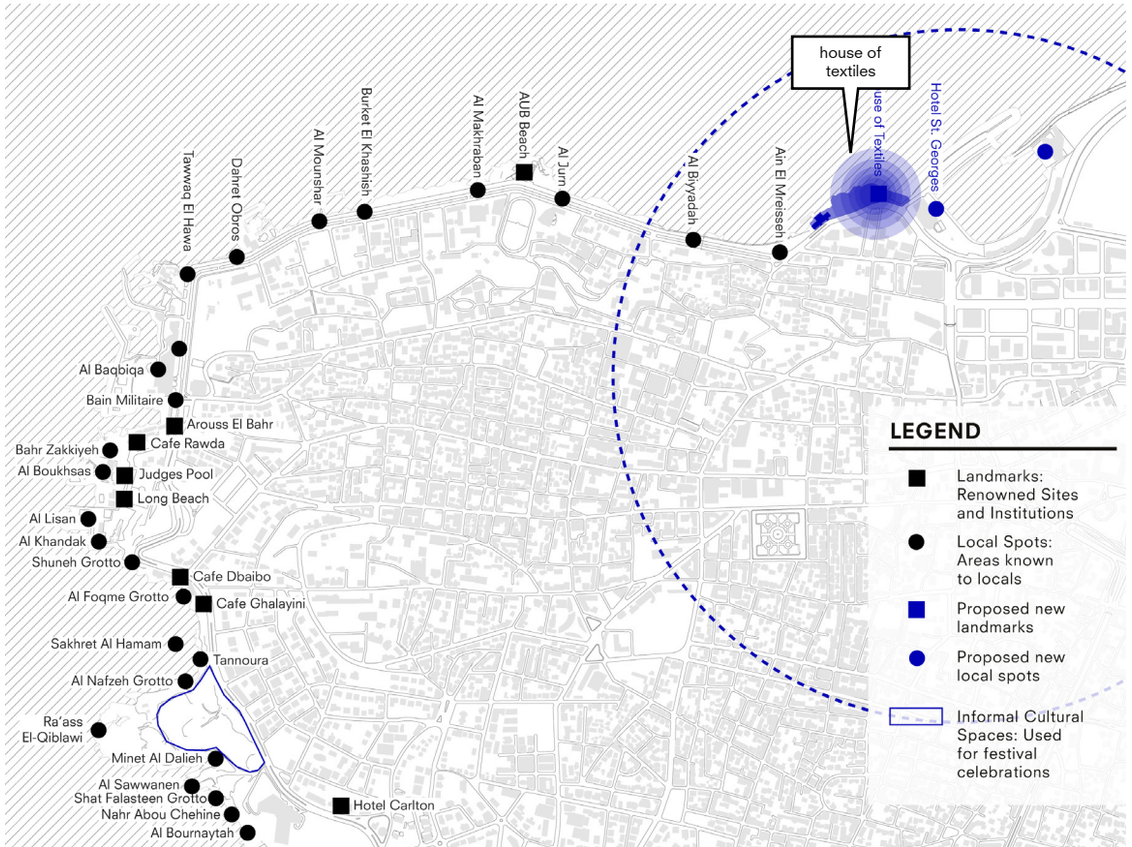
One of these actors is the Mzannar family's business, who used to own a 300-year-old textile factory in Beirut. Yet, due to the ongoing financial crisis the factory had to close its doors in 2020, leaving the traditional factory in an abandoned state. The family is today inheriting a small shop which barely serves as an income. Therefore, introducing the use of recycled threads to the family's business can embody a progressive step, which is obedient with a global trend for ethical production and consumption as well as sustainability desires.
The second user is represented by replast, a local waste recycling company from Beirut. The company has been focusing on new technologies within the recycling business for several years now and represents the most important recycling company in the area.

To finally add the required research, design and innovation to the process, two Universities will support the Design (The Creative Space Beirut School of Design), as well as engineering aspects (The Lebanese American University, School of Engineering). As Universities, they are closely linked to ongoing research innovations on a global scale which can further benefit the new production.

On an urban scale, the building intends to act as a new touristic, as well as local attraction node for the city of Beirut. On the one hand, tourists will visit the project on a temporary basis and act as the main economic driver. On the other hand, locals shall use the building more frequently on a daily/weekly basis and take advantage of the great variety of jobs offered, as well as its potential in becoming a communal meeting spot for residents.



site situation today ill. 1



landmark array along beirut's coastline ill. 2

02 2.2 DESIGN BRIEF

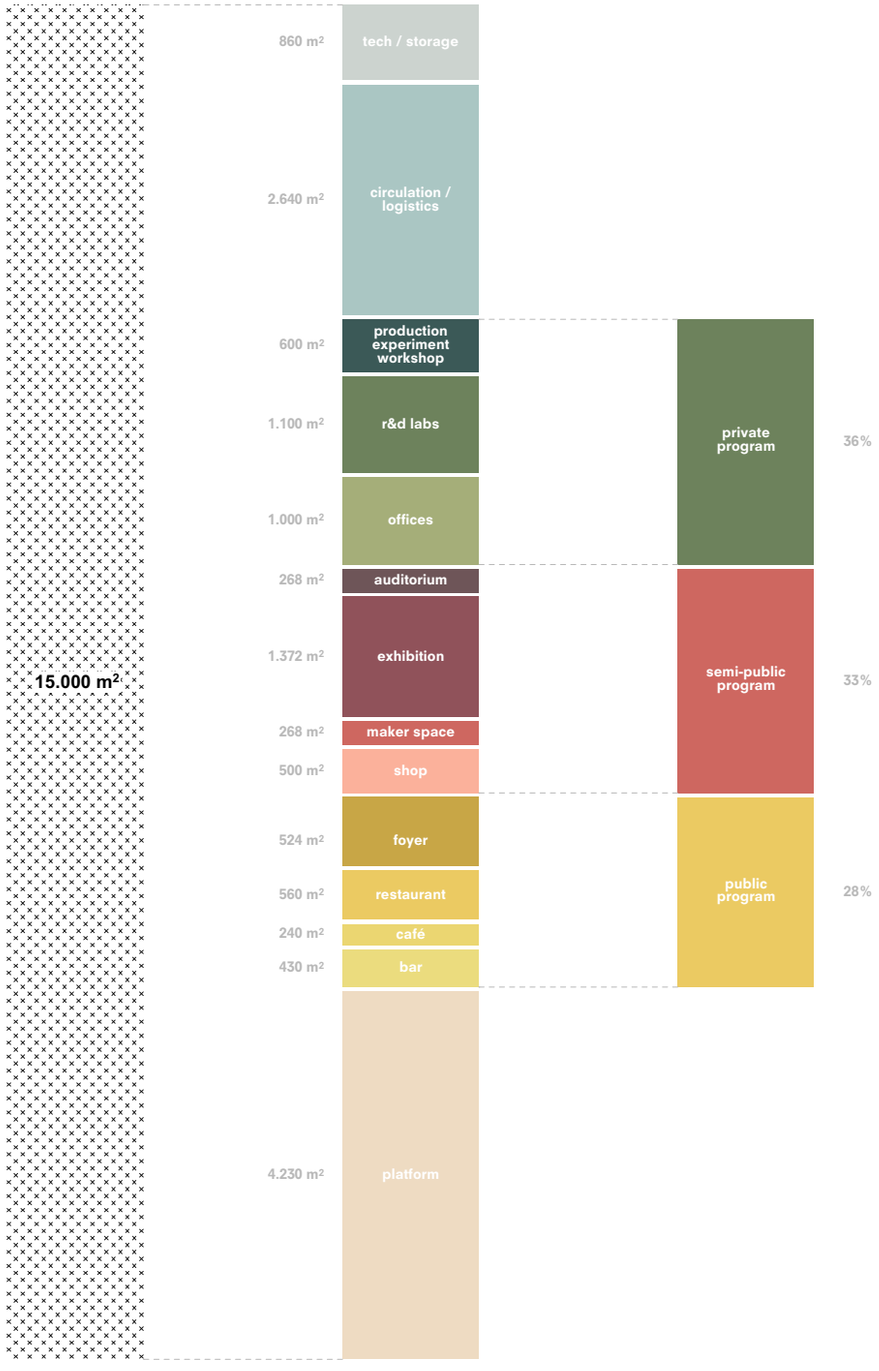
The design brief defined guidelines and requirements regarding the site, the project's ambitions, its program and the desired materialization.

The project aims to create an antithesis to the current urban trends along the coastline. The newly proposed intervention intends to enable an open, accessible, and vibrant coastline for Beirut. It shall act as an exemplary project which visualizes the waterfront's quality, brings back awareness of its significance, and re-establishes the waterfront as the most important asset for the city. Thus, the proposal suggests to open up the site and create a continuous and accessible space for the public, connecting sea and city. To achieve this permeability, the cluster of buildings currently blocking the site is proposed to be demolished. The historically valuable elements on site, such as the existing Maison de l'Artisan and the old Palestinian Ladies' pool, are to be kept and restored.

In addition to this, the design brief defines a re-connection of the city and the waterfront through the reaction and extension of a historically important axis. Through the enforcement of this axis, the two, currently fragmented elements of the city are reconnected and are once again enabled to benefit from each other. The new building itself aims to act as a physical extension of this axis and continue into the sea. Hereby, the building obtains an important visibility, enables large spaces for surrounding public use, as well as creates a dialogue with the water by strictly orienting itself toward the sea. The historical axis becomes a new importance and acts as an essential urban connector.

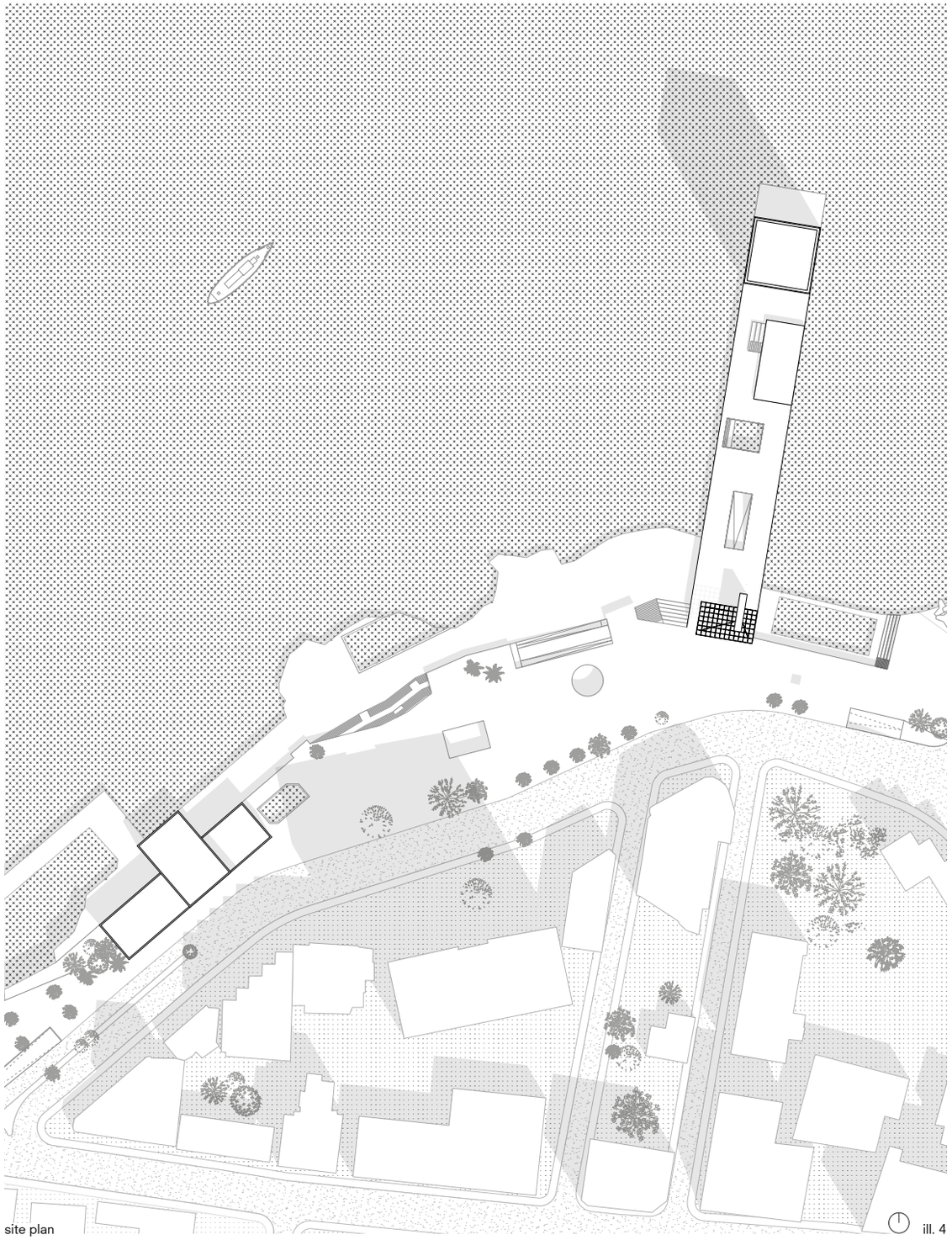
Moreover, the project intends to act as a new coastal landmark for the city of Beirut. The building's proposed function, as well as an urban need for reactivation of the coast both ask for a high level of visibility, attention, and a point of reference. The building's representation as a landmark can further act as an encouragement and inspiration for other implementations along the coastline that further activate the seaside. This spread could eventually trigger a continuation of the current array of landmarks, which is now abruptly stopping at the Eastern end of the Corniche. Following this concept, the flagship experience center holds an important role in acting as an exemplary intervention which proposes urban activation and public invitation.

In order to be able to function as a new landmark for the city, to act as a point of reference, as well as to attract its required attention, the flagship experience center asks for a high level of visibility on an urban layer. This prominence is intended to be achieved through a vertical structure on site, which inherits public program and thereby allows access to everyone. This shall function as a critical reaction to the real estate speculation along Beirut's coastline. Today, a wall of highly expensive high-rise buildings meandering around the coast excludes the public from experiencing the sea from high up. Through the implementation of a publicly accessible vertical structure, the views on the sea and the coastline are not only granted to the very few who can afford it, but to anyone who wishes to enjoy it.



Moreover, the design brief also states a guidance for the project's program. This program results from a thorough research on case studies, as well as an analysis on the building's requirements. Multiple projects were analyzed in regards to different aspects, such as routing, spatial scaling, relationships, inventory etc. Since the project intends to offer a multiplicity of programatic aspects, a variation of case studies was examined. The most influential references for the project's typology as a flagship center though, were the House of Chocolate for Lindt in Zurich and the Guinness House in Dublin.

This study has eventually led to the fixed program which consists out of three main part: a public, semi-public, and a private part. The fully public part includes all exterior, public spaces such as a platform/ pier, and a bar, a café, and a restaurant. All these functions are supposed to be detached form the rest of the program and work independently.
The semi-public part is defined through optional ticket/entrance requirements, that may split the fully public layer, from this semi-public layer. It includes most of the program of the actual flagship experience center, which consists out of a flagship store, a participative maker space, multiple different exhibition spaces, and an educative auditorium.
As a third part, the fully private part is only accessible to the workers of the building. Several different office spaces, investigative research and design labs, as well as a production experiment workshop can be found here.
All these spaces together make up for the whole composition, which adds up to around 15.000m² in total.



site plan ill. 4

2.3 SITE CHOICE

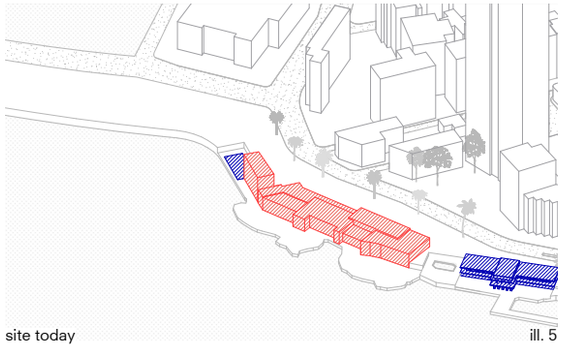
The project is situated in the North of Beirut's city center, right at the waterfront. The location illustrates a dominant node for the city, as it forms the Eastern ending point of the Corniche - Beirut's most important and most vibrant public space. Moreover, the site's prominence is emphasized through its proximity to the water, its surrounding infrastructural nodes, as well as its historical significance.

