Content

01 BEIRUT
Introduction

02 (IM)MOBILITY
Introduction
History - public transport
Present - car
Challenges
Alternative - ferry service

02 PROGRAM RESEARCH
Ferry terminal
Pier
Swimming pools
Nightclub
Parking

02 SITE ANALYSIS
Envelope
Massing
Privitization
Pollution

03 DESIGN BRIEF
Volume research
Site
Program

04 DESIGN
Iterations
Concept
Ferry Terminal
Passengers

05 CONCLUSION
Conclusion

BEIRUT


BELLA RIVA

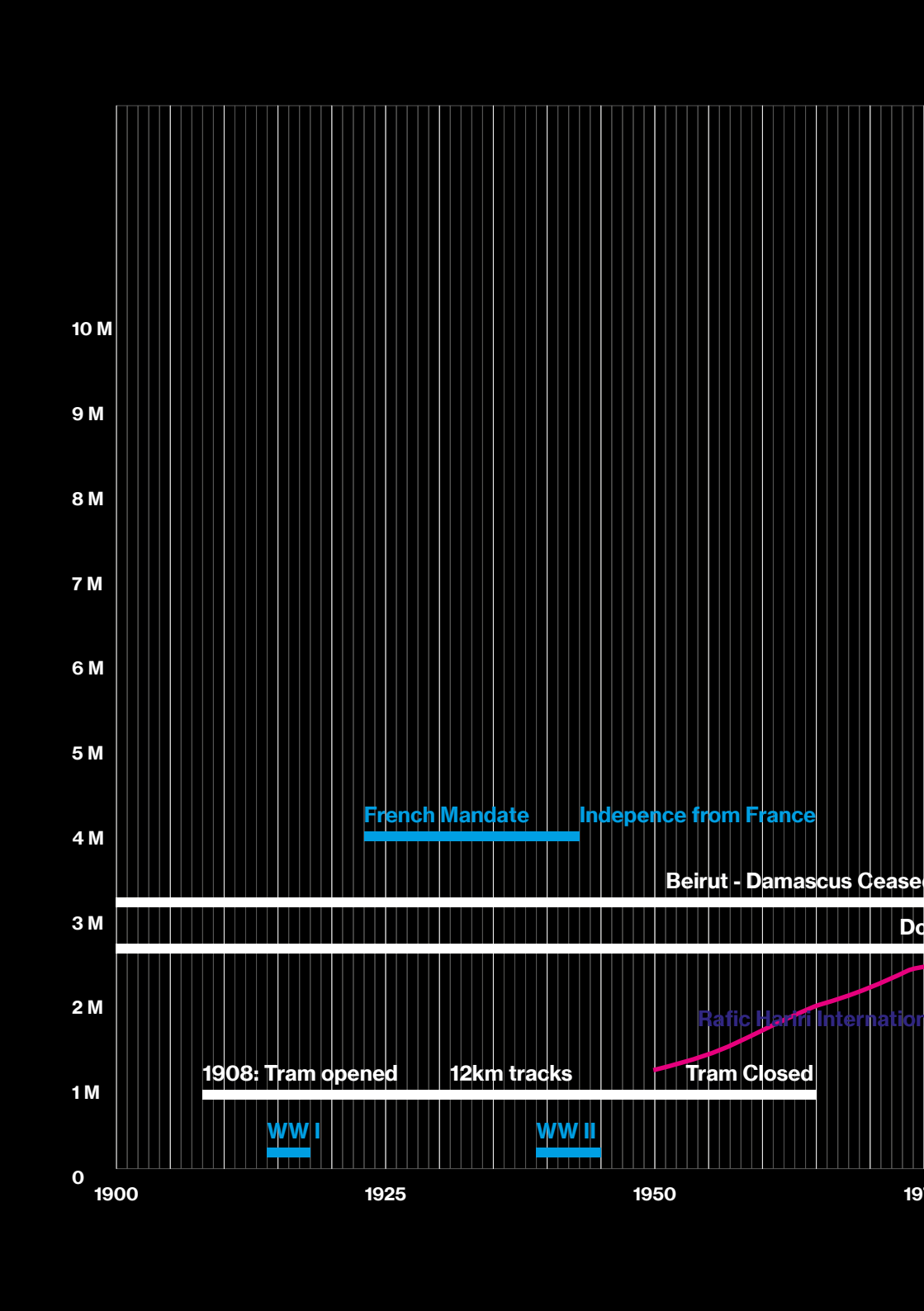
Netherlands
17.4 million inhabitants

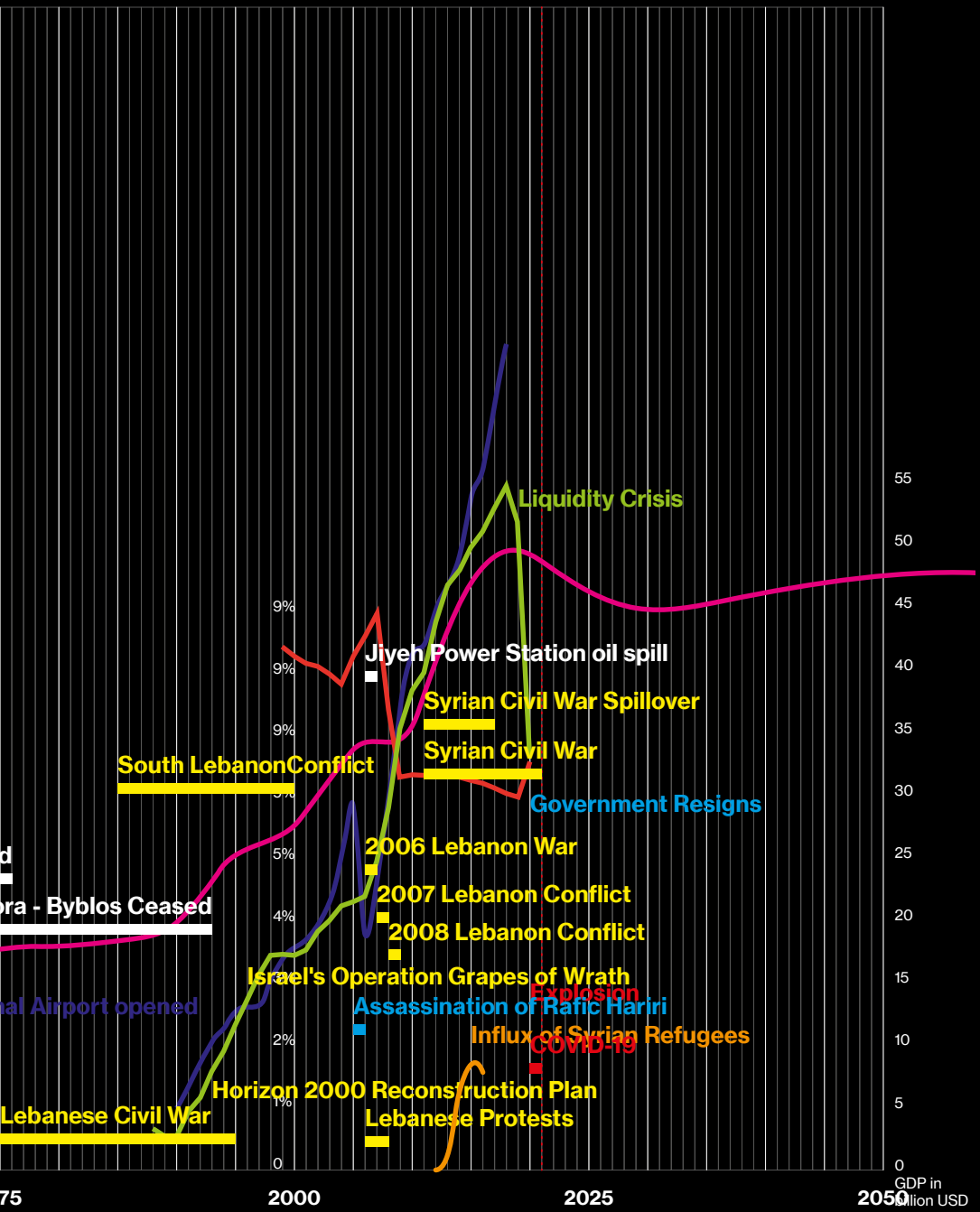
Lebanon
6.8 million inhabitants

INTRODUCTION – Once called Paris of the Middle East, Beirut is the capital of Lebanon, a small country in the Levant, with almost 7 million inhabitants. Located on a hilly platform on the coast the Greater Beirut Area houses 2.4 million citizens.

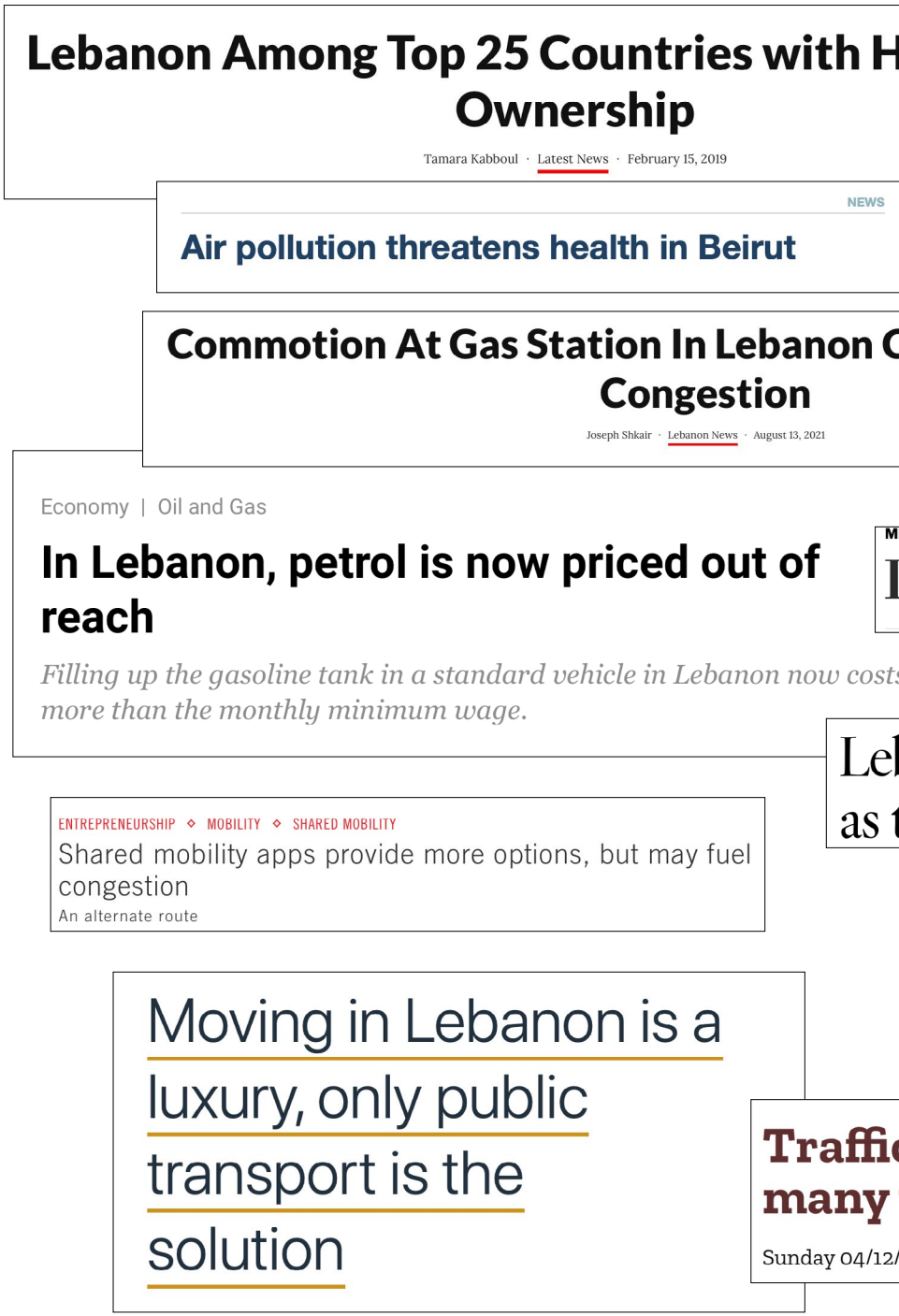
Lebanon has a troubled past as years of Civil War and armed conflicts left the sectarian country with many challenges. Due to the Syrian Civil War across the east border and the large influx of refugees it created, refugees now make up around 25% of the population. Aside this crisis Lebanon is also facing an energy crisis, as the grid is not able to provide 24/7 electricity.

On the 4th of August 2020 the country was shocked by one of the largest explosions ever in the port area. The shockwave destroyed large parts of the city and made many homes uninhabitable. In the aftermath of this crisis Lebanon spiralled down into an economic crisis, one of the worst in history.


10 M
9 M
8 M
7 M
6 M
5 M
4 M
3 M
2 M
1 M
0
1900
1925
1950
French Mandate
Indepence from France
Beirut - Damascus Cease
Do
Rafic Hariri Internation
1908: Tram opened
12km tracks
Tram Closed
WW I
WW II


Liquidity Crisis
Jiyeh Power Station oil spill
Syrian Civil War Spillover
Syrian Civil War
South LebanonConflict
Government Resigns
2006 Lebanon War
2007 Lebanon Conflict
2008 Lebanon Conflict
Israel's Operation Grapes of Wrath
Explosion
Assassination of Rafic Hariri
Influx of Syrian Refugees
COVID-19
Horizon 2000 Reconstruction Plan
Lebanese Protests
Lebanese Civil War
ra - Byblos Ceased
al Airport opened
9%
9%
9%
5%
4%
2%
1%
0
55
50
45
40
35
30
25
20
15
10
5
0
GDP in
Billion USD
75
2000
2025
2050

(IM)MOBILITY



Lebanon Among Top 25 Countries with H Ownership

Tamara Kabboul · Latest News · February 15, 2019

NEWS

Air pollution threatens health in Beirut

Commotion At Gas Station In Lebanon C Congestion

Joseph Shkair · Lebanon News · August 13, 2021

Economy | Oil and Gas

In Lebanon, petrol is now priced out of reach

Filling up the gasoline tank in a standard vehicle in Lebanon now costs more than the monthly minimum wage.

ENTREPRENEURSHIP ◇ MOBILITY ◇ SHARED MOBILITY

Shared mobility apps provide more options, but may fuel congestion

An alternate route

Moving in Lebanon is a luxury, only public transport is the solution

Traffic many

Sunday 04/12/

lighest Car

Fueling car in Lebanon now more than salary

Causes 1 Km Traffic

Road traffic needs immediate intervention

iddle East

Lebanon is running out of gas — literally

s

banon's people line up in 'queues of humiliation' their country unravels

Lebanese man dies in accident waiting in gas station queue

c congestion adds to Lebanon's woes

/2016

Lebanon's car culture questioned in crisis


HONDA


Propel
CALTEX
Havoline
Ecofuel
Diesel
Ecofuel


Apec
Apec


Signs & Beyond
ar Wash
شركة قبلان التجارية
CO.


Hypco
Shell
HELIX
Motor oil

MOBILITY CRISIS – Besides a financial and refugee crisis, Beirut is also facing a mobility crisis. After the explosion in the harbour the flaws of the car centred mobility model became even more apparent. This graduation project researches mobility in Beirut and the challenges arrising from it and proposes an alternative mode of transport.

Train to Damascus

Tram at the Martyrs' square

Tram at the Martyrs' square

HISTORY OF MOBILITY – In the past Beirut had various modes of public transport: train lines connecting Beirut to Damascus and Byblos, a tramway measuring twelve kilometres at its peak, and a bus network connecting the coast with the mountains. Unfortunately years of Civil War and political failure completely destroyed these public transport networks leaving a void. This void was filled by two informal transport hubs on each side of the Green Line, the demarcation line between fighting parties during the Civil War. From these two nodes, Cola Intersection and Dora Roundabout, shared taxis and minivans departed to all parts of the city. In the absence of reliable a public transport system they became the only alternative to public transport, although being unreliable, chaotic and unsafe. Fights, over who takes which ride, frequently erupt between bus drivers and political forces such as Hezbollah and the Amal Movement control and influenced the hubs.

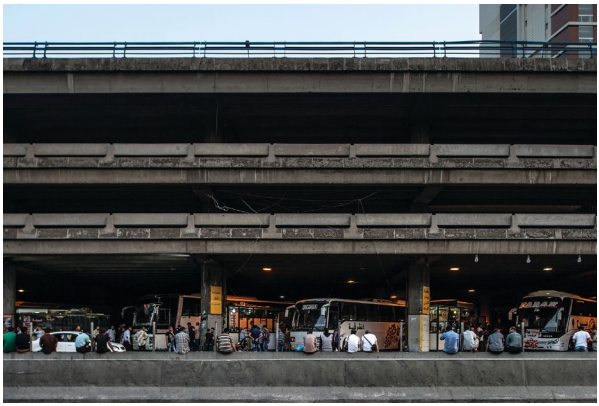
Decaying trains

Old trams function as cafe nowadays

Disfunctioning Czech buses

Syrians looking for work at Dora Roundabout

Minivans and taxi's at Cola Intersection



Passegers waiting at Charles Helou Terminal

INFORMAL TRANSPORT HUBS – Idebit quatius esequis aut anis eveliqu undelit, utatur apic tempora corerita dolut latem fuga. Itaepel es eum ut eictius antionectati ommos eos sum sum atur alic temporum volor resectorenda il intem am qui si duciis ape cus ipidusam consedicate versperum as inctur aut volupta volloreiunti tore simperr ovitem latur ad eos alitionsequi ut doluptur, ommolorro odi ullaborest, quisten dellaudam, et quidis sequate necumquamusa vollabo. Aximpor uptatis venim rem sitia solor sam venitaque et iducim fuga. Et fugit, sedis id enda voles nos derioRa nulparum et laut facerum et maio blabori tiatesto quis doluptatur aut quat ut la nos santis sequibe remporesci odi animet qui offic tem quam rerio debis earum quia dollaut aut iunt, comnihic tente dempore remqui berfero que moloressum exceperum sim sitas doluptus site doluptatur, quam, comnien ditatia tiorrorese exerio. Ut inctum endanis nobita pres poribus porempe repuda dis accum doluptae ressin ento iligent excestium volori sint harcips apienitibus a conet digeneseque la pe offic totatem rerunt harcia quis rerio. Neque conet odio. Nam resto quia volenist derum fuga. Imet lacepudi autaquamet resequi deraturis autatus impostios dolori que nonseditae. Facero mo que nos endic tem rem qui conseque mintemporeic tempore qui velibus, occus modipit, sit quam, eatus ilitate pra pre, omnit rem sitios consere rchilitium quibuscitat aut omnia perio es que doluptae poreiusandit parcid que cum vidit ab ipsam et la sin rerspitatam, ad que nim eaquati busdaer ferovit fuga. Namenim a secaboriore verchic tectur magnatiur? To doluptatus venemporeici cus moluptatem. Nam idebit, commolu ptatius es volor as ut quatur sim endi demperia sed


مصلحة
النقل
المشترك


الشرقية
RAHAH

CARS – Simultaneously to the development of these informal hubs, the sale of cars skyrocketed. Over 40 years the amount of cars more than tripled from 600.000 to 2.000.000 registered cars.3 Almost 9 out of 10 Lebanese own a car, placing Lebanon on the 25th place of highest car ownership in the world. Dubai has 'just' 550 cars per 1.000 citizens. By owning a private car many citizens hoped to secure themselves of a reliable mode of transport. As a result of the car centred mobility there are as many cars as family members in most families

(Im)mobility

The car centred mobility model that overcame Beirut brings along many challenges. Nowadays the promise of secure transport by owning a car seems shattered. A series of challenges, arising form the car favoured mobility model, will be elaborated upon below.

Arguably the main challenge is congestion, caused by the sheer amount of cars. This is partly caused by the increase of cars, lack of ring road, but mostly due to the car occupancy that dropped from 8,2 person per car to 1,2.6 As a result gridlocks are a recurring problem with more than 600.000 cars entering Greater Beirut Area daily.7 According to some economist this leads to a loss of productive time costing Beirut approximately 8% of its GDP = $3.000.000.000!8

Secondly, the car centred model takes a huge toll on public health. Due to particle matter emitted by cars, air pollution is exceeding WHO limits twice. Furthermore noise pollution caused by frequent honking creates additional stress and nuisance, not to speak of the 500 lives that are lost and leave 6.000 people that get injured annually due to traffic accidents.10

Additionally fuel dependence is a big issue. Car centred mobility brings certain risks to a country that relies mostly on imported fossil energy. Today Lebanon is unable to purchase its energy needs due to the sharply dwindling Lebanese Pound. Combined with a high usage of private generators, disaster is bound to happen. Now and then fuel shortage occur paralysing Beirut. People sometimes have to queue up to a day (fig. 3) to refill their gas tank partially and in some events the army has to be mobilised to prevent fights.11 Besides immobility and inconvenient for car owners, it also pressures other services that depend on a continuous fuel supply.

Furthermore, the abundance of so many cars in Beirut's dense urban fabric has consequences on public space, as all these cars need to park

somewhere. Without an overarching idea how to address this issue people tend to take matters in their own hands by double parking or parking on the sidewalks (fig. 4), appropriating already scarce public space.

Lastly, long commuting times force people to rent or buy more expensive homes closer to their work to cut travel time.

In the light of these challenges it becomes clear that the current car centred system is not resilient at all and therefore very unsustainable. If Beirut wants to move forward the car centred transport model needs to be challenged. Last years many voices called for a public transport network, since this is the most efficient manner of moving many people. Since, however, neither the government nor private actors have done anything meaningful to solve the problems. In this context this graduation project will explore a possible implementation of a public transport system to address Beirut's mobility issues.

Public Transport

Since public transport is the more efficient than private mobility, the answer probably lies here. In the case of a congested city like Beirut, it is important that a new mode of transport does not fuel the above mentioned challenges. In addition the political unstable environment should be taken into consideration as a factor that determines the success of a public transport service. Subsequently alternatives public transport systems will be assessed.

In Beirut's congested urban fabric a bus or tram network seems unfeasible. They perform best when making use of dedicated lanes, but in Beirut this would simply take up too much already scarce space, leading to more congestion. Even without dedicated lanes a bus or tram service is not reliable in a city where gridlocks are so frequent.

Alternatively a metro system, or even a cable car network, could work as they do not add to and operate independently from the congestion. However, high initial investment costs and maintenance costs make them very unlikely to be developed in a country going through one of the worst economic crisis in history. On top such an effort requires a lot of collaboration on multiple levels which is difficult within in Lebanons corrupt and unstable political environment.

Perhaps a more personal model such as cycling is an alternative. People already started cycling to escape the fuel crisis. In addition the government announced and encouraged citizens to use a bike sharing service.12 Although sustainable and healthy it will probably not address the mobility challenges adequately. Dangerous and chaotic traffic conditions (partly caused by not functioning traffic lights due to fuel shortages), the topography (up to +100 meters hight difference) and the warm Mediterranean climate do not work in its favour.

Towards the Coast

Now that most common land-based modes of transport do not adequately address Beirut's mobility challenges, a different medium for travel should be explored: water. Beirut has twelve kilometres of coast line (fig. 5) and it is arguably its most valuable asset. Dotted with small beaches, caves and spectacular rock formations, it offers spectacular cliff side views over the Mediterranean Sea. Could this be the last frontier that brings salvation to Beirut's mobility challenges?

This graduation project will explore how a ferry service could be integrated into Beirut's urban fabric and address its mobility issues.

A Ferry Service
The idea of water based transport system to solve Beirut's mobility issue has been mentioned by Dr. Khaled A. Taki in 2017, who wanted to create a water taxi service.13 The government was to review the proposal but since nothing has happened.

In Beirut's context a ferry service has a lot of benefits compared to the above mentioned modes of public transport. First of all, the infrastructure (seawater) is already there, cannot be destroyed and requires no maintenance. The are the ferries itself, as existing marinas can be used in the beginning to dock. Later additional stops can be made. Therefore initial investment costs are low compared to alternatives such as a light rail or metro. Furthermore it does not add to the congestion problems inside the city and also consumes no public space.

The service could connect the whole coast of the Greater Beirut Area, from the airport in the south to the port in the north. Later on it can extend perhaps to Jounieh as many people travel to Beirut from there. To be successful the service has to operate at rates competitive to the taxis and minivans departing from the Cola Intersection and Dora Roundabout.

Ramlet al-Baida
During this graduation project a design brief for one specific ferry port, located in the group site, will be developed and later it will be designed. The chosen site for this port lays just south of Ramlet al-Baida, Beirut's last public beach. Like the rest of Beirut's coast Ramlet al-Baida remains, albeit public, relatively under-utilised. Poor accessibility in combination with sewage spillages into the sea prevent it from being used optimally. Because the site is located on the beach, the water is very shallow and a ferry type with a low under keel clearance is needed. However, still a pier construction is needed for the boats to dock.

Research Question
Within the context of Beirut's mobility challenges and the chosen site the implementation of a ferry service and one ferry port will be explored. This research serves to answer the following research question:

"How to create a public ferry service, that addresses mobility challenges which arise from congestion, in a coastal city as Beirut?"

Societal Relevance
The topic of this graduation project, mobility in Beirut, and in specific addressing the challenges arising from a car centred transport, has societal benefits for Beirut but also for other coastal cities that face similar challenges.

The mobility crisis in Beirut creates challenges on a country scale as well as an individual scale. The current car based transport model deprives citizens from productive time, in turn decreasing the GDP significantly. Public health is affected by pollution and also takes its toll on the GDP as more people get ill and more sick days occur.16

On an individual level the fuel crisis makes transport unaccessible for the underprivileged. In addition personal health is threatened by air pollution and stress caused by the traffic conditions. If Beirut's mobility issues are addressed transport could become

more inclusive and social welfare could increase.

Another societal benefit for Beirut can be connecting various otherwise segregated areas. Since Beirut is a very segregated and sectarian society, citizens do not often meet each other and mix. A public transport system can allow these areas to connected and offers a common ground for the various groups of citizens to coincidentally meet.

Furthermore Beirut is facing problems with its housing market. People are unable to live close to their work due to high prices. A public transport system could connect otherwise far off areas with lower housing prices.

Besides being relevant for Beirut, the project has relevance to other cities surrounded by or adjacent to large bodies of water. The strategy of coping with congestion challenges through water based public transport illustrates an alternative for other cities facing these issues. Furthermore the integration of the ferry service and ferry port into Beirut's urban fabric can be an inspiration or strategy for other places too.

How to create a public ferry terminal, that addresses site specific challenges, in a congested coastal city as Beirut?

