MASTER-/DIPLOMARBEIT

Kreuzfahrt Wellen
Cruise Waves
Neue Kreuzfahrt in Konstanza
New Cruise Terminal in Constanta

ausgeführt zum Zwecke der Erlangung
des akademischen Grades eines
Diplom-Ingenieurs / Diplom-Ingenieurin
unter der Leitung von

Manfred Berthold
Prof Arch DI Dr

E253 - Institut für Architektur und Entwerfen

eingereicht an der Technischen Universität Wien
Fakultät für Architektur und Raumplanung

Ioana Laura Constantin
Matr. Nr. 01327929

A 1120 Wien
Dunklergasse 21

+43 660 3978750
ioanalauraconstantin@gmail.com

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Abstract

The port of Constanta represents an important symbol of the city not only for the industry, but also for the tourism of Romania because it has a very long history of development, being founded by the Greek colonists.

The cruise ship industry has been showing a continuous growth, being estimated between 2012-2013 26 million passengers carried annually. Some of the most popular destinations in the Black Sea are ports Trabzon, Odessa, Yalta, Sevastopol, Sochi, Constanta and Nessebar. The growth is characterized by the attractiveness of the Black Sea destinations, the increase of the consumption in the EU (growth in cruise market) and a diversification of services on the shore by improving attractiveness of destinations on the Black Sea.

In the last years, the number of cruise ships, which stopped in the Port of Constanta, shows a constant increase as well as the time they spent in the port. According to the Constanta Port Authority, the number of ships that visited Constanta port in 2014 was 106, clearly showing a significant growth of the total number of passengers, who are passing through the port.

As the statistics show a growth of the tourism in Constanta and the cruise terminal hasn't seen a modernization or an expansion in the last years, my intention is to plan, as a master thesis, a new whole cruise terminal for the passengers, but also a new center for the inhabitants of the city. This means not only new buildings will be developed for the seaport, but also it will include a new headquarter for different companies and administration of the harbor.

Kurzfassung

Der Hafen von Constanta ist nicht nur für die Industrie, sondern auch für den rumänischen Tourismus ein wichtiges Symbol der Stadt, da er eine sehr lange Entwicklungsgeschichte hat und von den alten griechischen Kolonien gegründet wurde.

Die Kreuzfahrtschifffahrt sind in einem kontinuierlichen Wachstum. Schätzungen zufolge werden zwischen 2012 und 2013 26 Millionen Passagiere pro Jahr befördert. Einige der beliebtesten Reiseziele am Schwarzen Meer sind die Häfen Trabzon, Odessa, Jalta, Sewastopol, Sotschi, Constanta und Nessebar. Das Wachstum ist gekennzeichnet durch die Attraktivität der Ziele am Schwarzen Meer, den Anstieg des Verbrauchs in der EU (Wachstum des Kreuzfahrtmarktes) und eine Diversifizierung der Dienstleistungen am Land durch die Verbesserung der Attraktivität der Reiseziele.

In den letzten Jahren hat die Zahl der Kreuzfahrtschiffe, die im Hafen von Constanta anhielten, ebenso wie die Zeit, die sie im Hafen verbrachten, stetig zugenommen. Nach Angaben der Hafenbehörde von Constanta haben 2014 106 Schiffe den Hafen von Constanta besucht, was ein deutliches Wachstum der Gesamtzahl der Passagiere zeigt, die den Hafen durchqueren.

Die Statistiken zeigen, dass der Tourismus in Constanta zugenommen hat und das das Kreuzfahrtterminal in den letzten Jahren weder modernisiert noch erweitert wurde, ist es meine Absicht, als Masterarbeit ein neues vollständiges Kreuzfahrtterminal für die Passagiere zu planen, aber auch ein neues Zentrum für die Bewohner der Stadt. Dies bedeutet, dass nicht nur ein neues Gebäude für den Seehafen entwickelt werden soll, sondern auch ein neuer Hauptsitz für verschiedene Unternehmen und die Verwaltung des Hafens.

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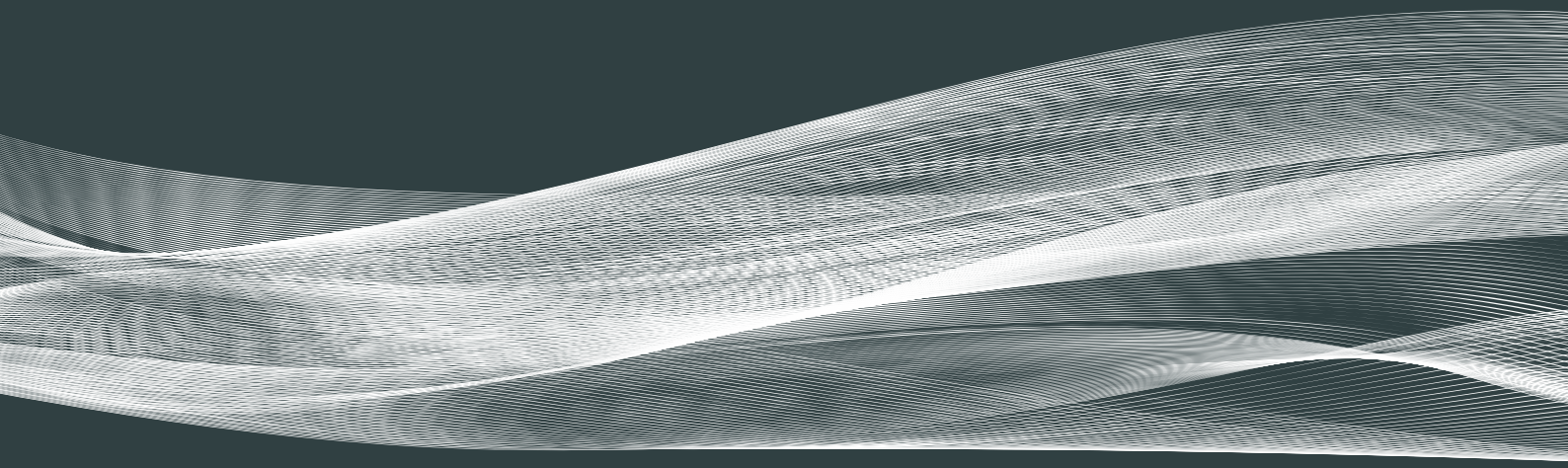
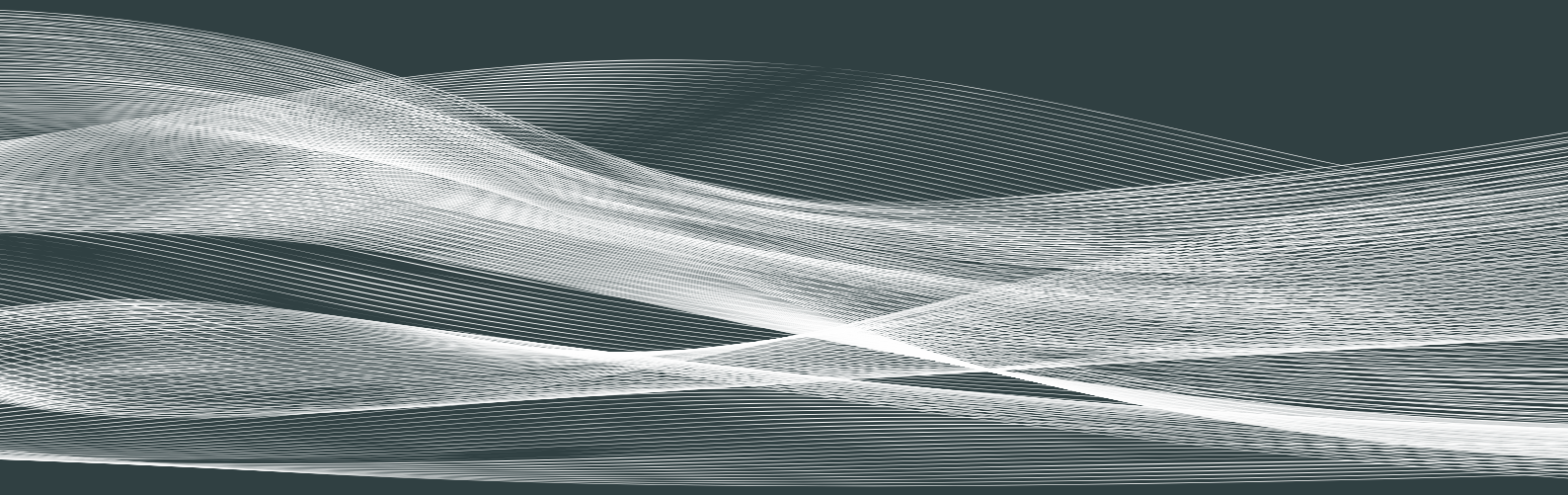




Introduction

Constanta is the largest city in the Southeastern region of Romania, being located on the Black Sea coast, and it has a 13 kilometres long beach.

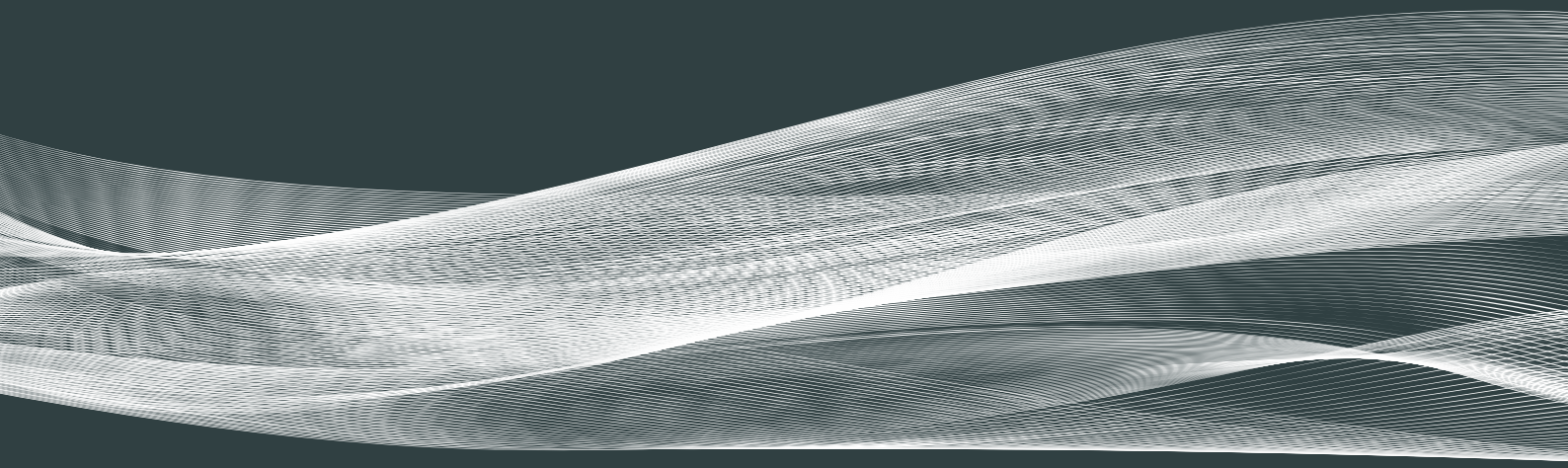
This city represents my hometown and I've always been fascinated, how everything works inside the harbor and luckily I got to see the processes of loading ships and how the transportation procedures work. Besides, the fact that Constanta has a large opening to the sea, the old town offers a fascinating view over its promenade and it is one of my favorite places to visit in the city.

As an expansion of the harbor was planned, but never took place, my intention is to propose a new planning for the cruise terminal in order to offer more facilities for the passengers and cruise ships.

To see whether this project is necessary or not for the city, I went to the harbor authorities and got documentation about statistics and forecast done by the officials of the harbor. The documentation showed growth in number of vessels and passengers and still there is expected to increase also in the next years. The factors which contributed to this growth are the attractiveness of Black Sea destinations, growth in cruise market and diversification of services on shore.

This means that in the next years, the city will host more visitors and the actual cruise terminal has a limited capacity (only 2 spots for docking) and a small building used as terminal. As this being said, my mastert thesis will represent a new location and planning for a cruise terminal, which will offer a higher capacity of vessels and passengers, but also new more facilities for harbor officials and inhabitans.

Fig. 1



Site plan situation

Position

Constanta is historically known as Tomis, it is the oldest continuously inhabited city in Romania. It was founded around 600 BC. The city is located in the Northern Dobruja region of Romania, on the Black Sea coast. It is the capital of Constanța County and the largest city in the region of Dobruja. [1]

1 https://en.wikipedia.org/wiki/Constan%C8%9Ba

Fig. 2

Fig. 3

Fig. 4

Fig. 5

Fig. 6

Fig. 7

Constanta is an ancient metropolis and Romania's largest sea port, having a history of 2,500 years. Originally called Tomis, legend has it that Jason landed here with the Argonauts after finding the Golden Fleece.

One of the largest cities in Romania, Constanța represents an important cultural and economic center, worth exploring for its archaeological treasures and the atmosphere of the old town center. Its historical monuments, ancient ruins, grand Casino, museums and shops, and proximity to beach resorts make it the focal point of Black Sea coast tourism.

Fig. 7

History Museum Constanta

Fig. 8

House with lions

Fig. 9

Ovidiu Statue

Fig. 10

Cathedral of Saints Peter and Paul

Fig. 11

Old cruise terminal building

Fig. 12

Aquarium Constanta

Fig. 13

Casino Constanta

Fig. 14

Promenade Constanta

Fig. 15

Genovese Lighthouse

Fig. 16

Tomis harbor

Fig. 17

Carol I Mosque

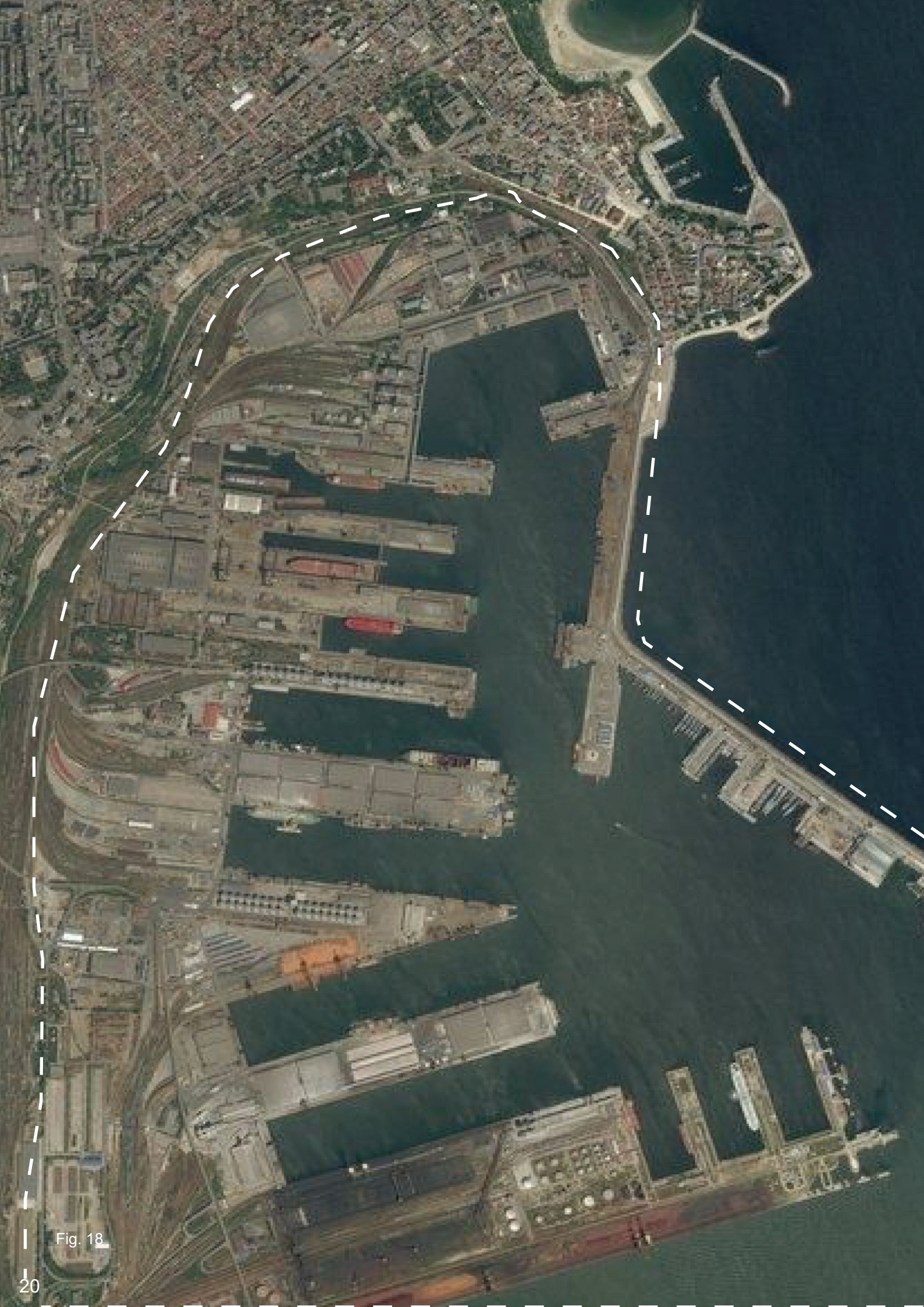


Fig. 18

The Port of Constantza is one of the main distribution centers for the Central and Eastern Europe’and it has a maritime and river port. Constantza Port can handle a capacity of over 100 million tons per year and it has 156 berths, of which 140 berths are operational.[1]

Fig. 19

The Passenger Terminal is located in the North of the Port of Constantza, on the North Breakwater, at the passengers berth.

Destination for many Danube and also maritime cruise routes, the Port of Constantza is offering the best conditions for berthing both river and maritime cruise vessels, facilitated by the existing depths at the new terminal. The existing mooring length is 293 m, the quay depth is 13.5 m, ensuring the mooring of big vessels, with drafts up to 10-11 m.

Located near the historic area of the Constantza city and the Tomis touristic Port, the new Passenger Terminal has an operation capacity of 100,000 passengers/year, being the most recent investment able to increase the activity on the Romanian seaside. [2]

Cruise Terminal

2 https://www.portofconstantza.com/apmc/portal/static.do?package_id=term_pasageri&x=load

The current terminal presents a small building and limited parking lot. Only one side of berth is available for cruise ships while the other one is used for merchant vessels. Also, the terminal is surrounded with gates and can't be accessed without any authorisation, unless a cruise ship is docking.


Terminal parking lot
Cruise terminal building
Cruise ship dock
Old lighthouse Carol I
Merchant ship dock

Fig. 20

History of the city

Fig. 21

Fig. 22

Fig. 23

The port of Constanta is located in Constanta, Romania, on the western coast of the Black Sea. It represents the main maritime gate of Romania and it is the largest harbor on the Black Sea and the 17th largest in Europe. The harbor has at present 87 berths in operation with an operation capacity of 75,000 thousand ton/year and it can operate 3,500 ships annually.

There are 39,900 m² warehouses in the harbor, 172.000 m² of platforms, a complex railway system consisting of 190 km of railway and approximately 100 km of roads. Port of Constanta has an important role for the economical market of the Black Sea.

From the beginning, the city of Tomis and te harbor played a significantly important role in the transit commercial activities, the area coming in time of the great centers that was linking the Lower Danube basin with the Aegean-Mediterranean area. Since the beginning, the Romanian seaside has been a “gate” used by the Getae, the Greeks and the Romans, and later on by the Rmanians, by playing a particularly important part for the traffic of goods from and towards the Romanian area and being in the same time a factor of cultural, material and spiritual iradation.

Among the oldest settlements on the Black Sea, Tomis Harbour was by far the most important. Historical sources mention different names for Constantza, by being named Tomi, Tomos, Tomoi, Tomoe, Tomeis, Tomiton, Tomoes, Constantiana and Constantia in the beginning. In the Greek and Roman sources the most used names were Tomis and Tomi, names which had Thracian origins.

The port activities began even from ancient times in this area, as in the 7-6th centuries B.C. there were settlers Greek colonies at the Left Pont, at Histria, Callatis and Tomis, on the places where previously the Thracians -Gethians had done trade changes, navigating on the Danube and on the Black Sea.

Fig. 24

Fig. 25

Fig. 26

In 260 B.C. the city of Tomis was strongly supported by Bizantium , which had interests in the trade of area, successfully opposed the combined attempts of Callatis and Histria to consolidate their domination over inhabitants of Tomis. This success allowed Tomis the freedom to make a considerable progress.
Tomis entered under Roman control in the years 73-72 B.C. when the great king Burebista included the western coast of the Black Sea in the Dacian State.

In second century A.D., Tomis was considered the most
important settlements on the western coast of the Black Sea, being referred to in the sources as " the Greatest, splendid city of the Tomitans". As as result of its development and
geographical position, it was ranked as " Metropolis of the Left Pontus".

The majority of the medieval documents, which refer to the 12th -14th centuries navigation in the Black Sea, also mention the port of Constanta, proving that it was a regular port for ships and a maritime traffic centre, mentioning the port of Constanta under the name "Constantza" or "Constansa".

In the second half of the 14th century the coastal zone was included in the process of founding the medieval state under the rule of Dobrotită.

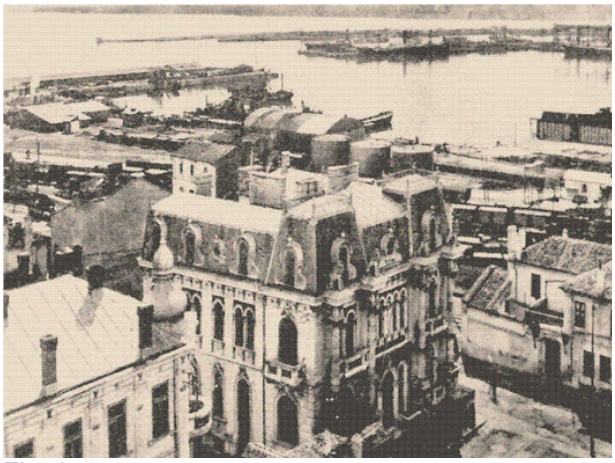


Fig. 27

Fig. 28

Fig. 29

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Starting with the second half of the 15th century, Dobruja and its litoral area fell under Ottoman rule, and it remains so until 1877, being known in this period as “Küstengea”. In the Middle Ages, the town was known on the maps with different names as: Constanza, Constanca, Constansa, Constantza, Constantia.

In 1857, the “Danube and the Black Sea Railway and Kustendge Harbour Company” English Consortium signed an agreement with the Ottoman authorities to build a railway between Cernavodă and Constanta, the document including also the existence of an important port at Kustenge, at that time, today Constanza.

After the Independence War in 1877, important devel opment plans for the port would be designed beginning with 1881 by Sir Charles Hartley, engineer of The European Committee of the Danube, later by the Romanian engineers: I.B. Cantacuzino, Gheorghe Duca, and especially by Anghel Saligny, between 1899-1910.

Fig. 30

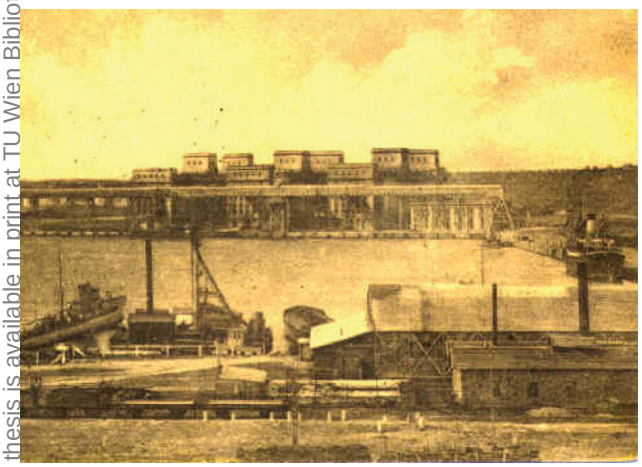


Fig. 31

Fig. 32

The evolution of the harbor is closely linked to the history of Dobruja and with the 20th century also to the Romanian history. It's the time when Constanta makes the transition to an important harbor, which can compete with other European ports. In 1878 Dobruja obtained an important meaning, making Constanta a more prosperous town, being built new facilities and modernizing the harbor and the town (the railway reconstruction , the Cernavodă Bridge).

Up until the First World War, Constanta has been showing a constant growth and the harbor was having and enormous traffic. The beginning of the WWI triggered a period of decline for Constanta harbor.

At the beginning of the third millennium, Constanta was a harbor characterized by all attributes: technical, managerial, historical and logistic in terms of location and work force. The present media describes Constanta port as " the South-European maritime gate", "the giant" of the Black Sea or "a genuine rival for other Black Sea ports".

The Constanta harbor became developed on different stages, the biggest port complex from the Black Sea and one of the major European ports. The harbor contains specialized sectors, modern equipped, where there are operated any kind of cargo except for gases.

Fig. 33

Fig. 34

Fig. 35

The port lies on an area of almost 10 km and it is about 5,5 km developed offshore, containing 3250 ha of southern area and the discharge of the Danube- Black Sea Channel that is connected to Danube at Cernavodă.

The Port of Constanta offers a major infrastructure for the maritime and river navigation, for the railway, road transport and through oil pipes, but it also has accessibility to the air transport by ensuring a good connections with the main supplies and markets. In the same time, the harbor offers facilities and specialized services for the development of the naval transport activities. The traffic capacity of the port is almost 85 millions t/year.

The cruise ship industry shows a continuous growth, being estimated between 2012-2013 26 million passengers carried annually. Some of the most popular destinations in the Black are ports Trabzon, Odessa, Yalta, Sevastopol, Sochi, Constanta and Nessebar. The growth is characterized by the attractiveness of the Black Sea destinations, the increase of the consumption in the EU (growth in cruise market) and a diversification of services on shore by improving attractiveness of destinations on the Black Sea.

In the last years, the number of cruise ships, which docked in the Port of Constanta, shows a constant increase as well as the time they spent in the port. According to the Constanta Port Authority, the number of ships that visited Constanta port in 2014 was 106, clearly showing a significant growth of the total number of passengers, who are passing through the port.

Evolution of Constanta Harbor

1876

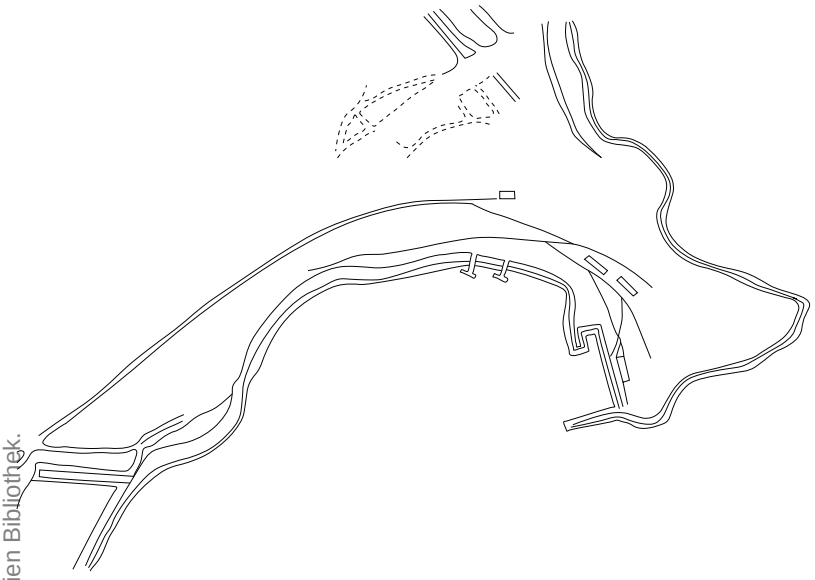


Fig. 36

1881

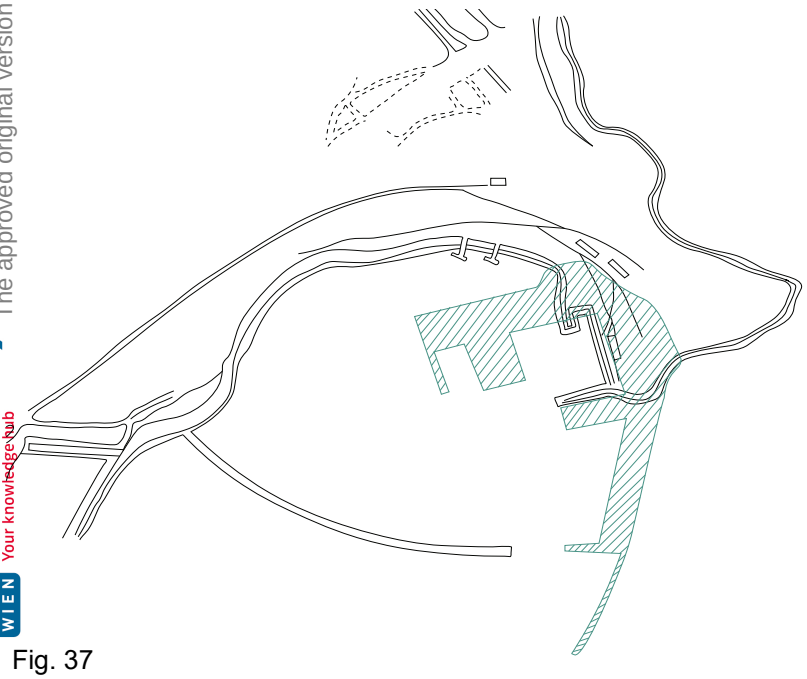


Fig. 37

1885

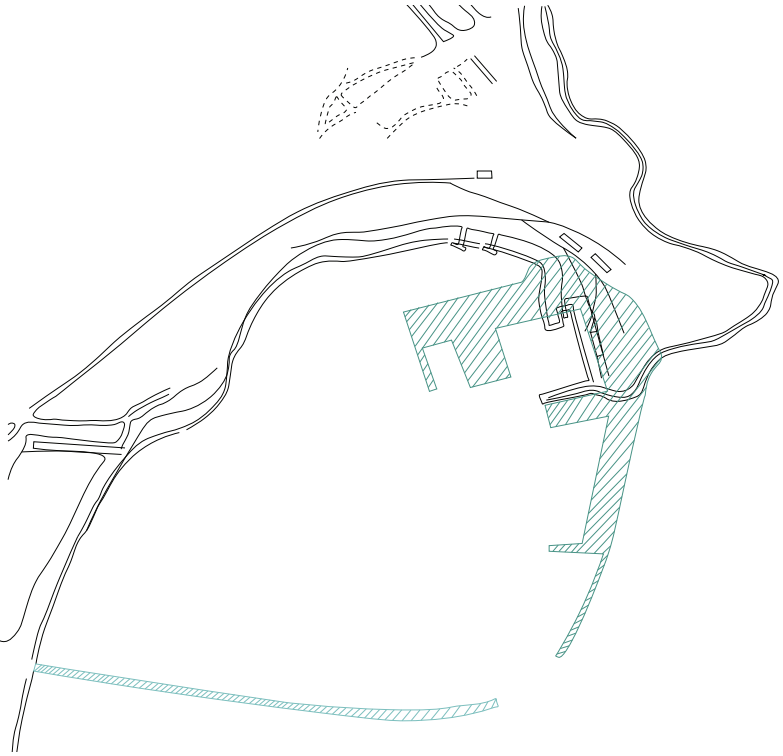


Fig. 38

1886

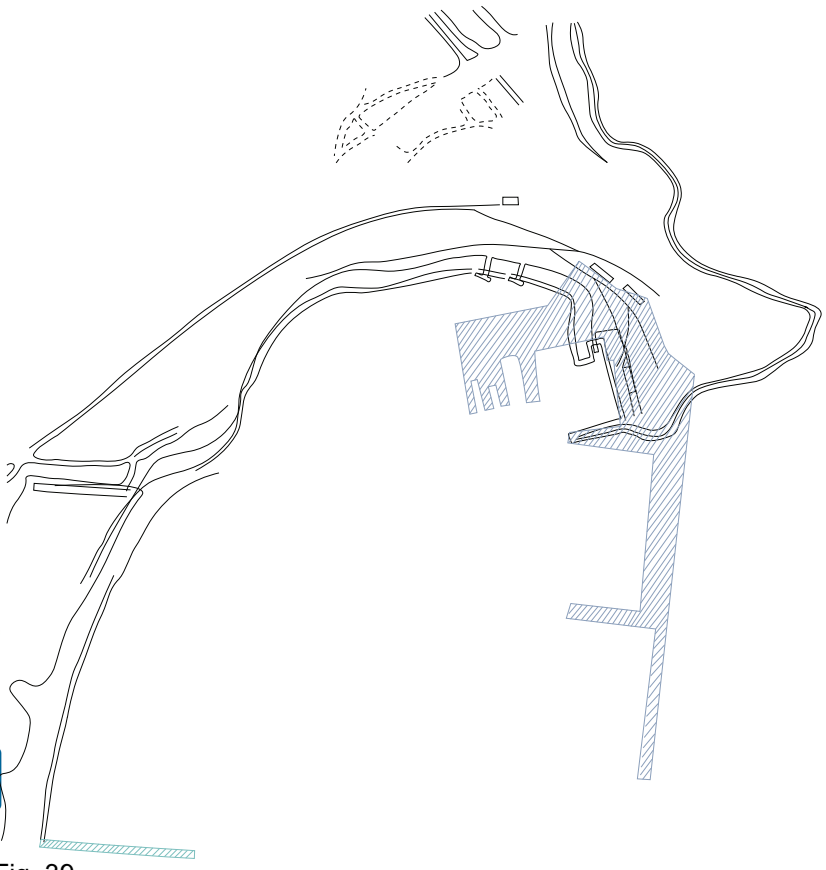


Fig. 39

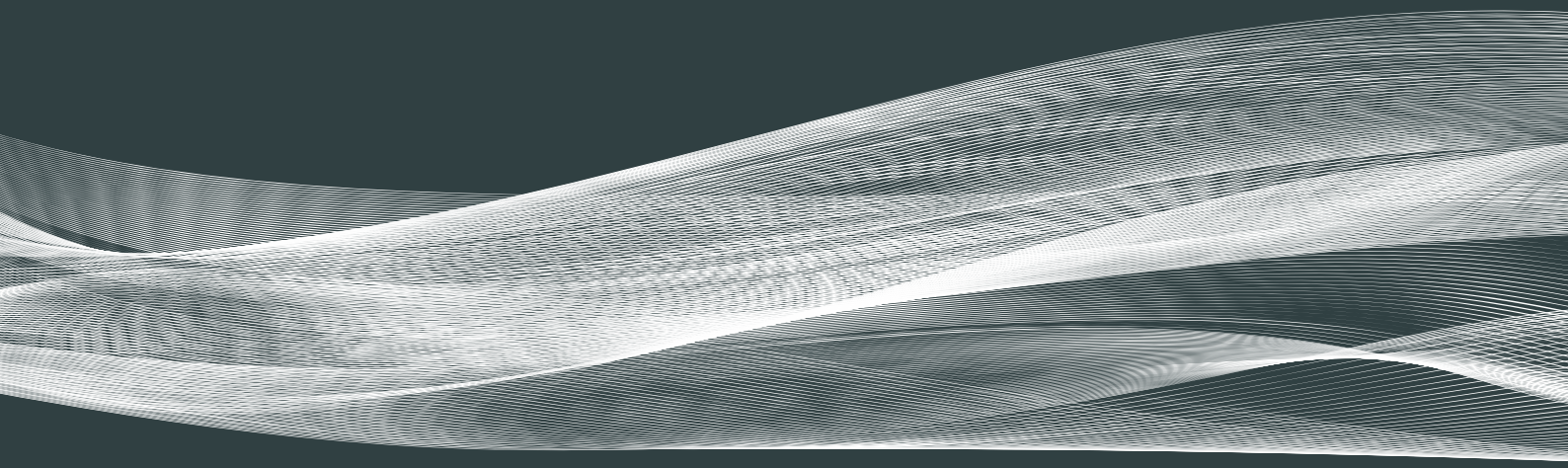
1895

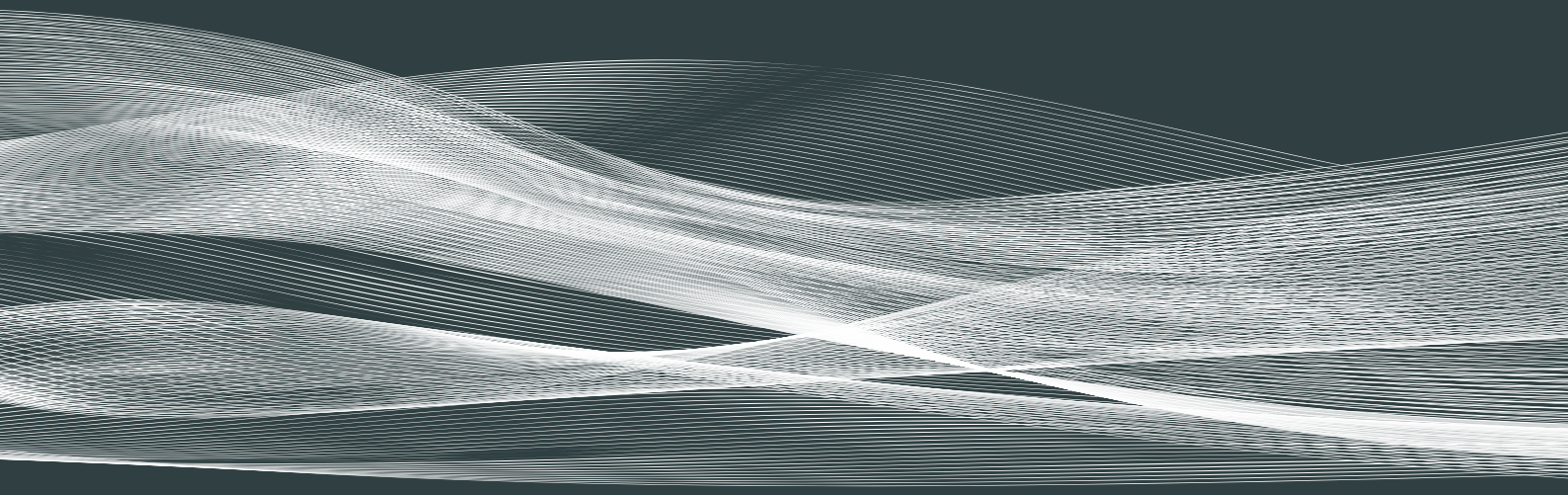
Fig. 40

1936

Fig. 41

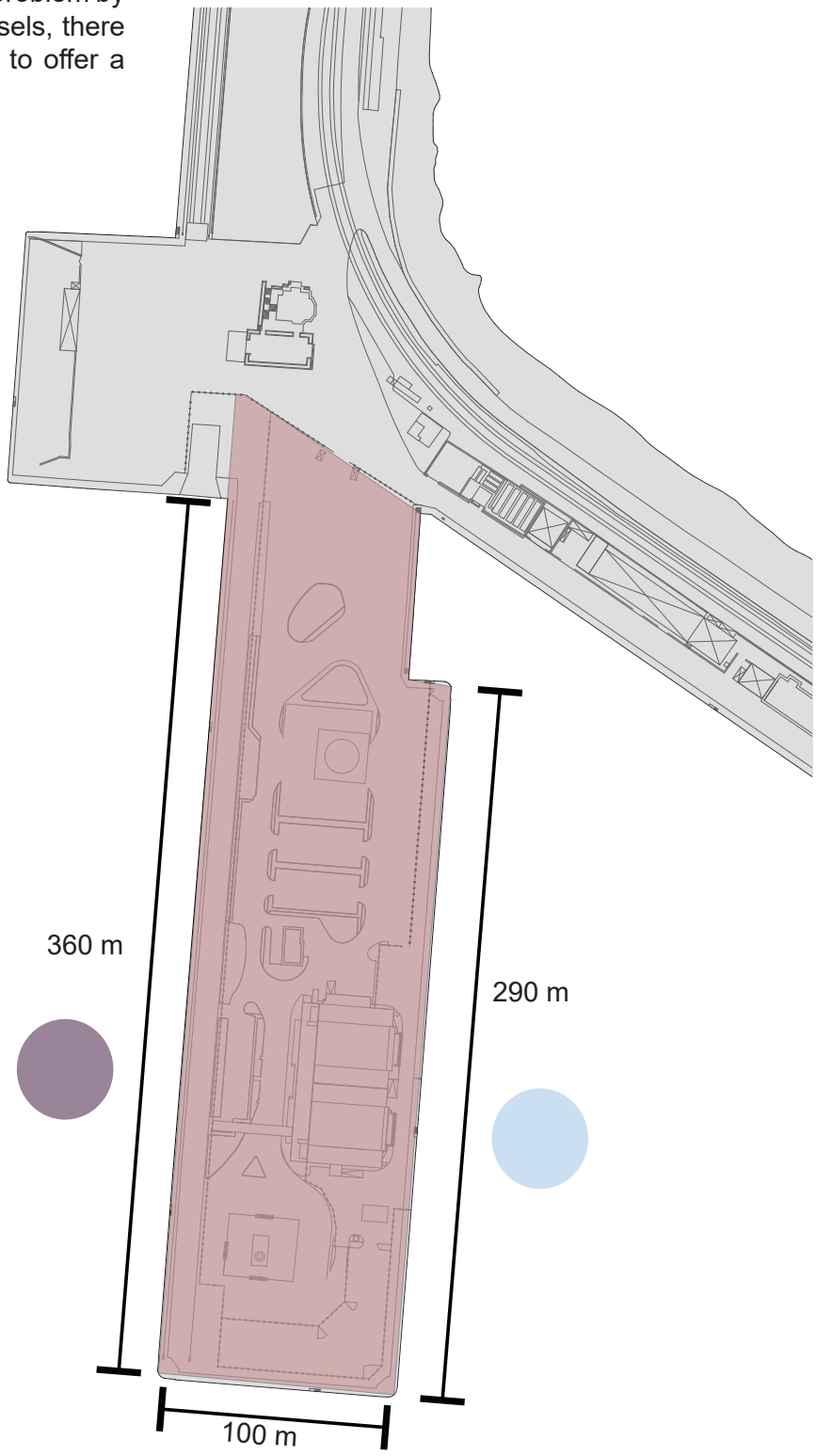
Fig. 42





Analysis

As the actual cruise terminal presents a problem by offering only one free spot for cruise vessels, there has been done some forecasts in order to offer a solution for the terminal.



merchant ship

cruise ship

Fig. 43

Fig. 44

Fig. 45

Fig. 46

In 2014 the National Administration of Port Constanta has realized a development strategy report, which meant to offer a basis for the current or future administration of the Constanta Port and includes planned projects.The cruise ship industry has shown a continuous growth pace, being estimated a 2,3% increase from 2012 to 2013, being carried 26 million passengers anually.

The main factors which contributed to a significantly growth are : the attractiveness of Black Sea destinations, growth in cruise market and diversification of services on shore. Between 2009 and 2014, the number of ships which were stopping in the port of Constanta has been constantly increasing, as in 2014 had been announced to visit Port of Constanta 2016 vessels.

This means that an expansion of the cruise terminal will be needed in order to handle the number of vessels, which will visit the city in the future.

Related to cruise terminal, there are 2 main projects as to be taken in consideration. First project is to rededicate the other side of the dock to cruise terminal and an expansion of the cruise terminal.

There are 2 major deficiencies of the current situation: shortage of capacity for the forecasted volume of cruise passengers and suboptimal port zoning.

There are 2 major projects which should be achieved. They are meant to increase attractiveness of Constanta region by providing a modern and attractive cruise terminal and boost the 'Cruise Tourism Business' at the Port of Constanta.

Fig. 47

Fig. 48

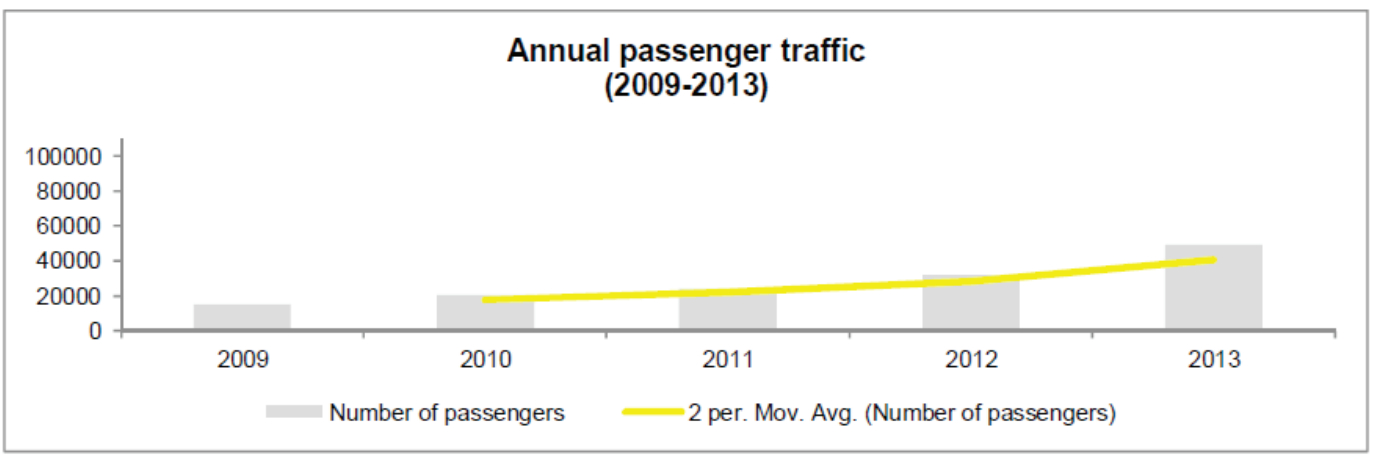
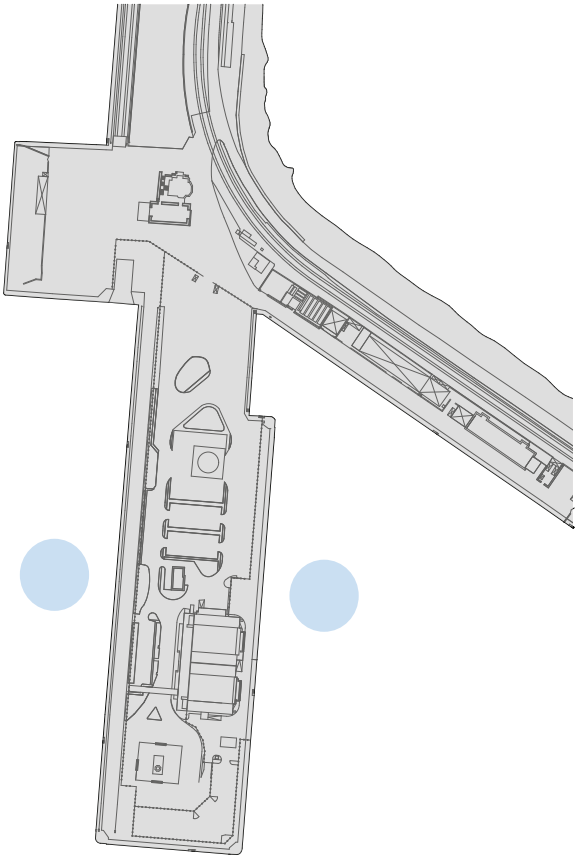


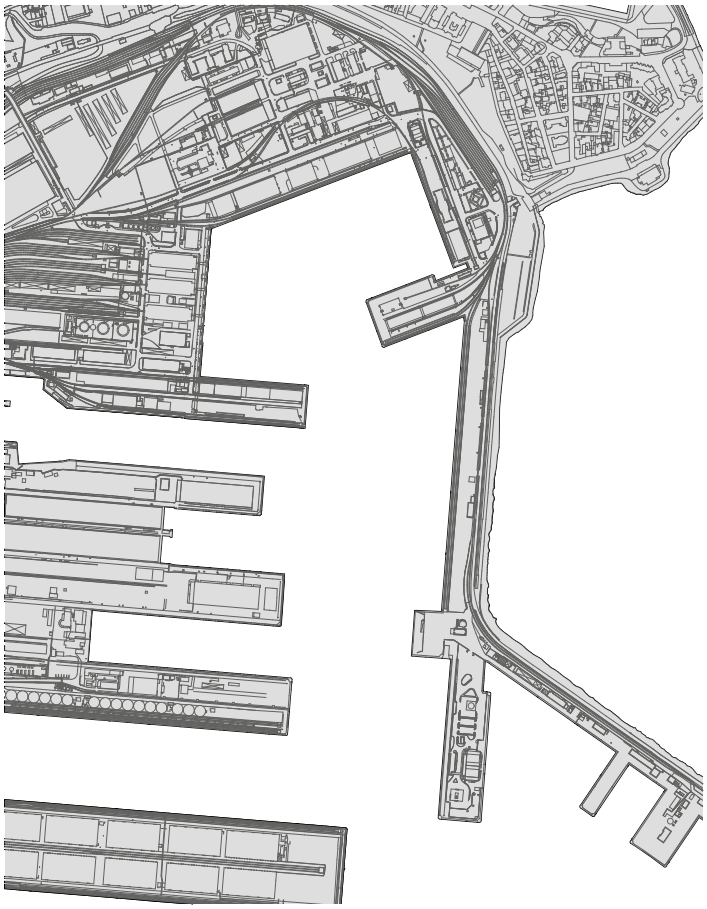
Fig. 49

The first project plans to improve the infrastructure of the cruise terminal offering the other side of dock in order to be possible for 2 cruise vessels to dock at the same time.



cruise ship

The latter project for the cruise terminal plans to show improvements for the cruise vessel traffic that is an expansion of the terminal, but does not describe what this process would mean.




