DIPLOMARBEIT

Revival of the shipyard "Uljanik"

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

Mladen Jadric
E 253
Institut für Architektur und Entwerfen

eingereicht an der Technischen Universität Wien
Fakultät für Architektur und Raumplanung

von

Domagoj Krhen
1227605

Wien, am

eigenhändige Unterschrift

Abstract

The legacy of the shipyard "Uljanik" started in 1856. The then small island, carrying the name as the shipyard today, is the place where the foundation was laid that would last 165 years. It would persevere and adapt to all technological changes to become one of the oldest shipyards in all of Europe. To the people that live in Pula it means more than just a workplace, it became part of generational pride. In the beginning of the 1990's, the shipyard was restructured into a joint-stock company. With poor management and the focus of the industry shifting away from Europe, the shipyard would close its doors at the end of 2019. The aim of this thesis is to propose a solution of preserving this historical landmark and ensuring that it would not be lost in time. With architectural and urban analysis presenting the current situation, its surrounding area and possible adaptations with examples from all over the world. With minor architectural changes to existing buildings to make them usable in many different scenarios while also preserving the form and history of this location.

Keywords: Uljanik, Pula, Shipyard, Readaptation, Cultural Centre, Naval, Maritime Museum.

Kurzfassung

Das Erbe der Werft "Uljanik" begann im Jahr 1856. Auf der damals kleinen Insel, die heute den Namen der Werft trägt, wurde der Grundstein für die 165 Jahre währende Geschichte gelegt. Sie passte sich allen technologischen Veränderungen an und wurde so zu einer der ältesten Werften in ganz Europa. Für die Menschen in Pula ist es mehr als nur ein Arbeitsplatz, es ist Teil des Stolzes einer ganzen Generation geworden.Anfang der 1990er Jahre wurde die Werft in eine Aktiengesellschaft umstrukturiert. Aufgrund des schlechten Managements und der Verlagerung des Schwerpunkts der Industrie weg von Europa würde die Werft Ende 2019 ihre Tore schließen.Ziel dieser Diplomarbeit ist es, eine Lösung für den Erhalt dieses historischen Wahrzeichens vorzuschlagen und sicherzustellen, dass es nicht in der Zeit verloren ist. Mit einer architektonischen und städtebaulichen Analyse, in der die aktuelle Situation, die Umgebung und mögliche Anpassungen anhand von Beispielen aus der ganzen Welt dargestellt werden. Mit geringfügigen architektonischen Änderungen an den bestehenden Gebäuden, um sie in vielen verschiedenen Szenarien nutzbar zu machen und gleichzeitig die Form und Geschichte dieses Ortes zu bewahren.

Schlüsselwörter: Uljanik, Pula, Werft, Anpassung, Kulturzentrum, Marine, Schifffahrtsmuseum.

Acknowledgments

Firstly, I would like to thank my family. My parents have been my greatest supporters over the years and they stand as my biggest role models. Thank you for all the help and time you have bestowed upon me, I will forever be grateful for that!

I would also like to thank, the love of my life, Dr. Sandra Brkanović, you have stood by me and helped me all this way. Without you this would not have been possible!

Lastly, I would like to thank my Mentor, Ass.Prof. Arch. Dipl.-Ing. Dr.techn. Mladen Jadrić for his patients, professionalism and knowledge that he has shown and thought me over the years of working on projects together.

"They say you die twice. One time when you stop breathing and a second time,
a bit later on, when somebody says your name for the last time."

-Banksy

1 INTRODUCTION

Motivation

Our perspective on life has changed dramatically since the start of the 2020 pandemic. It has been a rude awakening for everyone around the world. We have come face-to-face with great loss. Not only in lives lost, but our way of life has completely changed. With production and work being put on hold, businesses have shut down, some temporarily and for others forever. Our lives are interwoven with the economy whether we like it or not and when certain businesses can no longer compete they shut down.

The question is, what happens when industry giants that have been around for decades fail? Who will replace them or what will remain of their legacy?

In architecture we formulate our work based on history, analysis, usage, function and form. We collect data to arrive at what is the most sensible conclusion. If a use of a structure is no longer viable, the economic viewpoint is to demolish it and create another that will be. This cold and heartless rule of numbers to generate profit does not consider the time, effort, love and care put into something that made it last so long as it did.

Some might say that industries are just buildings for people to work in, that this is their only function. They are easily built so they can be easily torn down when the time comes for them to no longer provide the function when they did. But at what point does something become more than a workplace? A place of pride? A place where generations of families put their effort, lives, and time towards. They may not evoke feelings of importance to someone who is not from that place, but to the people who live there, it represents their livelihood.

Thesis organisation and structure

The thesis is organized into 5 chapters with detailed urban analysis and architectural design. Chapter one covers personal motivation of what led to pursuing this project and how all the needed information was gathered. In chapter two, the work focuses on the history and location of the project. I this chapter the information gathered is organized in a way to help understand the legacy and importance of the shipyard Uljanik. What brought to its development, how it functioned as an industry giant for over 150 years, and in the end, what brought to its downfall. In chapter three, the work focuses on the urban analysis of the region today and its relation to the planning site. It also covers economic and cultural importance to the region and why a cultural centre would be a needed addition to the city and region. Chapter four is a short overview of the personal inspiration that push the design choices with the project. Lastly, chapter five covers the "Five-step" program in which the area would be cleaned up, prepared, and refurbished with a new design, whilst retaining its original form and industrial feel

Methodology

In order to understand the aim of this thesis it is necessary to understand its geographical location, its history and the socio-economic situation that has faced the city of Pula and also the shipyard Uljanik.

Information such as city plans both old and new were gathered from the Municipality Council of Pula. They are used to explain the history of the city and future expanding plans. Historical documentation and of previous plans for the city were gathered from the "Society of Istrian Architects" in analogue form and digitised by me. To help better understand the situation of the Shipyard and the historical relevance to everyday people living in Pula I have interviewed members of the Municipality Council and locals that have generations of family members from there. The history of the shipyard, plans and old photographs were gathered from the main site from "Uljanik Groupe" the company that oversees and manages the shipyard. Although the bankruptcy filing of the company has had its assets frozen and not available to the public, other forms of plans and documentation were gathered from the trustee in bankruptcy of the company.

2 GEOGRAPHY AND HISTORY

Geography

History has played a significant role in what is Croatia today, most of all in its seacoast region. Through millennia of European civilization development, the region was influenced by different people and their cultures. The natural abundance of the sea coast made it favoured by different people that lived there. Life along the sea was crucial in the early ages of civilisations. With over a thousand little islands spread across the Adriatic Sea many different civilisations set roots, developed and flourished in this region.

The City of Pula, which is the focus of this thesis, is situated at the south point of Croatia's largest peninsula Istria, at the head of the Adriatic between the Gulf of Trieste and the Kvarner Gulf.

The entire peninsula is shared by three countries today: Croatia, Slovenia, and Italy. Croatian part of the peninsula is inhabited mostly by Croats (68%), Italians (6%), Serbs (3.5%) and Bosnians (3%).[1] However, today's demographic shows a great difference to what it once was during the beginning of the 20th century (Last consensus made by the Austro-Hungarian Empire) where ("Spezialortsrepertorium der österreichischen Länder I-XII, Wien, 1915–1919", 2013) Croatians made up 43%, Italians 38%, Slovenes 14.3% and Germans 3.3%.[2]

1 - https://en.wikipedia.org/wiki/Istria
2 - https://wiki.edu.vn/wiki13/2020/12/16/istrien-wikipedia/

Figure 1 | Pula Municipality in Istria

Figure 2 | Croatia in Europe

Figure 3 | Istria in Croatia

History

Although the archaeological community widely agrees that the region of Pula was a settlement inhabited by people from the prehistoric era, evident by Neolithic findings, the true history of these times is unfortunately lost to time and myth. Very few significant trails of tribes, colonies, and later nations, who called this region their home, remain to this day.

The true history of the city begins in the 1st century BC when it became a Roman colony. They used the geographical location of the area and naturally formed bay as a port city and trading centre of the empire. With the knowledge and expertise that the Roman empire possessed their expansions of old settlements were both vast and very evident by their building style. The city expanded and was built upon the previous settlements that occupied that area. Because of the pragmatic approach from the Romans, they did not demolish the entire region, they used what was left and expanded with their urbanistic layout. Therefore, the centre of the city stands out from other Roman colonies for its radial layout of the streets, presumably leftover by the settlements.

Figure 4 | *Ancient road layout left before the Roman Expansion*

Figure 5 | *Roman roads added to existing layout*

During Roman times, the population reached its peak of 30.000 inhabitants, which helped solidify its importance to the empire. Thus, city fortes and many famous landmarks were built at that time. Remaining gates from the city fortes nowadays greet and fascinate tourists, like the “Gates of Hercules” or the “Twin Gates”. Amphitheatre still stands, to this day, as one of the most important archaeological and historical landmarks of Europe. The Romans also advanced the city's water and sewage system. In addition, the region remained as their colony for a very long time, therefore there are an abundance of artefacts, leftover materials, and other objects from that period.

Figure 6 | Arch of the Sergii, Pula, Croatia

Figure 7 | Amphitheatre in Pula, Croatia

Figure 8 | *Temple of Augustus (14 AD)*

Figure 9 | *Porta Gemina (3.st AD)*

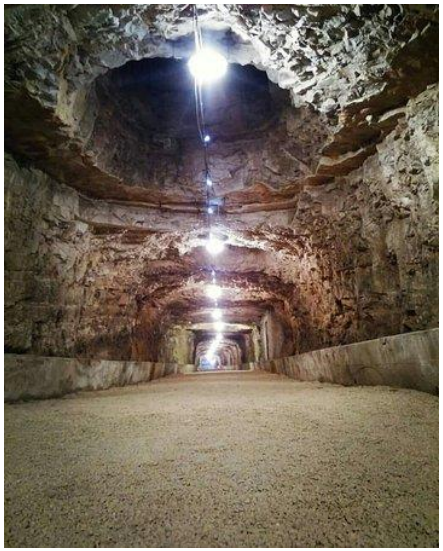


Figure 10 | *Tunnels of Pula, Zerostrasse*

Figure 11 | *Lion sculpture, Amphitheatre*

Figure 12 | *Grain Mill in barracks*

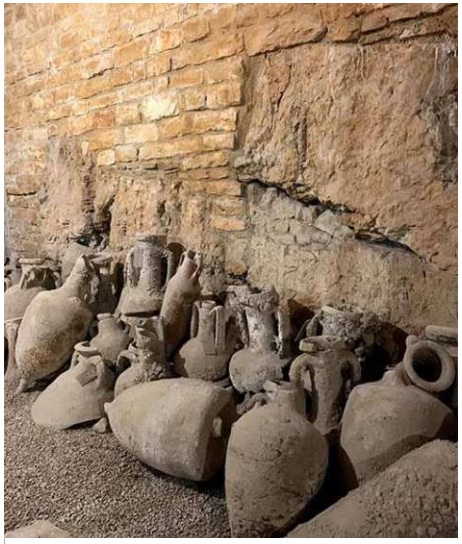
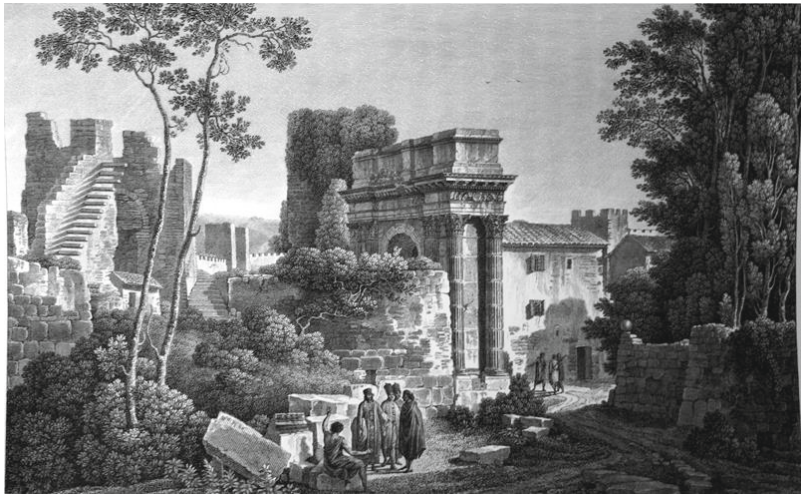


Figure 13 | *Amphoras from Roman times*

During the Middle Ages, the Byzantine Empire held control of the region, using the city of Pula as a port. Not having great importance as the city, it was eventually sold to the Venetian Republic. Later on, it fell to a great period of decline as it was ravaged by the plague. It is because of this that it ceases to be a city and becomes a settlement yet again with only a few hundred inhabitants living as farmers and fishermen. Once one of the more important Roman colonies became ruin overgrown by vegetation.

By the end of the 16. century the Republic of Venice would start building massive forts and fortifications around the city of Pula. Once again staying true to the old city plan of antiquity and using it as a ground plan for its expansion. Today the city of Pula still holds more than a dozen forts, barracks, and castles from that period.

Figure 14 | *View of Pula`s Sergi Arch, 1782*



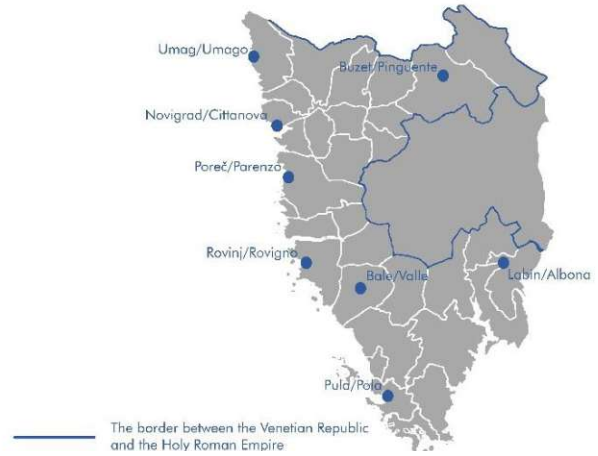


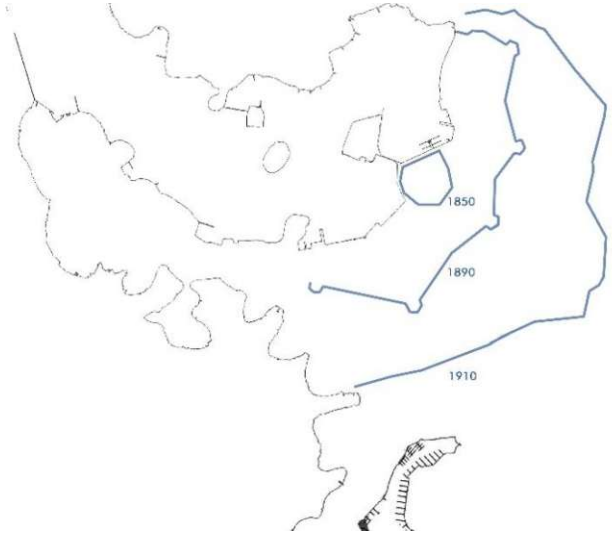
Figure 15 | *Territory held by the Venetian Republic from 14.-17. St.*

Figure 16 | *Castle of Pula is a star-shaped castle with four bastions was built in 1630*

The biggest census findings of inhabitants in the region come from the start of Austro-Hungarian rule. Their role in shaping the city and the region is evident to this day. Pula grew from a fading provincial town into an industrial city. And it is in this period that we see the starting phase of the Shipyard Uljanik and the inception of its history.

The great revival came in 1813, when the Austro-Hungarian Empire took control of the region and invested heavily into the city of Pula to make it its main shipbuilding centre and port for worldwide trade. During this period the most intensive form of urbanisation takes place to expand the city.

