

FLAMINGO NATURE PARK

Revitalisation and adaptive re-use of Salina
in Ulcinj, Montenegro

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MASTER-/DIPLOMARBEIT

Flamingo Naturpark

Revitalisierung der Saline in Ulcinj, Montenegro

ausgeführt zum Zwecke der Erlangung
des akademischen Grades einer
Diplom-Ingenieurin
unter der Leitung von

Gerhard Stadler
Ao.Univ.Prof. Dr.phil.

E251-02 - Forschungsbereich Denkmalpflege und Bauen im Bestand

eingereicht an der Technischen Universität Wien
Fakultät für Architektur und Raumplanung

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Wien, am 25.05.2021

Unterschrift





Figure 0. Flamingos at Salina

Die Salzanlage in Ulcinj, Montenegro wurde in den 30er Jahren des 20ten Jahrhunderts errichtet; wegen der perfekten Klimabedingungen und der fast direkten Lage am Meer, war dies eine perfekte Lokation zur Errichtung einer Salzanlage. Sie war lange Zeit eine der größten Betriebe im ehemaligen Jugoslawien, hat in ihrer beste Zeit sogar 60.000 t jährlich produziert und war Zentrum des Lebens für viele Einwohner von Ulcinj. Ihre Bedeutung ist nicht nur wichtig wegen der Salzproduktion, sondern weil dieses Areal eine spezielle Lagune geworden ist, mit ca. 250 verschiedenen Vogelarten die die Saline als „Vogelflughafen“ nutzen. Im Jahr 2005 wurde die Saline privatisiert und war dadurch nicht mehr 100 Prozentig produktiv, viele Mitarbeiter wurden entlassen und es wurde immer weniger Salz produziert. Im 2013 wurde das letzte Mal Salz gesammelt und seit dem steht die ganze Anlage leer. Das Meerwasser wird noch immer mit Pumpen in die Anlage gepumpt, da die Vögel und Ihre Nahrung kein stehendes Wasser bevorzugen. Heutzutage ist die Saline mit einer verlassenen Ruine zu vergleichen, welche an besseren Zeiten erinnert. Das gesamte Salinenareal hat den Status eines Naturschutzgebietes erhalten und wird seither als Naturpark verwendet. Damit waren glücklicherweise die Pläne zur Errichtung einer Hotelanlage hinfällig. Die Saline braucht dringend eine Revitalisierung und muss wieder zur Salzgewinnung genutzt werden, ebenso wie der Erhalt der Vogelbestände. Die Diplomarbeit beschäftigt sich mit der Revitalisierung, Aktivierung und teilweise Umnutzung der Salzanlage. Im Fokus steht das ehemalige Verwaltungsgebäude, dass seit dem Ende der 70er Jahren verlassen ist. Für dieses Objekt ist ein Saniernungskonzept überlegt worden, welches die Umnutzung und Umplanung des Gebäudes in ein Salz Museum, zum Nahe bringen der komplexen Geschichte dieser Anlage, fokussiert. Neben dem Verwaltungsgebäude wird das ehemalige Salzlager umgeplant, um in dieser riesigen Halle ein Veranstaltungssaal und ein Learning Zentrum unterzubringen. Für die restlichen Baukörper am Gelände wird ein Vorschlag in Form eines Masterplans gemacht, in welchem die verschiedenen Funktionen abgebildet werden. Das Ziel des Projekts ist die Möglichkeiten dieser Anlage aufzuzeigen, damit dieses Gebiet wieder attraktiver genutzt wird. Es ist eine Kombination von Eco/Vögel/Ausbildungstourismus, welche zusammen mit der Nähe des Meeres sehr viele Personen anziehen könnte und gleichzeitig Arbeitsplätze für Einheimische schaffen könnte.

KURZFASSUNG

Ulcinj Salina was constructed in the 1930s in Ulcinj, Montenegro because of its ideal climate conditions and its direct position on the coast which made it perfect as a saltworks location. The Ulcinj Salina was one of the most successful companies in Ex-Yugoslavia; it produced yearly up to 60.000 t and it was the centre of everyday life for many Ulcinj inhabitants. It is not only significant because of the salt production; it represents a very special bird sanctuary with over 250 different bird species that use it as a special kind of airport. In 2005 Ulcinj Salina went under privatization and wasn't functioning completely after then; a large number of employees were fired and the amount of produced salt was always getting smaller and smaller. The last salt harvesting happened in 2013 and since then it has been abandoned. Today, the former glory of this manufacture can barely be recognized because of its post-apocalyptic appearance. The pumps are still functioning and getting the saltwater into the salt pans as this specific ecosystem could not survive without the water flow. The whole area has been put under protection and has gotten a status of a nature park. Luckily, with this declaration plans to turn this area into a luxurious hotel resort had been put to sleep. Nevertheless, the Ulcinj Salina needs an urgent revitalization solution and initiation of salt harvesting, especially because of the birds. This project targets revitalization, activation and partial re-use of the manufacturing building complex. The main focus is the Administration building and the salt warehouse. The Administration Building has been abandoned since the end of the 70s; a set of conservation measures has been planned for this object as well as re-use as a Salt museum which brings the rich history and manufacturing process of saltworks closer to the visitors. Apart from the museum, a learning centre and multi-functional event hall will be presented as a solution for the immense warehouse hall. For the rest of the objects of the Salina complex, a proposition of future use will be made in form of a master plan where some new functions will be presented aside from salt production. The goal of the project is to show different possibilities which this area could offer to make it more appealing. It represents a combination of eco, ornithological and educational tourism which could attract different groups together with the closeness of the sea and at the same time create job positions for the locals.