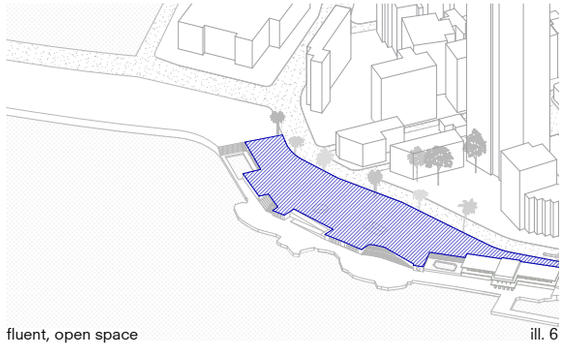
Within the background of the city center as the only part of the city where significant historical value is still present, the site represents a symbolic choice of rediscovery for Beirut. It embodies hope for future change through its continuation of events in time. The site's collective memory indicates a desire for advancement. The flagship experience center continues the evolution of Beirut's history through a new chapter of hope for the city: the rediscovery of its coastline, and the revitalization of its textile industry. As the Lebanese industry is reviving its textile manufacturing capabilities, the city is simultaneously rediscovering its waterfront. With both the coastline and the textile industry representing cultural and historical assets for Beirut, the site becomes the connecting core and a symbolic representation of progress.

historical timeline beirut ill. 3

PROJECT DESCRIPTION

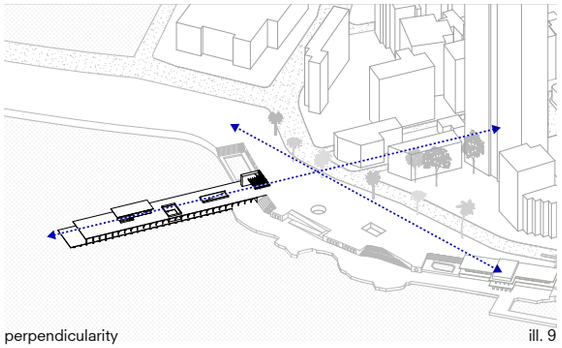
03

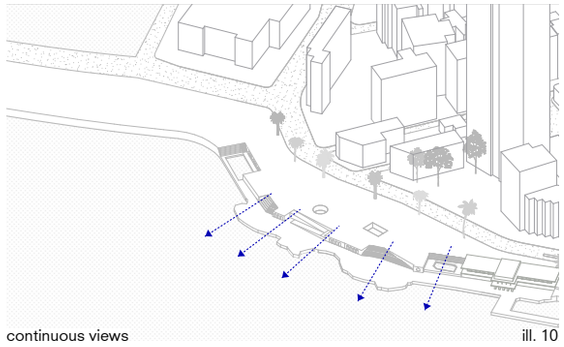

site today ill. 5

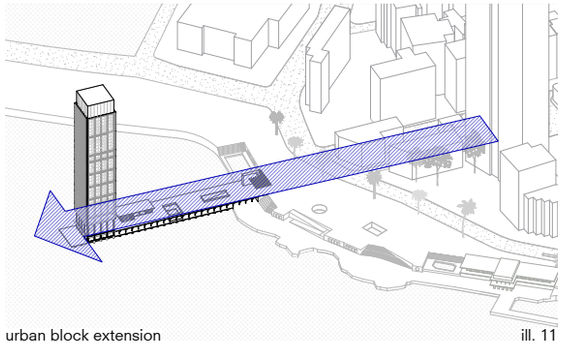

fluent, open space ill. 6

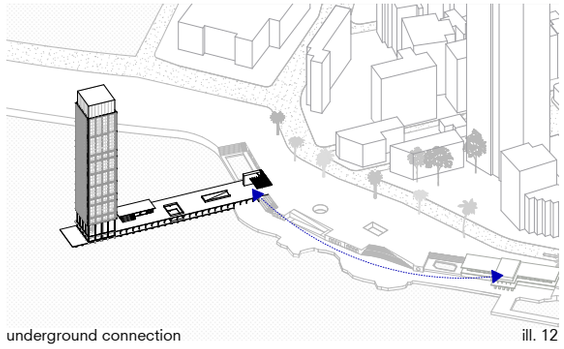

fragmented coastline today ill. 7


continuous coastline ill. 8


perpendicularity ill. 9


continuous views ill. 10


urban block extension ill. 11


underground connection ill. 12

03 PROJECT DESCRIPTION

The design has three main conceptual ambitions: improving the accessibility of Beirut's waterfront, creating a new landmark for the city's coastline, and reconnecting the city center with the coastline. As a response to these ambitions, the project is composed of different fragments that react to the conceptual desires in different ways.

In order to achieve a more accessible coastline, the design proposes a demolition of the current block of buildings on the east of the site as this physical obstruction is currently limiting the waterfront's full potential. The demolition allows a fluid space to open up towards the water, activating a new continuity from the city towards the sea (ill. 6). The coastline can herewith not only be visibly perceived, but also physically experienced with the newly accessible waterfront.

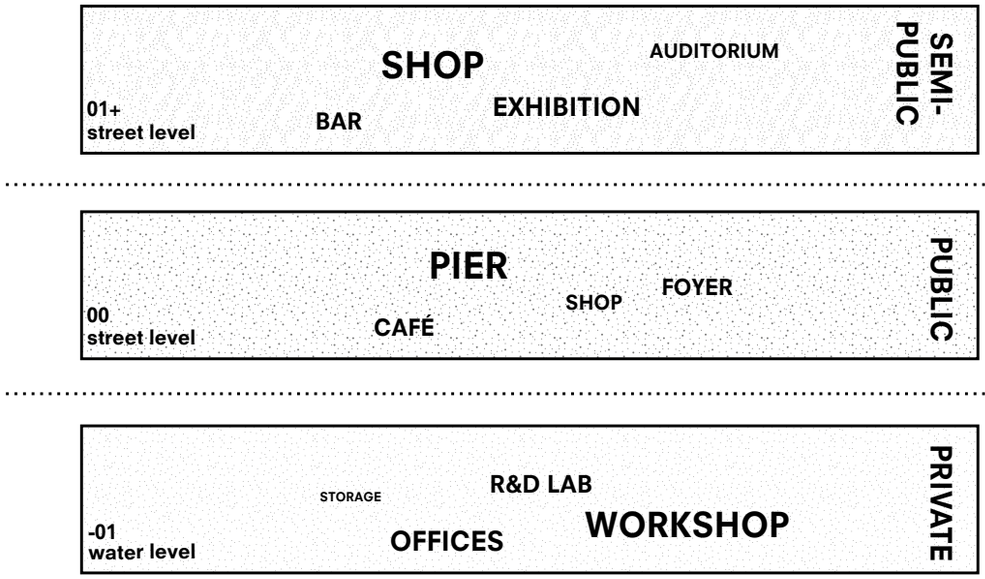
This experience is further reinforced by a separation of the public space into two layers: a street level and a water level; with both offering a different value and atmosphere. The street level acts as a public and open space, while the water level offers a more private and intimate atmosphere, directly linked to the sea access (Ill. 7+8).

In order to assure these qualities, the design proses a strategic approach of perpendicularity to the coastline's orientation. As a consequence, the project is articulated as a pier structure that is covering only a small part of the coastline, and leaves most parts open to the public (Ill. 9). This strategy of perpendicularity shall act as an exemplary approach to Beirut's waterfront development. The position of the perpendicularly oriented pier evolves from the reaction to a historically important axis which has been described in the design brief. The ambition of re-establishing this once crucial connection between the city and the coast shall be achieved through an extension of this axis. Hereby, the street acting as a physical connector shall regain its significance for both essential parts of Beirut, the city center and its waterfront.

The whole pier itself acts as an extension of the existing urban block to achieve a well integrated urban implementation (Ill. 11). The continuation of the urban pattern into the sea represents another connection between the city and the water and stitches the two fragments together.

This connectivity is not only established on an urban layer, but also on an architectural layer. The existing building 'La Maison de l'Artisan' is connected to the newly added building through an underground part, that is caved into the coastline (Ill. 12). Therefore a continuous movement is generated on all levels.

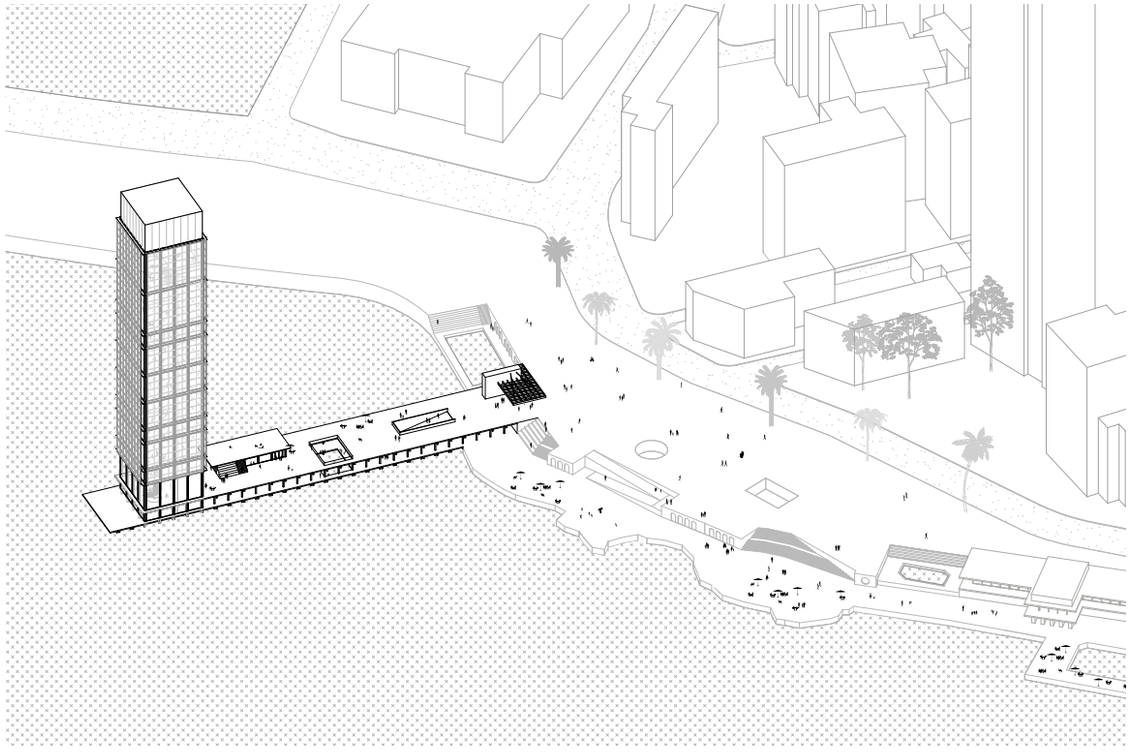
To achieve the required layer of visibility, which results from a previous analysis on the site, as well as the project's program, a tower is proposed at the end of the pier, representing the end point of the public pathway (Ill. 8). This tower carries a symbolic meaning for Beirut's coastline, as well as Lebanon's revived textile industry. Both ask for an iconic, representative and visible presence. Therefore, the tower is placed at the nexus of the two most important view axes - from the Corniche, and from Zaytunay Bay. As the only publicly accessible high point of Beirut's coastline, it acts as a critical antidote to the private real estate speculation that has been going on in the past few years.



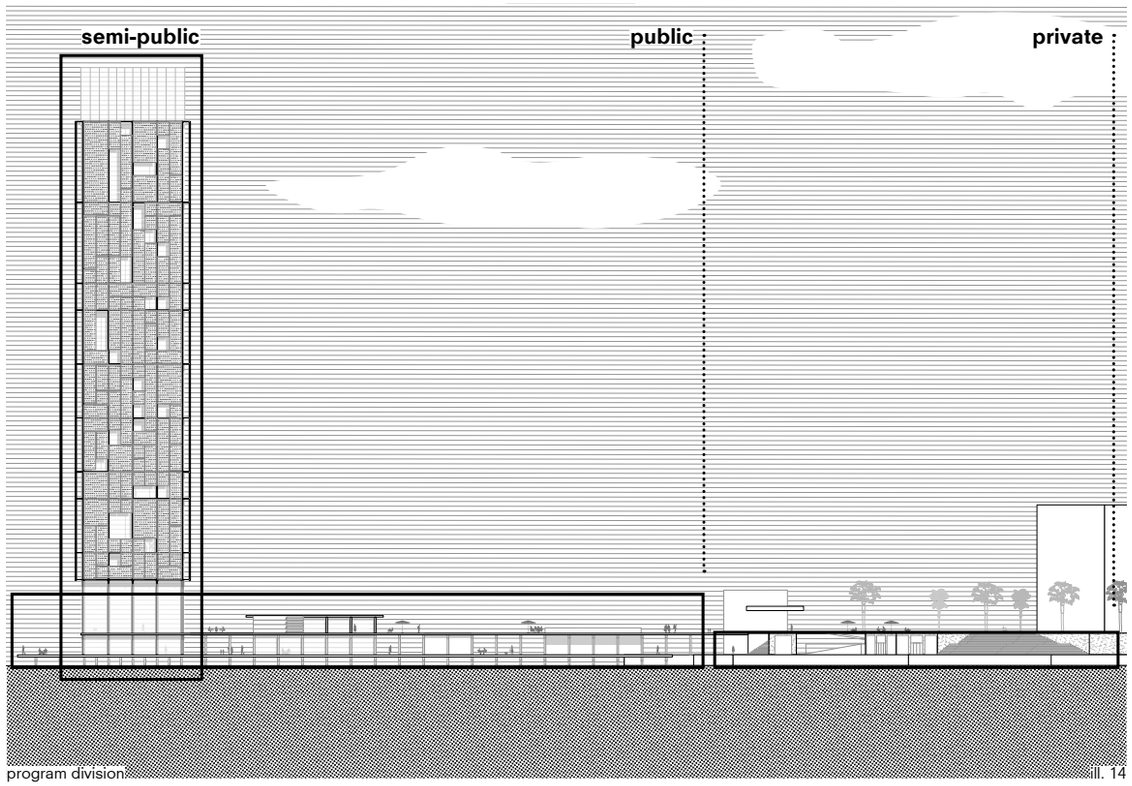
3.0 CONCEPT

The project includes a variety of programatic aspects, that are divided into public, semi-public and private parts. The building formulates this division strictly into three fragments which follow the given site layers. This results in the ground floor level being the most public, the -01 coast / water level containing the private program, and the remaining semi-public functions being integrated in the +01 levels of the tower at the end of the pier.