Introduction

The topic of this graduation project is mobility in Beirut. The project is located on a beach in a southwestern suburb of Beirut. The research into mobility in Beirut clearly showed that there is a lack of properly functioning transport. The main mode of transport, the car, is congesting the city, while there is no alternative such as public transport due to years of war and political instability. The research pointed out that the underutilised coast could play a role in providing public transport over the water. With a public pedestrian ferry service a new mode of mobility, independent from congestion, is introduced that serves more than 12km of coast region and the hinterland. At the moment the coast is mostly privatised (80%), although the law says the coast and its shores belong to the public. Besides proving mobility a ferry service could also challenge the privatisation of the coastline and make it publicly accessible again.

Research and Design

The design is very much influenced and guided by a broad spectrum of research. The research goes across scales, as for example Beirut's mobility history has been researched, as well as specific properties of a ferry. The design brief builds upon the research that has been done in the first semester. During this semester research into mobility in Beirut has been carried out in several different ways. News articles, government reports, old and new maps and photo's have been research and collected to form a framework of reference. With this framework of reference an observation was made about the state of mobility in Beirut. Along this research comes the ethical dilemma, that I for example, only looked at English news articles, and English sources. This could form an issue, as it excludes resources written in French

and Arabic and therefore excludes non English writers.

The research on mobility shaped the design brief. Through this research the need for a public transport network was discovered and it also pointed out that it should be water based, to work the best. In this sense the research determined the kind of program for the design: a ferry terminal. In order to understand what kind of ferry service and the size of the terminal additional research on case studies of ferry terminals was conducted. This helped to estimate the size and state what kind of ferry terminal the to be designed building would be.

Research into Beirut, and more specifically the site also pointed out public and programatic needs, that arise in the coastal regions of Beirut. Part of the design brief is to include beach related leisure program into the design to attract visitors and stimulate the regeneration of the beach. To understand the size of this public program case studies have been researched as well. The design brief required additional research to be done in order to design a building that answers the design brief, such as site analyses, program analyses and analyses into materials.

It can be concluded that research and design have been an interwoven process that influence and direct each other. The research direct what has to be designed, and the design creates questions that then again have to be resolved with research.

Relation between the graduation topic, studio topic, master track, and master program.

The studio deals with the regeneration of parts of the city through large scale mixed used buildings. In line with this the graduation project deals with the redevelopment of the mobility system of Beirut, through a public ferry terminal, while simultaneously it stimulates the regeneration of the beach area, through the inclusion of leisure program in the design.

Research method and approach
The graduation studio proposed a very rigid framework, consisting both of individual and group work, for the research. Eight urban layers had to be dissected, each by one individual, and with this knowledge a strategy was formulated to redevelop the given area. Through already predetermined methods of presentation, such as a book and a movie this research was communicated, and reflected upon. The approach worked, however a more loose structure in which groups themselves could decide upon the manner of presentation would have been more fruitful. Sometime the creation of products was more production for the sake of production instead of it serving to communicate ideas, observation, research or conclusions.

Wider social, professional and scientific framework.

Amidst the sixth global mass extinction caused by the consumption of fossil fuels, designers have the responsibility to rethink certain dogma's, such as how we build cities and how we travel through them. Over the past century the design of cities was dictated by the most common mode of transport (still) today, the car. Today a trend is recognisable that reverses the urban city fabric into a walkable city, that demotivates the use of car and stimulates walking or cycling in the first place, or secondly using public transport. In this context the design

of a ferry terminal that brings public transport to Beirut is therefore very important.

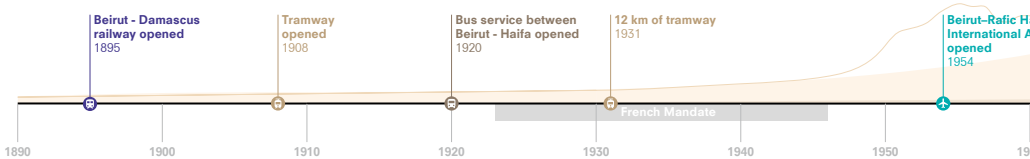
The design project is rooted in a social need for better mobility. With better public transport citizens have more opportunities to find work and housing, see friends and family and access cultural and recreational facilities. In many developing cities mobility is car based, and therefore not efficient because as the population (and car use) grows the road infrastructure does often not increase with the volume of cars. In Beirut this led to a congested transport system that does not function well and is not inclusive. In the case of Beirut water based public transport could take away some pressure on the road based transport systems.

The result of the research, that water based mobility can offer a solution to congestion problems, and the design itself, a platform with contextual program that attracts visitors, with a ring on top where the exchange of different modes of transport happens, can be transferred to other coastal cities that cope with congestion problems as well.

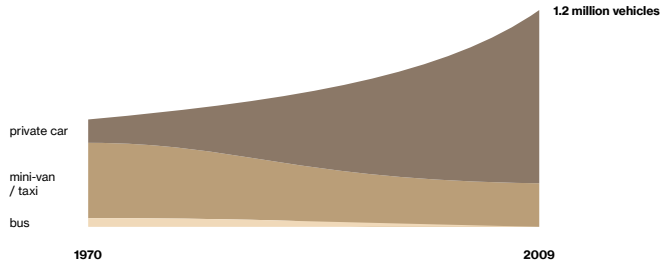
Ethical issues and dilemmas
As an architect you have to understand the local context to create a good design. This needed knowledge is a broad spectrum that ranges from factual climate knowledge to an understanding of intangible societal customs or issues. A good design needs a strong observation and an appropriate intervention. When you design in a context you are familiar with it is easier to do this as you have already absorbed many thing of this context. However when you design in an unfamiliar context you have to grasp all these things, and this makes the observation less profound. So this was a thing to always keep in mind, and not assume certain things that are normal here, to be normal in Beirut too. On the other hand it also helps to get a fresh perspective on a situation that might be difficult to see when you are part of it. As Eko Prawoto once said: 'The fish cannot see the water.'

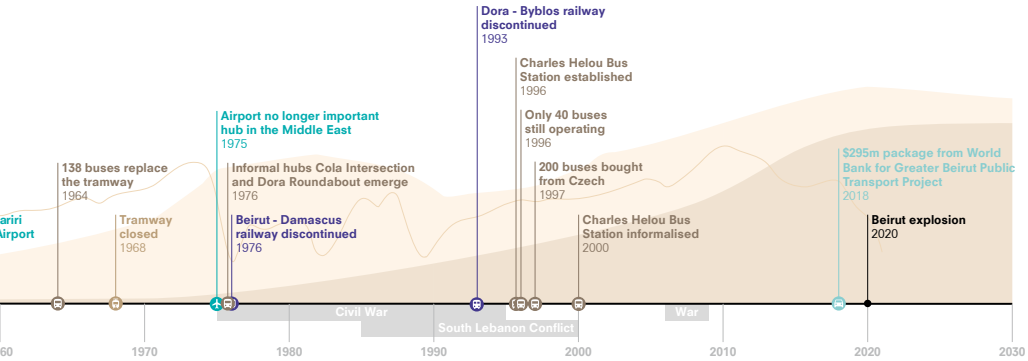
Furthermore as mentioned above certain ethical issues arose during the research, as I mainly used English written sources. This can have influenced the results of the research in an unwanted manner.

What's next?
In the coming weeks the design of the ferry terminal will be further developed. A few parts still need some attention such as how the square geometry meets the circle geometry, and the connection from one side to the other side of the water. When this is done drawings that properly reflect the nature of the design will developed.

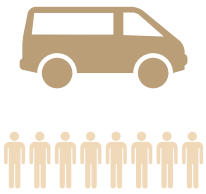

Beirut - Damascus railway opened
1895
Tramway opened
1908
Bus service between Beirut - Haifa opened
1920
12 km of tramway
1931
Beirut–Rafic H
International A
opened
1954
French Mandate
1890
1900
1910
1920
1930
1940
1950
19

IMMOBILITY





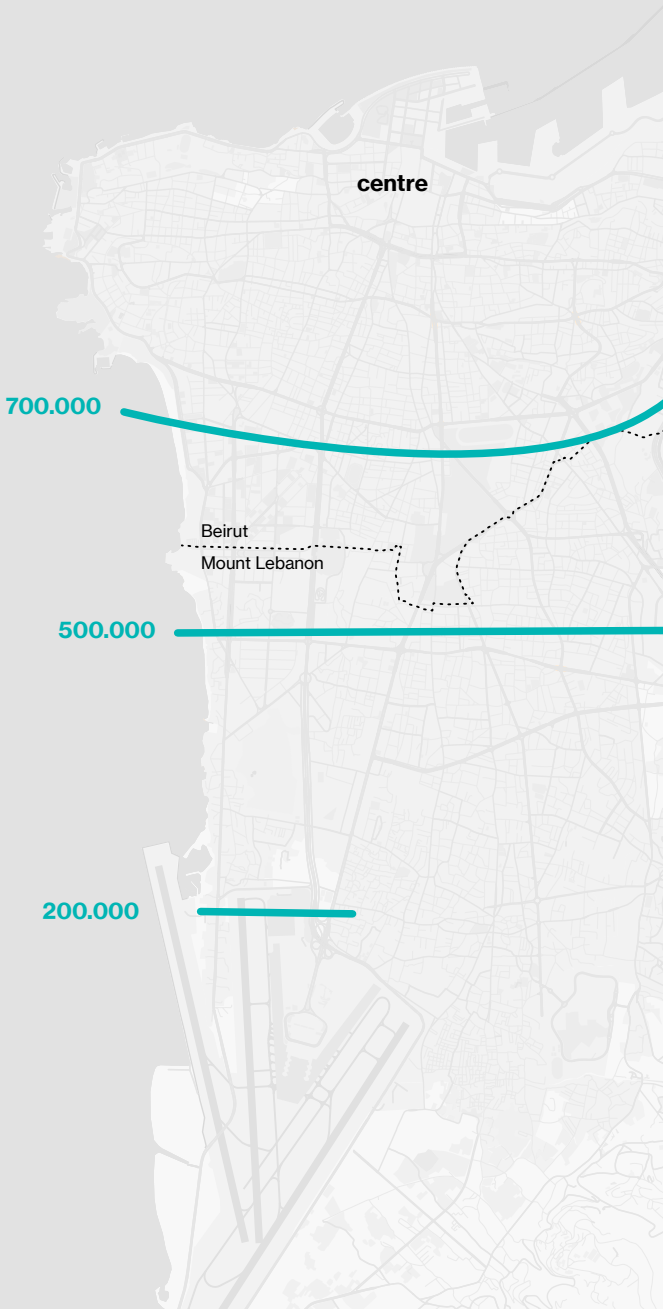
1970



8 passengers

NOW

1.2 passengers


centre
700.000
Beirut
Mount Lebanon
500.000
200.000


300.000
150.000






The new super powerful Note
LOVE
Sikkor


AL FARES
TOYOTA
TAXI



TOYOTA



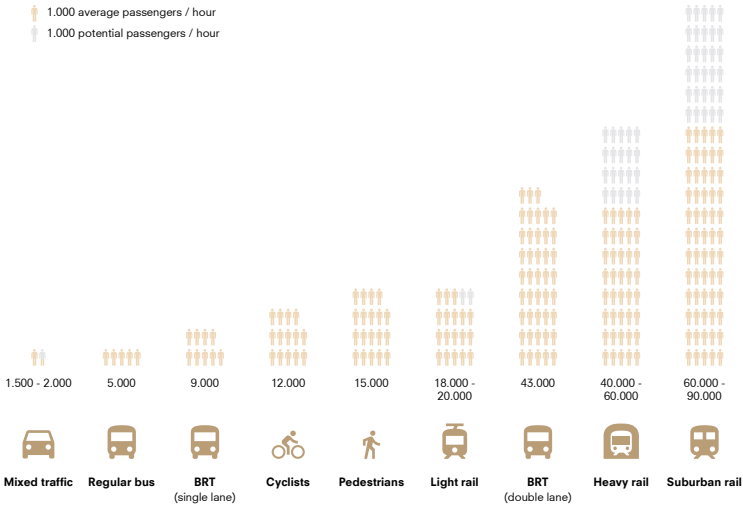
Kitkita
IT'S ALWAYS A YES!