ABSTRACT



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Table of Contents

1. Geographical and historical overview of Ulcinj
 - 1.1 The city and the surroundings
 - 1.2 Ulcinj history
2. The salt and salina
 - 2.1 The white gold
 - 2.2 Salt production in the Balkans
 - 2.3 The Ulcinj Salina- a turbulent history
 - 2.3 Saline today
3. The site analysis
 - 3.1 Urban analysis
 - 3.2 Location and Landscape
 - 3.3 Water
 - 3.4 Vegetation
 - 3.5 Building description
 - 3.6 Ornithological significance and birdwatching
 - 1.3.6.1 Main characteristics
 - 1.3.6.2 Close-up
 - 3.7 Tourism
4. Monument preservation and conservation
 - 1.4.1 Cultural heritage preservation in Montenegro
 - 1.4.2 Industrial heritage in Montenegro
 - 1.4.3 Recording measures for Administration building
 - 1.4.4 Preservation measures for Administration building
5. Design and implementation
 - 5.1 Salina Museum
 - 5.1.1 Plans
 - 5.1.2 Sections & Views
 - 5.1.3 3D Perspectives
 - 5.2 Learning center/Event hall
 - 5.2.1 Plans
 - 5.2.2 Sections & Views
 - 5.2.3 3D Perspectives
 - 5.3 The Flamingo nature park
6. Bibliography

1. GEOGRAPHICAL AND HISTORICAL OVERVIEW OF ULCINJ

1.1 The city and the surroundings

Montenegro is a republic state in the southeastern Europe. It is located on the Balkan Peninsula, where it also has its coast on the Adriatic Sea. On the western side, Montenegro is surrounded by the neighbor countries Croatia and Bosnia&Herzegovina, on the northeast by Serbia and Kosovo, and on the east by Albania. The capital of Montenegro is Podgorica, which is also the largest city.

Throughout its turbulent history, Montenegro has changed several times its size and number of inhabitants. Today the country has an area of 12 812m² and 620 000 people living in it¹. Ulcinj is a town on the southeast Adriatic coast of Montenegro, the southernmost city of the whole country. It has almost 20 000 inhabitants and an area of 255 m². On the south side of the city, the mountain Možura (622 m a.s.l.) is located, and next to it is the Rumija mountain. On the west side, the next city is the city of Bar, which is maybe the most important city on the country's seaside because of its harbor and trading significance. On the east side of the city of Ulcinj, there is the Bojana river who is flowing into the Adriatic sea and divides Montenegro from its neighbor Albania. You can't really say that the city's area is a mountain area, but there are a couple of hills that surround the city, and they are: Pinješ (108m), Mendre (160m), Bijela Gora (289m), and Meterizi. Following the east side of Ulcinj, the terrain is flowing more into the field-one, with lots of it like the Ulcinj field, Zoganj field, Anamalsko-vladimirsko field, Štojska field,... In the vicinity of the city there is also Šas lake and some rivers of smaller size³. Ulcinj represents a multi-ethnic city, with several nations living in it, the biggest ethnic group being Albanians (70,66%), and the second largest group are Montenegrins (12,44%)⁴.

¹ Crna Gora, Zavod za statistiku, „Crna Gora u brojkama“, Podgorica, 2012
<https://www.monstat.org/userfiles/file/publikacije/CG%20U%20BROJKAMA/Crna%20Gora%20u%20Brojkama%20cg-FINAL.pdf>, (21.04.2020)

² ibid., 16.

³ Gani Karamanga, „Lijecenje prirodnim faktorima u Ulcinjskoj regiji“, Savez stvaralaca Albanaca iz Crne Gore, Ulcinj, 2008, 17.

⁴ Prostorno-urbanistički plan opštine Ulcinj 2020, <https://mrt.gov.me/ResourceManager/FileDownload.aspx?rId=173930&rType=2>

Both Montenegrin and Albanian are official languages in Ulcinj and they are as well taught in school. Being on the seaside Ulcinj also represents an important touristic point of Montenegro. The touristic zone of the city extends from the Little beach (Mala plaža) in the city itself, until the Ada Island and Albanian border. The coast has two faces; a steep and a flat one. The part with the steep rocks and cliffs is rich with vegetation and covered in pine forest and maquis and spreads all the way from the Mala plaža until the Đerane and Port Milena and is about 3,5 km long⁵. The Great Beach (Velika Plaža) is the most momentous part of this area with its 12,5 km length and sandy landscape. It spreads from Port Milena until the Bojana delta and Ada island. Velika plaža has become a really beloved touristic destination in the past few years, especially for the lovers of kitesurfing. That is the reason why the Bojana river (that pours out from Skadar lake and pours in at the end into the Adriatic sea) has become insanely urbanized by the overwater bungalows that also attract a lot of tourists. Behind Velika plaža, there is Ulcinj and Zoganj field, Ulcinj saline, Upper and Lower Štoj.

Ulcinj is connected to other cities like Bar, Budva, Tivat, Boka bay, Dubrovnik, etc. via the Adriatic highway. The distance from Ulcinj to Bar is approximately about 27 km, to the capital Podgorica about 78 km, to Skadar (Albania) about 40km. The nearest airport is the one in Podgorica that is about 70 km and the one in Tivat that is 85 km distant.

⁵ Gani Karamanga, „Lijecenje prirodnim faktorima u Ulcinjskoj regiji“, Savez stvaralaca Albanaca iz Crne Gore, Ulcinj, 2008, 21.