Figure 17 | City fortification and expansion during the Austro-Hungarian Rule



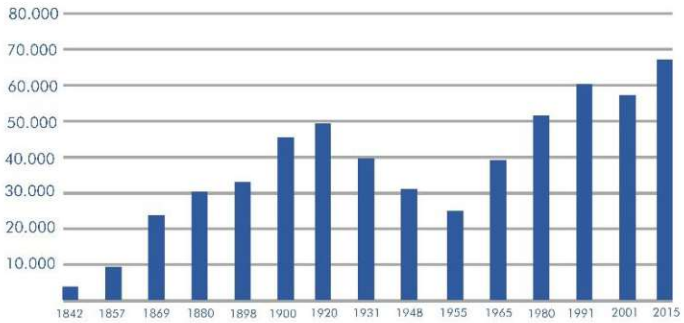
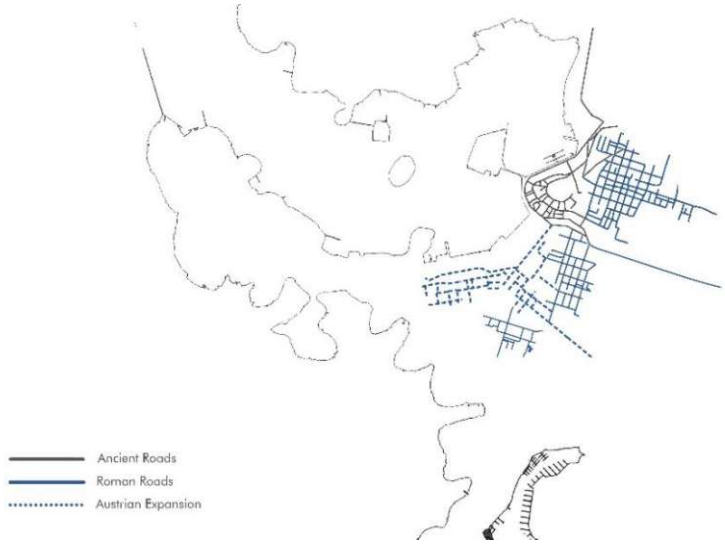


Figure 18 | Population census starting with detailed records from the start of the Austro-Hungarian rule to today

Figure 19 | City street expansion along the coast which started the construction of the Pula military shipyard by the Austro-Hungarian Empire



History of Uljanik

The name of the shipyard "Uljanik" comes from the name of the island on which it is situated. The island, prior to its expansion and addition of the shipyard, was a naturally formed island in the bay of Pula (also known as St. Florian). Peasants of the nearby village Premantura used the island as an olive farm from whose fruit would be used to produce oil. In the beginning of the 19th century the Austro-Hungarian empire bought the island as many more lands in that region. As a token of respect to the previous owners, one olive tree remains on the island as a symbol of heritage which still produces fruit to this day.

Not much remains today of the original form of the island. Heavy industry and expansion of the island were necessary to accommodate the needs of the production. Its natural form has been overtaken by a concrete and stone form with sharp and right angles. To this day the island has been expanded and rebuilt more than a dozen times and the only vegetation remaining on the island is the olive tree.

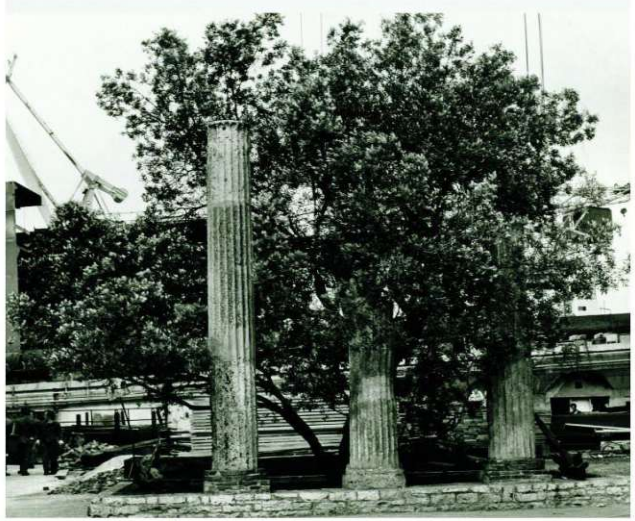


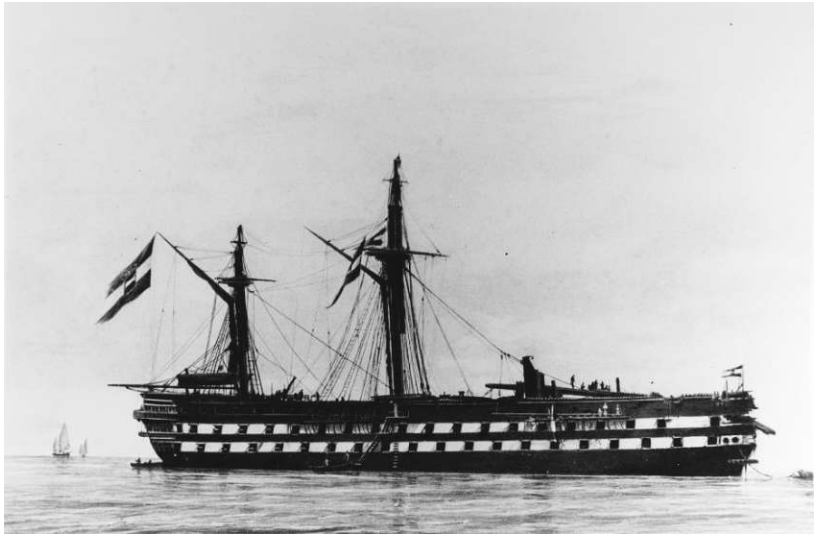
Figure 20 | *Olive tree on the shipyard island, approx. 1910*

Figure 21 | Olive tree on the shipyard island, present day

In 1856 Pula was selected by the Austro-Hungarian Monarchy to be its next naval base and main war harbour. Empress Elizabeth laid the foundation stone on December 9th that year. Two years after its inception the shipyard would produce its first ship “SMS Kaiser " and launch it to sea from the ramp of Uljanik Island. The ship was 74 meters long, with a displacement of 5,337 tons with three sail beams and a steam engine. [3]

In the following years under Austro-Hungarian management the shipyard would produce another 56 warships for its naval fleet. The main hull construction of all larger ships was done on the island, but warehousing, administration and small-scale production was done on the mainland, situated south of the island.

Figure 22 | *SMS Kaiser, first warship produced at shipyard Uljanik*



3 - https://www.uljanik.hr/en/about-us/history

Figure 23 | The Battle of Lissa, oil on canvas by Volonakis, Constantin (1866)

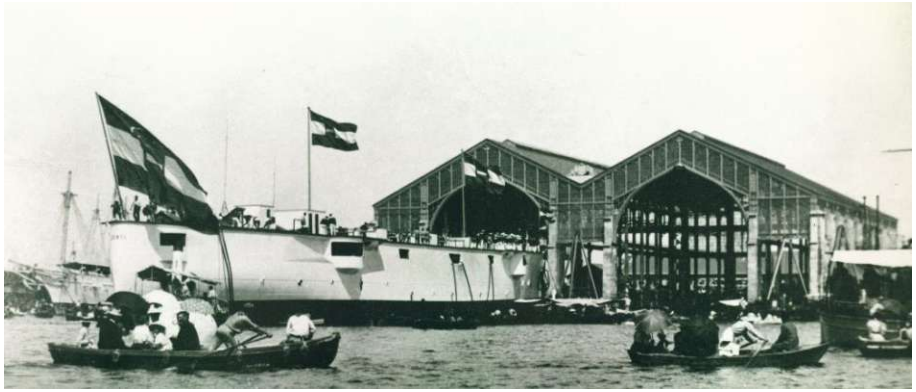


Figure 24 | *Covered sea ramps during the Austro-Hungarian rule*

Figure 25 | *Water regulated ship docks on the side of the island*

Figure 26 | *Mainland Pula and the shipyard island before the bridge construction*

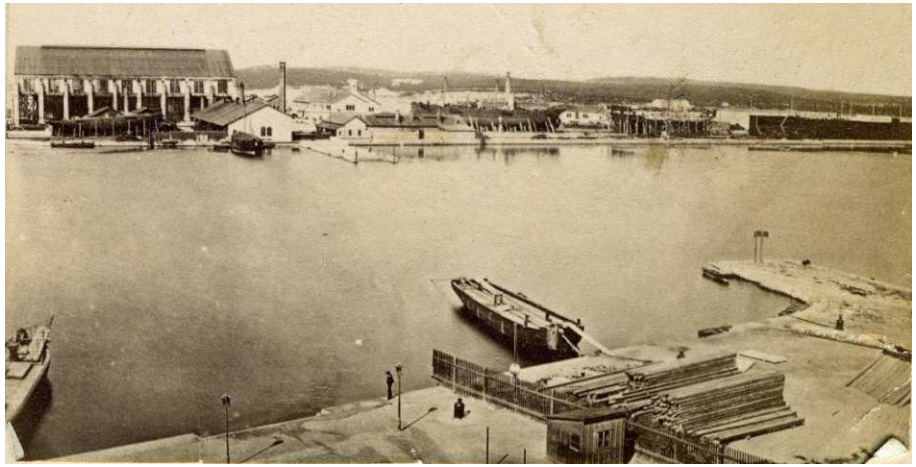


Figure 27 | *Mainland Pula and the shipyard island after the bridge construction*

Uljanik stayed in power and management under the Austro-Hungarian empire from 1856. to 1918. In the aftermath of the first World War the region of Istria, as many other regions on the Dalmatian coast were taken over by Italy.

They would use this shipyard for repairs, transport of goods, disassembling of old and outdated war ship. Later on, before the second World War would be used as one of the construction grounds for war submarines. Where the Italian navy successfully began not only a revolutionary movement in maritime warfare, but also establish first dedicated Navy personal for submersibles.

Figure 28 | *Construction of a submarine during the 2nd World War*

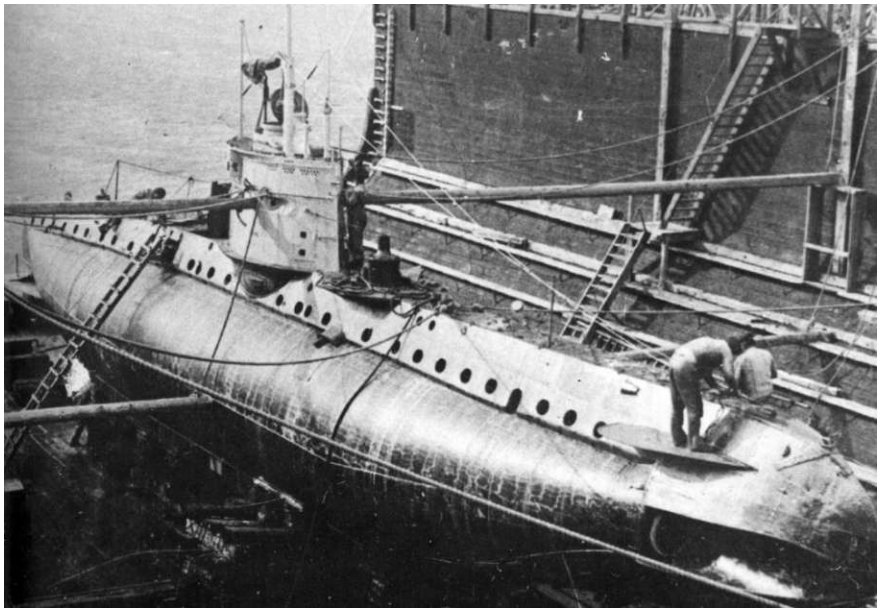
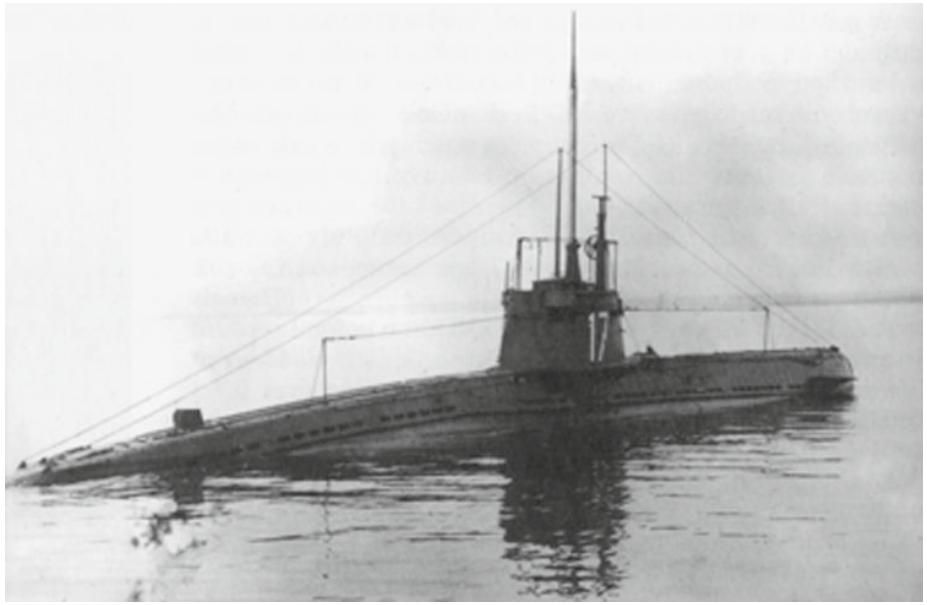


Figure 29 | *Submarine at sea after construction*



After the Italian regime capitulated in 1943., the city of Pula and other territories of Istria stayed under Axis rule by the Germans. German troops quickly filled the vacuum created by the Italian retreat thereby taking control of the shipyard and its resources. During the period of 1943. to 1945. the city of Pula refers to it as the “dark times”. Massive prosecution, accusations and executions of anyone who was thought to be an enemy of the Axis powers. The shipyard and other state-owned facilities where working overtime to try and keep up with the losses the Axis powers were facing.

Figure 30 | *Analysis of the bombing of Pula, 08.06.1944.*

Because of its position north in the Adriatic, natural protection of the bay and significant production volume of warships it was heavily targeted by the Allied forces' air attacks. In 1944. the Allied power conducted heavy bombings all over the Adriatic coast, because of heavy industry that was in proximity of the large cities massive casualties and loss of civilian life was experienced in these regions. In Pula the entire island and part of the city centre were decimated by bombings.

Figure 31 | *Arial view of the bombing of Pula by Allied Powers, 09.01.1944*

After the liberation of Pula by the Allied forces in 1945. the Anglo-American Command began reconstruction and in 1947. the renovation was continued by the Republic of Yugoslavia. In 1951. the first ship was put to sea by the newly restored shipyard. It was a tugboat "Neptune", which would signify the beginning of a new era in the shipyard's legacy.

From the early 60's to the early 80' the shipyard produced all manners of ships and cemented its foothold on the world scene by applying new technologies and ship building techniques. It would become world famous for producing very reliable car carriers (Ferry's) and Ore/Oil Carriers. This was the time of the greatest success of the shipyard, not only in production but employment. It was a great pride to work at Uljanik and the state ensured that it would work with government contracts and financial aid when needed.

Figure 32 | *Oil Tanker "Berge Istri" on its maiden voyage from the shipyard*

With political unrest and the subsequent end of the Republic of Yugoslavia in the late 80's the work and the shipyard suffered with almost no work. In 1991 the start of the Croatia War of Independence brought the entire industry to a halt. No new contracts were being issued due to the risk of investing during war time. After the war, in 1995, the land of Istria and subsequently the management of the shipyard returned to Croatia as its final and current owner.

Figure 33 | *Oil Tanker "Berge Istri" at sea*

Uljanik would become a joint-stock company with new market-based bases. With new investors and prospects from around the world the shipyard would be renovated and technologically adapted to new industry standards. The company would flourish in the next decades, constructing ships for clients all over the world in high numbers, pushing the technological curve in its favour.

In 2008. global financial crash would be the beginning of its downfall. Issuing massive layoffs because of small demand. The company in control, "Uljanik Group", suffered great losses over time trying to maintain the industry afloat. Unfortunately, without government aid the once 20,000 worker strong shipyard would drop its employment to below 5000 and in 2020 because of the COVID-19 pandemic it would file for bankruptcy. Issuing the end of an era for the shipyard.

Current talks with the government are not going in favour of "Uljanik Group". It is believed that the land might be sold to outside investors, with the small industry tile on the mainland repurposed to only work for production of small-scale contracts for overseas companies.

Figure 34 | *Arial view of a sea platform construction*

Figure 35 | *"Grande Detroit" Car/Truck Carrier put to sea in 2005.*

Figure 36 | "Isaac Newton" sophisticated sea cable layer put to sea in 2015.

Figure 37 | *Last activity remaining on the island of Uljanik is the artistic work by Dean Skira. Neon luminescence that highlights the cranes of the forgotten titans of industry named "Glowing giants"*

3 URBAN ANALYSIS

Urban Analysis

As was stated in the chapter on geography and history, the city of Pula has been developed and expanded from Roman times to the present day. Its grand history is evident with its urbanistic layout and organization of the city. The city centre has always been along the coastline, with the old settlement-like layout of the street it stands out from most of the city and is very recognizable. After the Second World War and the socialistic political stance of the Republic of Yugoslavia, the expansions of any major cities in the country needed to achieve certain key factors.

With every new housing expansion in the city, certain criteria had to have been met to advance the everyday life of citizens. They would introduce city sub-centres to *break the mould* of one centre of a city and apply future possibilities for expansion. These sub-centres would function on an urban scale as small satellites to the main centre of the city. But on a small scale, they would bring all necessary amenities to the people living in them.

As seen in Figure 38, the city developed along the coast and inland to the east mostly. Use of land was allocated mostly for housing and industry for over 100 years with tourism being only an afterthought. But with the natural evolution of the city and the social plans from the 1960s to the late 1990s, it has achieved a hybrid role in the region.