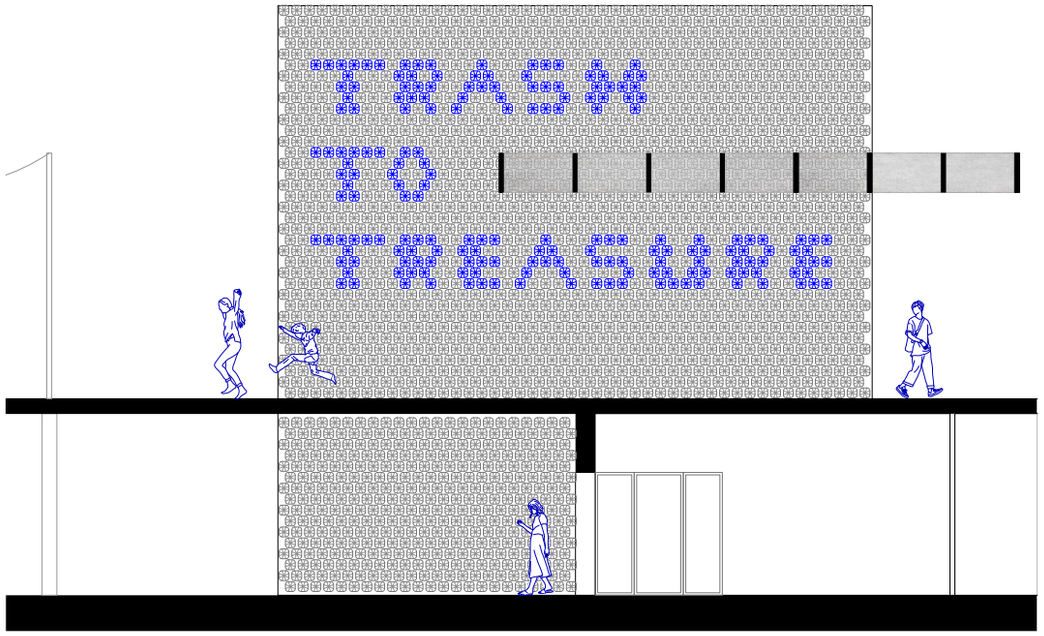
Following the program's translation, the building can be split into three main fragments - a private part caved into the coastline's topography, a public pier, and a vertical tower.

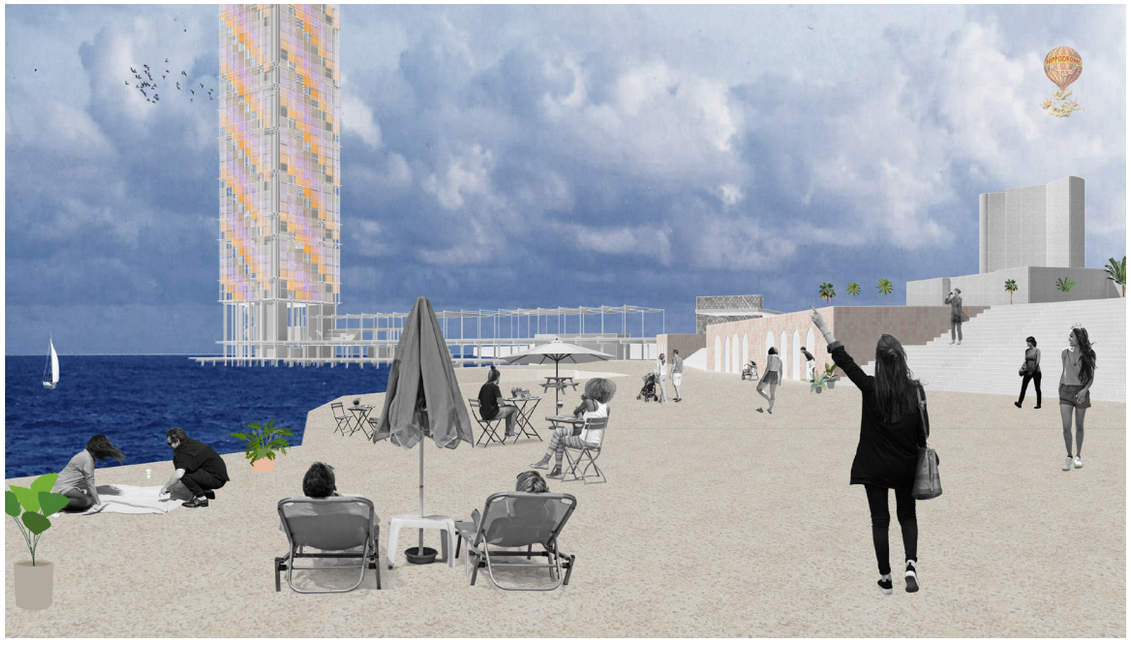


isometric view ill. 13



program division ill. 14

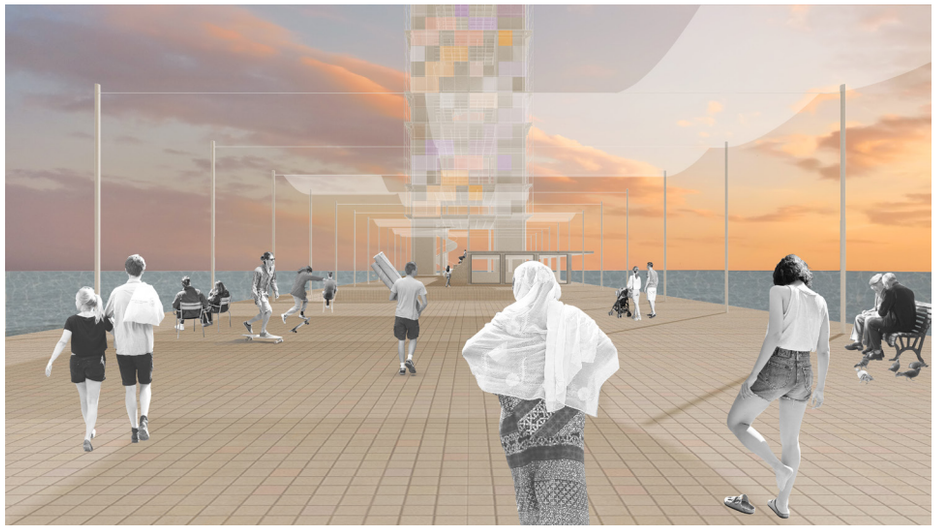




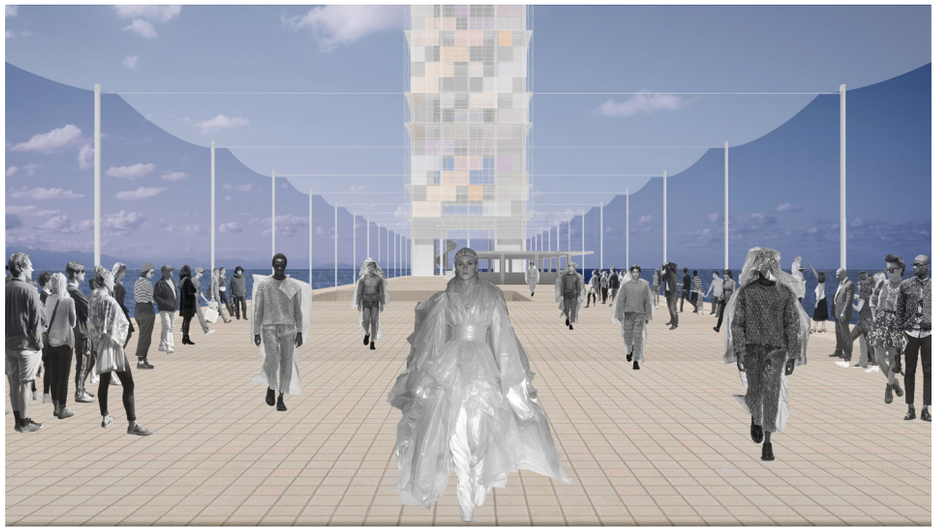
03 3.1 COAST LAYER

The private part of the program is translated into the caved in, underground layer of the coast. It is only visible from the water level and completely hidden from the public on the street level. Decisively placed look-out points in the coast's new facade enable a dialogue between the in- and the outside. They furthermore allow the public to observe the processes that are happening inside, and to create a certain level of curiosity for these.

Multiple research & design labs and offices for the further development of the revived textile industry are placed here. Additionally a workshop, run by the workers, can open up to the public occasionally in order to make the process of up-cycling more participative. Visitors can make use of the space and become familiar with the procedure. This shall encourage a bottom-up concept for the coast's materialization. Visitors or people that use the building on a regular basis can create their own items / materials and herewith appropriate the surrounding space.



morning scenario



midday scenario

night scenario

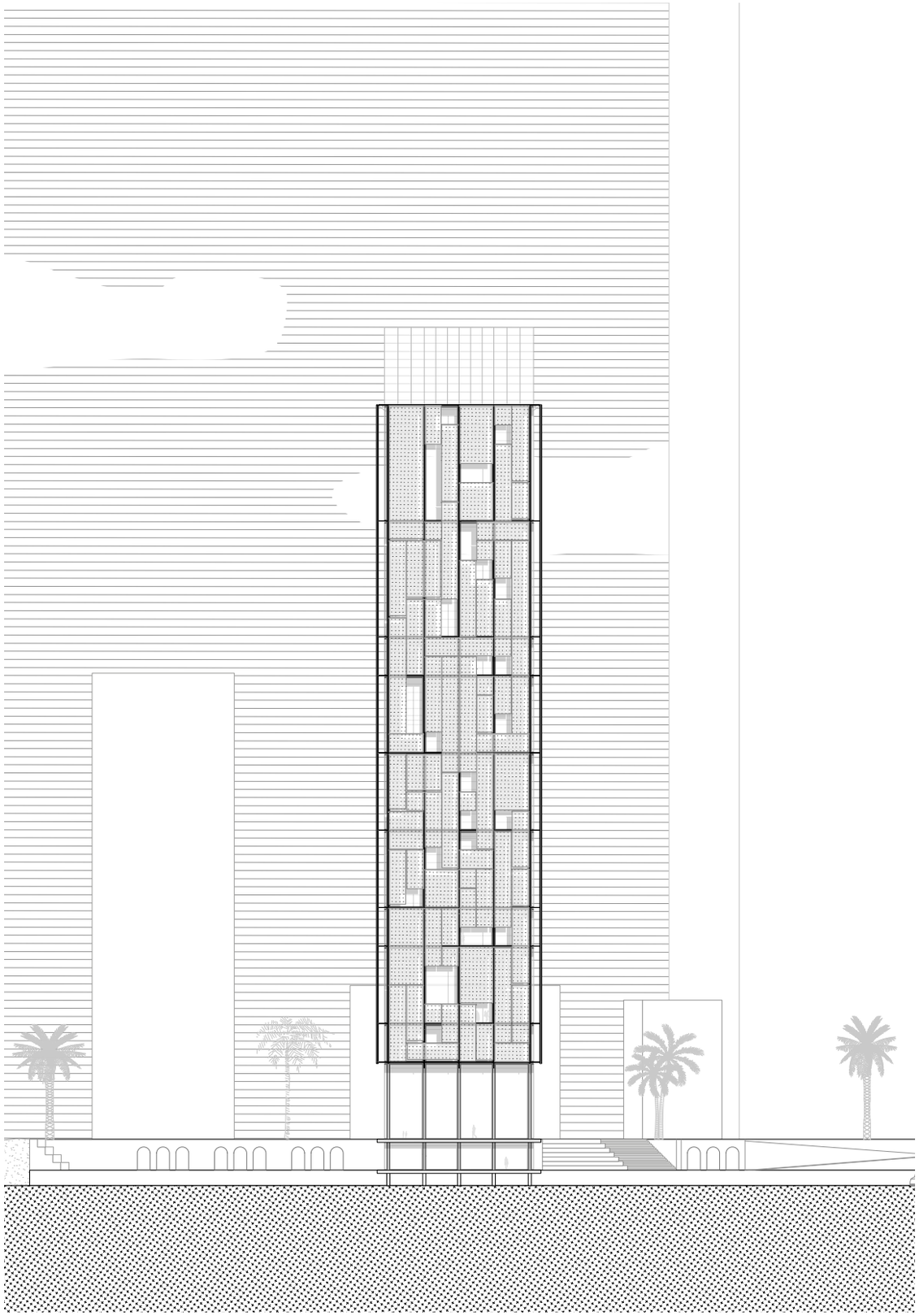
03 3.2 PIER

The beginning of the pier is indicated through the urban roof, which also acts as an urban point of orientation. It consists of an open waffle roof structure, that is supported by a concrete core. This core does not only function as a structural base of the roof, but also acts as a vertical connector to the private program underneath. A staircase, as well as a lift is hidden within the core and is only accessible for the workers dedicated to these connected spaces. Moreover, this core is made out of ecobricks, which can basically be done by anyone. Plastic bottles are filled with other sorts of waste in a high density and are then able to support a load-bearing structure.

The pier itself is designed as a completely public part of the composition. Any visitor can experience both layers from the beginning of the pier until reaching the platform at the very end. It acts as an extension of the public coastline and offers multiple different activities. While the top layer is rather exposed to the sunlight and the public, the bottom layer offers a more private environment with shading on hot summer days.

A void in the structure allows direct access and views towards the water. An additional theater staircase invites the visitors to stay and enjoy the space. Additionally, a pavillion embedded in the composition includes a fully public café that activates the pier. The whole pier represents the process of recycling in its materiality. As one strolls along the pier, one is confronted with a variety of materials made from recycled waste. The load-bearing structure is made from recycled structural concrete. It gives a special pattern and color pallette to its form. Additionally, the pier is covered with tiles that are made from recycled plastic PET bottles. These can be picked up and replaced by the visitors, including them into a participatory process of making.

Lastly, several furniture elements are 3D-printed, also using plastic waste as a resource. To conclude, the whole pier picks up ideas and hints about the process of up-cycling and its potentials in different layers and materials. In this way, it raises awareness and encouragement amongst the visitors.