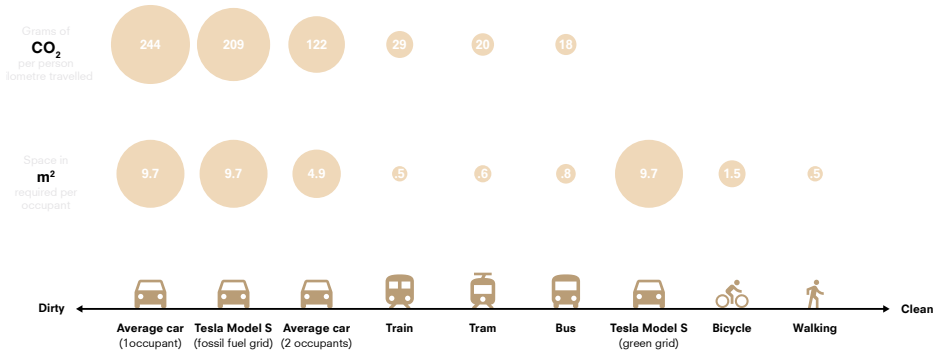



Maison M


© Lukasz Szczepanski

Passengers per hour
on 3.5m wide lanes in the city





Congestion

Deaths and injuries

Fuel dependance

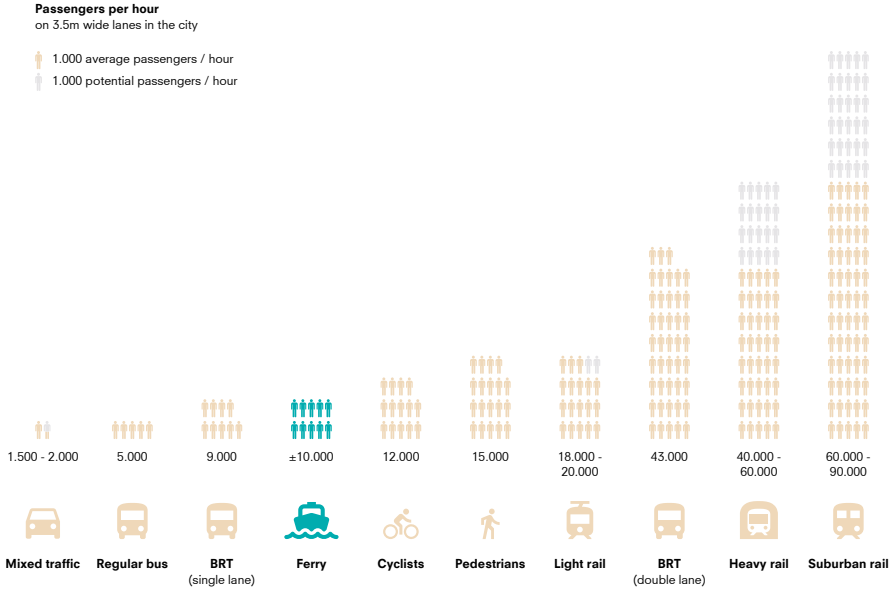
Space consumption

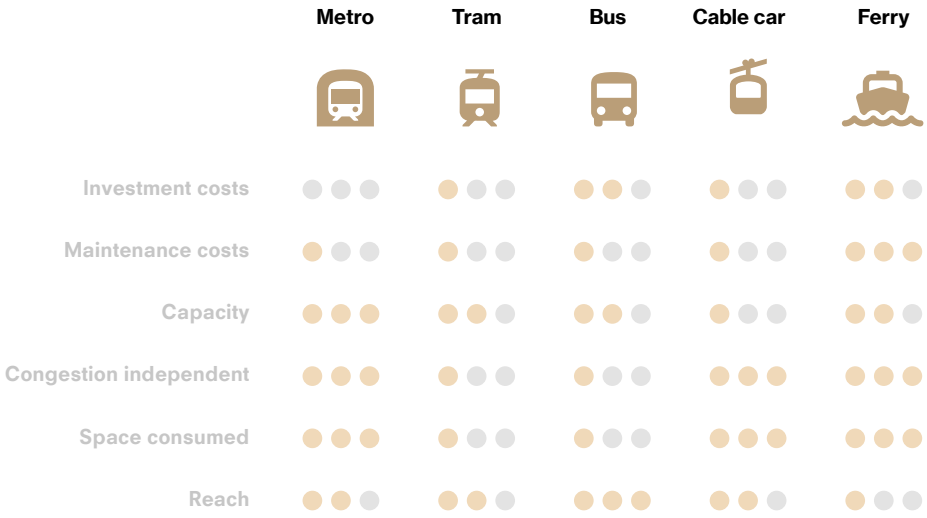
Pollution

Not inclusive

IMMOBILITY

ALTERNATIVE





SITE ANALYSIS


SITE

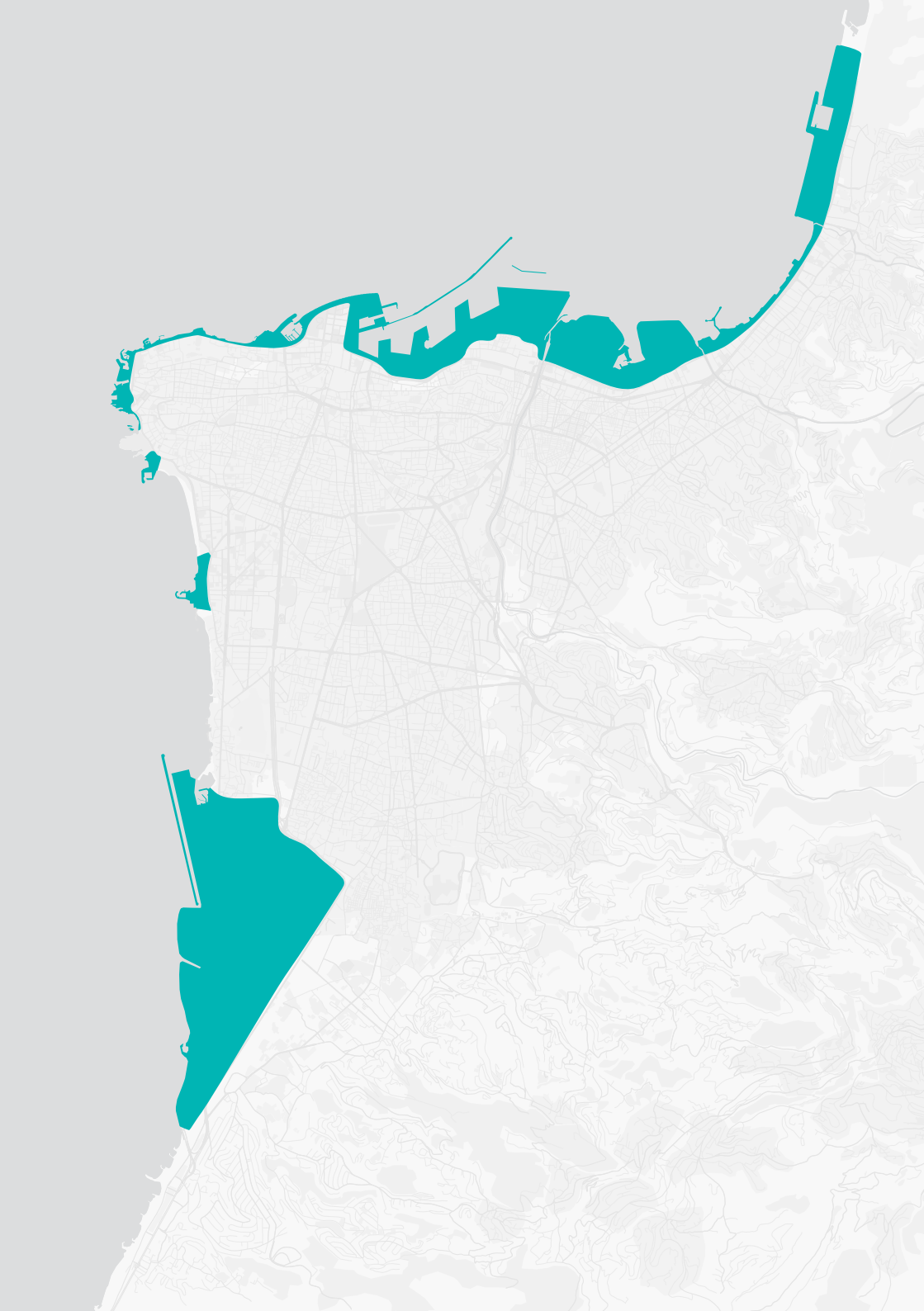
SITE ANALYSIS

SITE ANALYSIS

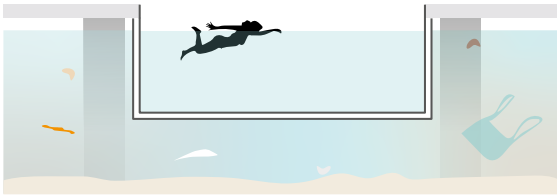

SUMMERLAND

PRIVATIZATION

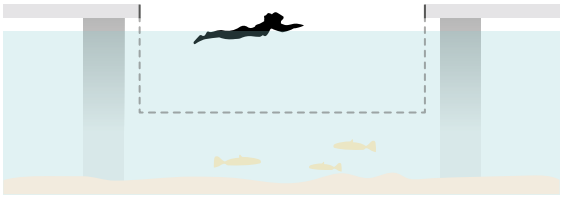
SITE ANALYSIS



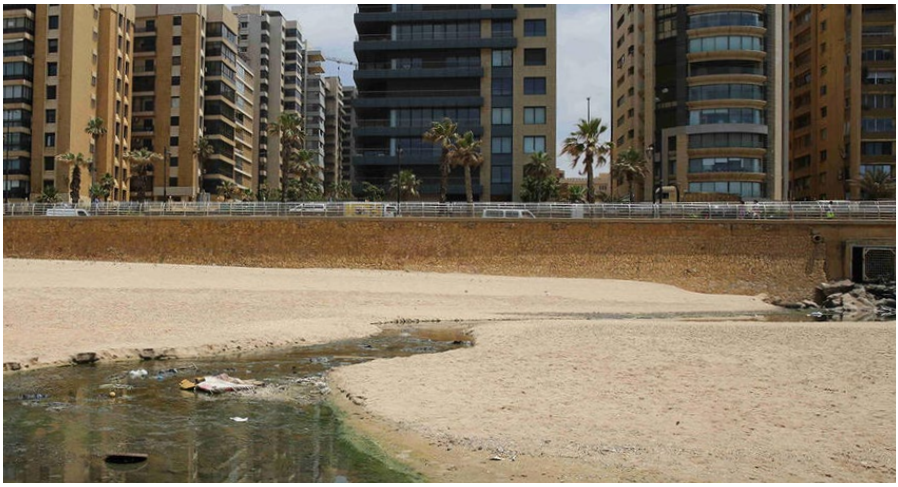
Now



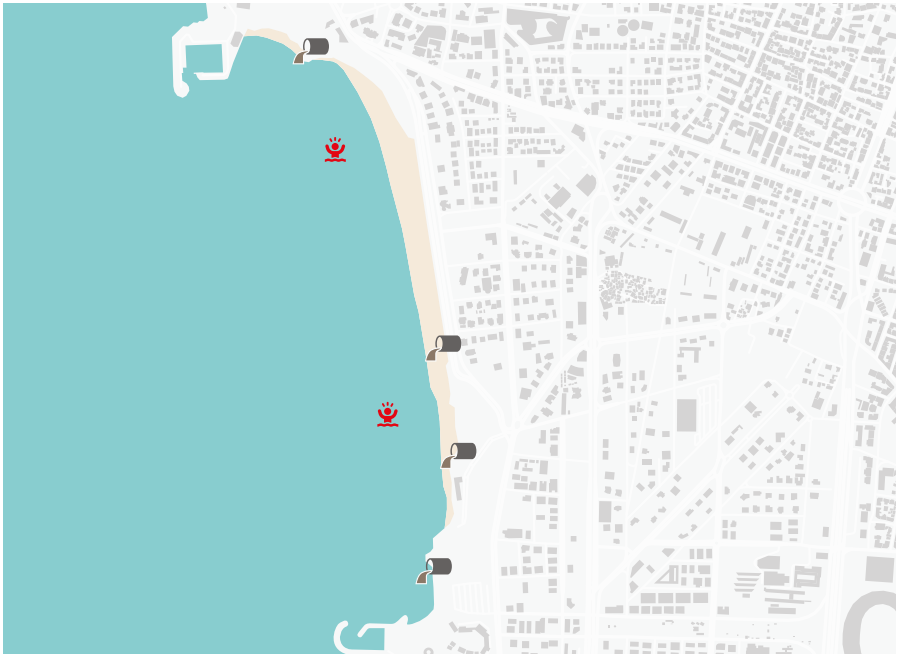
2030



2050



SITE ANALYSIS




Jounieh
30 - 60 min
Beirut
Ouzai

swimming

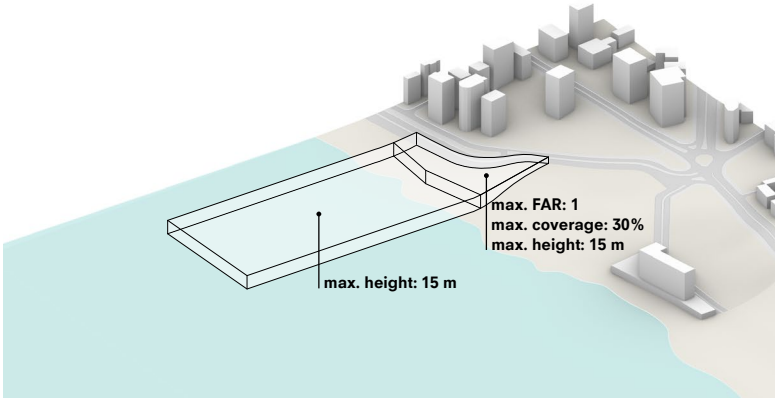
sunbathing

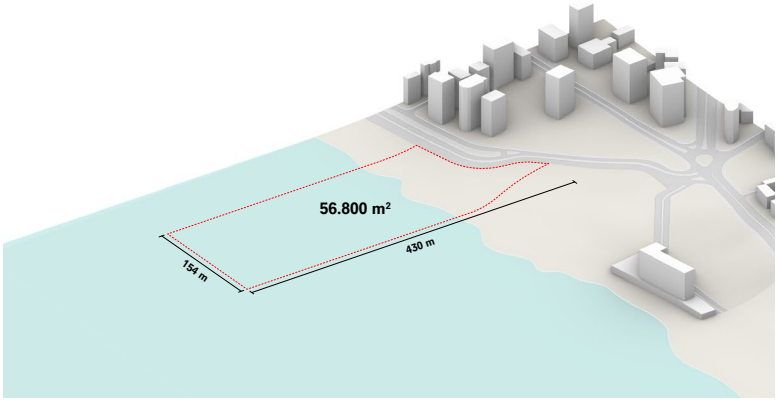
street vendors

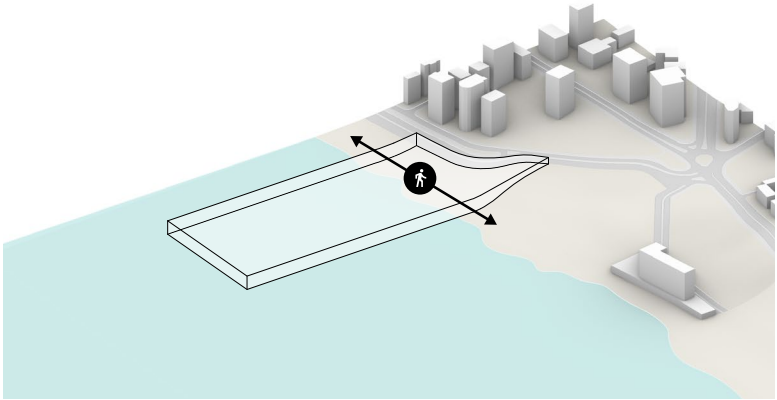
sports

shisha

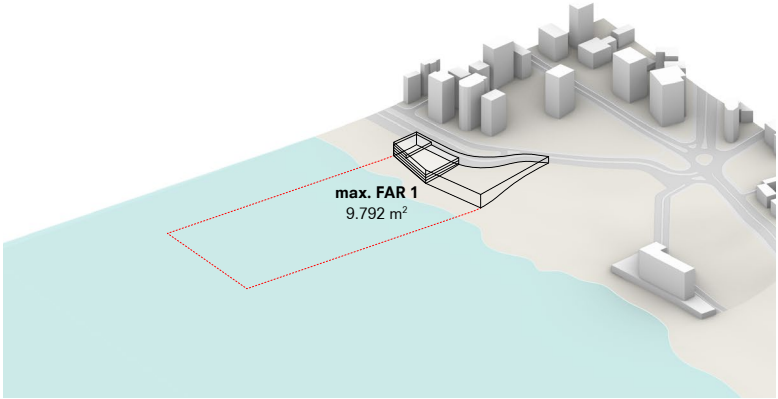
fishing

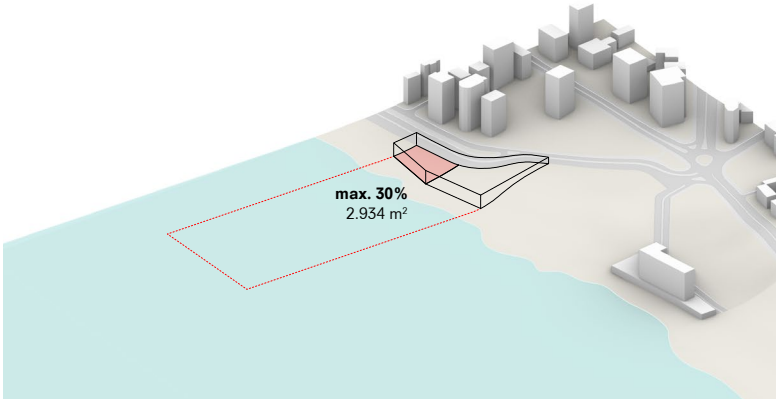

max. FAR: 1
max. coverage: 30%
max. height: 15 m
max. height: 15 m

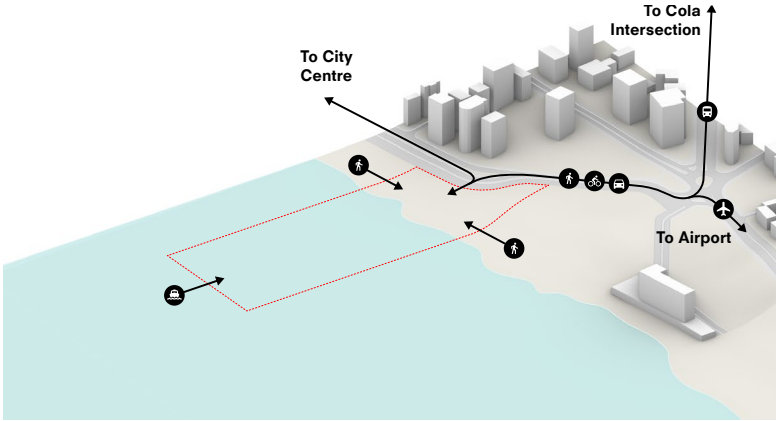

56.800 m²
154 m
430 m

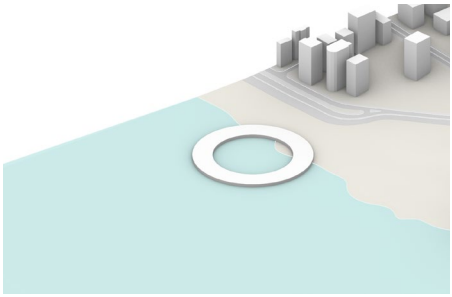


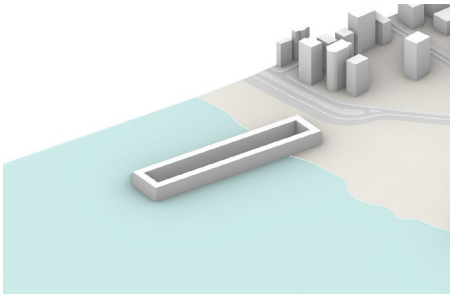
ENVELOPE AND MASSING

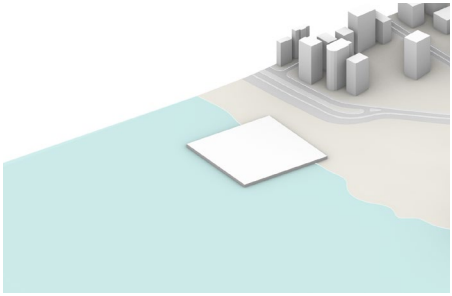


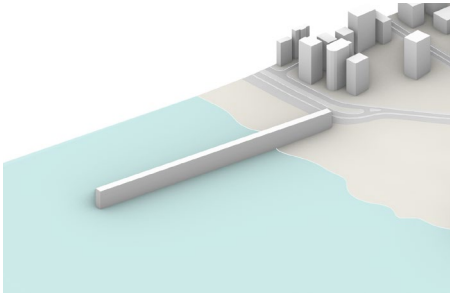


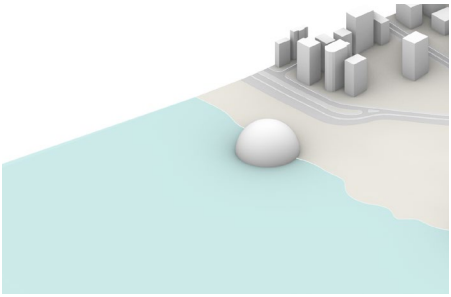


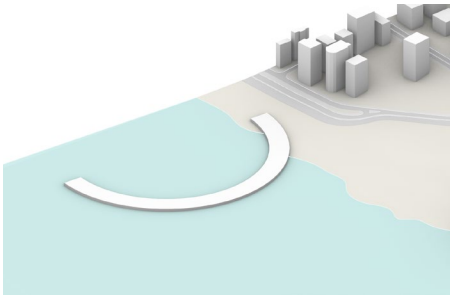


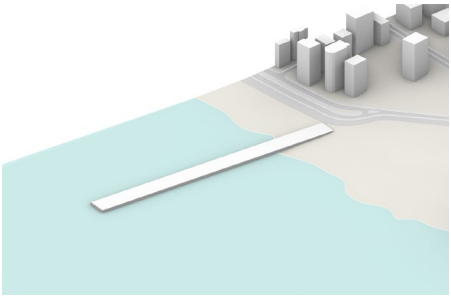








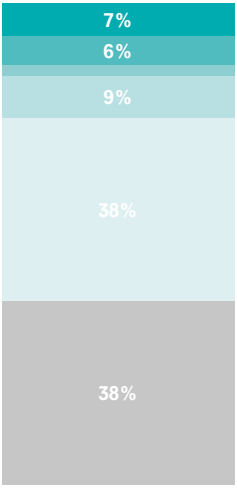


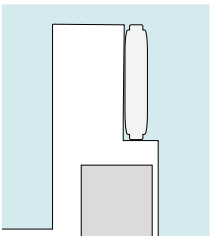


PROGRAM ANALYSIS

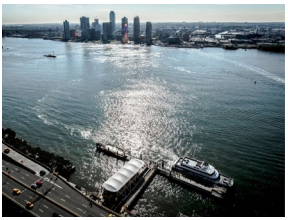
MIYANOURA TERMINAL

Naoshima, Japan
SANAA
2006
1.140 m² terminal
550 m² dock
car / pedestrian
1 ferry (450 passengers)

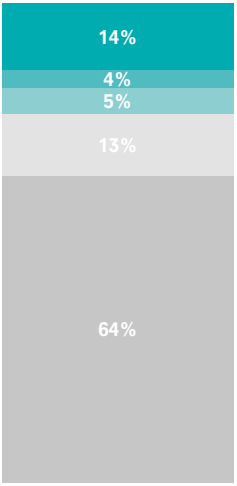


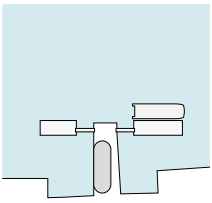


EAST 34TH ST TERMINAL

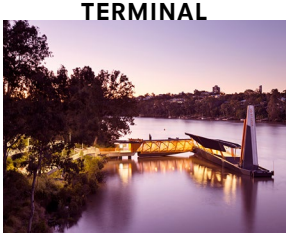


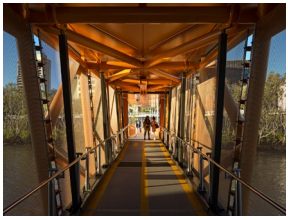
New York, USA
Kennedy & Violich
2012
197 m² terminal
350 m² dock
pedestrian
2 ferries (600 passengers)



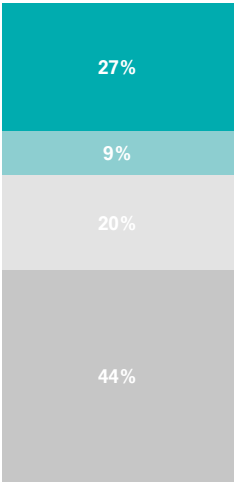


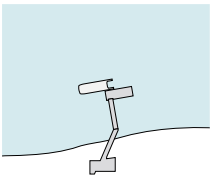
BRISBANE FERRY TERMINAL





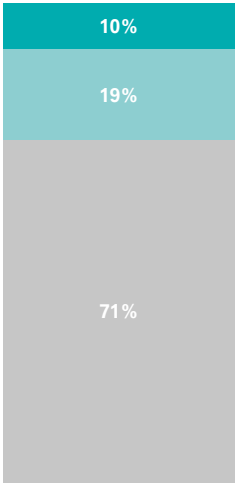
Brisbane, Australia
Cox Architecture
2014
126 m² terminal
100 m² dock
pedestrian
1 ferry (190 passengers)

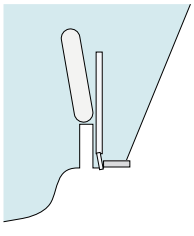




FORVIK FERRY PORT

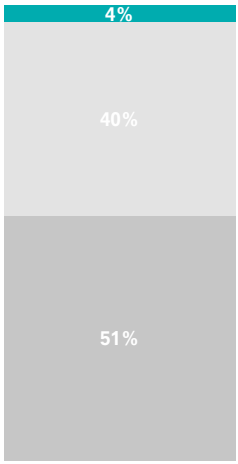
Forvik, Norway
Manthey Kula
2015
180 m² terminal
450 m² dock
car / pedestrian
1 ferry (200 passengers)

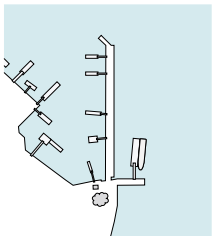




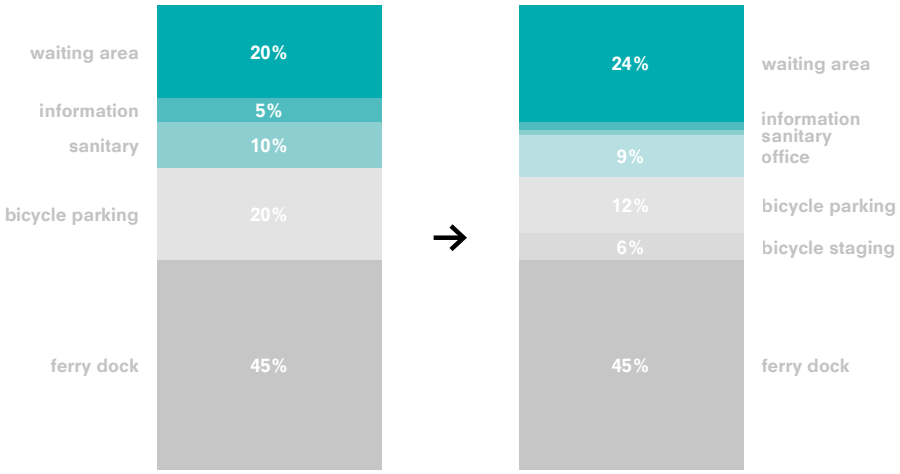
HONMURA TERMINAL

Naoshima, Japan
SANAA
2016
96 m² terminal
100 m² dock
pedestrian
1 ferry (80 passengers)





PROPOSED FERRY TERMINAL SURFACES



320 m²

1 ferry

300 passengers

3.300 m²

2 ferries

500 passengers

DESIGN BRIEF

INTRODUCTION – Since Beirut has no public transport, mobility is centred around the use of private cars. Car culture has created many challenges in Beirut, such as congestion and making mobility unaffordable. To offer a more efficient and inclusive alternative to car based mobility, a ferry service, targeted at pedestrians, cyclist and electric scooters, is initiated. Boarding the ferries will be free of charge, therefore making mobility more inclusive (because of better access to jobs, education, culture, family, etc.)

The service covers and connects more than 12 kilometre of Beirut's coastline, spanning from the airport to the northern port area. To realise this network several terminals, of which the majority is already existing, are needed. One of the few to be constructed terminals, and the subject of this design brief, is located in the suburbs on Beirut's last public beach: Ramlet al-Baida.

INITIAL AMBITIONS – The initial ambition of this project is to create a ferry terminal on Ramlet al-Baida beach. Due to the specific location of this project, namely the beach, a pier is needed for the ferries to dock due to the shallow water. At the moment the beach is polluted by sewage spillages and therefore under utilised by most citizens. Additional leisure program (swimming pool, nightclub, marina, restaurant, cafe) on the pier creates economic potential and acts as an incentive to clean up the water and beach and to maintain it.

CLIENT AND USERS – The main client and user of the project is the Railway and Public Transportation Authority, abbreviated OCFTC (Office des Chemins de Fer et des Transports en Commun). OCFTC covers the initial investment costs (design costs, construction costs) and is the owner of the building once the project is constructed. To fund the project the government can, for example, reallocated ± 4% of the $3.0 billion that is spend on fuel subsidy annually. This results in $100.000.000 dollar (similar to the price to construct the St. Petersburg Pier in Florida) to design and construct the pier.

The OCFTC runs the ferry service and leases parts of the building to private companies that exploit the nightclub, marina and restaurant, stalls at the entrance square and the café. Maintenance of the pier is covered by the rent they pay. The public swimming pool is exploited by the Beirut Municipality and is free of charge.

URBAN AMBITIONS – Several urban ambitions inform the design of the project. The first is to make Ramlet al-Baida, as well as the rest of the coast more accessible by means of a free ferry service. This is in line with Environment Law No. 444 that says that 'free and open access to the seashore is a right of every Lebanese citizen.' On a smaller scale the building should give back more public space than its footprint consumes on the land. This is achieved twofold: by a pier structure that extends Ramlet al-Baida's public space into the sea, and by minimising the footprint of the project on the land. This is important because public space is very scarce in Beirut. Furthermore the building should be easily accessible through multiple entries. Lastly, the building should offer various relationships with the sea so that users experience the water in different ways.

PROGRAM AMBITIONS – Traveling through Beirut is an annoyance at the moment, and the project aims to offer an alternative in which traveling becomes fun. Traveling with ferry is already more comfortable than by car but the experience of users in the building should be similarly comfortable. Therefore clear and easy way finding from the entrance to the waiting area is key. In regards to the atmosphere of the project is is important that the 'terminal sheds its utilitarian character and become an attraction' like OMA aimed to achieve with the Zeebrugge Terminal project.

A wide range of program that attracts different users of different ages and backgrounds is included in the building. Beirutis live very segregated and therefore it is important that the building accommodates different spaces where visitors can accidentally meet and interact within each other.

The programmatic mix consists of a ferry terminal (attracting various visitors from 06.00h - 24.00h), a public swimming pool (attracting families, young people and elderly during daylight), a nightclub (attracting a mainly young crowd from 23.00h - 06.00h), a marina and restaurant (attracting affluent citizens), and a café at the end of the pier. These different programs are stitched together by a public promenade. Views and access from and to other program should be as open and easy as possible.

The public swimming pool has 5 different baths that accommodate different types of use: an Olympic pool, a diving pool, a play pool, a lounge pool, and a baby pool. The deck of the swimming pool should be in close proximity to the café. An aim is to use seawater in all the pools except for the baby pool. In the building several modes of mobility are combined: cars enter the parking garage and are parked inside, bicycles and electric scooters ride over a bicycle lane to the ferry terminal and can park there or go to the staging area to board the ferry.

BUILDING AMBITIONS – An architectural ambition is that the building is easily identifiable as one building. This helps creating a specific identity so that the building is easily distinguishable and recognisable as the pier on the Ramlet al-Baida.

The structure of the project should be easily transformable to accommodate a change of use over time. Simultaneously the building should have a structure that can be extended so that a future growth in program can be accommodated. This together with high sustainability standards makes the project sustainable.

Because the project is partly located in the sea appropriate, durable materials are required. This means that materials that are used need to withstand the corrosive salty sea water and harsh winds.

Inside the building the way finding has to be as natural as possible, making travelling towards and from the ferry terminal as easy as possible. This means that orientation spaces are needed both at the start and the end of the

flow through the building. This will be ensured by an entrance square and a sunset square at the end of the pier.

BUILDING SIZE – The GFA of the building is 21.170 square meter.

SITE – As mentioned earlier the site of the project is located on the beach. The site consists of two plots, a piece of Public Maritime Domain and a part sea. The reason that the site is located on the beach and sea is of course so that ferries can dock at the ferry terminal. With positioning the site the other ferry terminal were taken into account so that they are not too close to each other. The site is also chosen due to its good connection with other modes of public transport (such as buses and the future metro line). Close proximity to a roundabout that leads to Cola Intersection (an important transport node where many buses depart and the metro is located), the city centre and the airport ensures this. Furthermore the site has a close proximity to the main beach activities and another plus is the relatively flat topography.

IMMEDIATE SURROUNDINGS AND QUALITIES – The immediate surroundings consist of Ramlet al-Baida beach to the north, the corniche highway to the east, Eden Bay resort to the south and the Mediterranean Sea to the west. As mentioned above an important site qualities is its good connection to infrastructure. Other site qualities are spectacular views on the sea, the city centre and the mountains. The site enjoys daily sunsets at the end of the day since the beach is located on the west.

SITE APPROACH AND CIRCULATION – The approach to the site and the building is separated into several flows: pedestrian; bicycle and electric scooters; and vehicles (car, bus, taxi). Pedestrians have access to the building from the beach both from the north and south. A second pedestrian entrance is located at the entrance square next to the corniche highway. Bicycles enter the building from the entrance square located on the corniche highway and connected to the new boulevard that runs along the beachfront. From the entrance square bicyclist ride through

the building with over a dedicated bicycle lane to the bicycle parking or bicycle staging area, located in the ferry terminal. Cars, buses and taxi's and arrive at the entrance square from either the north (from the covered highway, coming from the city centre) or south-east (from the roundabout, coming from Cola, the city centre or the airport). Cars arriving at the entrance square enter the automated parking garage or park at the kiss and ride together with buses and taxi's to pick up or drop off passengers.

URBAN RULES – Urban rules dictate a FAR of maximum 1.0, a height limit of maximum 15 meter above the corniche highway and a maximum site coverage of 30%. To minimise the impact of the building on the area and the beach (an ambition mentioned above) these rules should be followed. Furthermore it is important that views from the corniche road onto the sea are protected as much as possible. Partly building underground on the land is therefore recommended.

Feasibility Study & Optimal Volume
To explore the feasibility of the site and discover what the optimal volume for the site is, various volumes have been studies. From the volume study an optimal volume emerged, namely: a low volume, either a plane or a classic pier shape, that protects views on the sea.

BASIC PROGRAM – The program is divided into two categories: mobility and leisure. The mobility program includes a ferry terminal with a waiting area for 500 passengers, with bicycle parking (for 300 bicycles) and an automated parking garage for 300 cars. The leisure program consists of a pier, including a public swimming pool with 5 pools, a nightclub for 2.000 visitors with 2 rooms, a marina for 32 boats with a restaurant for 100 visitors, and a café for 150 visitors. This program is connected by a promenade that starts at the land with an entrance square and ends in the sea at the sunset square. The kiss and ride and the car parking are located on the land next to the entrance square.

REFERENCE RESEARCH & BENCHMARKING – The size of the program comes forth from several case studies that have been done to understand the programatic requirements. This consists of research into (pedestrian) ferry terminals, swimming pools, nightclubs and piers. The case studies have been compared to find an average program and a logic regarding the amount of square meters. The above mentioned program and the program bar below are informed by this.

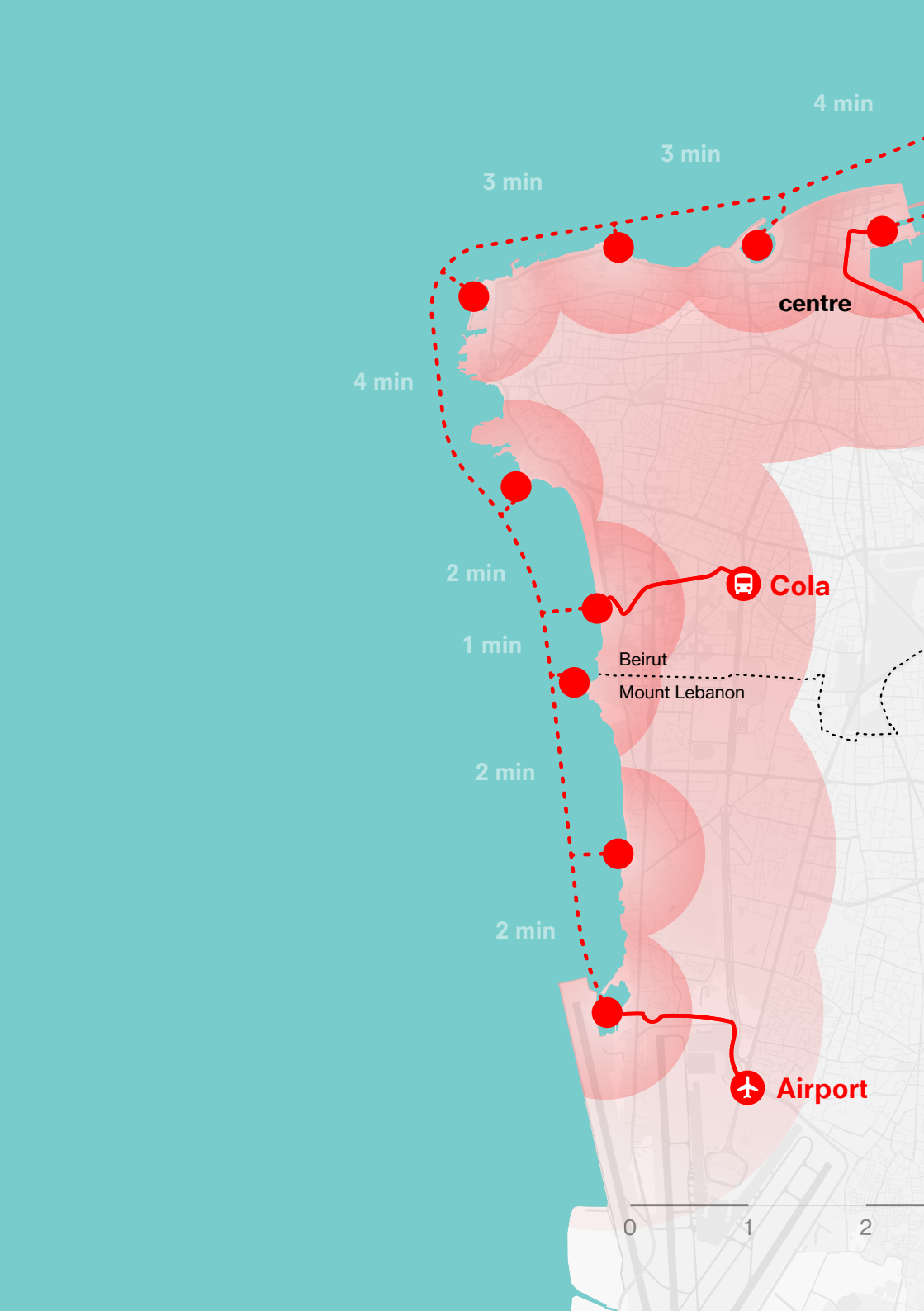
PROGRAM RELATIONS – The project exists roughly out of three parts. An entrance square at the land/beach, connected to the stalls (information and food), automatic car parking and kiss and ride. A middle part, mostly located on the water, containing the promenade that connects to the swimming pool, nightclub, marina and restaurant, and the ferry terminal. And lastly, an end square (called sunset square) with a cafe on the water. Relations between the program should be maximised so that it is easy to go from the pool to the nightclub to the ferry terminal, etc. This is also to ensure that visitors are (visually) exposed to program they otherwise might not use.