Figure 38 | *Project zone with highlighted city centre and sub-centres*

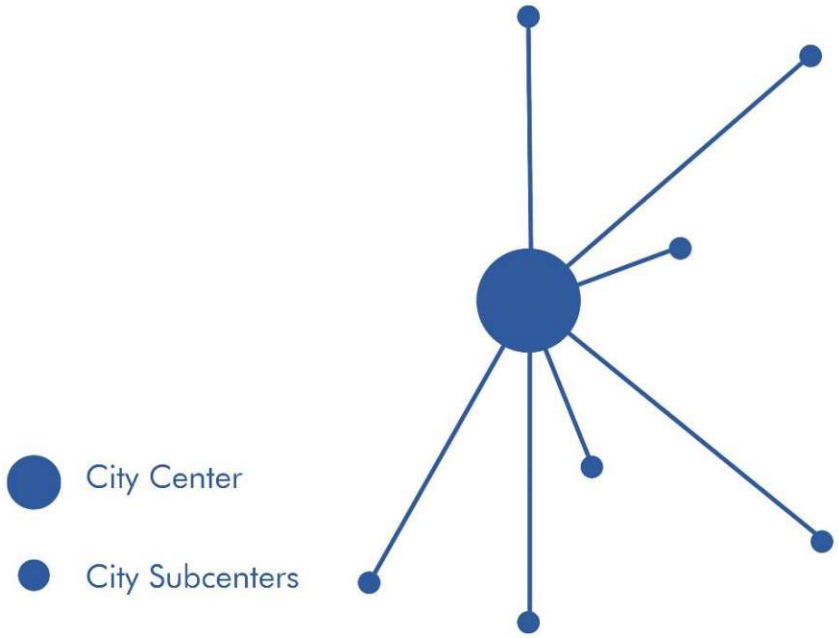


Figure 39 | *Abstract figure of connectivity between City Center and Sub-centers*

The development of sub-centres created a rise in private businesses, public spaces, and cultural locations. Which brought more people to live in the city, provided diverse working opportunities, and elevated the cultural appreciation of its citizens. Each sub-centre would also provide adequate education for the younger population like elementary schools and kindergartens.

Higher education such as vocational schools or high schools would still depend on big-scale urbanistic planning with regards to the population density. Academic institutions such as the University of Pula, Faculty of Informatics of the City of Pula, and Faculty of Economics and Tourism of the City of Pula are situated to the very centre of the city. As are the city council headquarters, courtrooms, and other administrative buildings. With this organization, the function of the city centre is to serve as a visiting location and the sub-centres as living locations. With an abundance of parks and public spaces surrounding the coast and inner-city it has become a gathering location for tourists and locals, and also a focal point of many cultural and entertainment attractions.

Figure 40 | *City Administration building of Pula, Communal Palace*

Figure 41 | *University of Pula*

Figure 42 | *Portarata Square and Arch of the Sergii*

Figure 43 | *2003 cultural event, largest tie in the world around the Amphitheatre in Pula*

Transport to Pula from Europe

If we look at figure 44 we can see that the focus point of the project is situated in the centre of Europe. With all forms of transportation available to reach the City of Pula.

It is a comfortable driving distances from Italy, Slovenia, Austria, Bosnia and Herzegovina, Hungary, and Croatia. At the same time, it is approachable from the sea with ferries, cruise ships, or private boats. For further distances flying to Pula by airplane is very plausible, as the city has an Airport situated about 10km outside the city centre. With bus and taxi services to help arrive at the location. The means of transportation are very flexible for this destination and that is important for the various preferences people might have for arriving here. The cities accessibility to the outside world is a key factor in ensuring that a new vibrant cultural centre will have visitors.

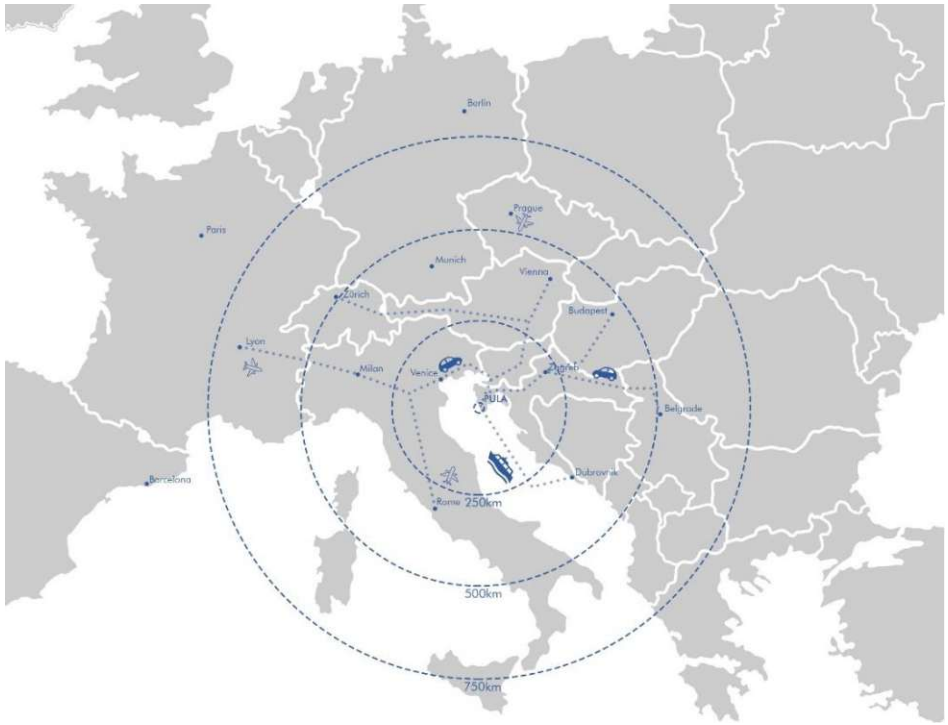


Figure 44 | Pula in relation to other key cities in Europa, with distances and means of transportation

Tourism and Culture

Tourism has been a major part of life for everyone living in Croatia. In the European Union, Croatia is in the top 10 most visited countries. Accommodating millions of tourists year-round, with the majority visiting the Adriatic coast during the summer. Although rural tourism has been rising in the last five years, it is still only a fraction of what the sea coast attracts.

With Figure 45 we can see the distribution of tourists in the top 10 most visited cities in Croatia in the last 5 years. The data has been taken from the yearly report made by the Ministry of Tourism. We can also see that Pula is in the ninth position on that list averaging about 500.000 tourists yearly.

Figure 46 is the distribution of tourists in all of the major regions of Croatia. We can see from that graph that the County of Istria is the most visited region by a significant margin. Out of the top 10 cities that are visited in Croatia, 6 of the cities are located in the County of Istria. Making it the foremost capital of tourism in Croatia. [4]

4 - https://mint.gov.hr/pristup-informacijama/dokumenti-80/statistike/11514

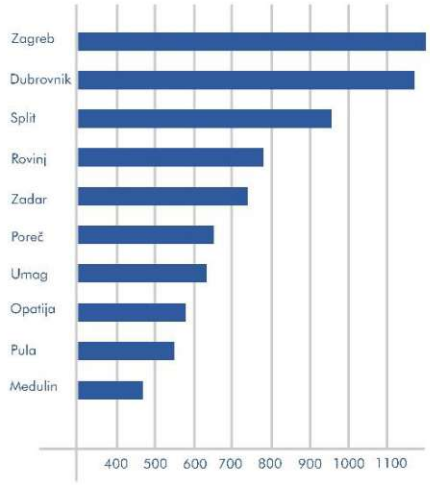


*Figure 45 | Most visited cities in Croatia, numbers counted in (x*1000)*

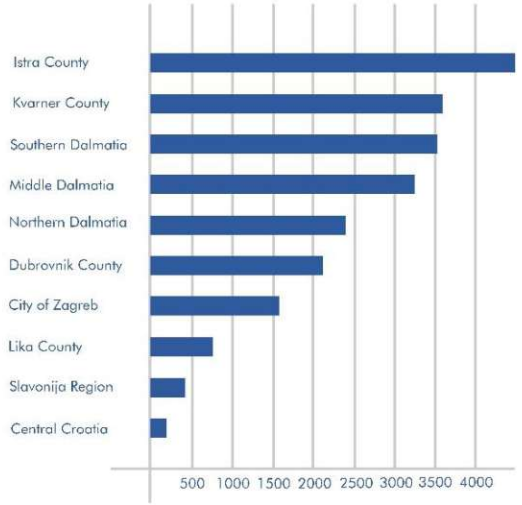
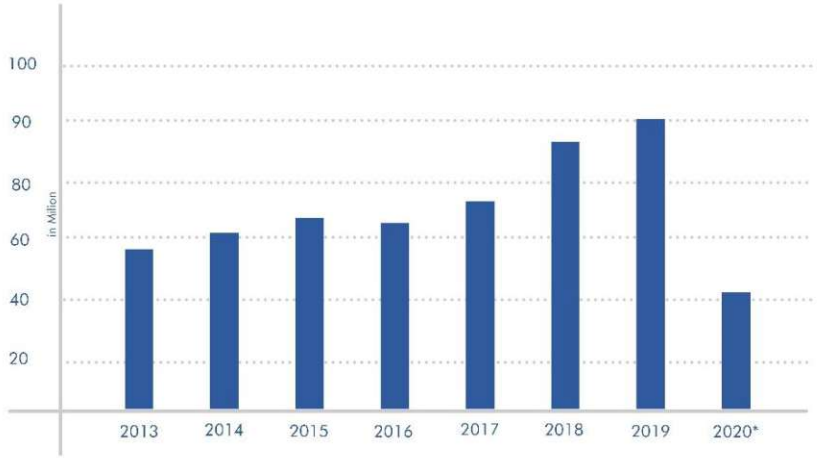


*Figure 46 | Most visited region in Croatia, numbers counted in (x*1000)*

With these high numbers of visitors, the city of Pula has also shifted from being an industrial city to being a cultural city favoured by tourists from all over the world. With urban planning commissions being very active in recent years to try and expand the city that would favour the cultural aspect.

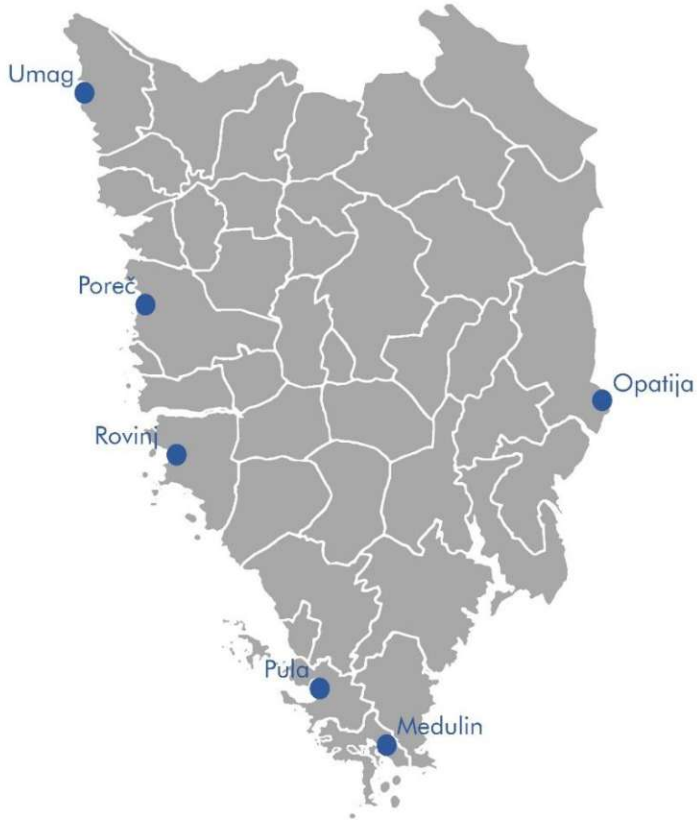
Figure 47 shows us the steady rise of visitors to Croatia from the year 2013 to 2020. **With the recent Covid-19 pandemic, the statistics for the year 2020 show a significant drop in visitors, but unofficial reports made quarterly by the government, show promising results in returning visitors compared to the year 2019.*[5]

Figure 47 | *Statistic of tourists visiting Croatia, from 2013 to 2020*



5 - https://mint.gov.hr/pristup-informacijama/dokumenti-80/statistike/arhiva-12059/12059

Figure 48 | *Locations of most visited cities in Istria*



Future Development of the city

According to the urban planning committee of the city of Pula, they have a city extension plan up until the year 2026. With most of the new real estate concentrating along the bay line. The plans consist of private housing for family homes, residential buildings for flats, commercial establishments, and two new marinas in the bay area.

The commercial establishments will consist of private spaces business, a new expansion of city port authority, leisure spaces, and hotels. Across the bay from the city centre, a new development plan has just been approved by the City Council for the construction of a marina and Resort complex that will be situated on Katharina Island. With higher demand for private ship docks, the city has agreed to this plan after 5 years of negotiations.

With these expansion plans for the city, we can see that the demand for tourism and culture has risen higher than the demand for an industrial business. The increase in visitors from Croatia and tourists from abroad will also mean there will need to be more event and cultural areas in the city to accommodate the demand.

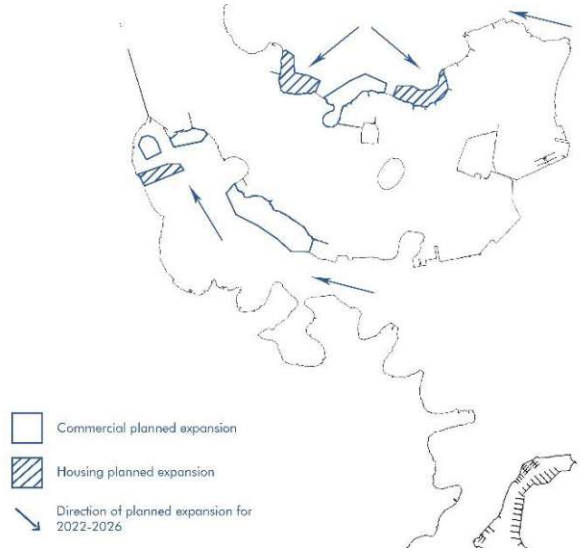


Figure 49 | *Future development areas by the Urban planning committee of Pula*

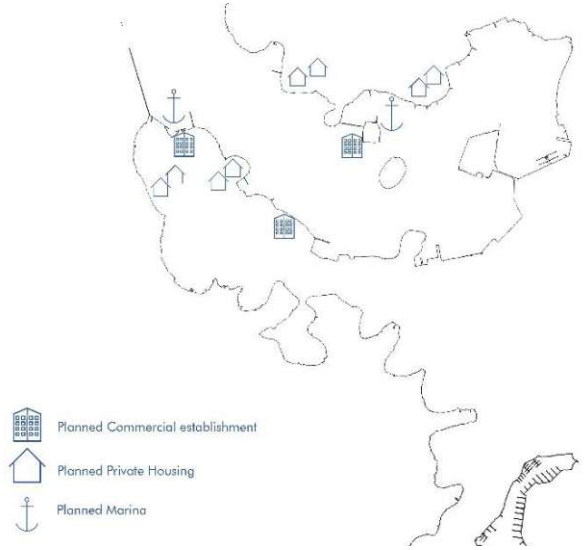


Figure 50 | Future *development structures by the Urban planning committee of Pula*

Figure ground plan

Figure 51 | *Figure-ground plan of the city of Pula*

Planning Site

The focus point of the project can be seen in Figure 52. With the recent negotiations with the government, the "Uljanik" Group was able to come to a deal concerning their bankruptcy. The agreement was two-fold; First, the shipyard had to deliver all of its ongoing projects and the proceeds would go to paying off their debt. Secondly, in order not to destabilize the area with massive layoffs of local working people, the government decided to step in and offer financial support. As a result, Uljanik Group lost all management decisions and all the big-scale productions were shut down from 2021. onward. Machinery and working force have been relocated to small-scale production.

Figure 52 | *Industrial Zoning of Uljanik Group*

In the past, essentially, the entire area worked as one industry, it was sectioned into different parts of production. The island section served as the final part of shipyard production; meaning it was the location where all of the parts made would come together to make the sea vessels and would be lowered into the sea. While the mainland section of the industry would focus on converting resources into parts, assembly of machines and motors, and the disassembly of older bigger ships.

This is the reason why the island is currently not in function. It is the management of the government that shifted full-scale ship production into small-scale parts production for export only. The reason is that unfortunately, the economic standpoint is that such big-scale production is no longer viable in this region in comparison to other competitors around the world. The government's stance is that they want to slowly push out the industries from the city, because of economic reasons.

With the stage being set so, it is obvious that the first implementation of something new in the region would take place on part of the industry that is shut down. Therefore, the project site was chosen for this thesis would take place on the island.

The approach to the design was set from aspects of Big-scale urban analysis to small-scale application of the space. It is important to understand how everything around the island works in synergy with it and vice versa.

Transport

With the analysis of the transport situation in the city and the bay area, the transport connectivity is detailly covered. The public transportation system includes sole public bus lines, nonetheless, it reaches most of the city's centre and the aforementioned sub-centers. It is also well connected with the city's airport. Other than the land transport, the City of Pula has a robust and very intricate sea-based transport route. Not only between different areas around the bay but with other cities along the Adriatic coast; both Croatian and Italian. Having in mind that most of the freight transport in the last few decades has been done over the sea, even though a rail system exists it is no longer in use. There are plans to revitalize it since it is connected to the Mediterranean Rail Freight Corridor (RFC).