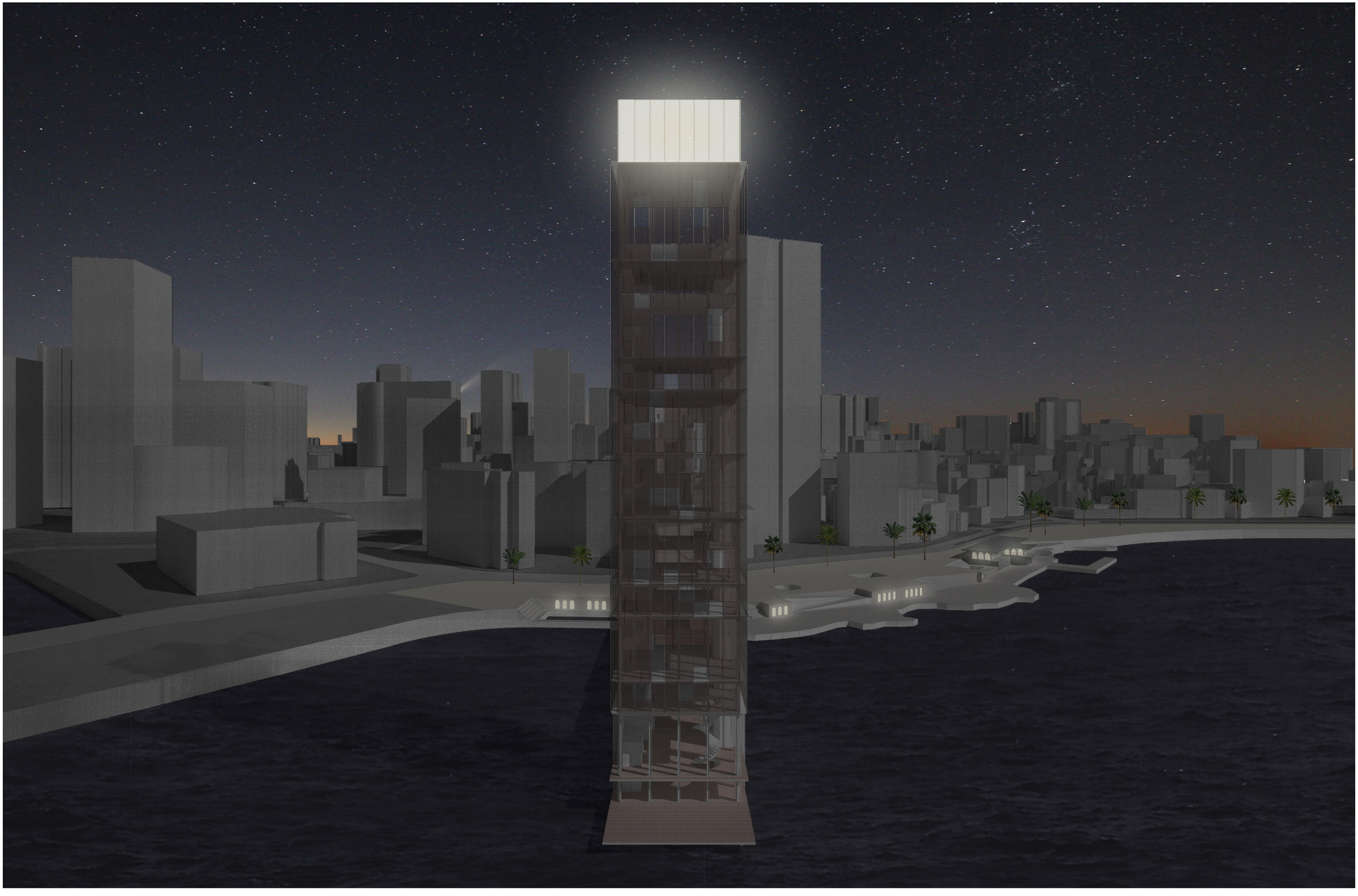
03 3.3 TOWER

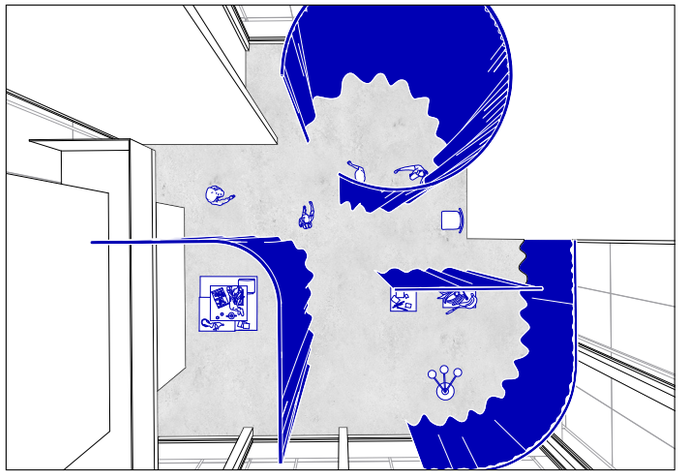
The tower represents the final point of the routing. With the inspiration of lighthouses in Beirut in mind, it acts as a point of reference, as well as a new landmark and urban node for the city. Through its positioning in the water, it can be perceived from all angles in its full height. It is designed as a simple square, vertical structure, allowing for maximum flexibility and adaptability. It includes the most important program of the flagship experience center. Multiple different exhibition spaces offer possibilities for various ideas and intentions. In addition to this, a spacious shop, reaching over two levels, as well as an auditorium, a workshop and a penthouse bar are included in the structure. Besides its flexibility, the designed open floor plans allow for continuous views towards the sea, as well as the city, which can be curated through mobile walls or curtains.

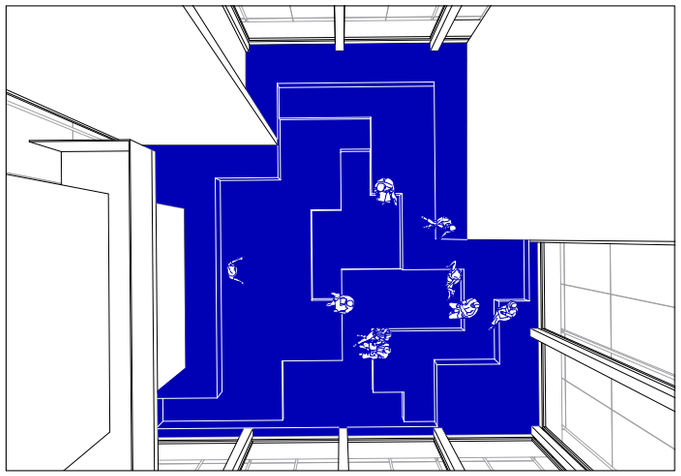
As it is the final point of the routing, the tower simultaneously represents the final outcome of the up-cycling process, resulting in textiles. This idea of textiles is picked up in different layers of the structure. Curtains can be used for separation of the space; carpets can additionally be attached to the floors in order to create different kinds of atmospheres and color schemes.

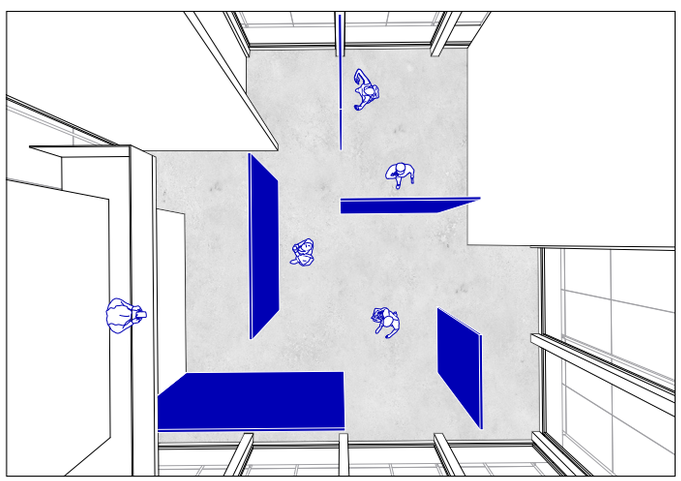
The tower's ambition to represent Lebanon's revived textile production is mostly visible from the exterior. The concept for the tower's facade follows the idea of a tailor's dummy, that can be dressed in various ways, according to specific desires and needs. A flexible light structure is attached to the exterior of the tower, serving as a base grid to fix textile fabrics to. A two-layered system of rails allows a completely flexible composition of these textiles. Almost any pattern or graphical expression can herewith be achieved. Besides the significance of the textiles' expression, they also serve as sun shading for the exposed structure.

The tower ends with a top-up made out of polycarbonate panels. It represents the idea of a light-house, fully standing in the water. Moreover, this top-up acts as a heat storage for the whole building, as it absorbs the heat that enters through sunlight. A heat-pump in the basement of the tower transforms this heat to the outside, and acts as an additional cooling system.

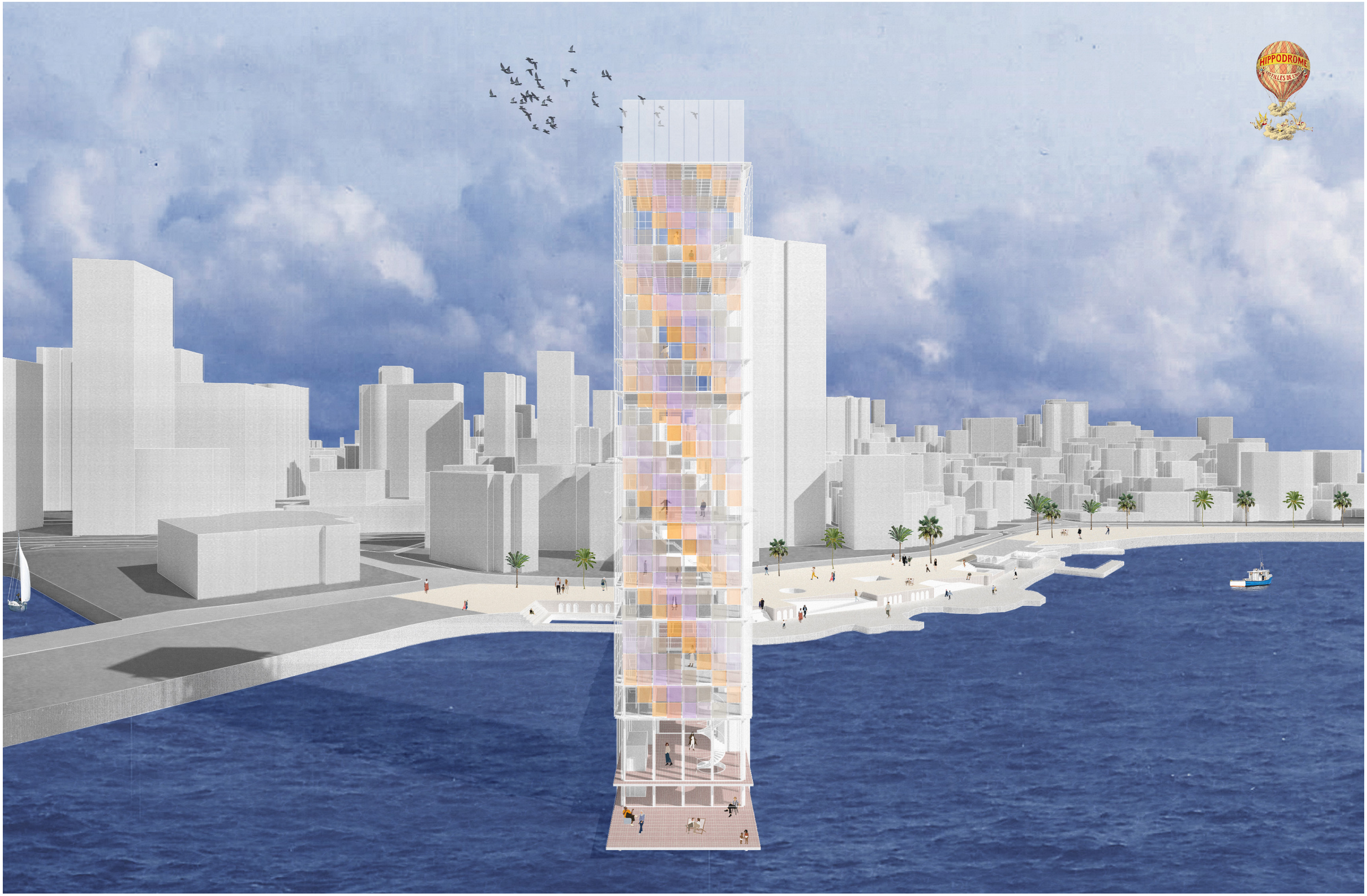








The interior concept aims for an open floor plan which maintains maximum views to the sea and the city and is able to hide the vertical circulation from the spatial experience. Consequently the tower's load bearing structure results in a system, consisting of 16 concrete-filled steel columns, together with 2 massive walls and a hidden bracing for its stability. Waffle slabs are placed in between this system, stabelizing the structure, and serving as a spatial element for the interior's expression. This allows for an open, flexible floor plan, that can be occupied in many different ways. For example as an exhibition space with mobile light-weight walls, that can temporarily be stored, a black box concept, for specific light requirements, a space defined through hanging, moveable curtains, or a landscaped auditorium, that can be mounted and de-mounted accordingly. This flexibility in the floor plan configuration allows for a variety of spatial qualities within the whole tower.


HIPPODROME


I WILL NOT!
Well actually...
NO.

REFLECTION

04

00 INTRODUCTION

This paper aims to act as a reflection and introspection on the graduation process in order to objectively assess the outcome and impact of the thesis. A variety of thematic aspects such as the relationship between research and design, the relationship between the graduation topic and the studio topic, the chosen research methodologies, as well as the project's relevance are being assessed and evaluated in the following.

Working in the urban context of Beirut, the Complex Projects Graduation Studio aims to investigate future potentials for the city's development through interventions that operate on an urban, as well as on an architectural scale. Looking at Beirut's city center as a place with a multi-layered background of challenges complexifies this task.

One of the many challenges that the country if facing is the massive waste crisis, which has been ongoing in Lebanon since 2015. As a reaction to this urgency, the thesis attempts to examine an alternative perspective on waste as a resource rather than a burden in order to revive the country's textile heritage. Thus, the hypothesis of turning Beirut's large piles of plastic waste into textile threads to feed the sector with innovation and competitive qualities is the key provider for this research. Thus, the potentials that the innovation of upcycling holds are perceived as a metaphysical represenation of hope for the city's future development.

As a consequence, the proposed architectural intervention wishes to represent itself as a symbol of hope and change in the same way. Therefore, the proposal represents a flagship experience center which exhibits, educates and promotes new innovation within the industry in a participatory way.

01 RELATIONSHIP BETWEEN RESEARCH & DESIGN

I personally see the two disciplines of research and design as an intertwined composite, where both parties closely rely on each other. Conductive research can only be driven by a desired goal or outcome in mind, while the design process is highly dependent on previously gained knowledge about context, history and current state, if not following a theoretical approach of solely intuition. Therefore, the research and its choice of methodologies followed throughout this graduation process has strongly been driven by its eventual influence on design decisions since the very beginning. Thorough research has been essential in the project's development, starting from the choice of interest topic until the final architectural expression. The initial choice for the thesis on Beirut's waste crisis and its textile production derives from an analysis on the current state of the art and history of Beirut, together with a simultaneous reflection on future potentials and innovations within the field.

Therefore, the research question on how an architectural intervention can encourage the perception of waste as a resource instead of a burden through the activation of Lebanon's textile heritage has been a guidance throughout the design process. Furthermore, a reasonable site choice could only be made after mapping, analyzing and understanding the urban context and its challenges. This also applies to other layers of the design, such as program, materiality, as well as desired architectural atmosphere. Research within the field of innovations in modern textile making, as well as waste upcycling later allowed a translation of this knowledge into architectural elements and innovations.

02 RELATIONSHIP BETWEEN GRADUATION TOPIC AND STUDIO TOPIC

The graduation studio of the chair of Complex Projects proposed a large scope within the bigger picture of Beirut, emphasizing on its future potentials for development. The catastrophe of the explosion on 4 August 2020 was given as an initial trigger for the design task. The explosion made a multiplicity of issues and challenges within the scope of the whole country of Lebanon more evident than ever. Challenges, that had been present before the explosion already, have only become more present and increased in their level of urgency. Therefore, I see the topic of this catastrophe as an intensification of the already existing range of problems in Beirut's context. This perception allowed a more independent search for a thesis topic.

Addressing the challenge of Beirut's waste crisis is only one of the many issues. The city has constantly been facing disastrous consequences of a collapsing waste management system, dating back to the beginning of the civil war in Lebanon (1975-1990). With this volatile and unreliable system not seeing any development throughout the past decades, Lebanon's waste catastrophe has turned into an unheard call for help. However waste has proven to be more than just a burden. Other countries who found themselves in similar situations have already realized this value. In these places, great progress can be seen due to this change of perspective. Therefore, the proposed innovation holds high potentials within the sense of future development, that was initially addressed by the studio.

03 RESEARCH METHOD AND APPROACH IN RELATION TO THE GRADUATION STUDIO

In order to achieve an understanding of the complexity of the city of Beirut and its multi-layered background, a variety of research methodologies have been applied throughout the research process. Following a qualitative approach of data collection, mainly based on non-participant observations, mapping, field documentation, collection of previously published research, (archival) literature review, online resources, image analysis and the analysis of relevant precedents and practices enabled the formulation of a better understanding of the place and its urban, political, social as well as cultural circumstances. The research then enabled a formulation of a theoretical hypothesis that has been supporting the design.

I believe that even when this personal choice of research methods and its followed outcomes in design has been supported by the studio quite well, it was sometimes pushed to look for outcomes, with the only goal of justifying a certain, previously and intuitively chosen design decision in mind. Moreover, the group research that had been done in the first semester has not really proven to be too helpful for the design process for any of us. Multiple weeks were spent mapping randomly chosen topics, without any further perspective in mind. In my opinion this method only leads to a very superficial understanding of the city's urban layers, but does not allow a thorough insight into any specific issue, while those weeks could rather be used to intensify a more specific knowledge.

04 THE PROJECT'S WIDER SOCIAL, PROFESSIONAL AND SCIENTIFIC RELEVANCE

The graduation project is aiming to represent progress and innovation within the production sector in different layers that can be applied to a wider scientific relevance. As it is proposing to introduce the innovation of plastic up-cycling to the Lebanese textile industry, it is suggesting a plausible change for the production chain, which has proven to be feasible in many other comparable places already.

The project as a flagship experience center does also contain a social relevance, as it is encouraging the public in a participative way to open up their minds on innovative solutions on many different layers. The building aims to advertise the great change it can bring and act as an educative tool.