0 m
- 50 m

A first step for planning the new cruise terminal is to check the depth of the water in the area of the promenade. The depth of the sea increases gradually offshore. Inside the harbor, the water has overall a depth of -13,5 meters, which allows the ships to dock in safe environments.
As the area is in slope, a dredging procedure must be done to achieve the necessary depth for the cruise ships to dock.

Fig. 50

Fig. 51

Modern Beach
during summer time takes place for the biggest music festival in the city

Port Tomis
the yacht and turistic port of the city

Old Town Centre

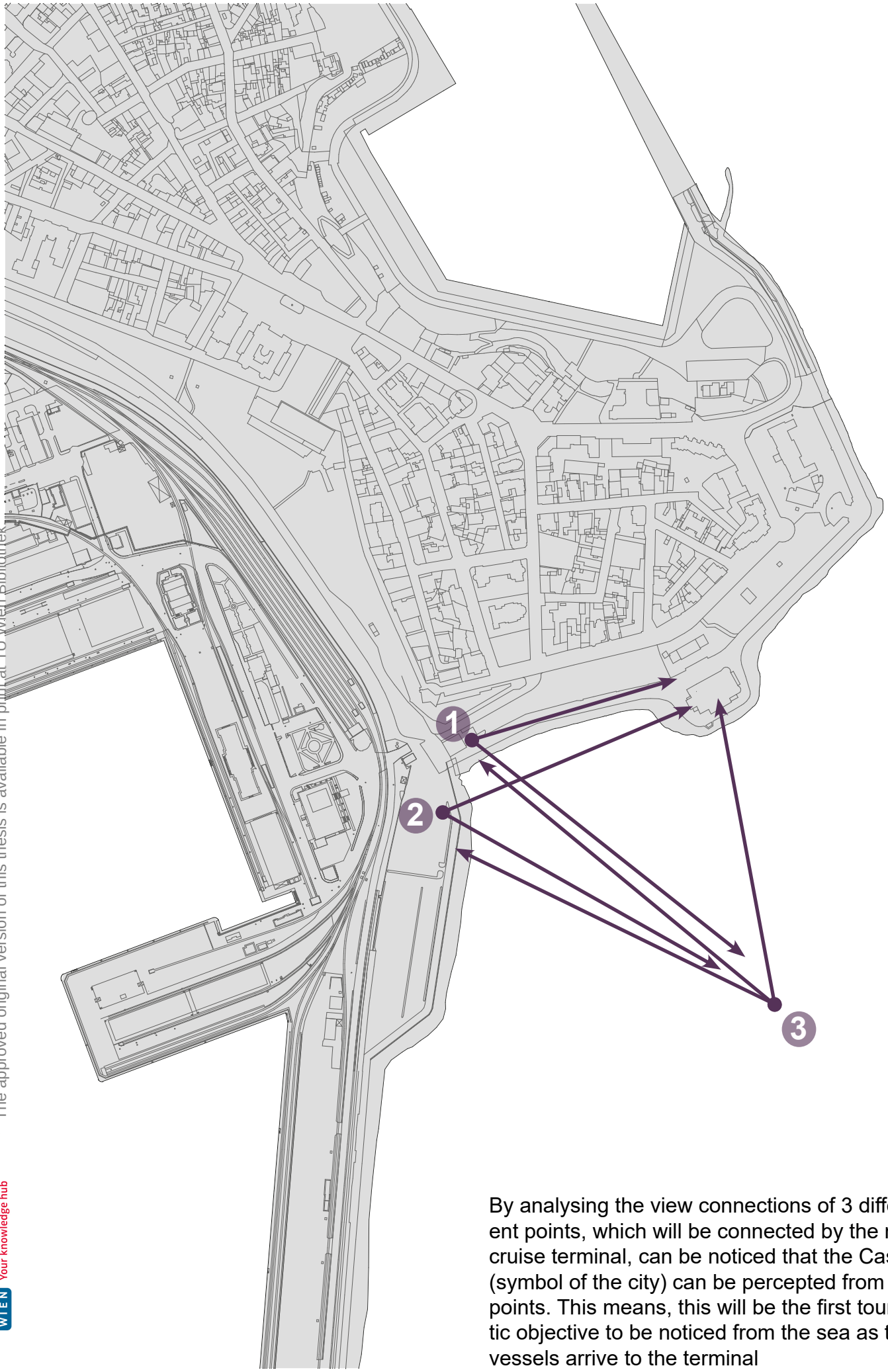
Casino of Constanta
the symbol and one of the main turistic points of the city

Public parking lot

New Cruise Terminal
proposed site plan for the terminal

Current Cruise Terminal

Fig. 52



By analysing the view connections of 3 different points, which will be connected by the new cruise terminal, can be noticed that the Casino (symbol of the city) can be percepted from all points. This means, this will be the first touristic objective to be noticed from the sea as the vessels arrive to the terminal

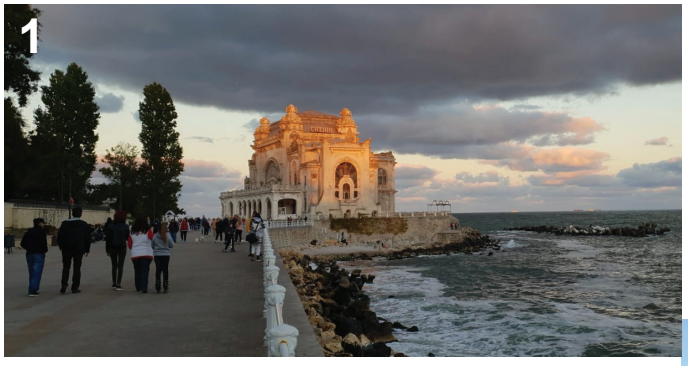


Fig. 53

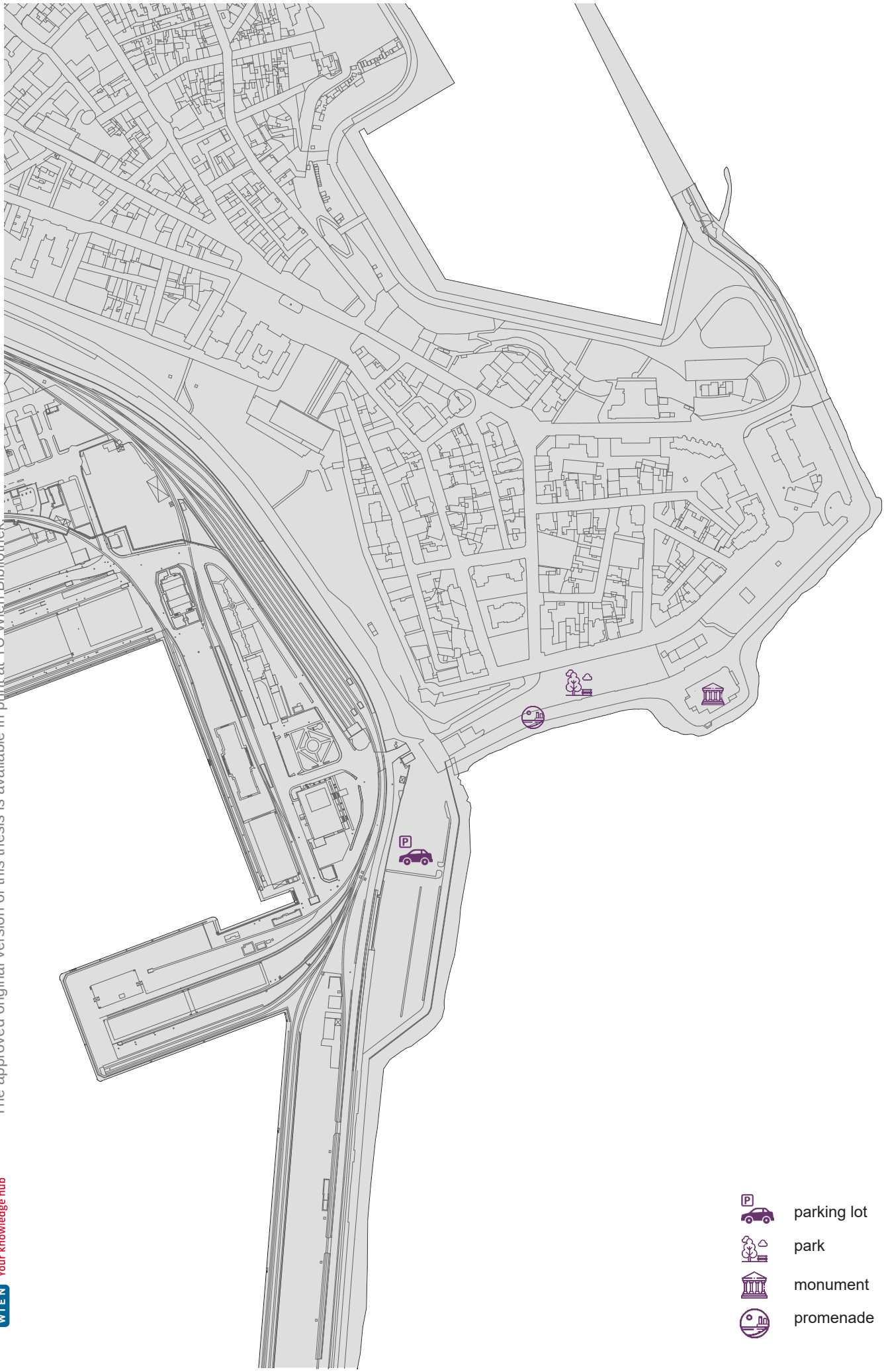
Fig. 54

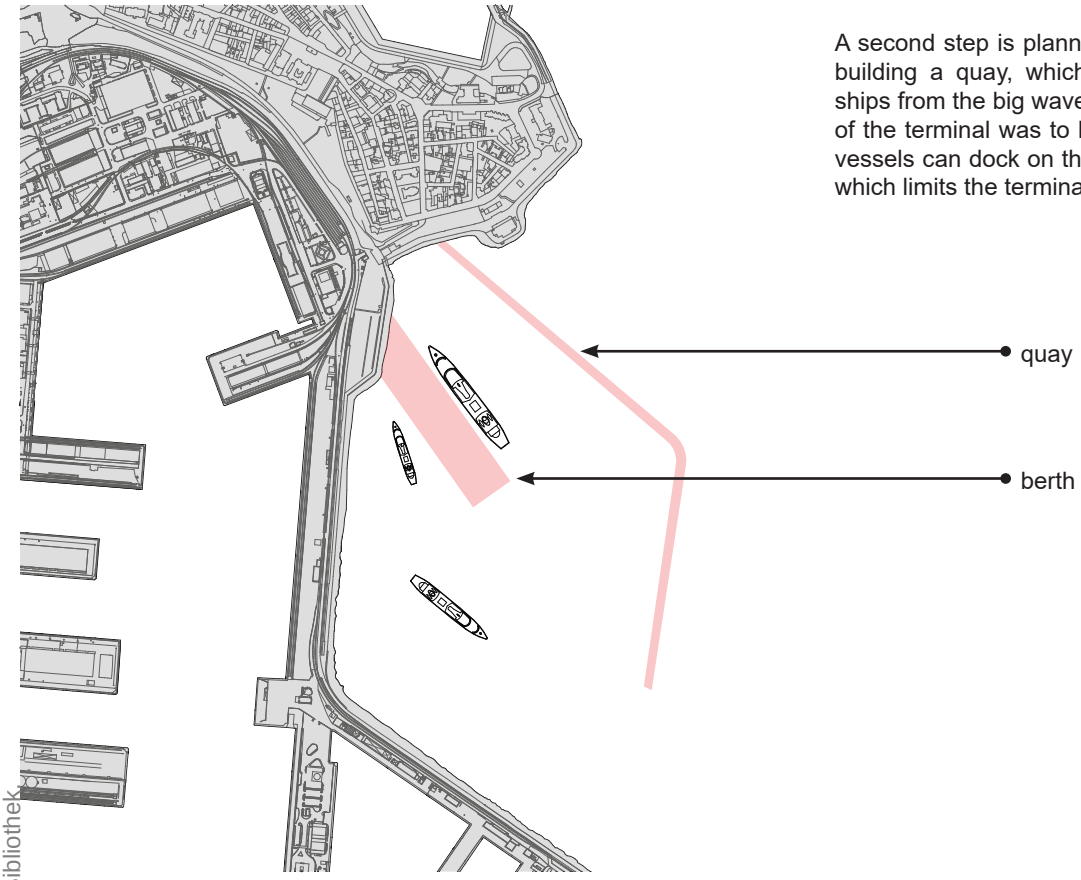
Fig. 55

Fig. 56

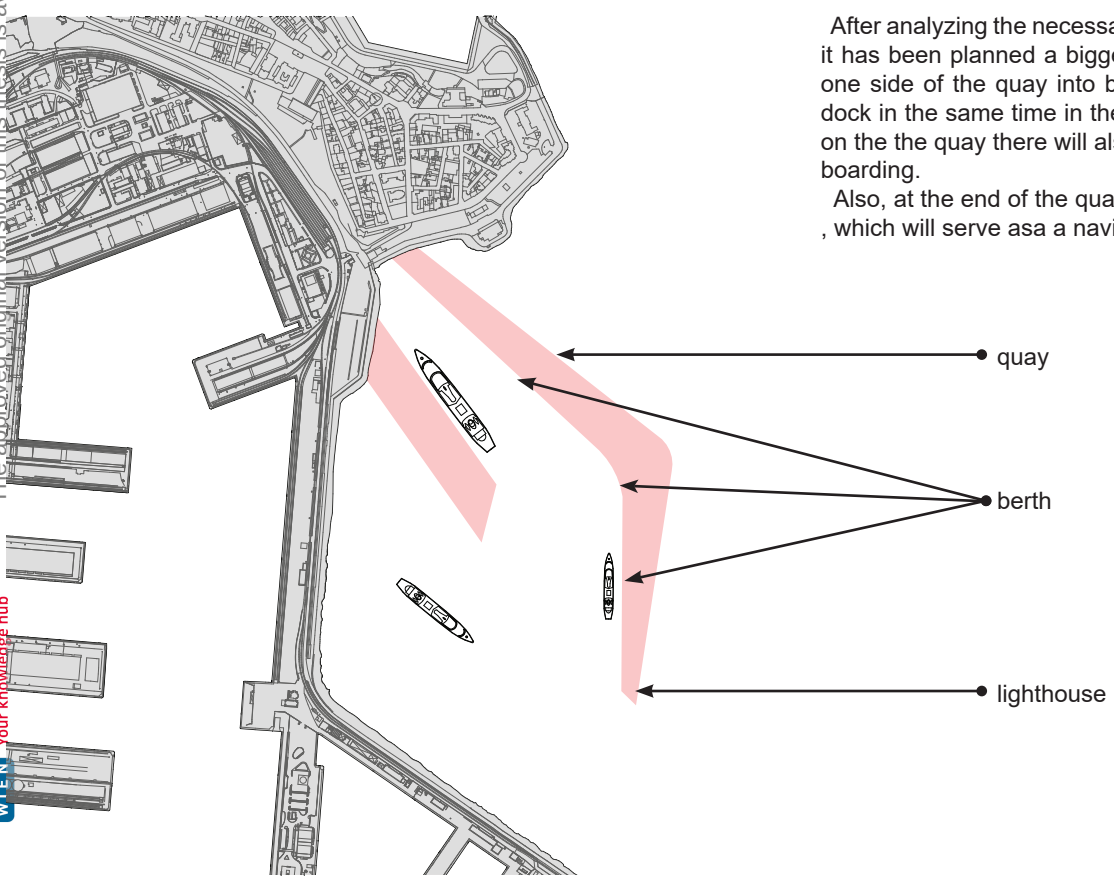
Fig. 57

Fig. 58



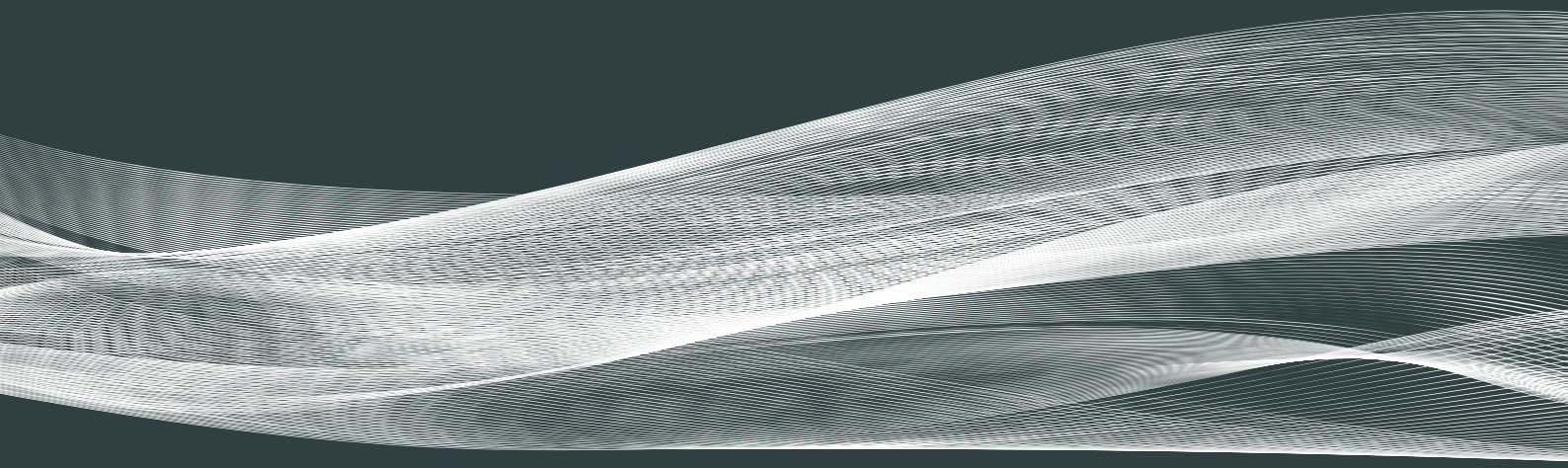


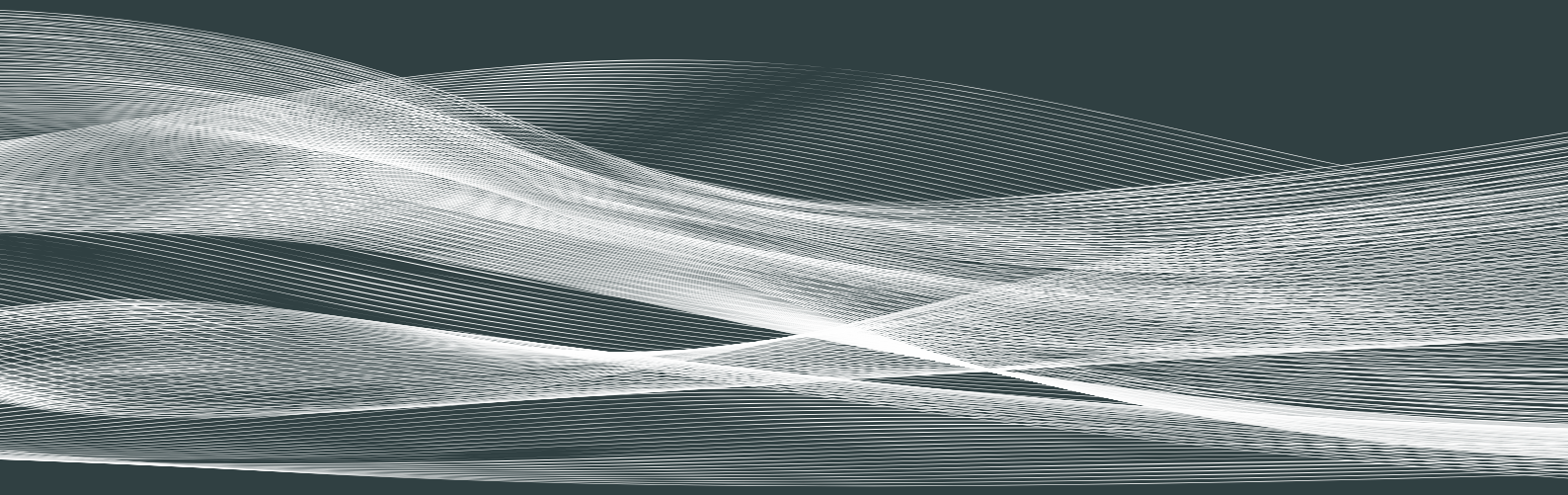
A second step is planning the limits of the terminal by building a quay, which protect the terminal and the ships from the big waves of the sea. The previous idea of the terminal was to have only one berth, where the vessels can dock on the both sides of it and one quay which limits the terminal.



After analyzing the necessary facilities for the terminal, it has been planned a bigger terminal by transforming one side of the quay into berth, so more vessels can dock in the same time in the terminal. This means that on the the quay there will also have its own building for boarding.

Also, at the end of the quay will be place a lighthouse , which will serve asa a navigational aid for the ships.



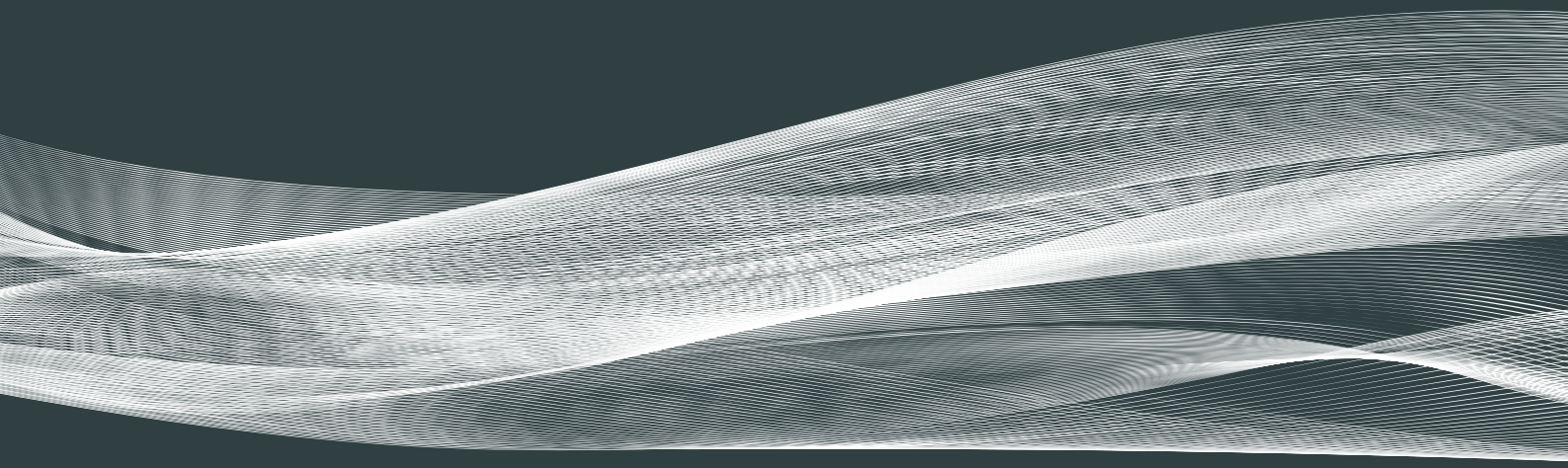


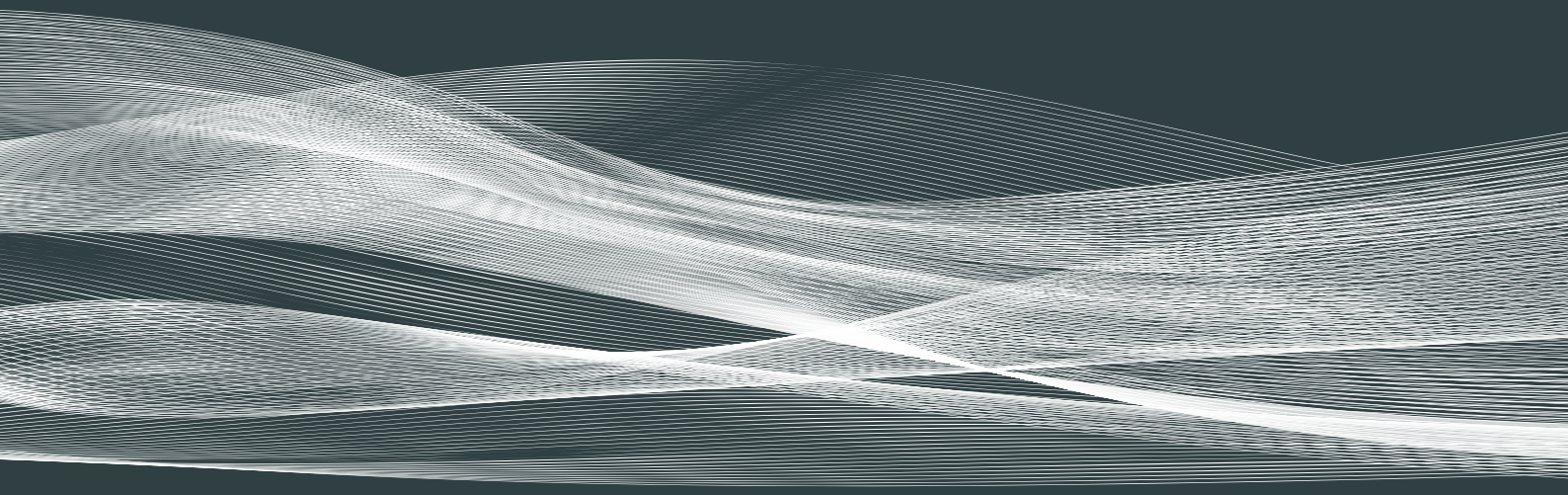
Objective of master thesis

As the current situation of the cruise terminal presents deficiencies and cannot handle more than one vessel in the same time, the target of the thesis is to plan a new cruise terminal, which will not only offer the possibility of more than one vessel to dock in the same time, but also by designing a new and attractive terminal which will boost the cruise tourism for the city.

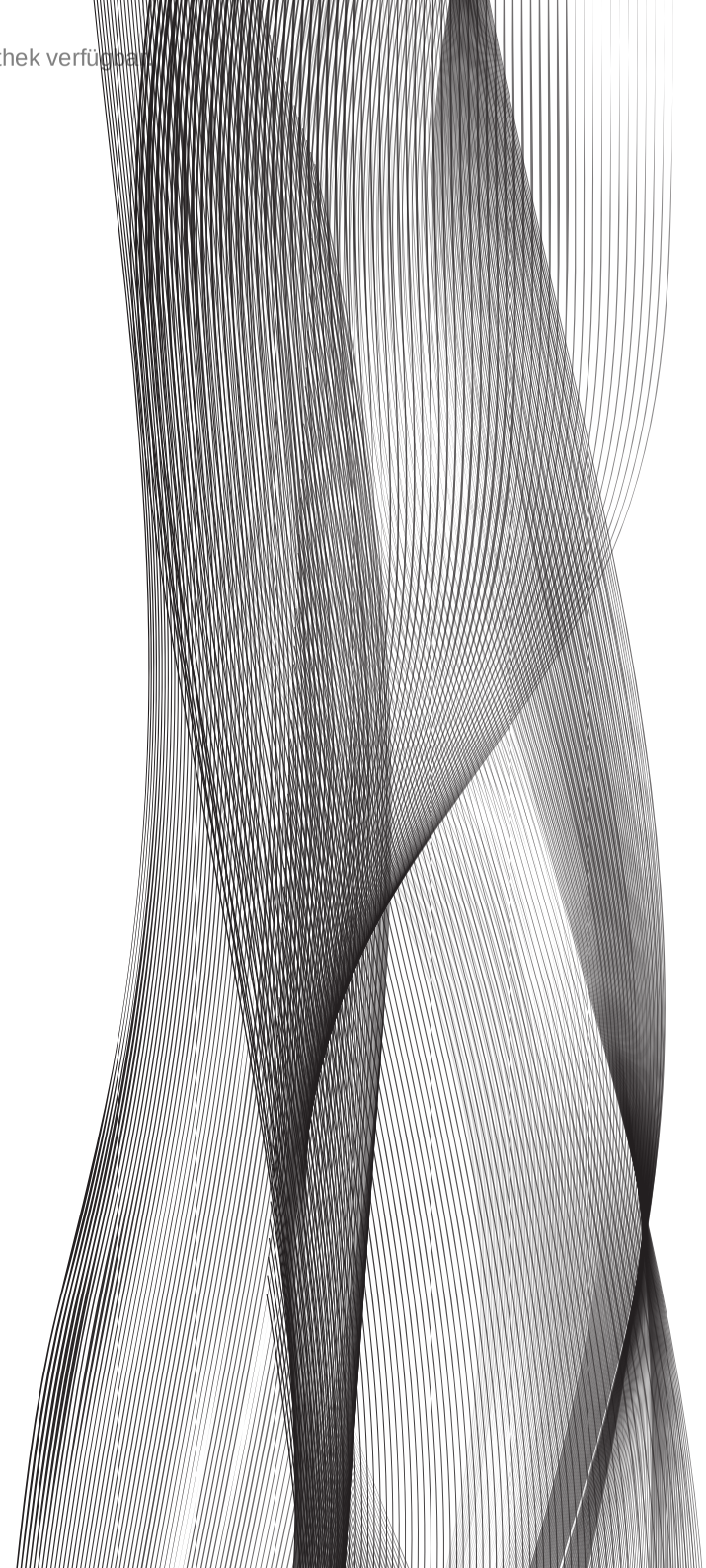
One of the main targets is to choose a new position for the cruise terminal, which will offer a much faster accessibility to the city, but also more pleasant and attractive surroundings for the tourists, who will be visiting the city in the future.

Fig. 60





Concept



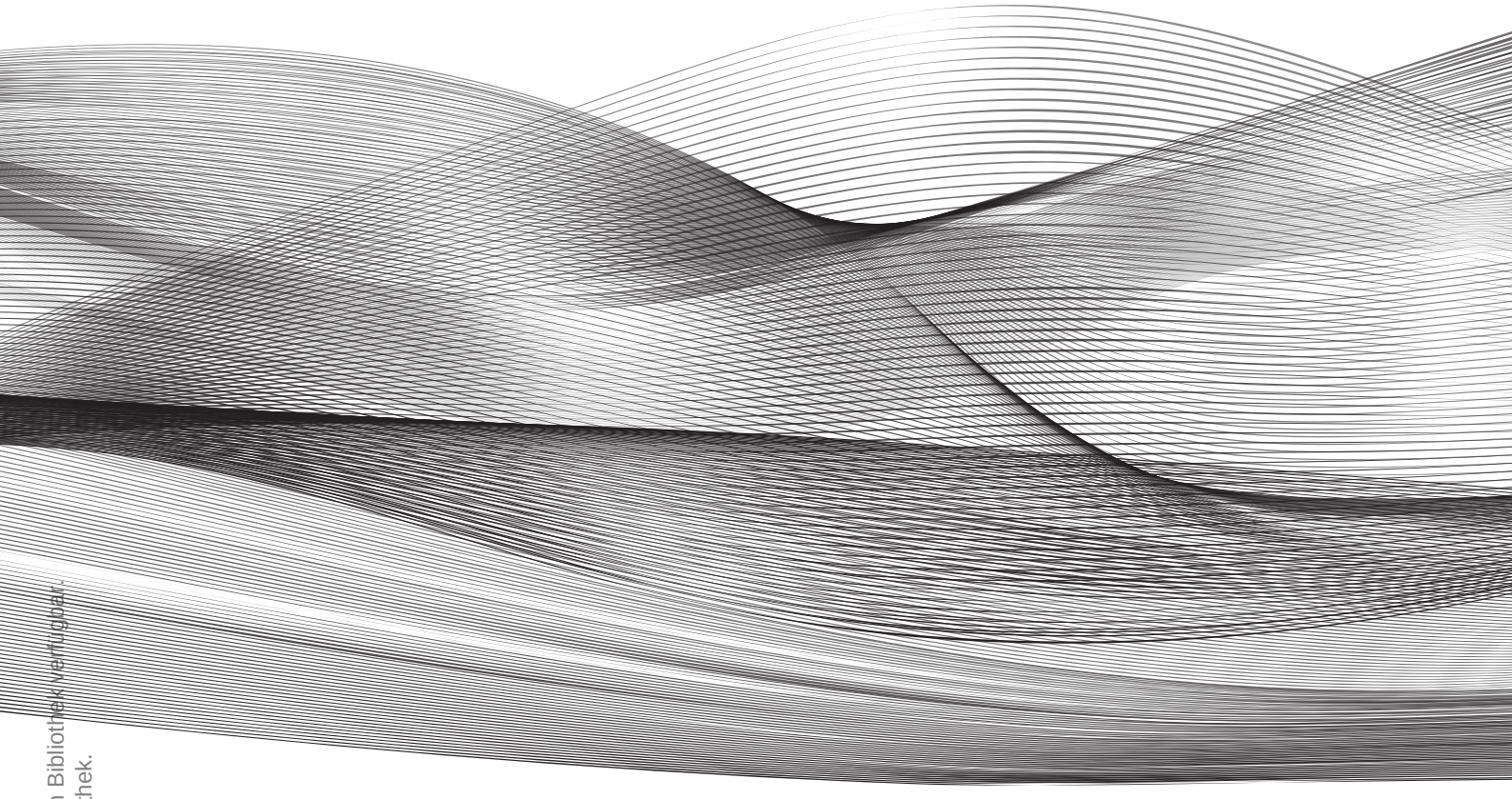


Fig. 61

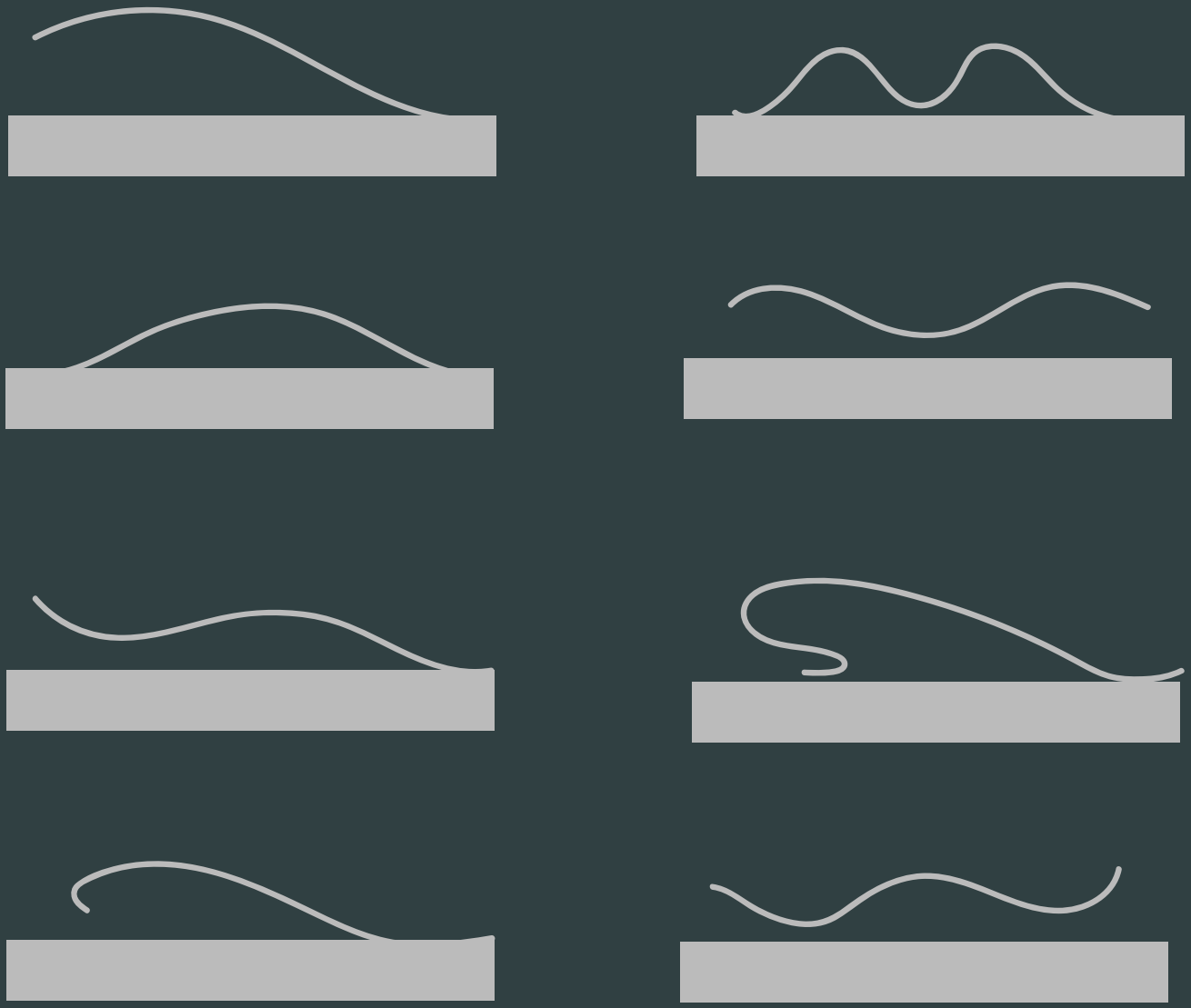
The concept has two main inspirations: sea-waves and landscape. The waves are the circular motions of the sea, having random height, duration and shape. The landscape plays as inspiration by the fact that the city is also situated on a hill, offering a beautiful view of the harbor and old town center.

The roof will take the shape of the waves, but because the landscape plays also an important role into the concept design, this means the roof and the ground will be merged. As inhabitans can see from the top of the city the old town, this means that visitors will also be able to see from the top of the building the surroundings.

First step was sketching different shapes of the roof for the first building in section to find the right form, which will be in balance with the surroundings.

Second step is represented by trying to find the right form in 3D model.

First building concept



different roof shapes, which can define the new terminal

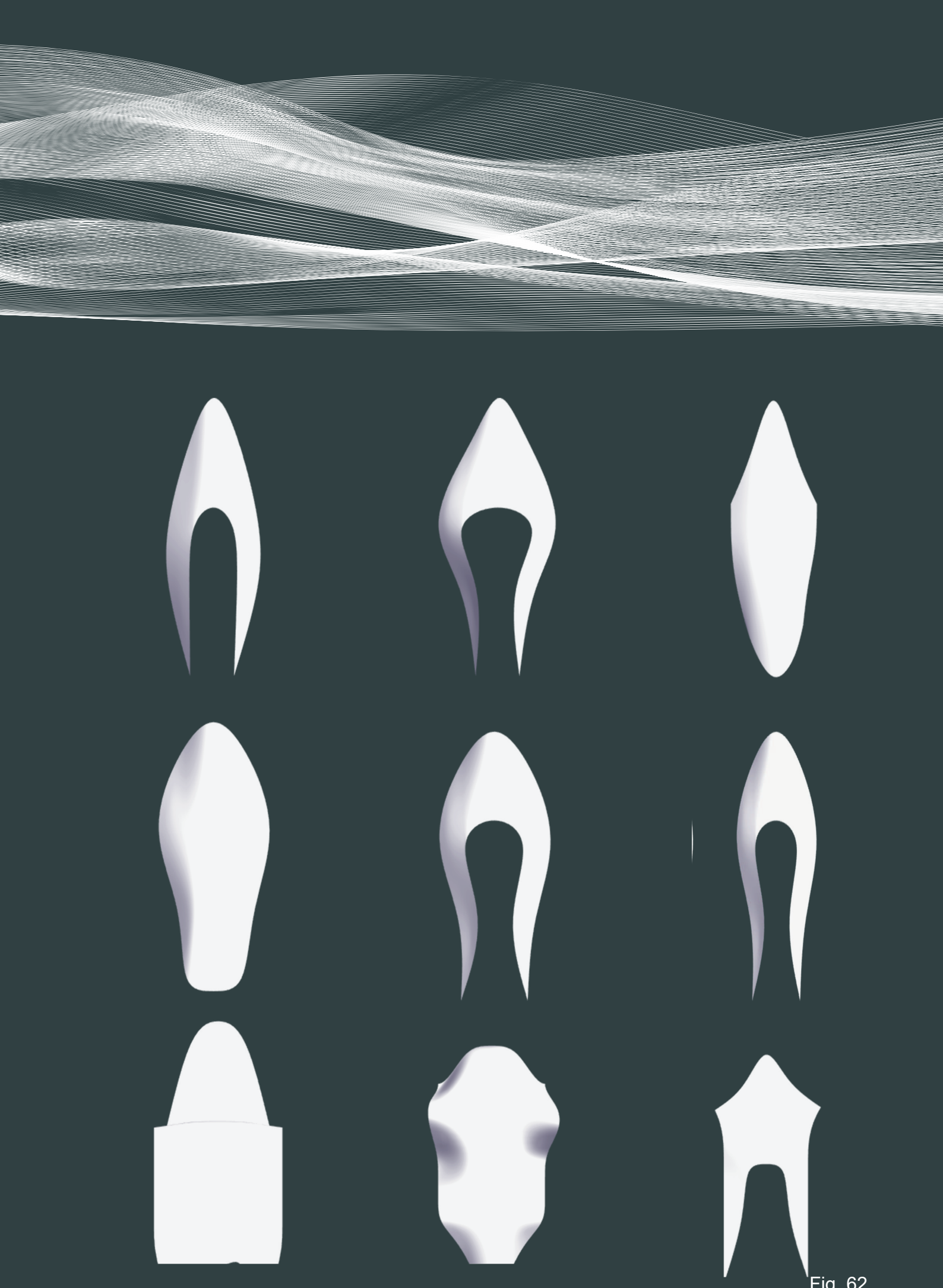
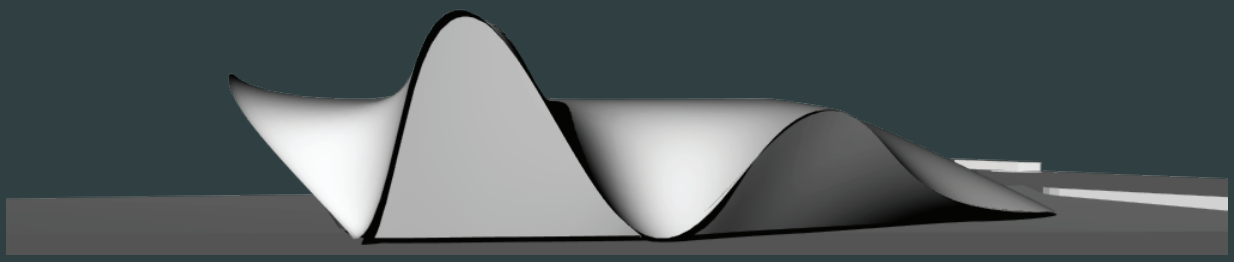
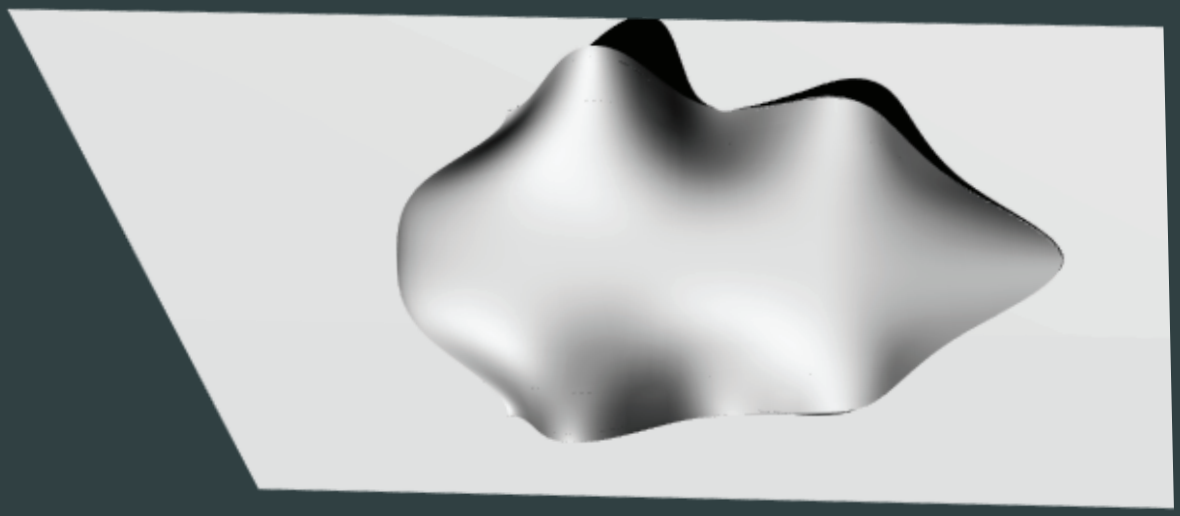


Fig. 62

First concept





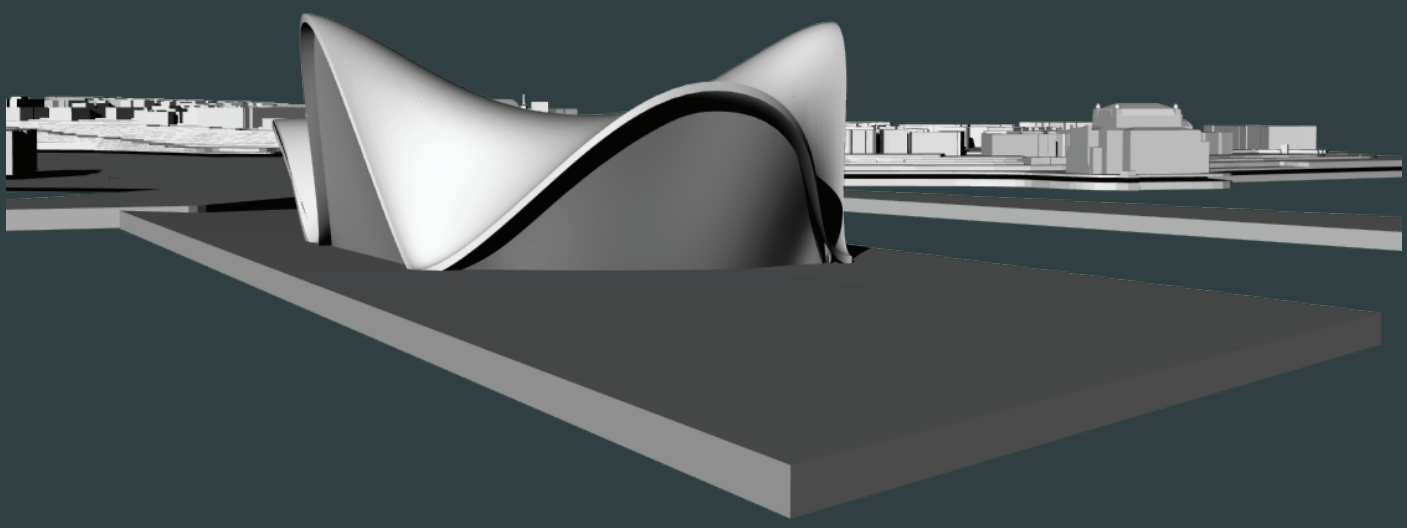
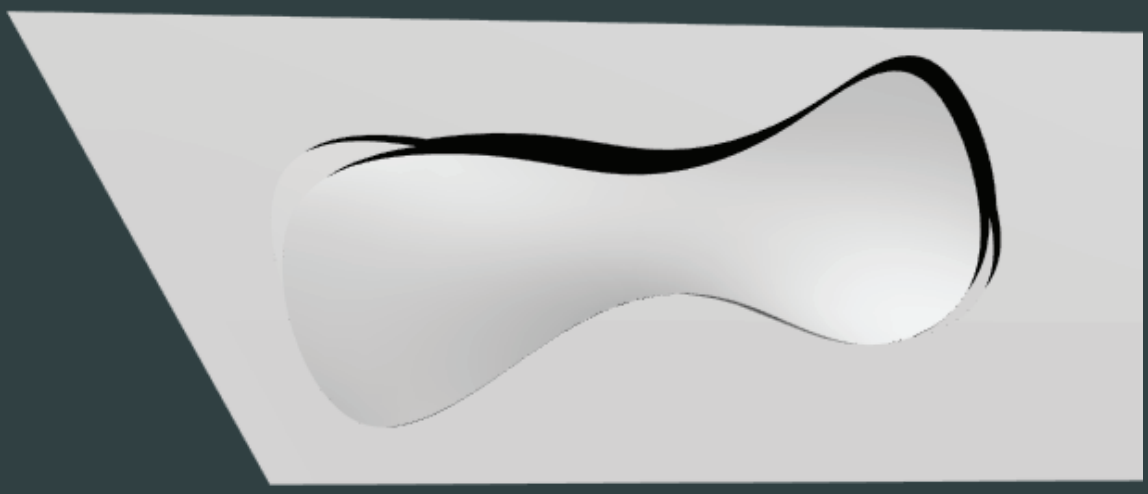