With its position in the core of the city, the island of Uljanik is well connected to not only the different parts of the city, but also to other cities in the region.

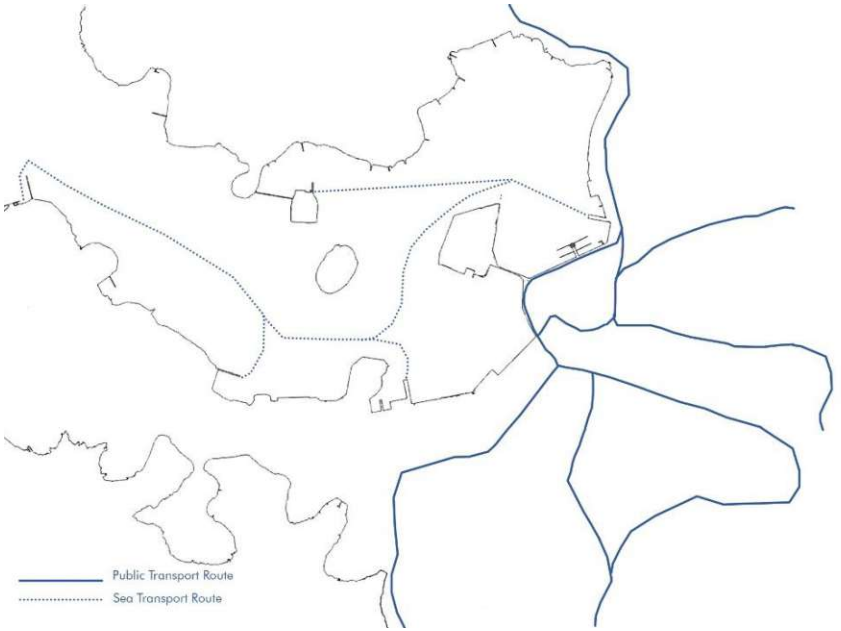


Figure 53 | *City and Sea paths of public transport*

Viewpoints from the Island

To revisit the importance of its position, we also must understand what is visible from the island. As a project that focused on preserving the identity of this island and treating its history as any other long-standing structure, we must position its importance in the city as such.

The island sits as a "crown jewel" in the core of the city, having open views to all sides. To the north is the mountainous forest region of Pule, which will be the next expanding part of the city. To the east an unobstructed view of one of Croatia's most important historical structures the Amphitheatre of Pula. the industrial landscape of the mainland part of the shipyard is to the South, while to the West dominates the bay entrance with the new marina being built on Katharina's Island. It is not fiction to say that everywhere one may choose to look from the island, the view would be breath-taking and awe-inspiring. It is precisely one of the reasons why a Cultural centre of such calibre would be fitting in this location.

Figure 54 | Viewpoints from the island Uljanik; Industry Zone, Amphitheatre, Vallelung Forest

4 INSPIRATION

Venice

The Venice Biennale is an arts organisation based in Venice, Italy. The name of the original and principal biennial exhibition the organisation presents. The organization changed its name to the Biennale Foundation in 2009, while the exhibition is now called the Art Biennale to distinguish it from the organization and other exhibitions the Foundation organizes. [6]

Arsenal in Venice is the prime example of a well-executed exhibition space on a large terrain. Remaining true to its roots with preserving the original buildings and restoring them with minimal to no changes servers as s a prime example to which to strive. With its long and prosperous history, it stands today as a giant in the world of culture. It both utilizes in-door and out-door space for maximal efficiency and interesting dynamic organisation.

6 - https://www.e-flux.com/architecture/positions/202487/this-is-not-an-exhibition/

Figure 55 | Old docking ports; Used today as exhibition space

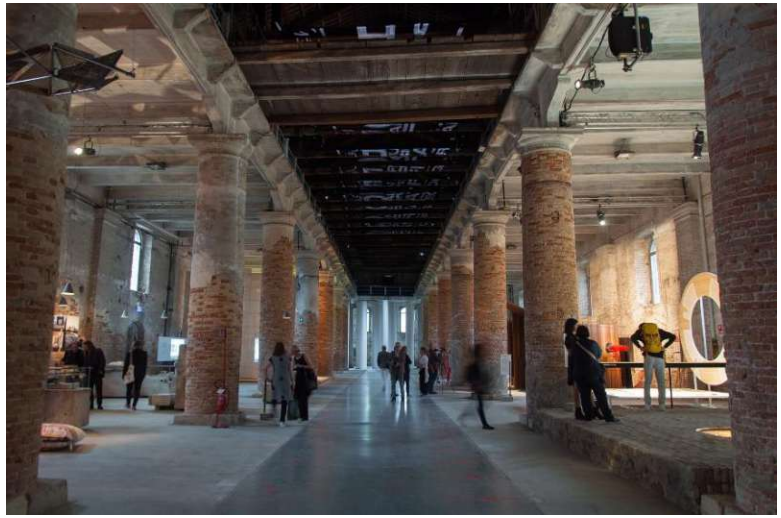


Figure 56 | Refurbished production space into an exhibition space

Barcelona

The Maritime Museum of Barcelona is located in the building of "Drassanes Reials de Barcelona", the royal arsenal of Barcelona, dedicated to shipbuilding between the thirteenth century and eighteenth century. The first mention of these arsenals date from 1243. in a document indicating the boundaries of the city of Barcelona where it mentions its shipyard.[7] It shows the history of the navigation from the early days together with the history of the Spanish Navy since the Catholic Monarchs, in the 15th century, up to the present. It also hosts several navigation instruments, weapons, portolans and paintings. The museum was declared a Museum of National Interest by the Government of Catalonia.

An interesting way this structure remained its identity was preserving the form of the building but making sure that all new additions to the objects are very different to distinguish from the original. A steel frame glass facade at the entrance of the hangars is covered with matt gloss to bring a feel of modernity to this old structure. A very indicative design language to keep everything minimalistic yet understandable.

7 - https://en.wikipedia.org/wiki/Maritime_Museum_of_Barcelona

Figure 57 | Arial view of refurbished hangars

Figure 58 | Interior space with exhibition space

Shanghai

In the Lujiazui financial district in Pudong, Shanghai, Kengo Kuma has reimagined a 1972 shipyard into a new 9,000-square-meter multi-use complex, named Shipyard 1862. Behind original, rugged brick walls, the old shipyard was once defined by a 12 by 30-meter grid, which allowed for massive interior spaces to hold ships. In this industrial-style adaptive reuse project, Kuma was careful to preserve the building's structural and material integrity.

These photographs provided by Julien Lanoo show how the industrial shell has been transformed by the refurbishment project.[8] Original brickwork was restored on the North facade, but the South facade was demolished years ago. For the West facade, Kuma designed a pixelated gradient brick system which connects the North and South by reflecting the unique restored weathered brick and remembering what no longer exists in a contemporary way. Suspended by 8-millimeter-thick stainless-steel cables, large clay bricks, in four shades of red, gradually fade in permeability toward the transparent South facade.

Figure 59 | *New brickwork façade; West side of the building*

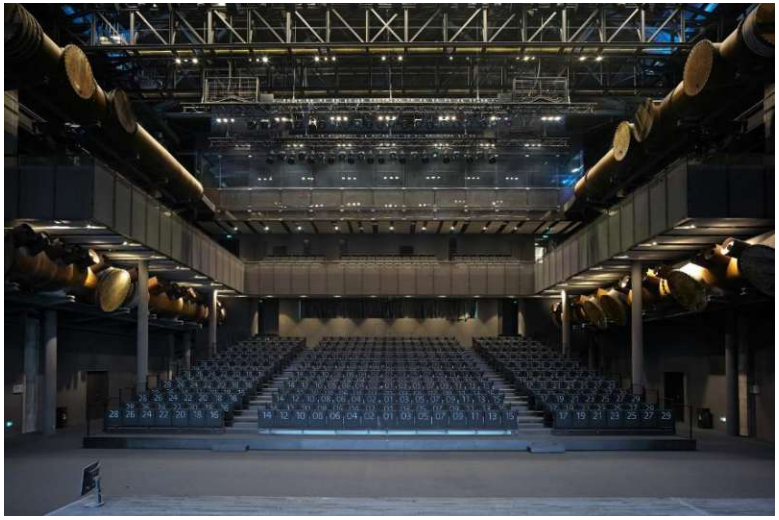


Figure 60 | *Hangar space refurbished into a conference room*

8 - https://www.archdaily.com/889132/kengo-kuma-transforms-shanghai-shipyard-into-multi-use-complex?ad_medium=gallery

Copenhagen

The Maritime Museum of Denmark you will experience a piece of iconic architecture built below ground around an old dry dock in front of Kornberg Castle. The award-winning architecture is designed by the internationally renowned architects from BIG – Bjarke Ingels Group.[9]

Leaving the 60-year-old dock walls untouched, the galleries are placed below ground and arranged in a continuous loop around the dry dock walls - making the dock the centrepiece of the exhibition - an open, outdoor area where visitors experience the scale of ship building.

A series of three double-level bridges span the dry dock, serving both as an urban connection, as well as providing visitors with short-cuts to different sections of the museum. The harbour bridge closes off the dock while serving as harbour promenade; the museum's auditorium serves as a bridge connecting the adjacent Culture Yard with the Kornberg Castle; and the sloping zig-zag bridge navigates visitors to the main entrance. This bridge unites the old and new as the visitors descend into the museum space overlooking the majestic surroundings above and below ground. [10]

9 - https://mfs.dk/en/the-museum/the-architecture/

10 - https://www.world-architects.com/de/big-bjarke-ingels-group-valby-copenhagen/project/danish-national-maritime-museum

Figure 61 | *Repurposed drydock with new walkways and interior space*

Figure 62 | *West side view of repurposed drydock*

5 PROJECT DESIGN

Uljanik Analysis

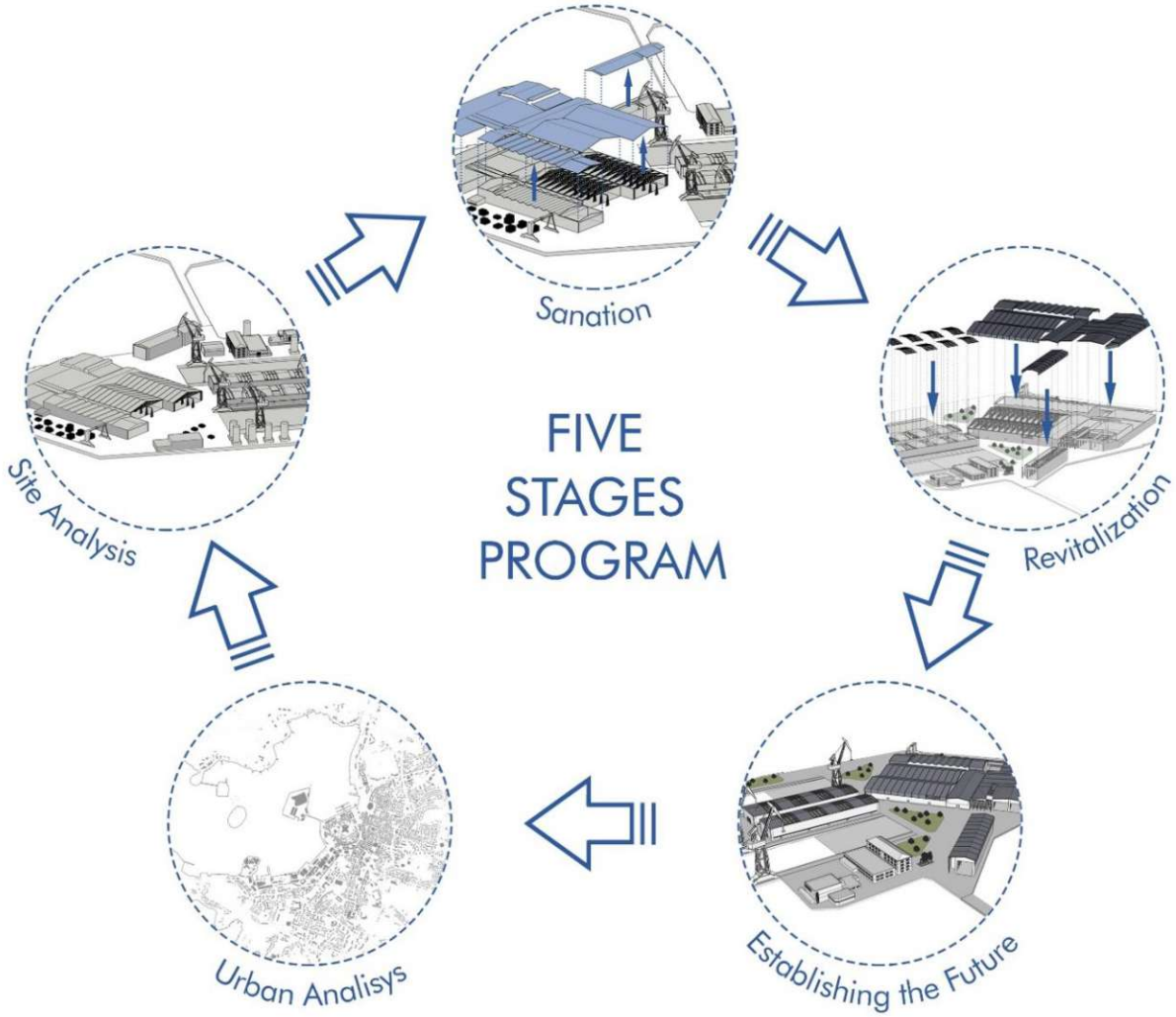


Figure 63 | Development program “Five Stages”