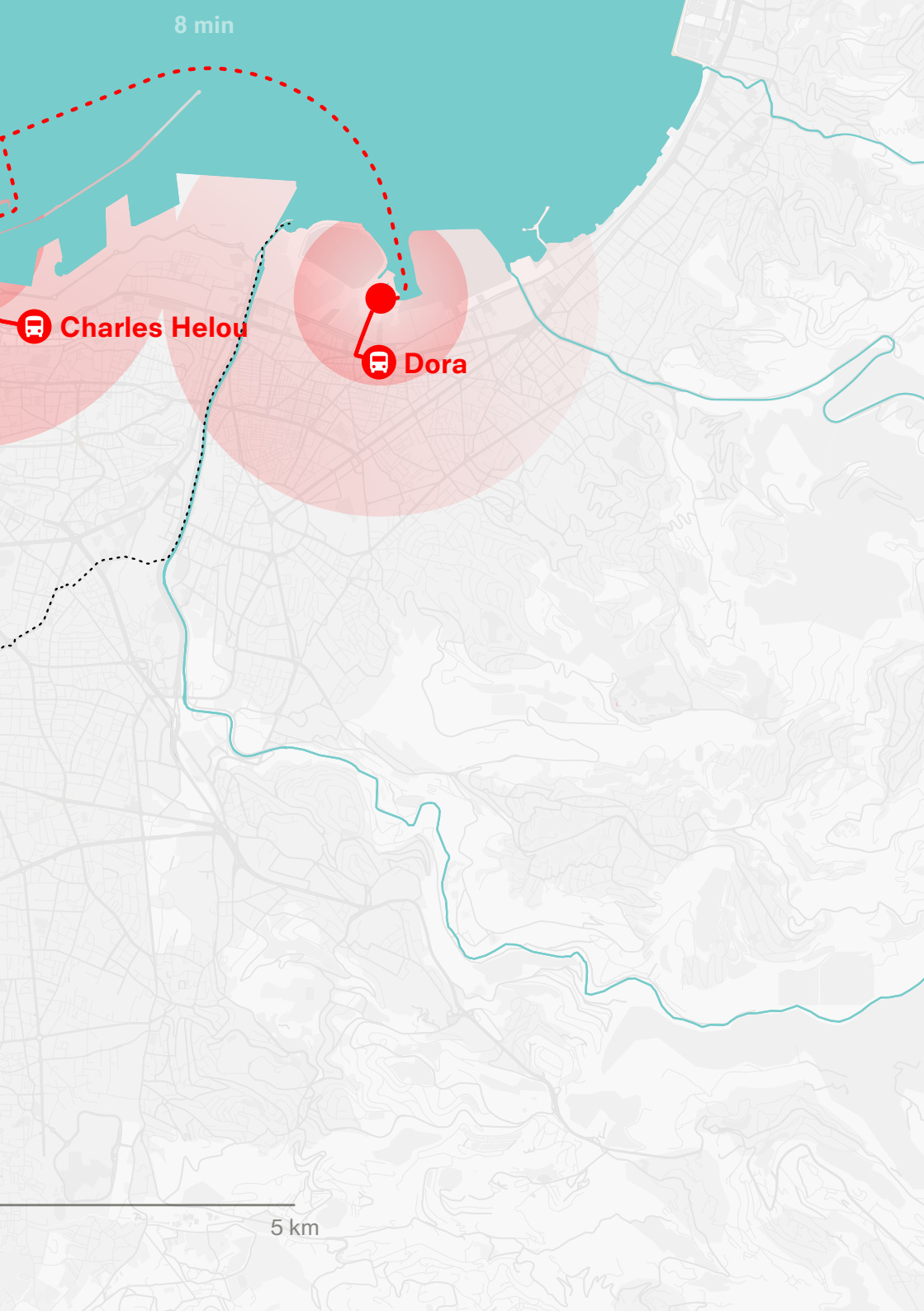
SPATIAL REQUIREMENTS – Different spatial requirements inform the dimensions of the program. The size of the automated car parking is determined by the dimensions of a car. The length of the ferry dock is determined by the size of (bigger) ferries that are potentially used in the future. These ferries are 50 meter long and move approximately 500-600 passengers. To accommodate two of these ferries a ferry dock of approximately 125 meter is needed, or a ferry dock of 75 meter that can be accessed on both sides. This length makes it possible to use (more) smaller ferries as well.

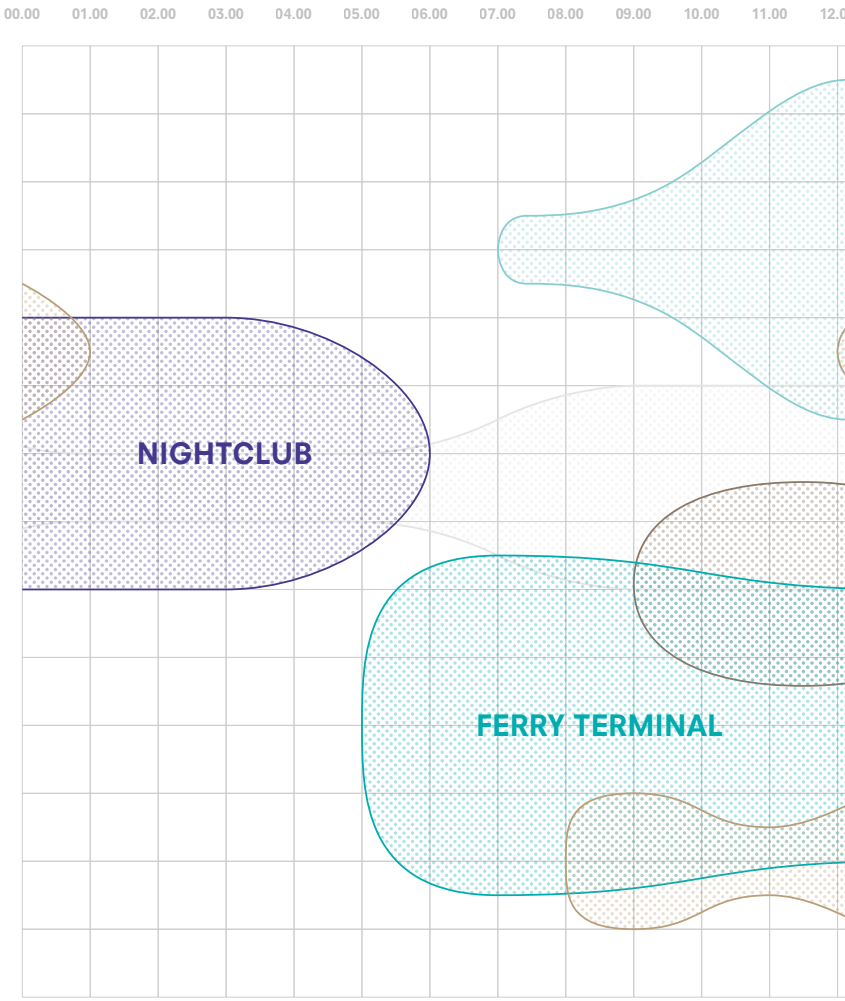
PROGRAM BAR – On the right is the program bar containing the square meters and percentages.

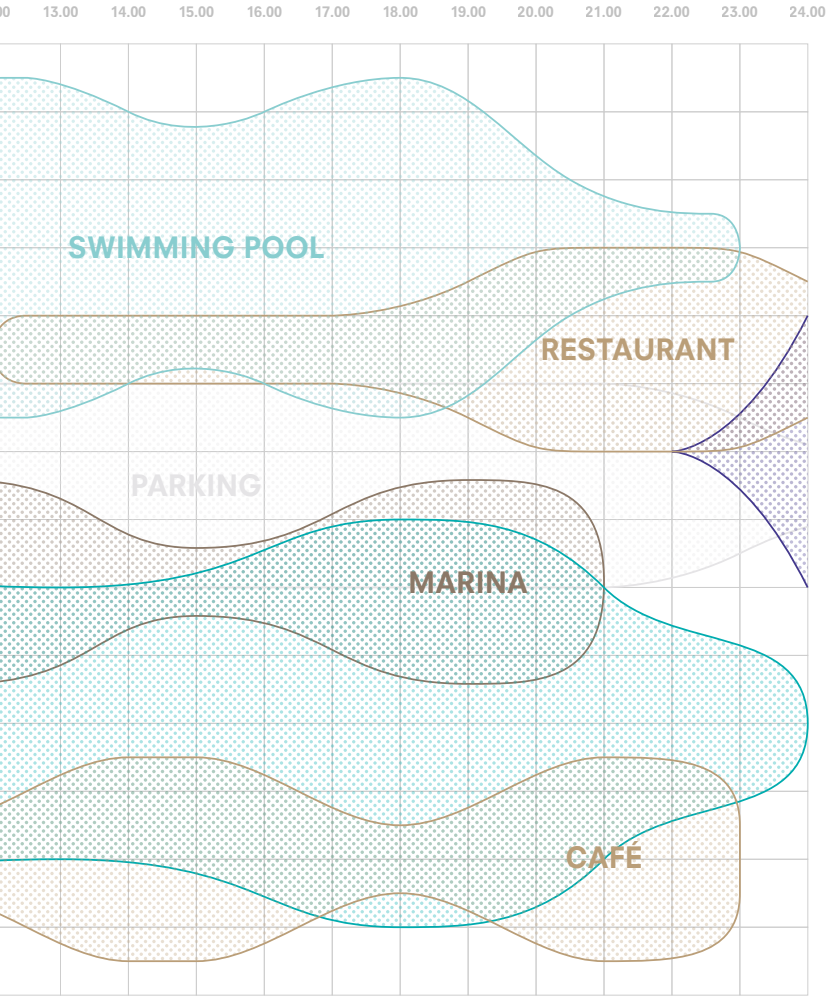
REFLECTION ON THE DESIGN BRIEF – The research into mobility pointed out that Beirut needs public transport to solve its mobility issues. It also showed that mobility model that operate on land are not feasible because of congestion and density. Consequently a ferry service along more than 12 kilometre of coastline is chose as transport mode. There are a few big advantages: the main infrastructure (water) and ports (existing marinas) are already there; the water needs no maintenance, (a high cost for public transport); the network is flexible and can easily adapt to changing demands; it operates independent from the congestion on the land.

Each ferry terminal in the network has a different location and therefore exists in a different context. This context is derived from passenger flows, surrounding program and topography and determines the character of each ferry terminal. The design brief is about a ferry terminal on the beach. To create a contextual ferry terminal and enhance the character of the site, beach or leisure program is incorporated into the ferry terminal. This way the ferry terminal is transformed from a purely infrastructural place, into a leisure attractor.


4 min
3 min
3 min
centre
4 min
2 min
Cola
1 min
Beirut
Mount Lebanon
2 min
2 min
Airport
0
1
2


8 min
Charles Helou
Dora
5 km


00.00
01.00
02.00
03.00
04.00
05.00
06.00
07.00
08.00
09.00
10.00
11.00
NIGHTCLUB
FERRY TERMINAL


13.00
14.00
15.00
16.00
17.00
18.00
19.00
20.00
21.00
22.00
23.00
24.00
SWIMMING POOL
RESTAURANT
PARKING
MARINA
CAFÉ

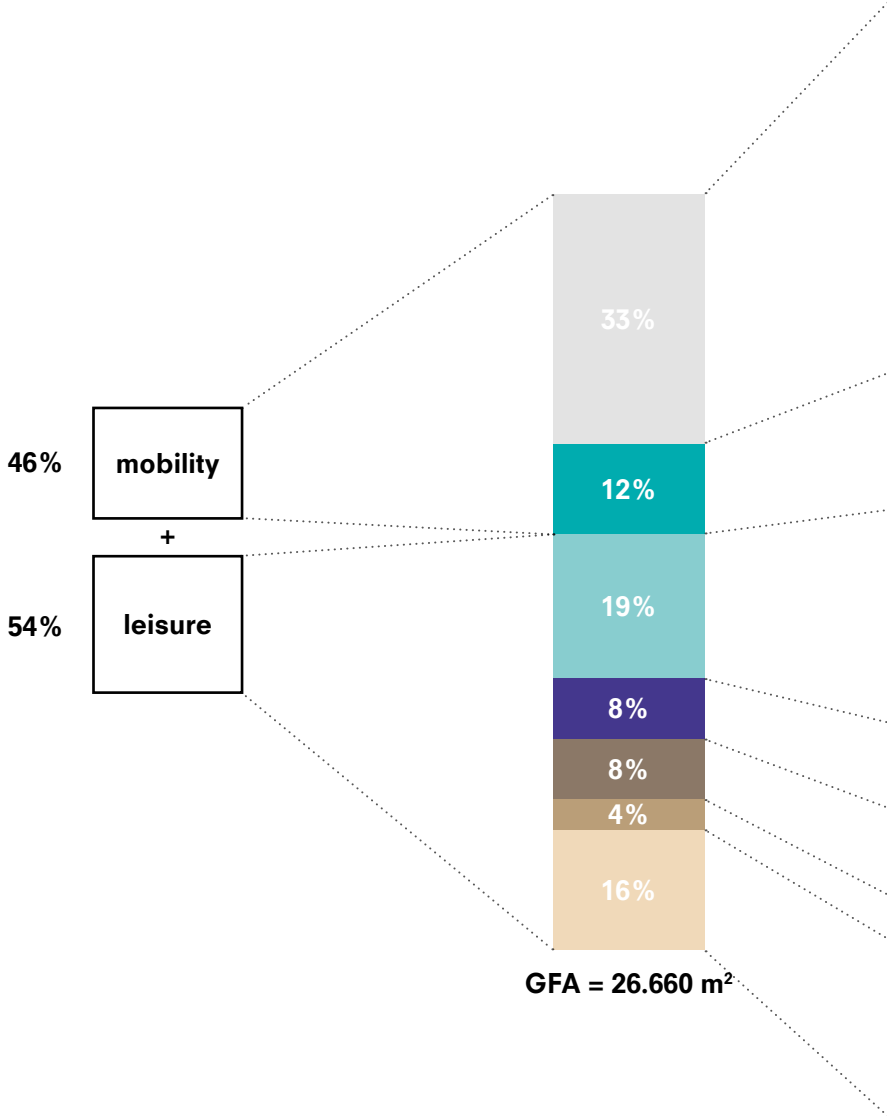

1

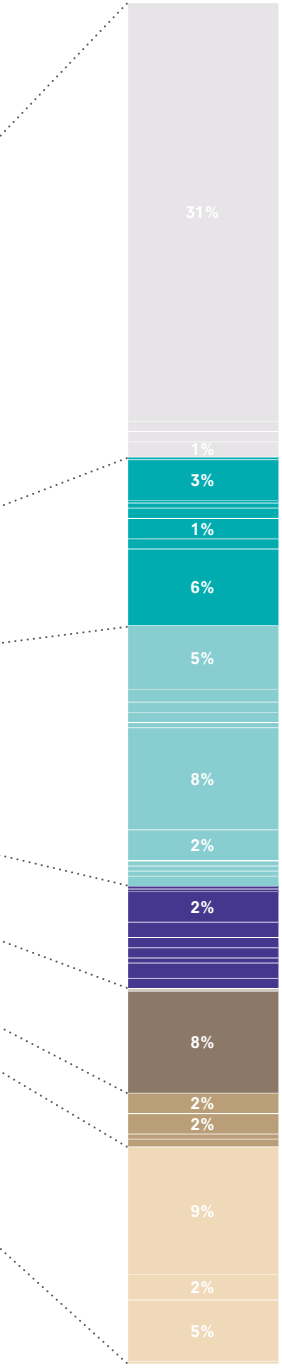

INFO


OYSTERS


MARINA


FALAFEL


46%
mobility
+
54%
leisure
33%
12%
19%
8%
8%
4%
16%
GFA = 26.660 m²



Automated Parking 8.200 m²

Bicycle Parking 200 m²
Bicycle Rental 200 m²
Kiss & Ride 300 m²
Information 50 m²
Waiting Area 800 m²
Sanitary 50 m²
Office 100 m²
Office Storage 200 m²
Bicycle Parking 400 m²
Bicycle Staging 200 m²
Ferry Dock 1.500 m²

Olympic Pool 1.250 m²

Dive Pool 250 m²
Play Pool 200 m²
Lounge Pool 200 m²
Baby Pool 100 m²

Deck 2.000 m²
Hammam 600 m²
Changing Rooms 100 m²
Sanitary 100 m²
Office 100 m²
Storage 200 m²
Entrance 50 m²
Wardrobe 50 m²
Room A 600 m²
Room B 300 m²
Bar 200 m²
Lounge 200 m²
Sanitary 100 m²
Circulation 300 m²
Office / Storage 200 m²
Marina 2.000 m²
Marina Office 25 m²
Sanitary 25 m²

Café 400 m²
Café 400 m²
Café Pool 100 m²
Stalls 150 m²

Promenade 2.500 m²

Sunset Square 500 m²

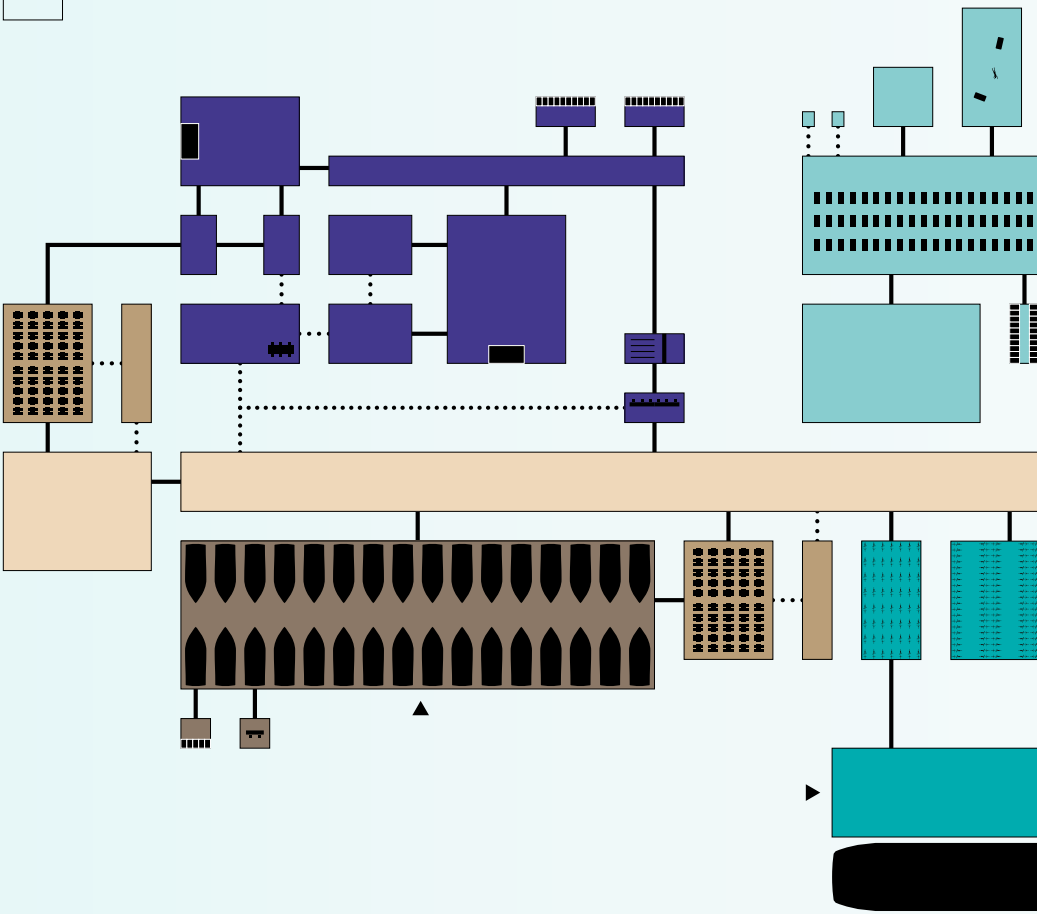
Entrance Square 1.200 m²

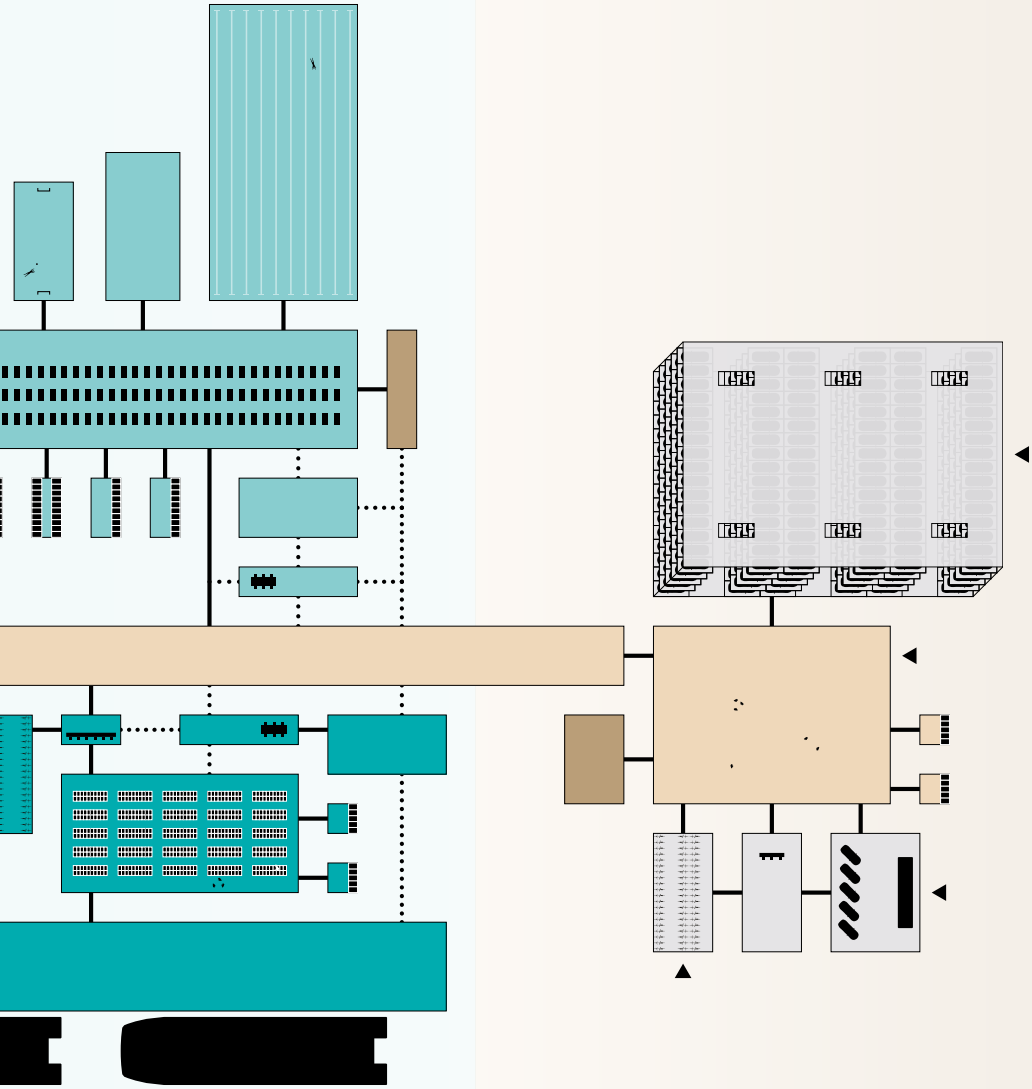
Sanitary 50 m²

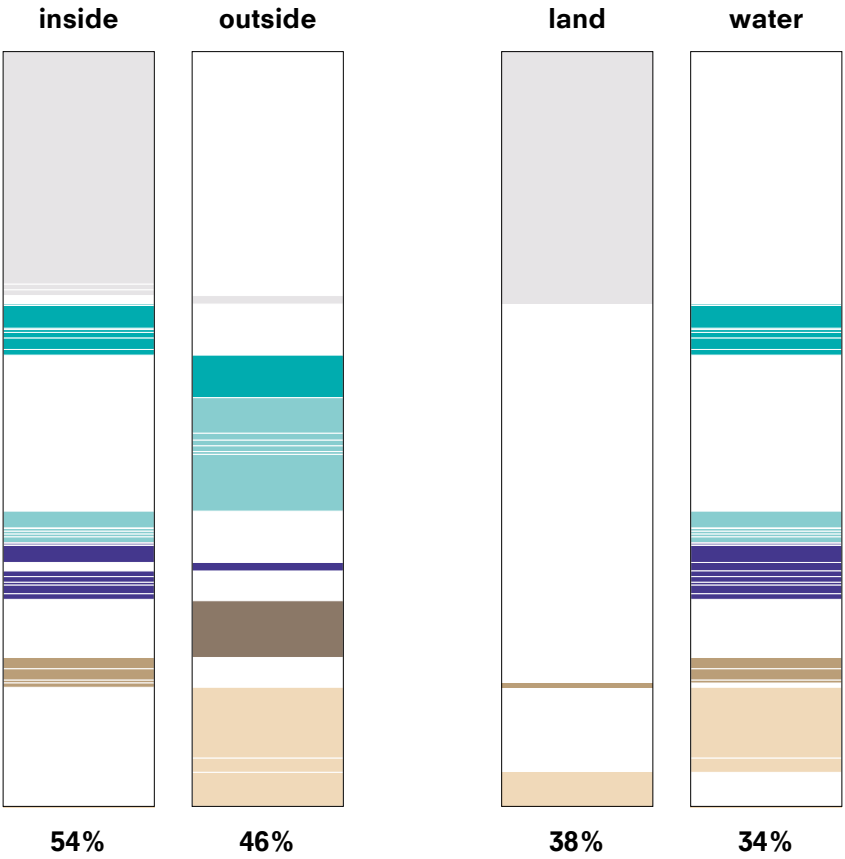
LEGEND

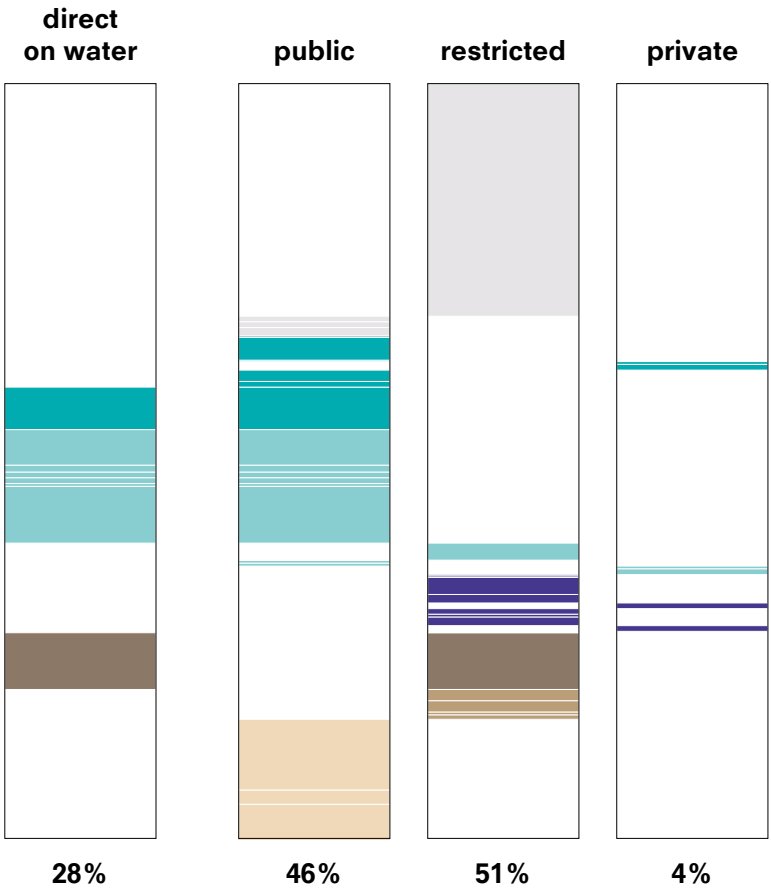
- parking
- ferry terminal
- pool
- nightclub
- marina
- food
- circulation
- public
- employees