On an architectural layer, the project is representing the idea of innovation too. Since the project intends to work as a new symbol and landmark for the city, as well as the revived industry, it intends to make use of innovative building materials, as well as innovative design decisions. Fabrics are being wrapped around the vertical structure, not only acting as a visual representation of the building's identity, but further also serving the purpose of sun protection. Moreover, these textiles are composed as smart textiles, meaning they include sensors that can support data harvesting, as well as energy harvesting. Therefore, they act as a communicative, intelligent device which can regulate the building's temperature, alter their shape, store and control heat, and perform other functions.
Displaying innovative solutions as such on a building with such an important standing could help to introduce progressive thinking into the design process on a bigger scale and encourage others to think in similar ways.

05 ETHICAL ISSUES AND DILEMMAS

Issues that were confronted during the graduation project did mostly refer to the urban context that the project is placed in. Proposing an intervention to a city and country, which finds itself in such a complex situation has been an ethical challenge throughout the year. The question on the architect's hierarchical positioning and top-down decision making over others has been a constant thought on my mind.

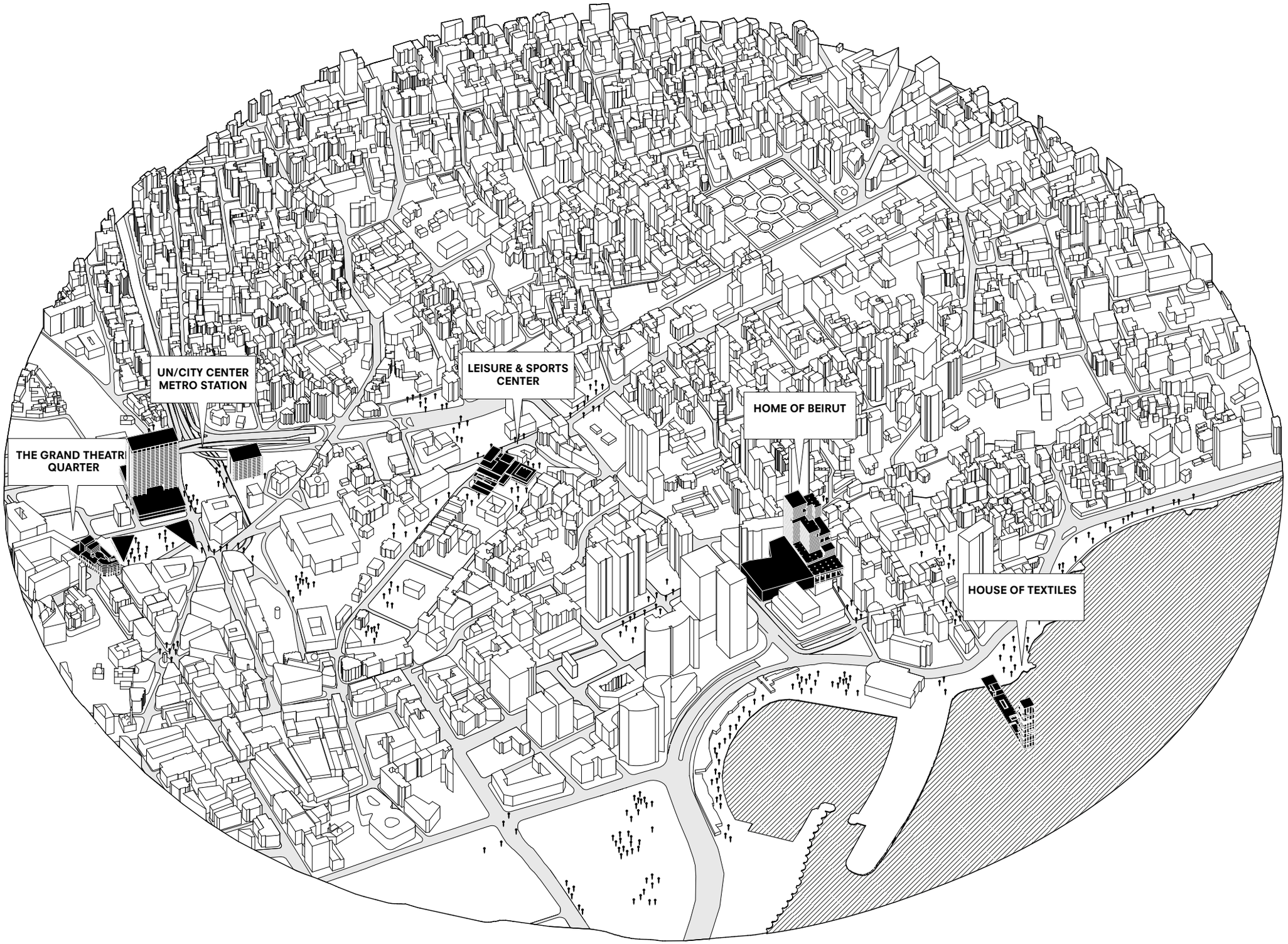
This becomes even more evident in a place, that could only be analyzed and understood on a very superficial level, due to geographical distance, cultural differences, language, history, and many other topics. I doubt that an academic project with a duration of less than a year can achieve the level of sensitivity and respect that a place like Beirut would have deserved and required. Visiting the city for a few days made this even clearer for me, especially when engaging in conversations with residents, hearing their stories, perceptions, broken hopes etc. It is questioning the plausibility of any proposed intervention in such a place. However, I do believe that it is important to raise awareness about happenings in such places, in order to be able to support financial, supportive and investigative help. Yet, this has led to a certain level of frustration and doubt about the project's relevance.