Entrance view of current state

Figure 64 | *Main entrance gate to Uljanik Island*

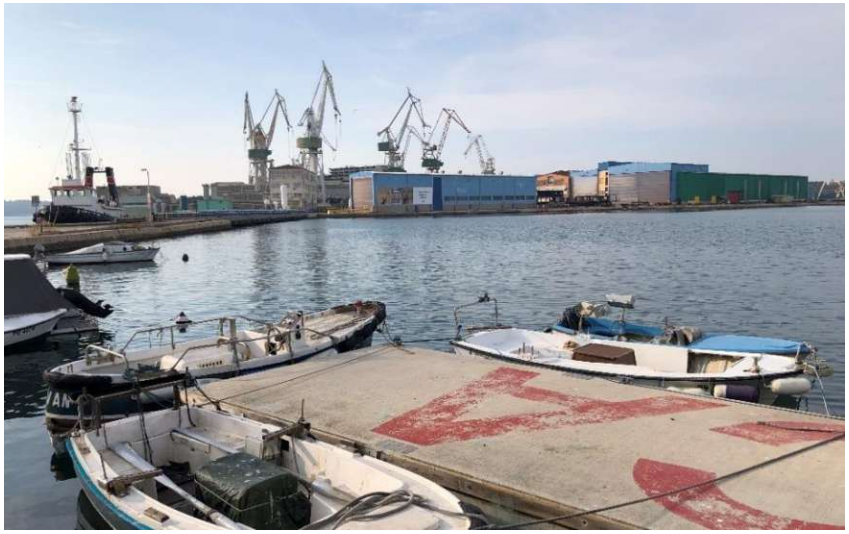


Figure 65 | *View of the island from city coast*

Figure 66 | *Approach to the island bridge*

Figure 67 | *Close-up of the island bridge*

Aerial view of current state

Figure 68 | *North-East aerial view of Uljanik island*

Figure 69 | *West aerial view of Uljanik island*

Figure 70 | *North-West aerial view of Uljanik island*

Figure 71 | *South-East aerial view of Uljanik island*

Arial view 3D model

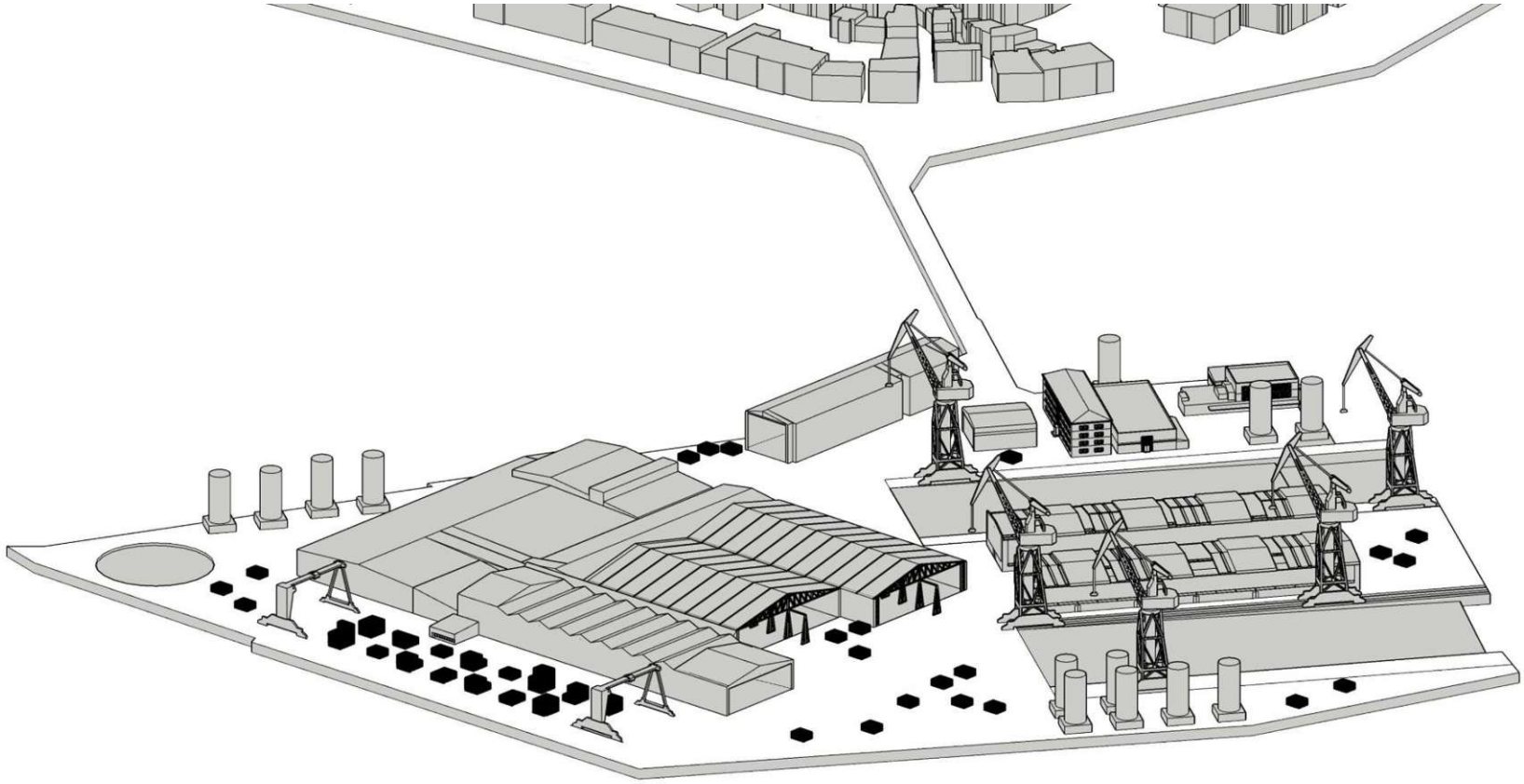


Figure 72 | *3D axonometric representation of current state*

Removal of unsafe structures

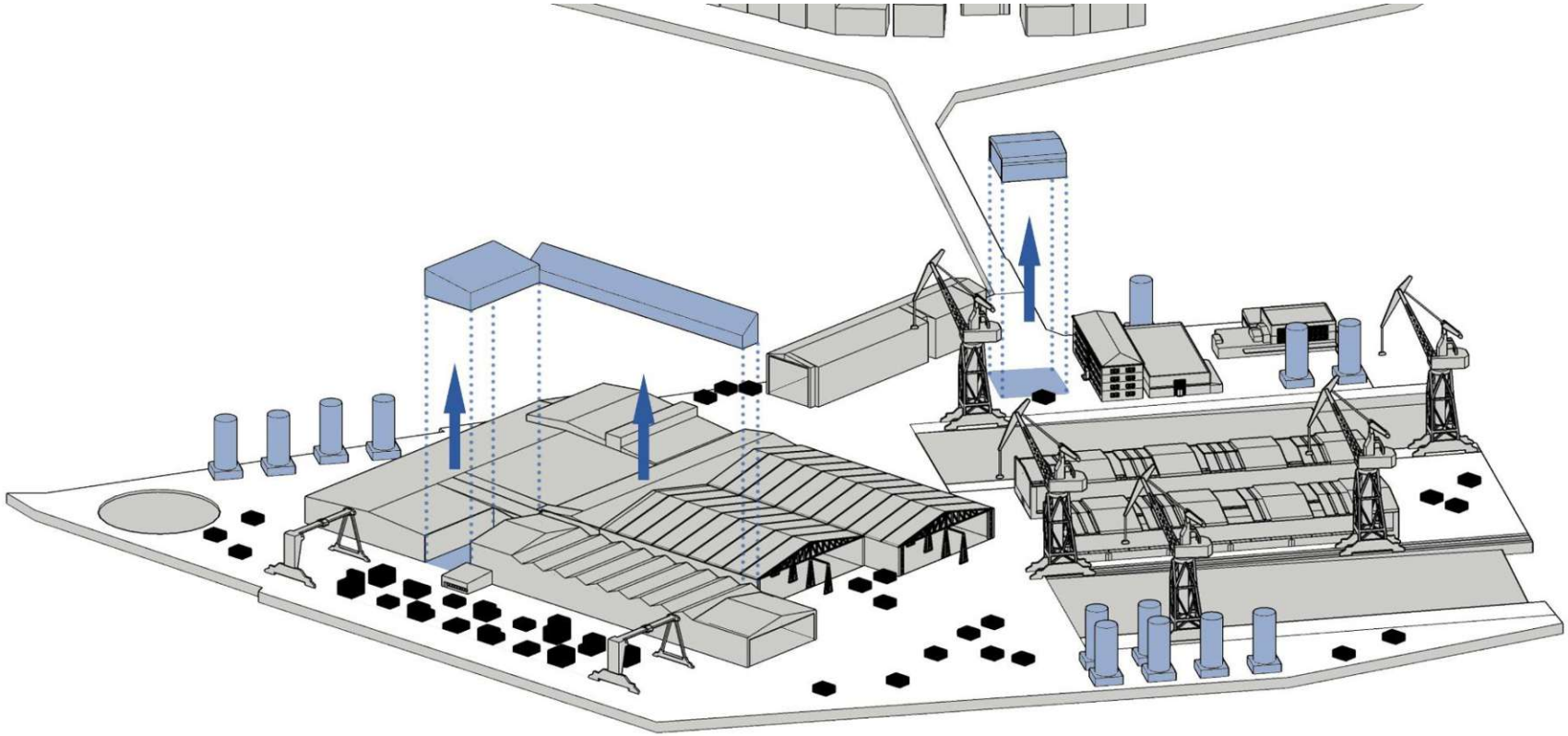
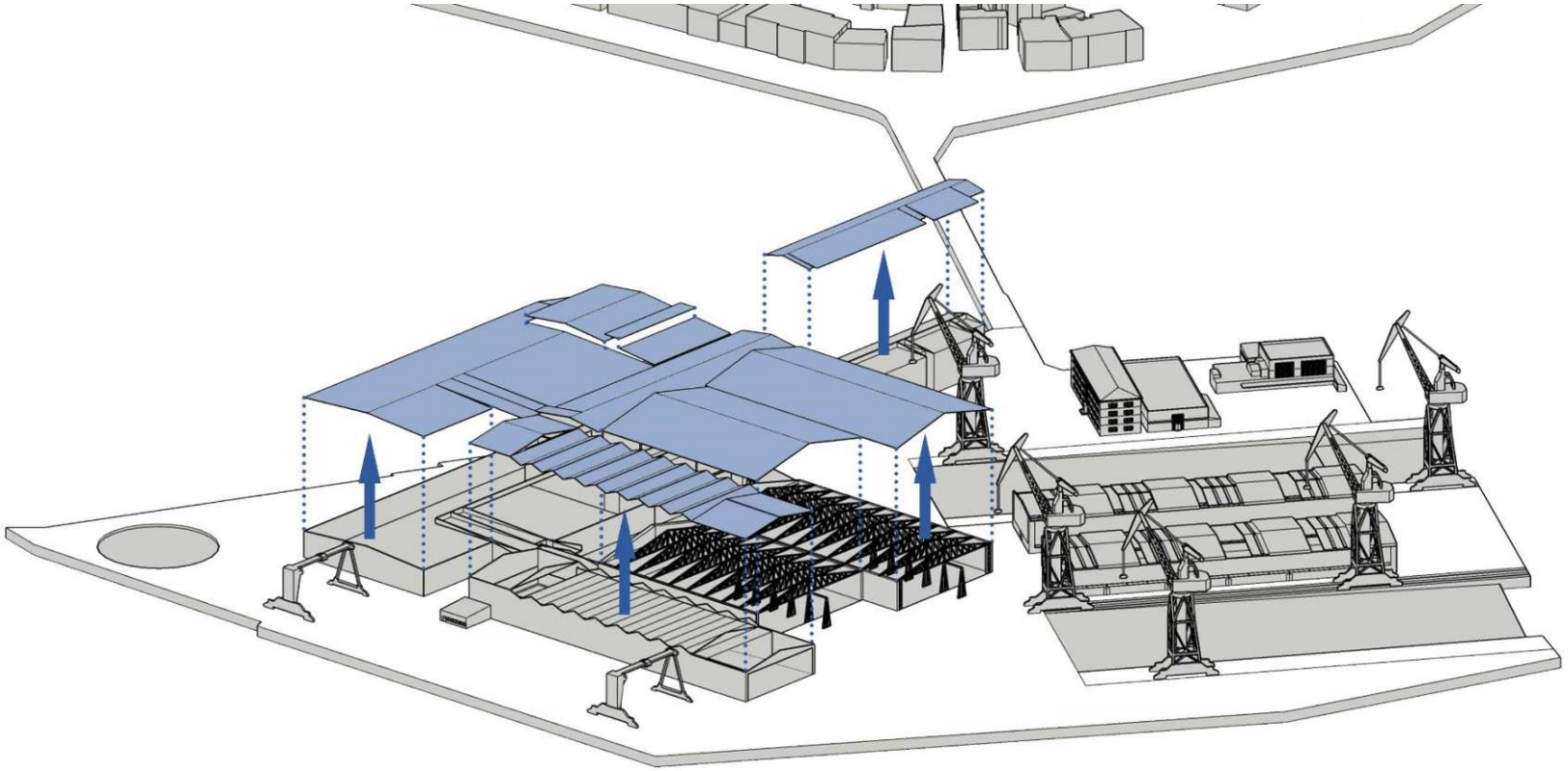


Figure 73 | *3D axonometric representation of the sanitation of unsafe island structure*

Removal off roofs unsafe roofs



Structures to be removed

Figure 74 | *3D axonometric representation of old roofs being removed*

New Transport System

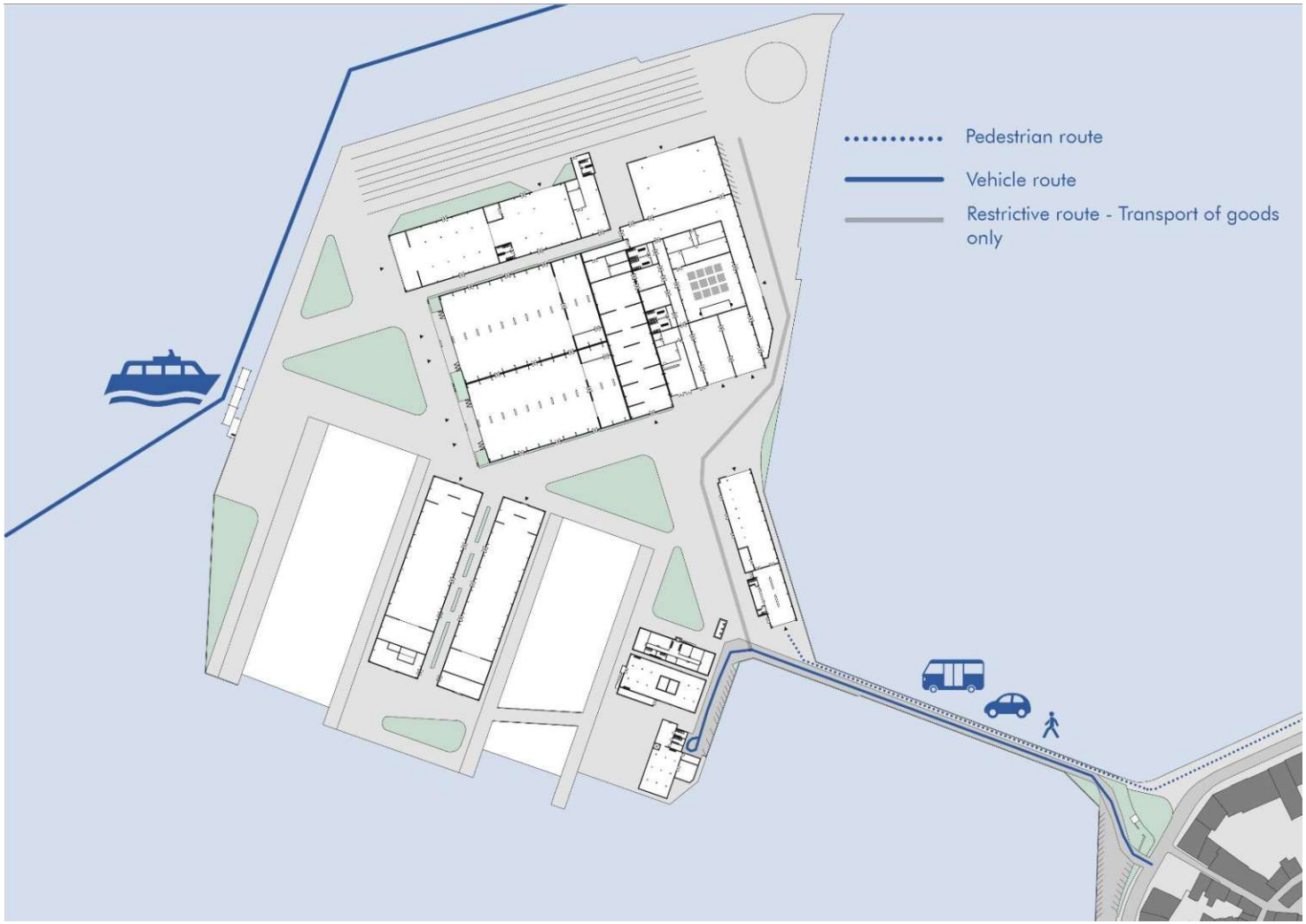


Figure 75 | Ground floor plan with represented new transport system; Sea by taxi ships and land by pedestrian road, personal car and small city bus

Emergency Exits

Figure 76 | Ground floor plan with represented emergency exit points from of the buildings and the emergency sea raft locations in case the bridge would ever become inaccessible

Building Cluster Layout

Figure 77 | *Ground floor plan of a categorisation of buildings on site into clusters with represented usable interior space*

Program Layout

Figure 78 | *Ground floor plan with generalized program layout on the island*

Building Cluster "A"

Figure 79 | *Floor plan of Cluster "A"; With detailed program layout of interior space*

Building Cluster "A"
New Roof System

In order to preserve the form of the structures and keep them recognizable to the people who worked there, the focus of the renovation was put on one element of every building; The roof. The roof is constructed of rib-like girders that are exposed and provide structural support and a distinctive overhanging part of the roof that drops down from the side of the building. Because all of the structures on the island were built decades apart from one another, they have little similarity with each other. So, in order to bring about unity between them, the roofs also function as a "uniform". Secondly, there were alarming hazards of badly constructed parts of the roof on location, therefore it was also a necessity.

With and industrial setting, there is also a need of preserving that feeling. That is why the use of metal girders and corrugated sheet metal for for the construction of the roof was chosen. Secondly, in order to achive maximum efficiency these metals can be found all over the island and recycled back to use after the sanation process.