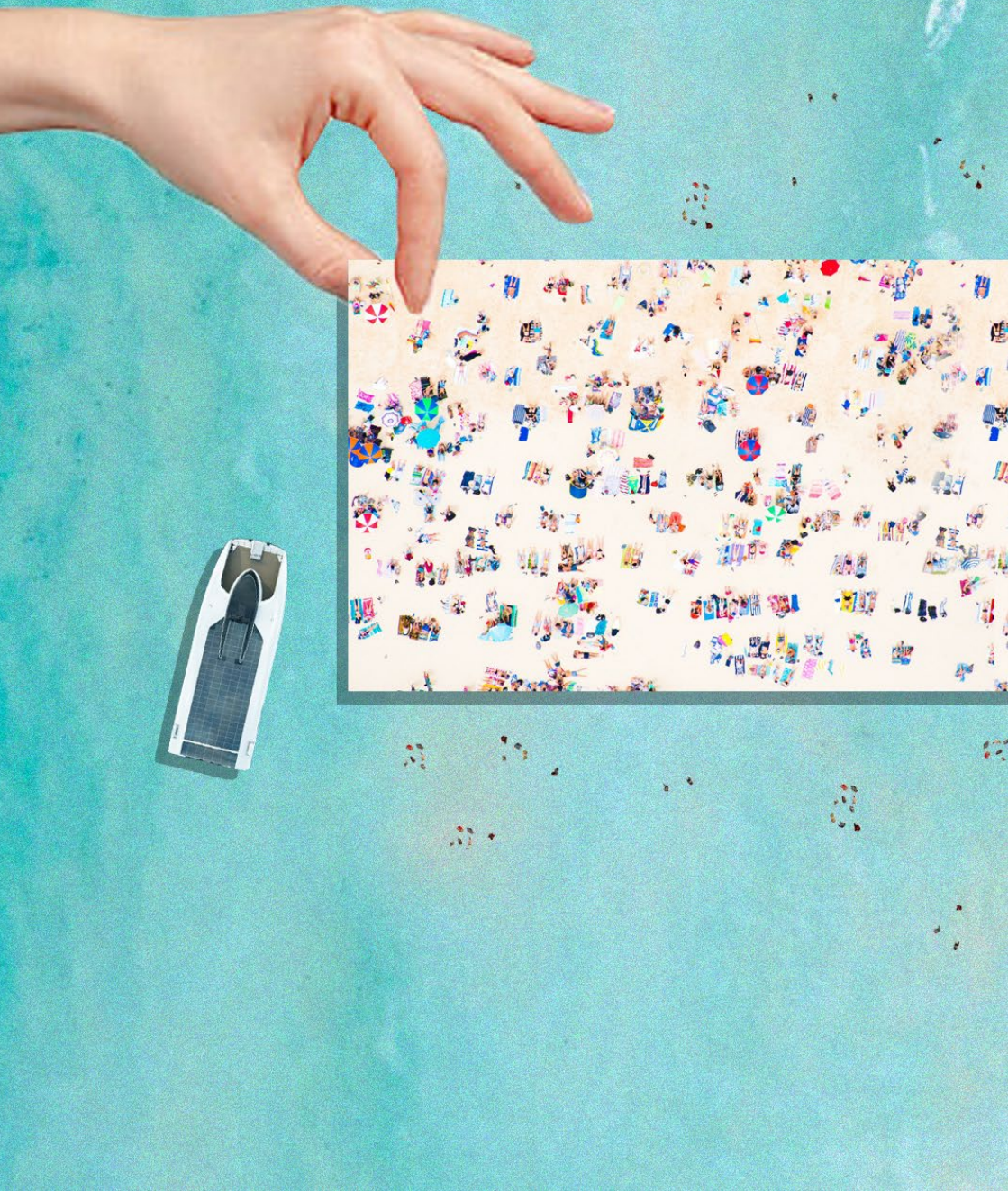
10 × 10m



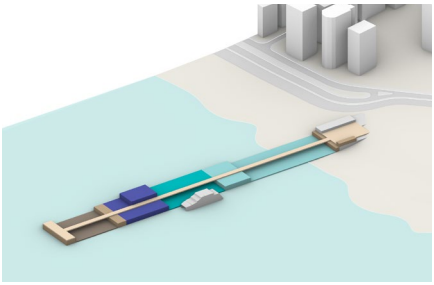
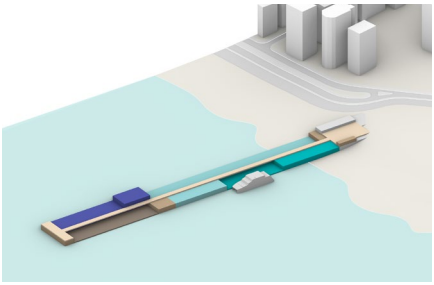
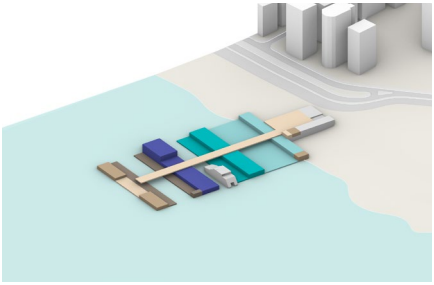
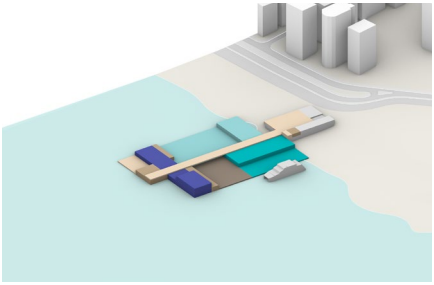
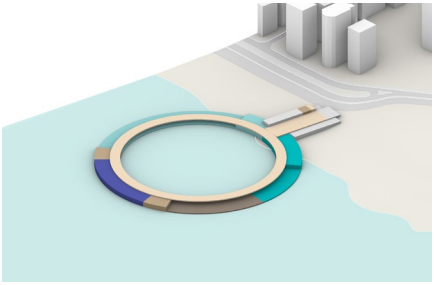
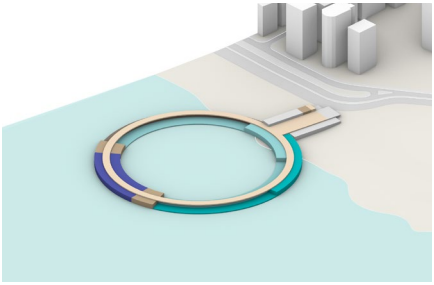
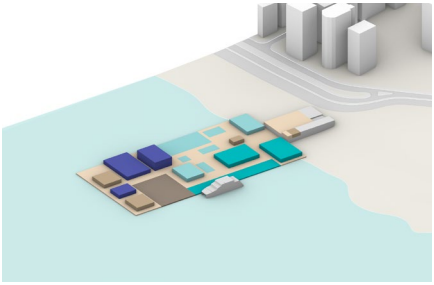
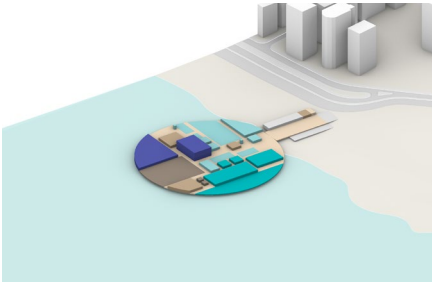


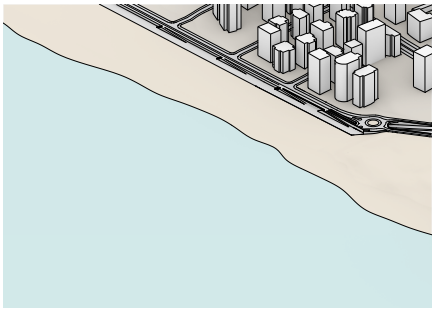

inside
outside
land
water
54%
46%
38%
34%

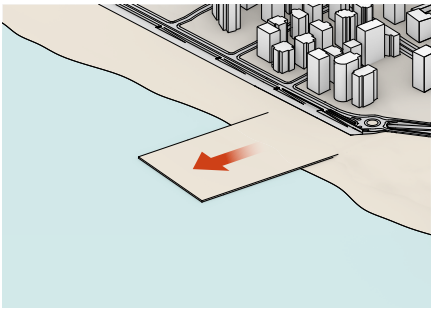

direct
on water
public
restricted
private
28%
46%
51%
4%

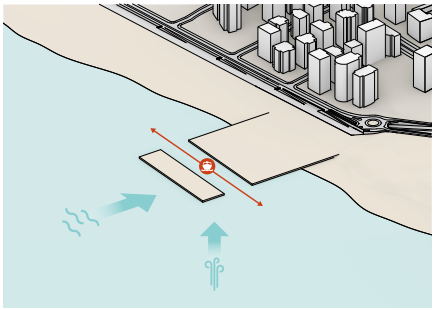


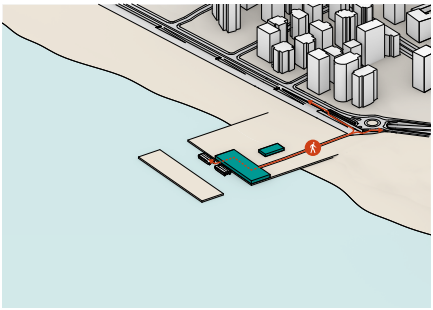
DESIGN

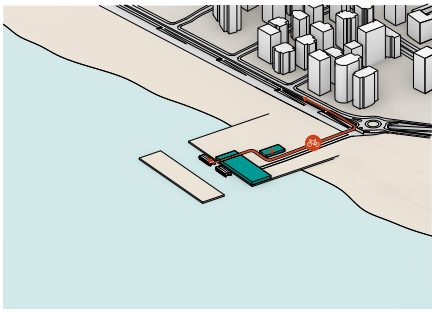









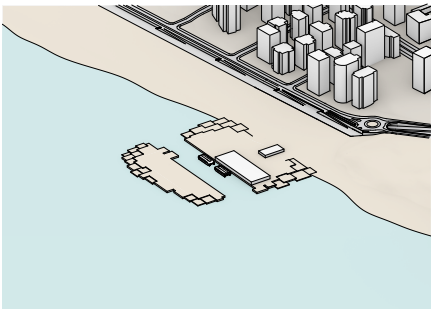


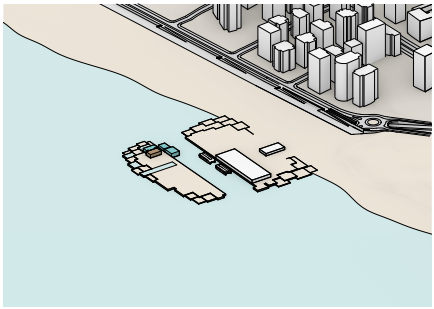


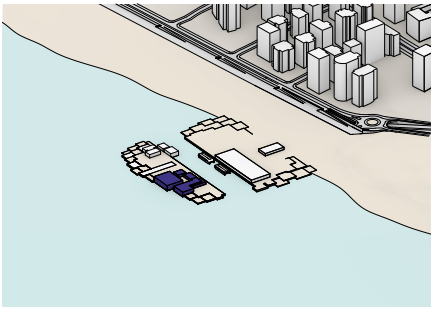


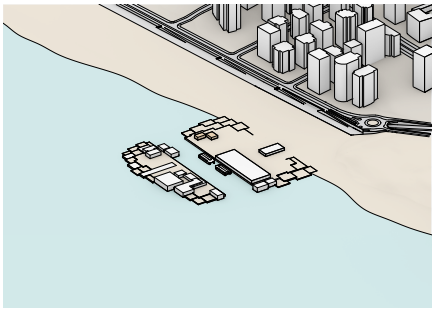


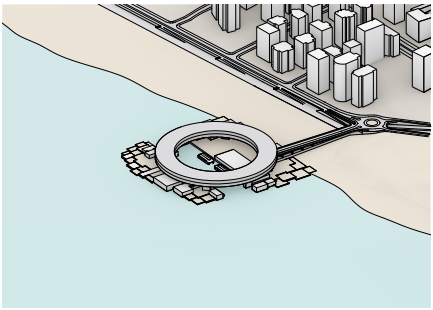


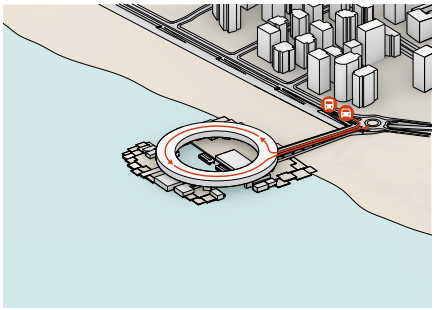


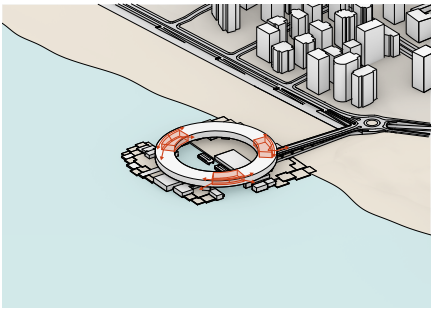


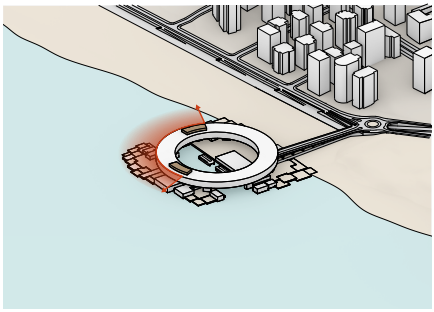


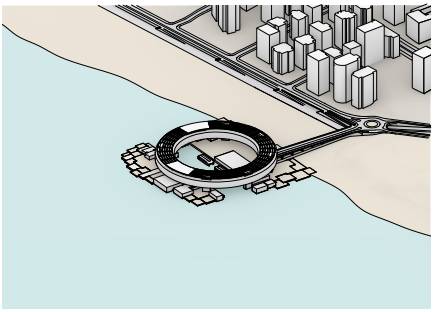


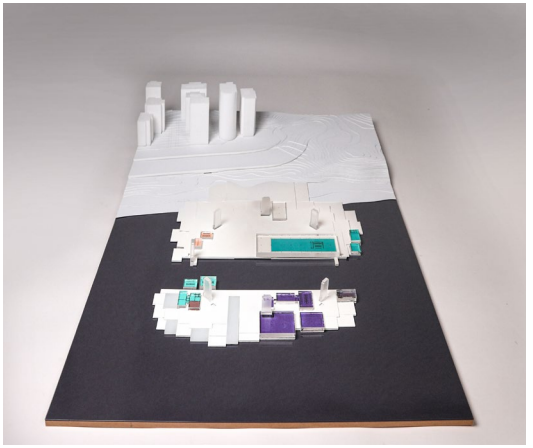


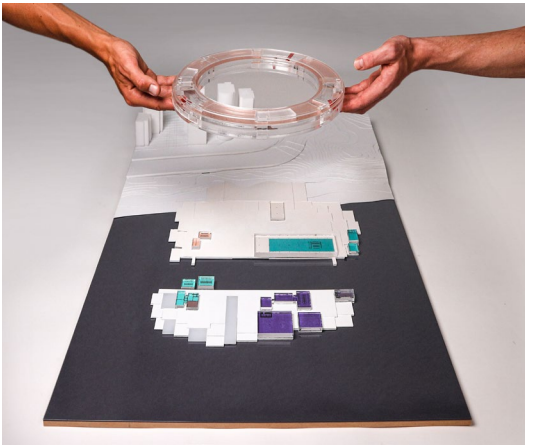


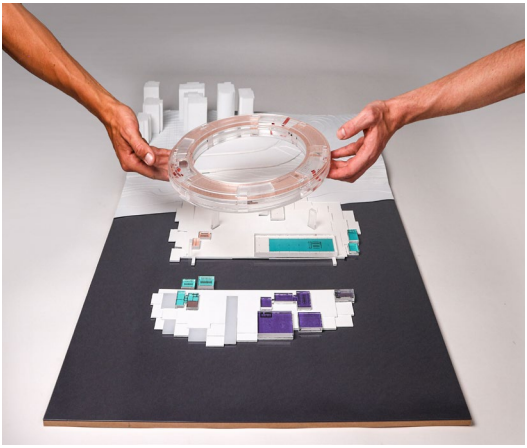


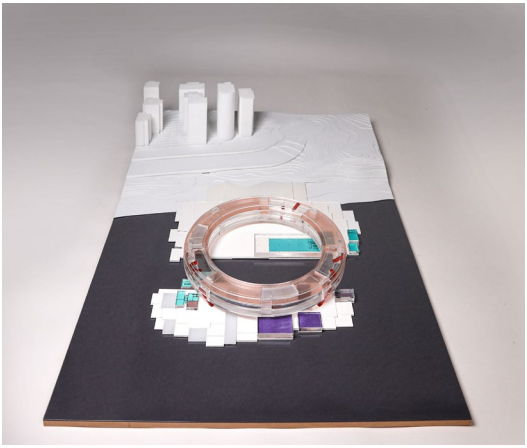


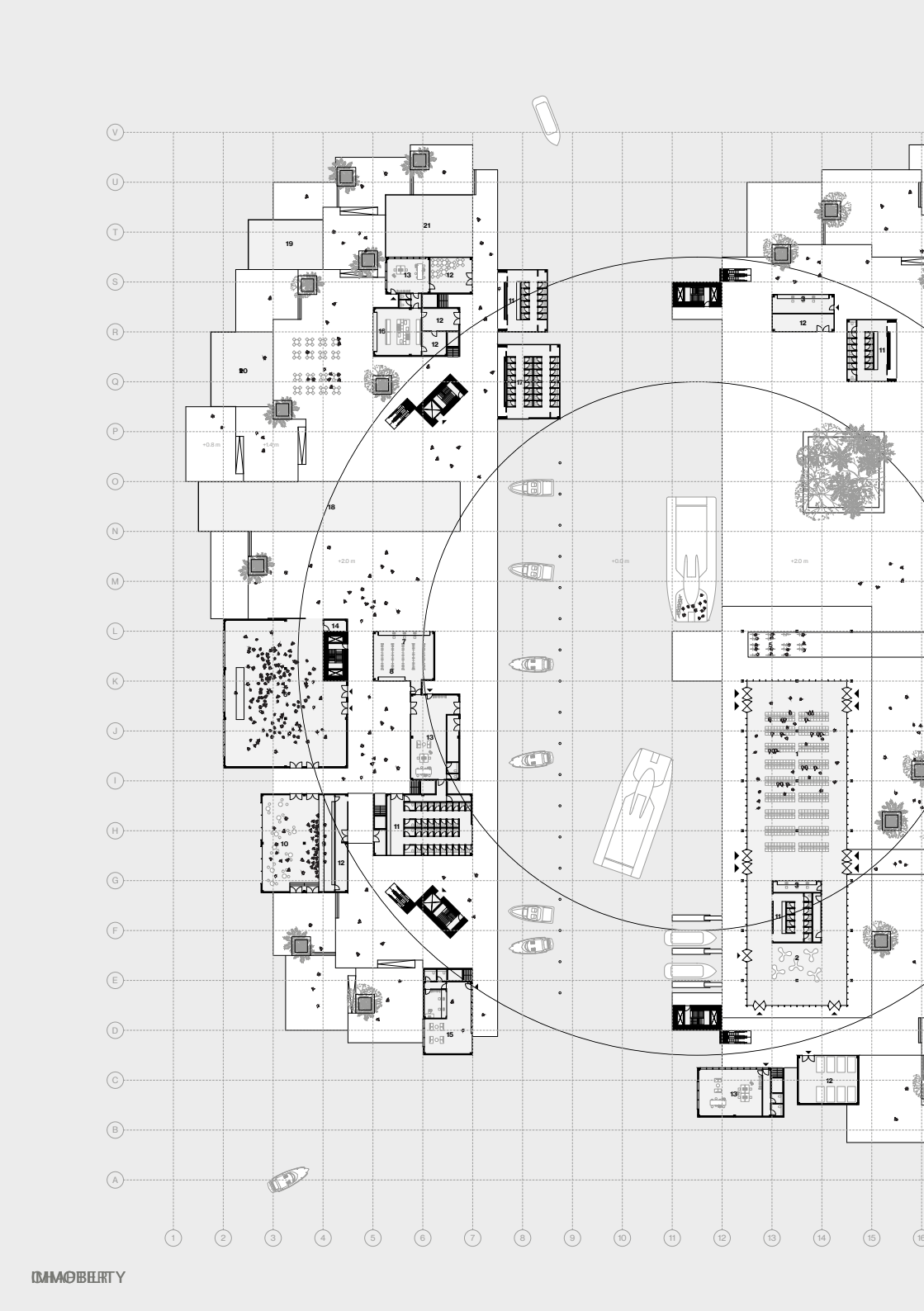


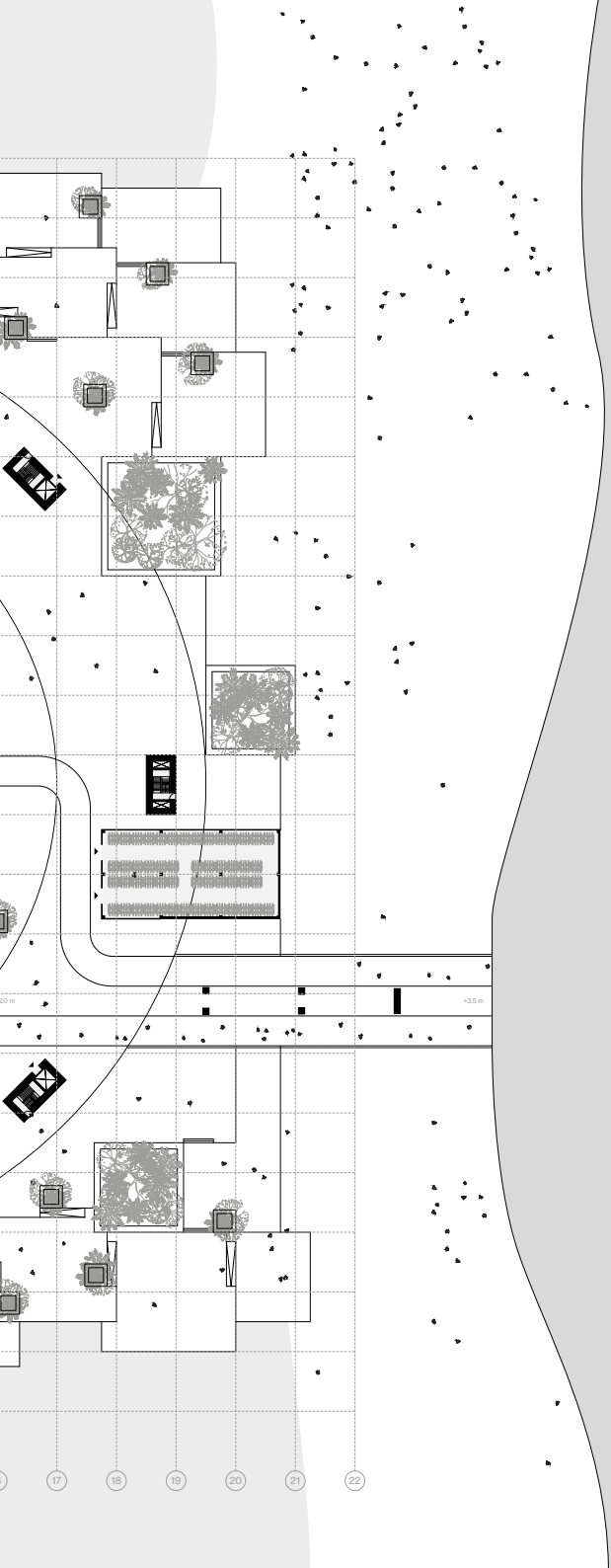









V
U
T
S
R
Q
P
O
N
M
L
K
J
I
H
G
F
E
D
C
B
A
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
+0.8 m
+1.4 m
+2.0 m
+0.0 m
+2.0 m



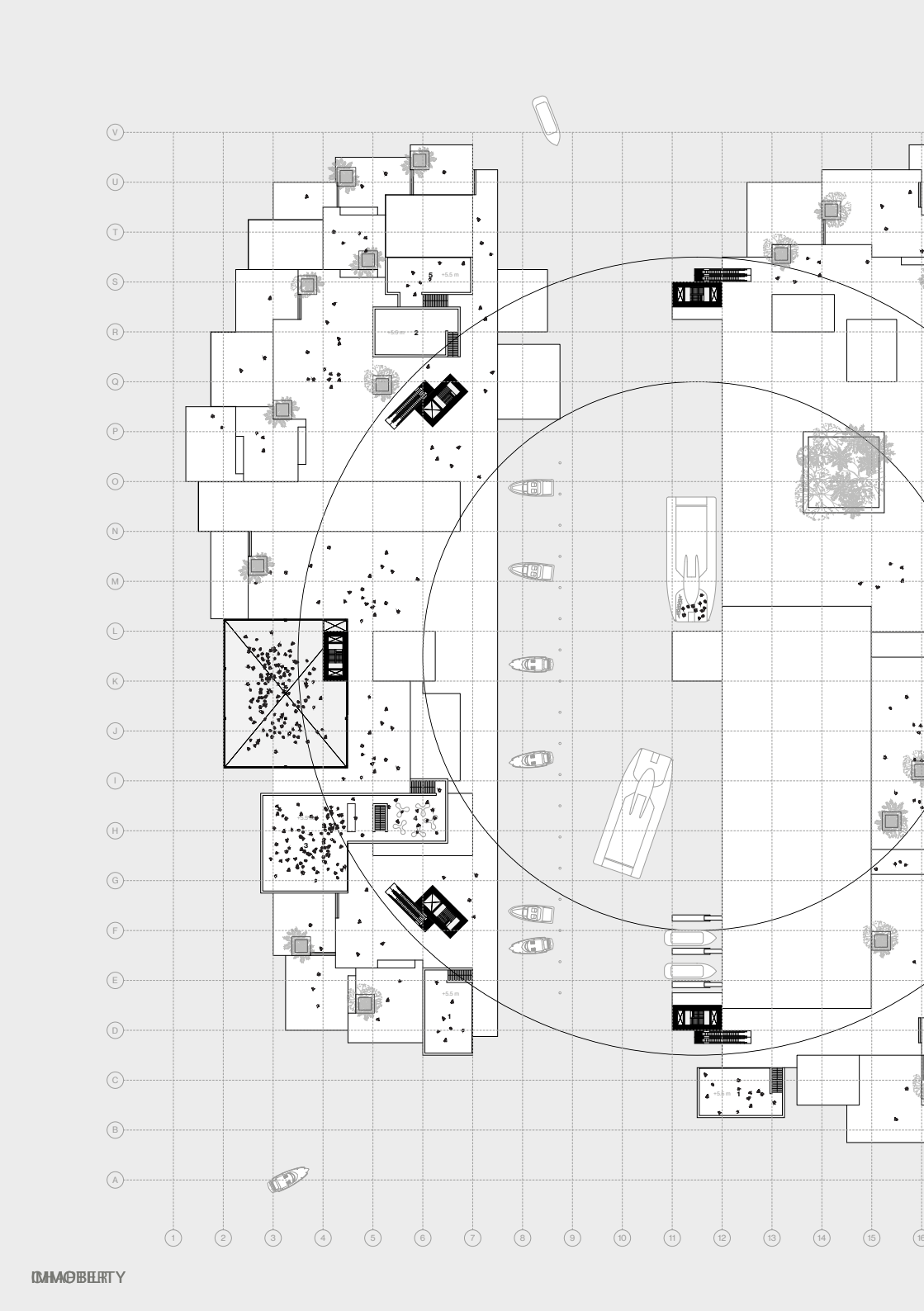
1 Waiting area ferry
2 Waiting area water taxi
3 Information
4 Bicycle and electric scooter parking
5 Bicycle staging
6 Main hall (multifunctional event space)
7 Tickets
8 Wardrobe
9 Bar
10 Lounge
11 Toilets
12 Storage
13 Office
14 Installations
15 Marina office
16 Café
17 Changing rooms
18 Lab pool
19 Lounge pool
20 Sports pool
21 Dive pool