DRAWING SET

05

group site plan

1:10.000

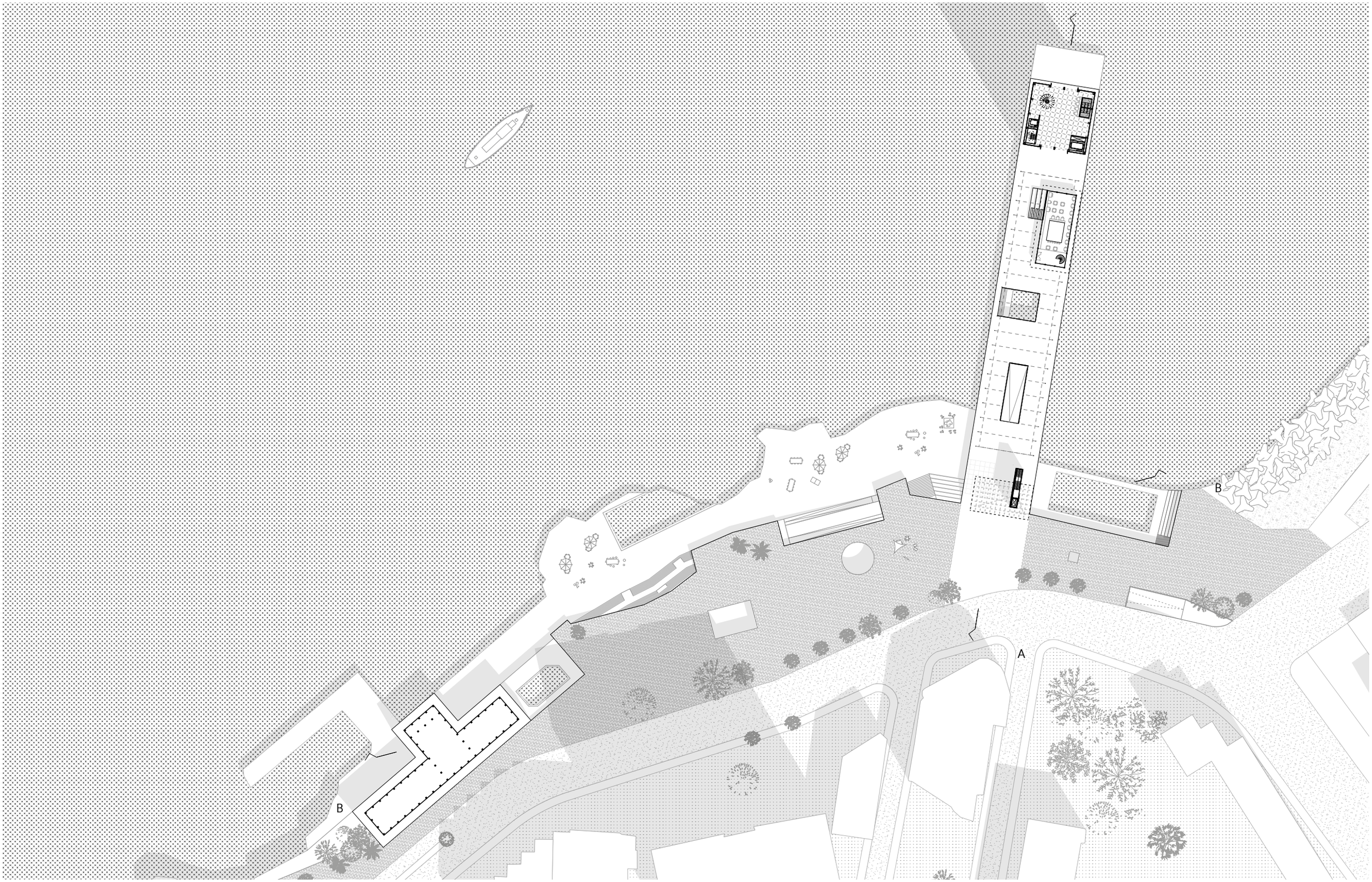


group axonometry

1:10.000

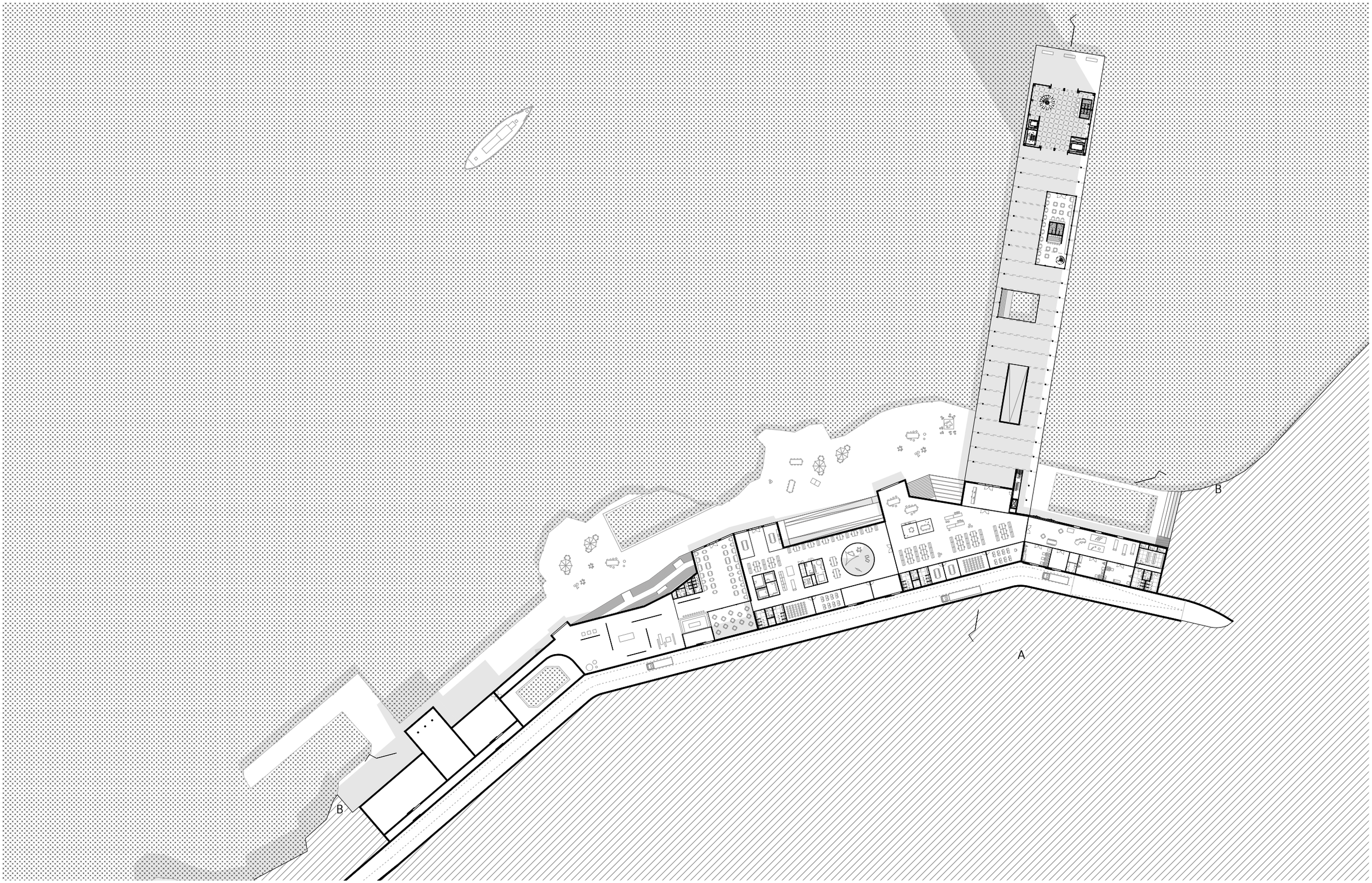
site plan

1:500



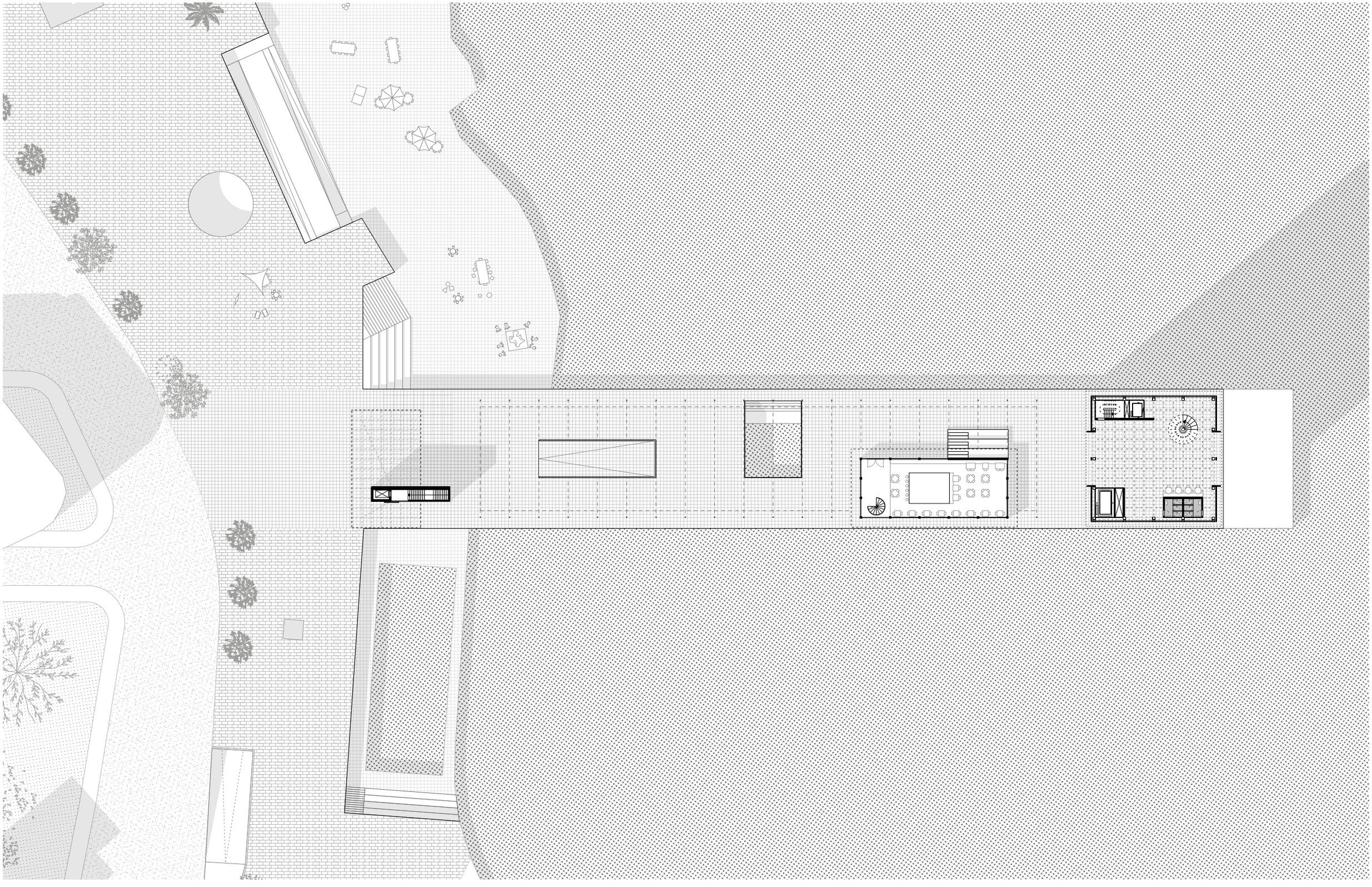
ground floor

1:1000



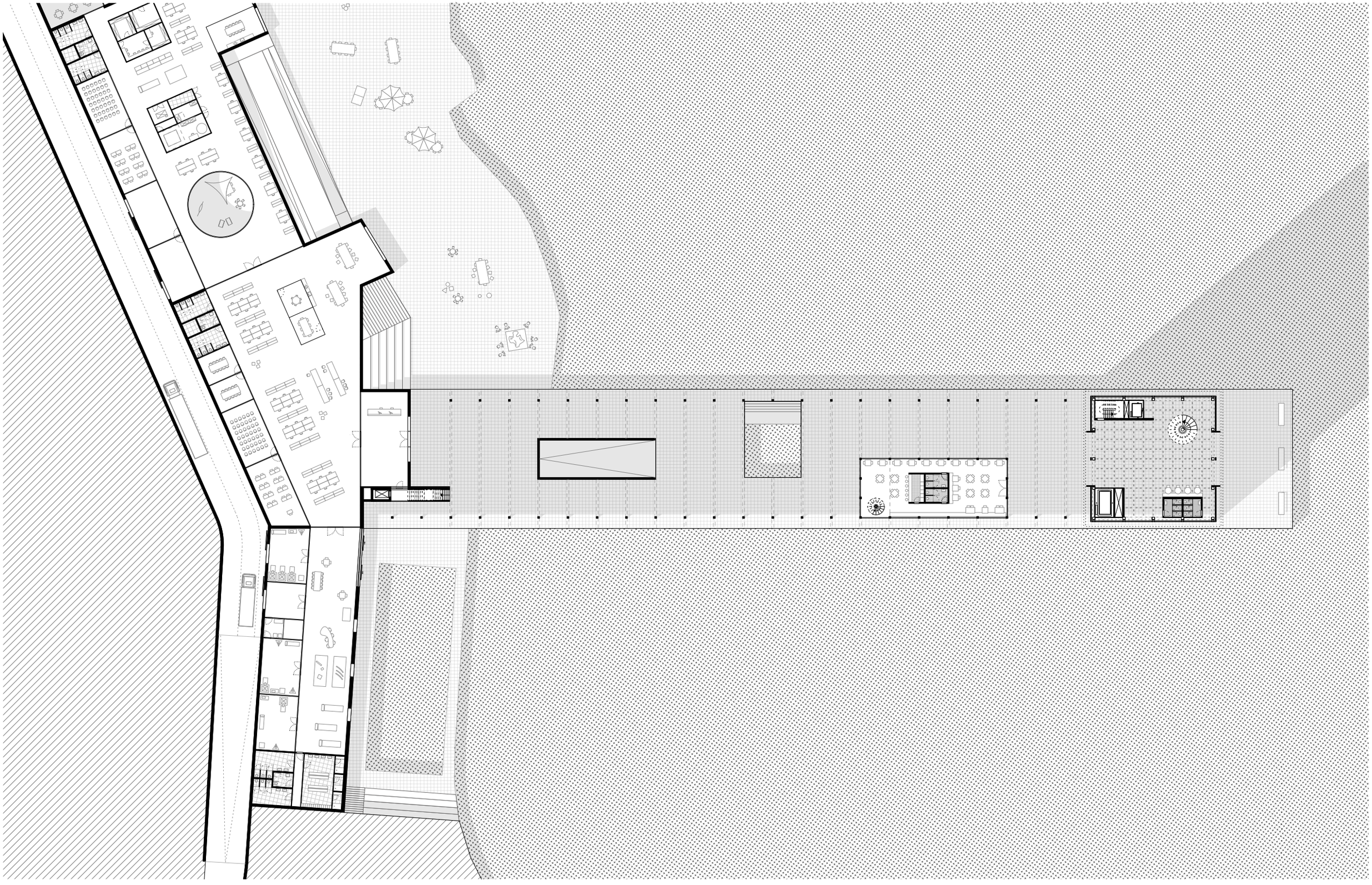
floor plan -01

1:1000



ground floor

1:500



floor plan -01

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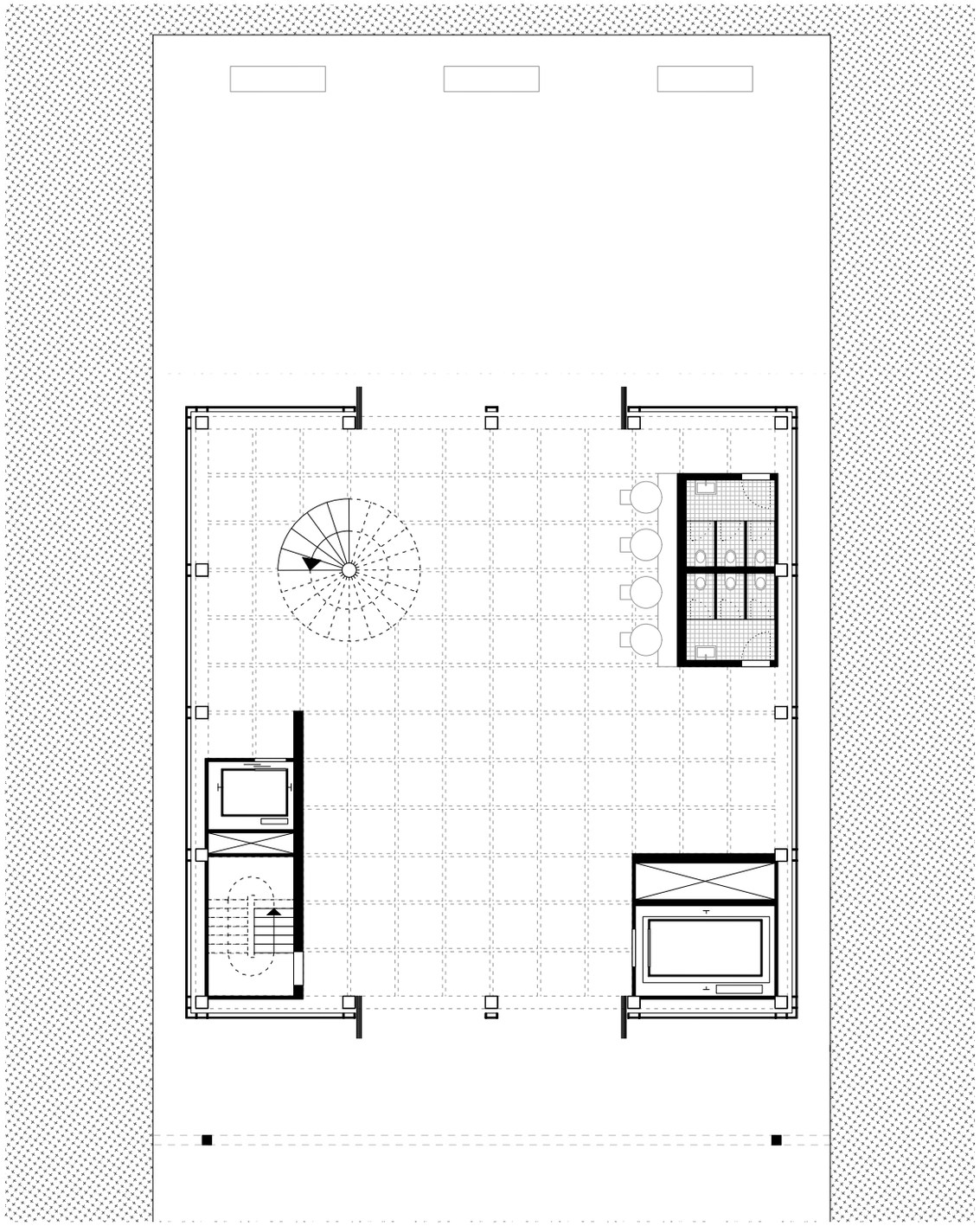
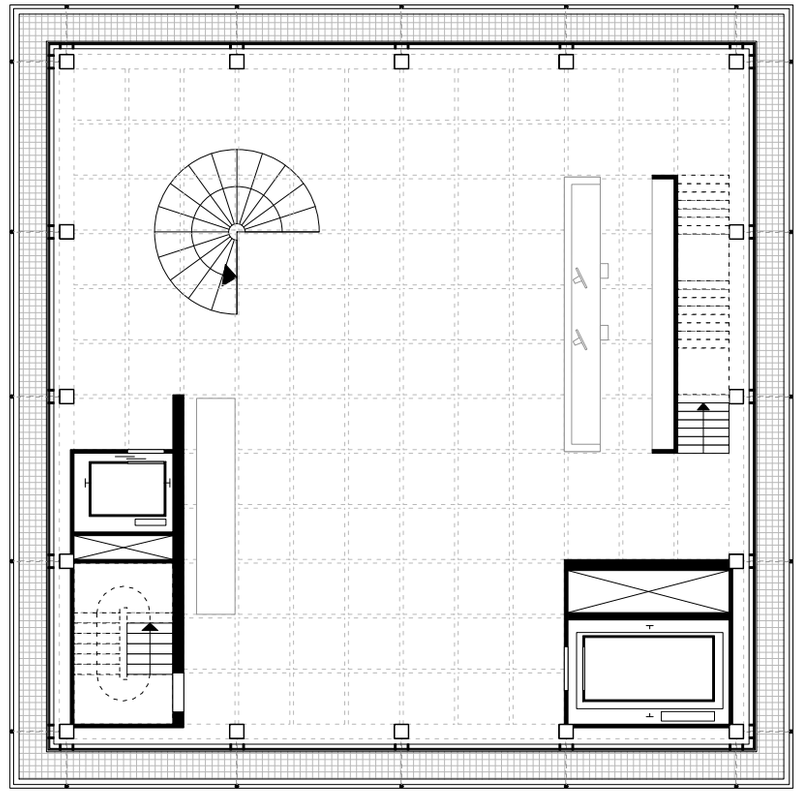


floor plan -01 tower

1:200



floor plan 01 tower foyer

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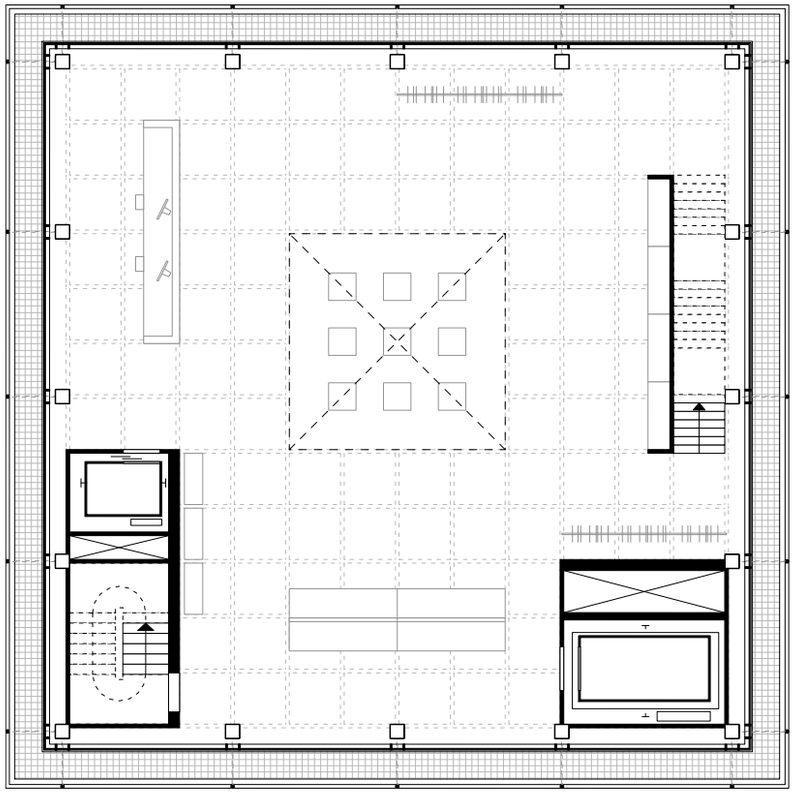

floor plan 03 tower shop

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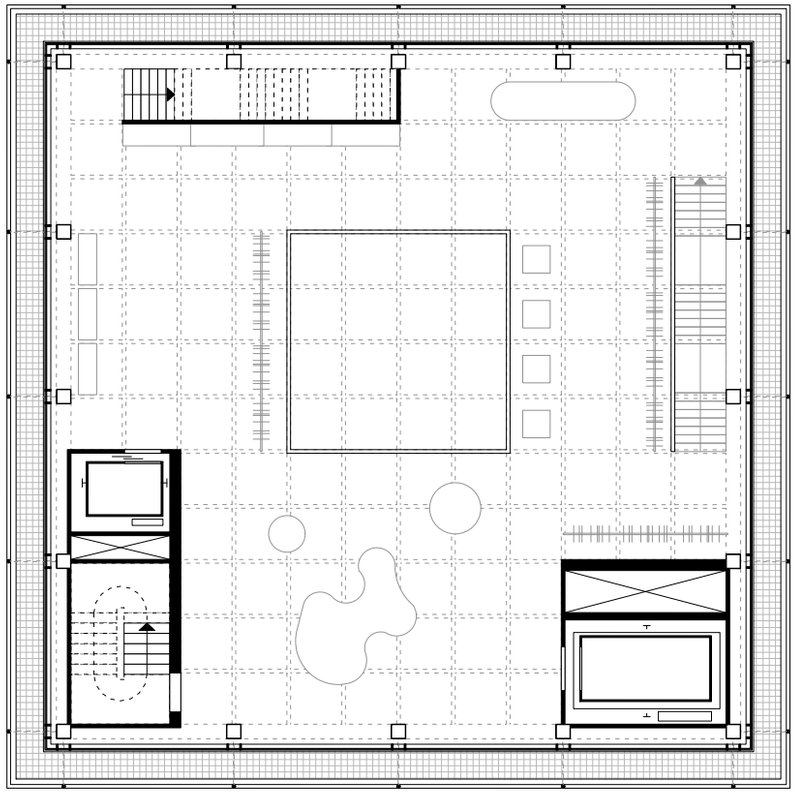