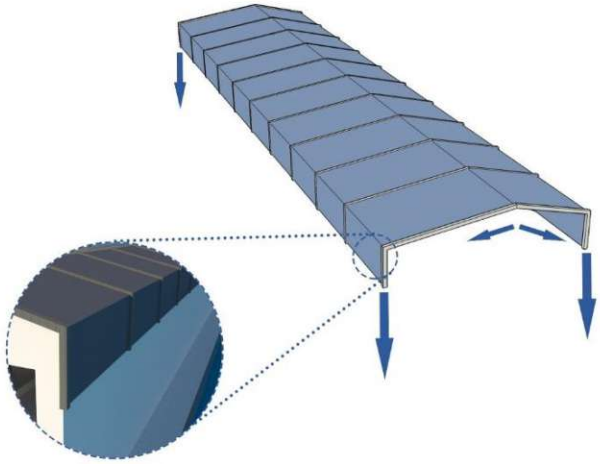


Figure 80 | *3D axonometric view of the New Roof design*

Figure 81 | *Axonometric view of Cluster "A" building with new roof being added*

BUILDING CLUSTER "B"

Figure 82 | *Floor plan of Cluster "B"; With detailed program layout of interior space*

Building Cluster "B"
New Bridge Construction

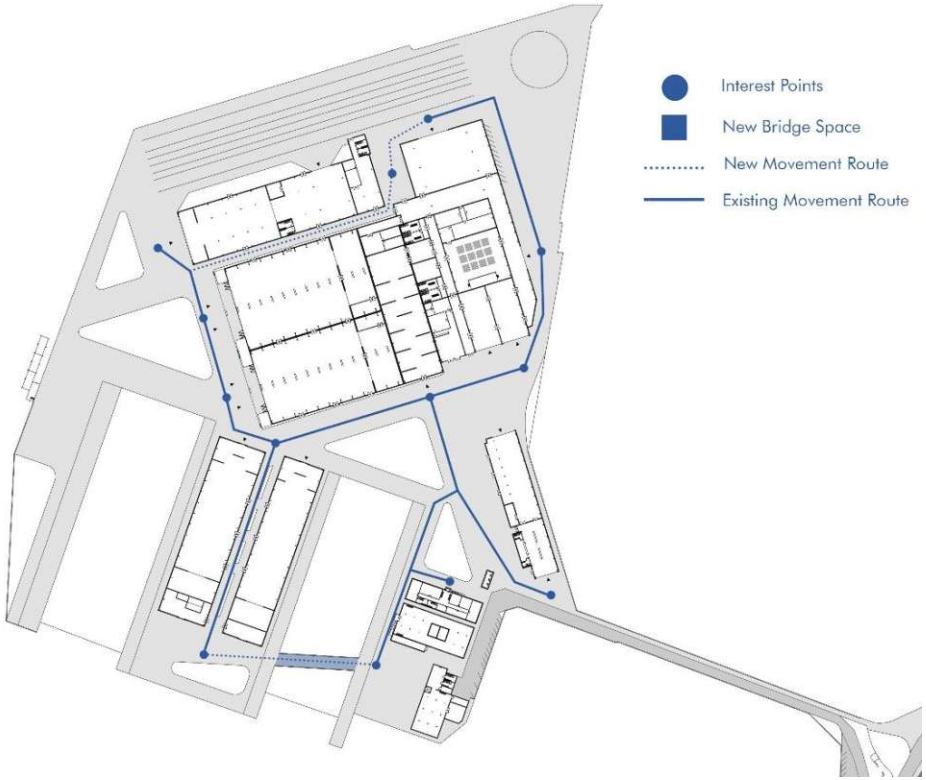


Figure 83 | Ground floor plan with old and new movement routes

With the organisation of the spaces on the island it was evident that some new connections have to be made. In order to achieve a better movement flow one, the island, a bridge needed to be places above the "sink-in "ramp between Clusters "C" and "B". Not only was it necessary for easy of movement but also in an emergency, the distance to the bridge for the mainland has been drastically decreased.

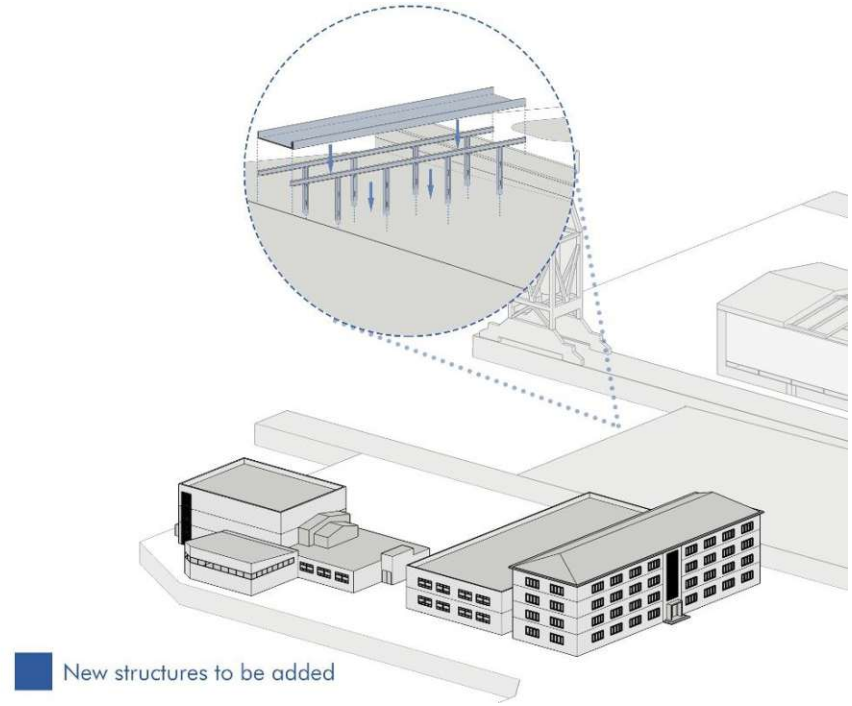


Figure 84 | 3D Axonometric view of the new Girder Bridge location and explosion

Building Cluster "C"

Figure 85 | Floor plan of Cluster "C"; With detailed program layout of interior and exterior space

Building Cluster "C"
Sunlight Control with Roof

The existing buildings on cluster "C" have a unique retractable roof sections. This mechanic was used during production time to let sunlight and fresh air into the hangar. With this mechanic it presents an interesting opportunity for different lighting scenarios for the exhibition space within. To further along the use of this mechanic and new steel-glass roof section was added over the void space. Thereby protecting the interior space from outside weather and sound.

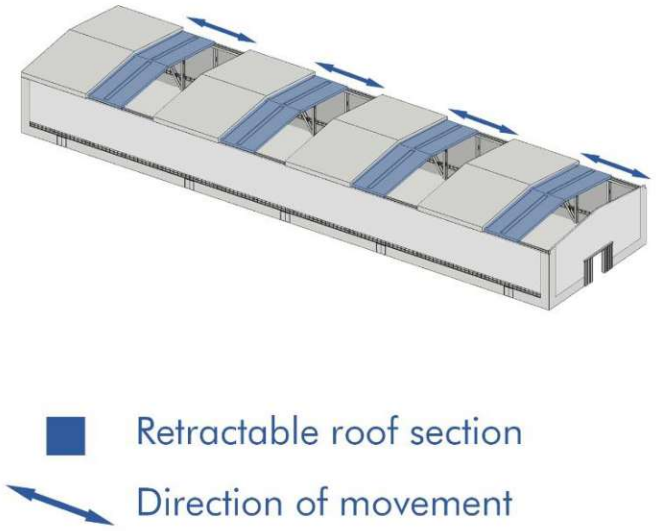


Figure 86 | *3D Axonometric view of retractable roof section and its direction of movement*

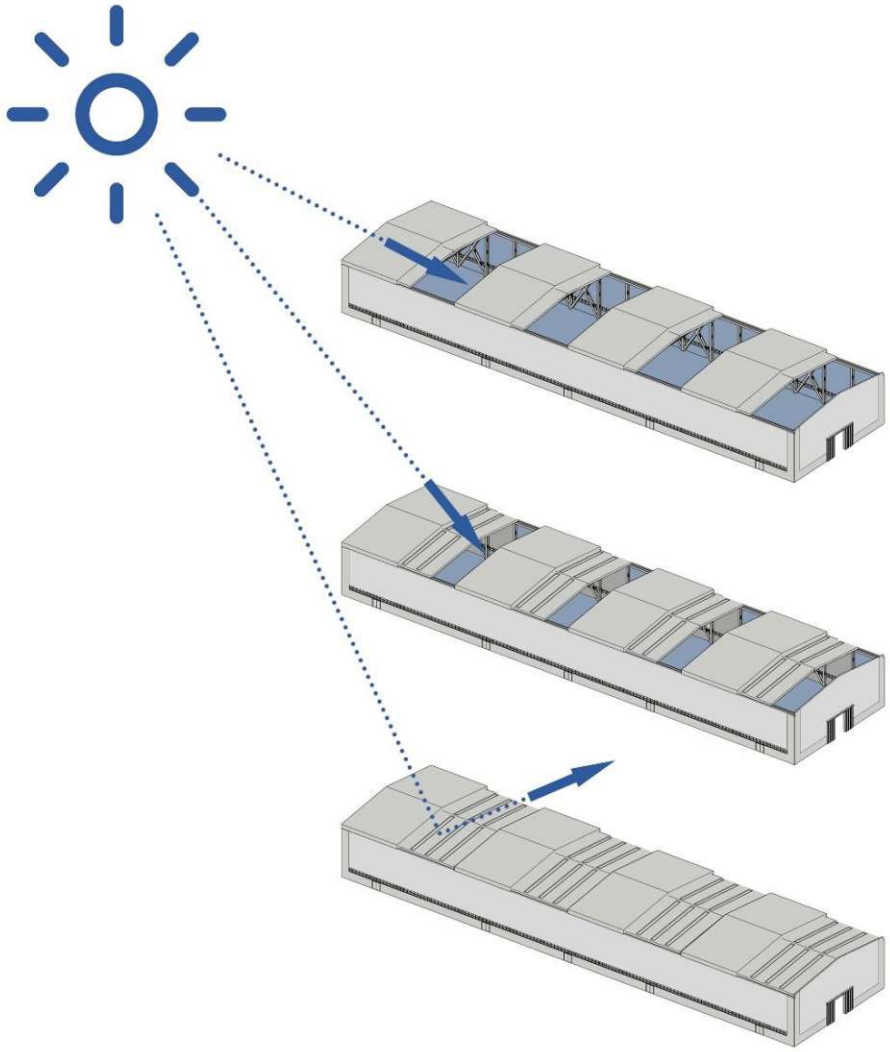


Figure 87 | *Different Stages of Sunlight passing through*

Building Cluster "C"

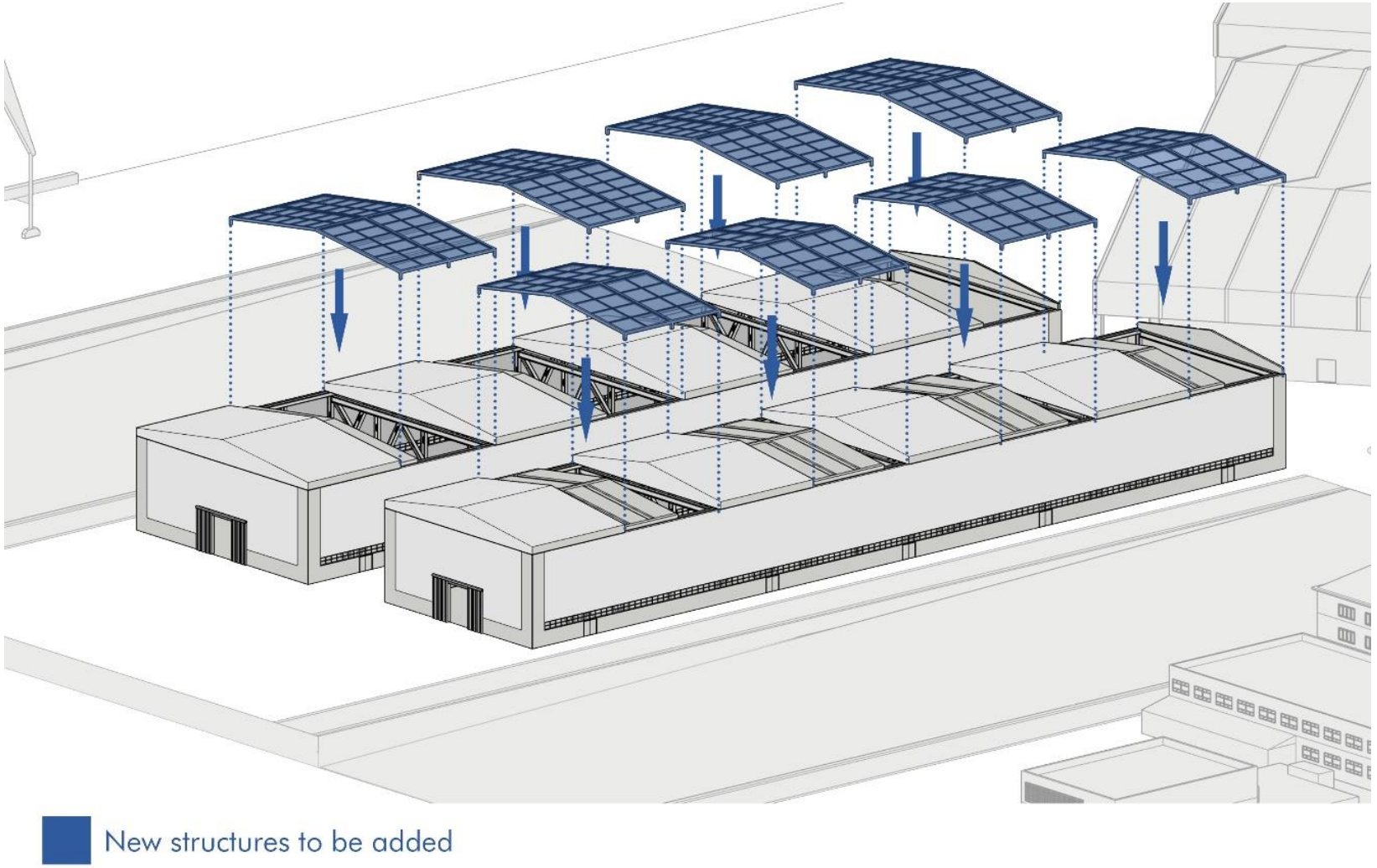


Figure 88 | *3D axonometric view of new roof section being added to the buildings of cluster "C"*

Building Cluster "D"

Figure 89 | *Floor plan of Cluster "D"; With detailed program layout of interior space*

Building Cluster "D"

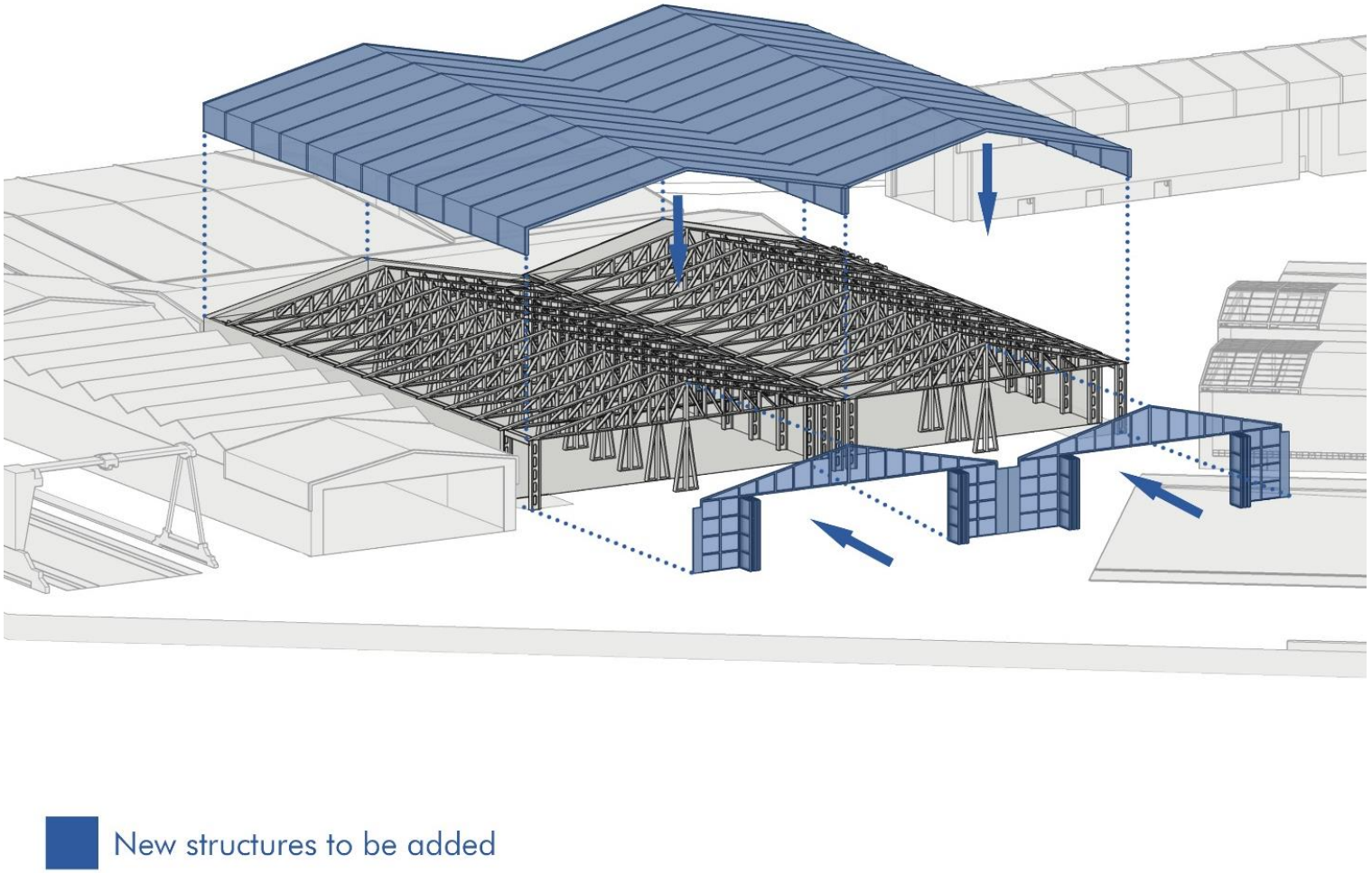


Figure 90 | *3D axonometric view of new roof section and curtain wall façade being added to the buildings of cluster "D"*