Fig.1 Map of Montenegro

1.2 The history of Ulcinj

It is believed that the city of Ulcinj represents one of the oldest settlements on the Adriatic coast, with some saying it is over 2500 years old⁶, but it can't be exactly proven. It has been a point of cultural clash between the East and the West, which only contributed to its rich and turbulent history. One of the things that prove its long history is an ancient „cyclops wall“, which with its special building method indicates its ancient age. Historical sources indicate the first inhabitants in the 5th century BC, and it is believed that the first inhabitants of Ulcinj were the Illyrians, an Indo-European tribe. At the time of the Illyrian state, the city experienced its full bloom. One of the earliest known names of the city was „Colchidium“, given because of the Greek tribe from Colchis, which are believed to have established the core of the city. Until 163 BC the Illyrian tribe Olcinijatas ruled over Ulcinj, so it got a new name-„Olcidium“. Afterward, the Romans conquered it, which led the city into a new era. It became an establishment with special privileges (oppidum civium Romanorum), after which it has also been granted an independent status-municipium. After the division of the Roman empire, Ulcinj was joined with the Prevalis province as a part of the Eastern empire, with the population being mostly Christian. The city has always been attractive to different conquerors because of its remarkable geographical position, climate and topography, and because of this, it was a harbourage to various demographic groups throughout the centuries.⁷ According to a legend, the oldest settlement has sunk into the sea after an earthquake in 444 AD. On the high cliff above the sea, a new one was built in the 6th century. In the 10th century Constantine VII Flavius Porphyrogenitus (Macedonian Emperor) mentions the city as „Helcinio“, and it has been confirmed that it was the part of Zeta state of Vojislavljević. In the year 1183, Serbian prince Stefan Nemanja has taken over the city.

⁶ Dragan K. Vukcevic, Bato Tomašević, „Crna Gora“, Atlas Group, Podgorica, 2006. 194.

⁷ <https://me.visit-montenegro.com/main-cities/ulcinj/ulcinj-history/>, (25.05.2020)

Because of its excellent position, the city of Ulcinj has become a significant center of trade and maritime in medieval times. It was ruled by Balša the 3rd from 1412 until he died in 1421. After the downfall of the Zeta state, the Republic of Venice has taken over it and ruled until 1571, when the city was taken over by the Turks who occupied the city almost until the 1880s. The ruined city was turned by them into a strong fortress and the city gets an oriental makeover that's was influenced by the religion which included mosques, narrow streets, and amams. The city of Ulcinj has become an important place in the battle against the Venetian republic. The city was finally liberated by the Montenegrins in the year 1878 until more than 300 years of Turkish occupation. On the 10th November of 1880, the city of Ulcinj was finally part of the principality of Montenegro. After that, the new housing was built and the city was developing, but until this day the city has kept its oriental look.⁸ Like many of the surrounding cities, Ulcinj also suffered consequences from World War I and World War II; in World War II, the country was conquered through Nazi forces until 1944 when Partizani liberated it and its southernmost city-Ulcinj.⁹

After the war, the country of Montenegro within Yugoslavia started to develop its various branches of industry and economy. The nation started developing and growing; all of a sudden the attention was brought onto the things that weren't appreciated until then; especially natural wonders that could also be utilized. That is how tourism found its place. This branch started expanding and developing, so many places were renovated. The coastal cities in Montenegro. Besides its magnificent location and climate, the city also offers an interesting clash of traditional, national and ethnic diversities which made its history only more colourful, and the city itself more interesting and attractive as an important tourist center.

⁸ Dragan K. Vukcevic, Bato Tomasevic, „Crna Gora“, Atlas Group, Podgorica, 2006. 194.

⁹ <https://me.visit-montenegro.com/main-cities/ulcinj/ulcinj-history/>, (25.05.2020)



Pianura de Marconichis. doue ui sonno dui vilazi.

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S. T.

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DVLCIGNO gia detto Vlcono
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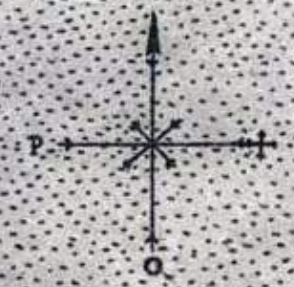


Fig.2 Antique Ulcinj 5

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Fig.3 Old Ulcinj, the Small Beach



Fig.4 Ulcinj today

2.THE SALT AND SALINA

2.1 The white gold

Salt, in past known as „white gold“, has changed its value and meaning in course of time. For the early cultures such as Egyptian, Sumerian and Babylonian, salt was one of the most significant materials of their time as they have used it for both spice and food preservation. For the Egyptians, it was salt really important as they used it in the mummification process. In those times salt was collected from either the salt water from the sea or salt desserts.

The Greeks and the Romans collected salt from the sea as they had access to it, which they obtained with the help of the sun which dried out the sea water that was held in special salt fields. The salt exchange was an important business for many countries and cities; the wars were lead because of it, and it was also normal to get it as a salary. With time people have learned to get salt more easily, and not just with the evaporation of the sea water; they learned to get it artificially too. In the Middle Ages, although salt was much easier to get, it remained an important product and cause of numerous battles. The cities and merchants who had a monopoly over the salt were significant and wealthy.¹⁰ Salt has lost its historical meaning because it became overmeasured; the new technologies have made it possible to produce more salt and in different ways, but it is nevertheless a compound of basically every dish made on this planet. It has made a long journey, from the „white gold“ that controlled the world economy, to the „white killer“ that has, more or less, just remained a spice that could cause health issues when being overly used. In chemistry, a salt is an ionic compound between a non-metal and a metal formed by the reaction of an acid with a base. It consists of anions (acid residues) and cations (metals). There are different salts, and they are divided by acid residues into chlorides, iodides, acetates, nitrates, sulfates, etc. Normal, or „kitchen salt“ is a mixture of salt with the highest percent of sodium chloride (NaCl), and a share of other minerals is linked to the method of production.