Fig. 63

Second concept



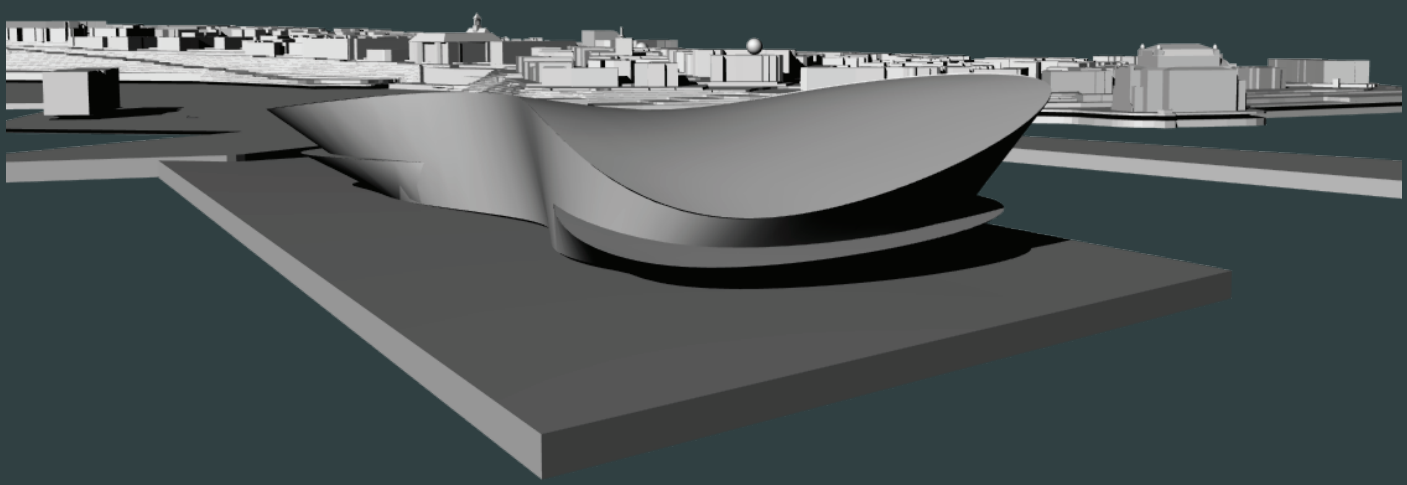
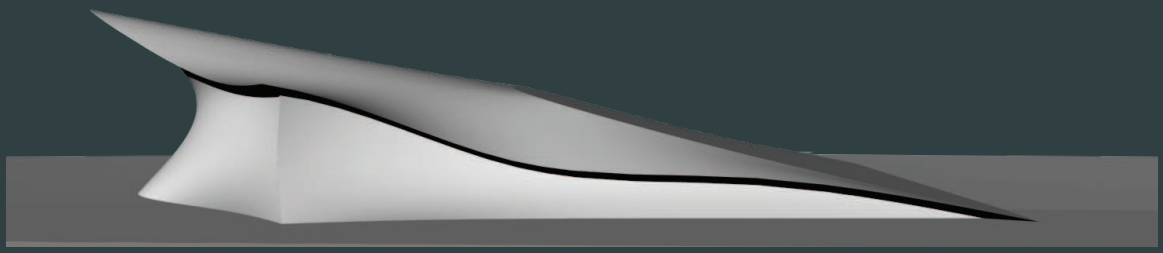
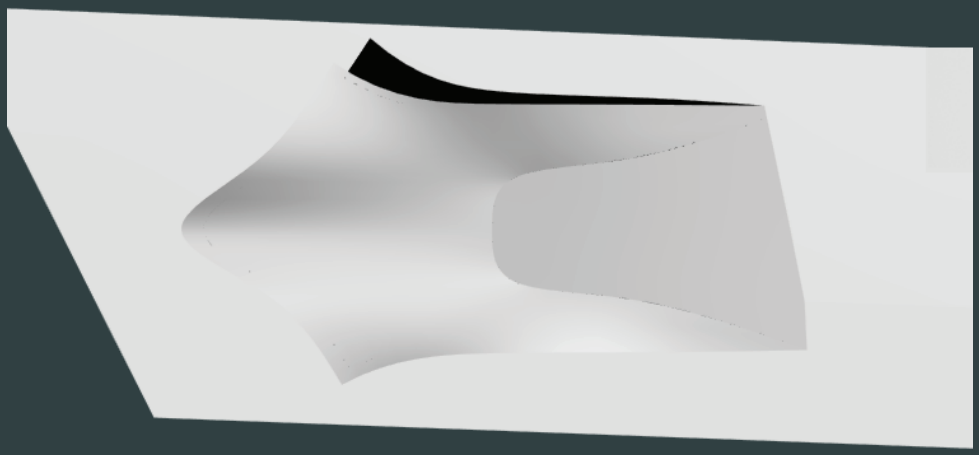


Fig. 64

Third concept





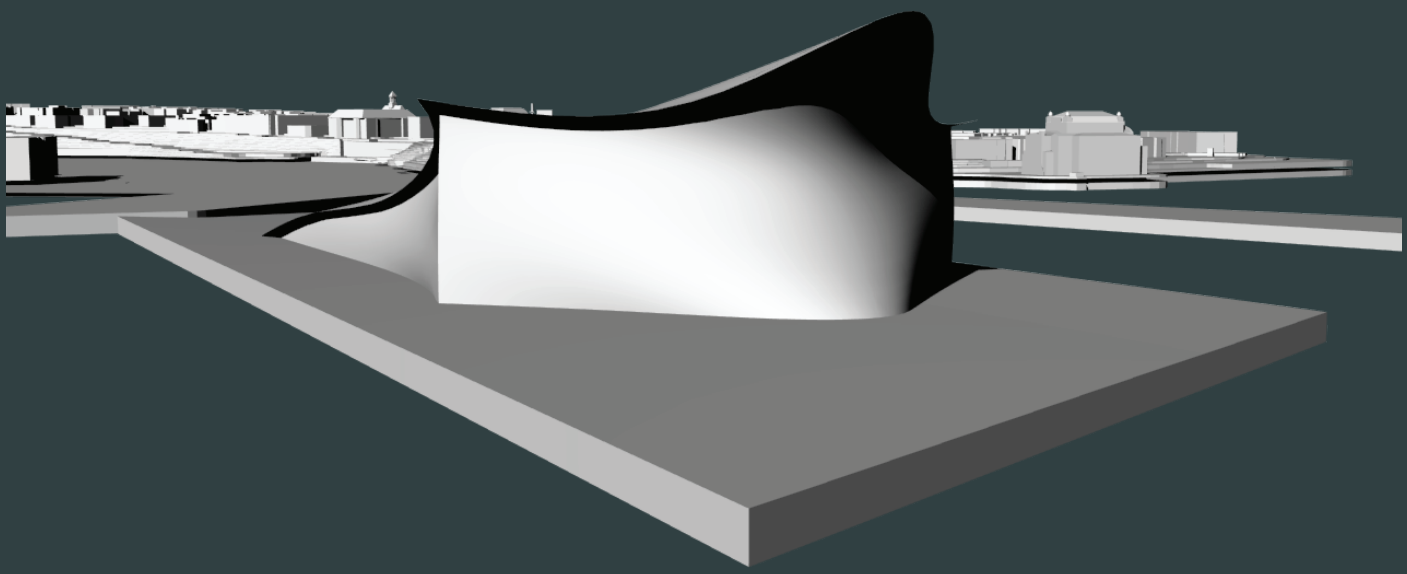
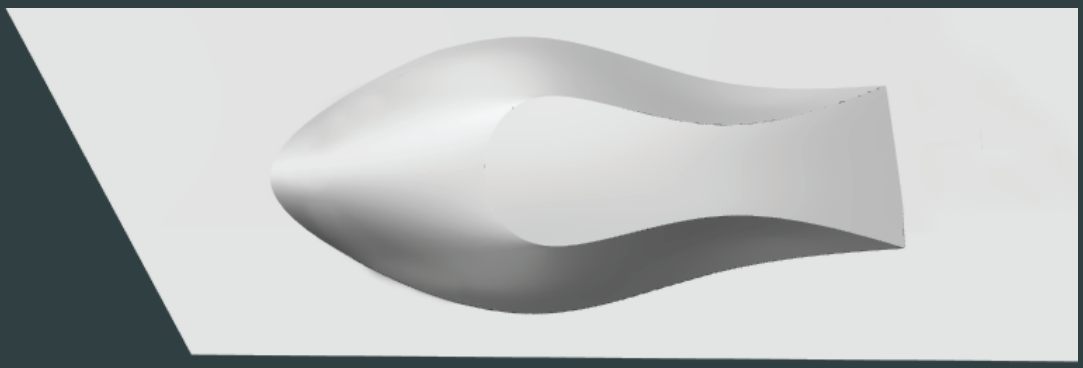


Fig. 64

Final concept



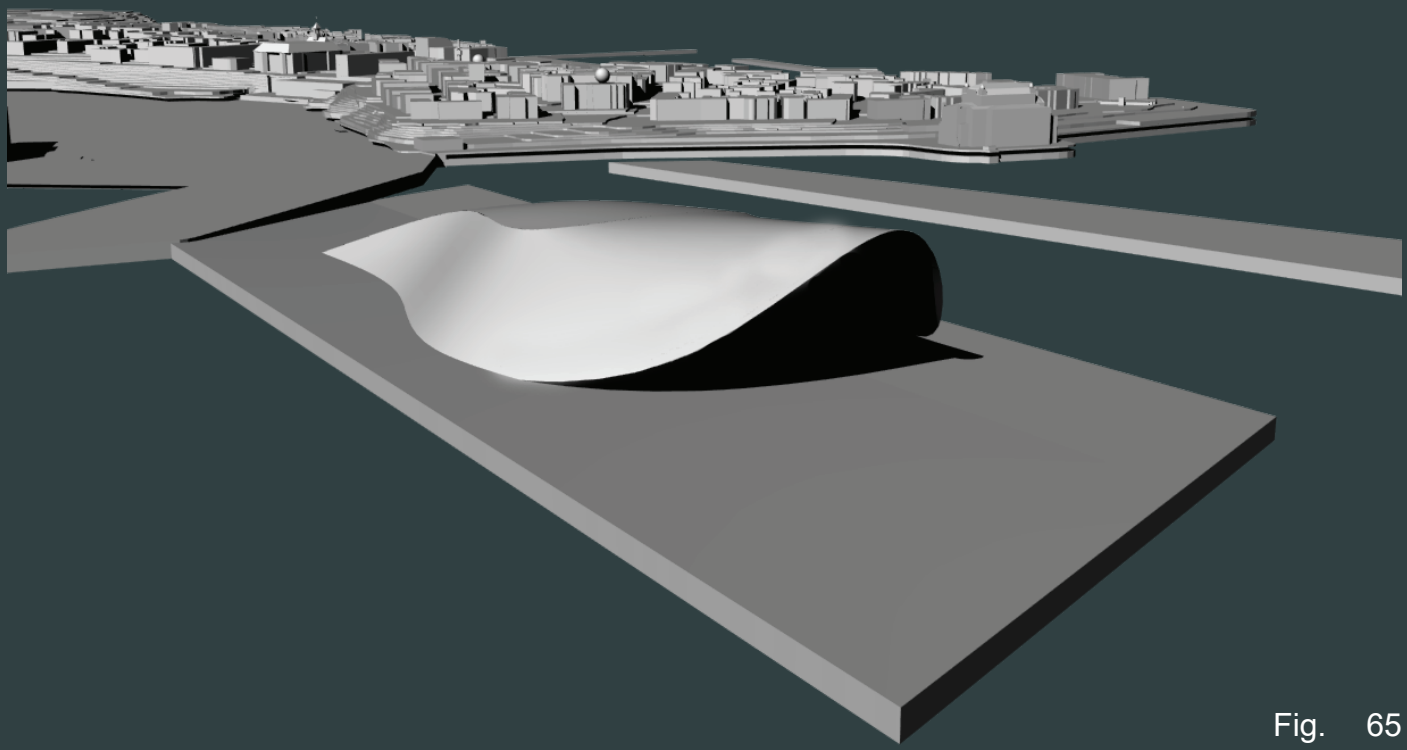
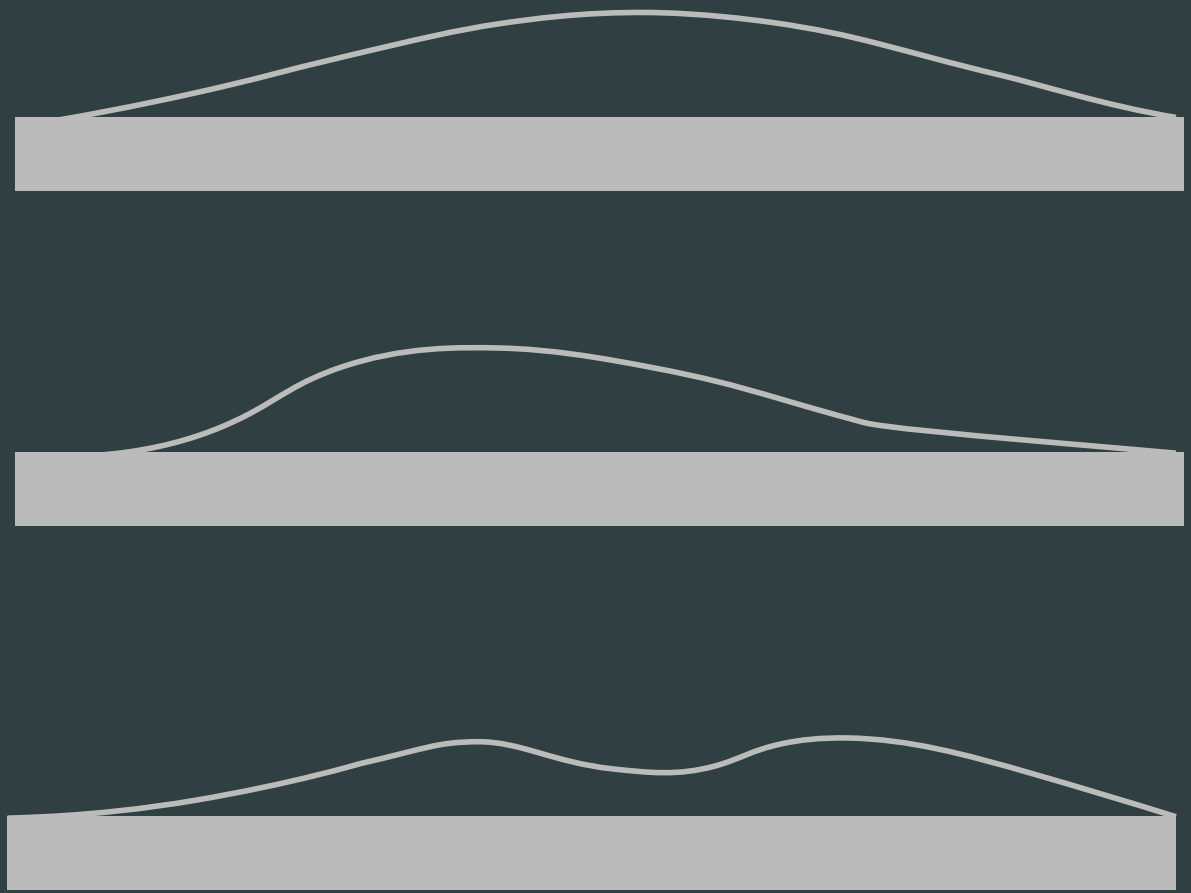
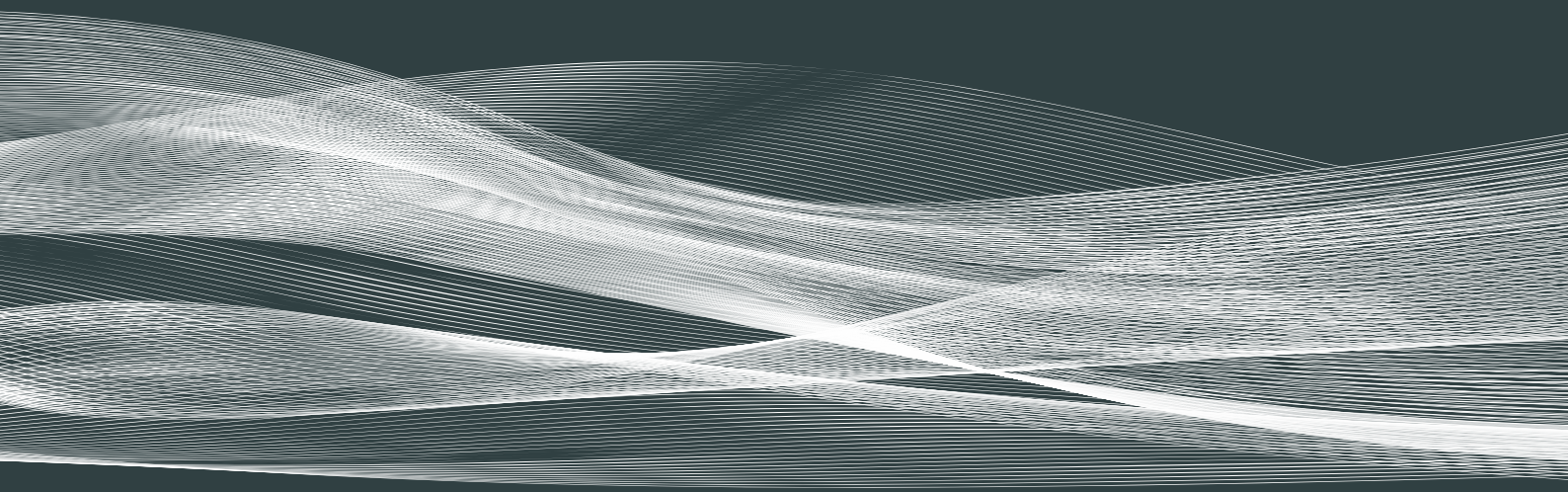


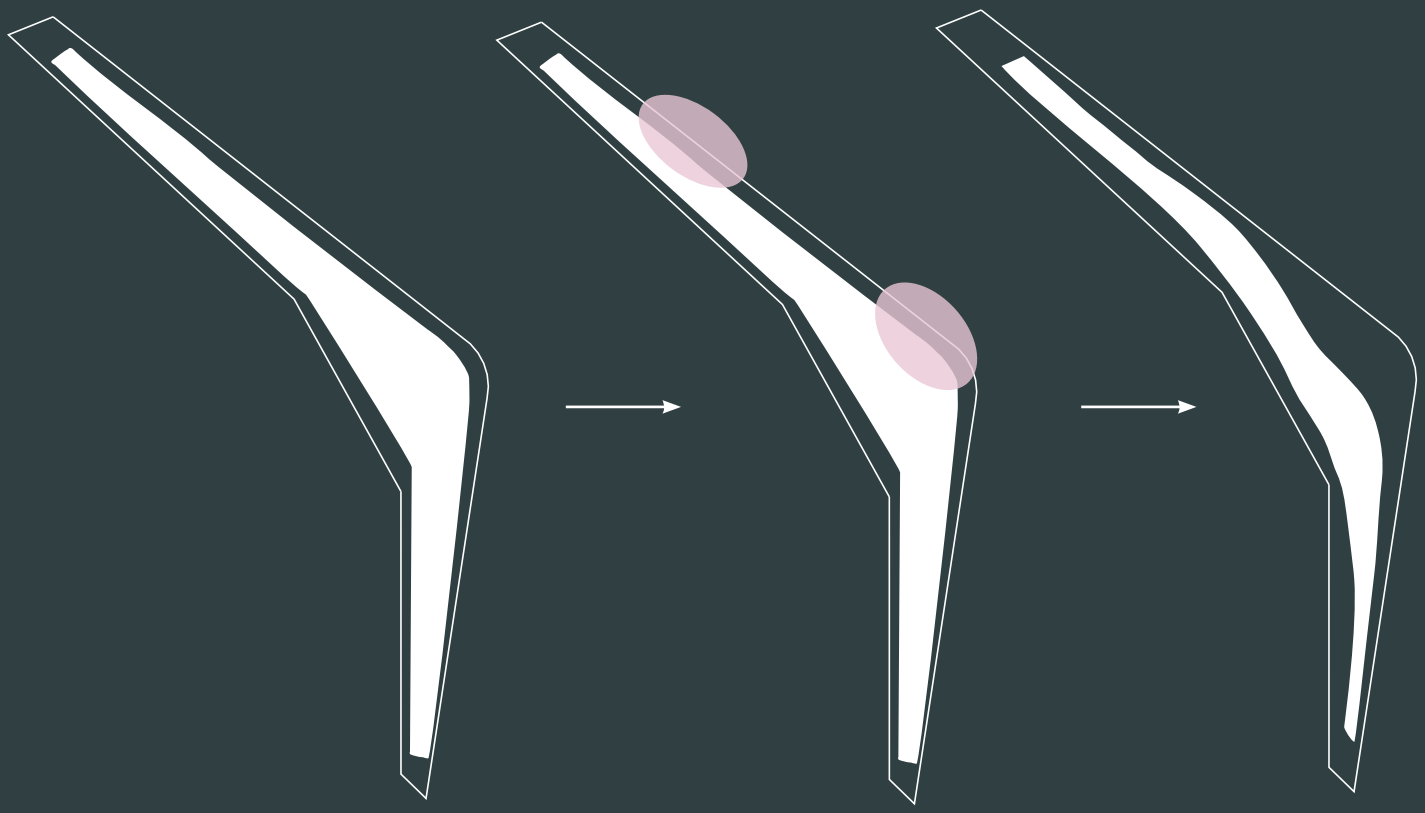
Fig. 65

Second building concept



As the second building will take the shape of the quay, the idea to create the landscape shape,some spaces which will function as a promenade with view to the city.





Promenade area

Result

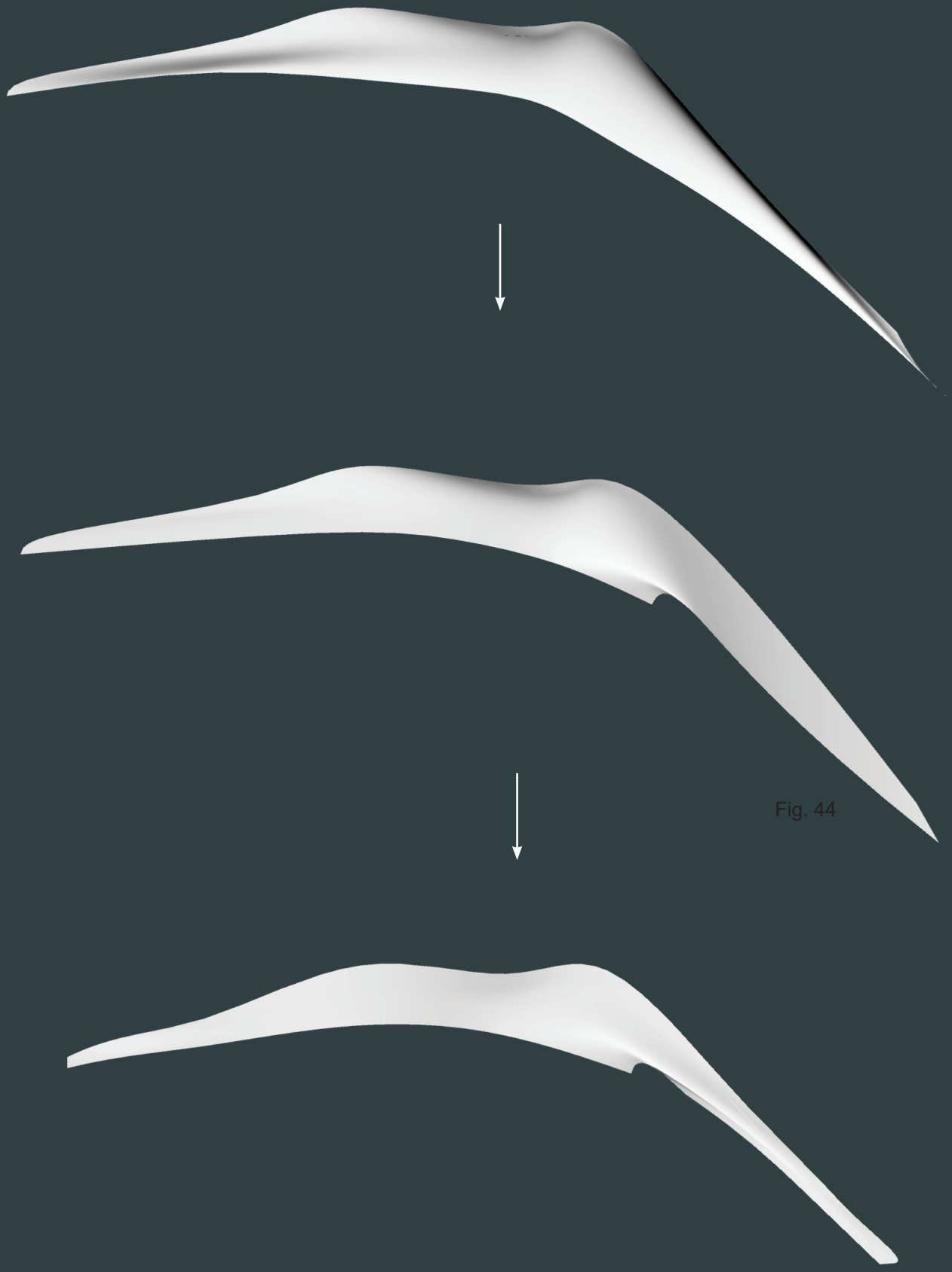


Fig. 44

Fig. 45

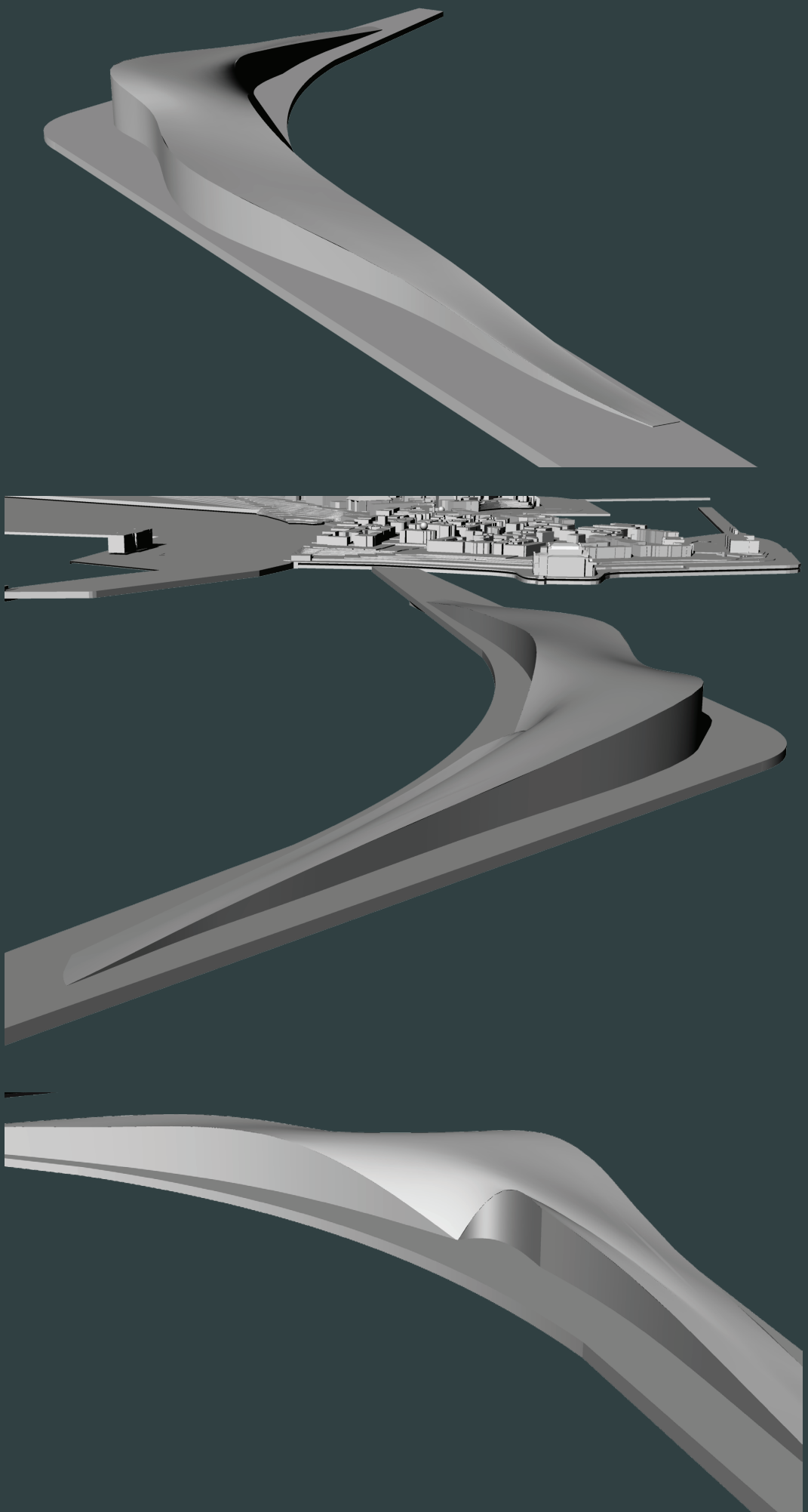


Fig. 66

Lighthouse concept

The lighthouse is essential för the harbor because is a navigational aid for the ships and it marks the coastline. As it is necessary for the new cruise terminal, it will also have its own concept which will have the same inspiration as the buildings are to become a symbol of the city.

Fig. 67

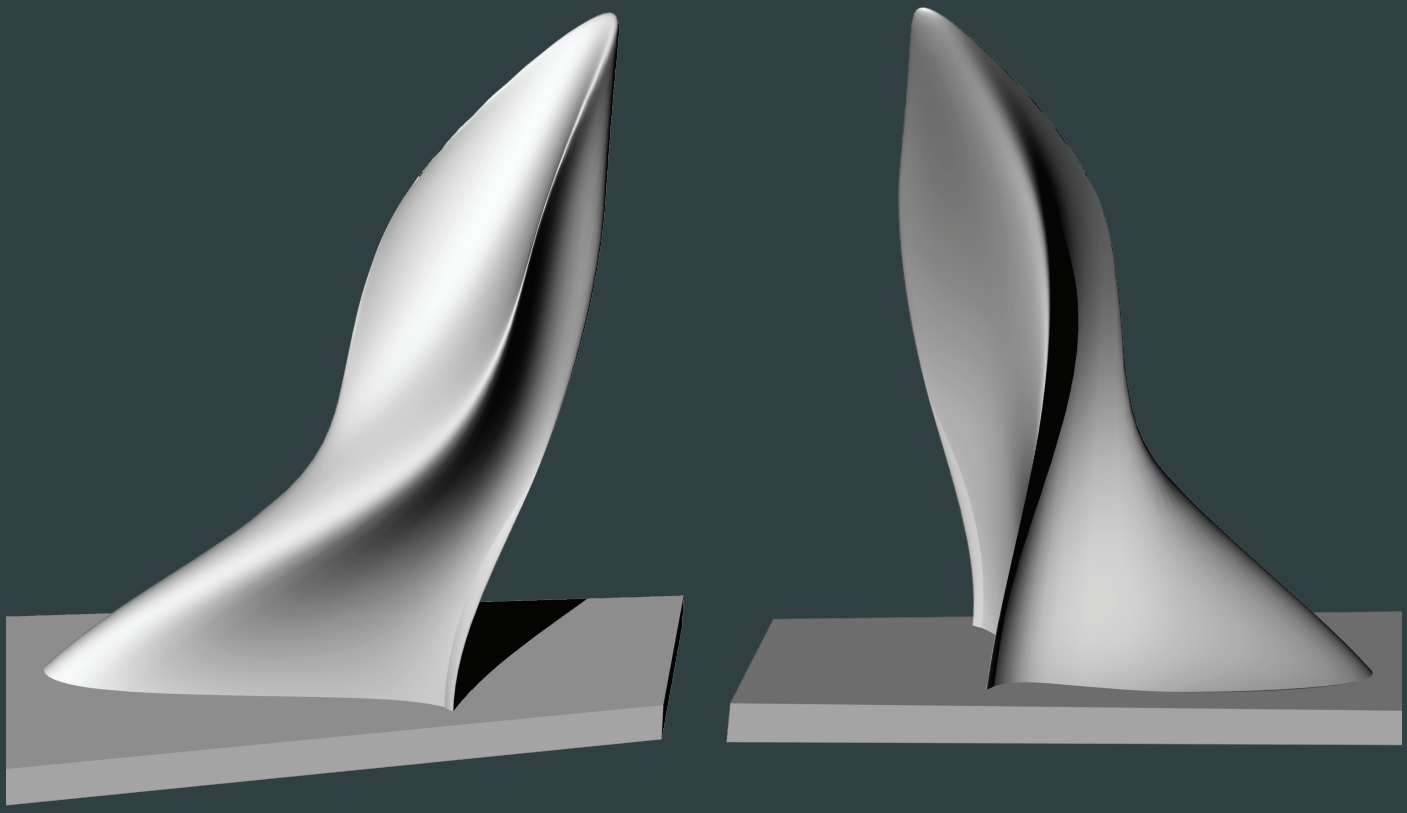


Fig. 68

Final concept result

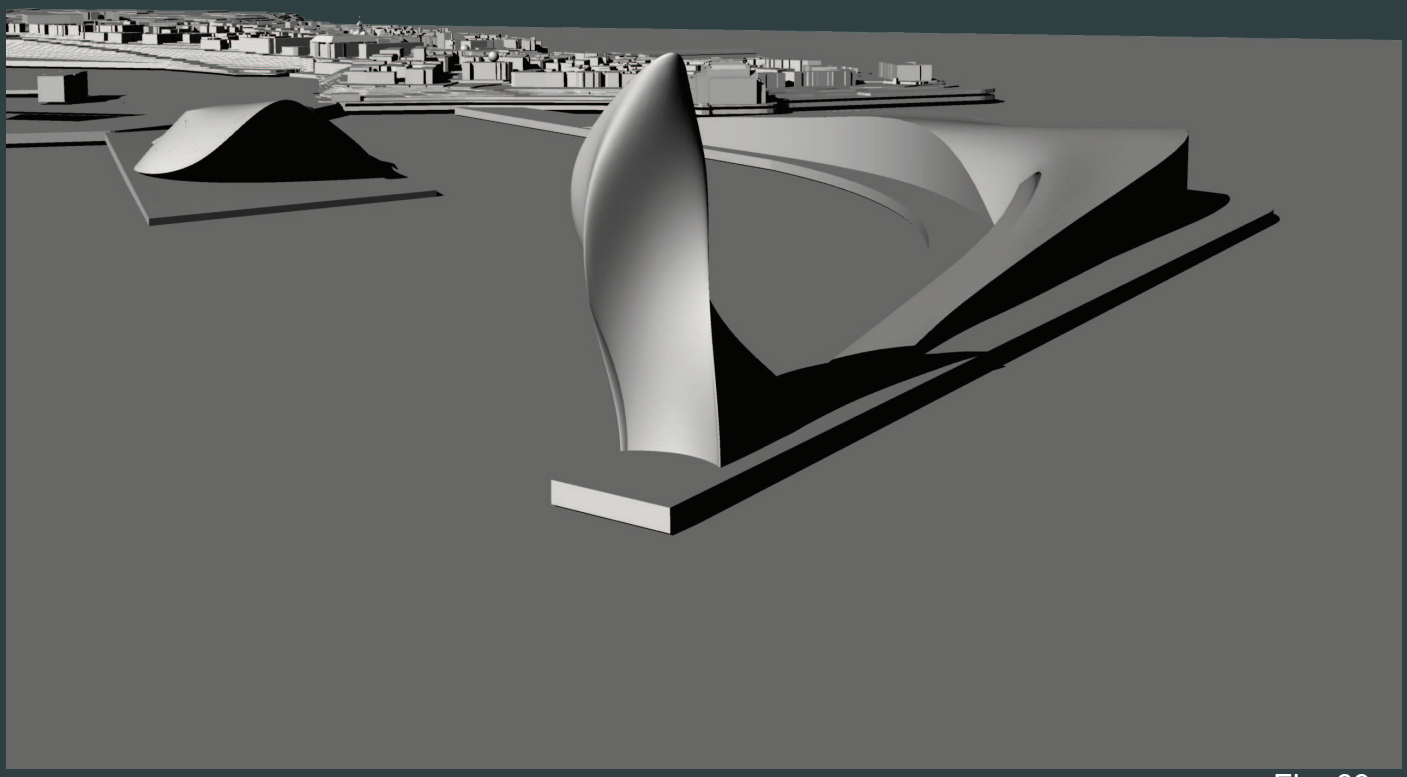


Fig. 69

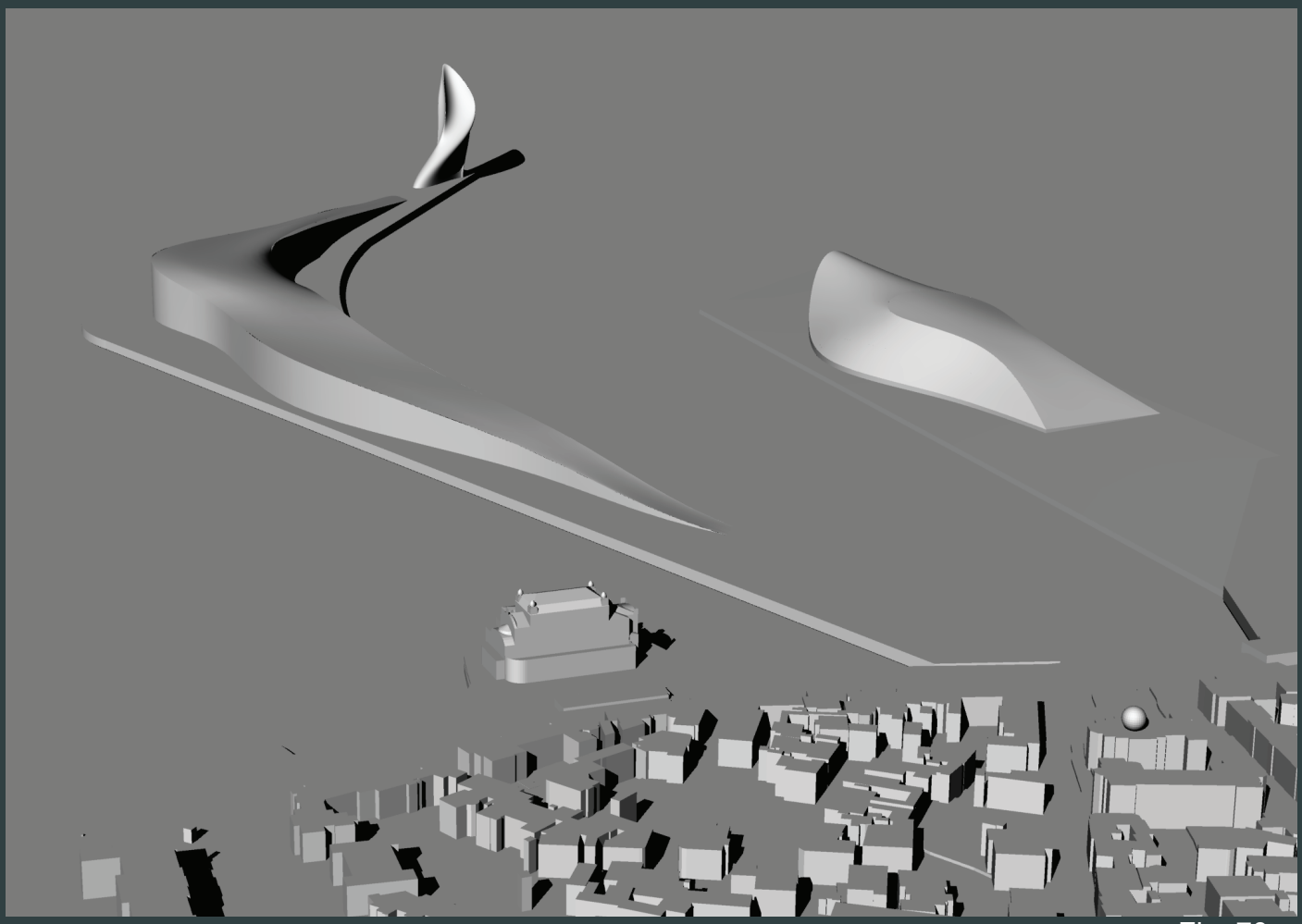
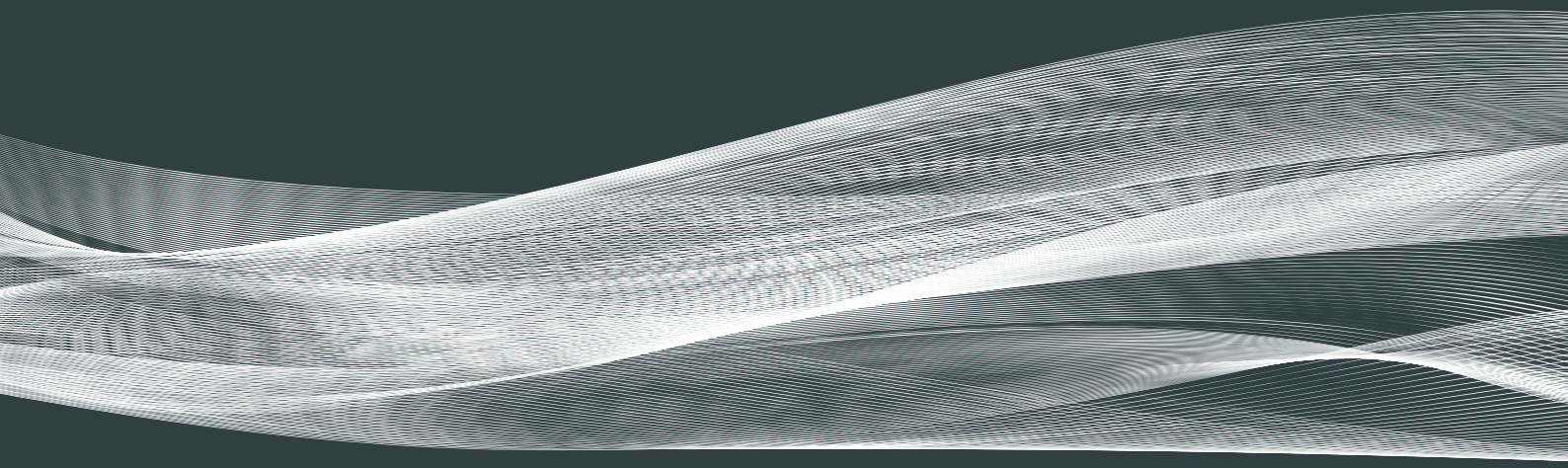
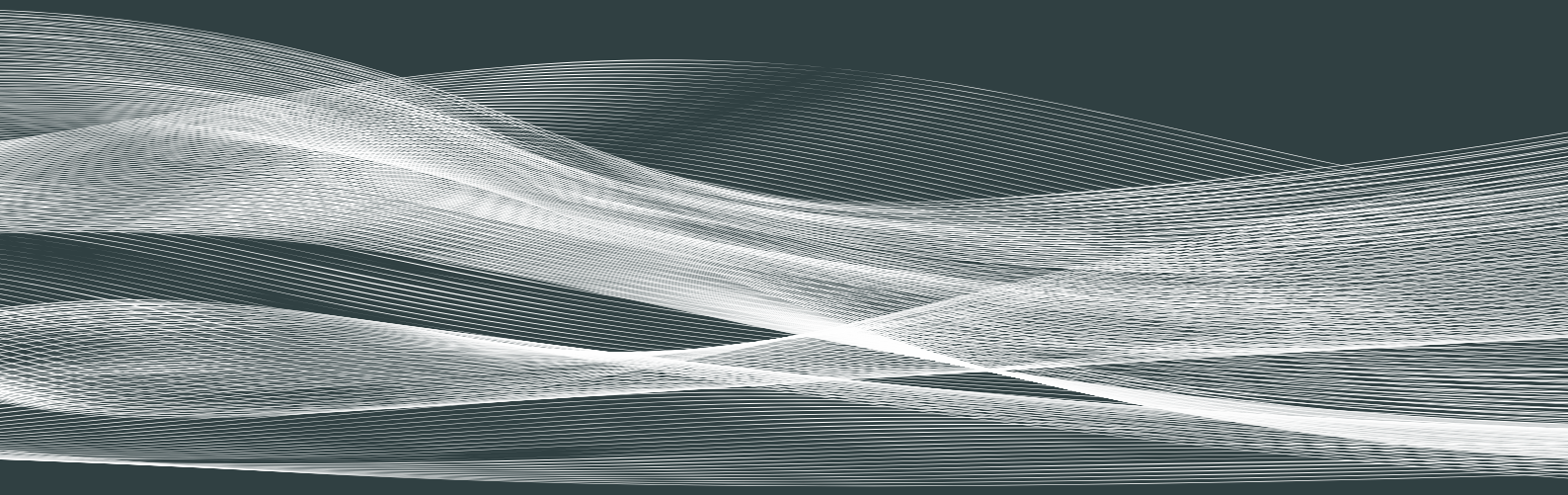


Fig. 70





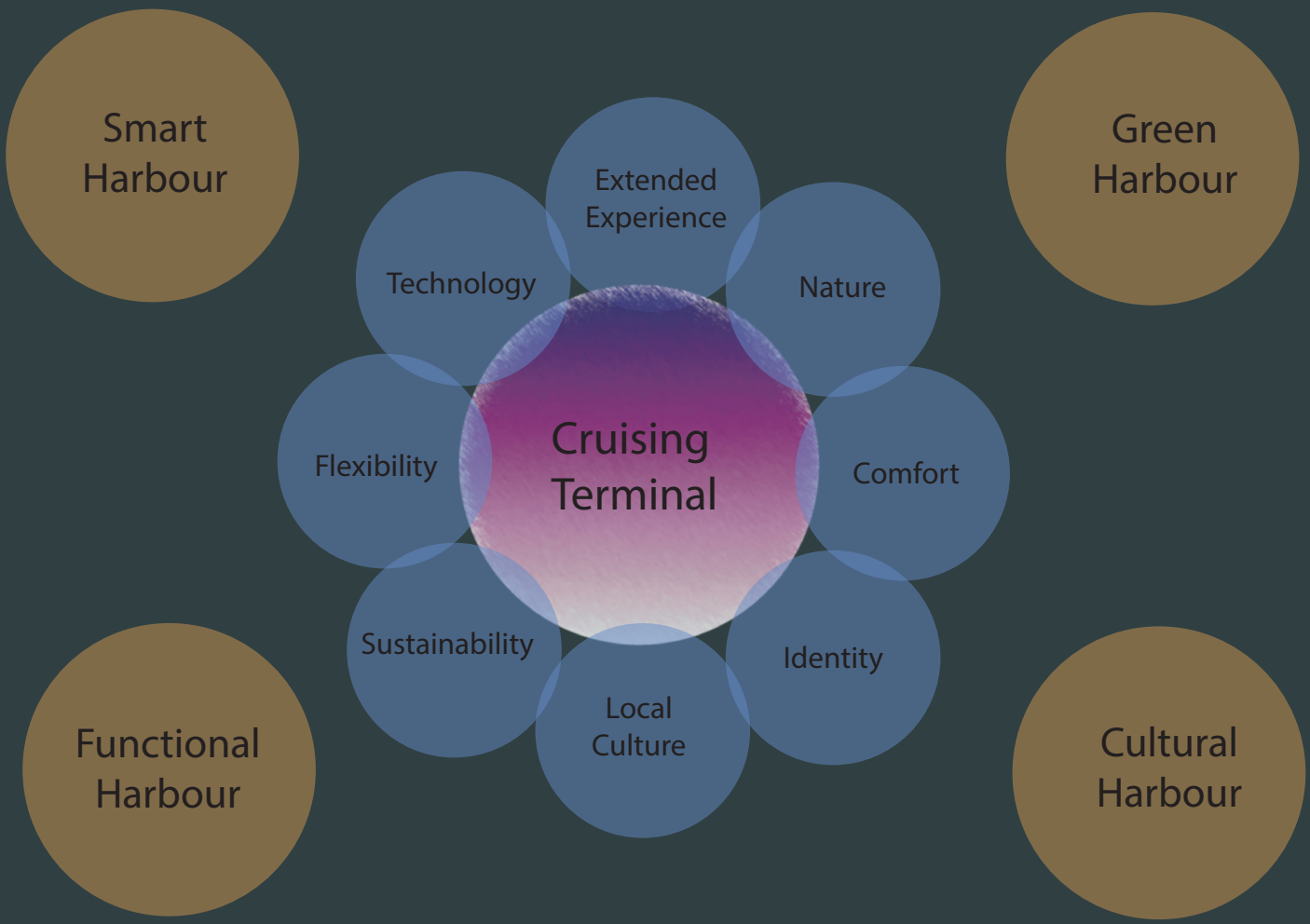
Design

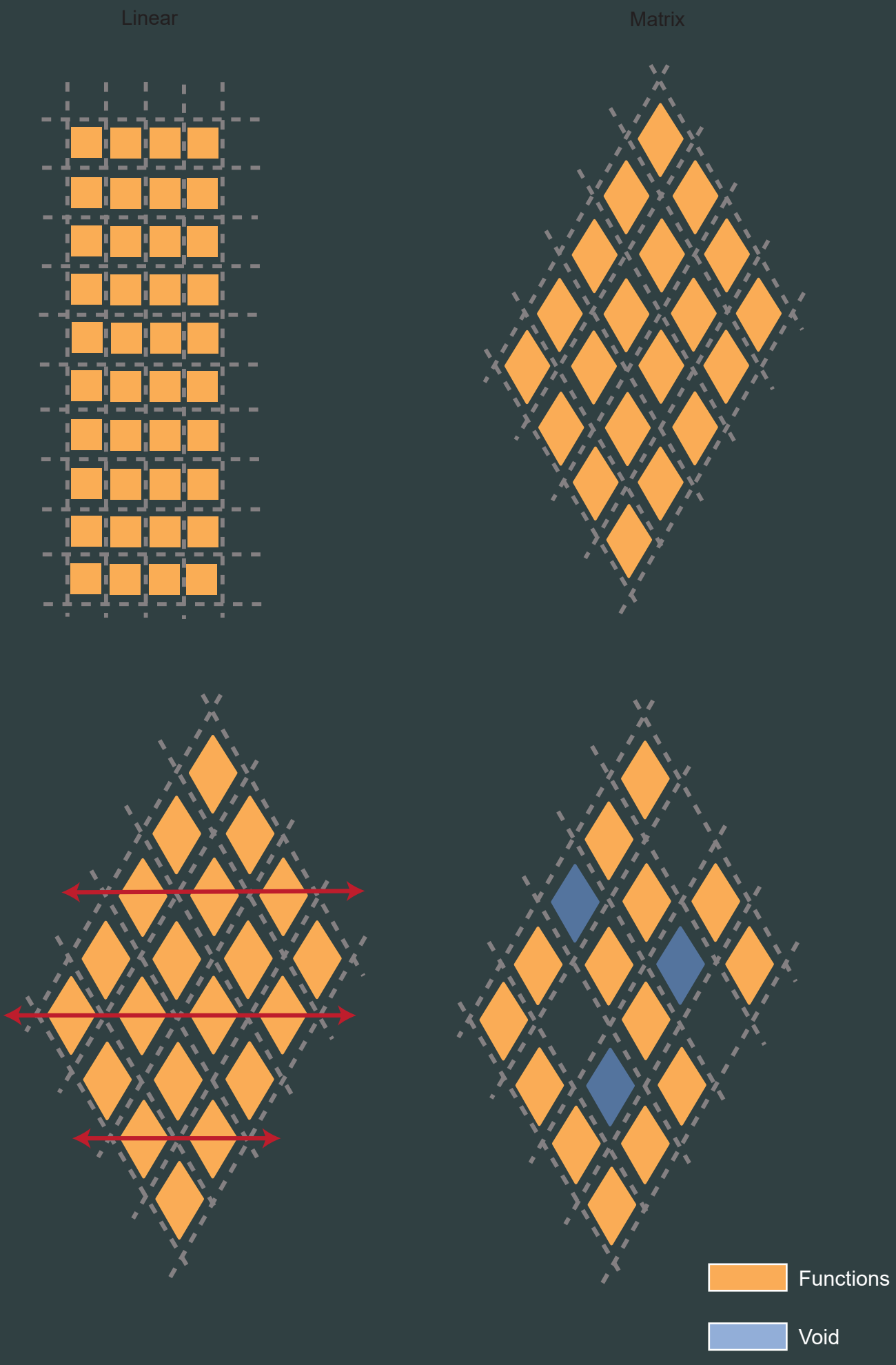
Circulation

The purpose of the new cruise terminal is not only to offer just a simple extension for the cruise vessels, but also to give a new identiy, be flexible and functional. The design offers efficiency, having short walk distances and the functions through the buildings being optimised.