Building Cluster "E"

Figure 91 | *Floor plan of Cluster "E"; With detailed program layout of interior and exterior space*

Building Cluster "E"

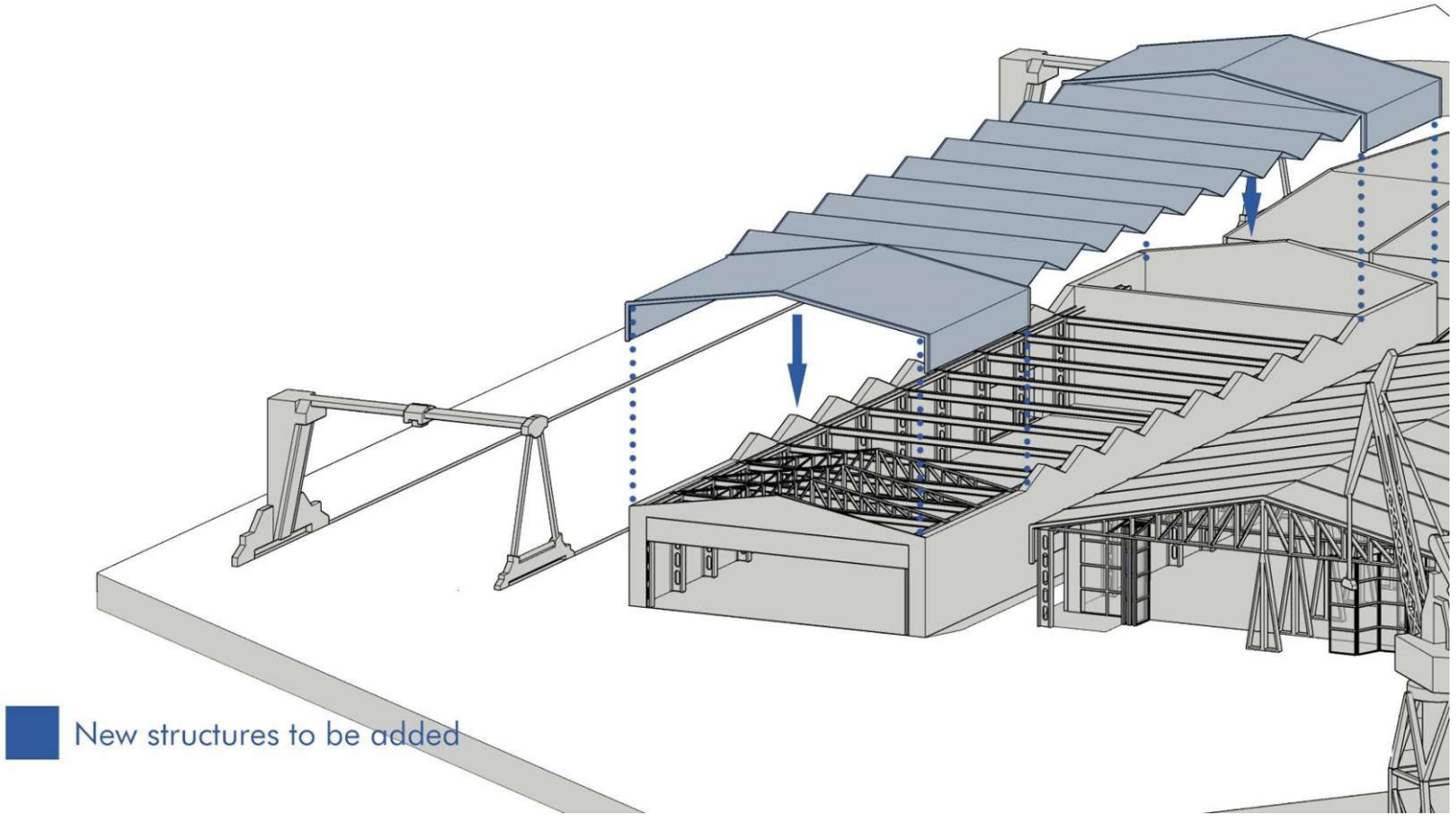


Figure 92 | *3D axonometric view of new roof section being added to the building of cluster "E"*

Building Cluster "E"

Collecting Path

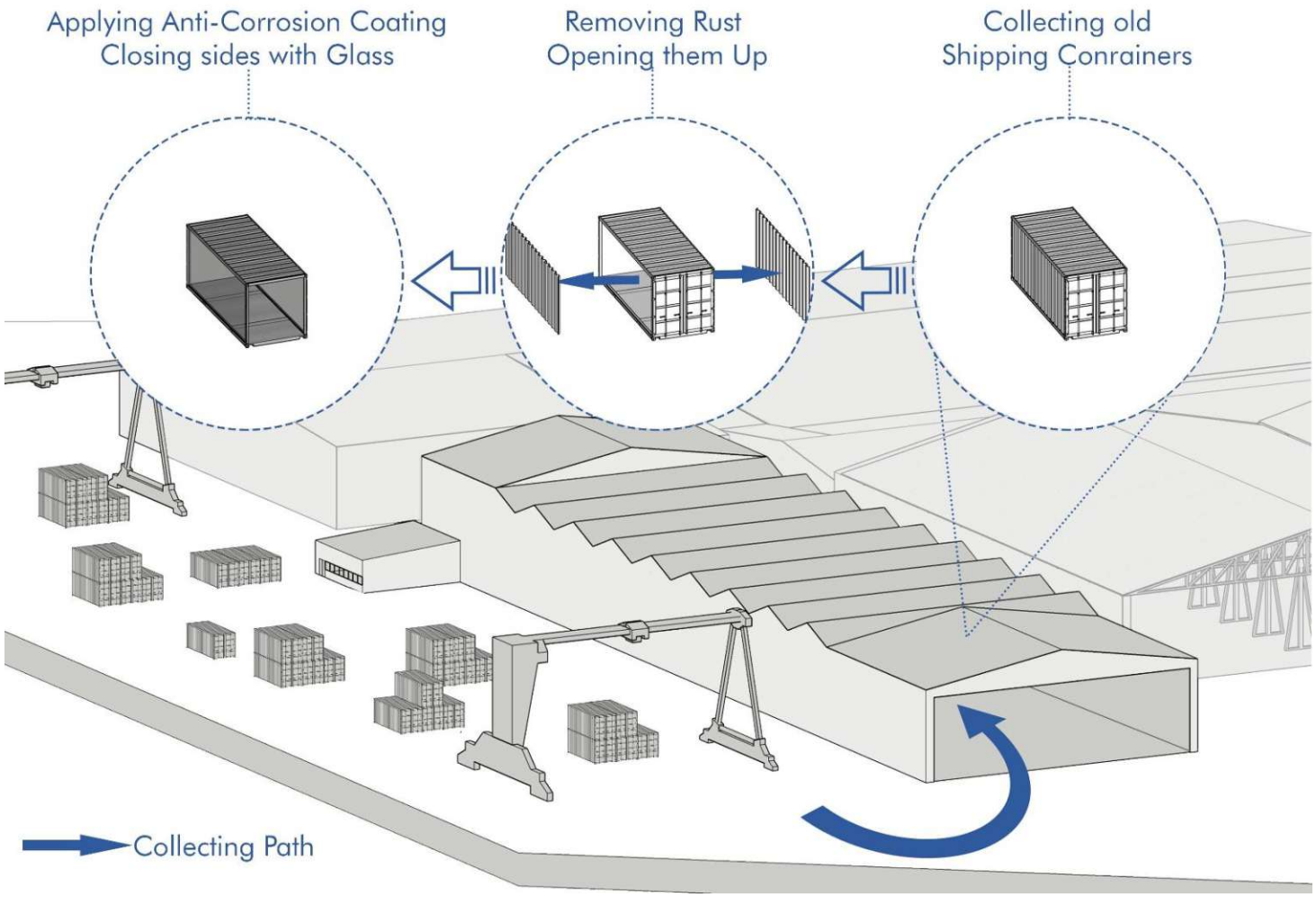


Figure 93 | *3D axonometric diagram of refurbishing old shipping containers in building cluster "E"*

Building Cluster "E"

Deployment Path

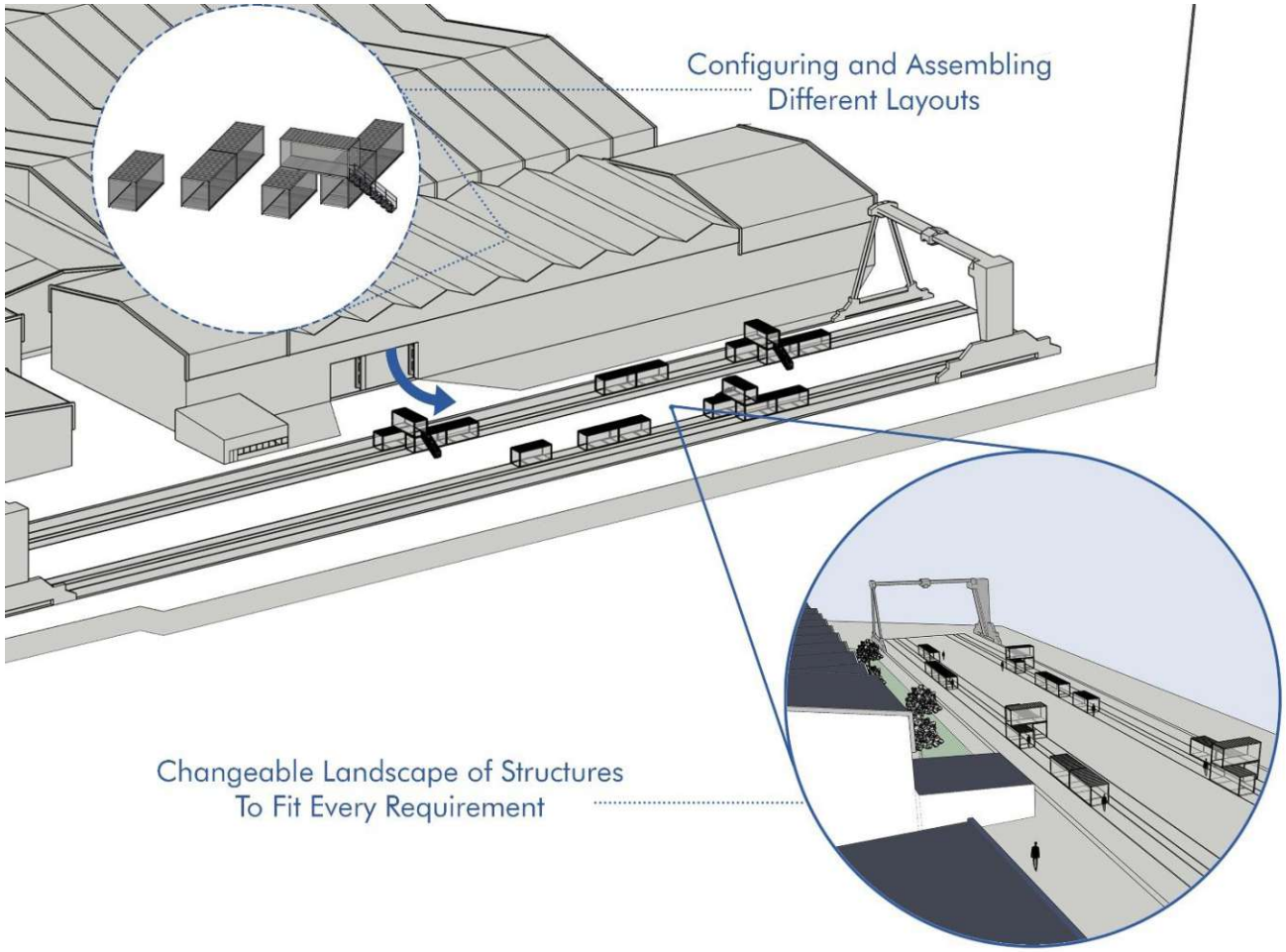
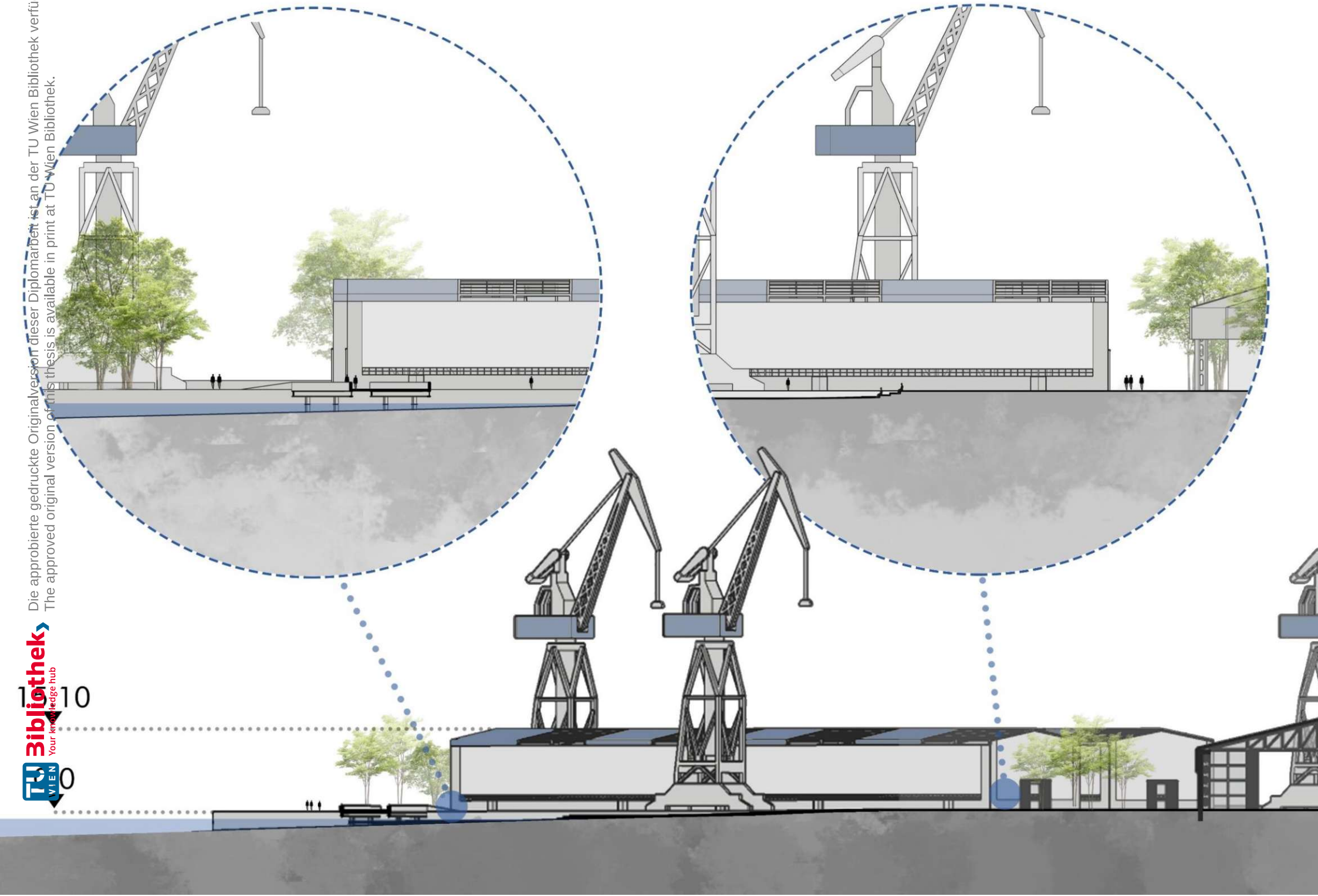
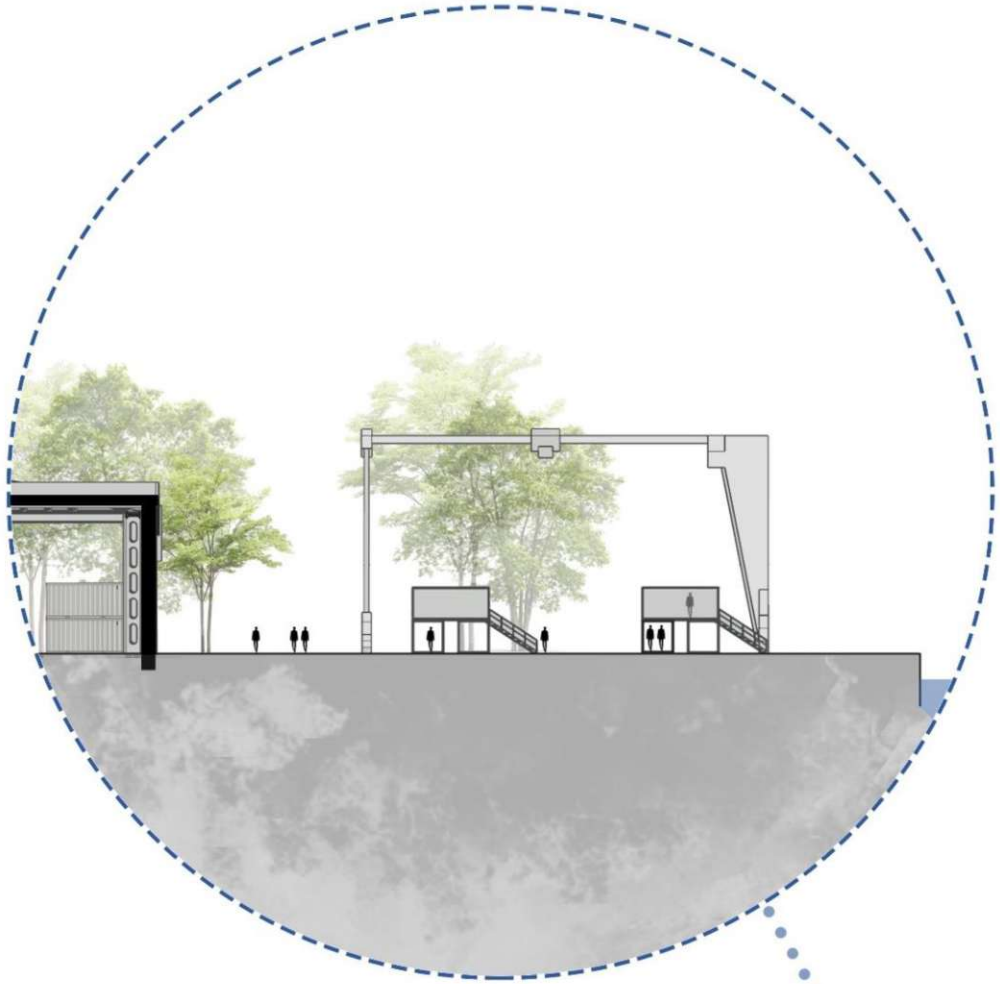
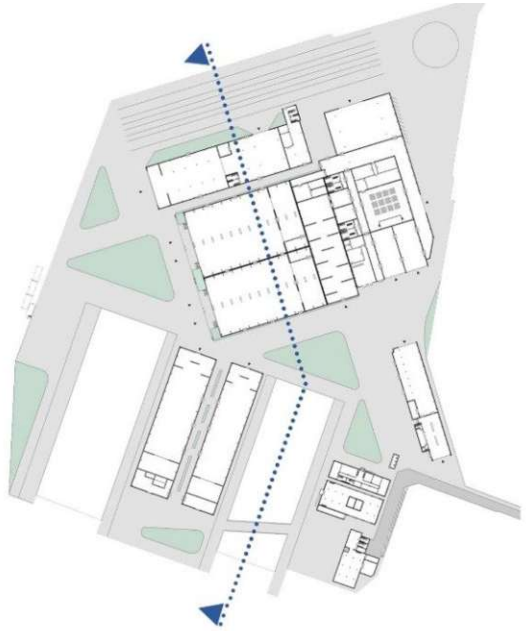
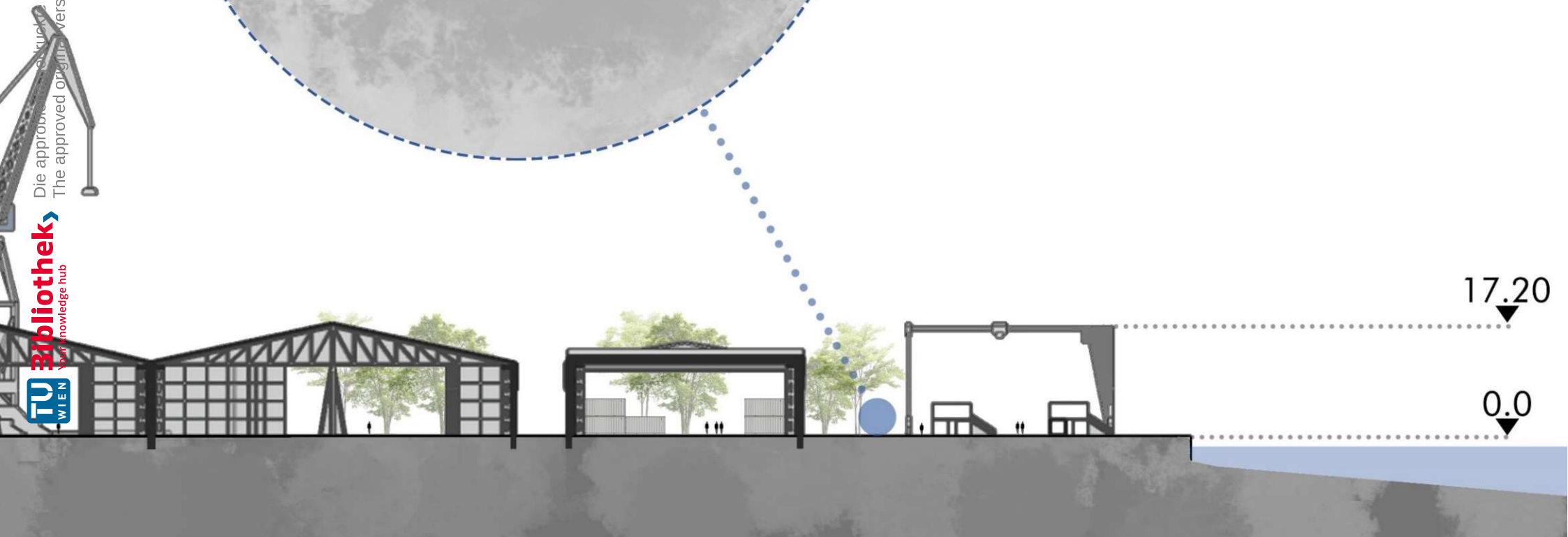