⁸ Kathrin Tonndorf, Eva Wager, „Salz“
<https://www.planet-wissen.de/gesellschaft/lebensmittel/salz/index.html#Hochkulturen>
(16.09.2020)

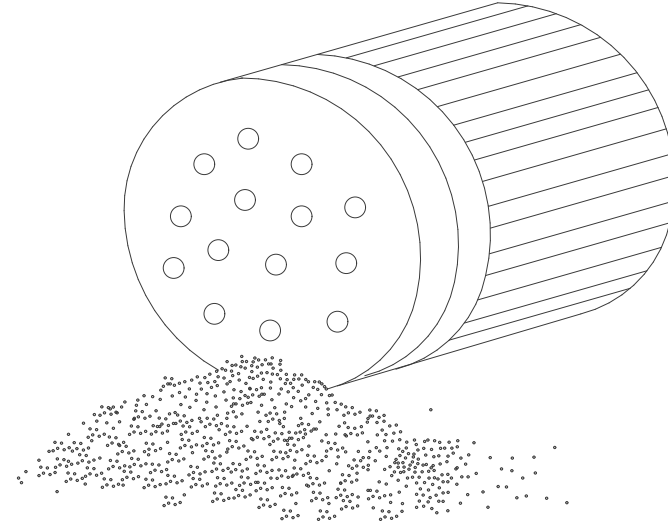
Salt comes not only in classical white that we all know. Its colour can vary from pale pink to light gray.¹¹ There are a few methods how to produce salt: from sea water, from inland salt water, salt mine, and artificial (vacuum steaming). The process of producing sea salt is the following one; the sea water that is placed in the shallow pools, influenced by the sun temperature and wind, evaporates until the moment where the kitchen salt (NaCl), can't be held anymore in a melted condition, so the process of the crystallization begins to unfold in special pools for crystallization, from which is the salt collected.¹² During the evaporation of seawater in saline, iron oxide is first extracted from the brine, followed by calcium carbonate (CaCO₃), followed by gypsum or calcium sulphate (CaSO₄) up to a salinity of 16 ° Bé.¹³ The salt (NaCl) begins to crystallize at a concentration of about 25.5 ° Bé. Sea salt pans are anthropogenic fields where man has transformed natural coastal wetlands by building embankments, canals, and shallow basins. With the help of sun and wind the seawater, which was transferred through a system of pumps, is thickened to its salt saturation. Salinas are most often found at the river confluence, which has created natural conditions for their development through the long-term accumulation of river sediments. They can be different and are often classified according to their geographical location, size, method of production and management, and the amount of salt produced. Considering salt mines and salt lakes, salt pans can be divided into six types or categories:¹⁴ Salt and salt mines inland; Salt lakes and depressions; Primitive salt pans; Handicraft salt pans; Industrial salt pans; Non-functioning; abandoned salt pans.

¹¹ <http://www.kpss.si/si/o-parku/soline-in-solinarstvo/sol>, (16.09.2020)

¹² Vaso Radovic, „Ulcinjska Solana“, Centralna narodna biblioteka Crne Gore, Ulcinj, 2008, 7.

¹³ <http://www.kpss.si/si/o-parku/soline-in-solinarstvo/sol>, (16.09.2020)

¹⁴ <http://www.kpss.si/si/o-parku/soline-in-solinarstvo/soline>, (17.09.2020)



2.2 Salt production in the Balkans



Fig.6 Secovlje Salt pans, Slovenia

Throughout the centuries has the Balkan Peninsula used its position on the Mediterranean for various purposes. Most of it was for trade, fish and sea industry, etc. One of the other benefits of Balkan's location is also the production of salt. Being on the Adriatic coast gave Balkan excellent conditions for producing salt out of the sea water. Other conditions that are helping out the process were also characteristic for the Balkan coast; especially sun and wind. That is why the Balkan countries such as Slovenia, Croatia, and even Montenegro and Albania have had their own manufacture of salt and were, or still are, successful at producing it.

Secovlje Salina Nature Park

The Secovlje Salina Nature Park (SSNP) is located on the coast of Slovenia. It covers 6.5 km² (of which 0.98 km² is dry land). It is part of the Piran Salinas (salt flat lands) which are composed of the still active Strunjan Salina and abandoned Lucija Salina. It is situated on the Adriatic coast, at the confluence of the Dragonja River in the southernmost point of the coastline of the Piran Bay,

and represents the northernmost saline on the Mediterranean. The area was proclaimed as a Nature Park by the Government of Slovenia in 2001. Piran Bay coast is well-known for its high-quality sea water, which makes, combined with the Mediterranean climate and its rich and fertile soil, perfect conditions for salt production. It also has created biodiversity of its own kind. The art of salt production represents a very traditional way, based on a 700-year-old method. Over a long period of time, a unique habitat has formed for halophytic or salt-loving flora and fauna. One of additional points of Secovlje's natural environment are the migrating birds which makes it even more fascinating. The saline's cultural heritage, which reflects centuries of salt production, is very opulent. Secovlje saline represents a salt manufacturing establishment that has to be taken care of because of its technology. It has been built that way that its architecture in some way protects its surrounding area which includes agricultural fields, car roads, airport, and other significant formations. It is well-hidden, far away from the industrial area, and because of its Nature park proclamation, it is preserved. The salt-producing area of Secovlje park spreads over about 593 ha, which is split up into two areas- the Fontanigge and Lera.¹⁵ The brine prearrangement is being done in Fontanigge, and both brine prearrangement and salt crystallization are being carried out in Lera.

Secovlje National Park is cooperating with the EU on a project which has its main focus on the preservation of the unique biodiversity that has been created in the area of the salt pans. That includes recovery and reconstruction of the water embankments, improved management that as the main focus point has rare and endangered bird species (like *Charadrius alexandrinus*, *Himantopus himantopus*, *Sterna hirundo*, *Sterna albifrons*, and *Larus melanocephalus*), as well as Little Tern (breeds only in Secovlje Saline), as well as coming up with a strategy how to utilize traditional methods in order to improve salina's habitat.¹⁶

¹⁵ Financial Strategy and Business Plan, Secovlje Salina Nature Park Slovenia, WWF Mediterranean Programme, May 2010, 11-14.