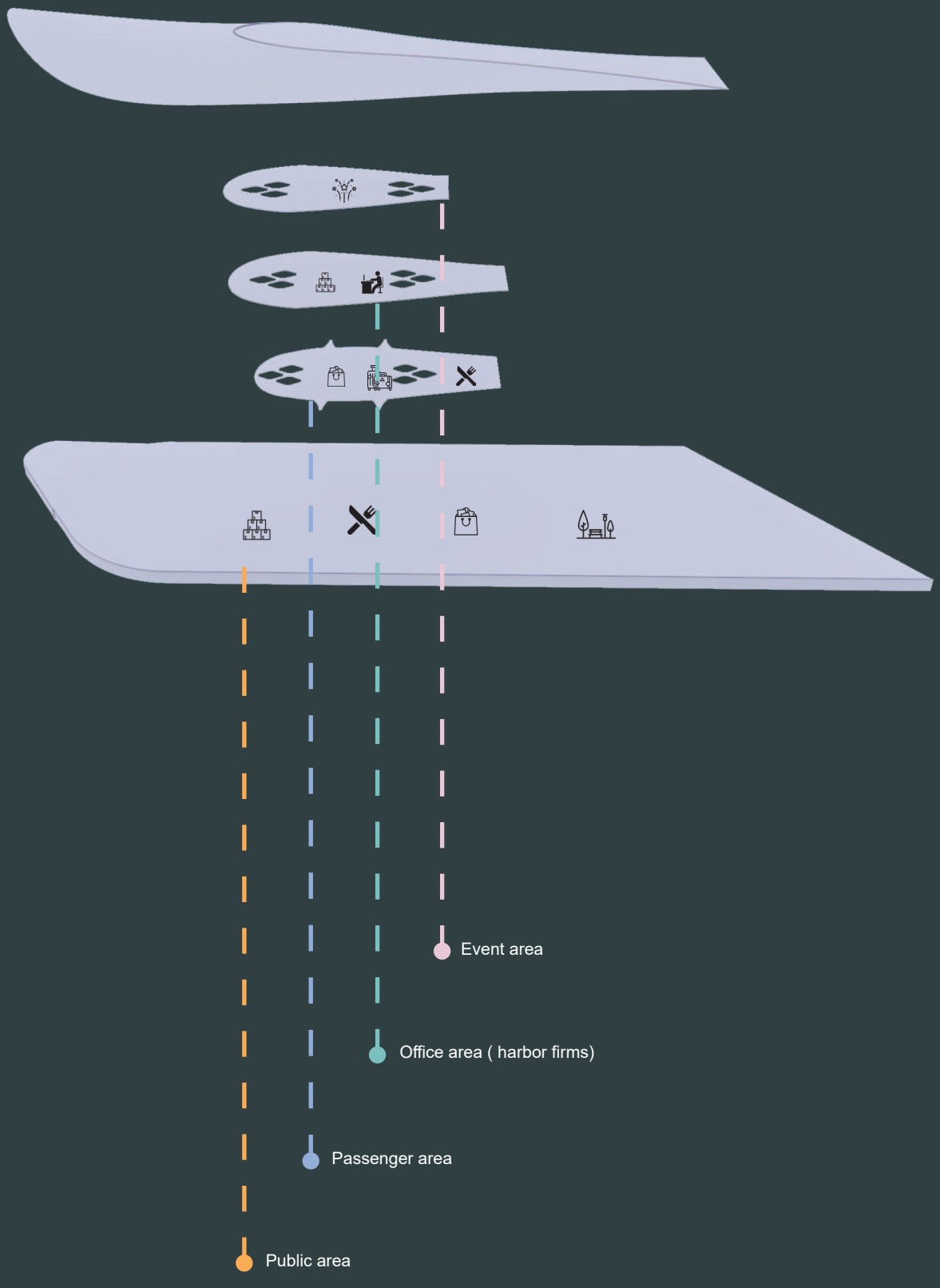
In order to accomodate a wider range of potential uses, there has been developed a matrix system, which allows the modules to be flexible, hold different functions (for example information point, restaurant, office etc.) and to offer the possibility for the inhabitans to access each point in an easy way.

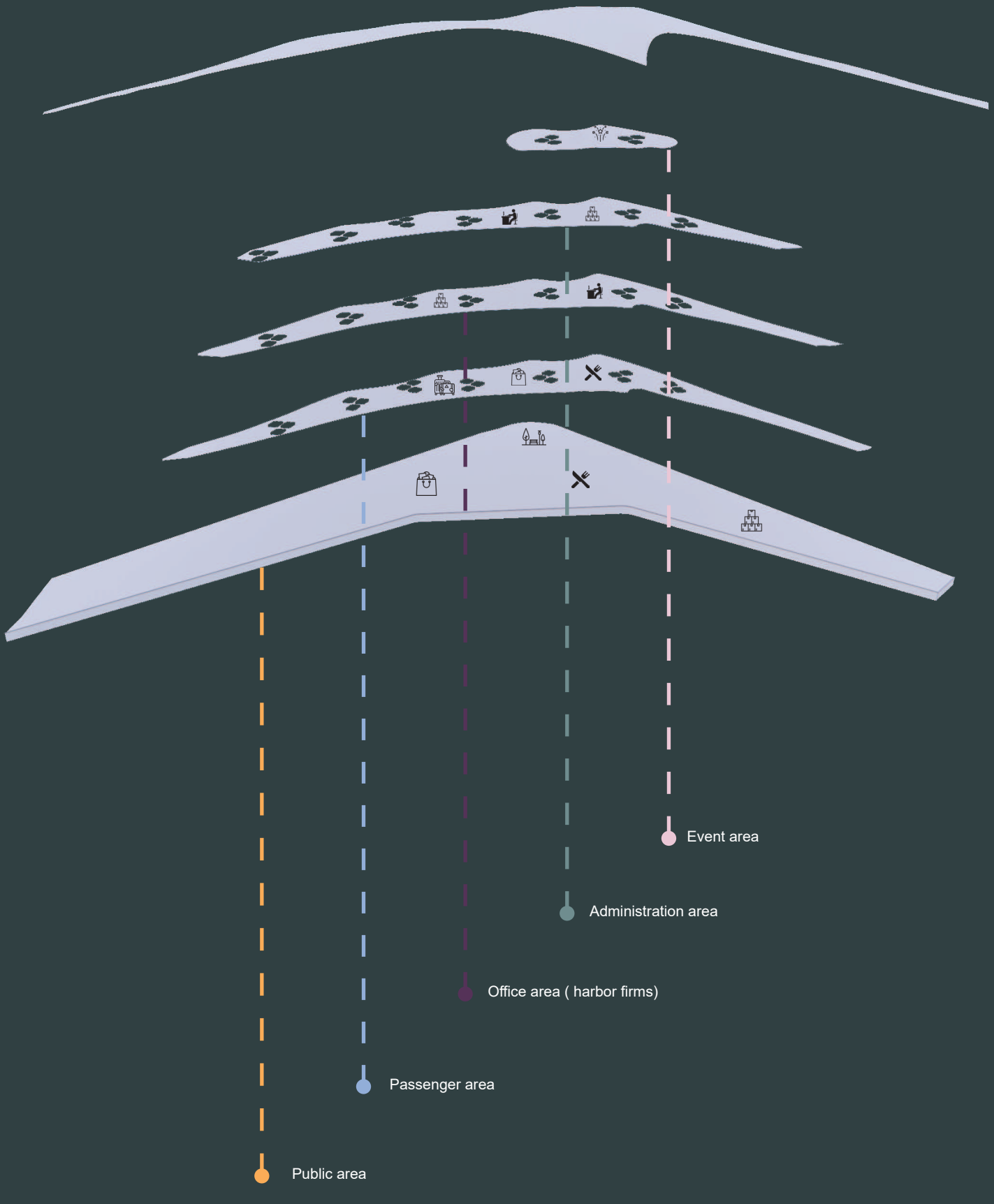
The modularity offers an adaptable system to the existing conditions. In this way, each floor will have a defined function and modules will be arranged in order to match each floor purpose.




Linear
Matrix
Functions
Void

Floorplans functions




Event area
Administration area
Office area (harbor firms)
Passenger area
Public area

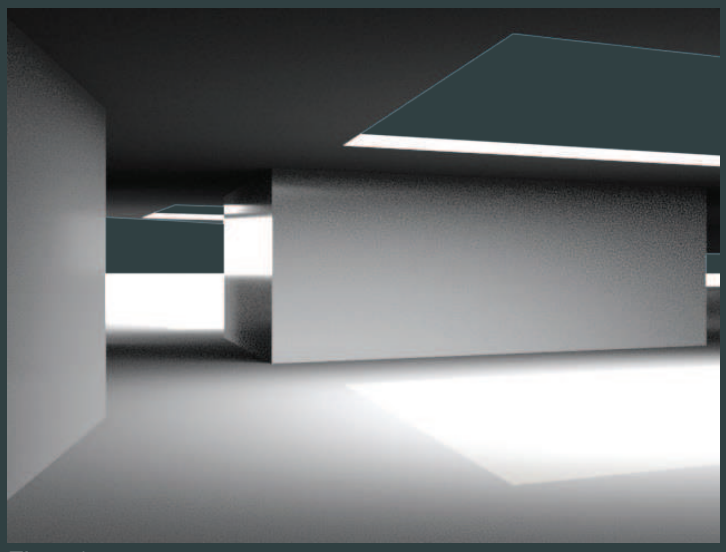


Fig. 71

Light situation

As light plays an important role in each design, one step into planning was to test the influence of the light inside the building. As diamond shape is the main form for the modules, by testing could be observed that only one hole at certain distance, couldn't bring enough light in the building. Besides, it has a very edgy form.

In order to have a better visualisation and experience for the visitors, the next step was to give the corners a rounded shape and increase the number of holes.

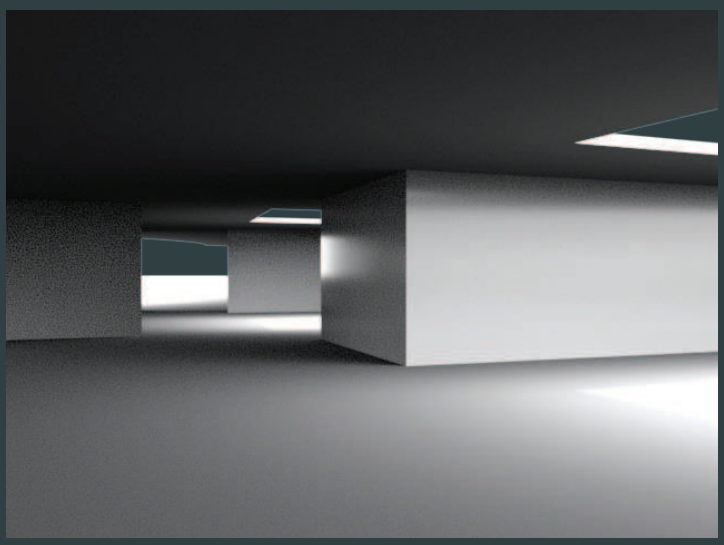


Fig. 72

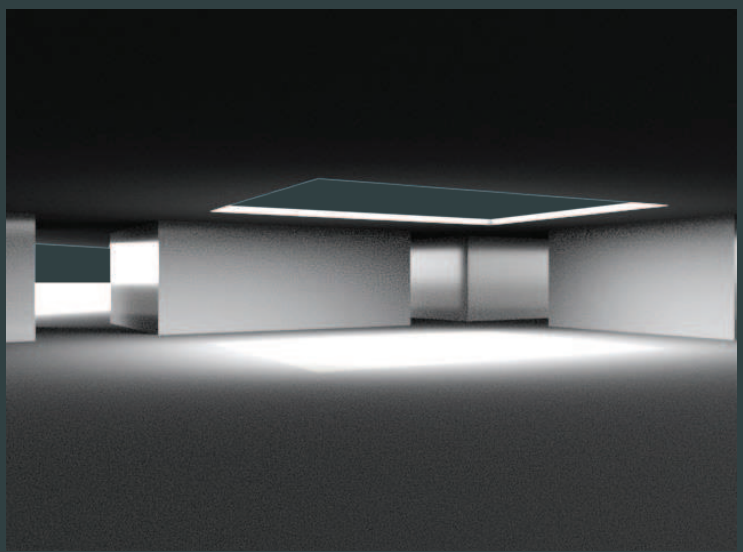


Fig. 73

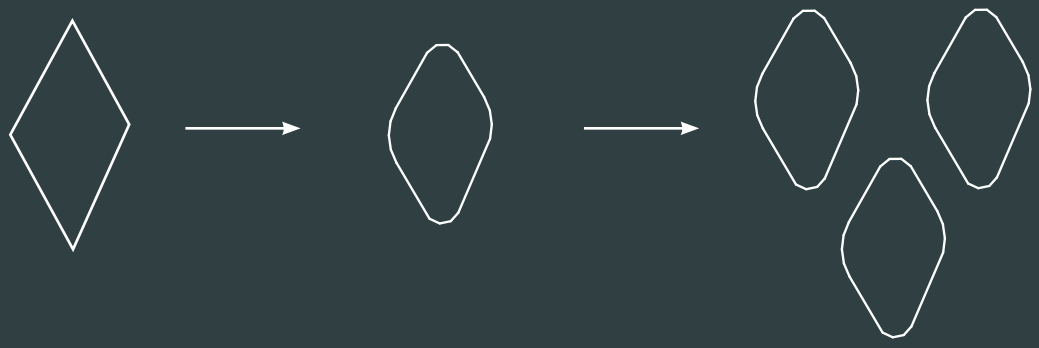


Fig. 74

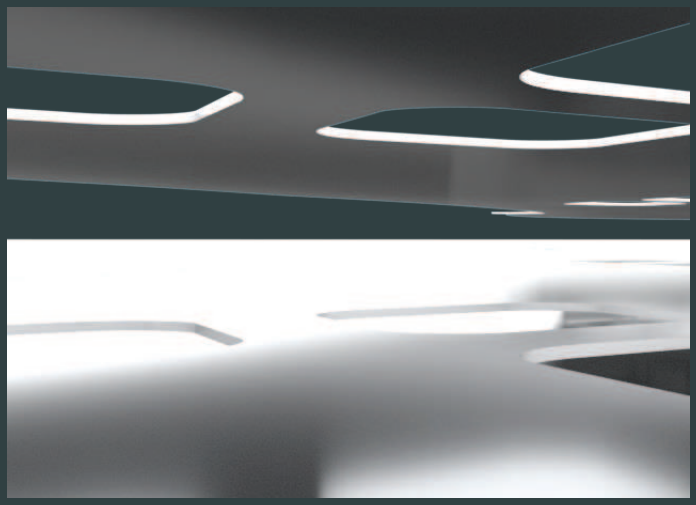


Fig. 75

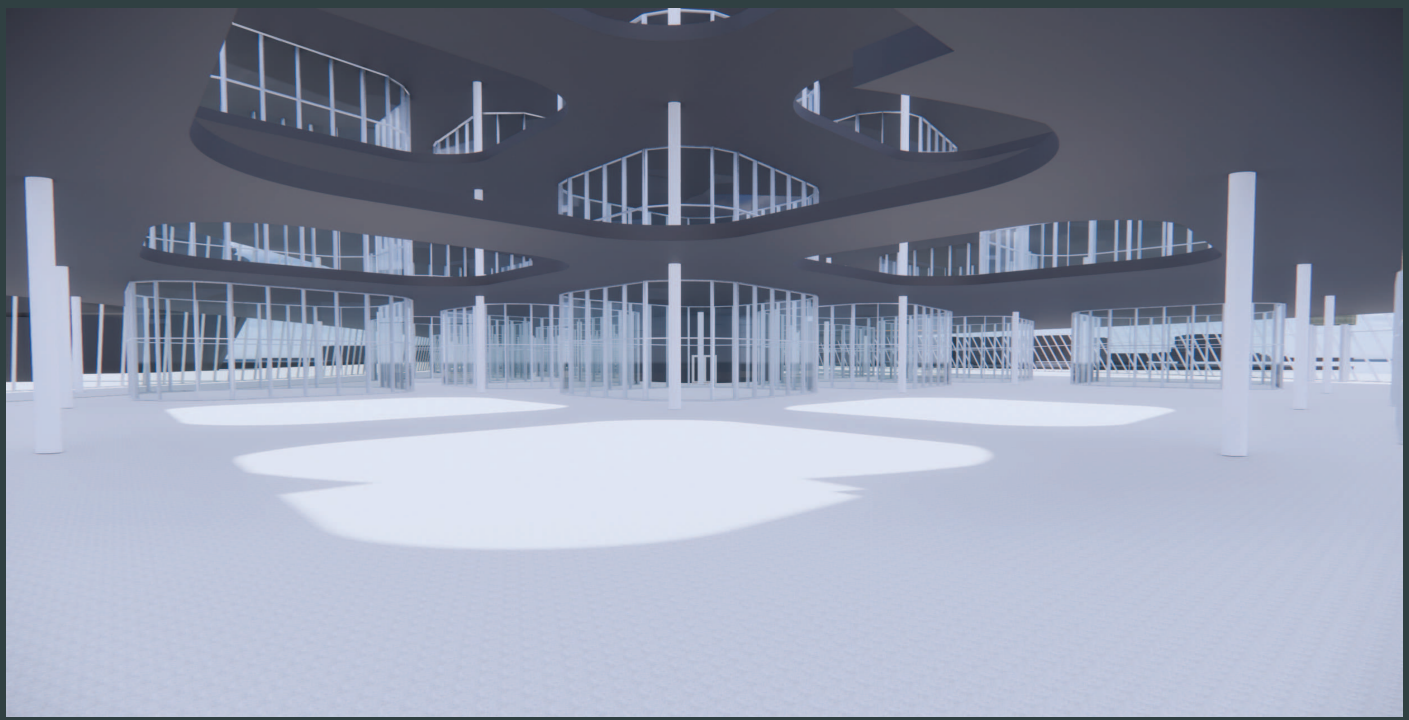


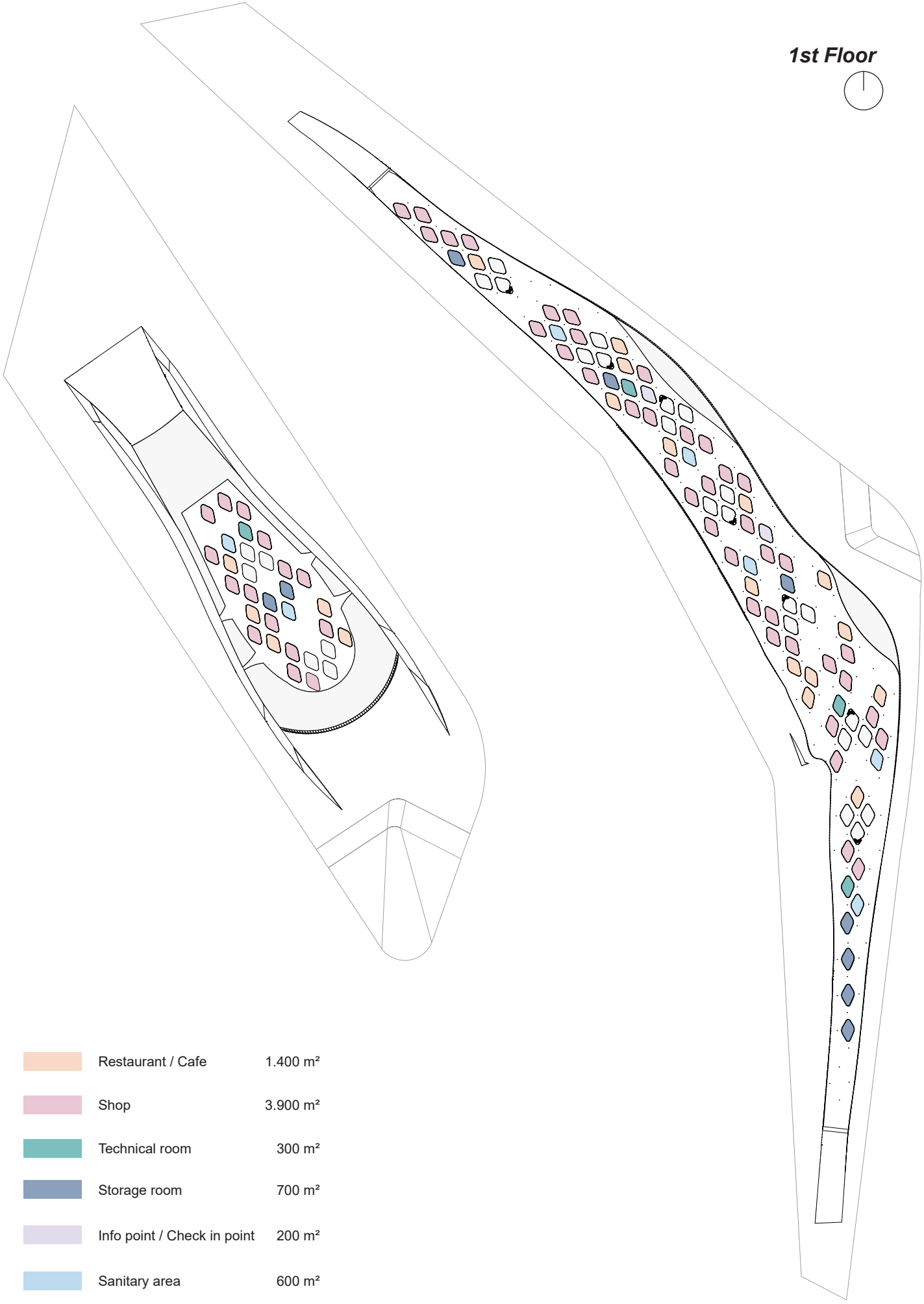
Fig. 76

Functions

Ground Floor

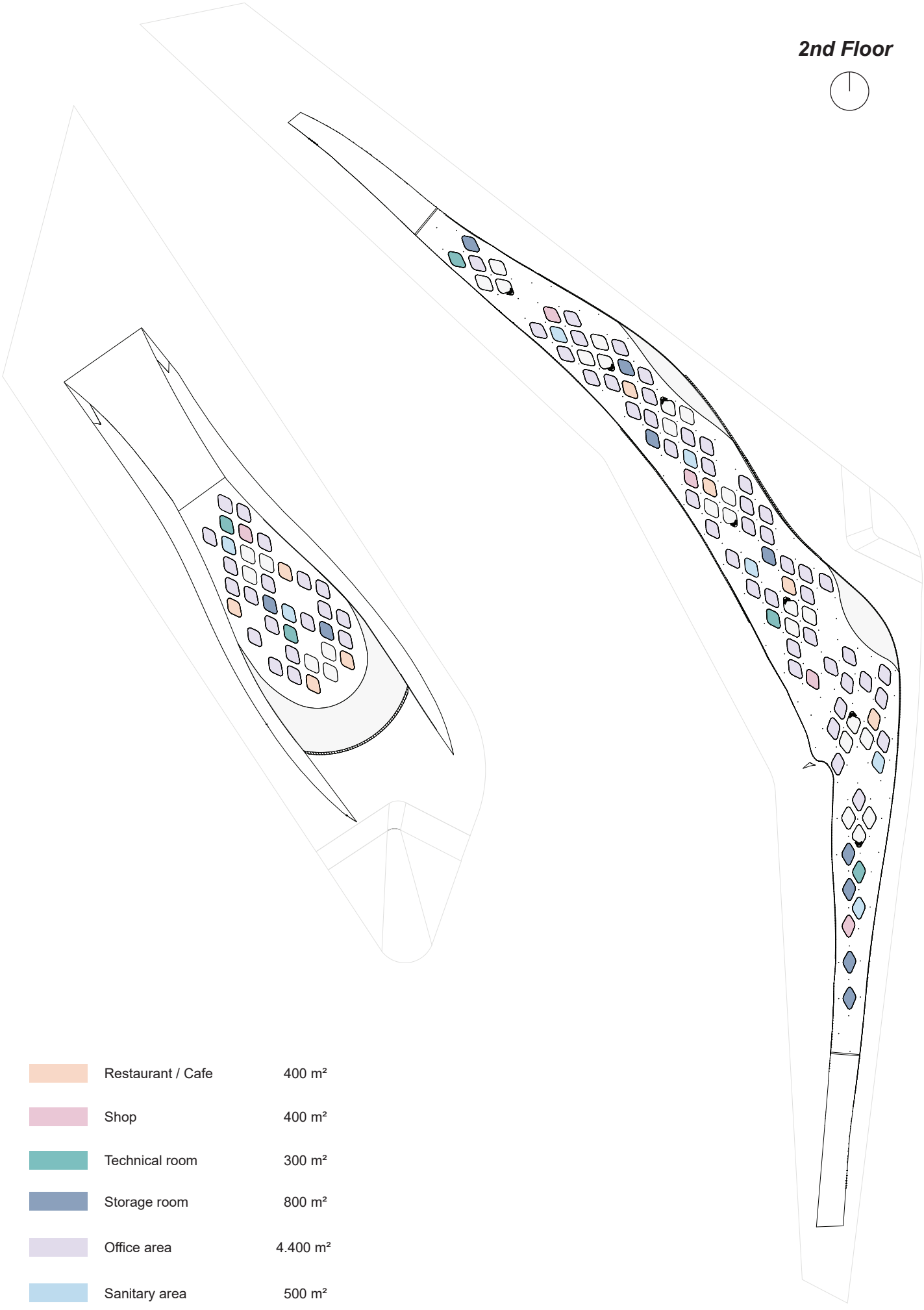
	Ticket shop	200 m²
	Restaurant / Cafe	1.400 m²
	Shop	5.000 m²
	Technical room	300 m²
	Storage room	1.100 m²
	Info point / Check in point	300 m²
	Sanitary area	600 m²

1st Floor



	Restaurant / Cafe	1.400 m²
	Shop	3.900 m²
	Technical room	300 m²
	Storage room	700 m²
	Info point / Check in point	200 m²
	Sanitary area	600 m²

2nd Floor

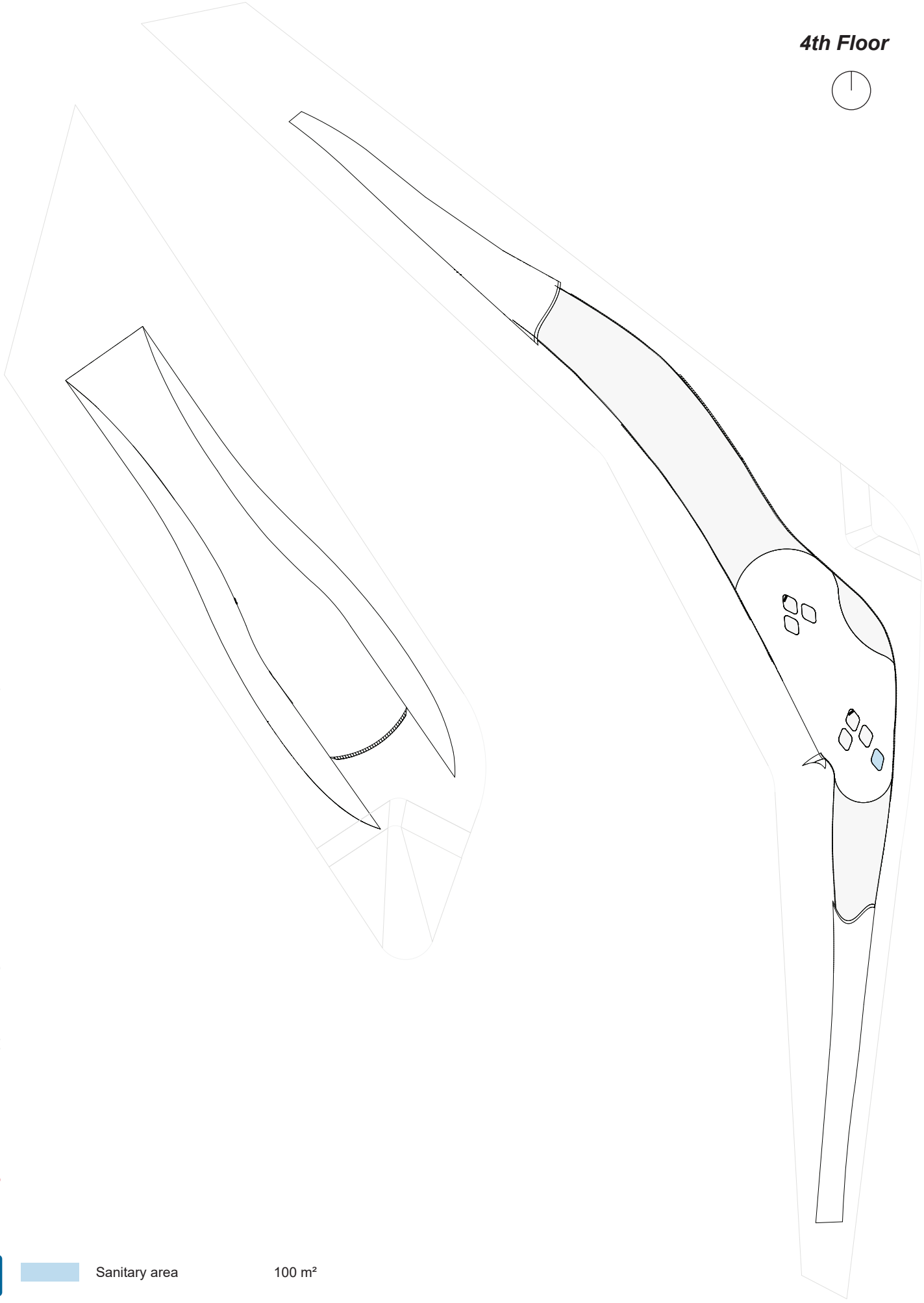


	Restaurant / Cafe	400 m²
	Shop	400 m²
	Technical room	300 m²
	Storage room	800 m²
	Office area	4.400 m²
	Sanitary area	500 m²

3rd Floor

	Restaurant / Cafe	400 m²
	Technical room	300 m²
	Storage room	600 m²
	Office area	4.400 m²
	Sanitary area	500 m²

4th Floor



Sanitary area 100 m²

Roof circulation

Fig. 77

As the roof shape is inspired by landscape, an idea was to make the roof accessible and walkable. This means that a system of ramps with stairs will be implemented on the roof and people will be able to walk, to reach different floors of the building, but also to experience the view from the top of the building.

Fig. 78

Fig. 79

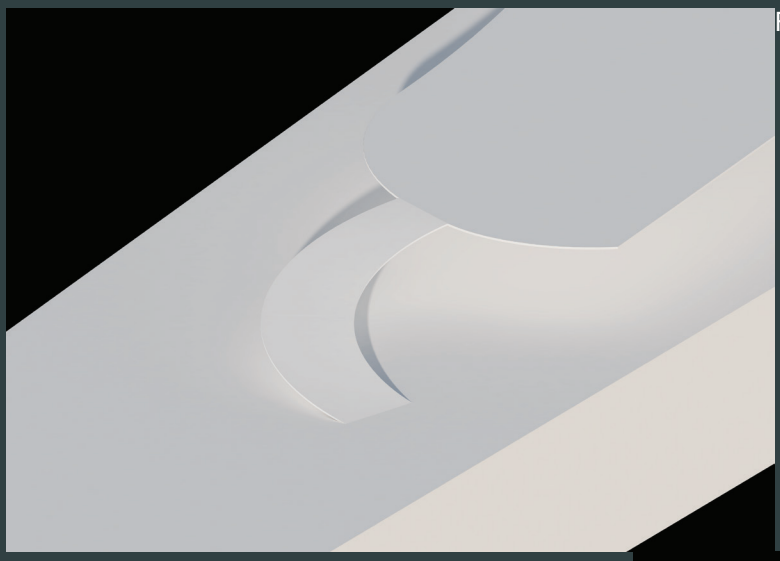


Fig. 80

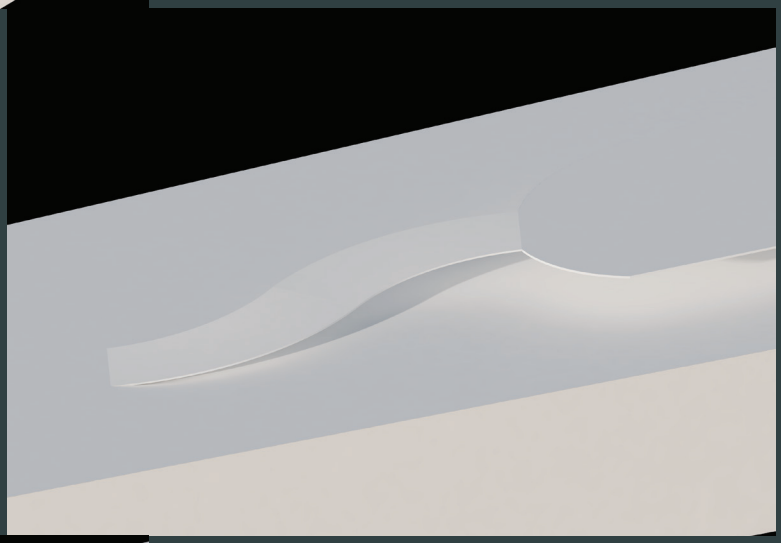


Fig. 81

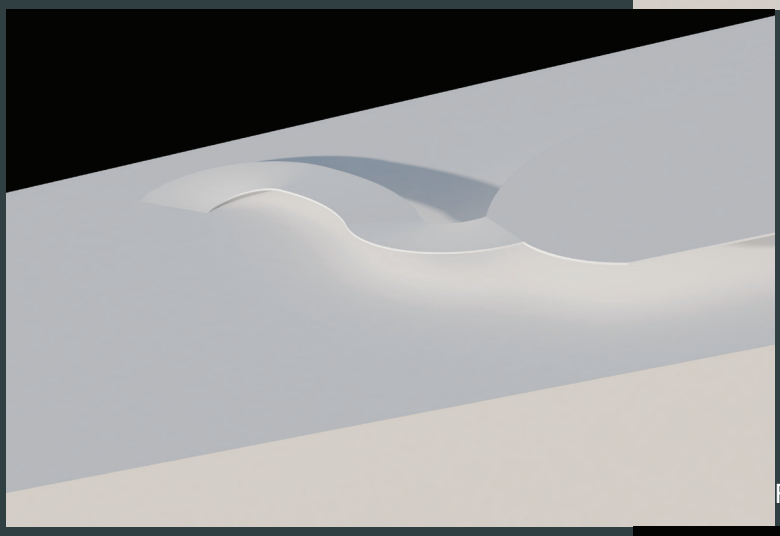


Fig. 82

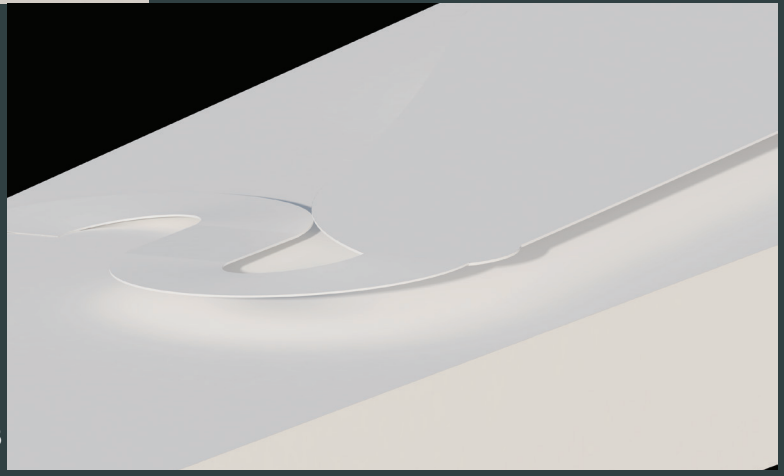


Fig. 83

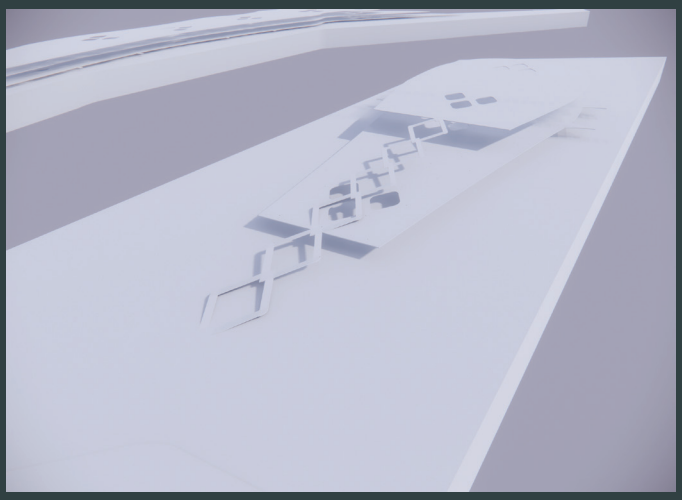


Fig. 84

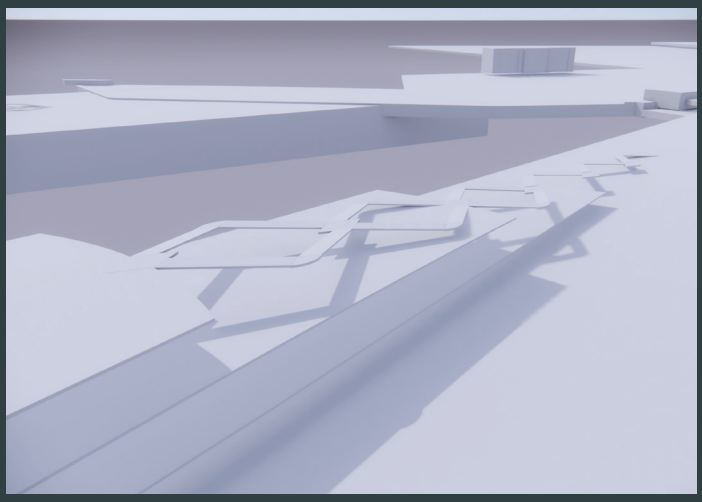
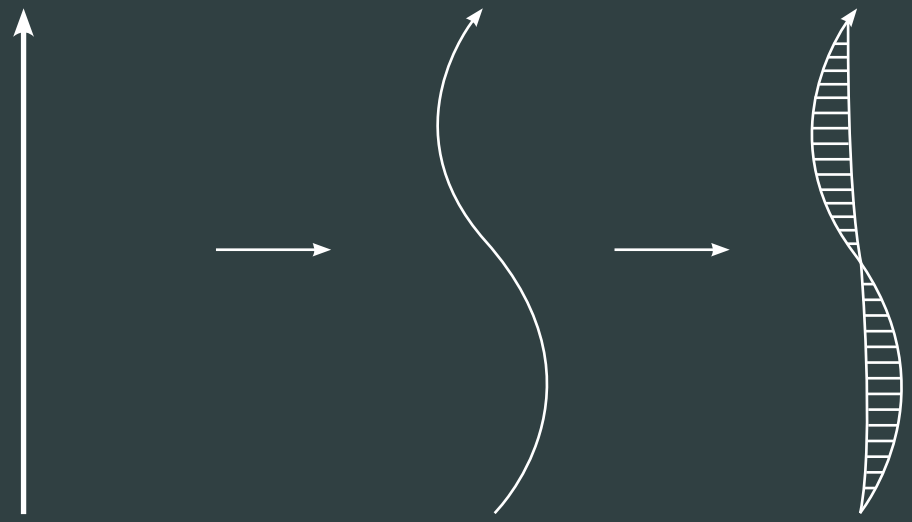
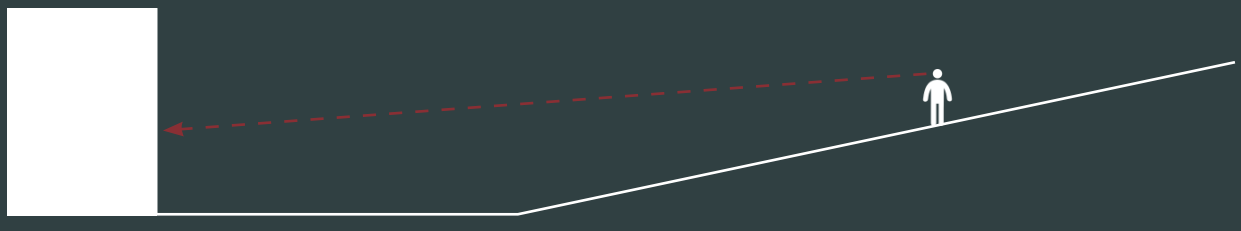