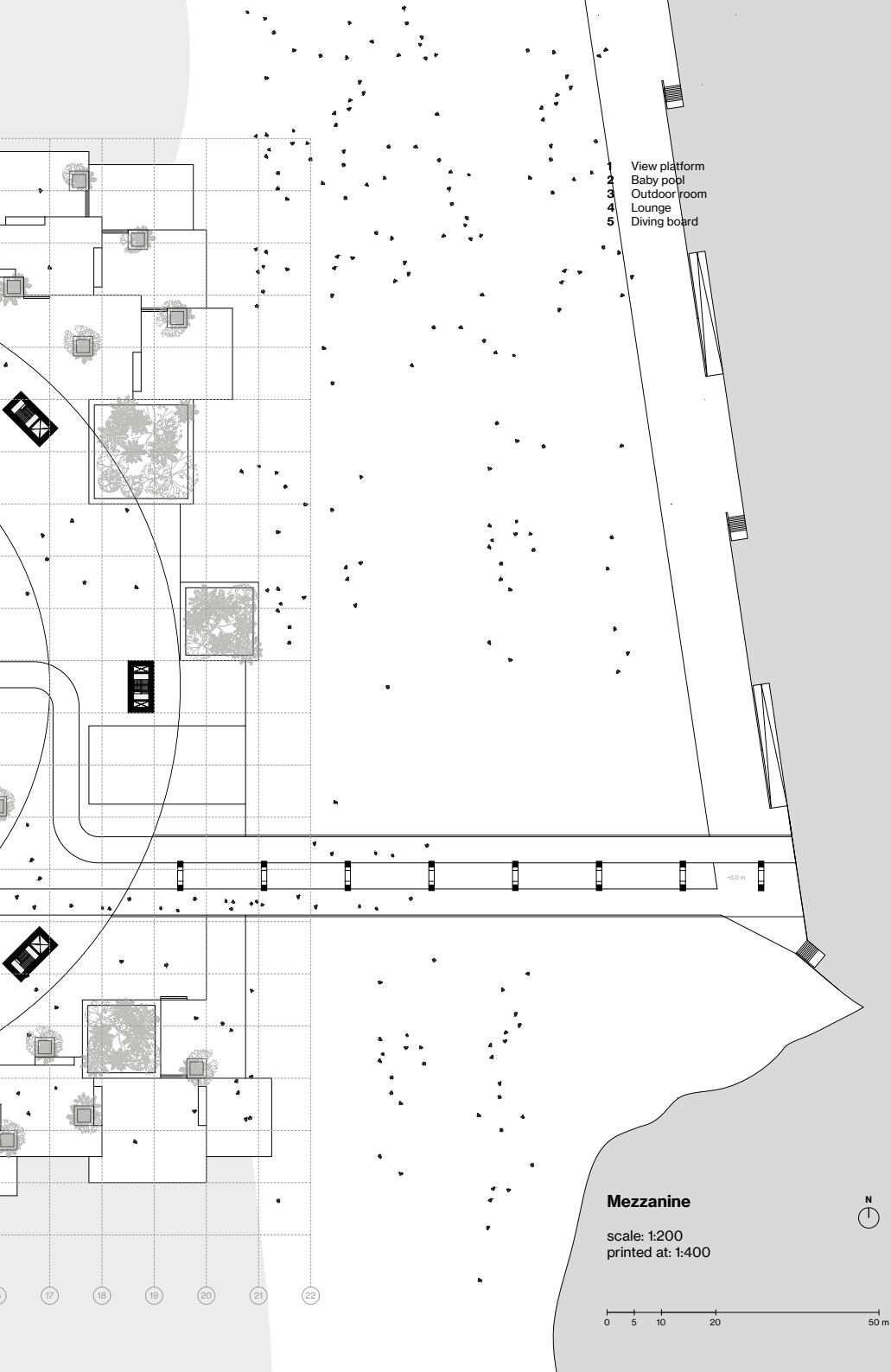
Ground Floor

scale: 1:200
printed at: 1:400

N

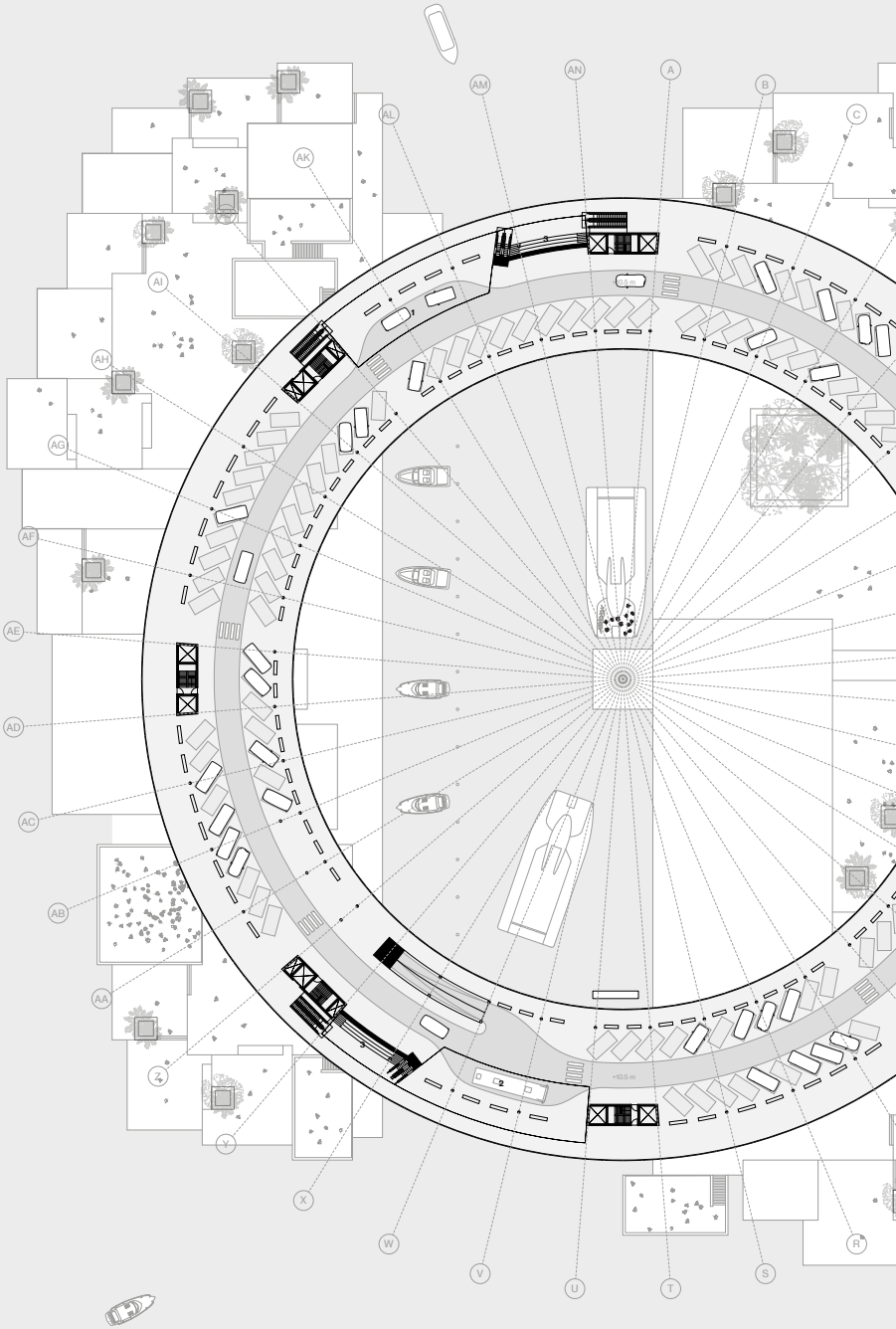
0 5 10 20 50 m

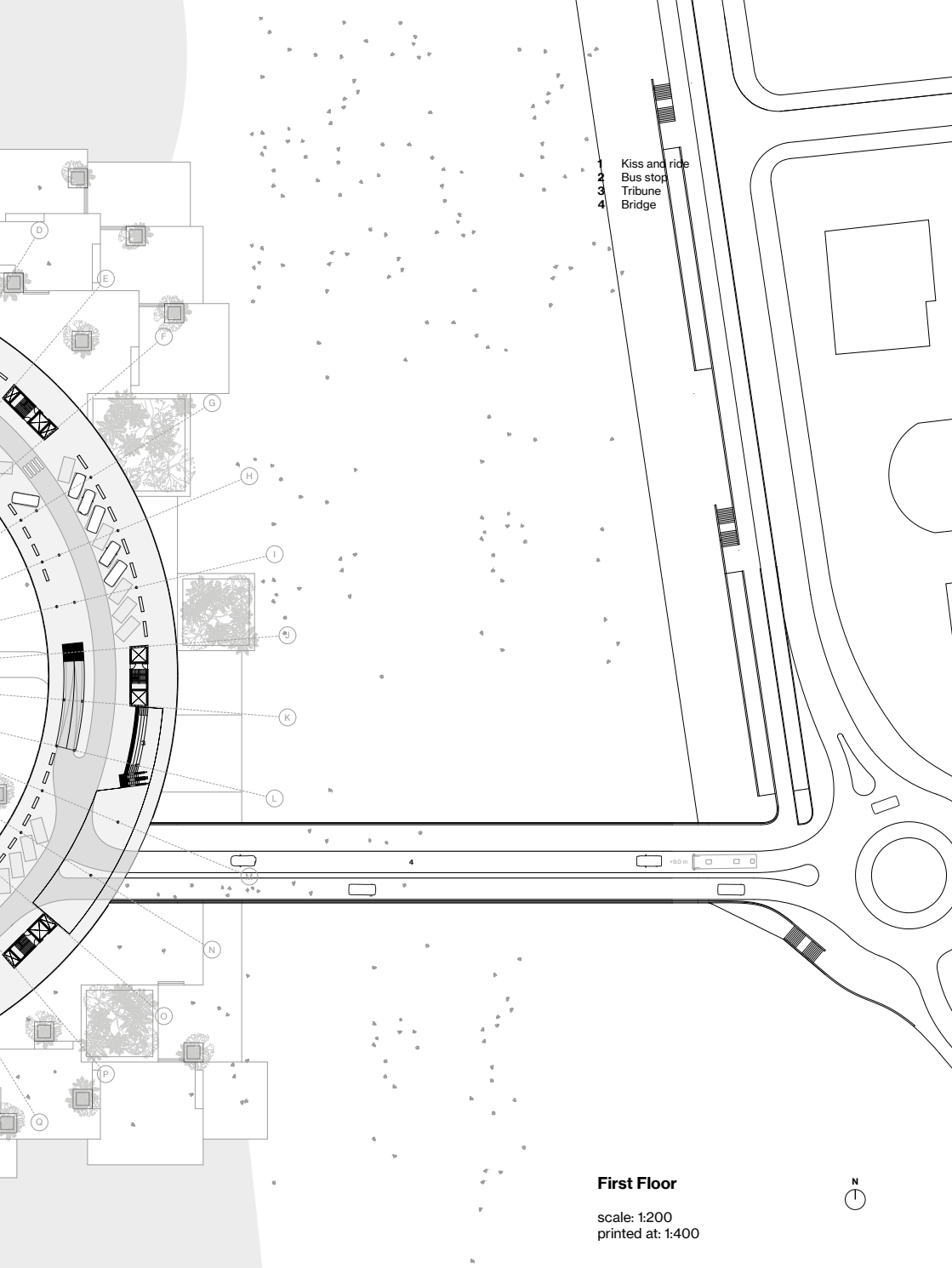

V
U
T
S
R
Q
P
O
N
M
L
K
J
I
H
G
F
E
D
C
B
A
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
+5.5 m
+5.5 m
+5.5 m
+5.5 m