¹⁶ <http://www.kpss.si/en/the-park/park-tasks/project-work/life-mansalt>, (11.10.2020)



Fig.7 Nin Saltpans, Croatia

Nin Salina

The Nin saltworks is located in the middle section of the Croatian sea coast, directly in the Nin bay. It is believed, that this salt work, has existed since the Antique, which has been testified by the Roman gate which can be seen in the salt pans even today. It was shut down by the Venetians in the 16th century to prevent any kind of foreign competition, but the salina re-opened in 1955 and today it represents one of three remaining Croatian saltworks. The area of Nin salina spreads over 55 ha. Its manufacture function so that the salt pans are filled in the springtime with salt water. After some time, when the weather conditions allow it, the sea water evaporates, and the salt layers on the bottom, after which it is manually harvested. The most useful weather conditions are, of course, sun and wind, which are crucial for the evaporation of water. For 8 mm of water, there is 1 mm of salt being evaporated. The Nin saline has developed a few steps in harvesting salt; the first one is being done with approximately 15-20 mm of salt. Before the process of salt collecting has begun, the brine must be released for the salt to dry out. Afterward the salt is collected by hand and then transported to the

storehouse. The average collection of salt lasts 63 days and includes three seasons- spring, summer, and autumn. The Nin Saline has had the amount of 3200 t in the last ten years. In its complex, next to the salt manufacture, it also includes a museum and house of salt. These establishments tell the history of saline and it describes the whole process. The Nin saline has had the luck to be surrounded by Croatia's five significant national parks-Plitvice, Paklenica, Northern Velebit, and Krka. The flora and fauna of Nin itself are fascinating and has also the biodiversity of their own, like other salt pans. The plants and animals living in this area represent a very interesting group that also counts some endangered species. The Nin saline has also been well known for its ornithological variety, counting over 280 different species of birds. These birds are mostly birds that migrate over that part of the Adriatic coast, but species nest here.

Some of them are stilt (*Himantopus himantopus*), kentish plover (*Charadrius alexandrinus*), oystercatcher (*Haematopus ostralegus*), stone curlew (*Burhinus oedicephalus*), little egret (*Egretta garzetta*), and many others. The plants in this salt works are also unusual as they have adapted to the living conditions that salt plants offer (halophyte). The Adriatic Sea is of a special kind, and it has also been shown in various scientific studies that it possesses over 80 essential minerals and trace elements that are significant for people's health. It is also very adequate for producing salt, as one of its characteristics is a very high salinity-one kilogram of salt dissolved 38.30 g of salt.

One of the other parts of Nin's natural wealth is its healing mud and has been used for medical purposes even in the Roman period. Because of the mineral percentage in it, it has been proved to be very healthy. The Nin saline represents an assemblage of favourable conditions-sun, wind, sea water, that all make it a perfect spot for the manufacture of high-quality salt.¹⁷

¹⁷ Priroda, Solana Nin, <https://www.solananin.hr/hr/priroda/>, (13.10.2020)

2.3 The Ulcinj Salina - a turbulent history



Fig.8 Ulcinj Salt pans

The Congress in Berlin in 1878 determined many things that influenced a large number of different countries and people. It also influenced the town in the southernmost coastal point of Montenegro- the town of Ulcinj. The decisions of the Berlin Congress did not satisfy the Turkish Government, which was denying to renounce Ulcinj to Montenegro. International Union forced Turkey to do it, otherwise, the city of Izmir (a very important port) would be confiscated. Turkey finally gave up, and on the 26th of November, Ulcinj has joined Montenegro. Since then, the city was caught up in economic, social, but also demographical stagnation. The new country did not make any investments in the city, so it just stayed where it was, without further growth. The situation continued further also at the time of the Kingdom of Yugoslavia. At the time the town had 4 200 inhabitants, whose main occupation was trade, agriculture, cattle breeding, fishing, and olive growing.

Because of Ulcinj's poor development, the construction of Salina was going to be a very significant event. The idea for Salina originates from the 1920s, as the Adriatic coast was thought to be the best location

for the construction of salt works. The first idea was to build salina with a capacity of about 12 000 tons and a total area of 1 800 000 m². The Monopoly Management of the State did not agree with this and required an object which would produce about 30-40 000 tons. The process of monitoring all the conditions that would be useful for such an establishment have begun, such as measuring the meteorological values. The Field of Ulcinj was found appropriate for the project for many reasons. Firstly, the large part of the Adriatic coast has steep mountains just above the shore, so finding a wide and open field next to the sea was not an easy task. Besides this characteristic, Ulcinj had many others, like the proper sea water salinity, wind, number of rainy and sunny days, evaporation, and the permeability of the soil; the first measurements of salt pools from 6th of October until the 1st of November 1928 were showing that the water permeability had made some favourable results. The project was accepted in 1926 from the Monopoly Management of the State and then it began the repurchase of the land from the local owners. Besides the purchased land, the Saline included the area of Zoganj lake with its 1 800 000 m² and wetland are of 1 804 267 m². The total area was about 8 865 300 m². After it was accomplished, the construction work began, but it didn't go as smoothly as planned-many contractors were changed, the construction itself required very hard labor conditions. The two persons stood out as most important and responsible for the construction, and that were engineers Guido Grisogno and Anton Koludrovic. Grisogno was a civil engineer and was in charge of construction plans, and Koludrovic was more in charge of technical issues, like the production technology, and selection of the proper location. Building of Salina also, fortunately brought benefits, such as jobs for the locals and developed the infrastructure in the area. Among other things, development of Port Milena was planned, a realization of water pipe lines with portable water, embankments on Bojana River, first residential buildings, etc. Even a very own electric central was being built, just for the needs of Salina, since it was borrowing Ulcinj's electricity. One particular reason why the construction was important,