Fig. 85



Ramp and staircare reshaped



view connection from the building

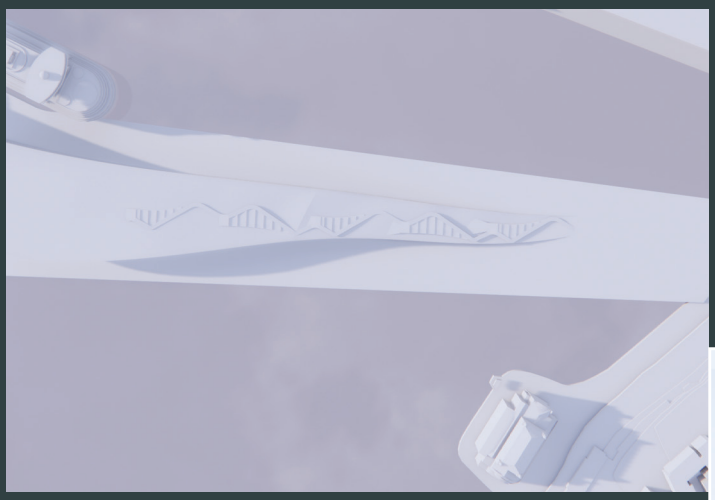


Fig. 86

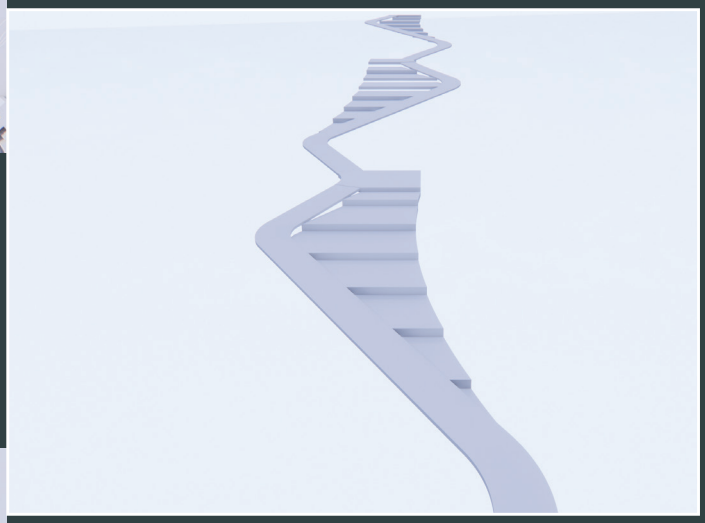


Fig. 87

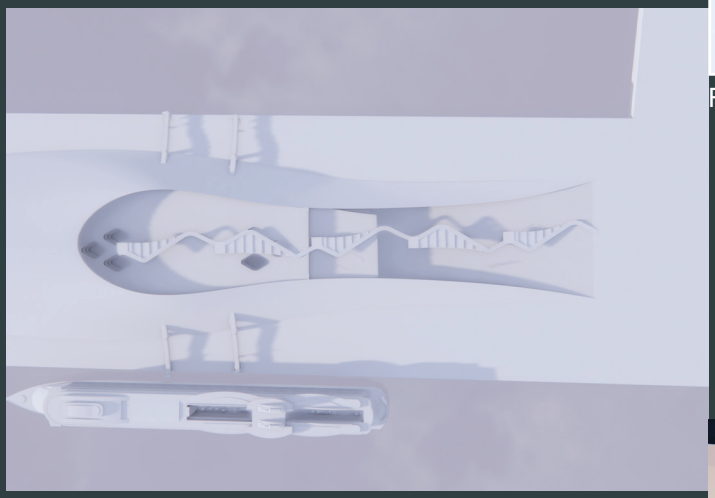


Fig. 88

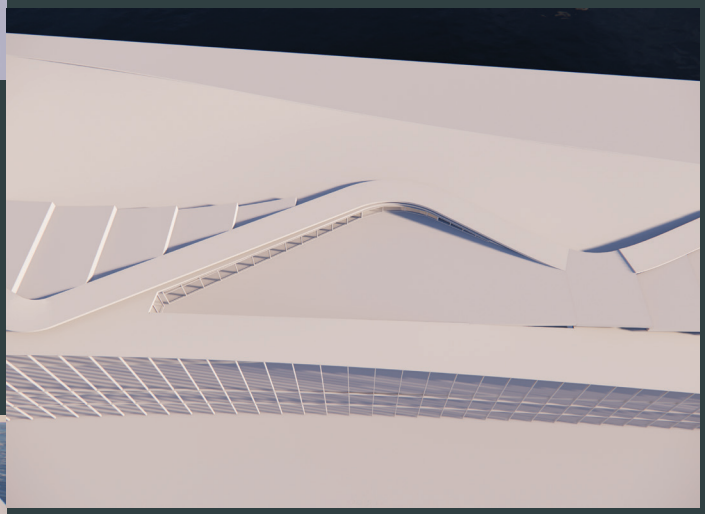


Fig. 89

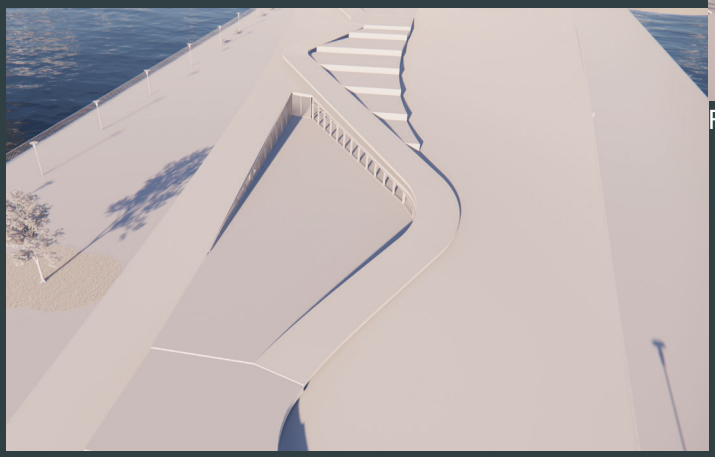
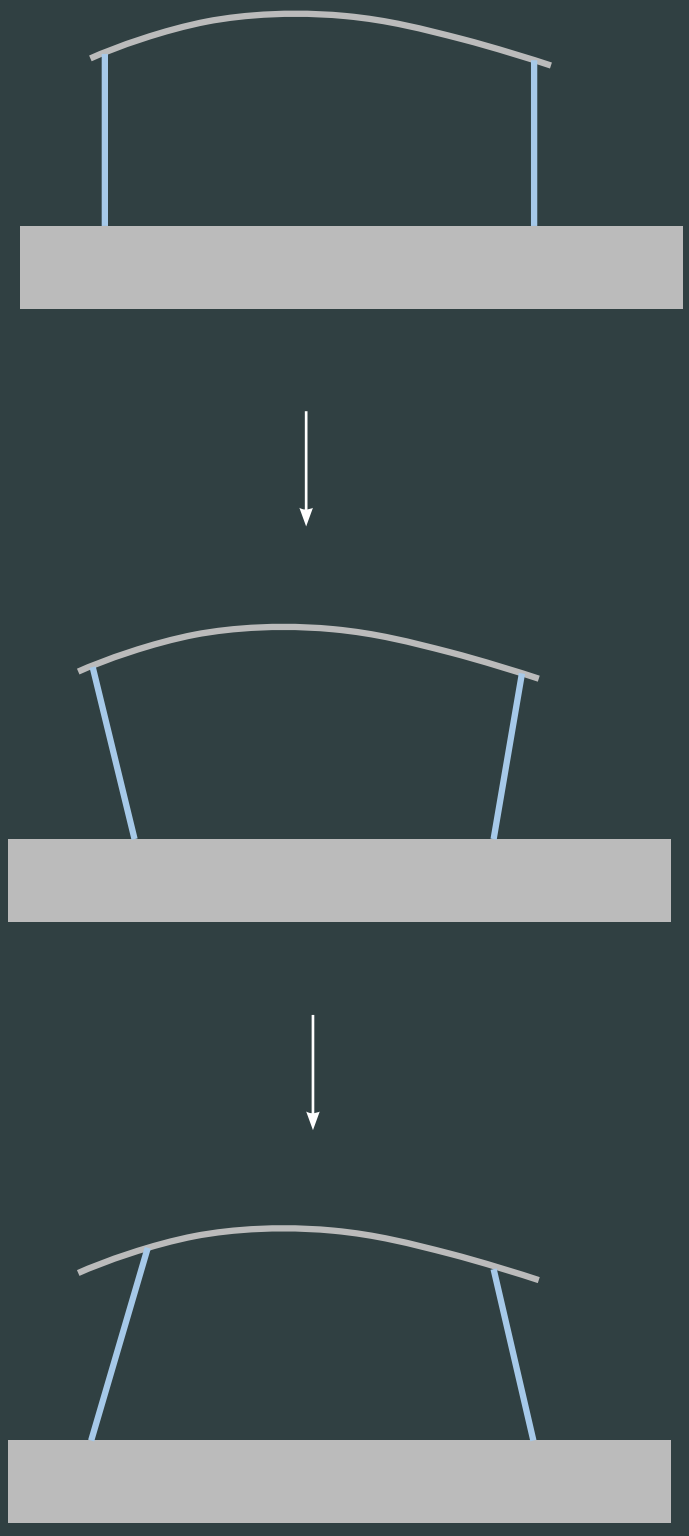


Fig. 90

Facade design



The facade is an important part of the building and plays a role into designing the cruise terminal. As the main idea is to offer a shape inspired by the sea waves, the target is to have a facade which won't have a vertical position, but it will have a wave form, following the roof shape.

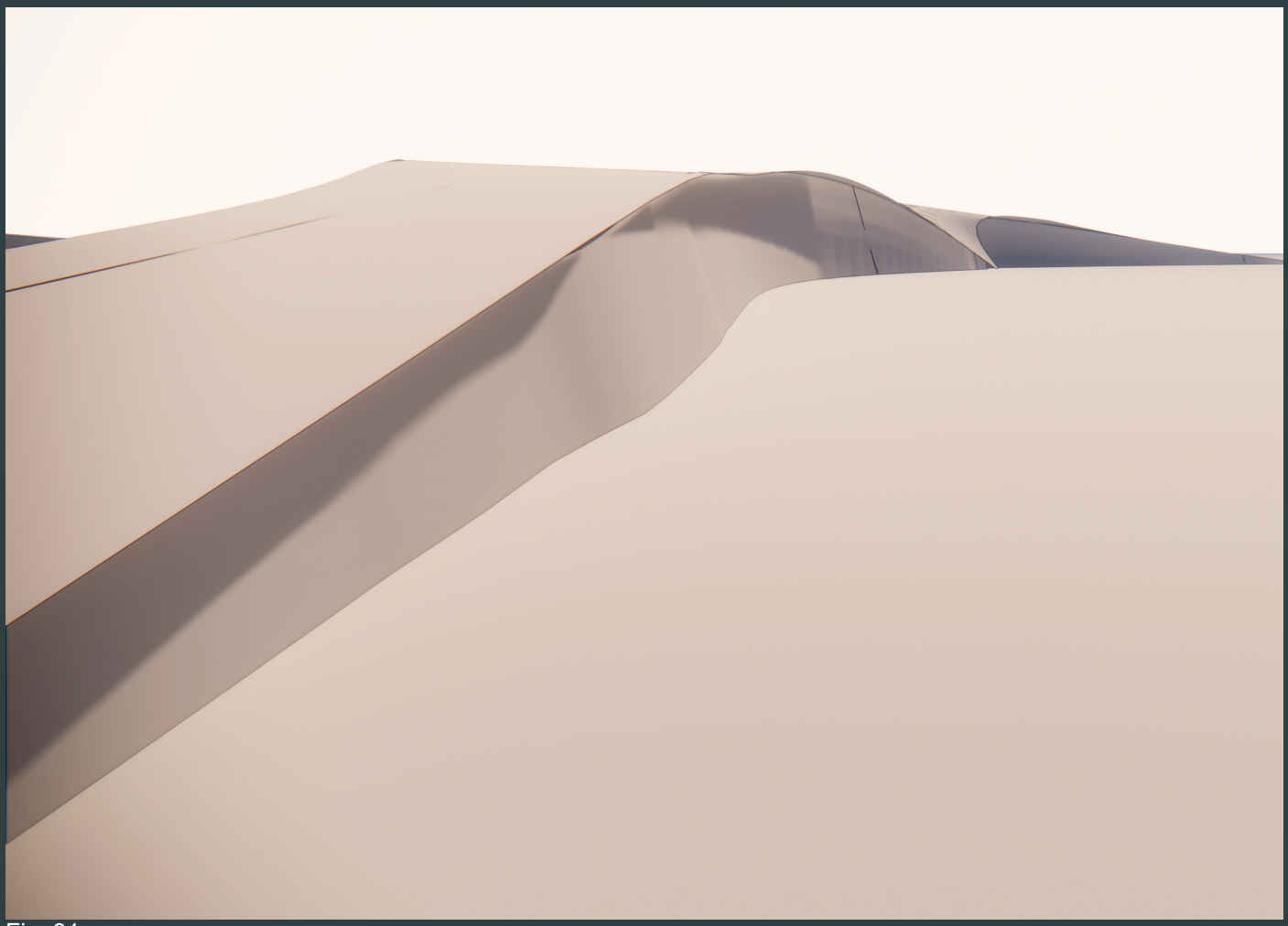


Fig. 91

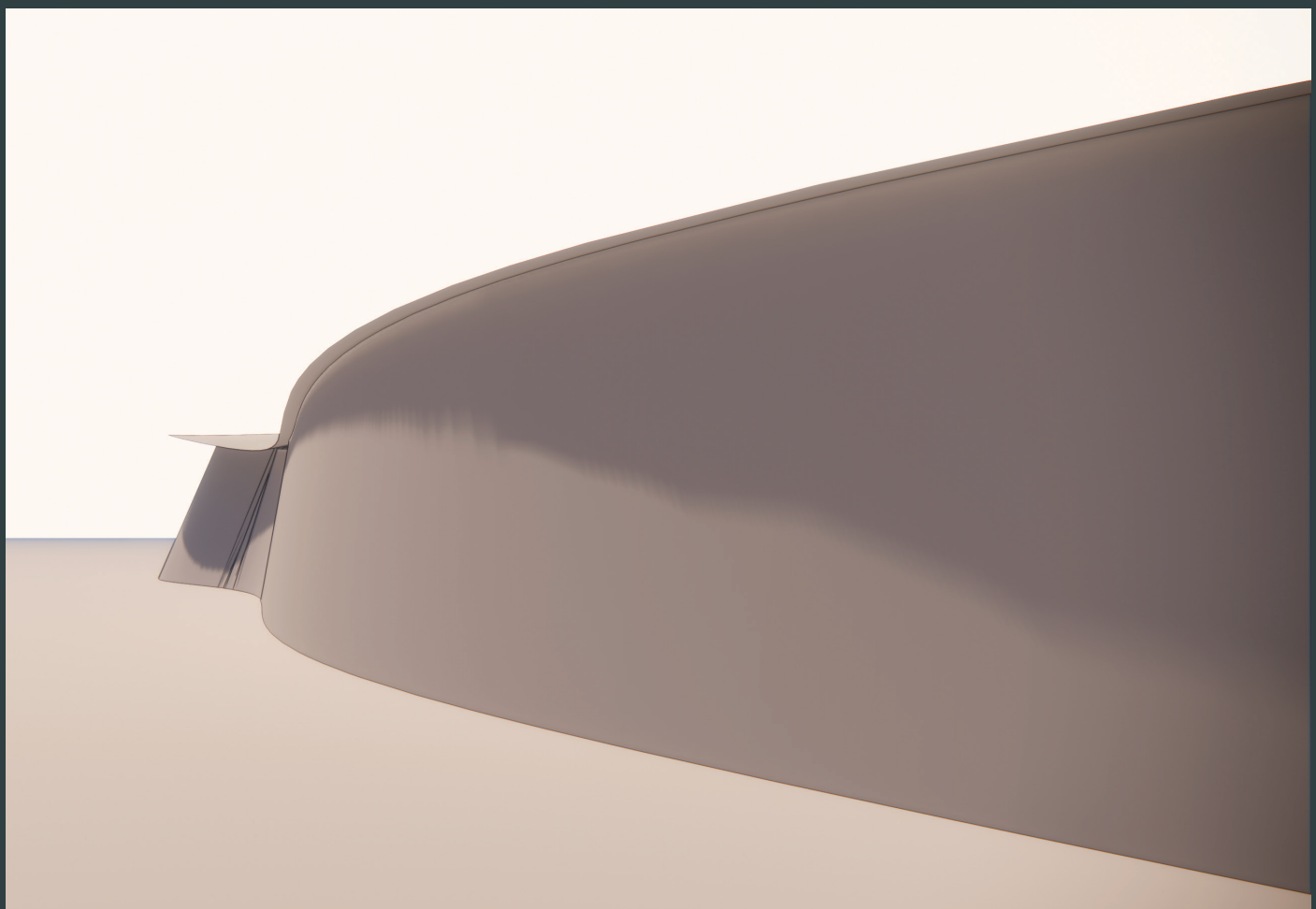
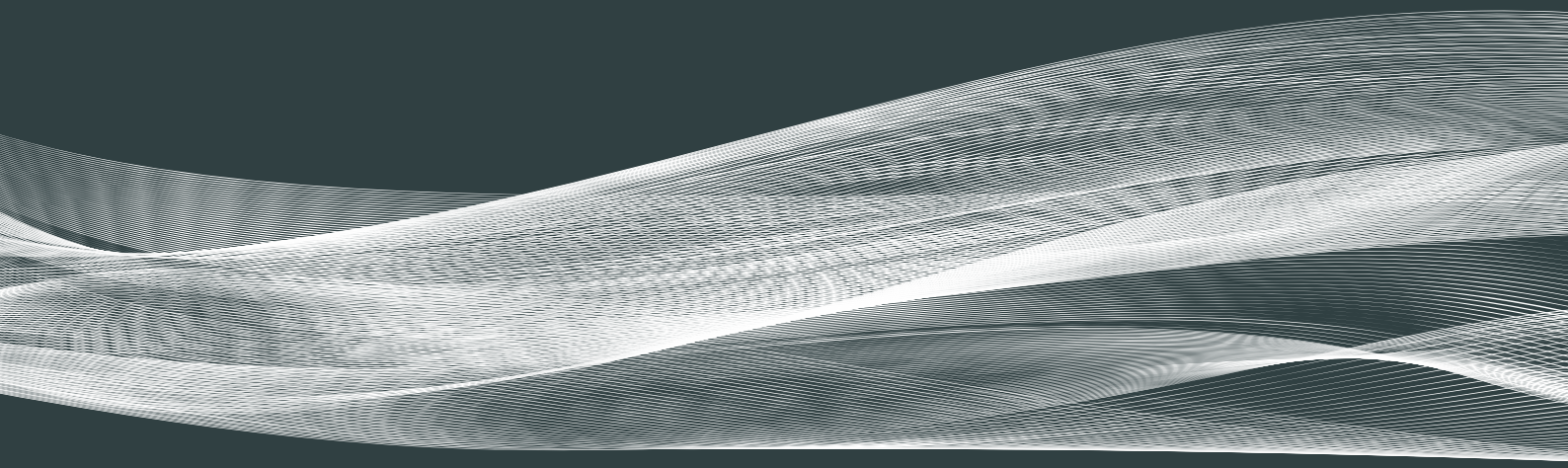
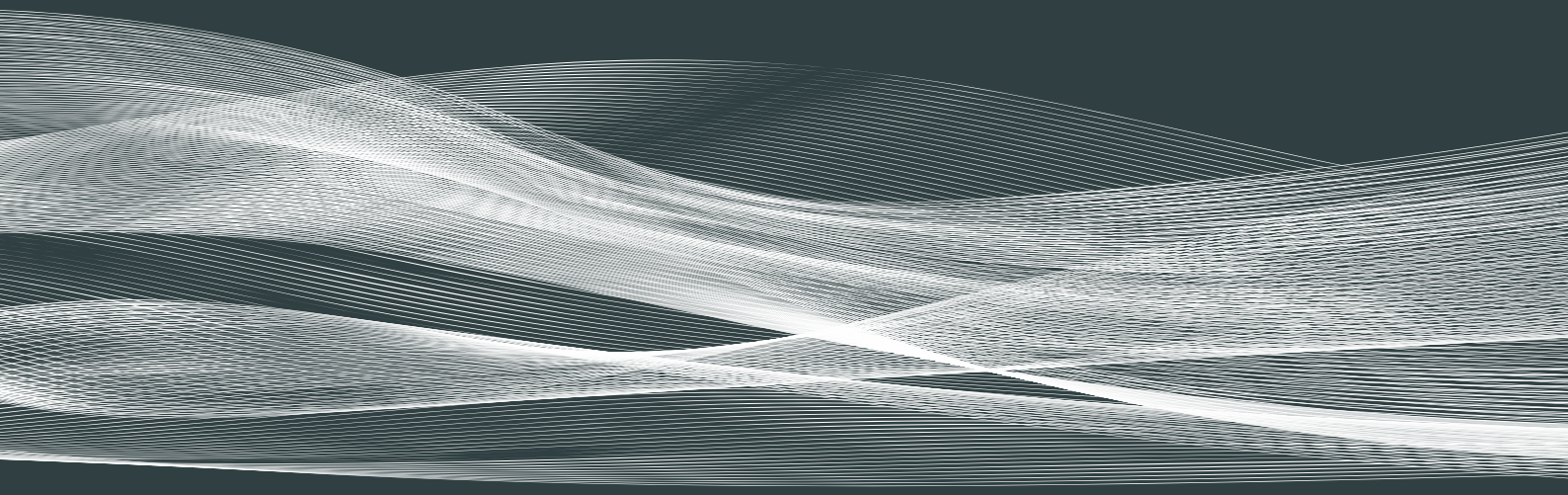
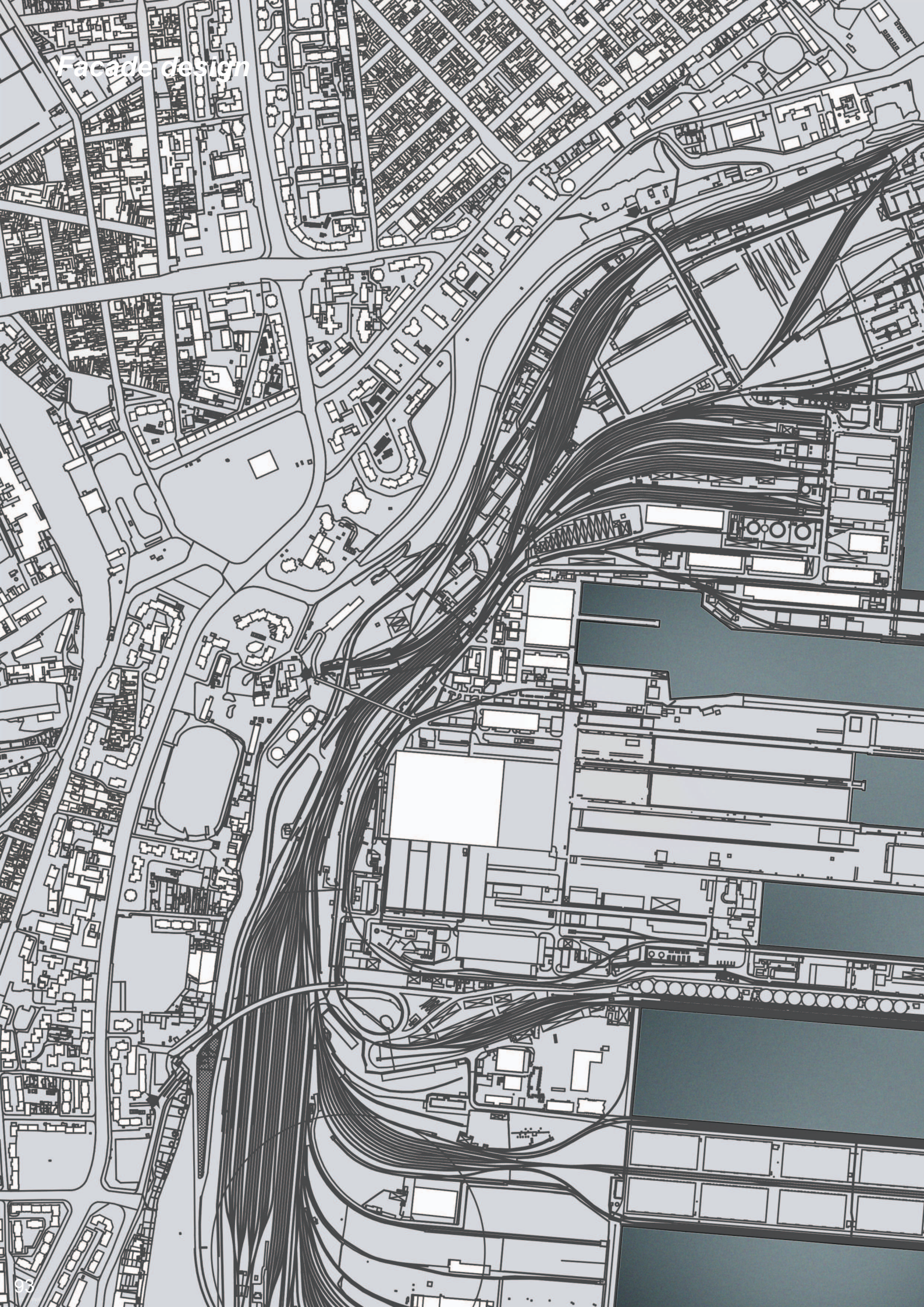


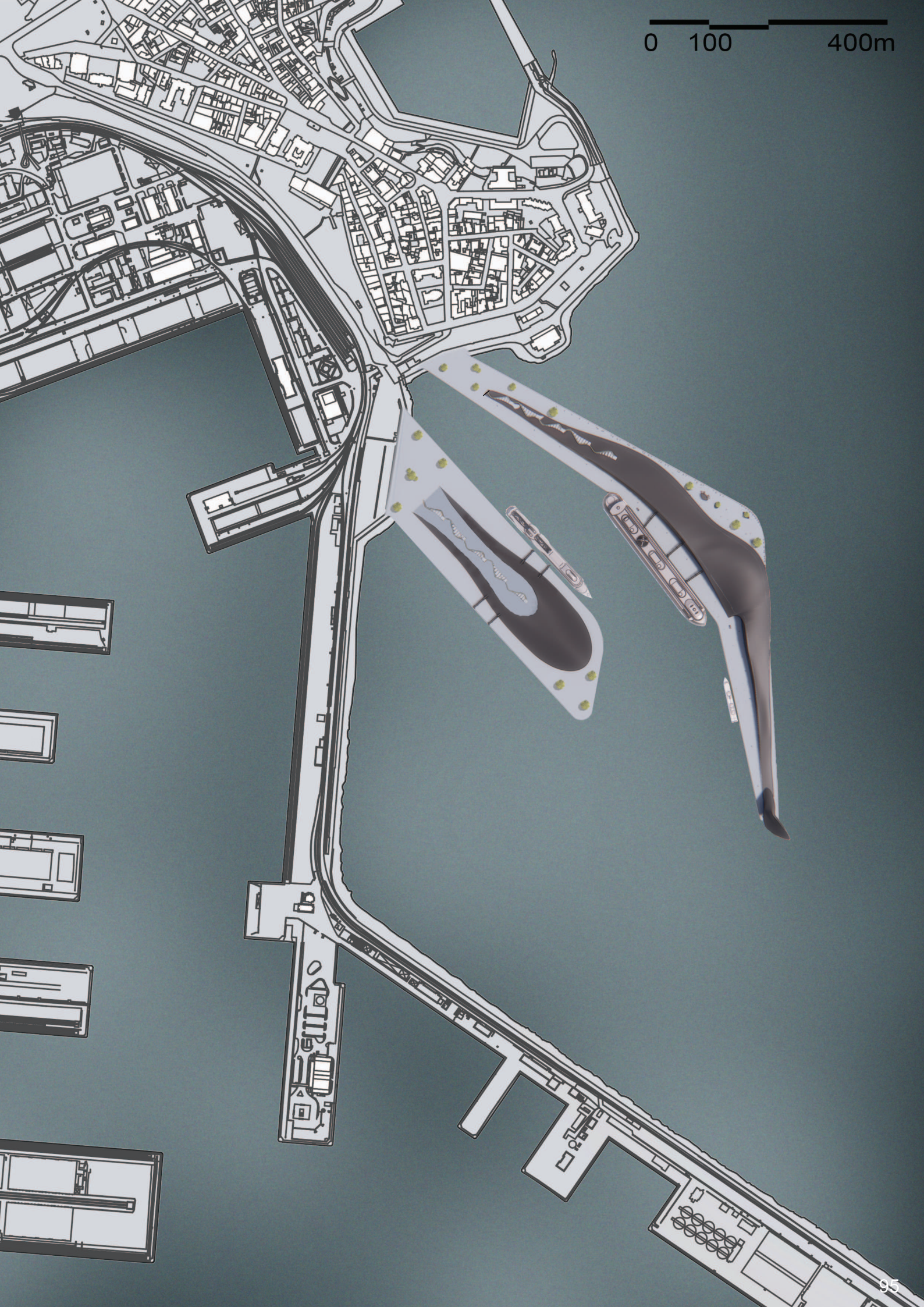
Fig. 92





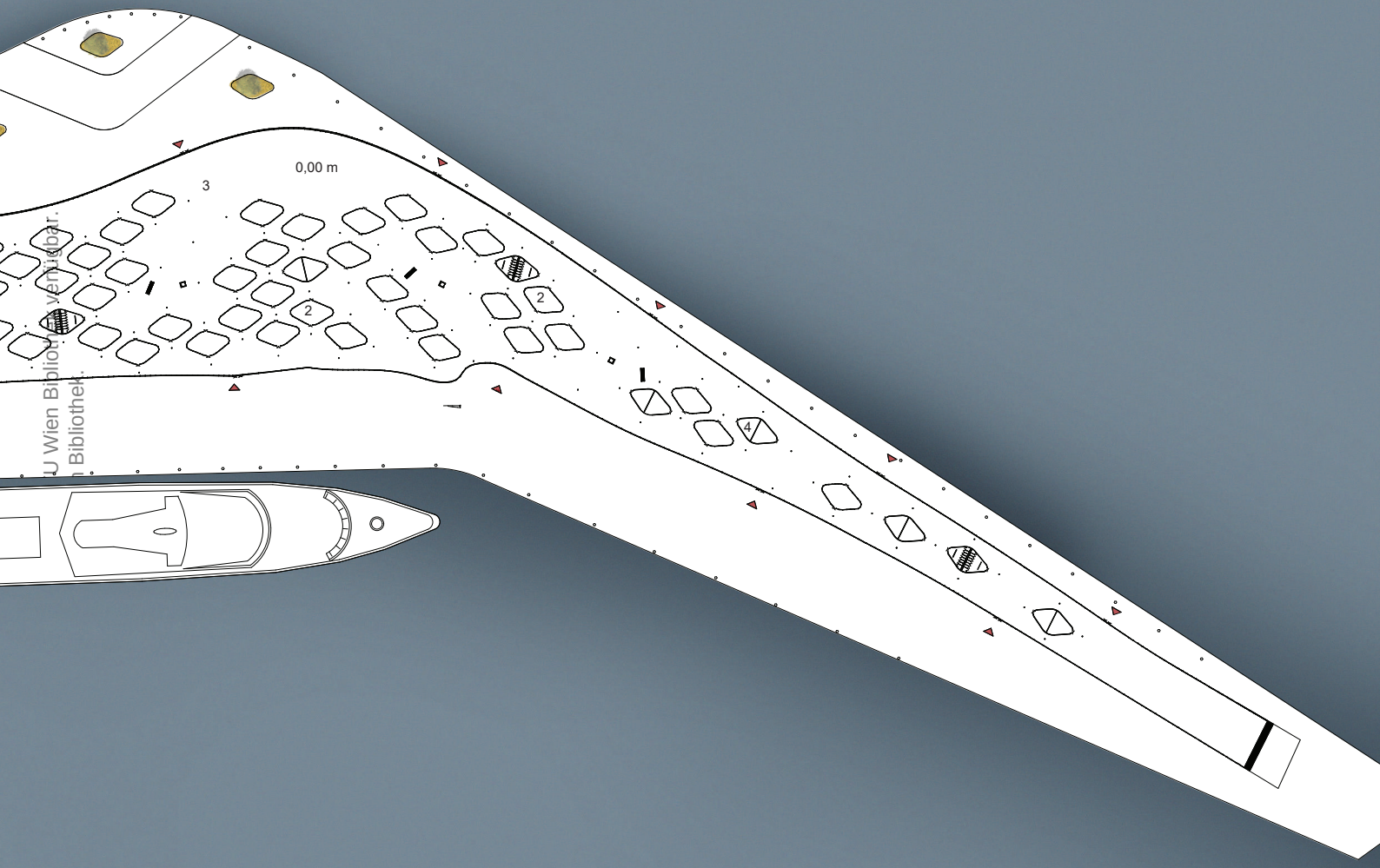
Result




0 100 400m

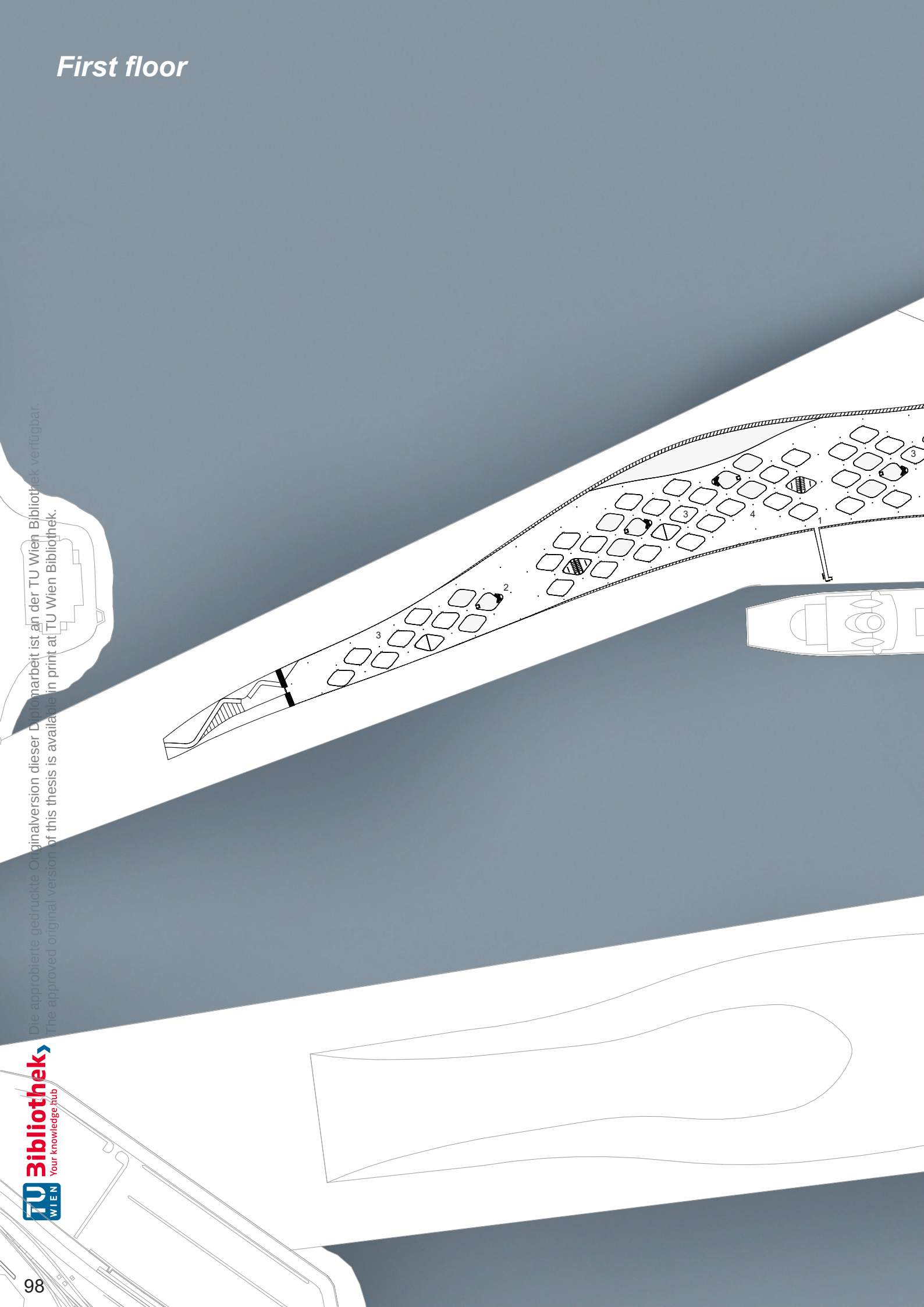
Ground floor

1 check in area
2 shop area
3 gastronomy area
4 storage area

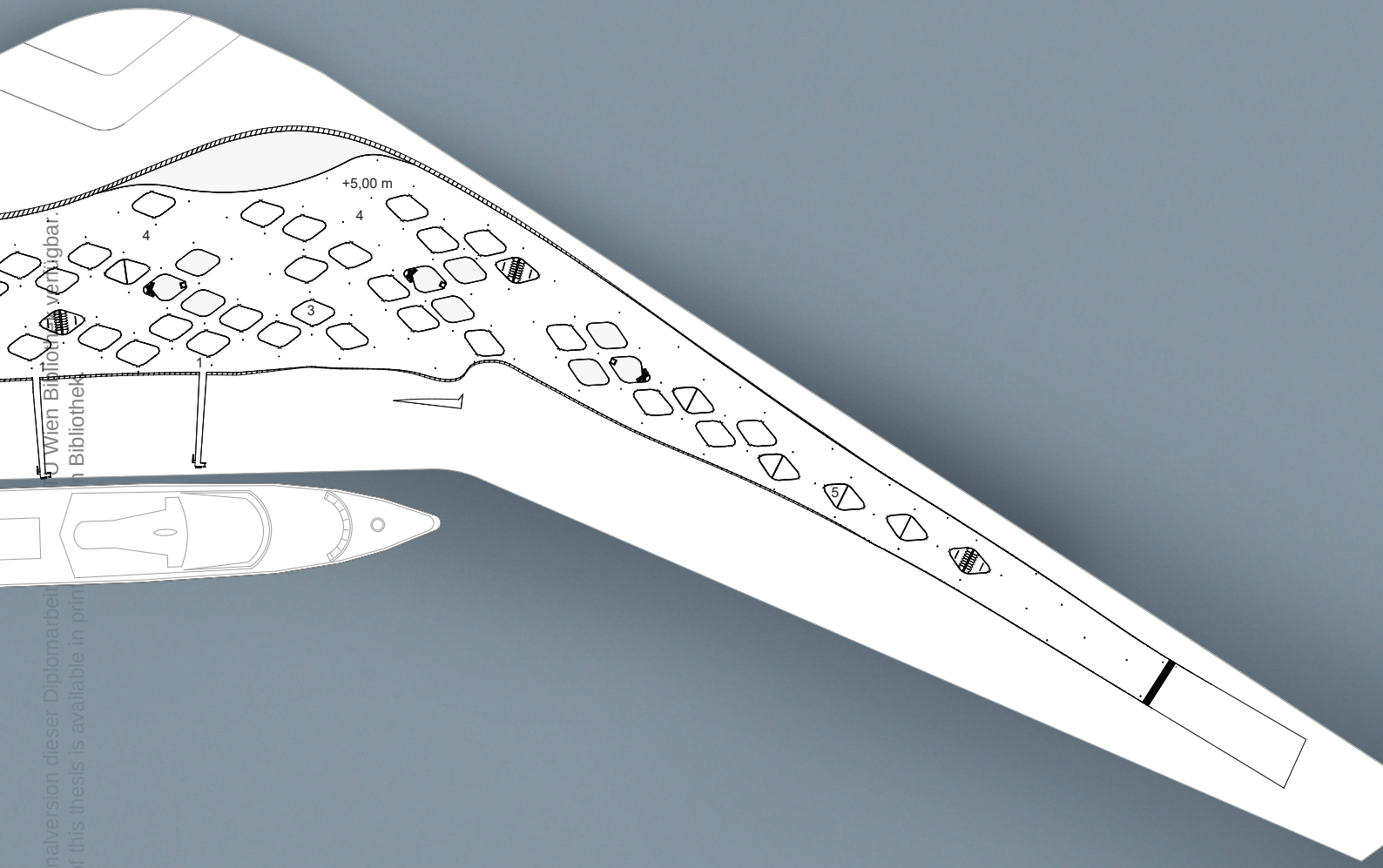


0 10 20 50 100

First floor



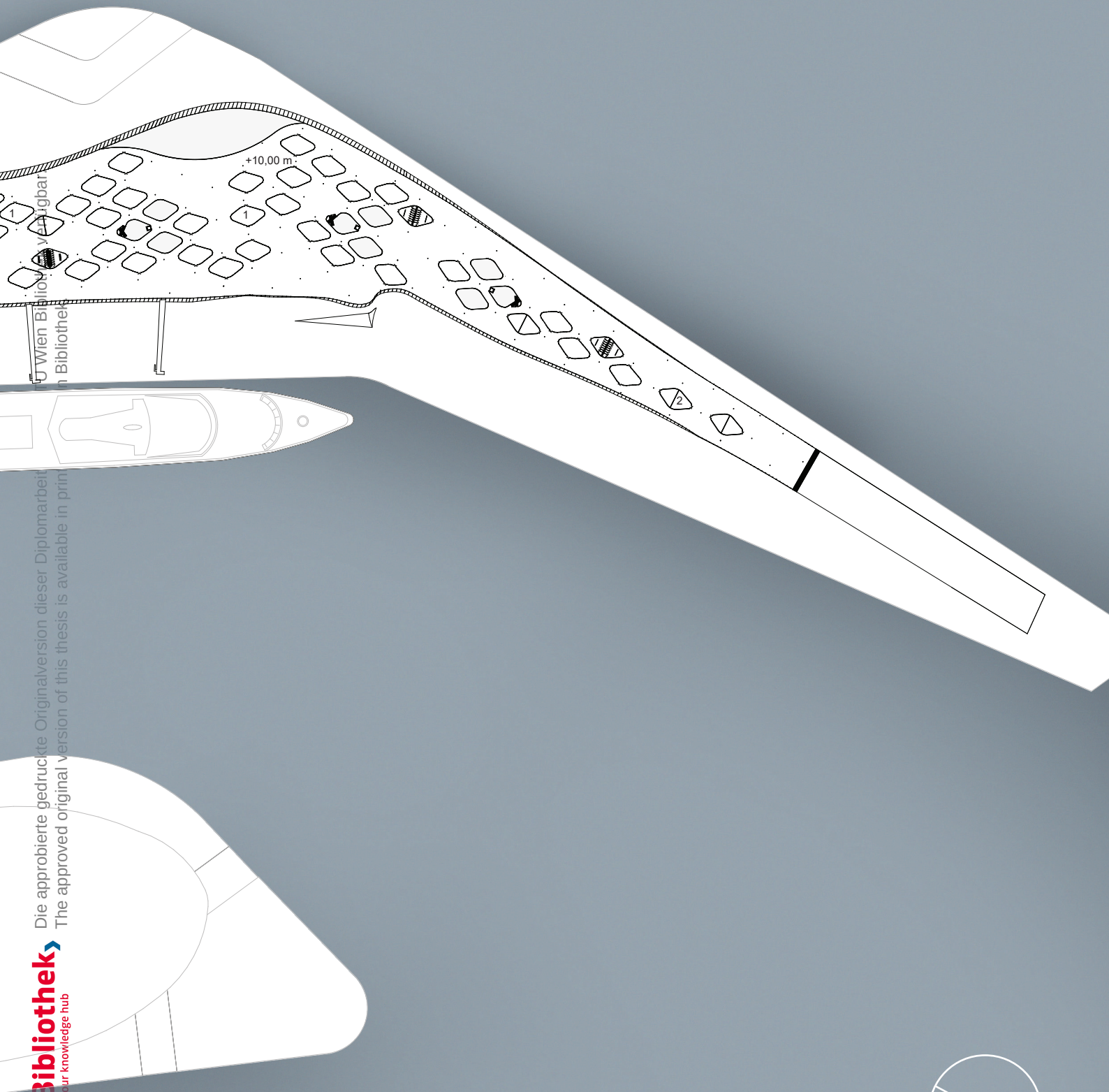
1 boarding area
2 security area
3 shop area
4 gastronomy area
5 storage area