Mezzanine

scale: 1:200
printed at: 1:400


AN
A
B
C
AM
AL
AK
AJ
AH
AG
AF
AE
AD
AC
AB
AA
Z
Y
X
W
V
U
T
S
R
+10.5 m

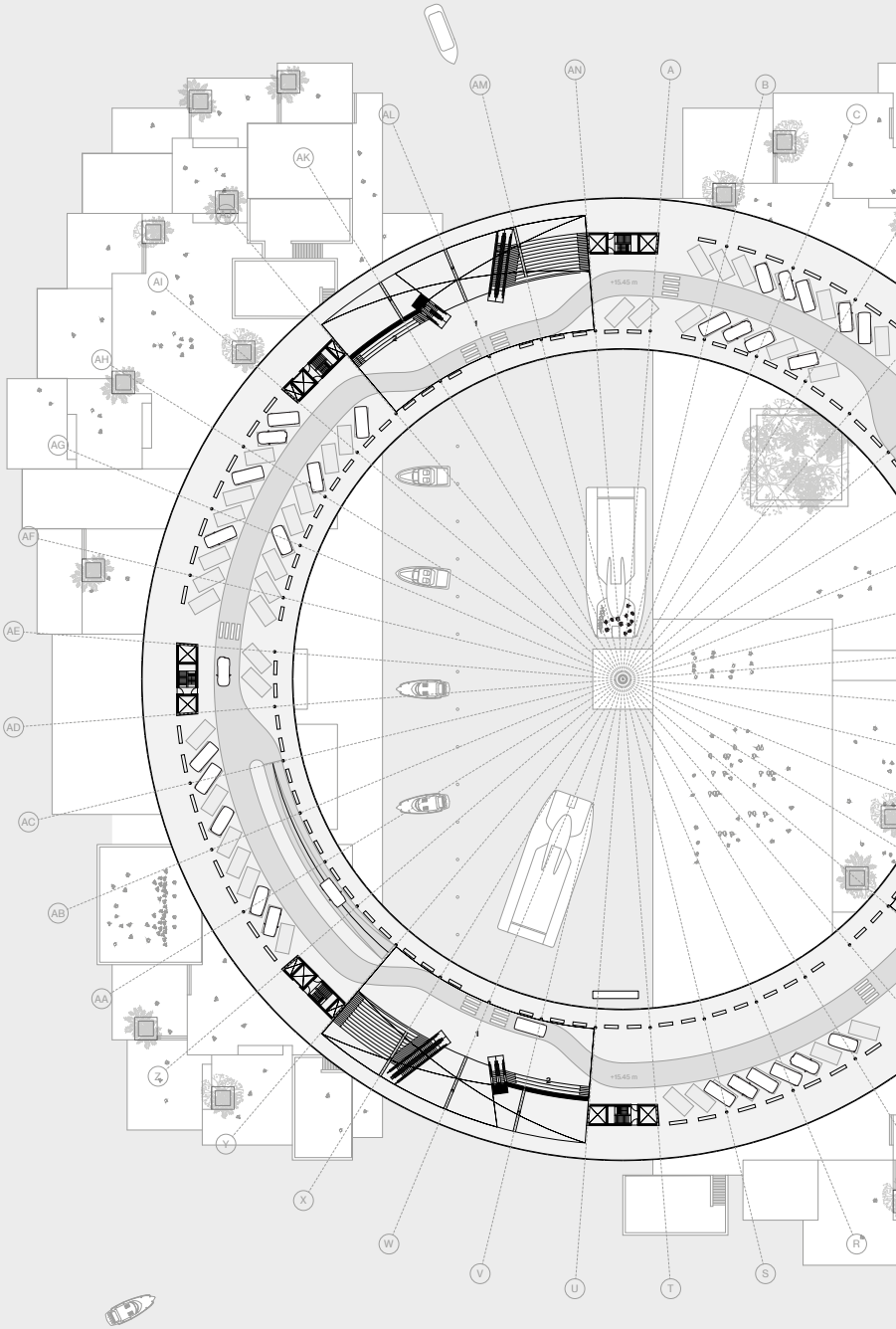


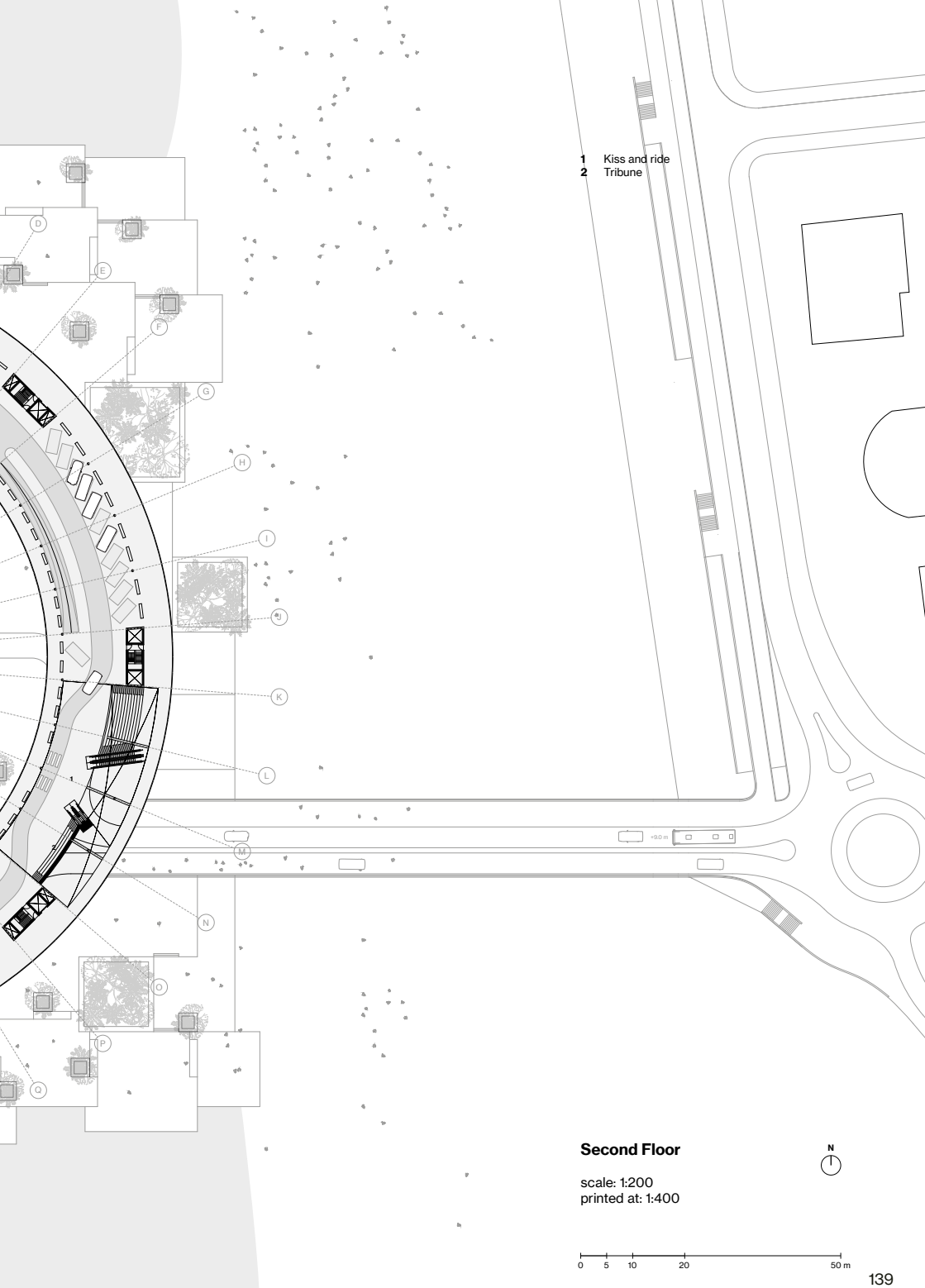
First Floor

scale: 1:200
printed at: 1:400

N

0 5 10 20 50 m


AN
A
B
C
AM
AL
AK
AJ
AH
AG
AF
AE
AD
AC
AB
AA
Z
Y
X
W
V
U
T
S
R
+15.45 m
+15.45 m

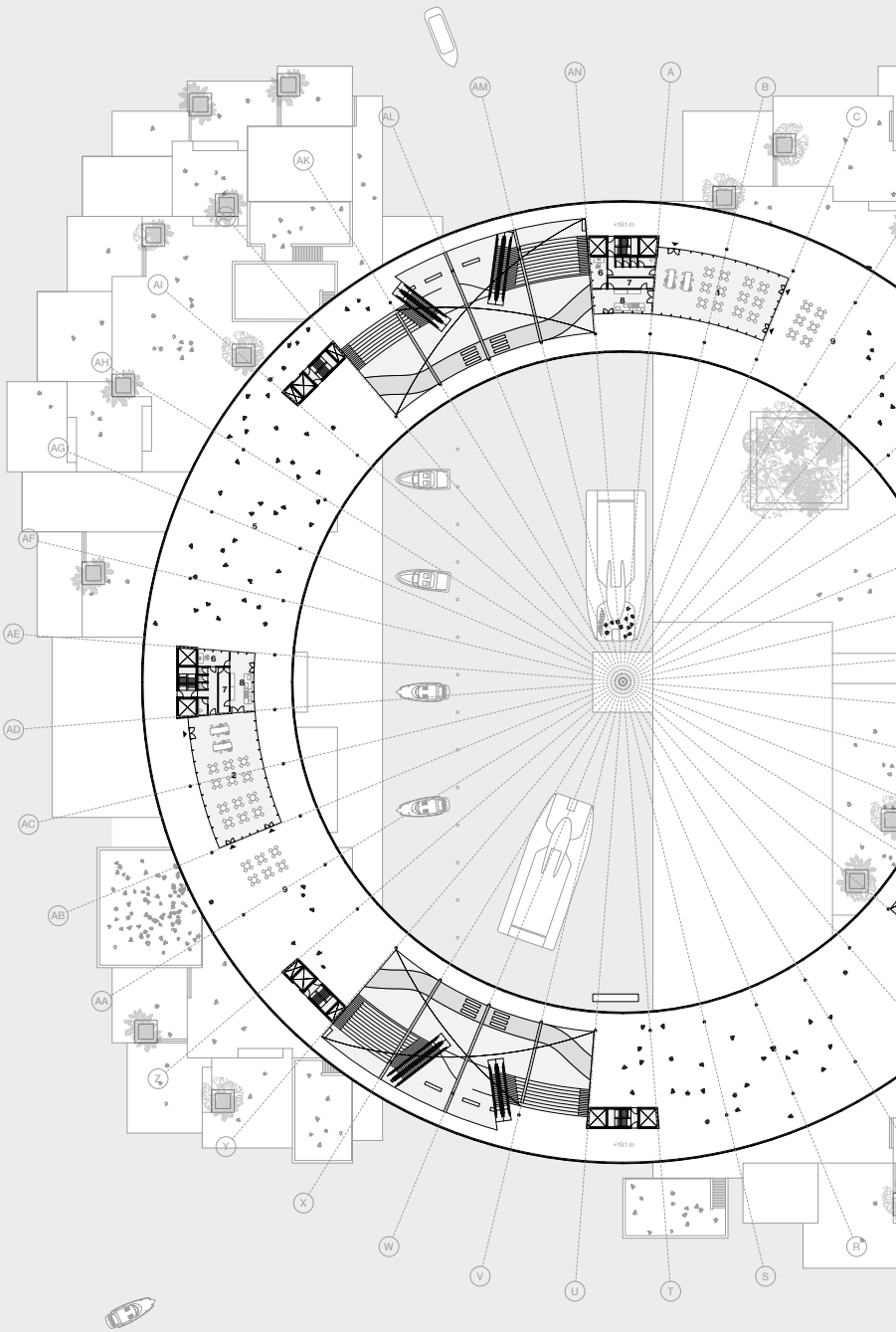


Second Floor

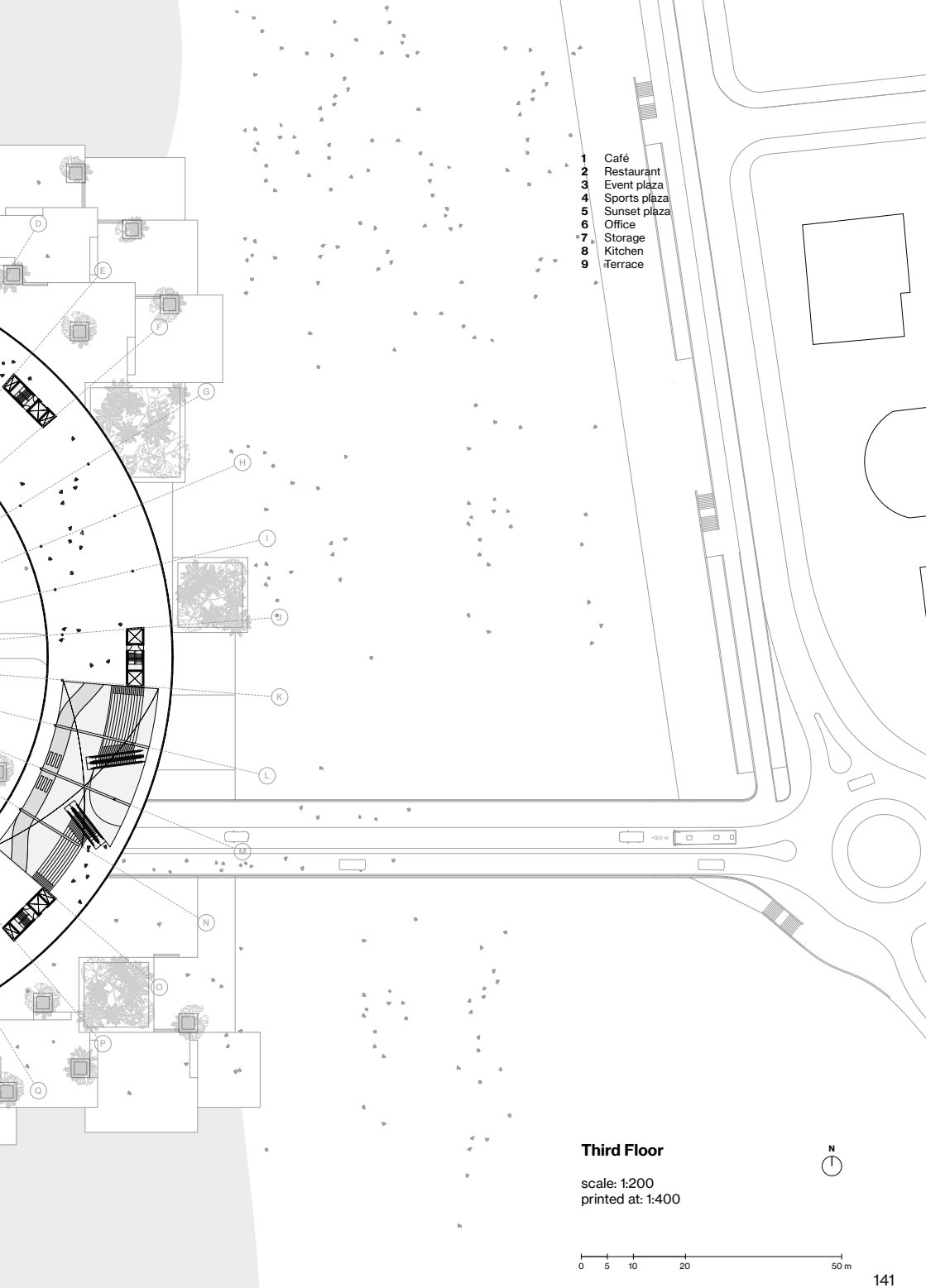
scale: 1:200
printed at: 1:400

N

0 5 10 20 50 m



CONFIDENTIAL PROPERTY

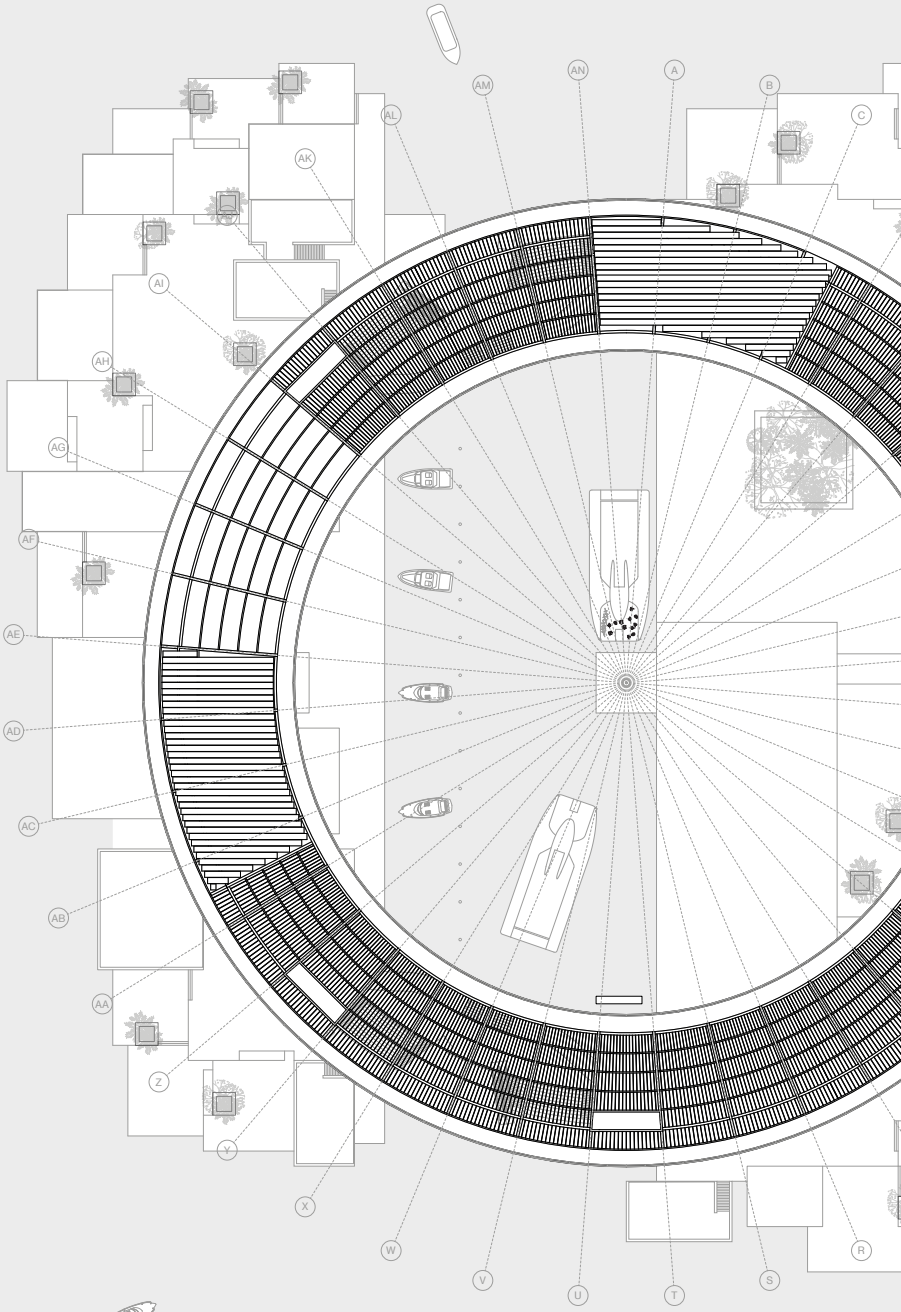


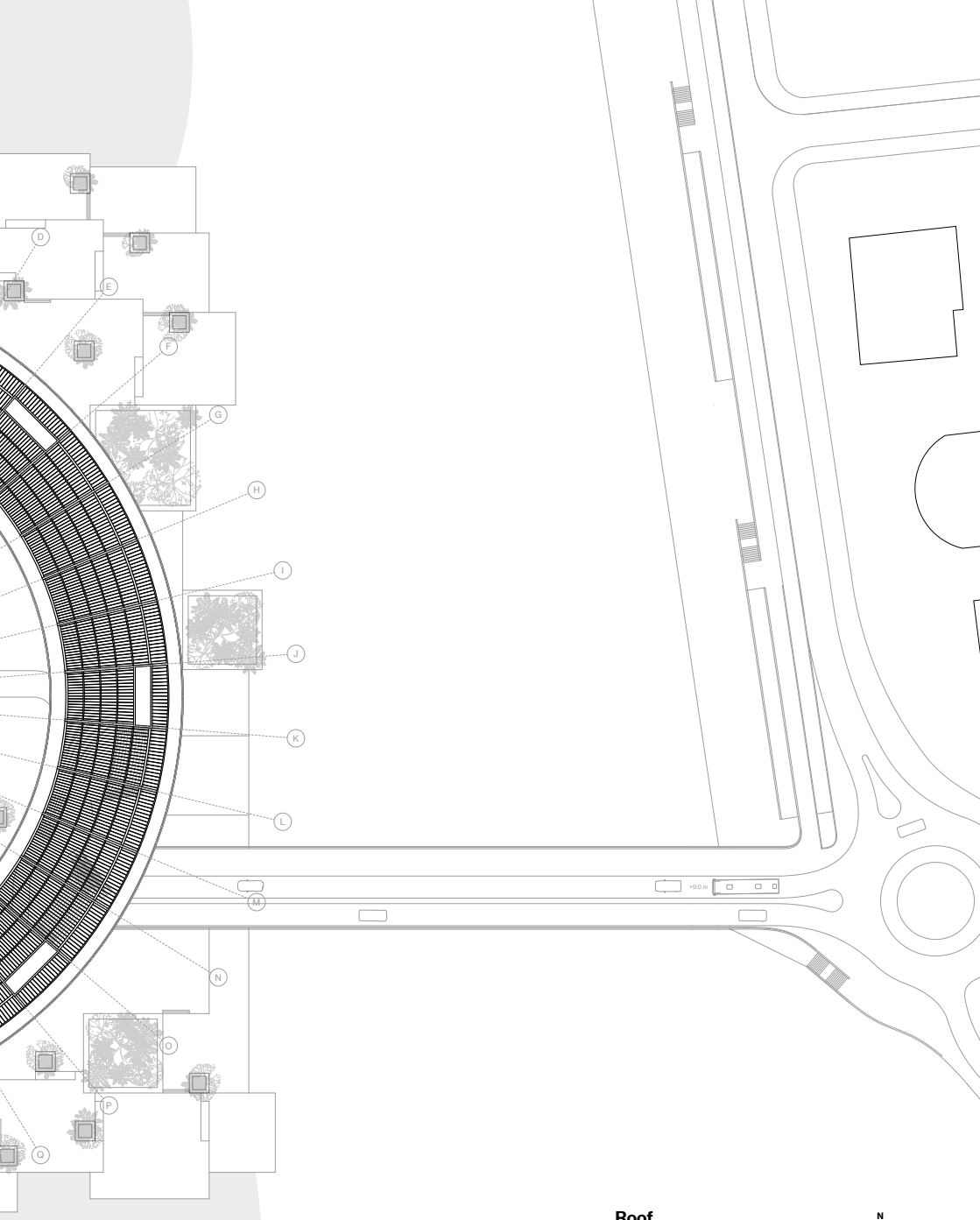
Third Floor

scale: 1:200
printed at: 1:400

N

0 5 10 20 50 m


AN
A
B
C
AM
AL
AK
AI
AH
AG
AF
AE
AD
AC
AB
AA
Z
Y
X
W
V
U
T
S
R

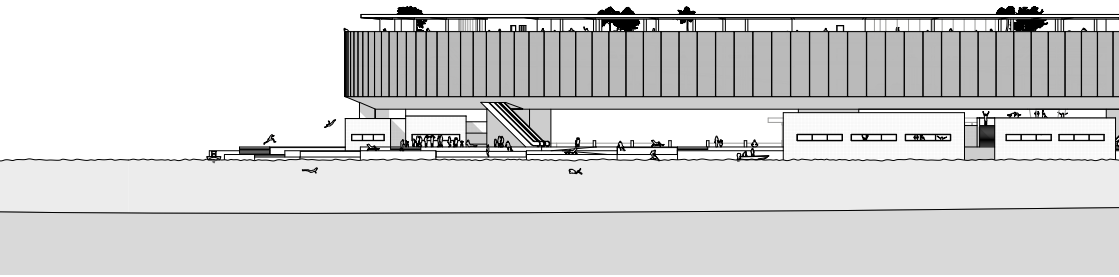


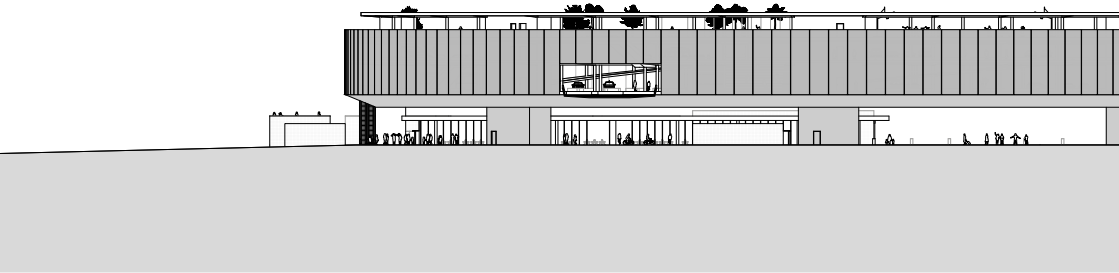
Roof

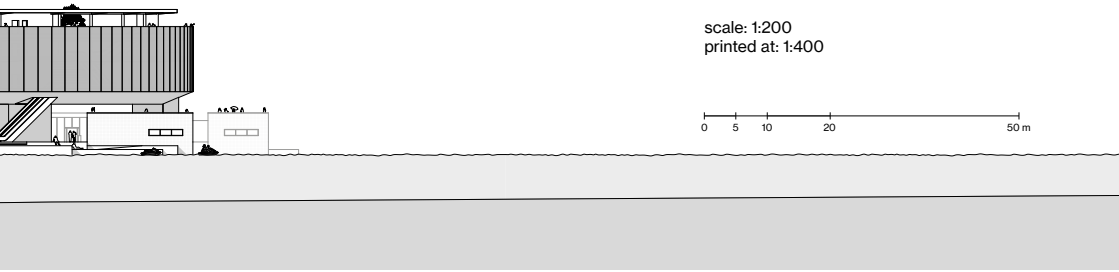
scale: 1:200
printed at: 1:400

N

0 5 10 20 50 m



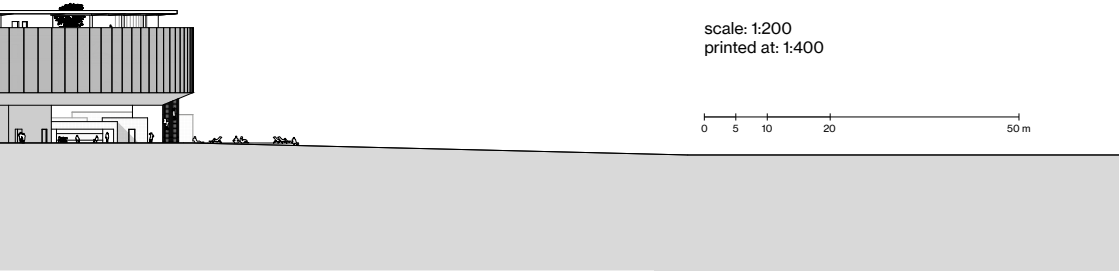




West Elevation

scale: 1:200
printed at: 1:400

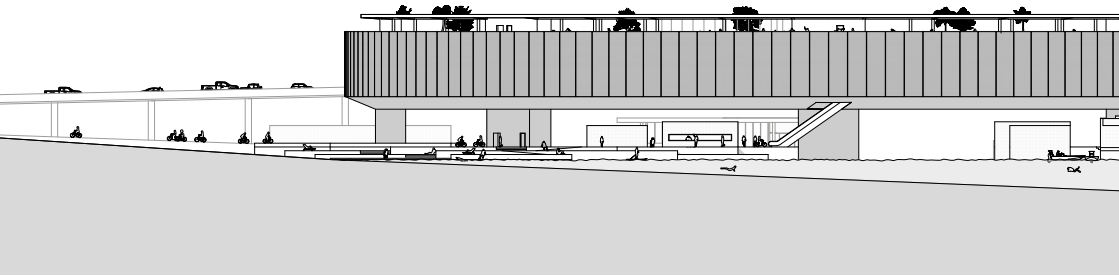
0 5 10 20 50 m

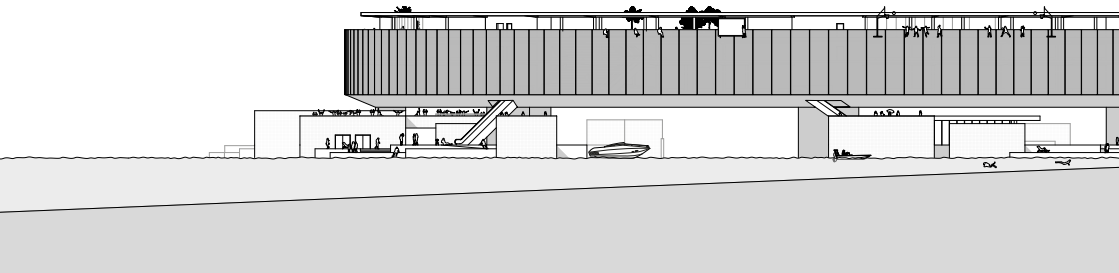


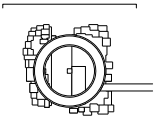
East Elevation

scale: 1:200
printed at: 1:400

0 5 10 20 50 m

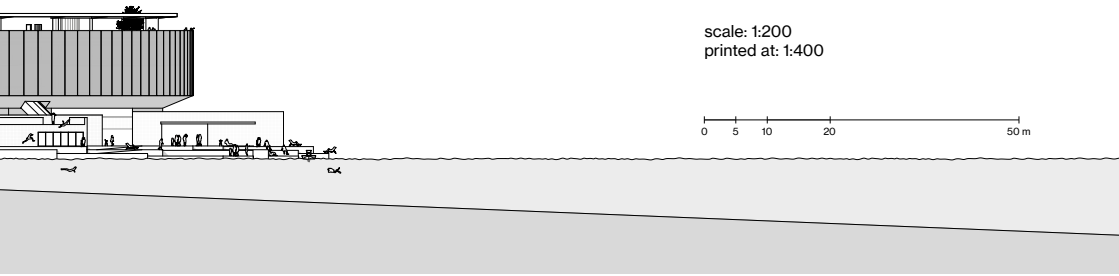


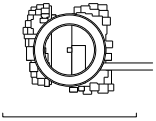




North Elevation

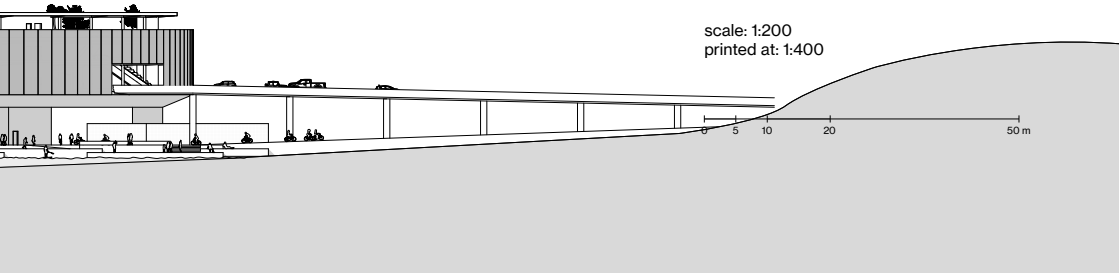
scale: 1:200
printed at: 1:400

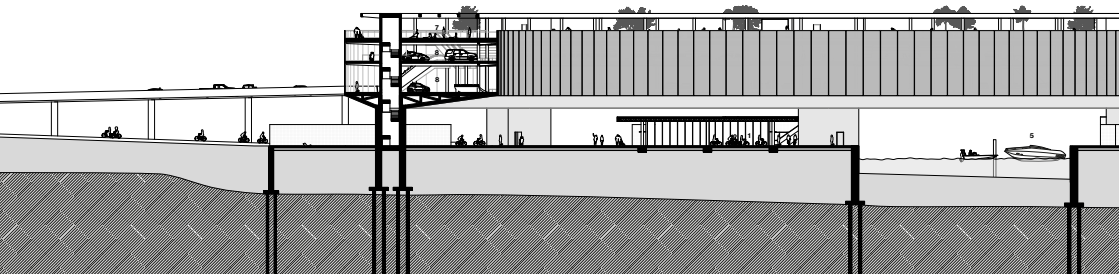


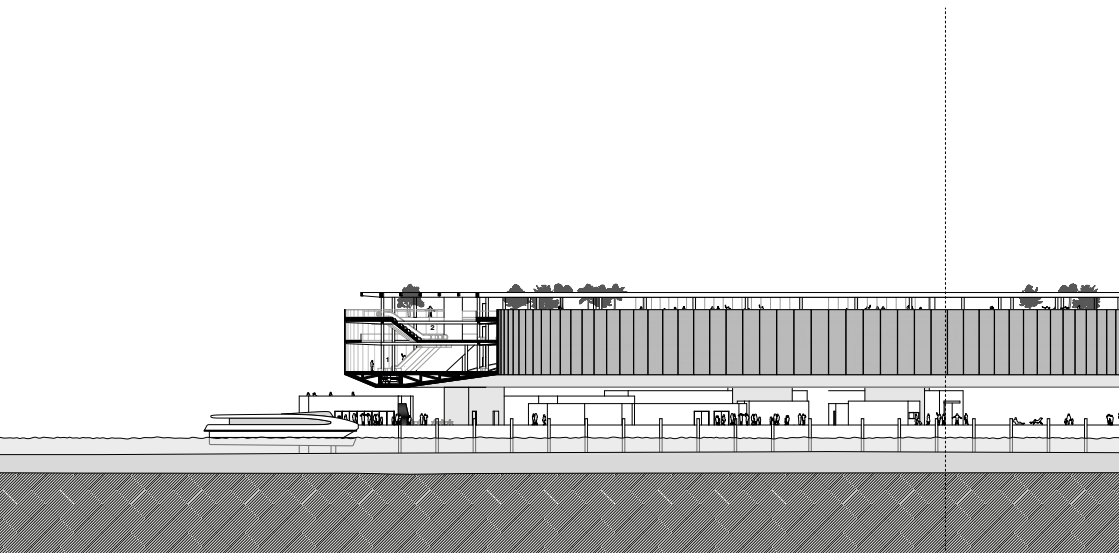


South Elevation

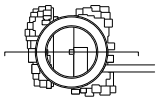
scale: 1:200
printed at: 1:400





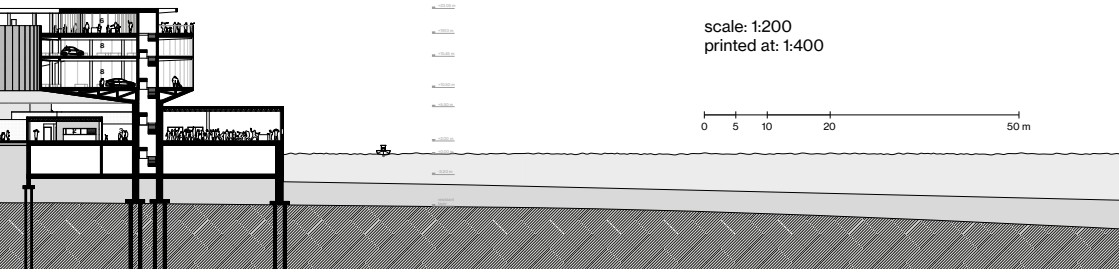


1 Bicycle staging
2 Wardrobe
3 Nightclub entrance
4 Main hall
5 Marina
6 Restaurant
7 Sports plaza
8 Parking

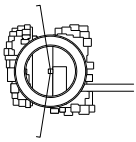


East-West Section

scale: 1:200
printed at: 1:400

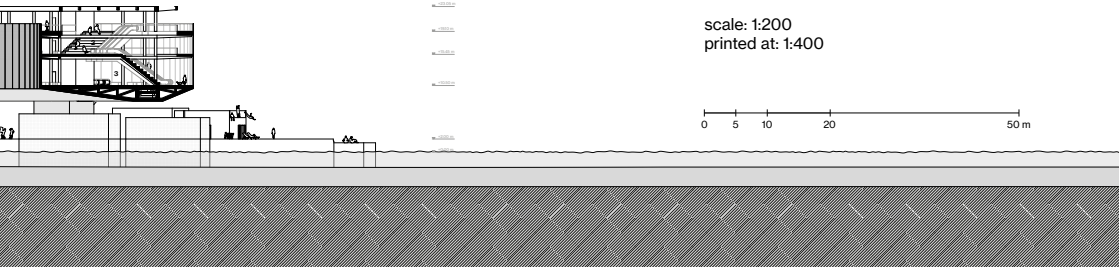


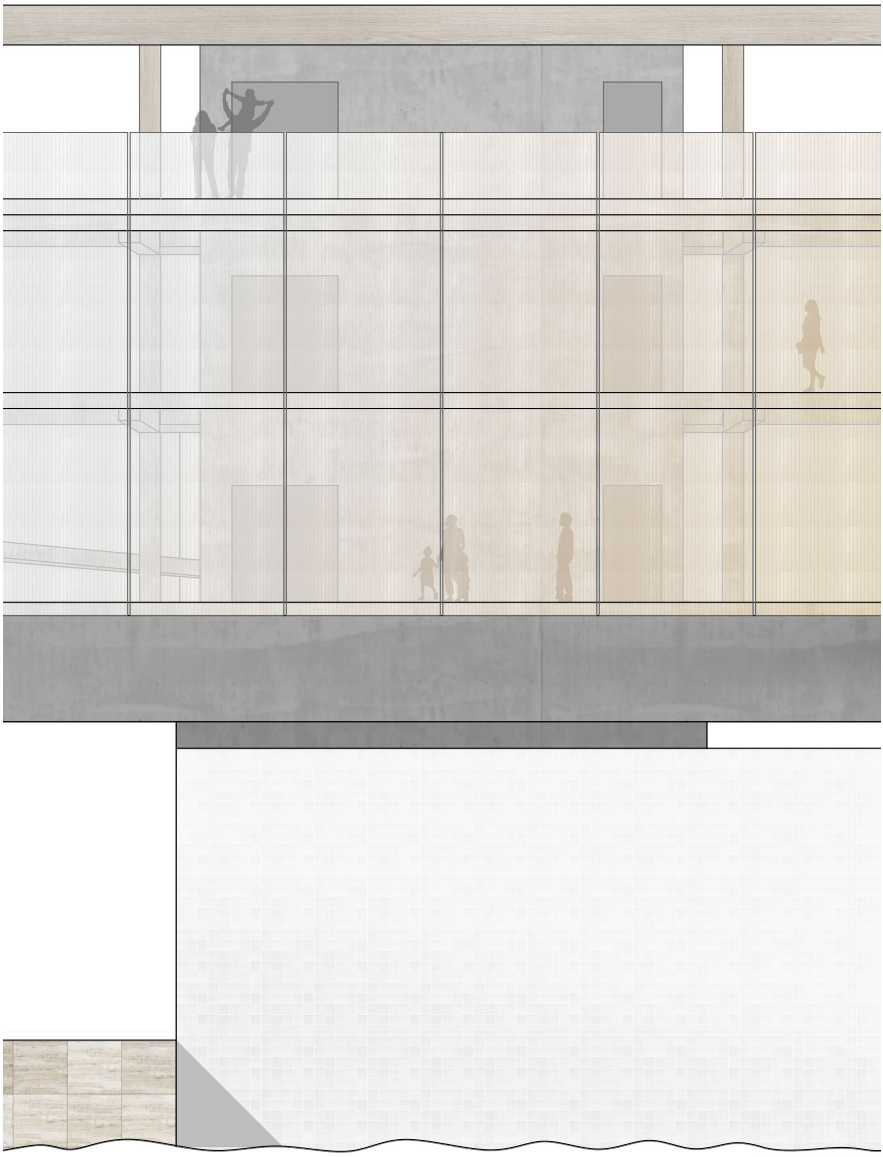
1 Bus stop
2 Atrium
3 Kiss and ride

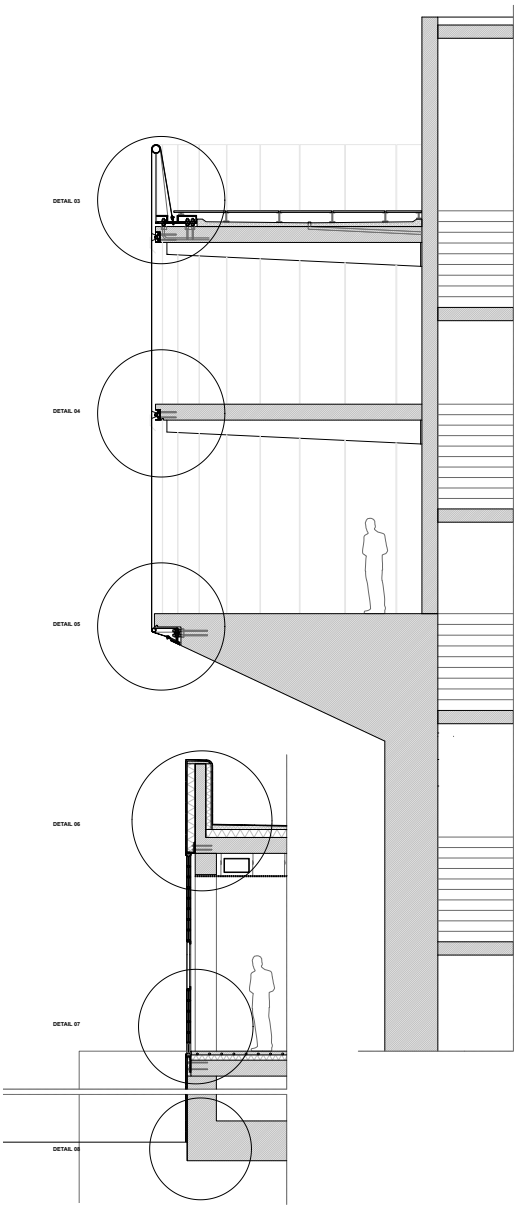


South-North Section

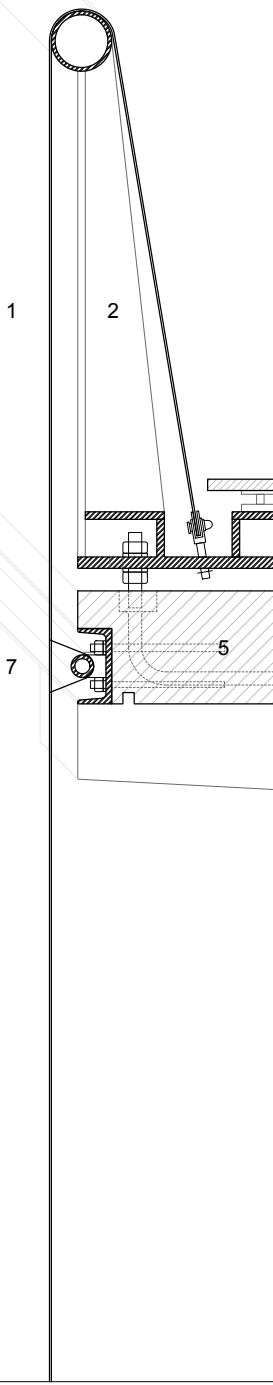
scale: 1:200
printed at: 1:400

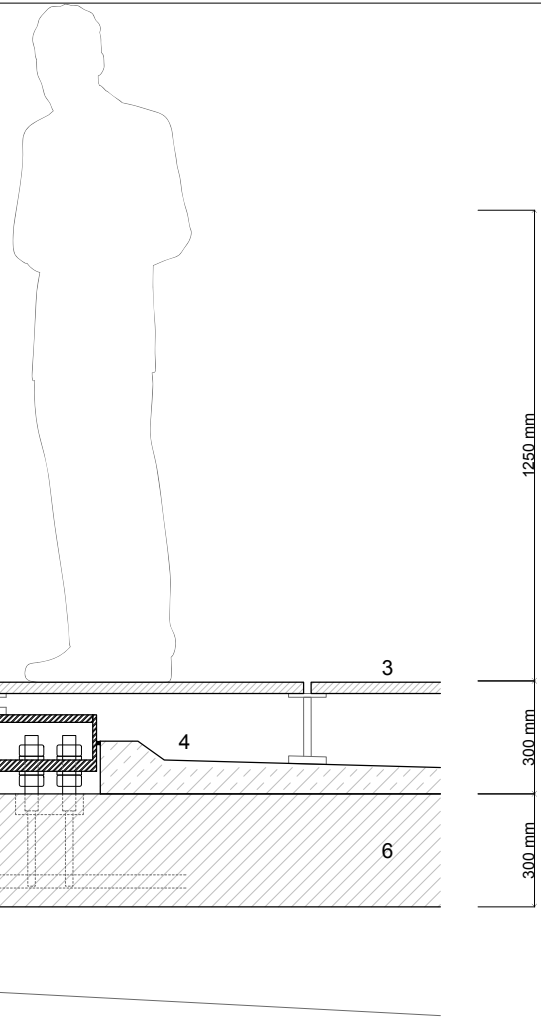





DETAIL 03
DETAIL 04
DETAIL 05
DETAIL 06
DETAIL 07
DETAIL 08

+10.25 m





1 Metal mesh of stainless steel
2 T-section steel
3 Lime stone flooring 30 mm, 980 × 980 × 30 mm