was the clearing of Zoganj mud. At the time, this area was a source of malaria-ridden mosquito and unfortunately, it caused many deaths. The Salina required also a functioning system for the supply of sea water, and that is why the construction and organization of Port Milena were necessary, and it could also be used as a shelter for war ships. Originally, the Port Milena was formed as a cause of a large flood on the 30th of October 1896, when both rivers Drim and Bojana broke came through Zoganj Lake. In this way, a path connected with the sea was created and it was big enough for the sailing boats. For Saline, it would be the main connection to the sea, starting on cape Djerane. The width of the channel was around 150 meters, 3-4 meters deep. It was planned to build one dock for the sailing boats, and one as a loading place for Saline. There was one particular problematic point of the channel, and it was the entrance. It was getting more shallow due to the waves and sand from the sea, and the sailing boats couldn't fit through it. The Bojana River also represented an issue as it would raise flood the St Djordje and Curke villages. It was an ongoing debate how to solve the Port Milena problem, whether to get excavators to extract the sand that layered on the bottom, or to construct a stone breakwater to prevent drifting sand from the coast; in 1939 the excavator option was being considered, although it was bearing a risk due to the possible lack of space for the storage of the pulled out sand.¹⁸ After the long construction works, the Ulcinj Saline was finally opened in the May of 1934. The first and test harvest was realized the following year where approximately 6 000 tons were produced. Anton Koludrovic was named as a director of Saline; Grisogno and Koludrovic managed the seasonal work and the terrain labor with 100 to 659 men daily was managed by Živan Pankovic. Saline was managed by the Monopoly Management of the Kingdom of Yugoslavia and the Law on State Monopolies from 1935 defined Saline's work and business organization. It was planned the salt production for people's and animals' needs, as well for industrial purposes.

¹⁸ Vaso Radovic, „Ulcinjska Solana“, Centralna narodna biblioteka Crne Gore, Ulcinj, 2008, 11-24.



Fig.9 Construction workers in 1932



Fig.10 First buildings at Salina 1935



Fig.11 Salt harvesting in the 1930s



Fig.12 Salina workers during the harvest in 1930s

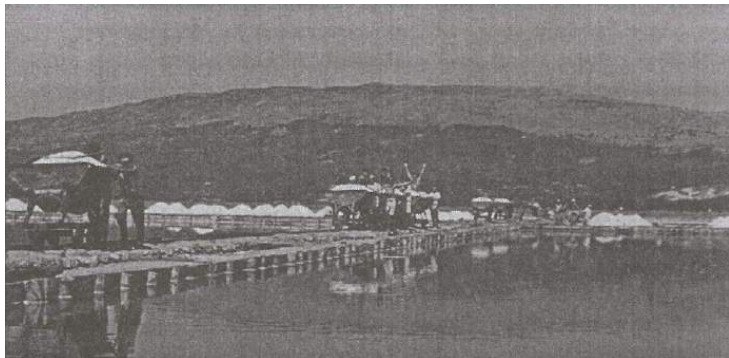


Fig.13 Salina workers transporting the salt

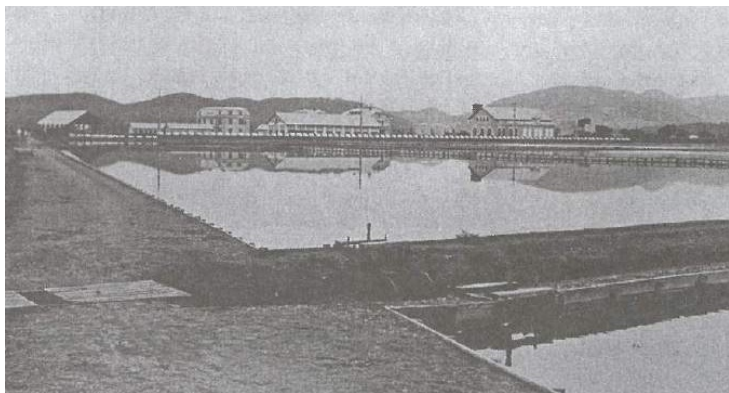


Fig.14 Salina in 1935

The total amount of salt production in the Kingdom of Yugoslavia was around 60 to 70 000 tons per year, from which Kreka-Simin Han Salina produced 50 to 60 000 tons per year, and the ones in Pag and Ston barely 10 000 tons. The total salt consumption of the Kingdom was around 130 000 tons, and the missing amount was to be provided by Ulcinj Salina. The seasonal work lasted from 1st of May until 1st of October. The salt was assembled right at the pools at the end of the period. Later on, it was collected on the 8 meter high piles on the embankments which were covered with tile. There was a small railway system that was only 600 mm wide with wagons, which was used as a salt transportation system. The salt was piled up with the help of the four electric cranes with the capacity of 50 tons per hour. The Milena channel was used as a transport path, as the salt was packed onto a boat from the salt embankments, which transported it until cape Djerane and the open sea where the steamships were waiting. Salina Ulcinj had different vehicles in usage, such as cargo and semi-cargo cars, wagons, boats, etc. Different pump stations were used for the supply of sea water. Ulcinj Salina also had within its complex residential units where the employers and restaurant workers lived; there was also a canteen with a capacity of 60 people. The year 1935 was not the most successful year with a total amount of 13 026 tons, despite its very beneficial weather conditions with a very hot and dry summer.¹⁹ In the pre-war period, the Ulcinj Salina produced about 9 171 tons per year and a total amount of 55 030 tons of salt. One of the reasons was also the fact that the terrain (such as removal of vegetation, trees, etc.) could only gradually be prepared for its maximum efficiency. In 1941 the war came and the hope for a successful harvest was lost. The Government's decision in Rome on the 12th of August 1941 together with a large part of Kosovo and Metohija, Plav, Gusinje, Ulcinj was incorporated into Albania, which caused a lot of dissatisfactions. The administration had also to be adjusted. The new authority, however, showed interest in Ulcinj Salina, and even sent

¹⁹ Vaso Radovic, „Ulcinjaska Solana“, Centralna narodna biblioteka Crne Gore, Ulcinj, 2008, 25-41.