0 10 20 50 100

Second floor

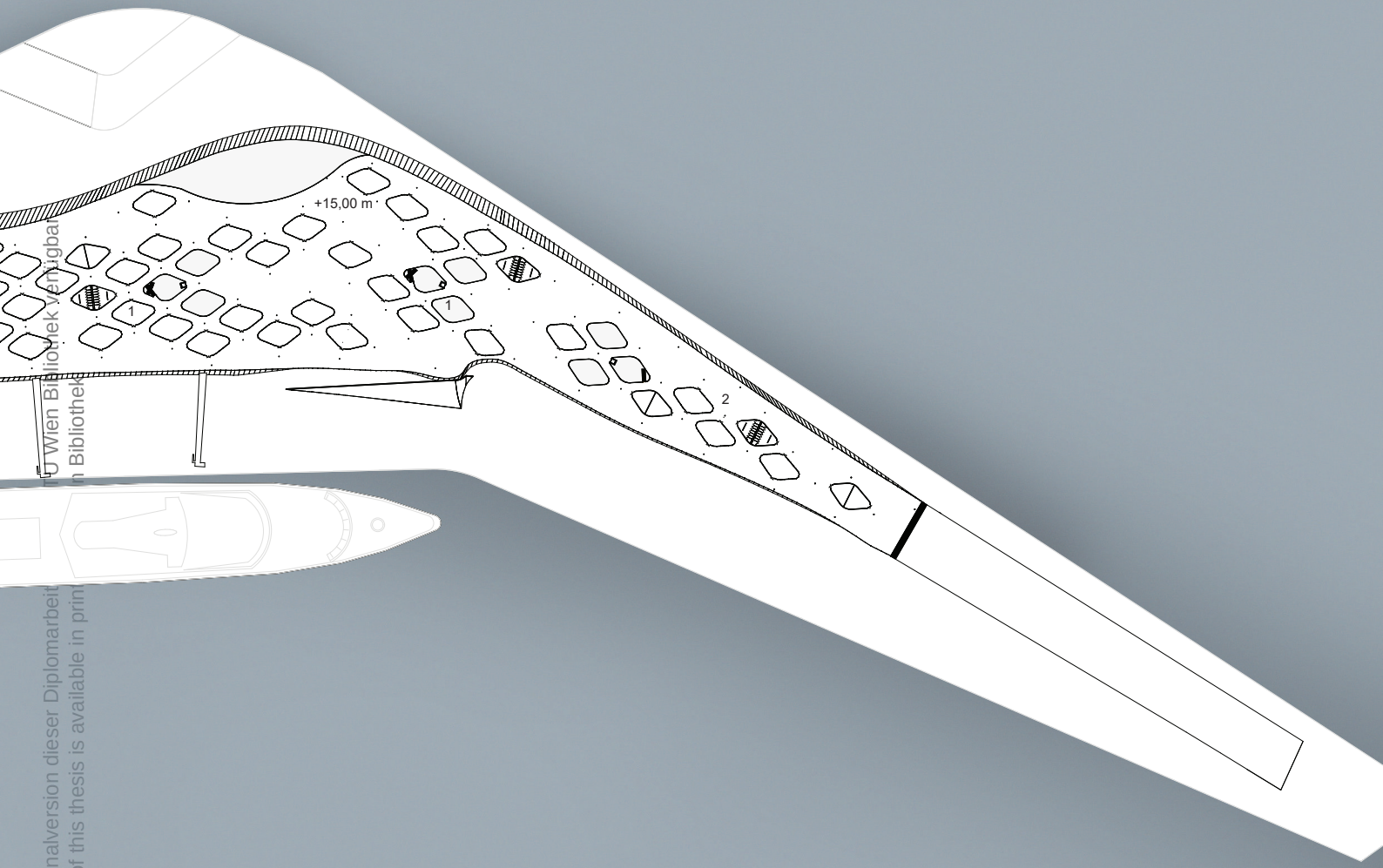
1 office area
2 storage area



0 10 20 50 100

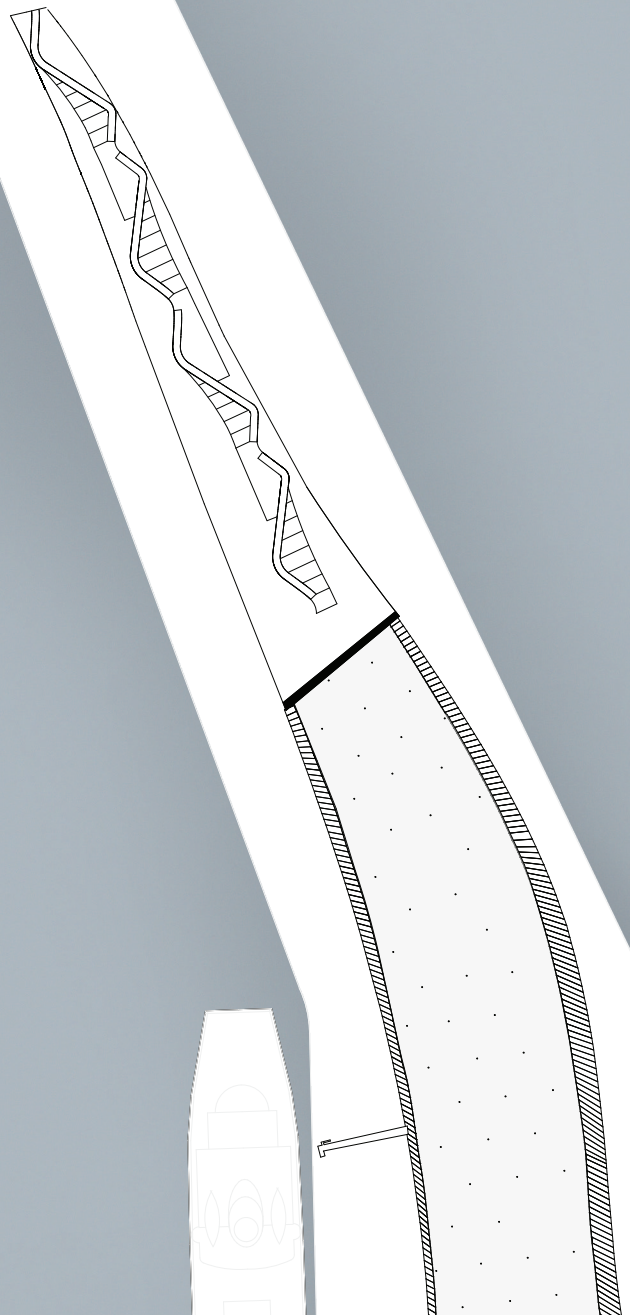
Third floor

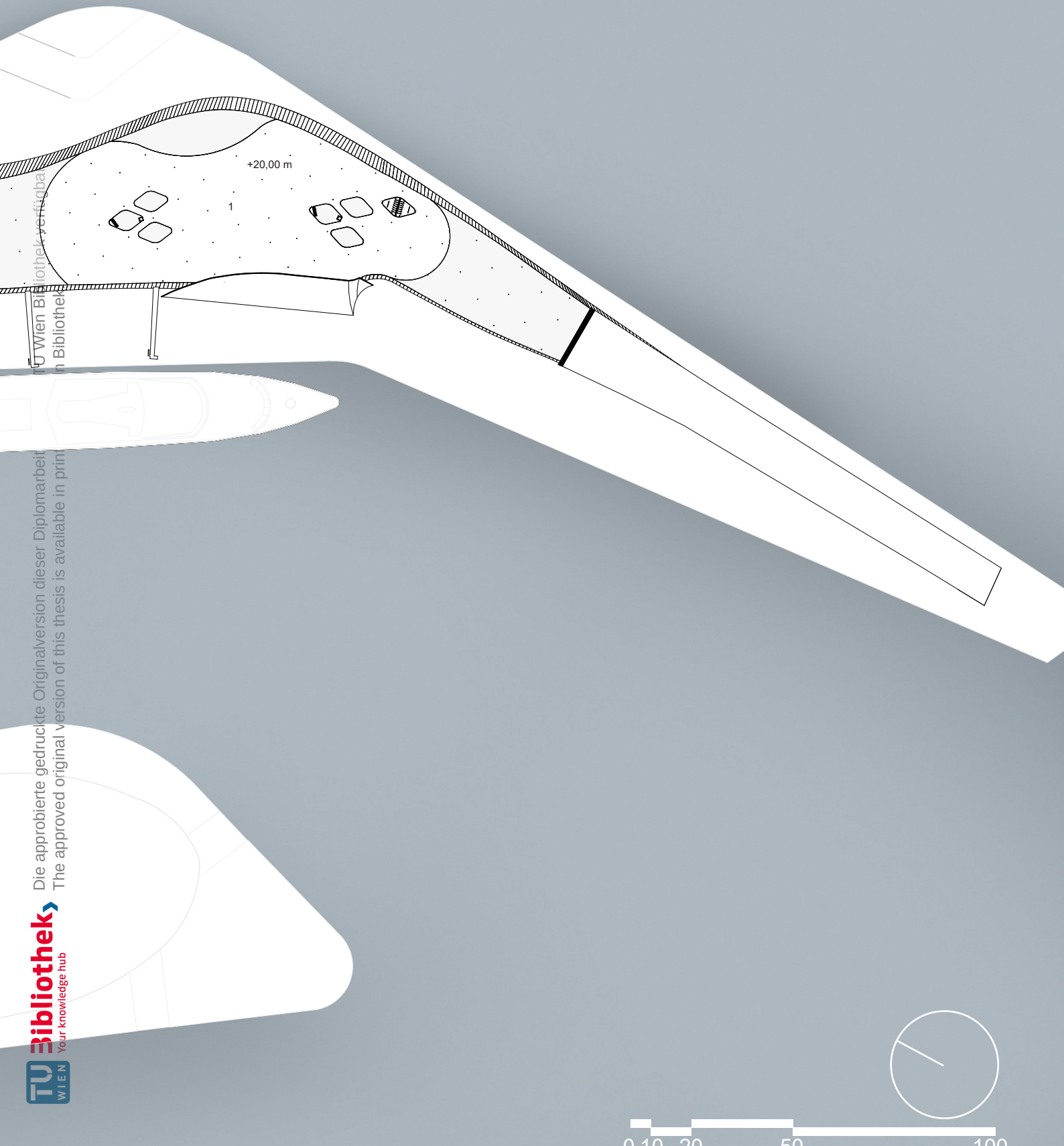
1 office area
2 storage area



0 10 20 50 100

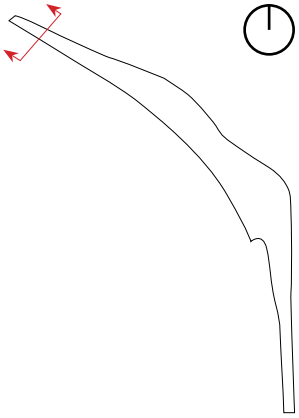
Fourth floor

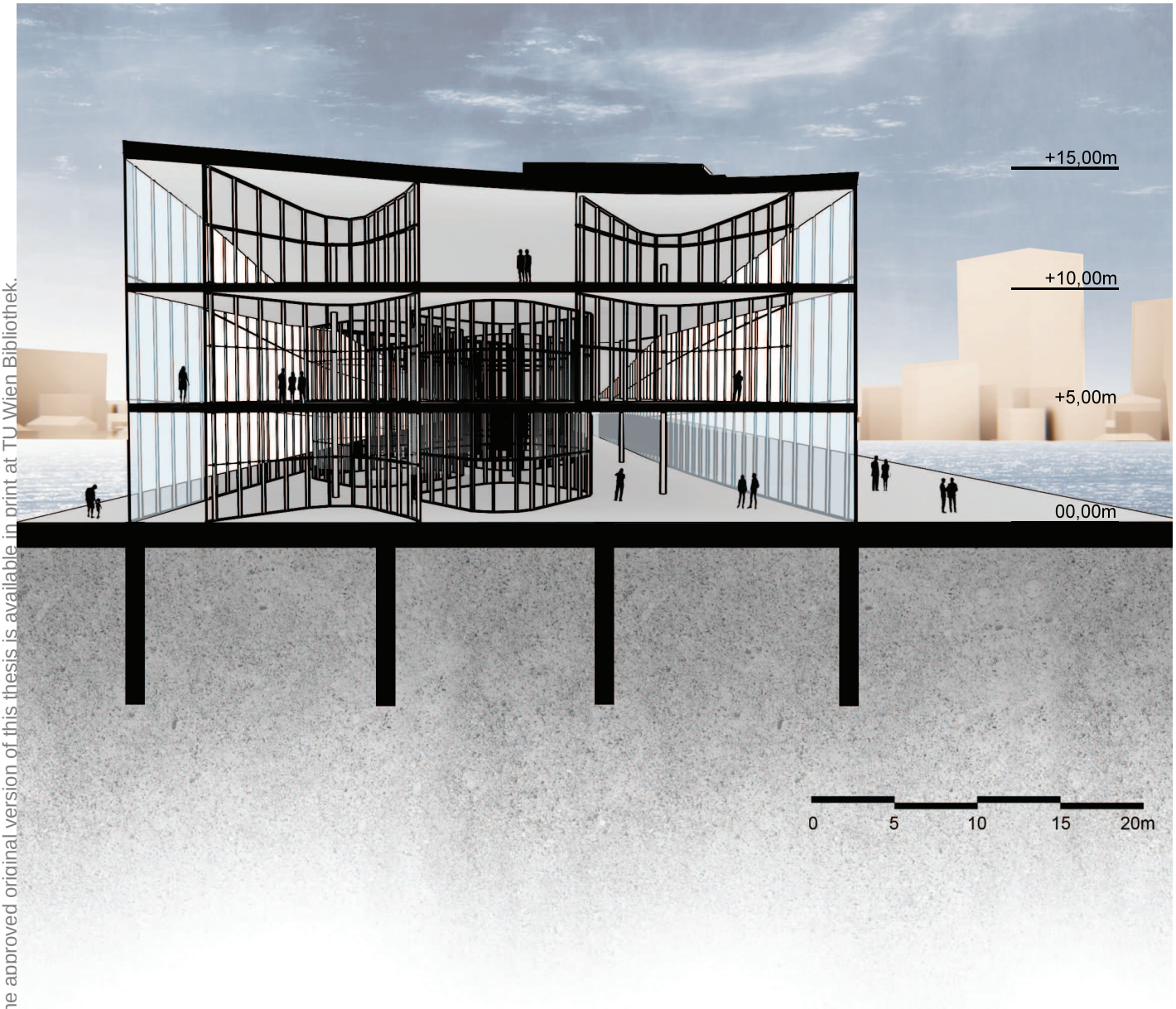




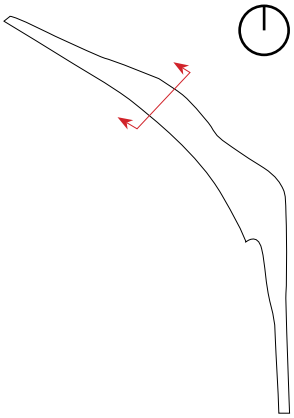
0 10 20 50 100

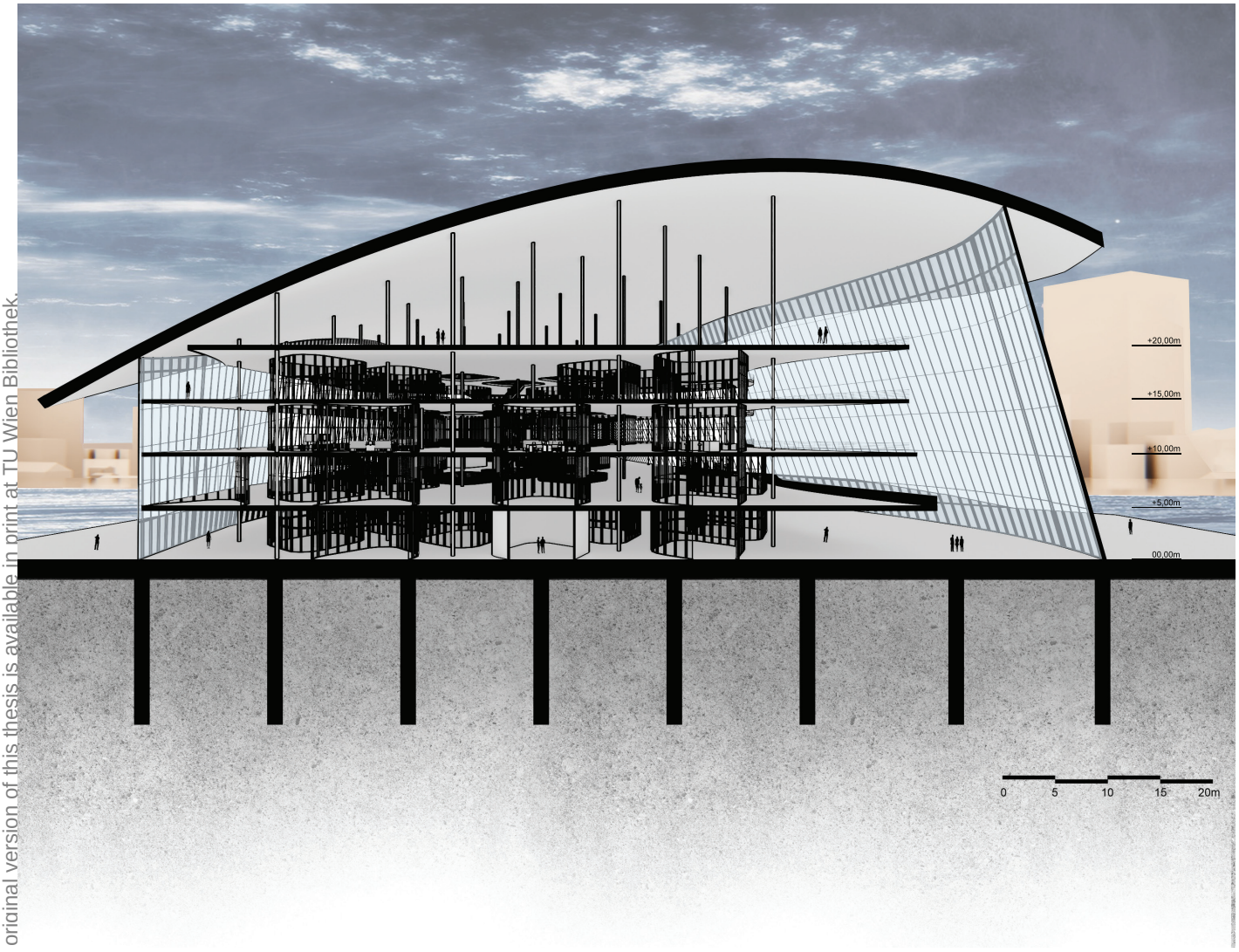
Section 1



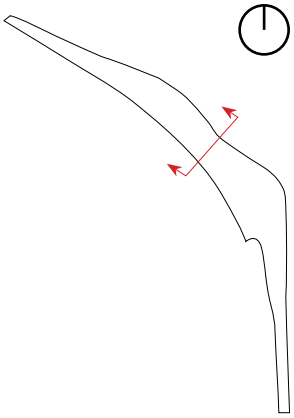


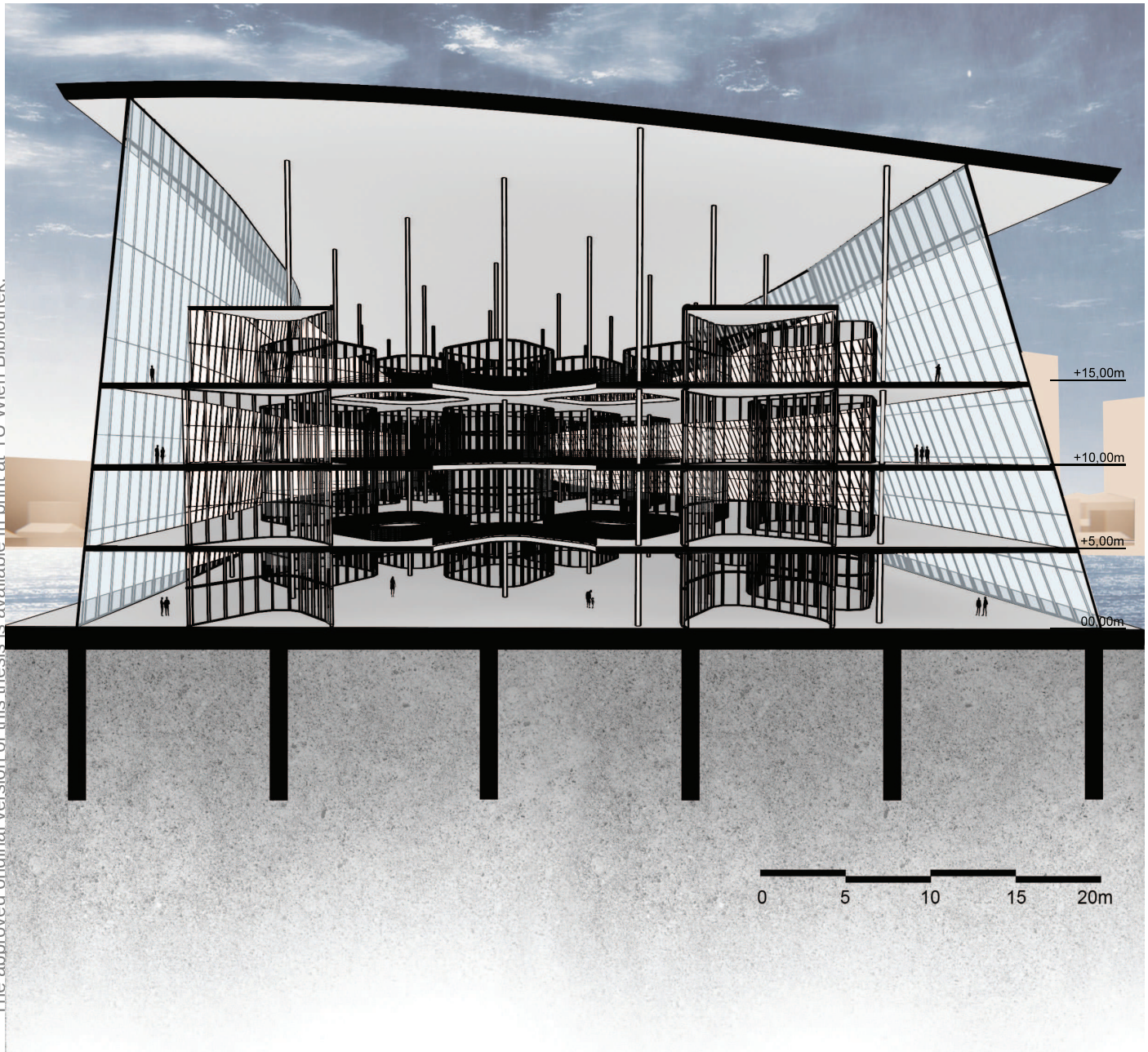
Section 2





Section 3





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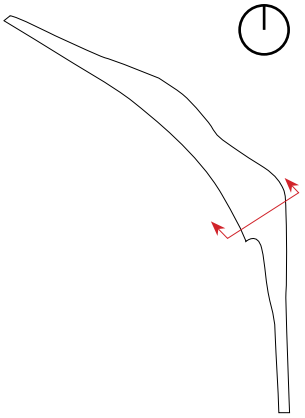

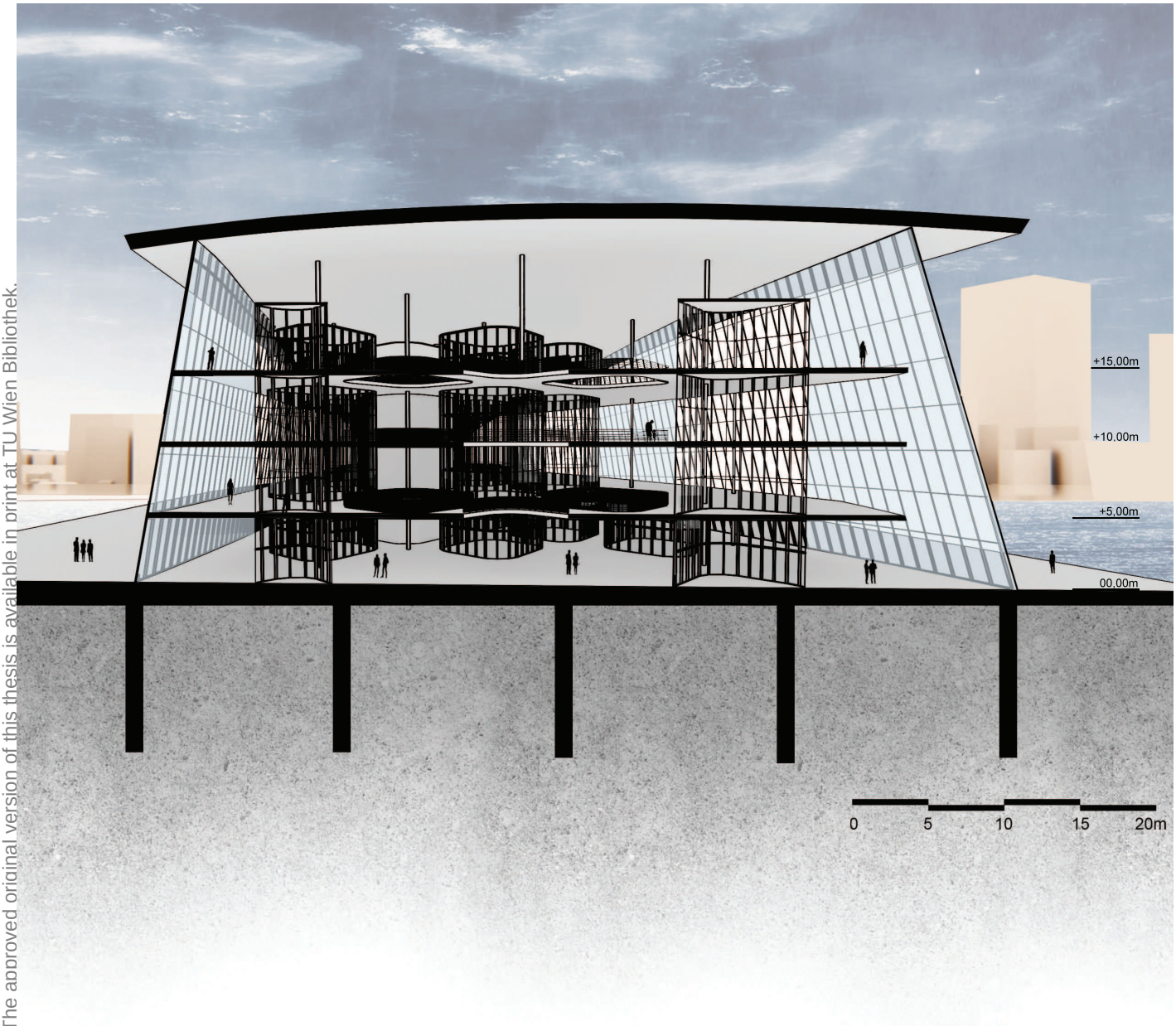

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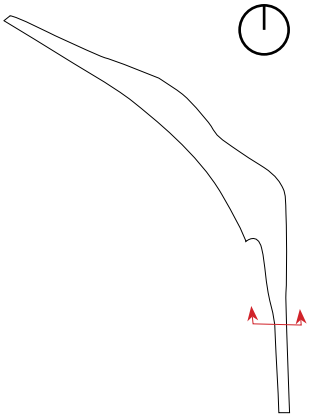
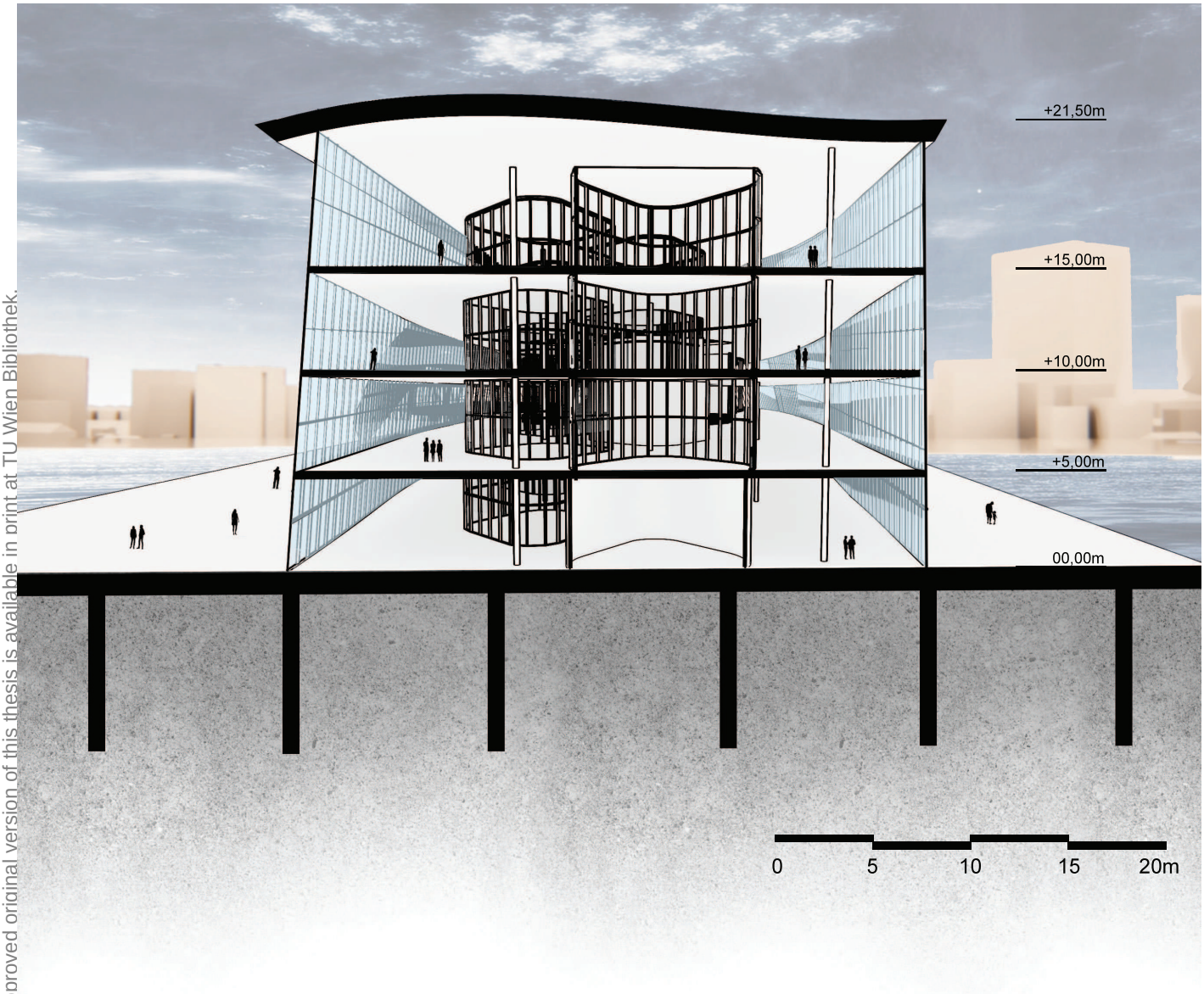
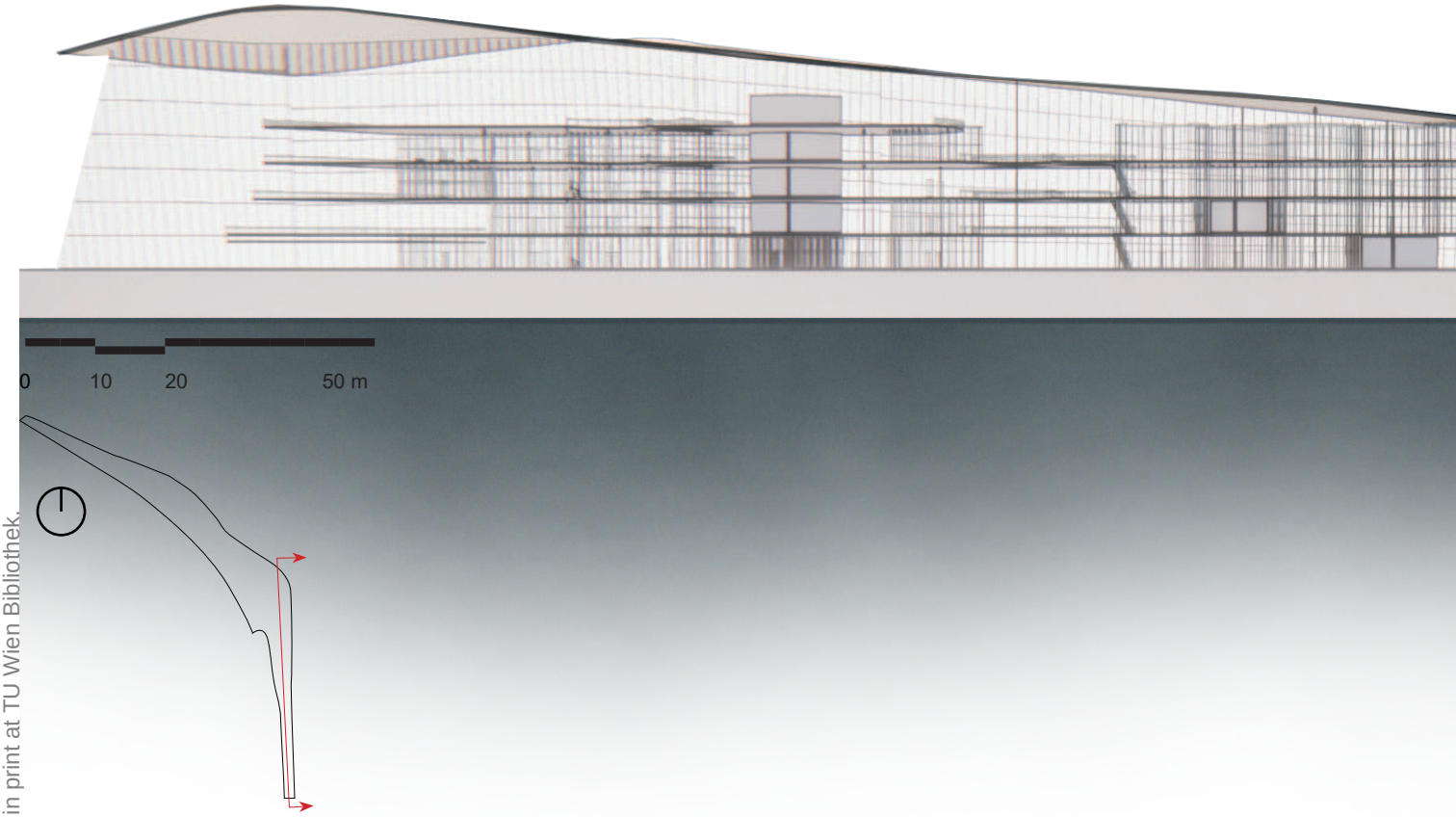
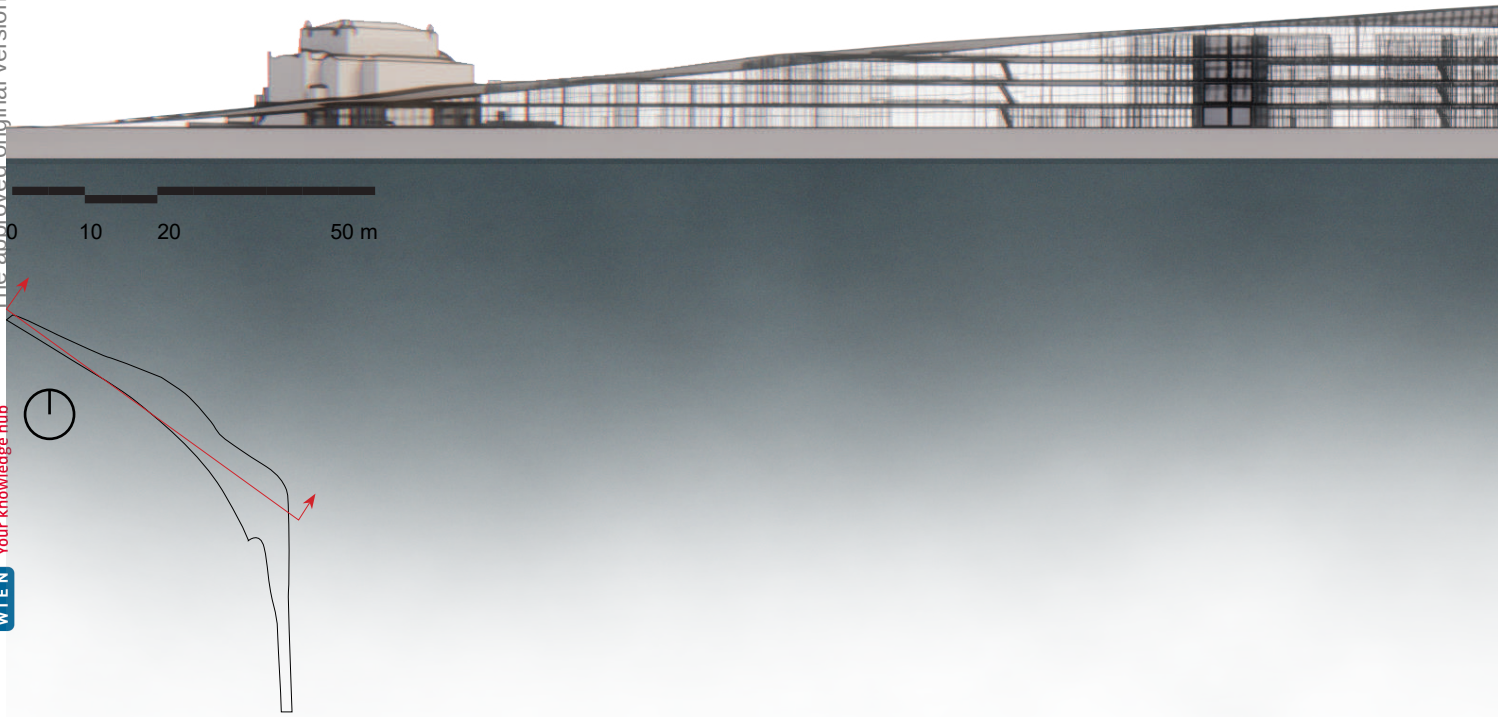