4 Precast concrete roof structure, 1% slope to collect rainwater
5 Anchoring: steel plates with threaded hole. Welded to reinforcement bars
6 In situ concrete, 300 mm
7 Circular hollow section, welded to u-profile holding metal wire mesh

DETAIL 03

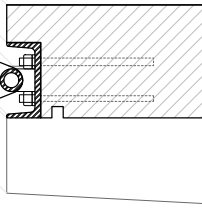
ring top
scale: 1:10
paper size: A2

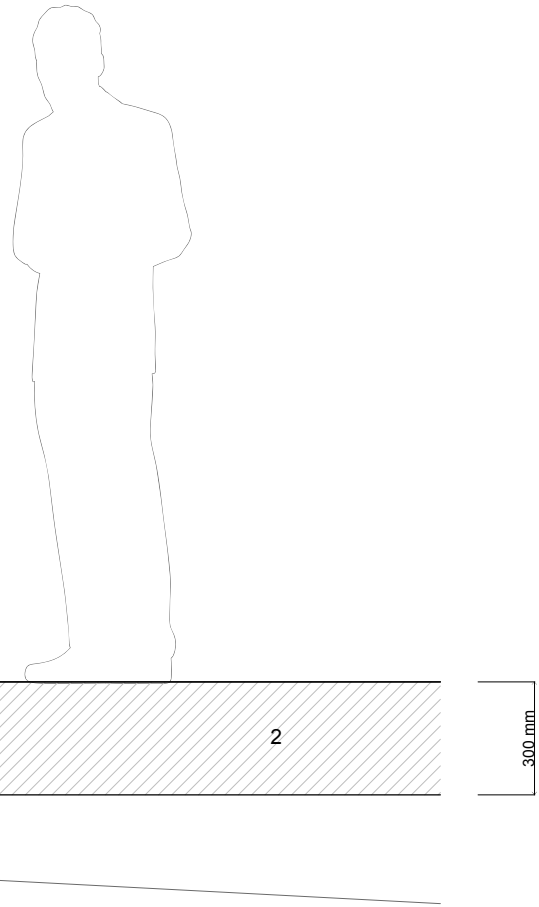
0 0.1 0.2 0.5 1m

1

+10.25 m

3

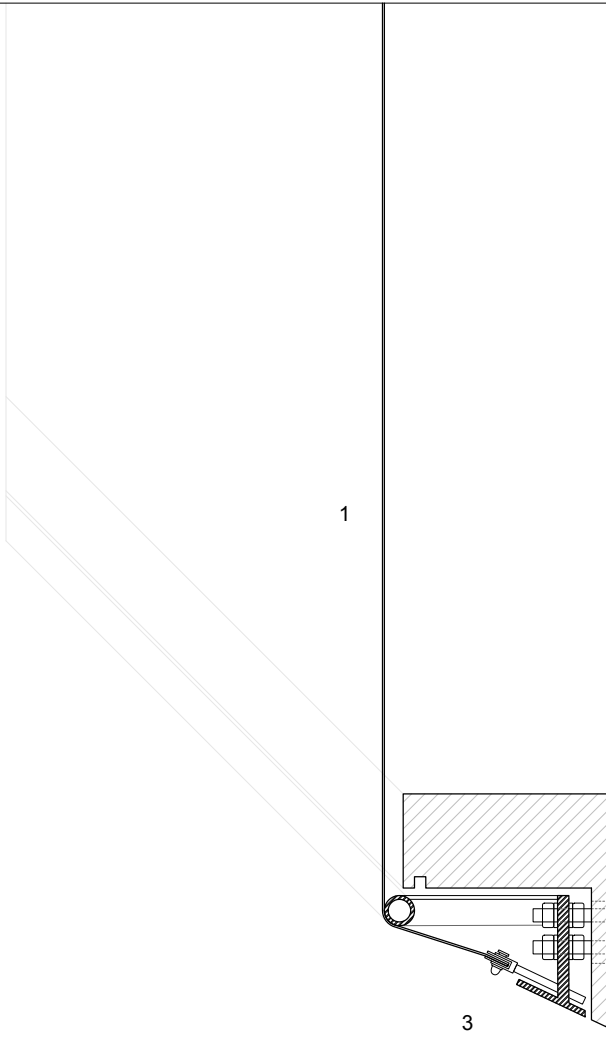


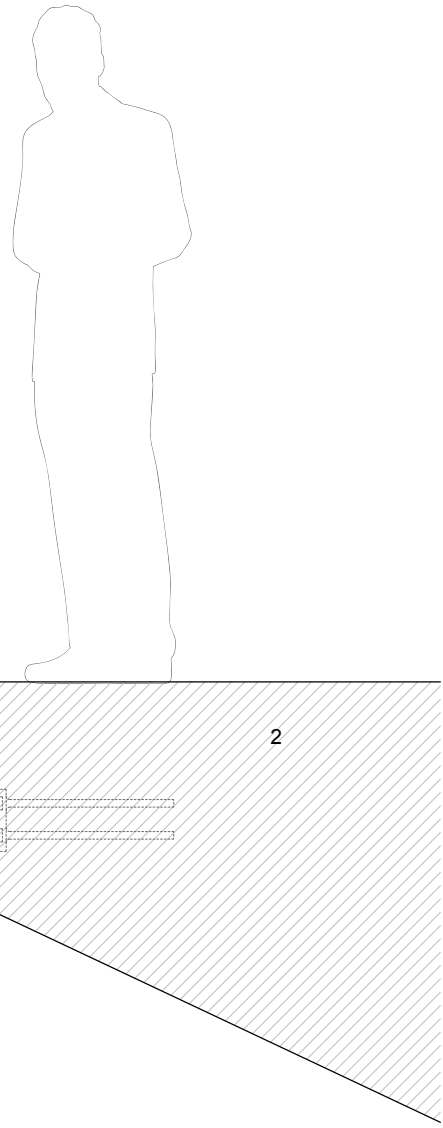


1 Metal mesh of stainless steel
2 In situ concrete, 300 mm
3 Circular hollow section, welded to u-profile holding metal wire mesh

DETAIL 04

ring middle connection
scale: 1:10
paper size: A2


1
+10.25 m
3

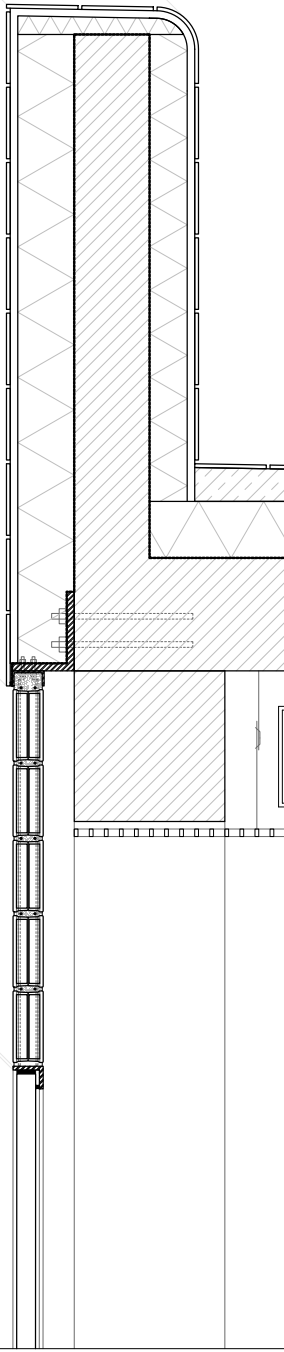


1 Metal mesh of stainless steel
2 In situ concrete platform
3 Anchoring: steel plates with threaded hole. Welded to reinforcement bars, threaded rods holding steel box section

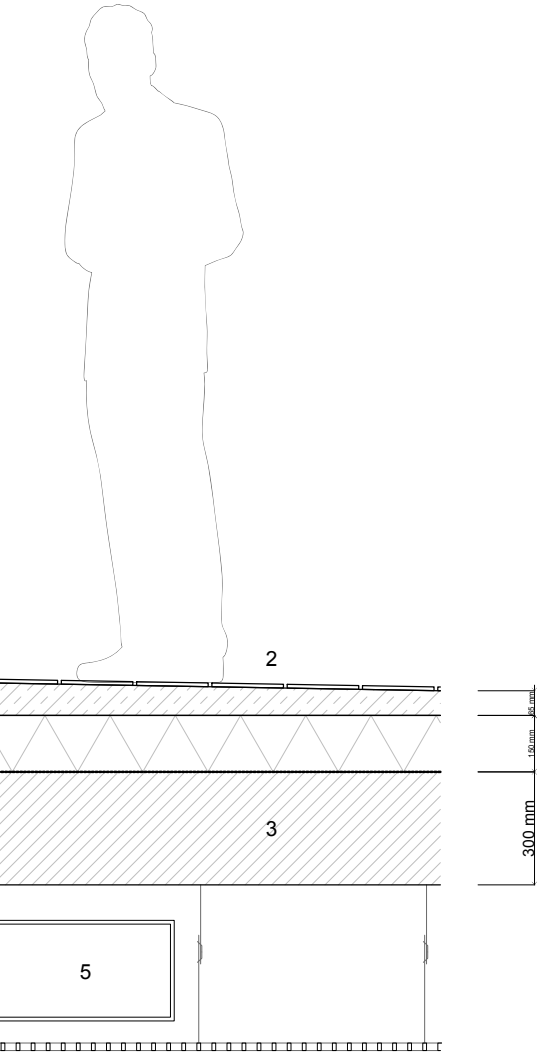
DETAIL 05

ring lower connection
scale: 1:10
paper size: A2

0 0.1 0.2 0.5 1m



+5.25 m

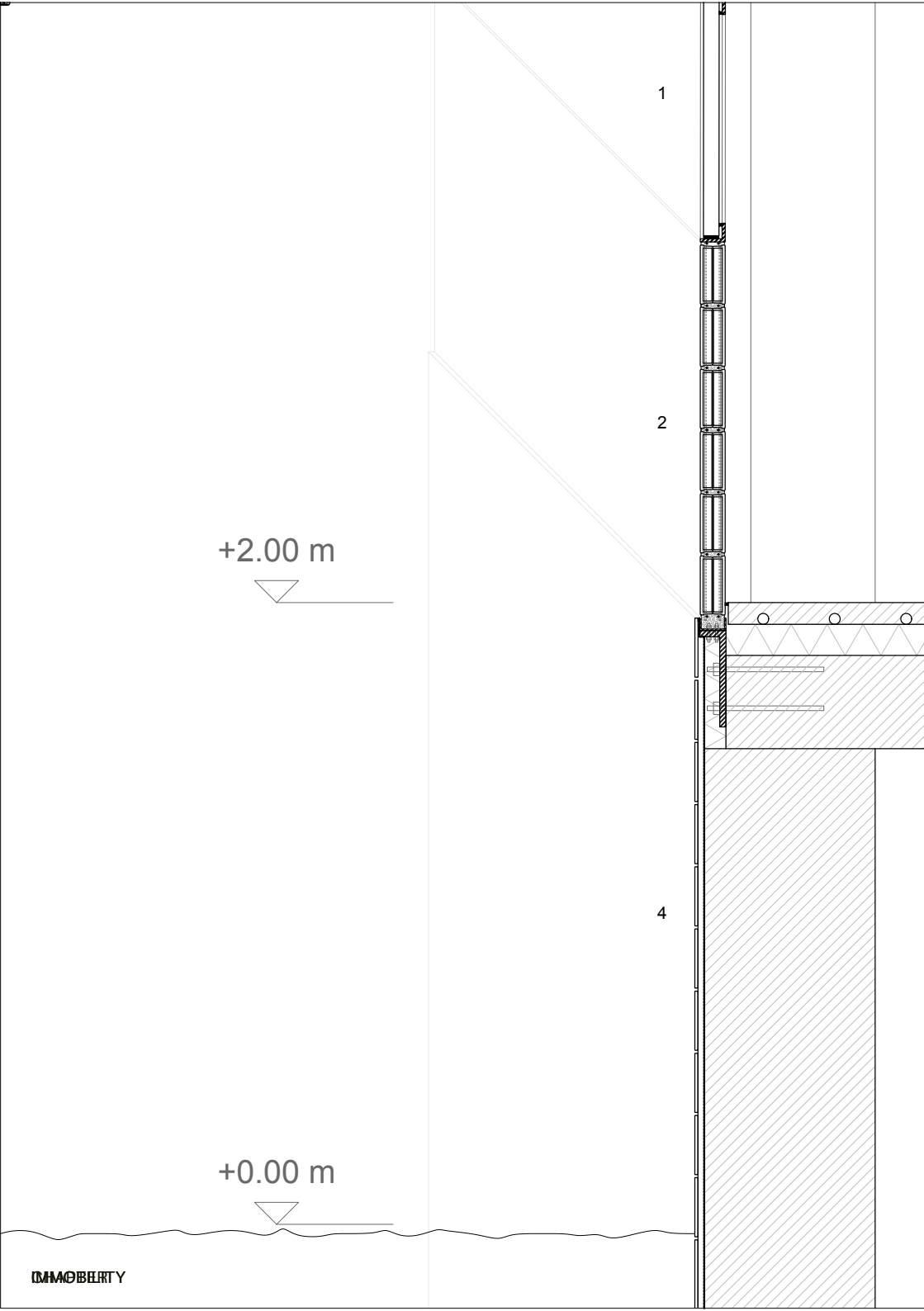


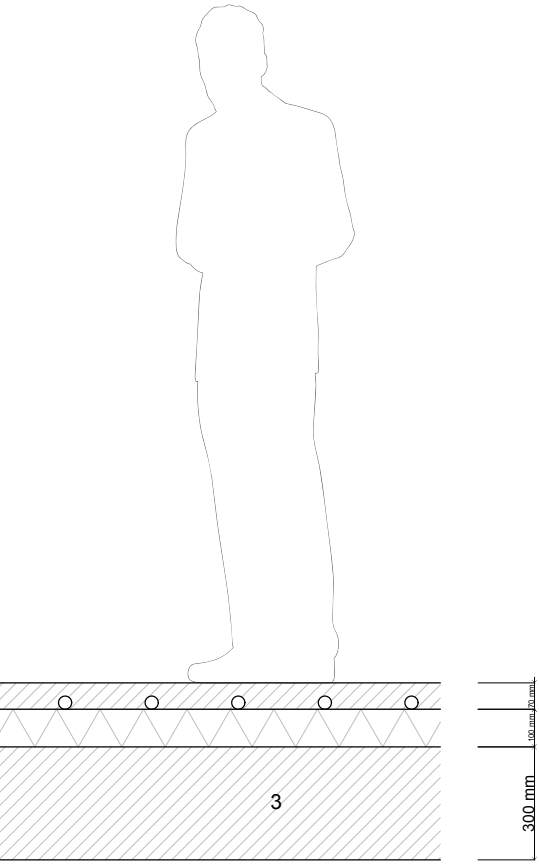
1 190 × 190 × 20 mm glazed ceramic tile (white), 65 mm grout, 150 mm insulation, waterproof membrane, 200 mm concrete
2 190 × 190 × 20 mm glazed ceramic tile (purple)
3 In situ concrete, 300 mm
4 Glass block, 190 × 190 × 80 mm, double chamber filled with argon gas
5 Mechanical ventilation duct

DETAIL 06

platform roof
scale: 1:10
paper size: A2

0 0.1 0.2 0.5 1 m


1
2
+2.00 m
4
+0.00 m

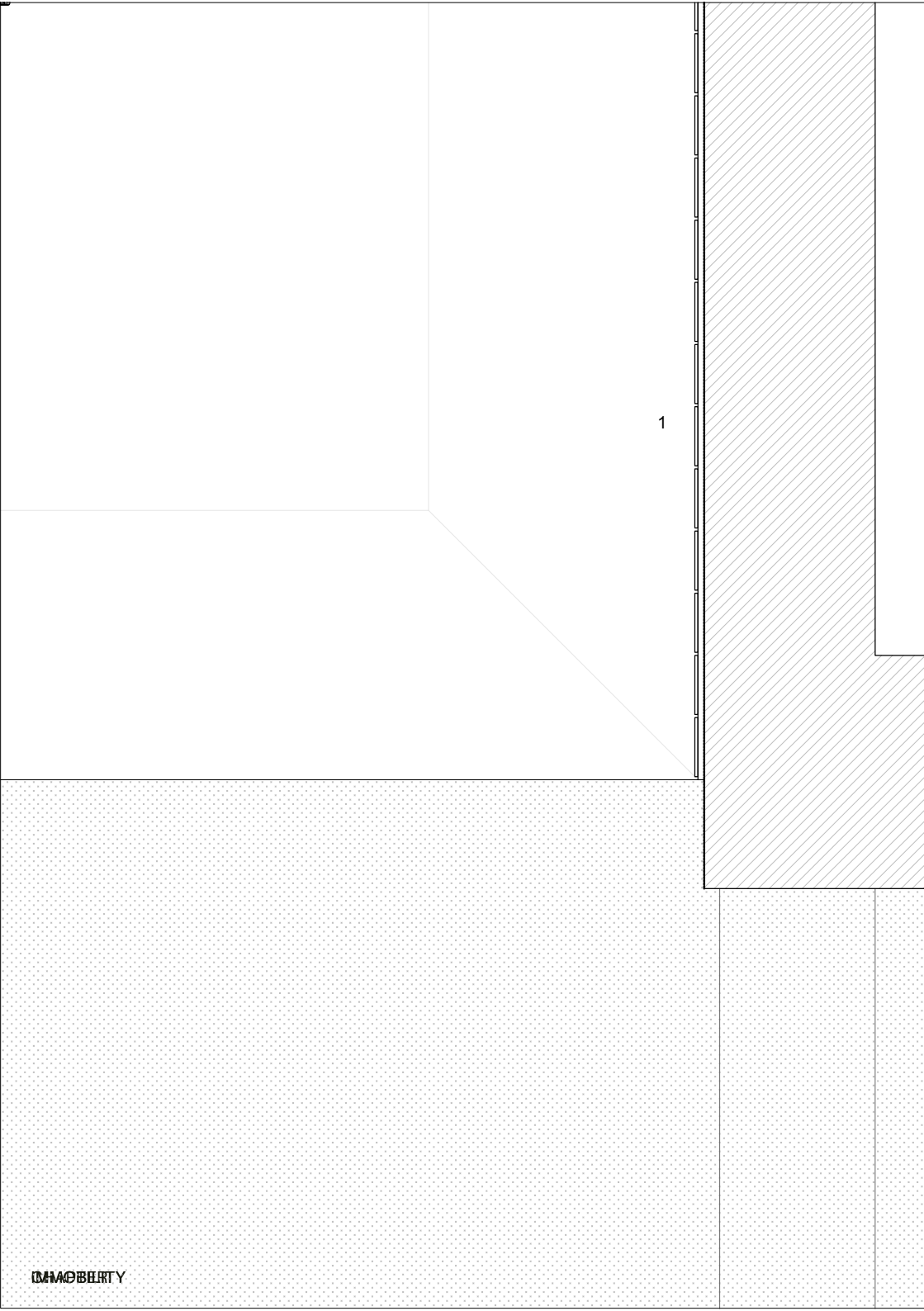


1 50 mm acrylic window, non openable
2 Glass block, 190 × 190 × 80 mm, cdouble hamber filled with argon gas
3 70 mm concrete finish floor, floor heating / cooling, 100 mm insulation Gutex, 300 mm in situ concrete
4 Glazed ceramic tile (white), 20 mm grout, 100 mm reinforced concrete wearing wall, waterproof membrane, 150 mm insulation, 30 mm grout, 500mm concrete

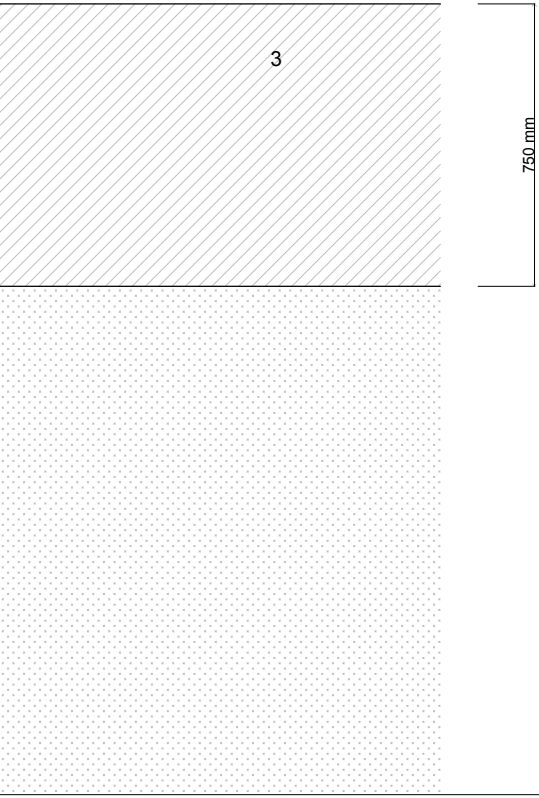
DETAIL 07

platform middle connection
scale: 1:10
paper size: A2

0 0.1 0.2 0.5 1m


1

1 Glazed ceramic tile (white), 20 mm grout, 100 mm reinforced concrete wearing wall, waterproof membrane, 150 mm insulation, 30 mm grout, 500mm concrete
2 750 mm concrete



DETAIL 08

platform foundation
scale: 1:10
paper size: A2

0 0.1 0.2 0.5 1m