floor plan 04 tower shop

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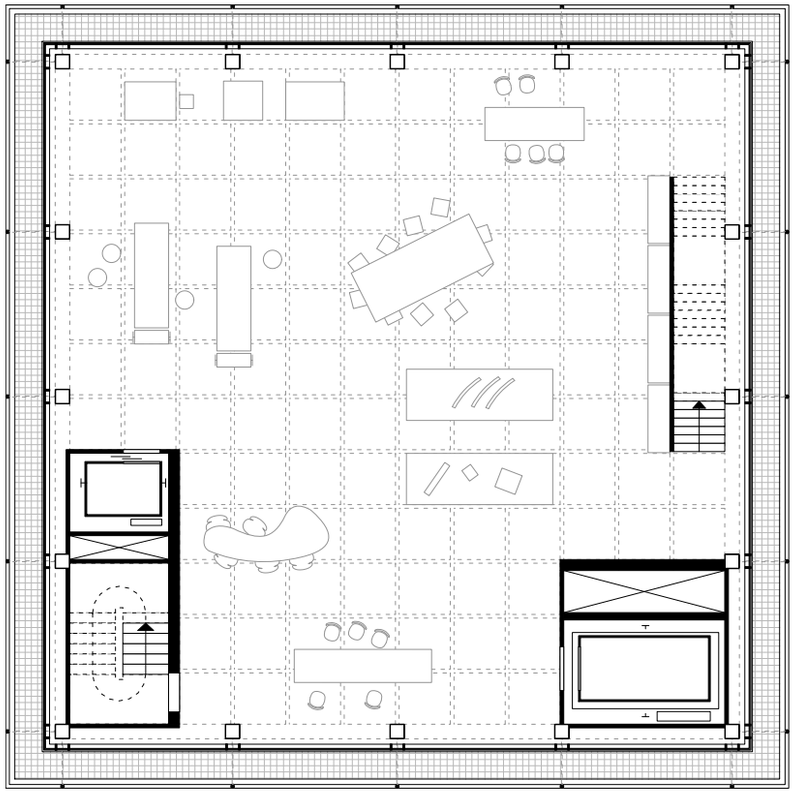

floor plan 07 workshop

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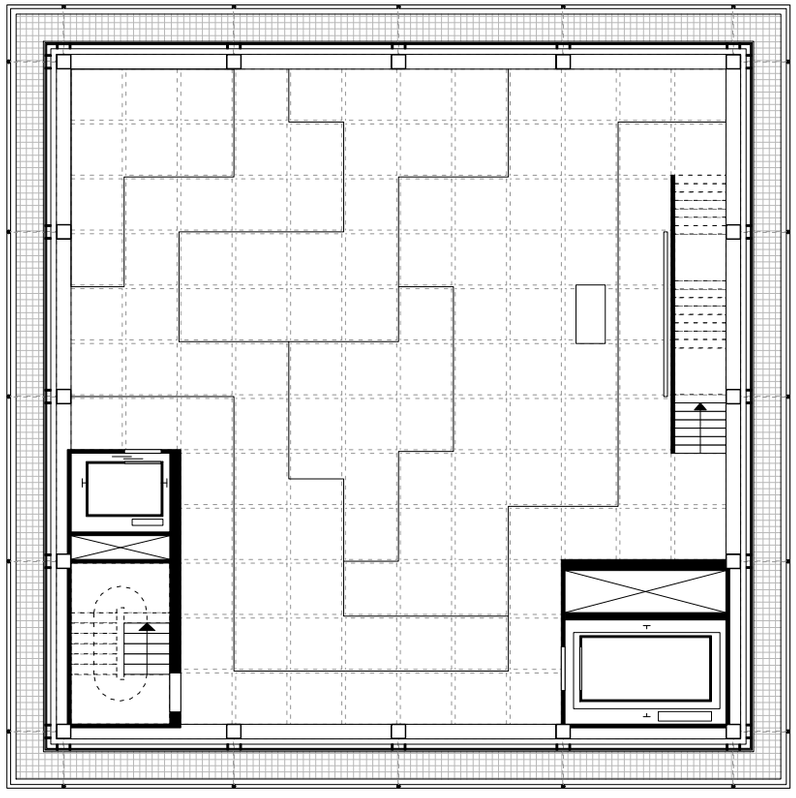
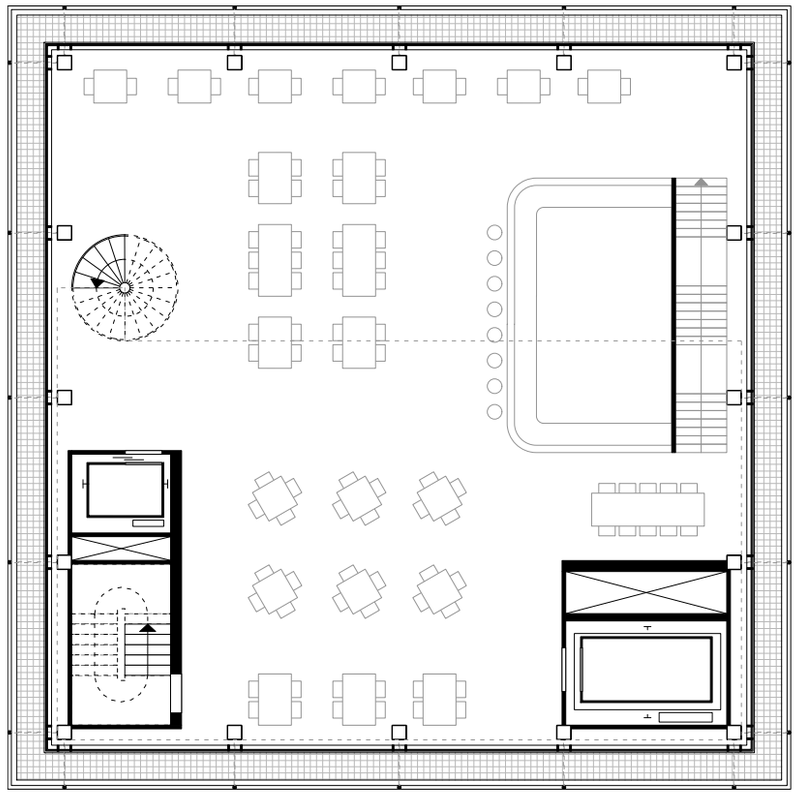


floor plan 08 auditorium

1:200



floor plan 03 tower shop

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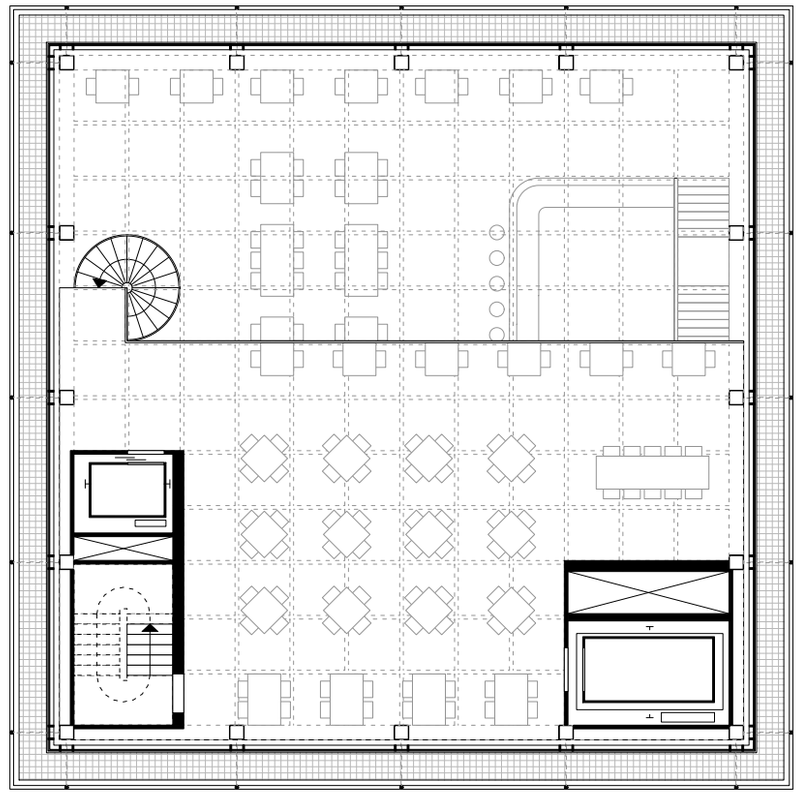

floor plan 04 tower shop

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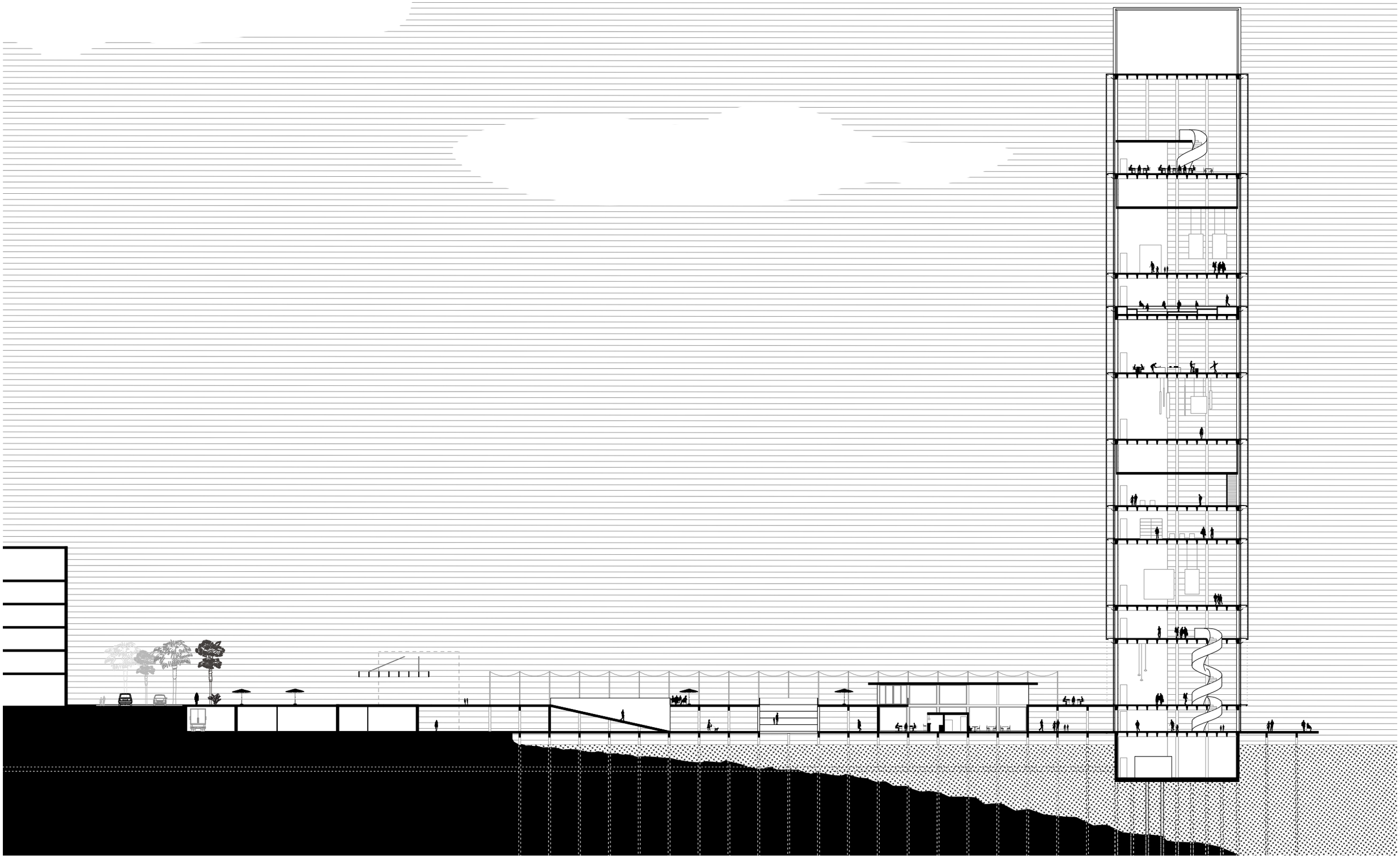
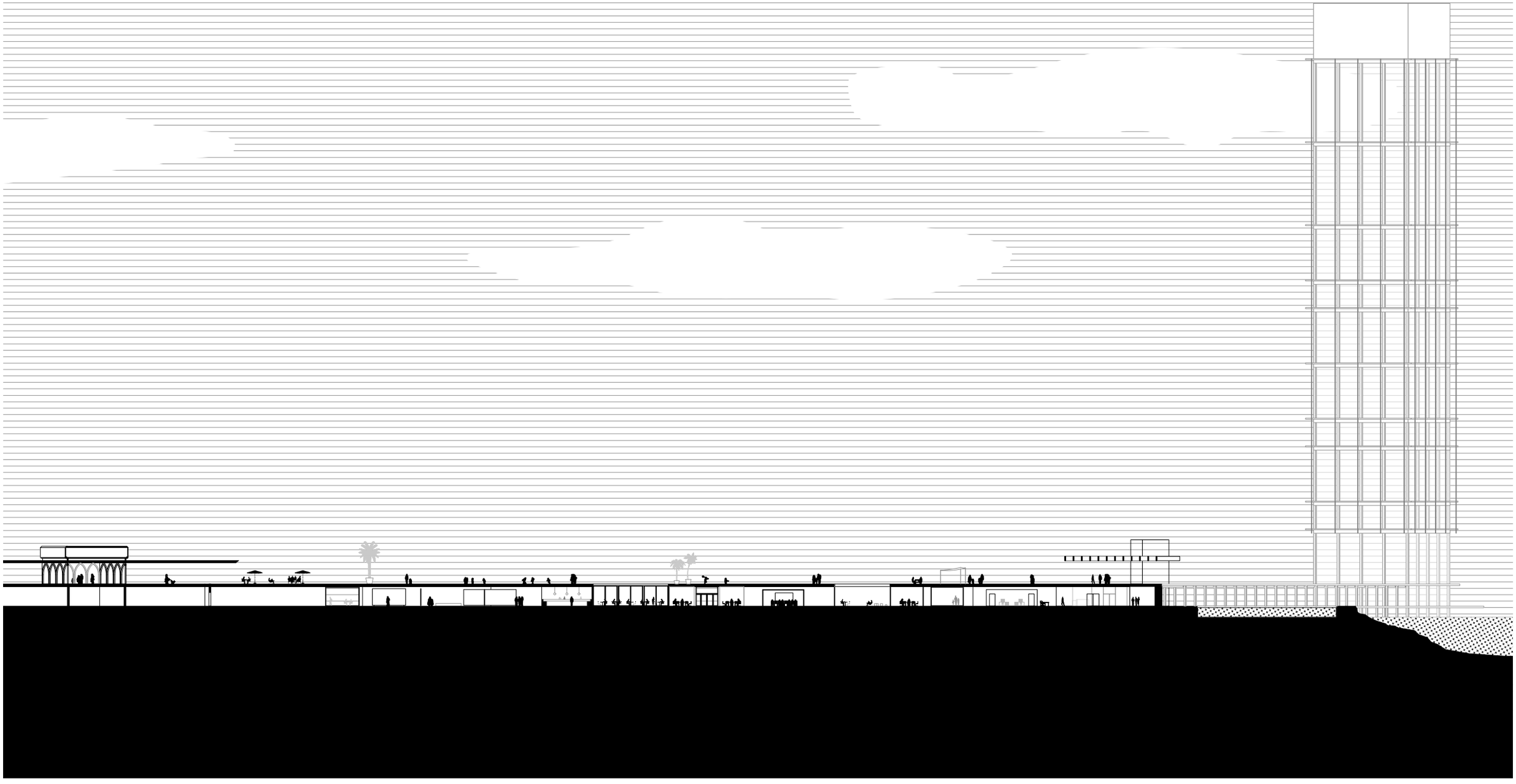