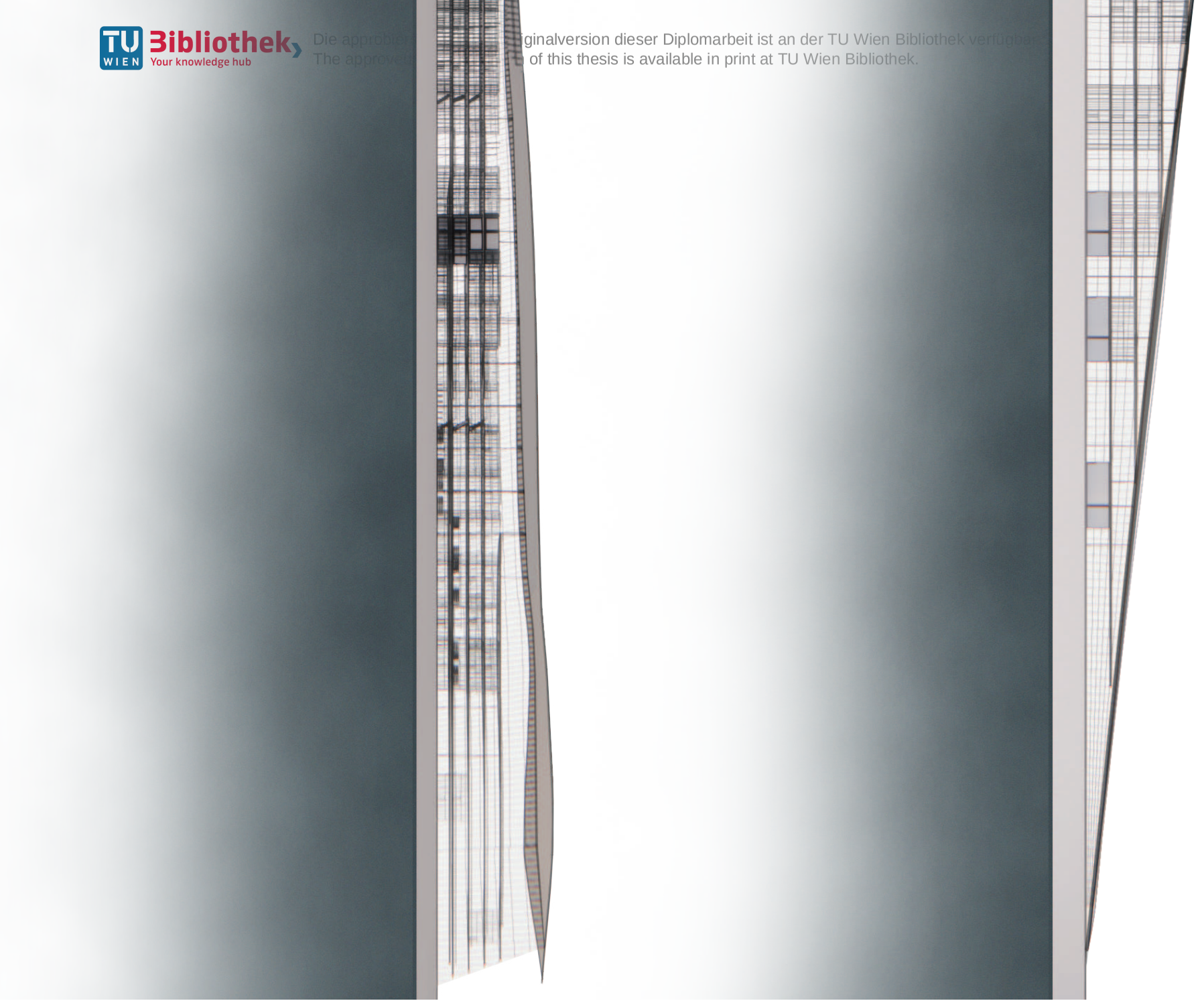


Section 6

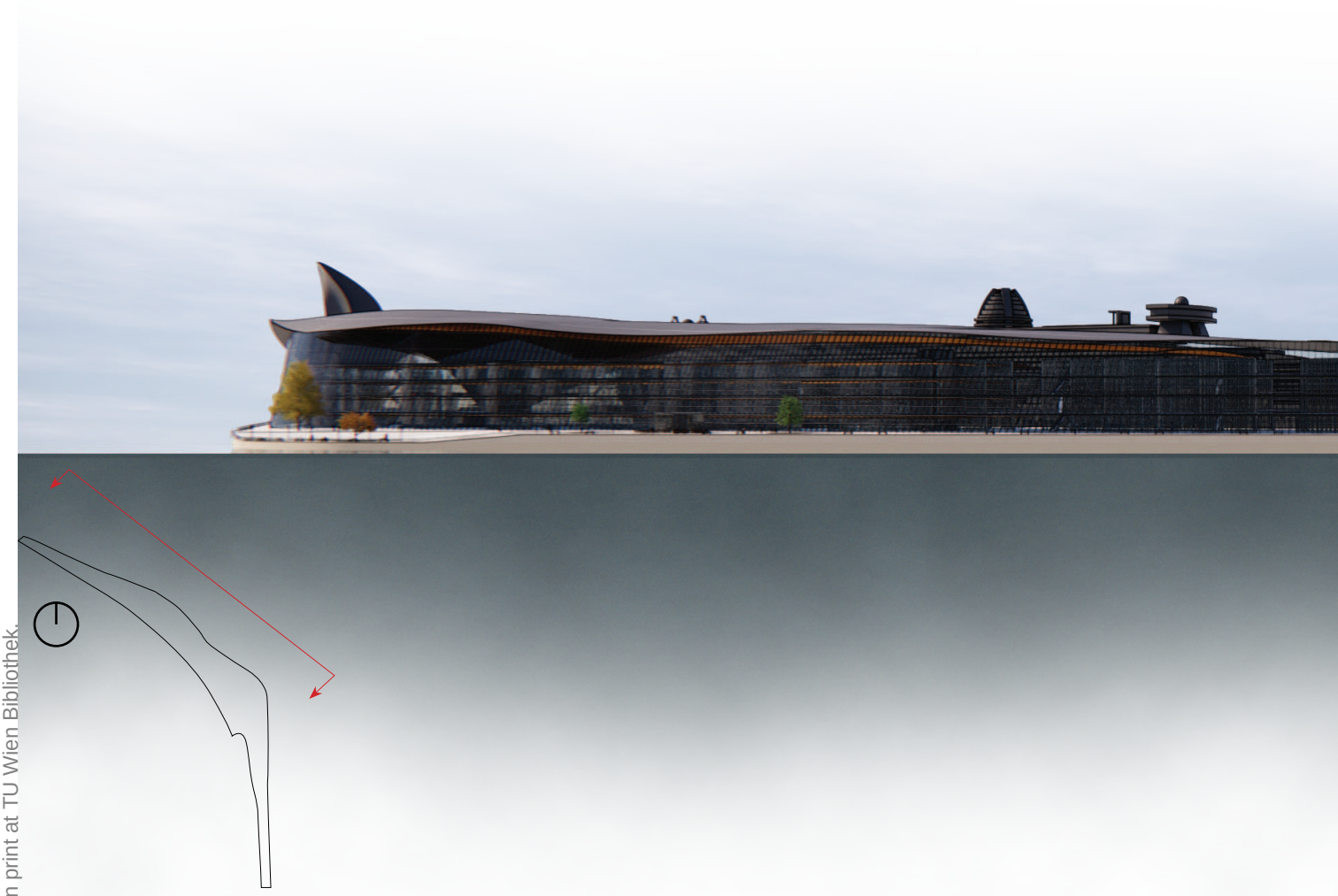


Section 7

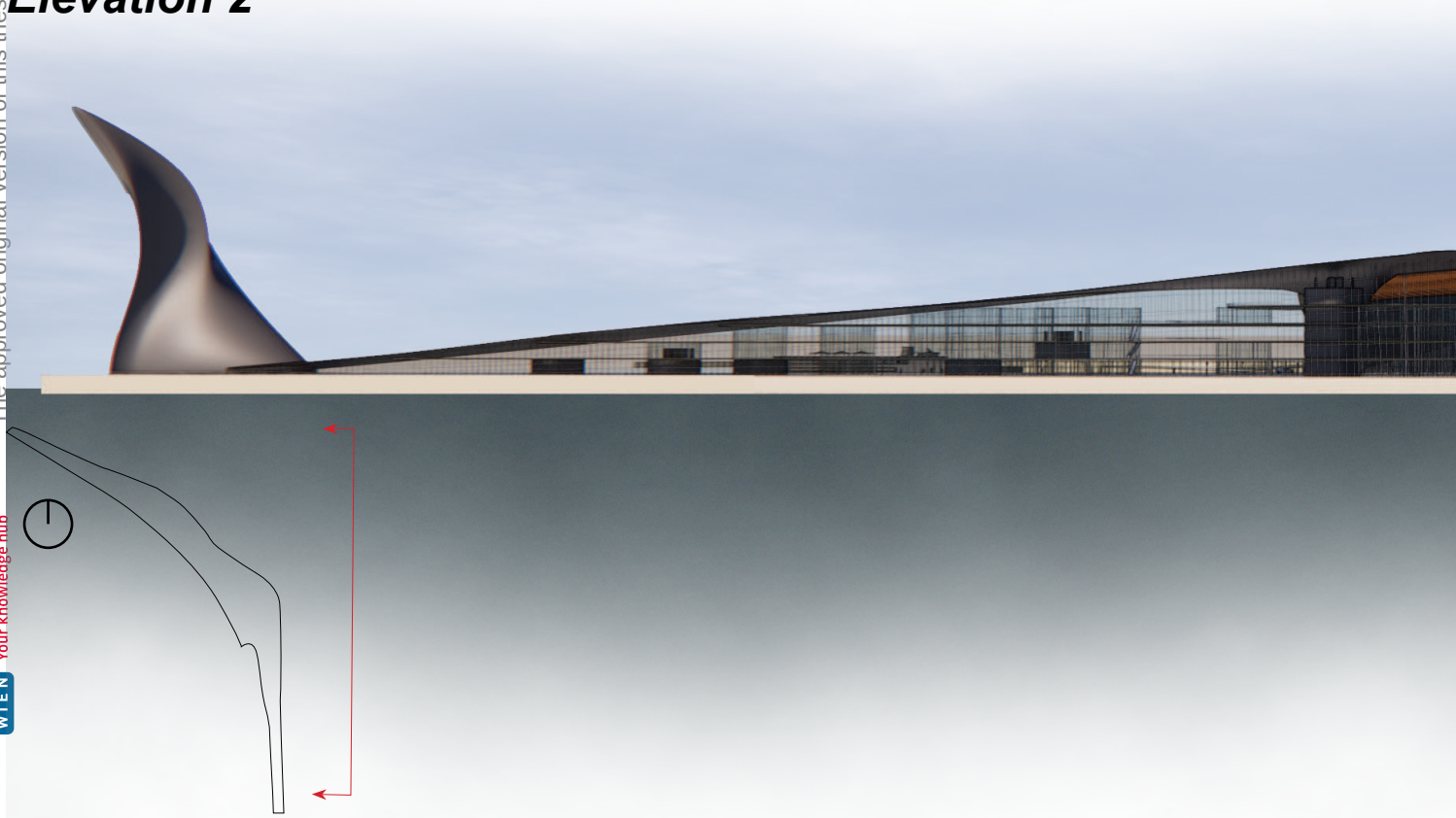


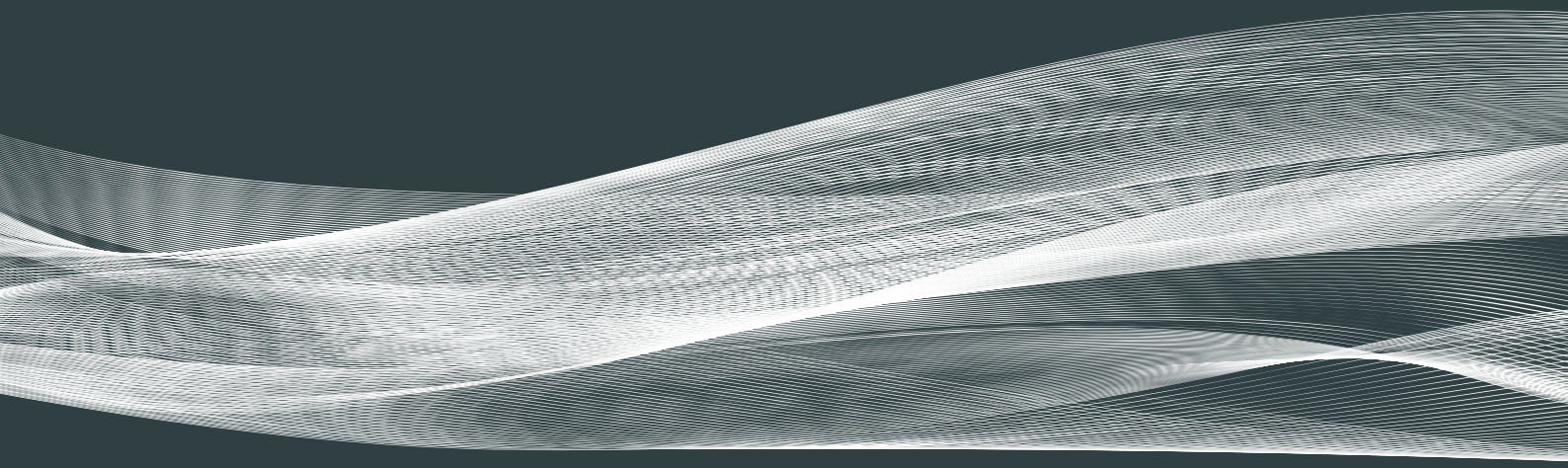


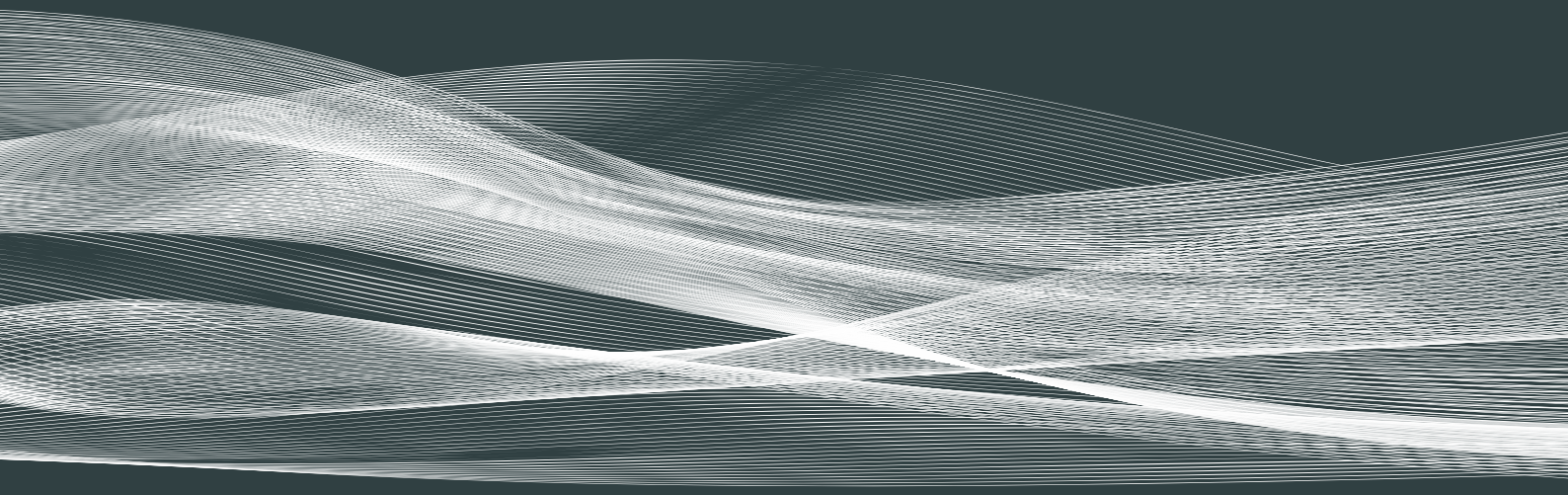
Elevation 1



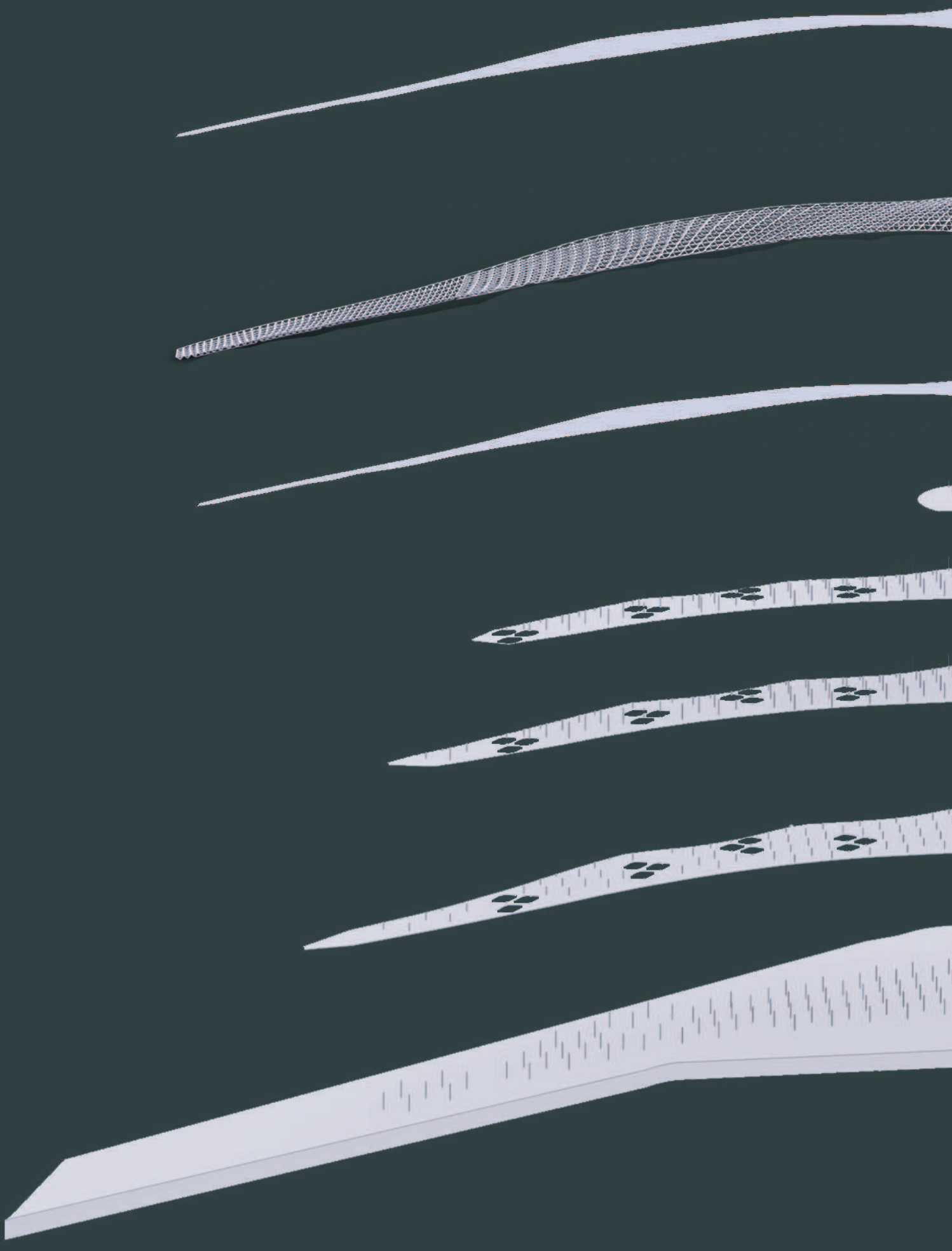
Elevation 2

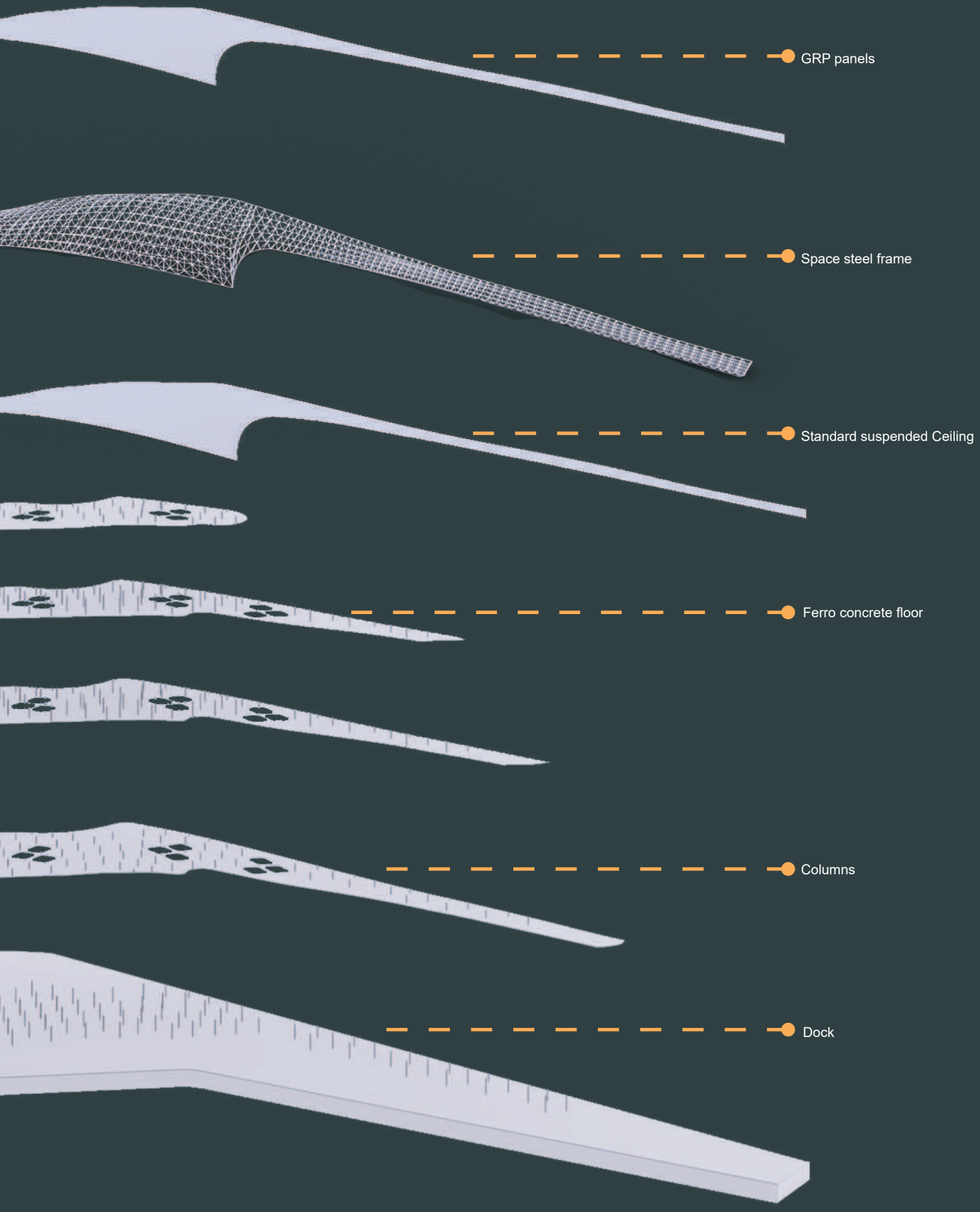


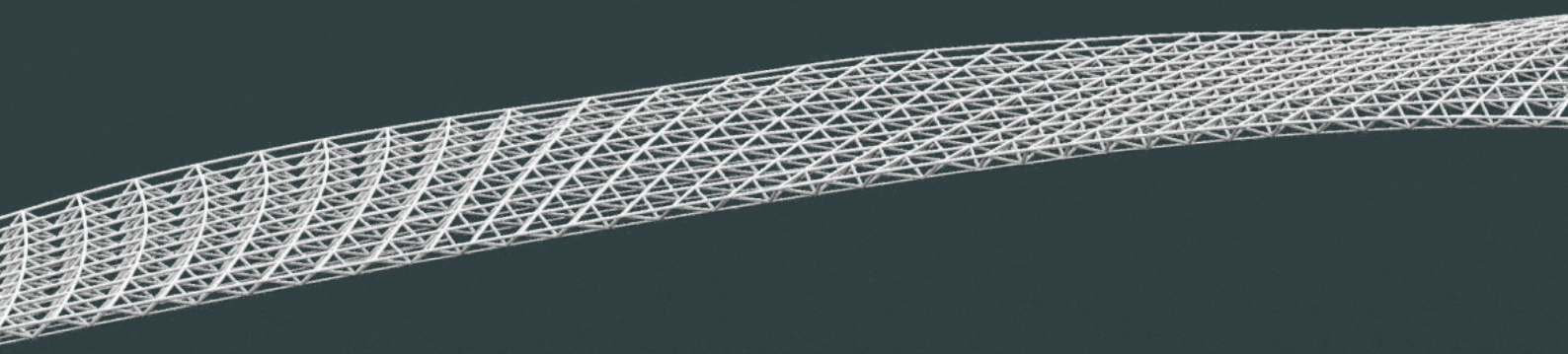


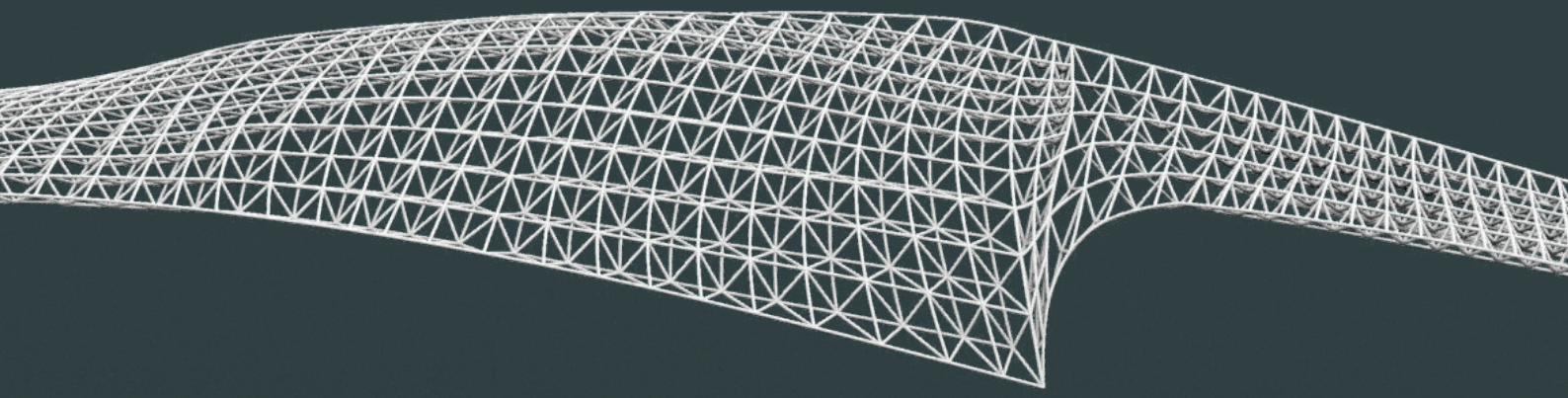


Construction




GRP panels
Space steel frame
Standard suspended Ceiling
Ferro concrete floor
Columns
Dock

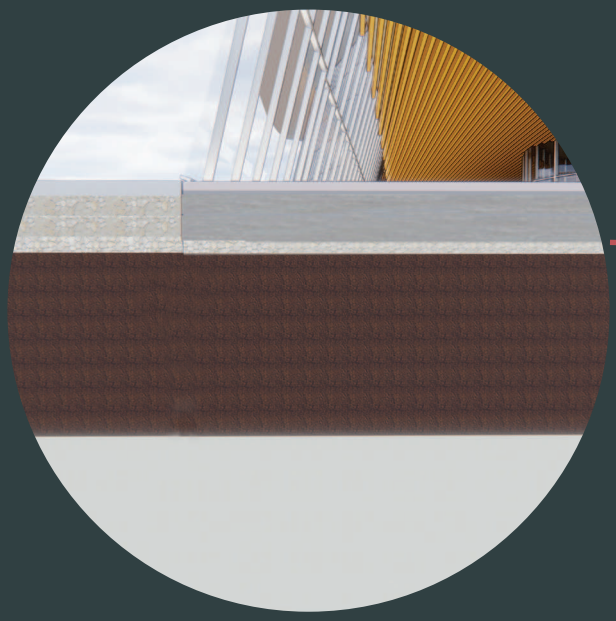


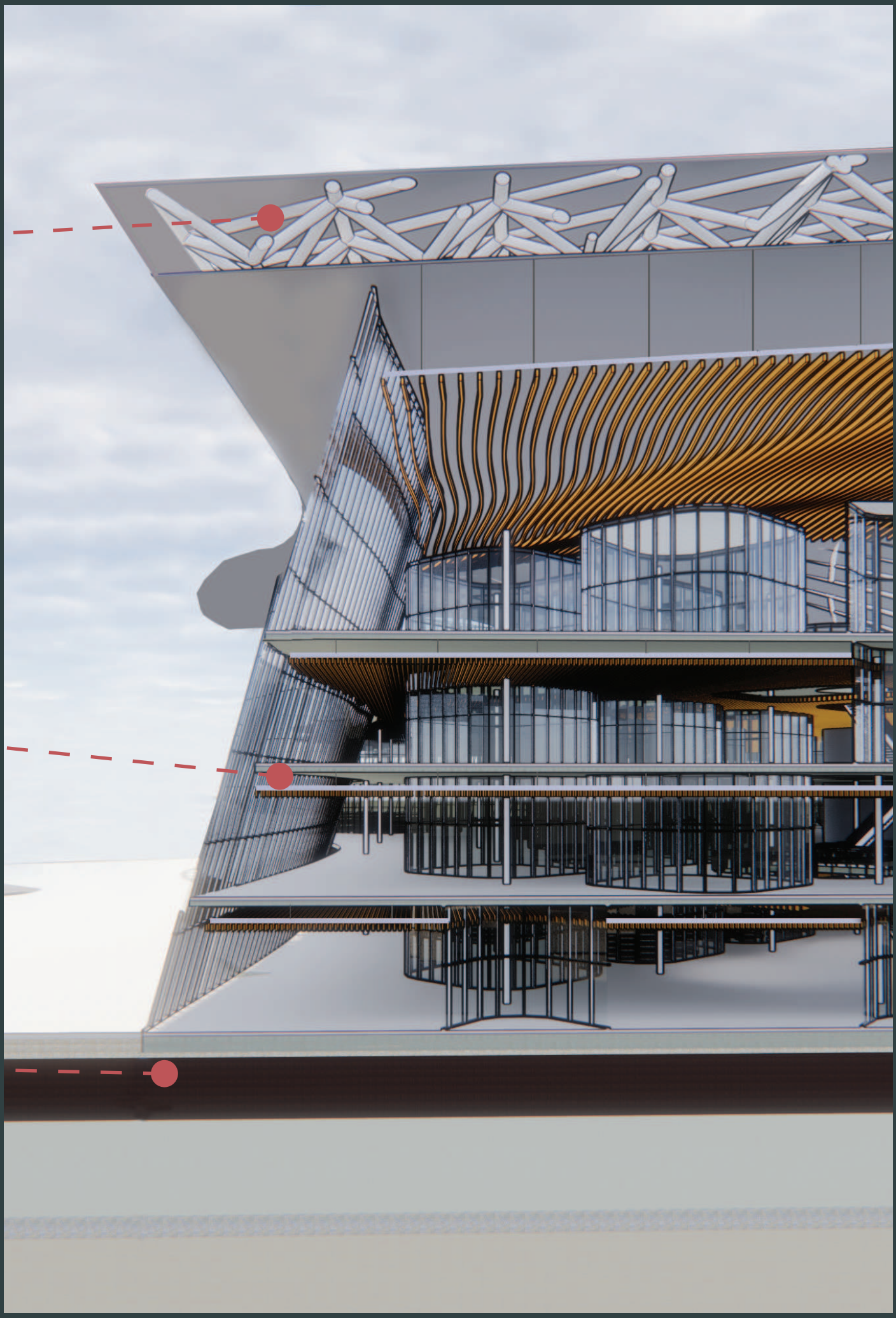


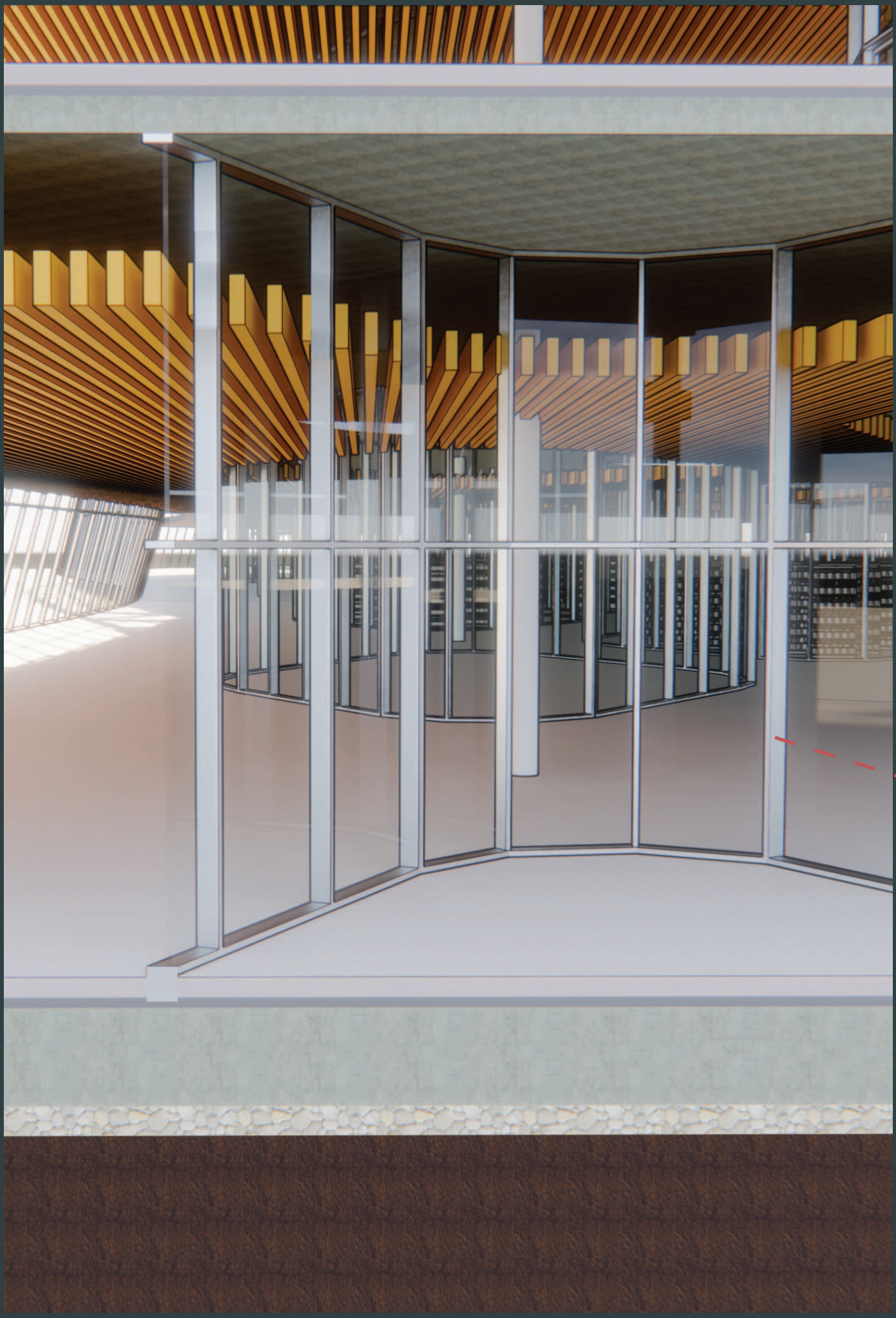
GRP Pannels
Space Steel Frame
Standard suspended Ceiling
Ceiling Mounting Track
Feature Battens

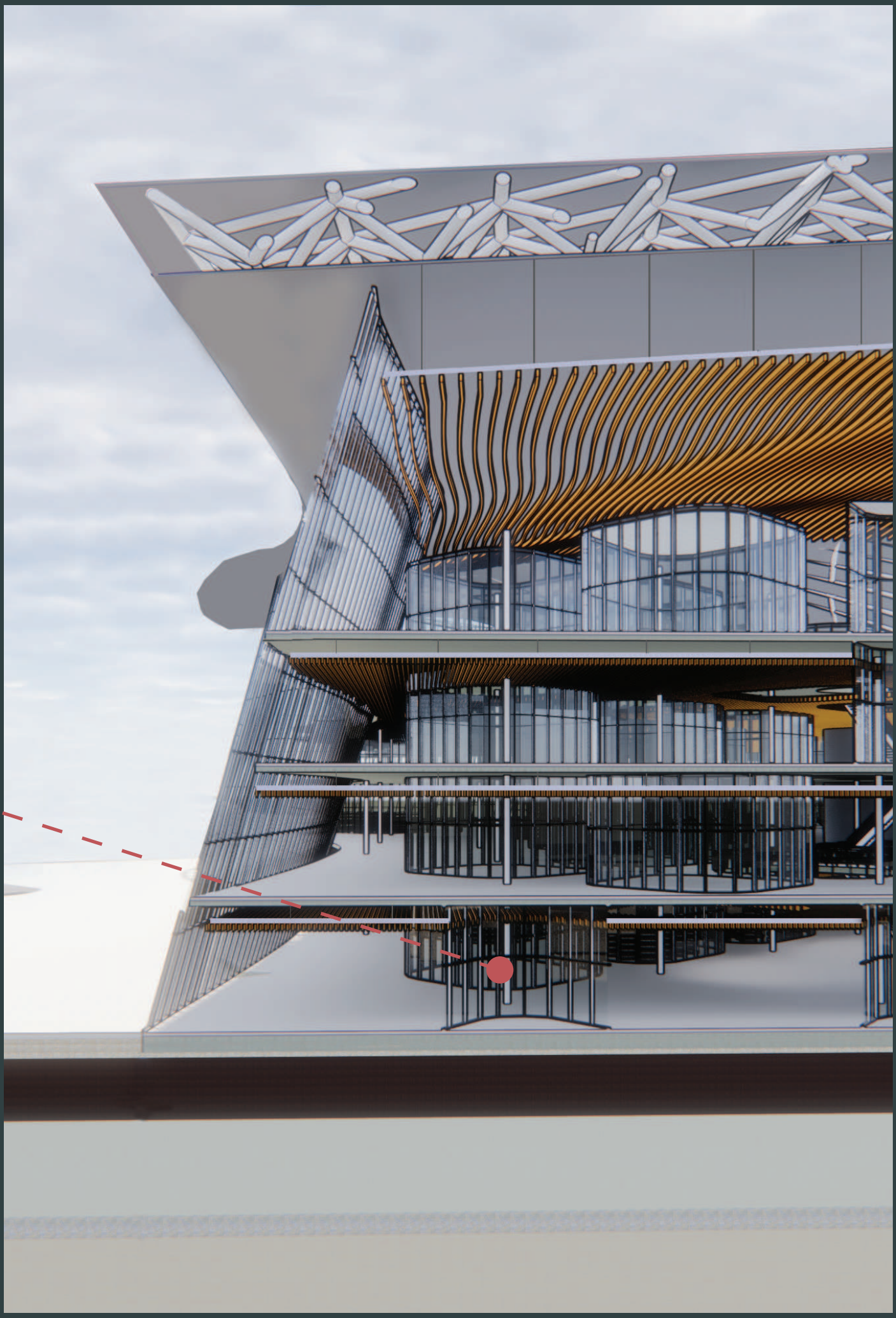
Epoxid floor system 1,5 cm
Screed 10 cm
Soundproof insulation 6 cm
Concrete 20 cm
Standard suspended Ceiling
Ceiling Mounting Track
Feature Battens

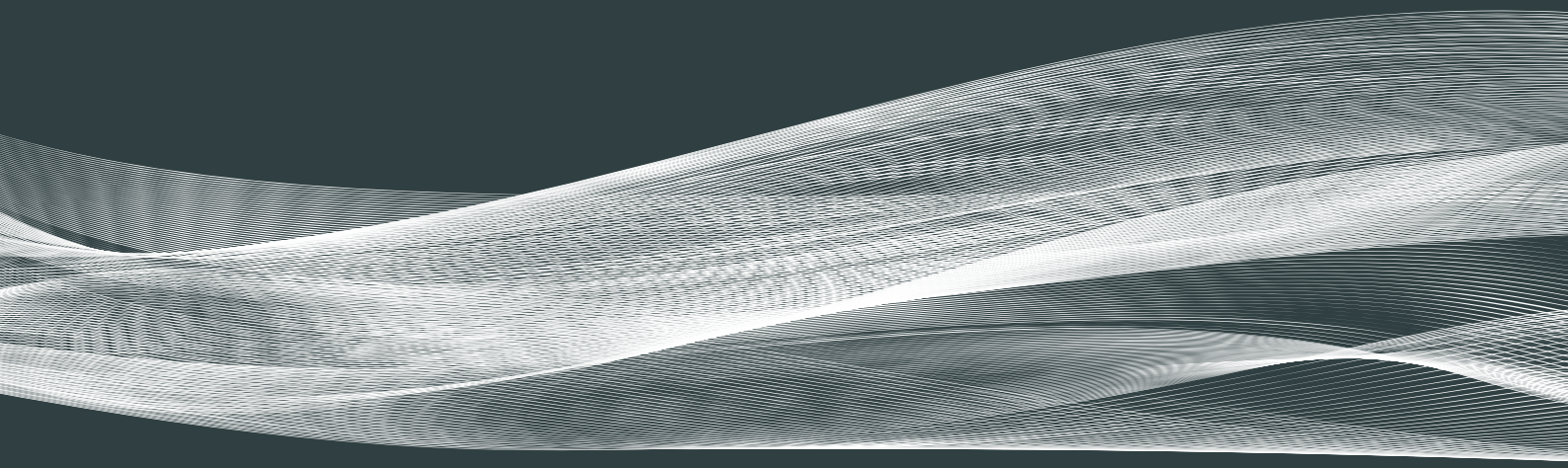
Epoxid floor system 1,5 cm
Screed 10 cm
Soundproof insulation 6 cm
Concrete 50 cm
Crushed stone 25 cm
Earth 250 cm
Sand 360 cm

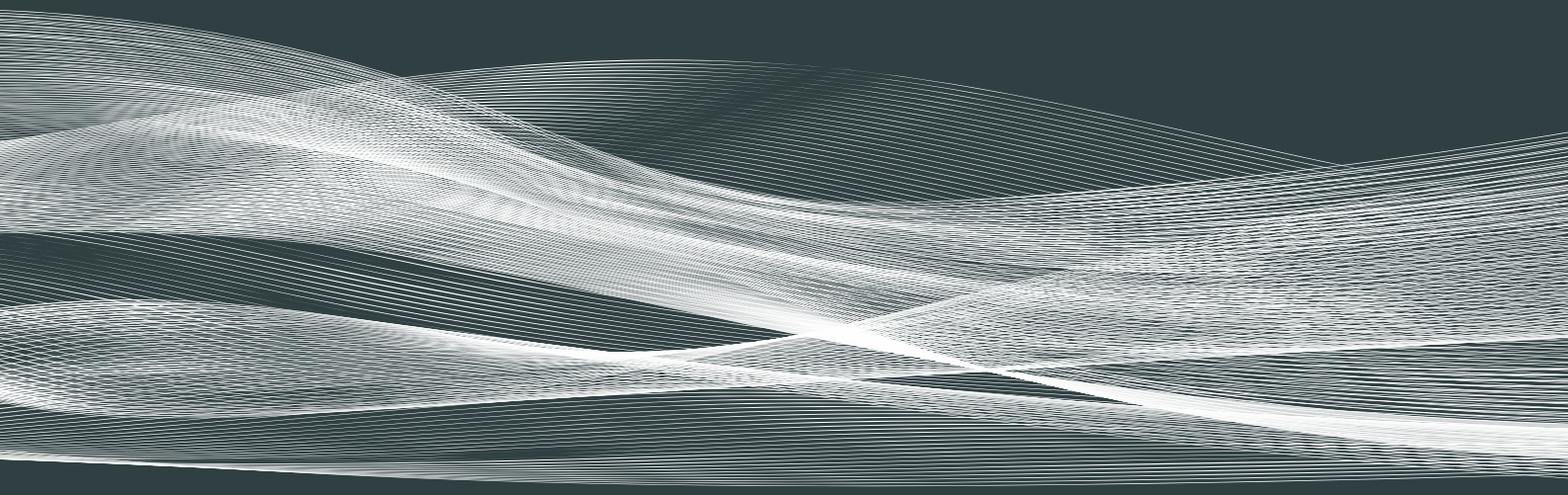












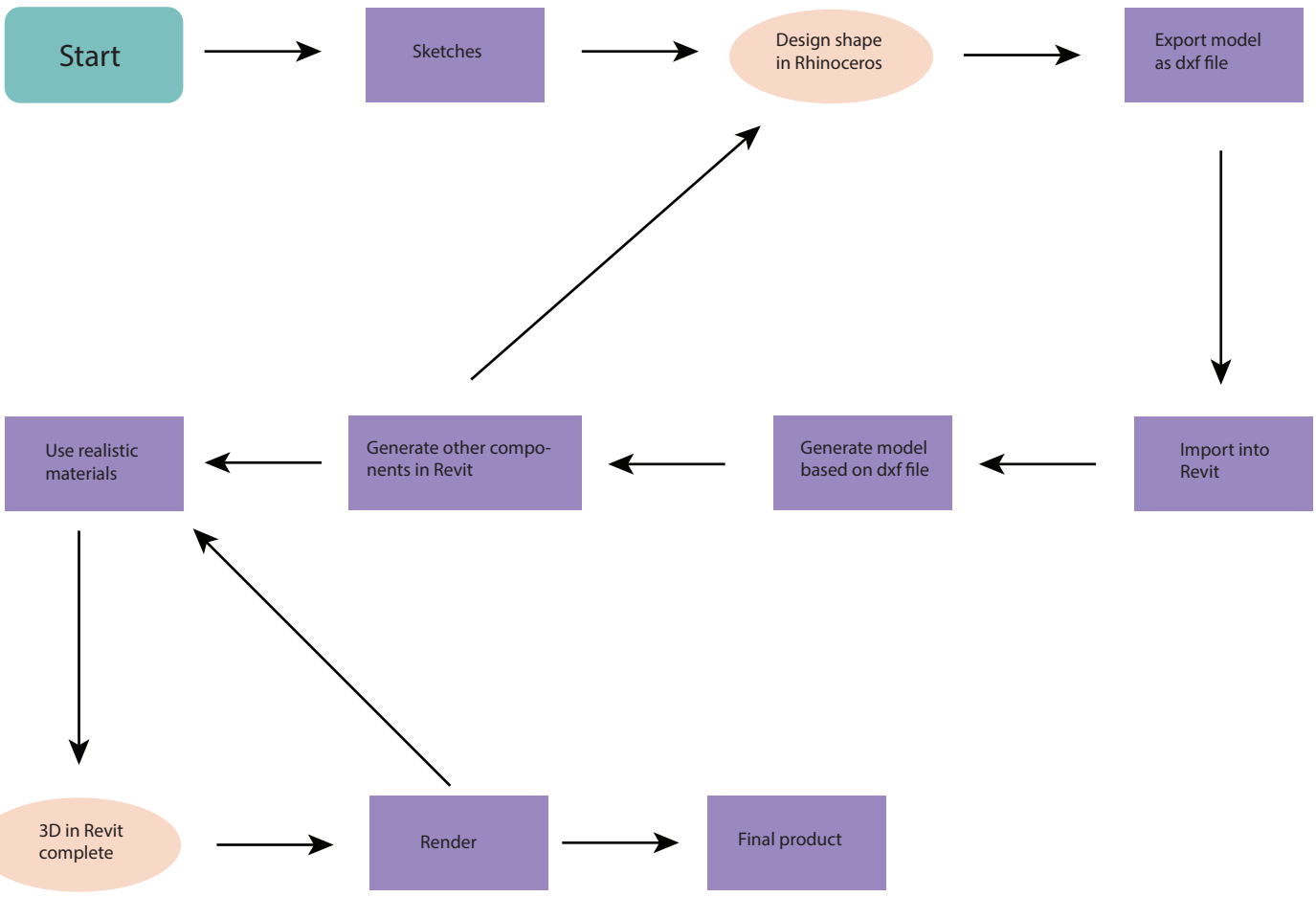
BIM workflow

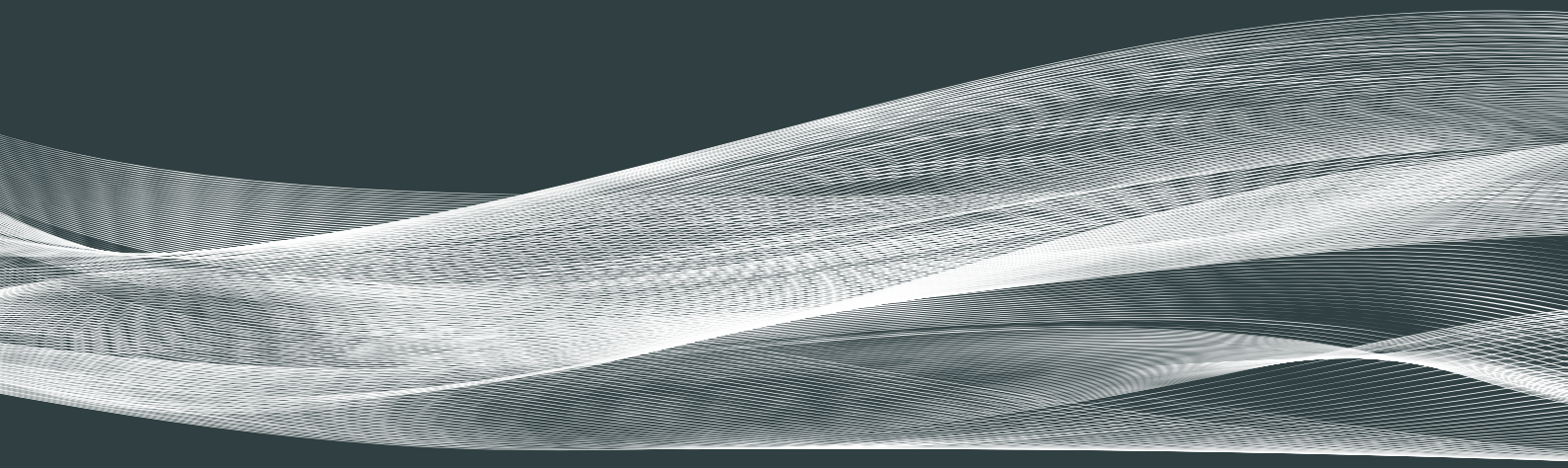
BIM workflow

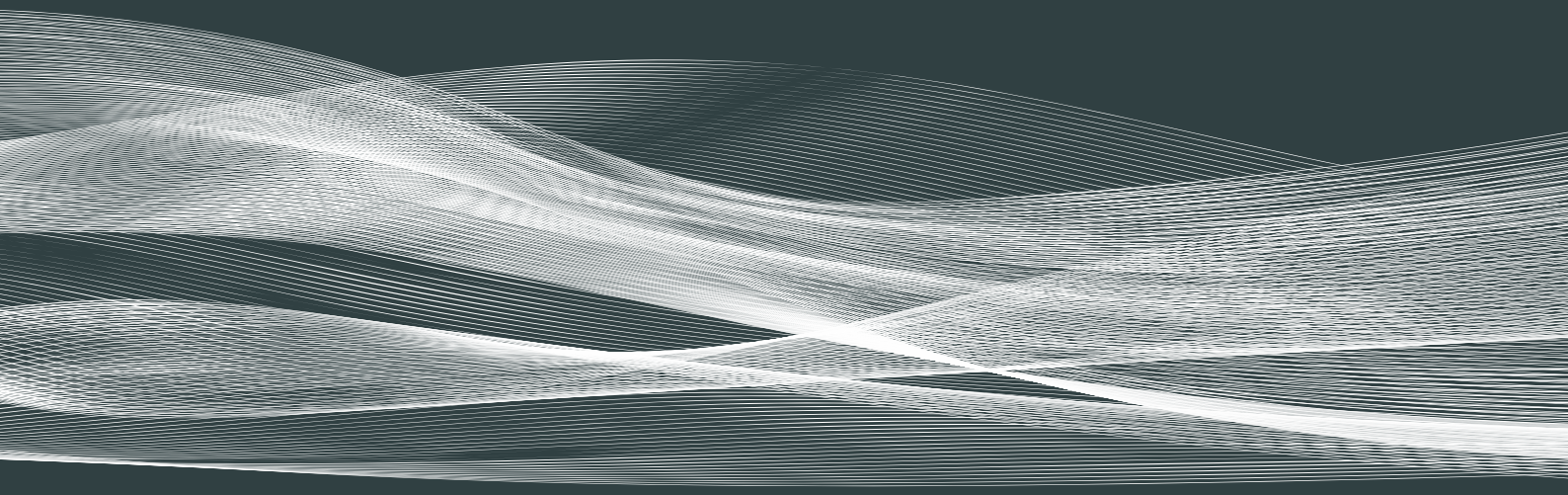
An important task of the master thesis is to realize the whole project in a BIM software (Revit) and to test the possibility of creating the whole shape in 3D.

As in any software, there are challenges which require the help of another software (Rhinoceros) in order to create specific shapes (for example the roof surface). Later on the shape is imported and regenerated in the software.

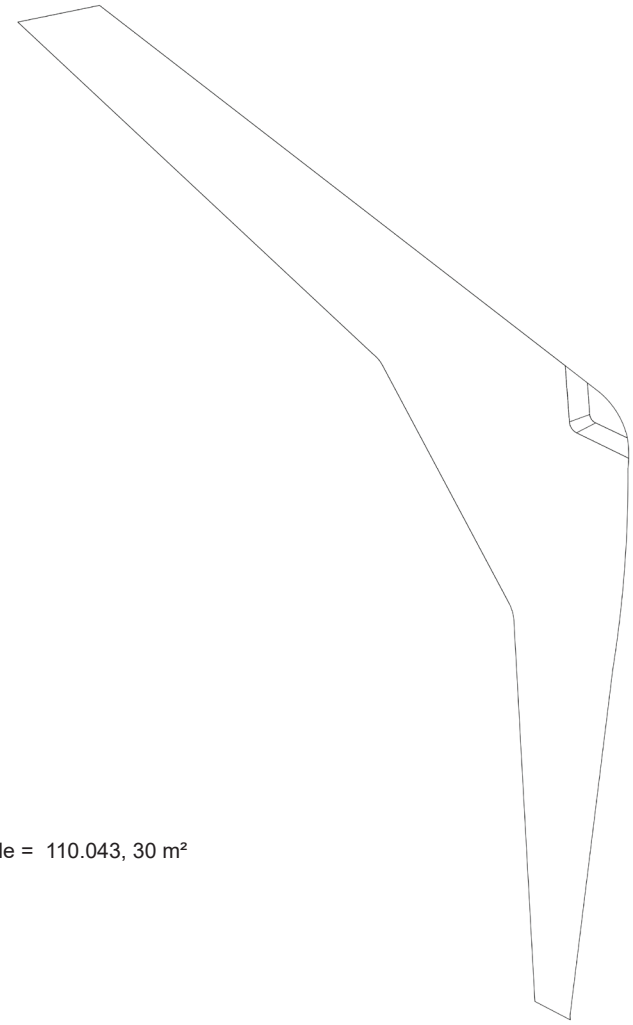
The workflow presents a combination of the two softwares. First was to create the shape in Rhinoceros and later on to import it in BIM software (Revit). After having the main structure all the building, it was possible to import the necessary oject families and materials which would bring an atmosphere for the 3D visualization.