Italian experts to examine in the autumn of 1941, and made remarks considering few elements that weren't favourable for the harvest such as flowing in of the sweet water in the Saline area, river Bojana's influence on decreasing salinity and wet winds from the Skadar Lake. They also have suggested solutions for this such as including the Zoganj Lake in the process of moving water, building Port Milena's small port, purchase of a stronger dredger. According to the experts' solution, the production was going to be increased to the point of 30 000 tons. The following year, in 1942, the harvest had a total amount of 8 000 tons of collected salt; in 1943 the improvements were visible and there were around 20 000 tons of salt. On the 8th of September 1943, the capitulation of Italy occurred, so the harvest in 1944 was not taken place because of the change of the authorities. On the 12th of September 1943, the German forces have taken their place, and the area was under the authority of the general of Albania.²⁰ On November 26th 1944, Ulcinj was finally set free. Unfortunately, the parts of the Saline could not be saved, such as building itself and watercraft; but luckily the partisans prevented the enemy to destroy the Saline and salt supplies (more than 17 million of salt were saved). With minimum repairs, the mechanical plant was generally in a good state and was able to function. Still, the war damage was big and counted the total amount of 18 383 633 dinars. After the war, an examination of Ulcinj Saline was made again on the 9th of January 1947, to evaluate the establishment. The conclusions were following; the performance of the Saline could be divided into three sections. The technical section was in charge of all technical performance of the Saline, and maintenance of units with mechanical plants, watercraft, and transport. The salt production section dealt with all the things and issues that considered seawater and salt, like filling seawater pools and the evaporation, collecting and transporting the salt, etc.; as well as the technical maintenance of the pool, embankment, and roads and the railway system for the industry's needs.