section A

1:500

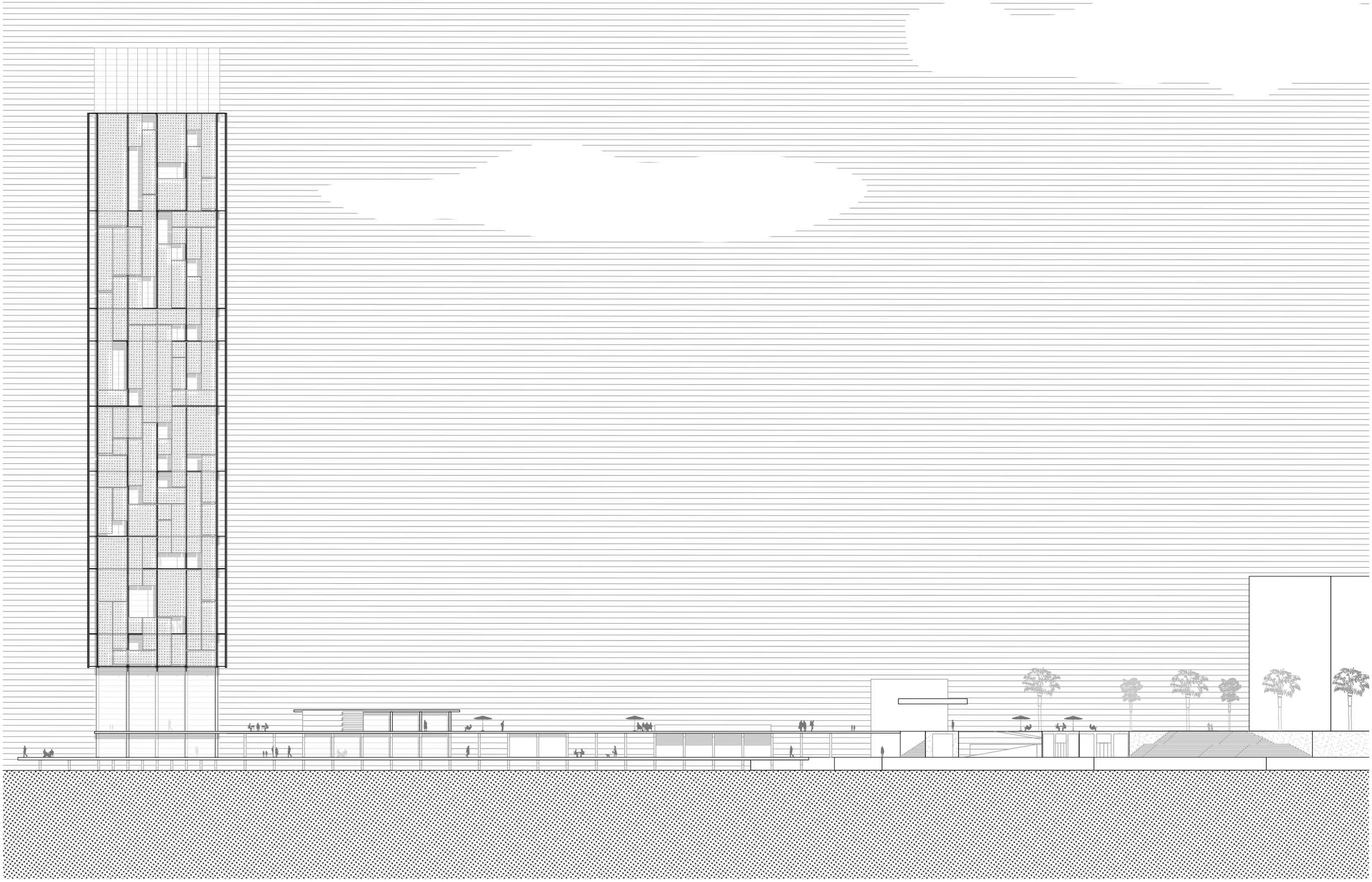


section B

1:500

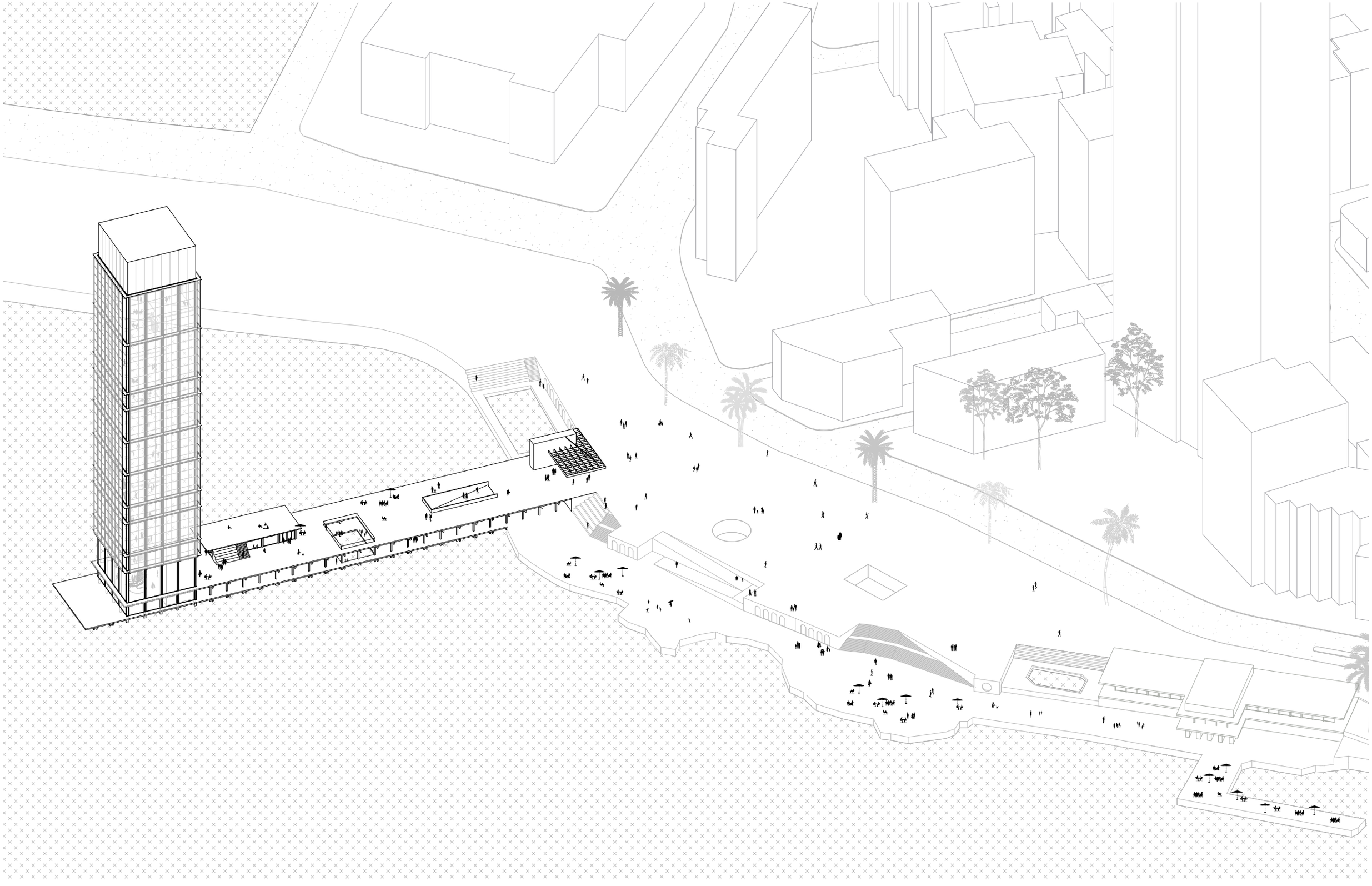
north elevation

1:500



west elevation

1:500

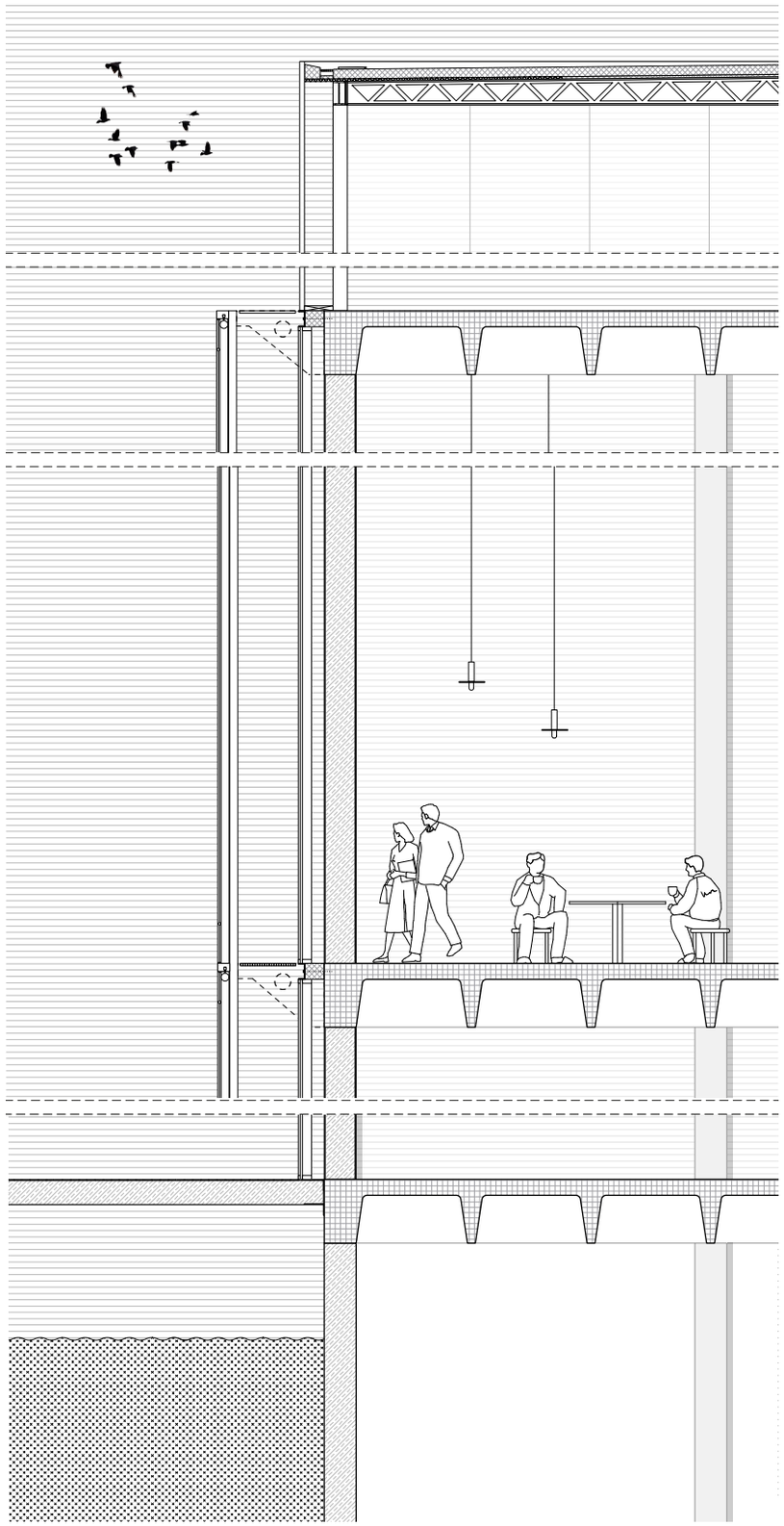


isometric drawing

interior fragment

1:50

envelope fragment elevation 1:20



interior fragment section 1:20

roof :

- EPDM single-ply membrane. 1,5mm. laid overlapping
- foam glass insulation. 120mm
- trapezoidal metal sheet. 30mm. insulated
- steel truss. 300mm-350mm

facade:

- MarlonStBlue polycarbonate sheet. 60mm. infared filter.
- heb 180

facade :

- horizontal steel rail 150mm
- vertial steel rail 120mm
- fabrics
- hollow steel columns 100mm
- metal mesh 30mm
- steel frame window. thermally isolated. double glazing. in-gap low-e coating.
- square hollow steel column, concrete filled 400mm

floor tower:

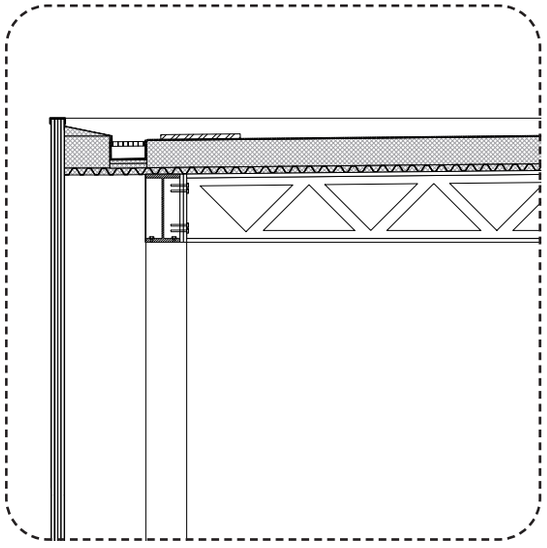
- Cement Screed 50mm
- Concrete Waffle Slab 800mm

floor pier:

- Tiles recycled plastics 10mm
- Mortar 5mm
- Concrete Slab 300mm

wall tower:

- waterproof concrete 400mm



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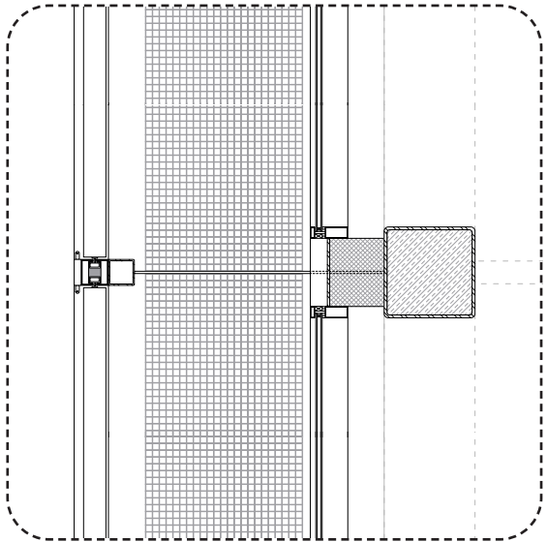
• trapezoidal metal sheet. 30mm. insulated

• steel truss. 300mm-350mm

facade:
• MarlonStBlue polycarbonate sheet. 60mm. infared filter. r-value=1,40 (m²K)/W

• heb 180



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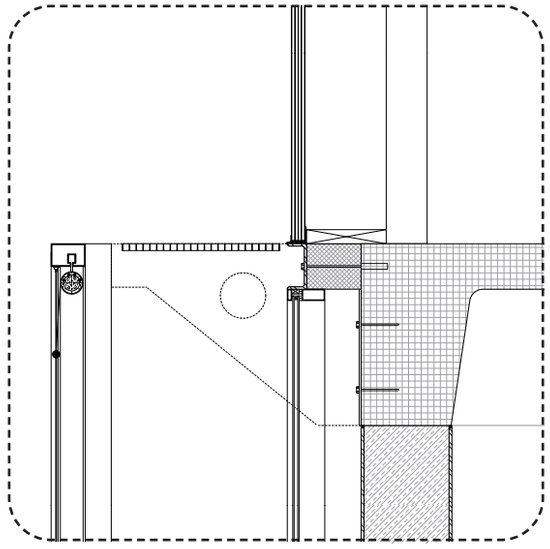

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floor:
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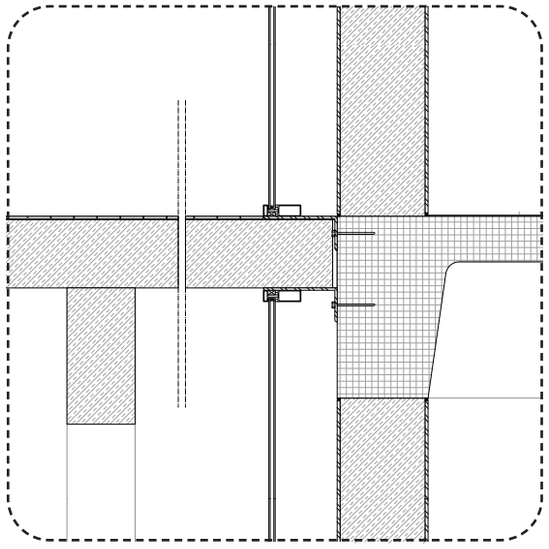

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in-gap low-e coating.

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floor tower:
• Cement Screed 50mm

• Concrete Waffle Slab 800mm

floor pier:
• Tiles recycled plastics 10mm

• Mortar 5mm

• Concrete Slab 300mm

THE END.