Figure 94 | *3D axonometric diagram of assembly and deployment of shipping containers out of building cluster "E"*









Final Concept (Renders)

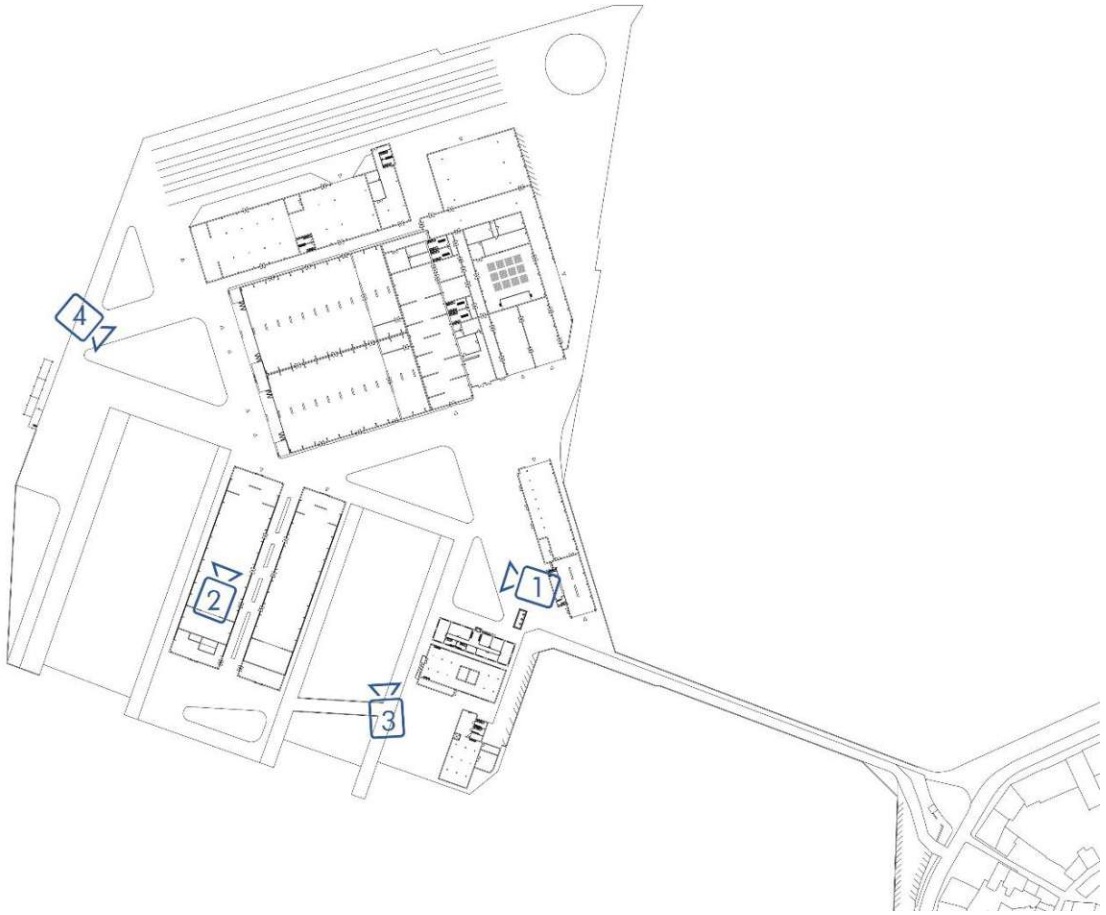


Figure 95 | Camera angles for Render Photos

Figure 96 | *Photorealistic view of the island; Camera Angle 1 (see Figure 95)*

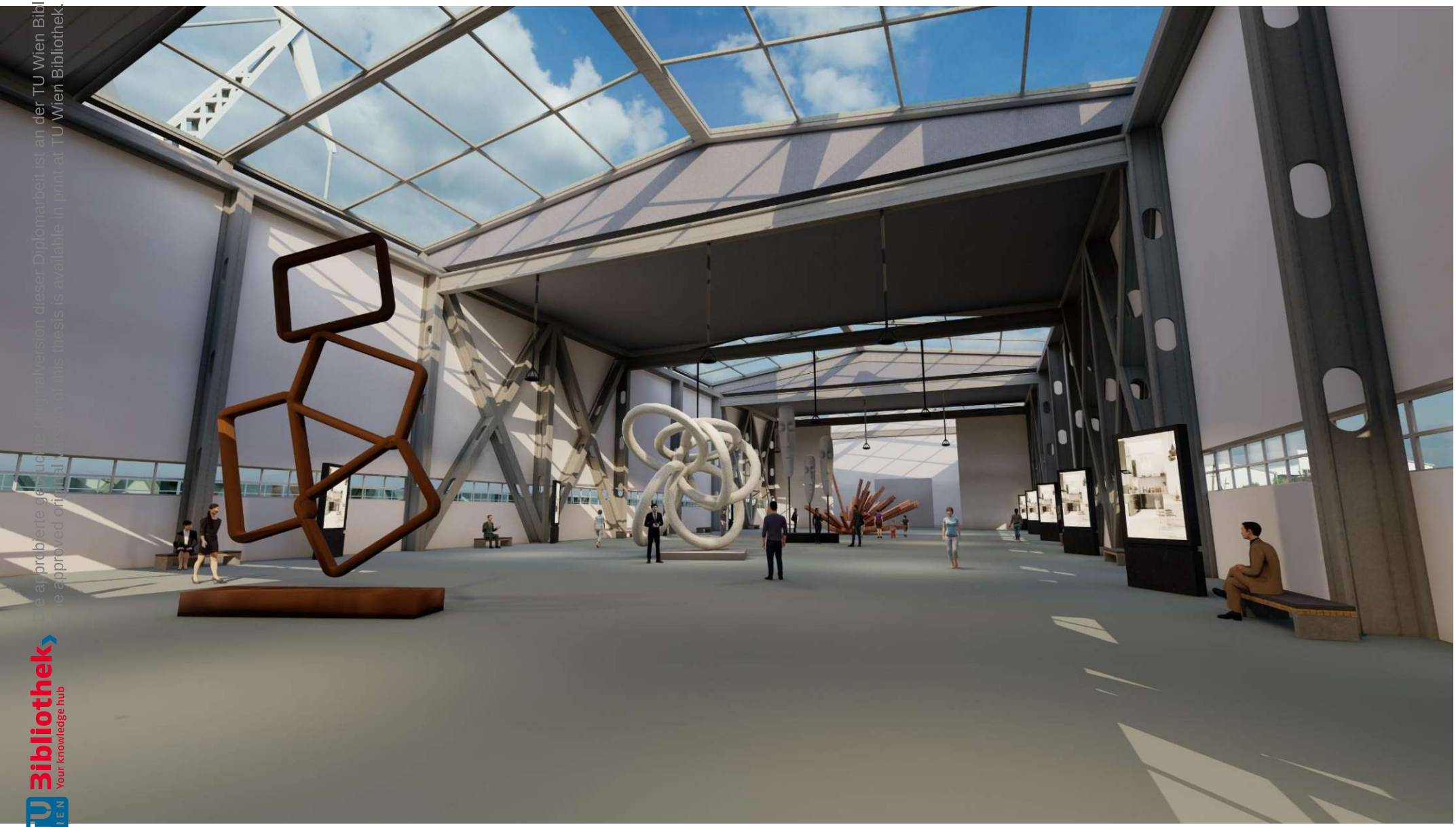


Figure 97 | *Photorealistic view of the island; Camera Angle 2 (see Figure 95)*

Figure 98 | *Photorealistic view of the island; Camera Angle 3 (see Figure 95)*

Figure 99 | *Photorealistic night time view of the island; Camera Angle 4 (see Figure 95)*

Bibliography

Books

1 - Univ.Prof. Dr. Arch. Thomas Hasler, Univ.Prof. Dipl. Arch. Astrid Staufer; Urban Prospects – Thesen für den Bodenseeraum; 2016.; Technische Universität Wien; Bachelor und Masterarbeiten

2 – Thomas David, Vladimir Kolar; ISTRA; 1983.; Jugoslavenska Revija; Beograd, Jugoslavija

3 – Dragutin Zdunić; PULA; 1976.; Grafički zavod Hrvatske; Zagreb, Croatia

Academic Papers

1 - Dr.sc. Klara Buršić-Matijašić, doc., Prof. dr. sc. Miroslav Bertoša, Branko Perović, kap., Dr. sc. Davor Mandić; Iz povijesti Pulske Luke; 2006.; Collection of Thesis; Pula, Croatia

2 - Stephen Davies; MARITIME MUSEUMS: WHO NEEDS THEM?; 2012.; Working Paper; Institute of Southeast Asian Studies, Singapore

3 - Kaushik Biswas, PhD William Miller, PhD, Scott Kriner, Gary Manlove; A Study of the Energy-Saving Potential of Metal Roofs Incorporating Dynamic Insulation Systems; 2013.; Article; Oak Ridge National Laboratory in Tennessee, USA

Sources

1 - https://en.wikipedia.org/wiki/Istria

2 - https://wiki.edu.vn/wiki13/2020/12/16/istrien-wikipedia/

3 - https://www.uljanik.hr/en/about-us/history

4 - https://mint.gov.hr/pristup-informacijama/dokumenti-80/statistike/11514

5 - https://mint.gov.hr/pristup-informacijama/dokumenti-80/statistike/arhiva-12059/12059

6 - https://www.e-flux.com/architecture/positions/202487/this-is-not-an-exhibition/

7 - https://en.wikipedia.org/wiki/Maritime_Museum_of_Barcelona

8 - https://www.archdaily.com/889132/kengo-kuma-transforms-shanghai-shipyard-into-multi-use-complex/5a85c951f197cc431e000154-kengo-kuma-transforms-shanghai-shipyard-into-multi-use-complex-photo?next_project=no

9 - https://mfs.dk/en/the-museum/the-architecture/

10 - https://www.world-architects.com/de/big-bjarke-ingels-group-valby-copenhagen/project/danish-national-maritime-museum

11 - http://praksa.hr/map-story/#

12 - https://hr.wikipedia.org/wiki/Brodogradili%C5%A1te_Uljanik

13 - https://www.uljanik.hr/index.php/en/about-us/history

14 - https://www.glasistre.hr/istra/stotinu-godina-pulskog-brodogradilista-scoglio-olivi-558959

15 - https://hr.wikipedia.org/wiki/Sto%C5%BEerna_zgrada_u_Puli

16 - https://hr.wikipedia.org/wiki/Hrvatska#Povijest

17 - https://tehnika.lzmk.hr/uljanik-brodogradiliste-d-d/

18 - https://www.vecernji.hr/biznis/dika-uljanika-deset-grdosija-koje-su-proslavile-pulsko-brodogradiliste-1310173/galerija-354683?page=12

19 - http://www.regionalexpress.hr/site/more/pomorski-arsenal-u-puli-1856.-1918.-9.-dio

20 - https://www.telegram.hr/fotogalerije/zivot/ljepse-je-sjecati-se-uljanika-onakvim-kakav-je-nekada-bio-mocna-masinerija-ovo-su-slike-iz-tog-doba/

List of Figures