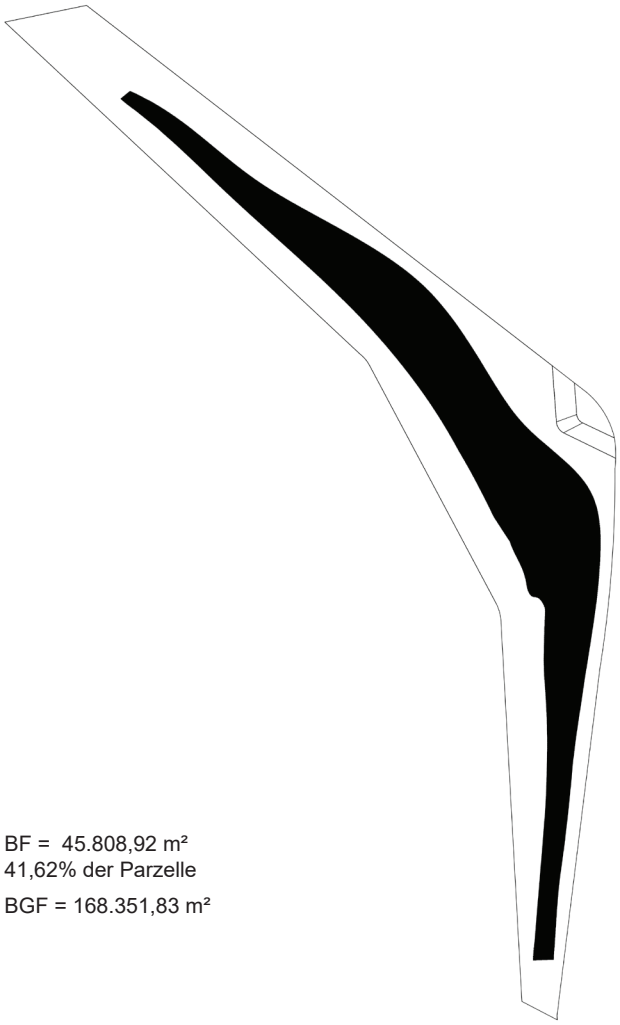




Surface evaluation

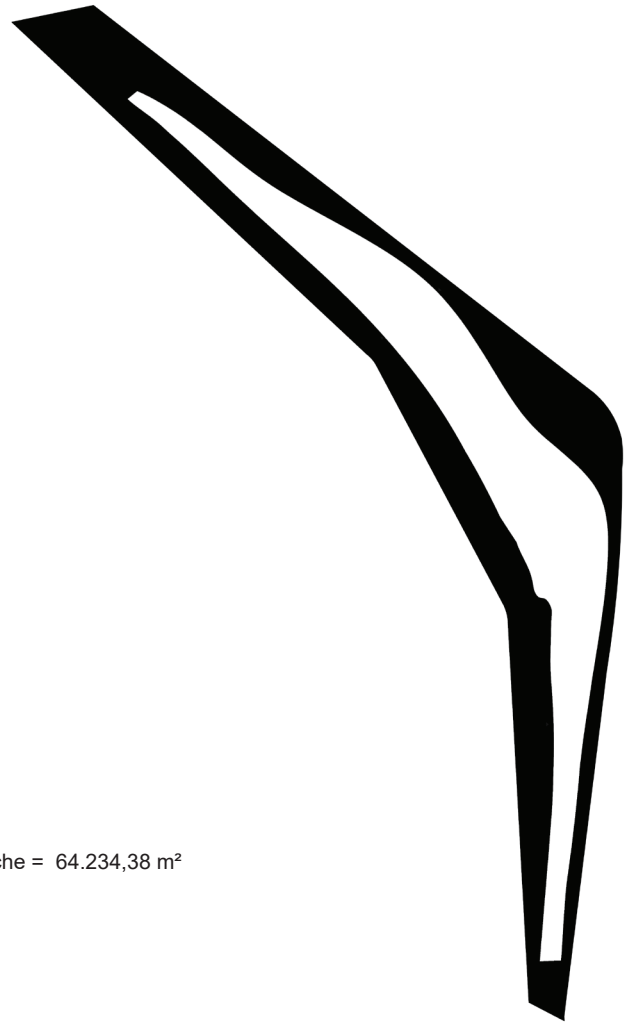


Parzelle = 110.043, 30 m²



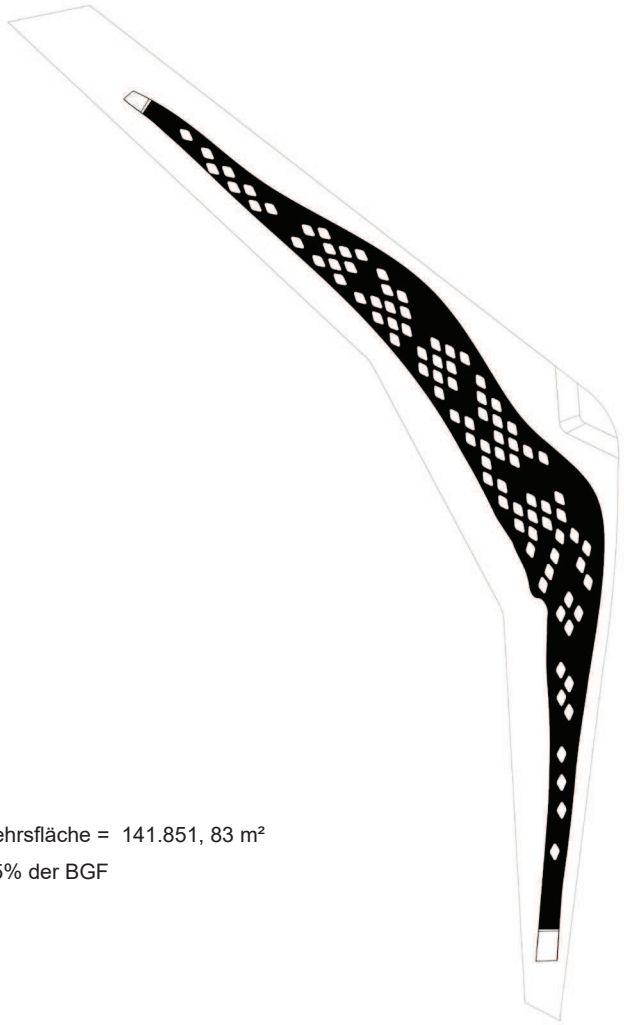
BF = 45.808,92 m²
41,62% der Parzelle

BGF = 168.351,83 m²

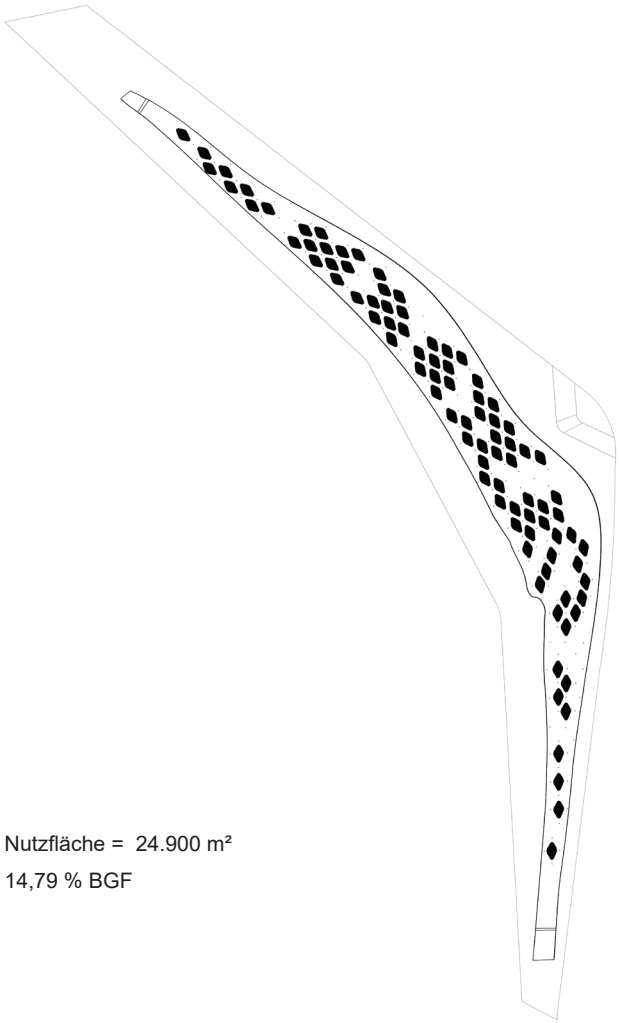


Freifläche = 64.234,38 m²

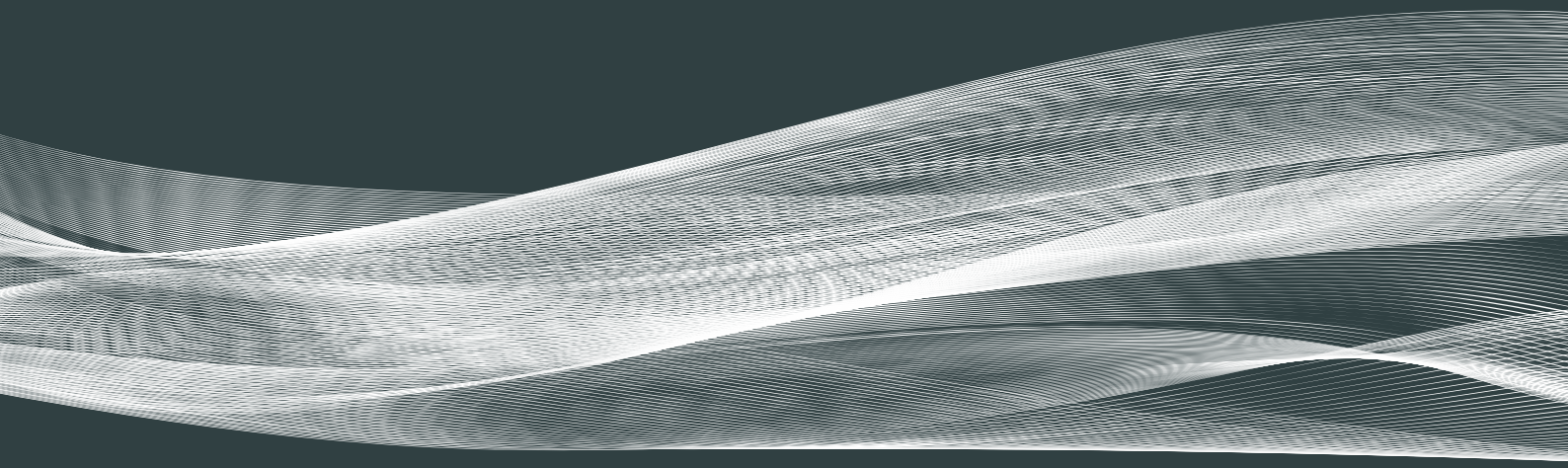
Tarafläche = 5.650,32 m²
3,35% der BGF

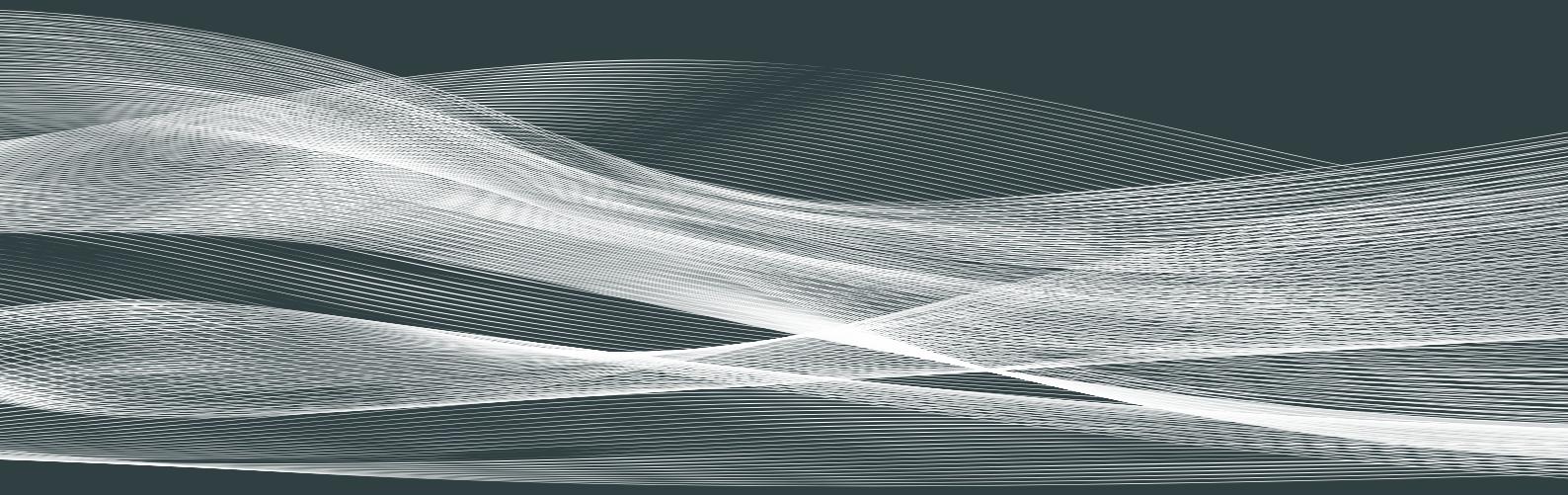


Verkehrsfläche = 141.851, 83 m²
84,25% der BGF



Nutzfläche = 24.900 m²
14,79 % BGF





Visualization

Fig. 93

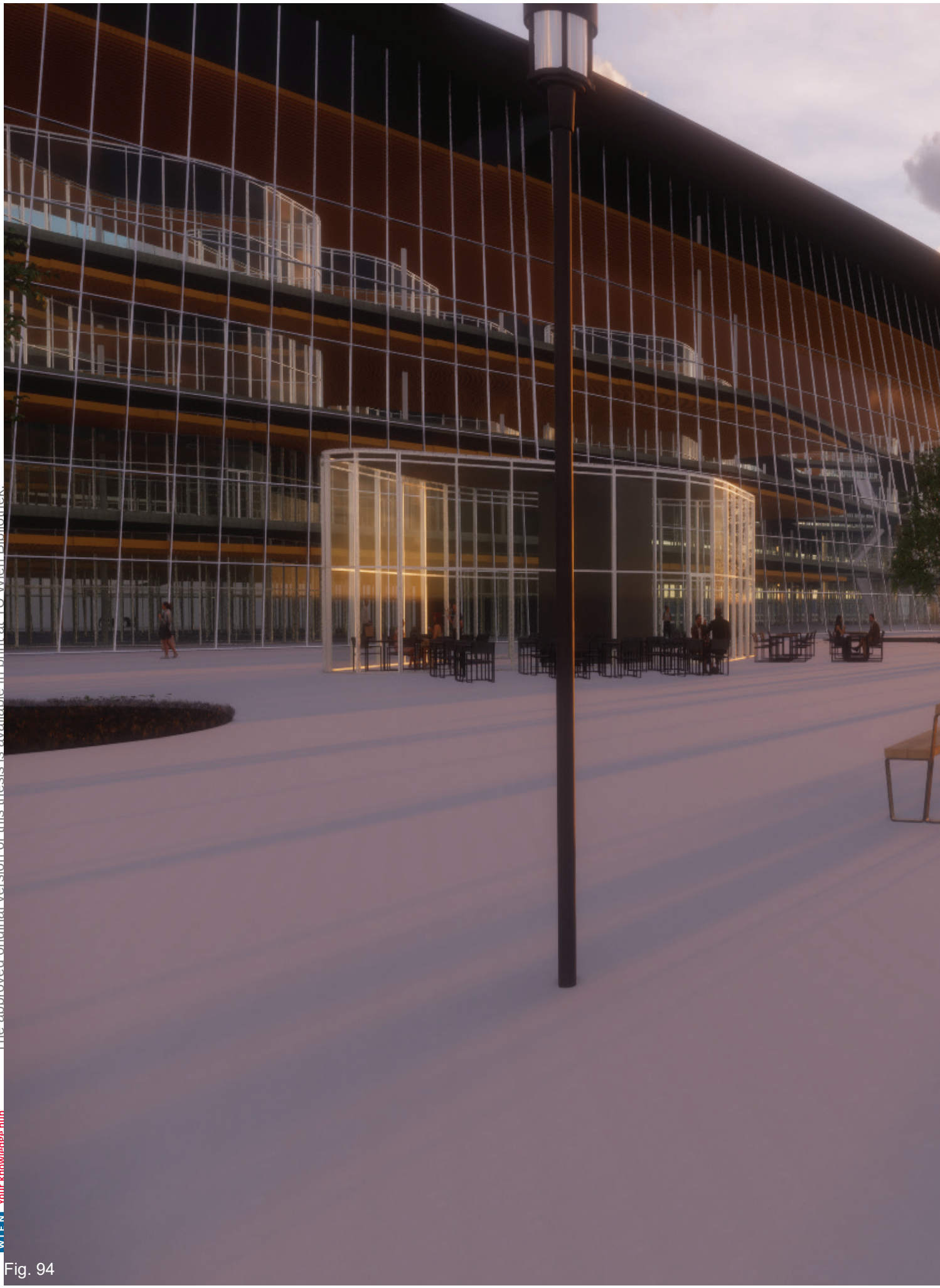
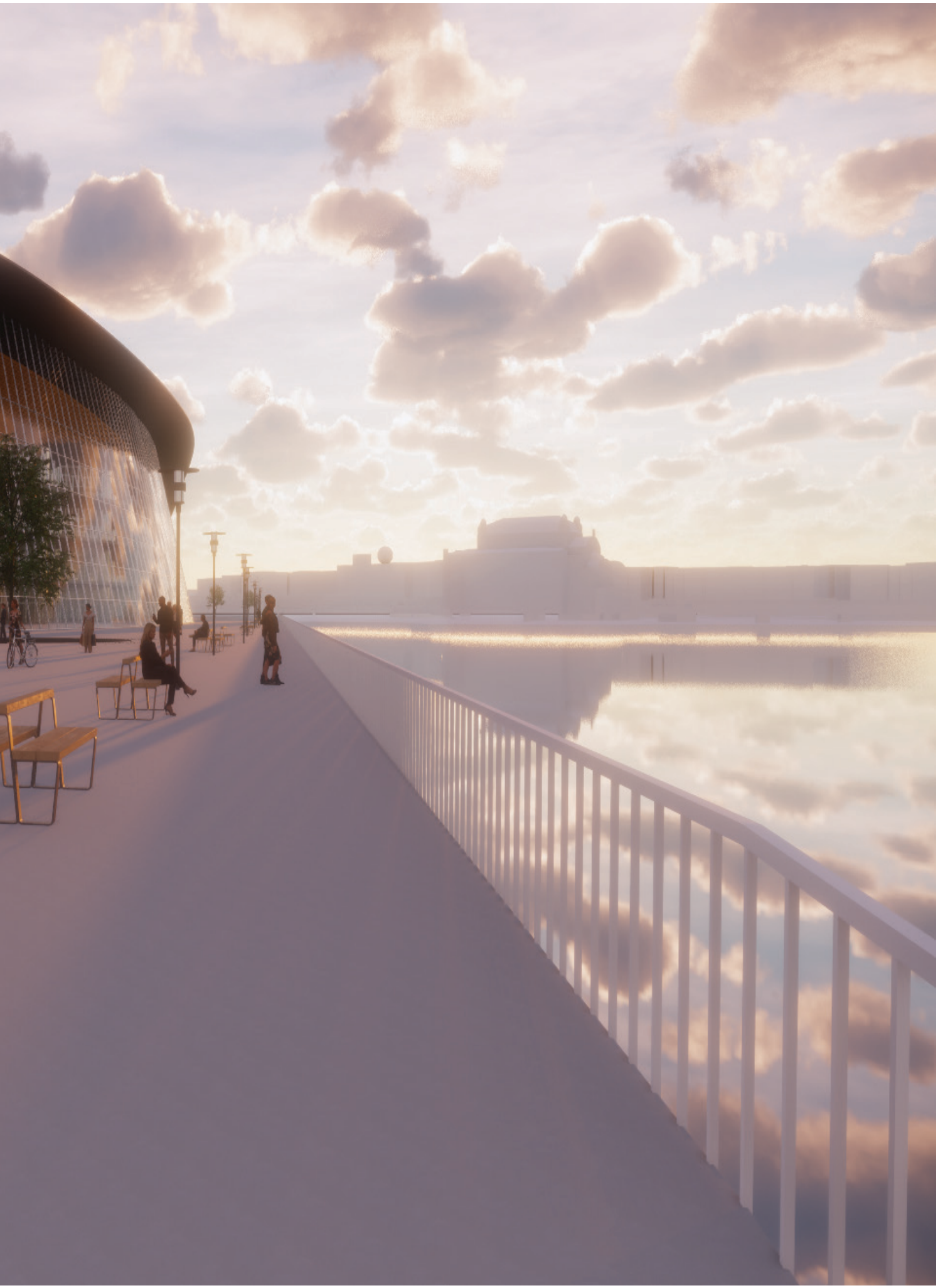


Fig. 94



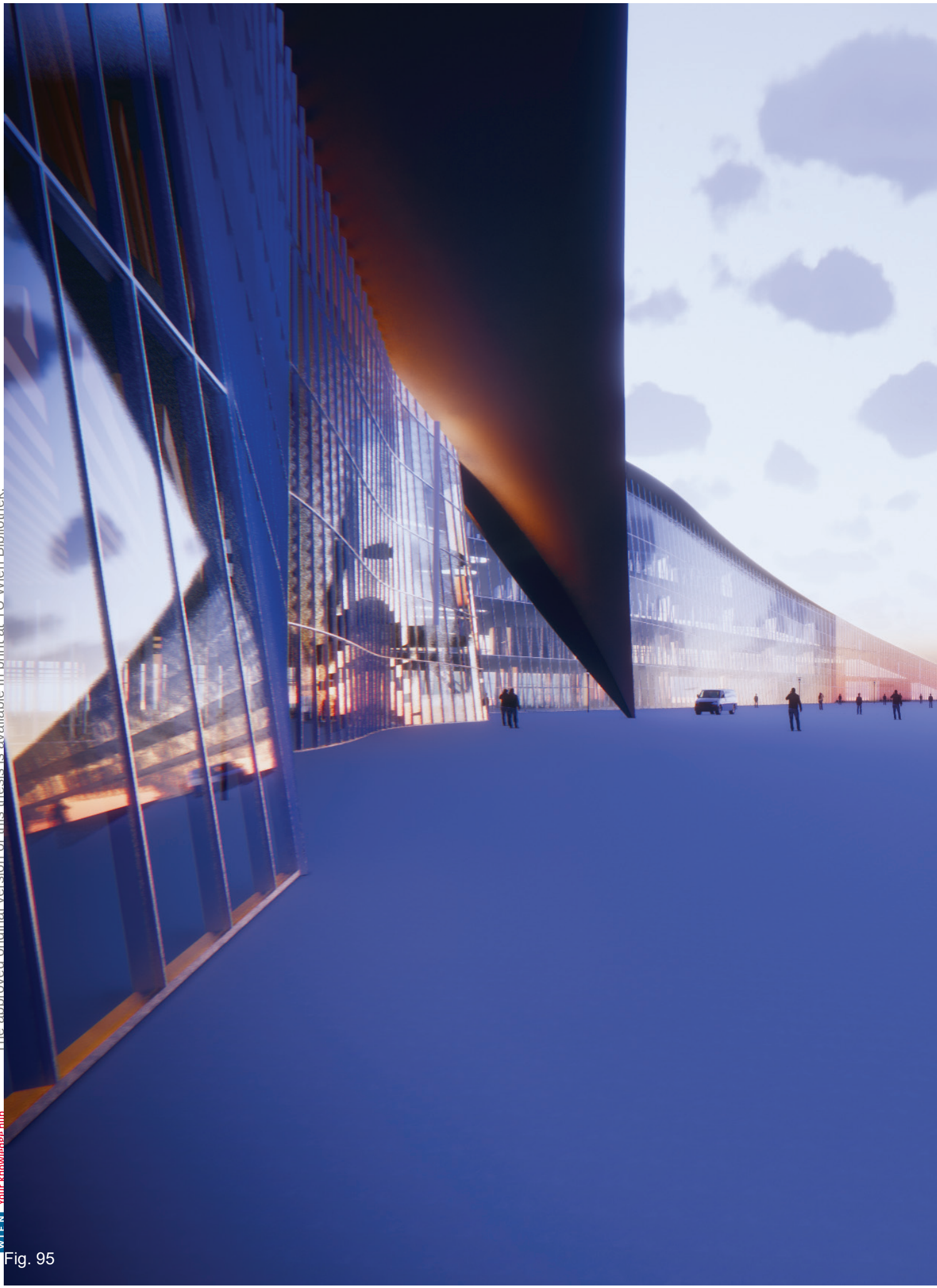


Fig. 95

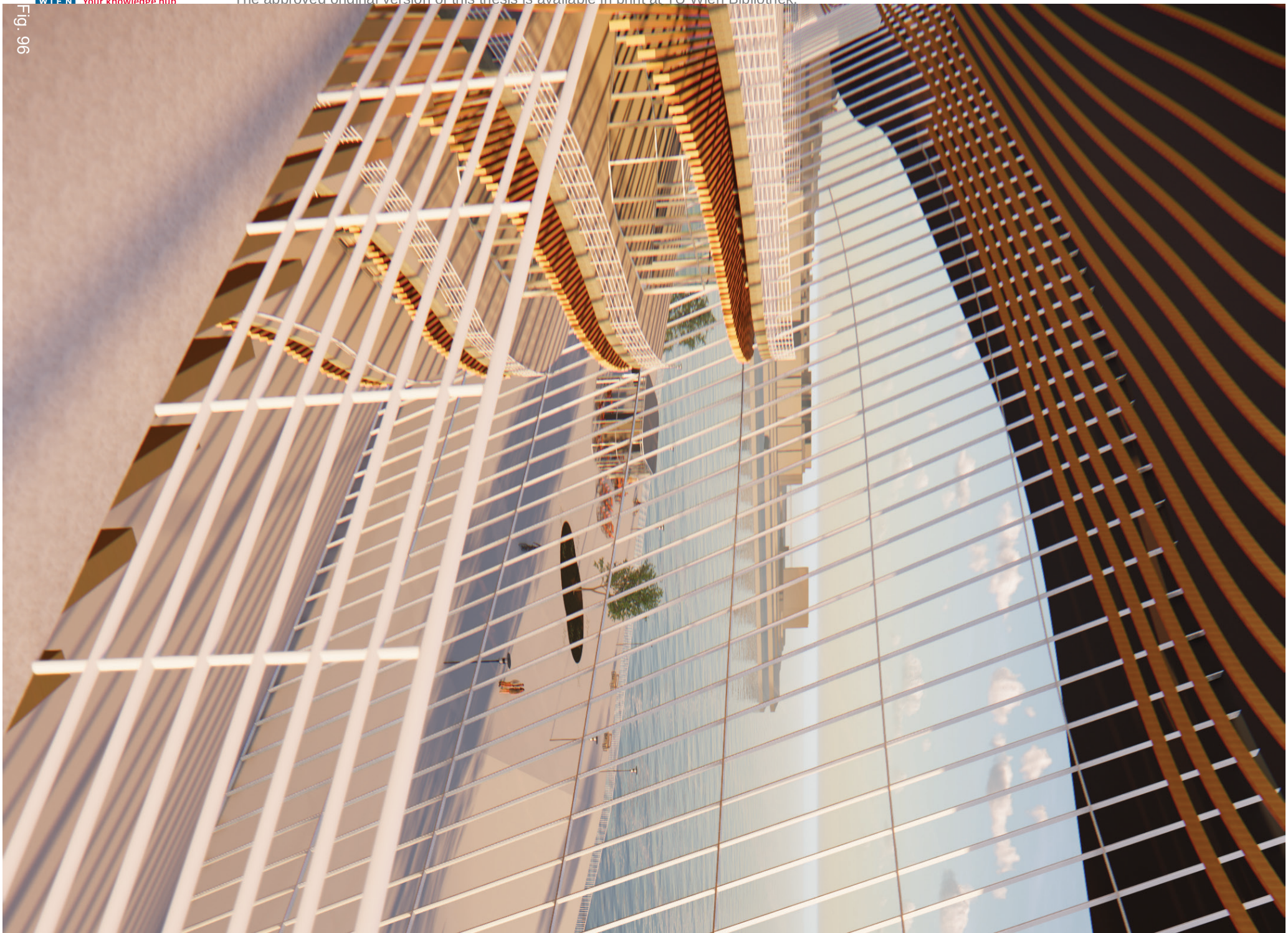
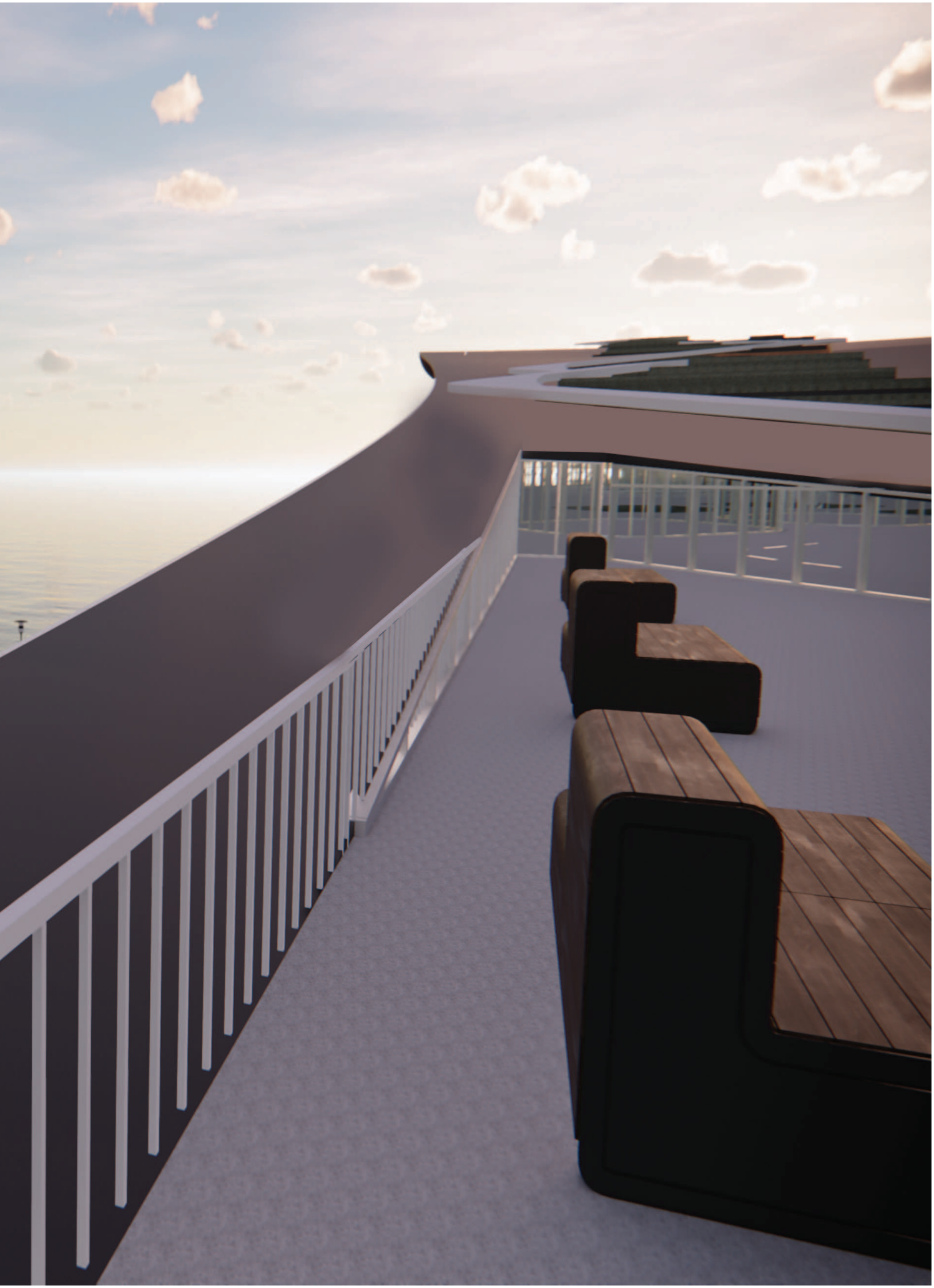
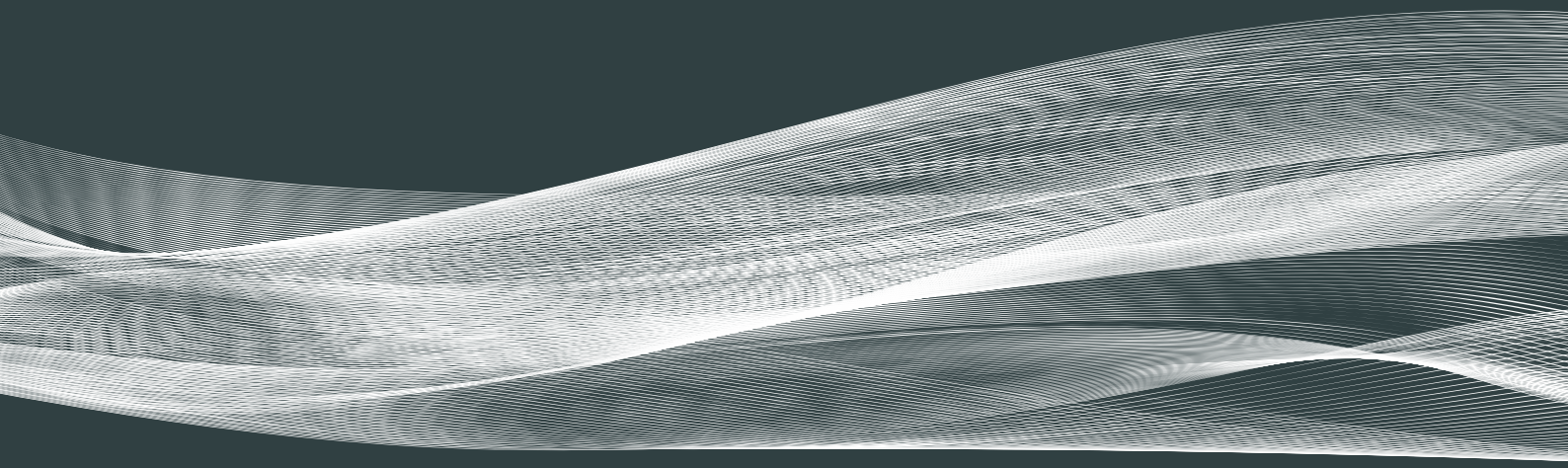
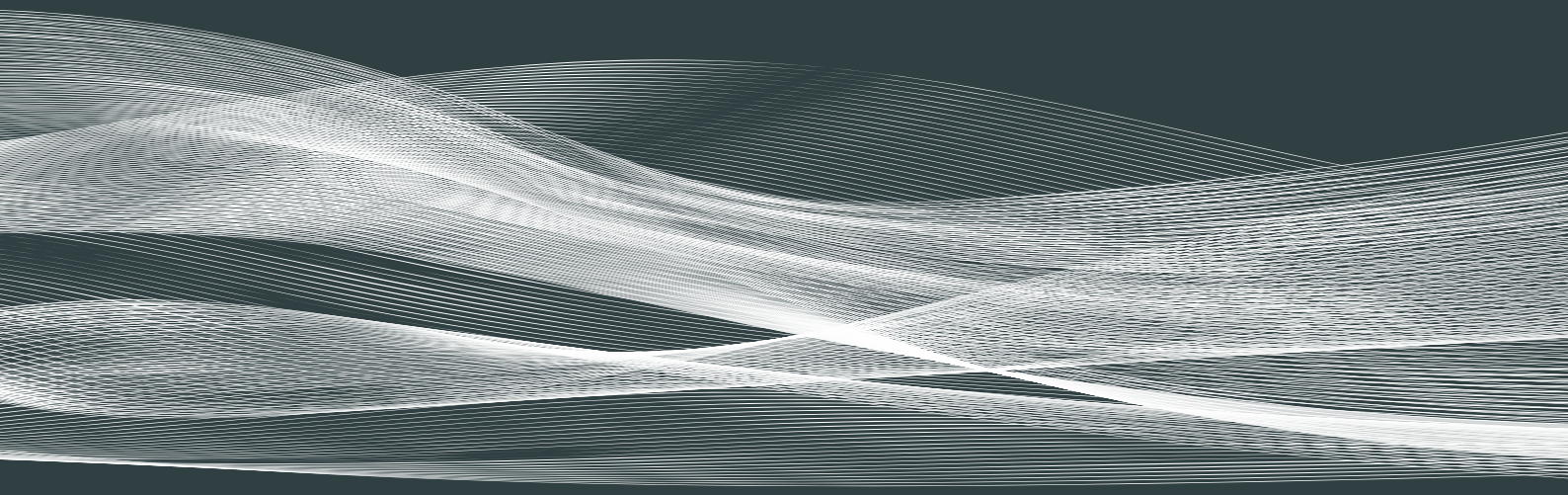


Fig. 96

Fig. 97







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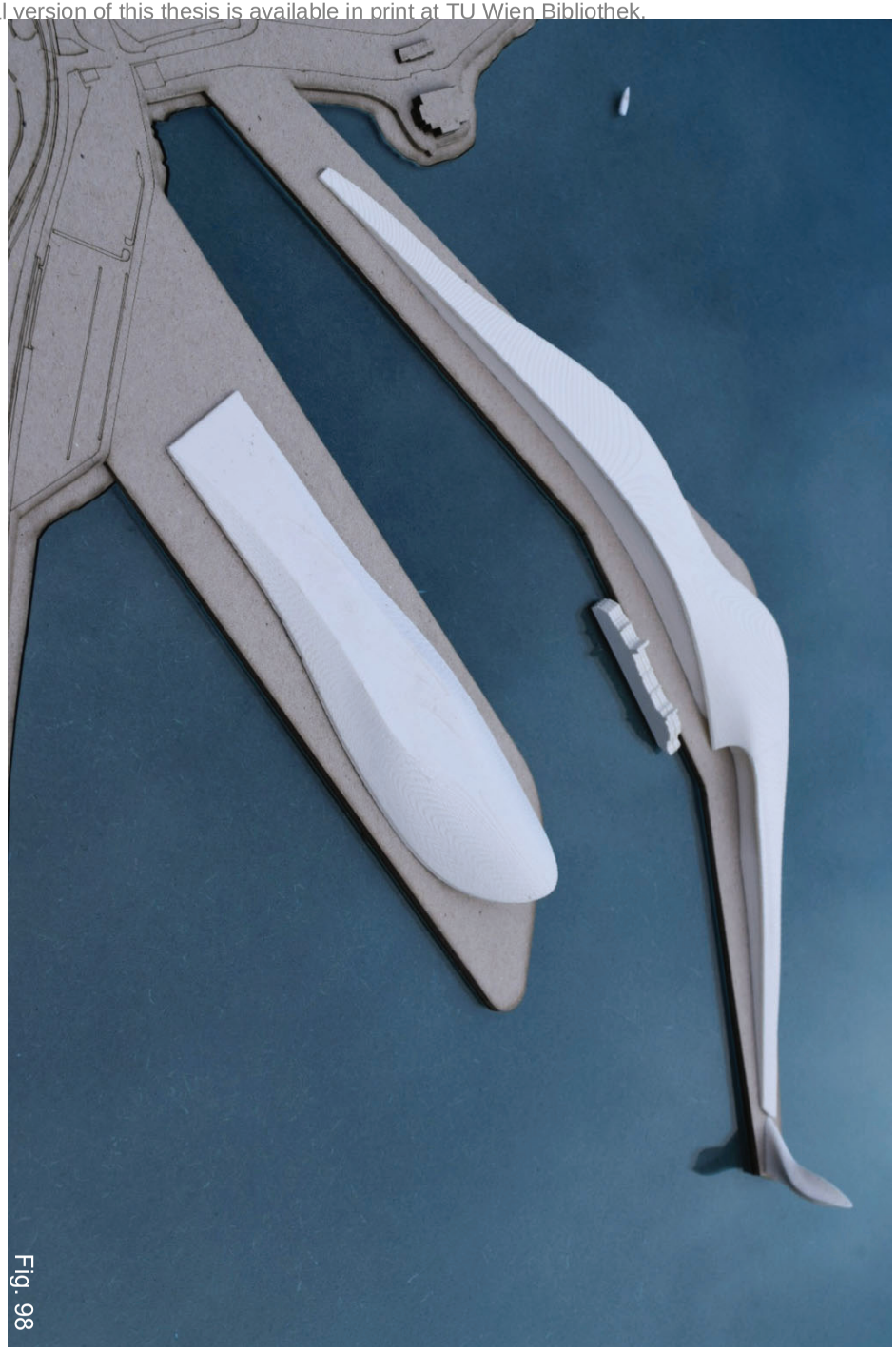

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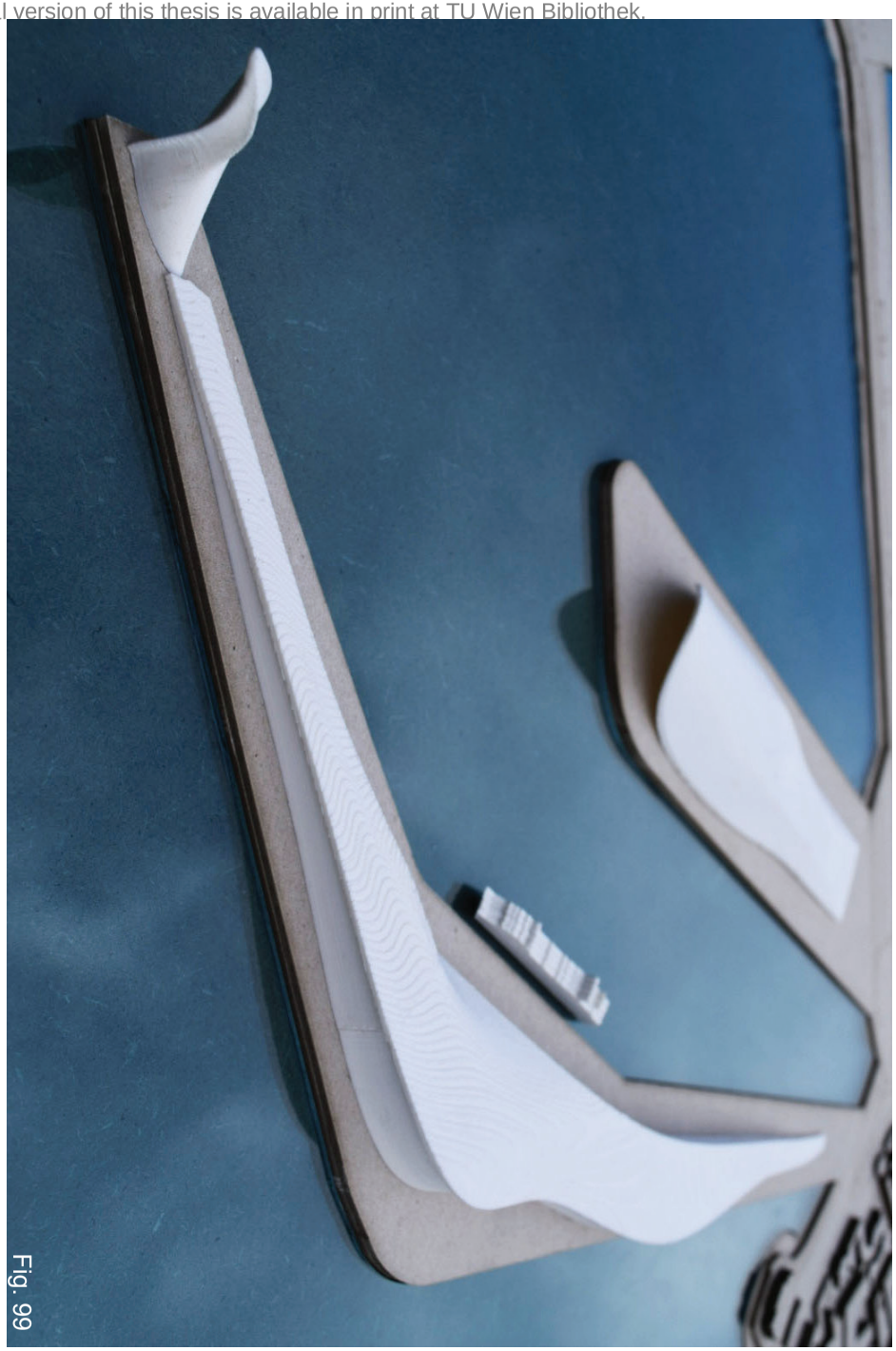

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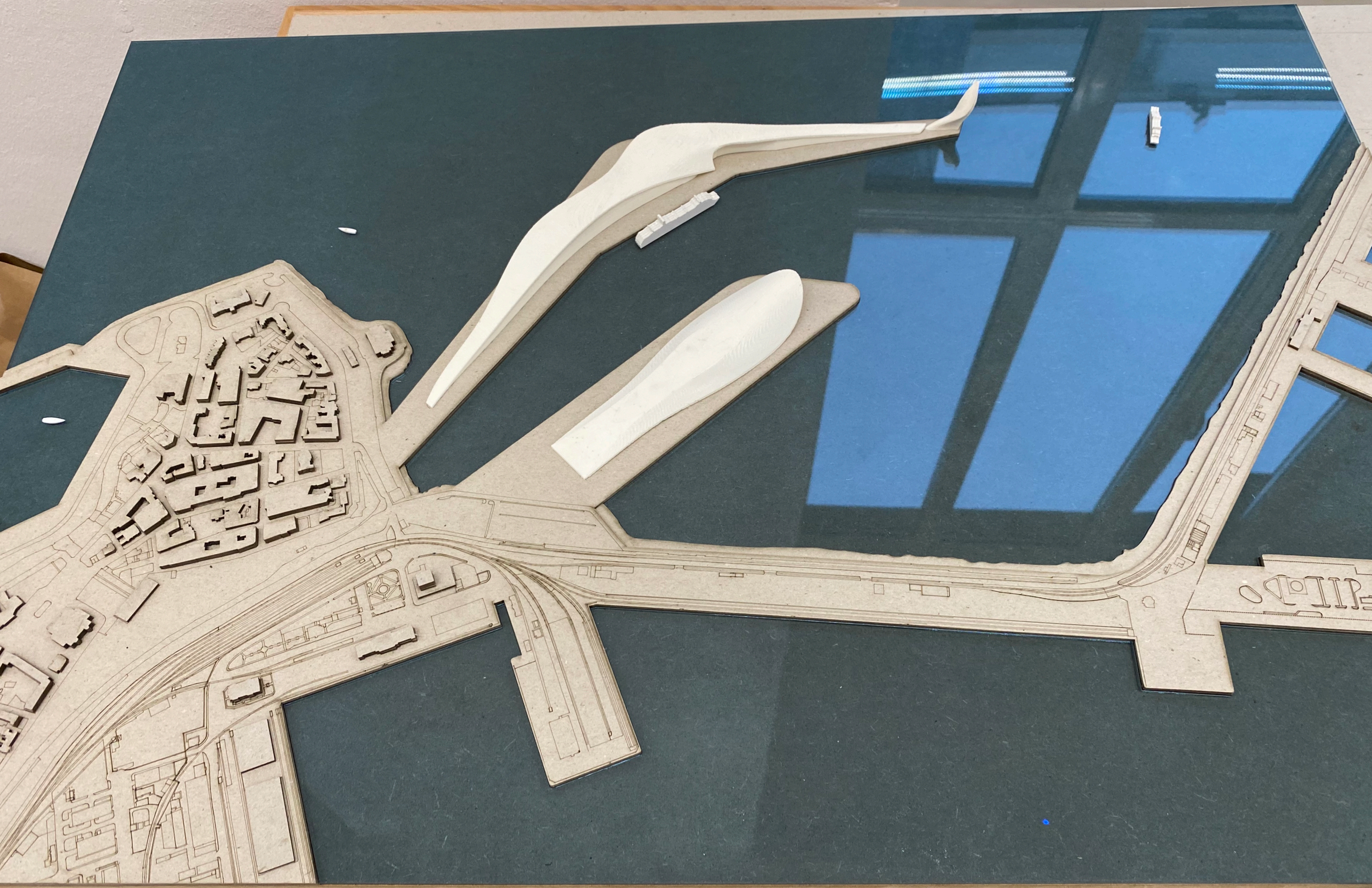

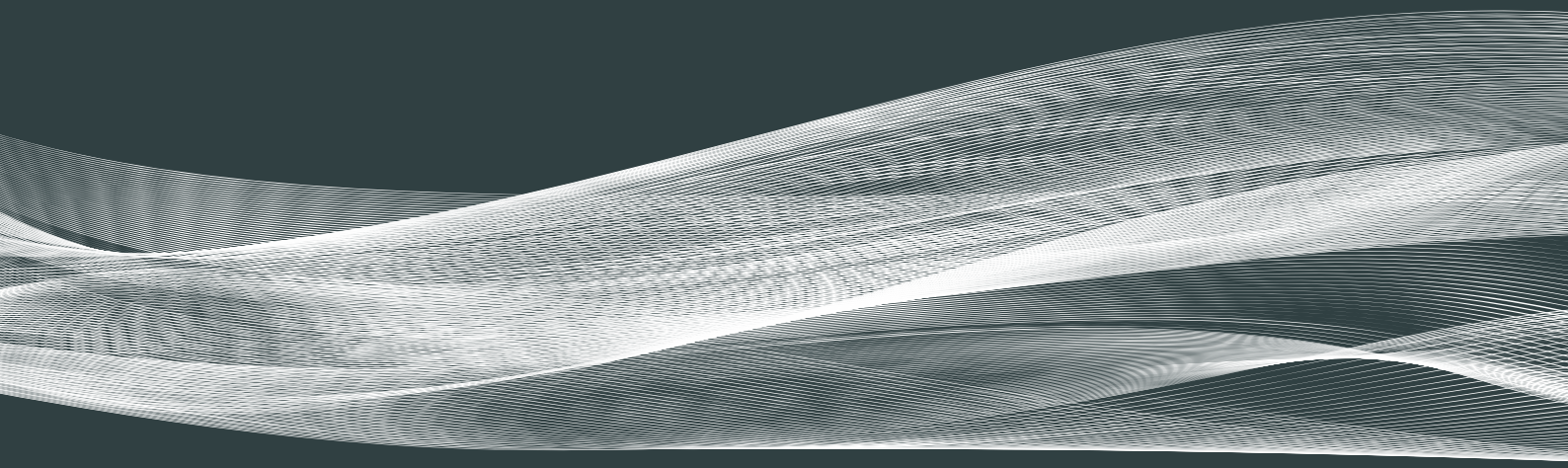

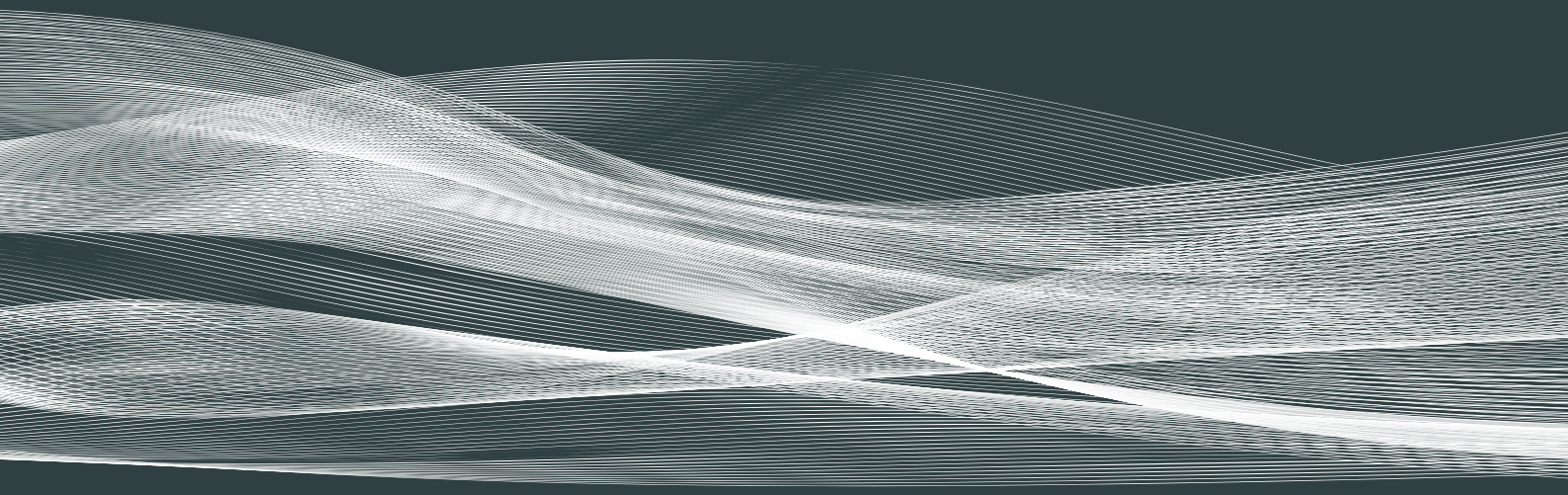

Conclusion

The project ‘Cruise Waves’ comes as an answer for the necessity to expand the cruise terminal in the harbor of Constanta and to offer a new experience, not only for the tourists, but also for the inhabitants of the city.

It combines the different functions necessary to a harbor, offering an interesting architecture and a panorama view over the old town.

‘Cruise Waves’ can represent a new point of interest for Constanta city.

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https://www.cugetliber.ro/stiri-economie-navele-de-pasageri-au-sters-portul-constanta-de-pe-lista-croazierelor-310669

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References

https://en.wikipedia.org/wiki/Port_of_Constan%C8%9Ba

https://www.portofconstantza.com/apmc/i.do?lan=en

Development of Strategy on short, medium and long term report, Consulting Consortium EY SRL - INROS LACKNER SE. Nov. 2014

Portul Constanta de la antichitate la mileniul III
Valentin Ciorbea, Editura Europolis Constanta, 1995

Portul Constanta intre traditie, actualitate si perspective
Valenti Ciorea, Editura Companiei Nationale Administratia Porturilor Maritime SA Constanta, 2007

Constantza Port Handbook, 2017-2018, tenth edition

Curriculum vitae

Ioana Laura Constantin, BSc Architektur
18 Februar 1994
Staatsbürgerschaft: Rumänien

Ullmannstraße 54/139
1150 Wien

Tel: +43 6603978750
E-Mail: ioanalauraconstantin@gmail.com

Berufserfahrung

07/2016	Praktikum Spazio3 Architektur ZT GmbH Detailplanung für Bahnhof in Neapel (Napoli-Afragola High Speed Train Station)
10/2015-11/2015	Praktikum Spazio 3 Architektur ZT GmbH Einreichplanung für ein EFH in NÖ
07/2015	Praktikum Spazio3 Architektur ZT GmbH Einreichplanung für ein EFH in NÖ und an Projekten im Bereich Innenarchitektur gearbeitet

Ausbildung

10/2017- 01/2019	Technische Universität Wien Fachrichtung: Masterstudium Architektur Abschlussarbeit: Kreuzfahrtterminal in Constanta, Rumänien
10/2013-07/2017	Technische Universität Wien Fachrichtung: Bachelorstudium Architektur Abschlussarbeit: Entwerfen: Neuplanung Floridsdorfer Markt
09/2009-07/2013	National Kollegium ' Mircea cel Batran', Constanta,Rumänien

Weiterbildung

2017	Design Morphine - Visual Machine V2.0 Render und post production Workshop mit 3DsMax, V-ray und Photoshop

Kenntnisse

EDV	Sketchup	Enscape
Adobe InDesign	Adobe Photoshop	Lumion
Autocad	Adobe Illustrator	
Revit	Unity	
Rhinoceros	3DsMax	
Grasshopper	Vray	