²⁰ *ibid.*, 42-47

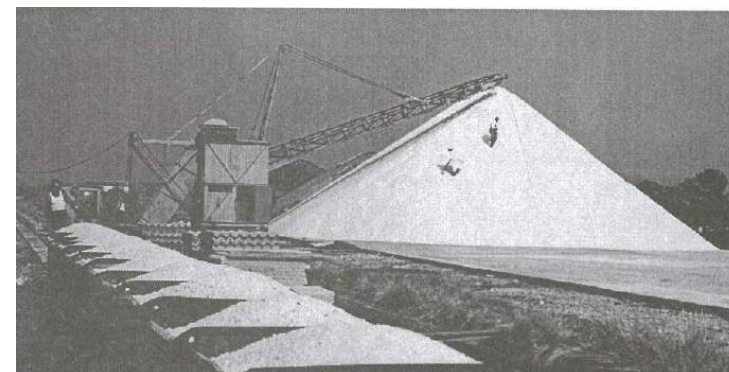


Fig.15 Salt aggregation crane

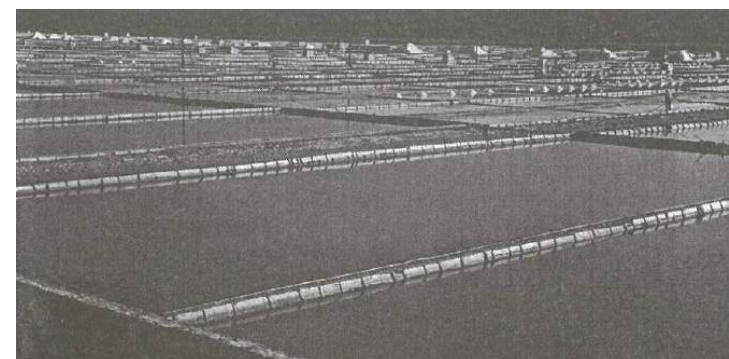


Fig.16 Crystallization salt pans

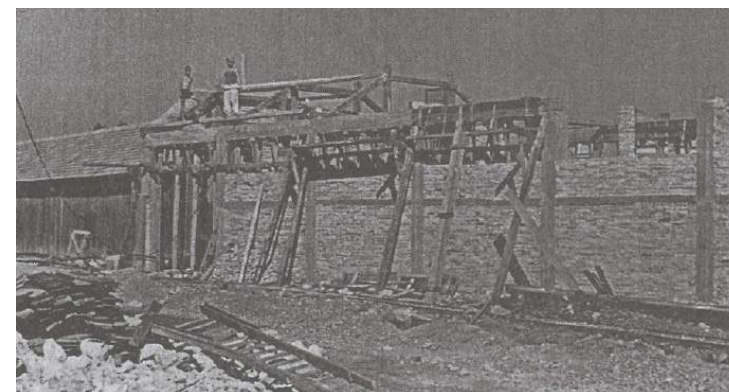


Fig.17 The construction of the salt warehouse



Fig.18 Celebrating the 13th of July together in 1961



Fig.19 Earthquake in 1979



Fig.20 Earthquake in 1979

The third section, the general section, took care of all the accountant, bookkeeping work, as well as general administration, statistics, supply department, etc. The whole establishment had 32 permanent employees, and 30 to 200 seasonal workers, and an eight-hour working day (8-12 and from 13-17). The whole manufacture took place in 88 evaporation and 103 crystallization pools; there was also a pool for reserve water-Zoganj Lake. The total area of the pools and lake had a total amount of 8 412 000 m². Besides the worker's kitchen, there could be also found a tobacco shop and library/reading room. As next planned was the making of a tunnel in Port Milena channel in the year of 1947 to supply the Salina even more with salt water and improve the water salinity. On the cape Djerani, at the beginning of the channel, there was a water pump constructed, with the capacity of 1000-1500 l/s, and the depth from it pumped the water was around 200 to 355 mm. The system for salt transportation from Salina to cape Djerane, an industrial railway, was built alongside a shore station for ships up to 200 tons of capacity to dock. This, together with great meteorological conditions such as an excellent amount of evaporation, has been of great help with the harvest. The one which particularly stood out was the one in the year 1952, which had a record amount of collected salt-all together 41 882, 25 tons of salt. Unfortunately, the salt produced this year was almost completely unusable since it has been soiled. This was a consequence of untutored staff, and the Salina has suffered great losses. Following years the Salina got a little enhancement, with warehouses being built to improve the whole manufacture process. The Ulcinj Salina got its name in 1950, and it was named Salina Bajo Sekulic. Bajo Sekulic was a partisan and national hero who was killed in a battle on the 30th of March in 1942, before which he was employed as a seasonal worker on Salina.²¹ The years that followed were not Salina's prime time, with significant financial losses and executives constantly changing. Despite all of this, the company was striving forward;

²¹ Vaso Radovic, „Ulcinjaska Solana“, Centralna narodna biblioteka Crne Gore, Ulcinj, 2008, 48-70.

a reconstruction and extension of Salina were planned in the March of 1965. The enlargement of the site for additional 850 hectares was in sight, in the area of Štoj, Knet, and Darza. This project would bring up to 90 000 tons of salt per year, with average weather conditions. There was a brief moment where the integration with the Salina „Solila“ in Tivat was being considered, but it wasn't realized as the future of the manufacture was not clear. What amplified Salina's problem was the constant loss of professional staff as well as growing financial debt because of numerous cash loans. Next to these problems, the path of bad luck for the Salina escalated on November 3rd 1968, when a strong earthquake hit Ulcinj. One person died, and 40 of them were heavily injured. Almost 70% of residential buildings in Ulcinj were damaged, and many of them completely unusable. Failures in Salina's production caused both by earthquake and weather resulted in large amounts of salt being imported from abroad.²² Years from 1965 to 1970 were the years of large investments, which included mostly improvements in the field of production increase and improvement of the salt quality. The most important additions included a new salt refinery plant, a bigger salt warehouse, a self-propelled conveyer as well as a storage and cleaning facility. A brand new art of production was in sight- an industrial one where the salt was being produced with the help of the vacuum. The enterprise was getting bigger with more workers and better-qualified staff. There was a problem with the general quality of Ulcinj's salt and it did not satisfy the standards of Yugoslavia's market, the reconstruction of the refinery facility was an important point. The organization and administration were also getting improved; with firm and clear visions of the establishment's future, but another large setback occurred. An additional 85 ha of land was bought from the municipality of Ulcinj, in the area of Štoj, alongside the road and towards the sea. In May of 1978, a decision has been made to put up a new thermos-compression facility for producing salt; it was finished in December of 1981.

²² ibid., 84-94



Fig.21 Collecting of salt



Fig.22 Salina workers



Fig.23 Salt packages



Fig.24 Reconstruction of the salt warehouse



Fig.25 Salt warehouse



Fig.26 Factory in the 2000s

On the 15th of April 1979, an earthquake of 9.2 Mercalli Intensity Scale hit Montenegro. The consequences were catastrophic; 101 dead, with 32 being only in Ulcinj. The total damage cost around 4,5 billion dollars. Ulcinj Salina also experienced fatal losses; electrical central, part of the warehouse, administrative building, pump facilities, etc. What also caused a lot of damage is the appearance of sweet water in salt pools.²³ The test phase of the new thermos-compression facility has started in 1983. Unfortunately, it did not go as expected and faced many problems and issues; it wasn't even completely finished and the enterprise's debt was only growing bigger and bigger.²⁴ The end of the 1980s and the 90s characterized a very unstable political climate in the region. The breakdown of Yugoslavia, war, and hyperinflation shook the whole country. Serbia and Montenegro together made the new Yugoslavia and faced terrible economic sanctions from the UN. While the whole country suffered because of it, it was opposite for the Ulcinj Salina; the salt shortage on the market and the salt became once again the „white gold“, especially on the black market. The suspension of the sanctions came on the 17th of November 1995-after the signing of the Dayton Agreement and ending of the War in Bosnia and Herzegovina. The inflation was so enormous which could be best shown on the prices of groceries; on December 22nd 1993 one liter of milk costed 9 500 000 dinars, and they could vary a lot in course of just one day. Because of this inflation state, the salaries in the Salina were not made in dinars, but in groceries such as flour, oil, sugar, etc. The production was also heavily influenced by the country's state. The transformation of the establishment was discussed in the April of 1995, and it was thought that if the Saline could not stay public property. It should become a form of simple joint-stock property. The year 1995 and 1996 characterized a rapid drop in salt production, employers, and salaries. In the June of 1998, there was a meeting called which got over 30 experts to discuss new solutions and methods; participants agreed that Salina was a

²³ *ibid.*, 95-101.

²⁴ *ibid.*, 102-104

significant part of the country's industry and that it should be really important to protect the product which represented also a strategic point. Unfortunately, the bad quality of the salt put the enterprise in a difficult position. The NATO attack on Yugoslavia in 1999 and War on Kosovo made it even worse as Kosovo was a major market for the Ulcinj Salina.²⁵ Mass Voucher Privatization (MVP) has found its way in the year 2001 and it was seen as a solution; it represents a process where a certain amount of property transfers from being state to being ownership of several private owners under equal circumstances. In this way, a certain part of the enterprise's capital was being assigned to the citizens for free via exchange vouchers for stocks of the companies. With this process, a total amount of 27% of the country's property was privatized, and the Salina had 53,74% of its capital was offered to exchange. There was shown a great deal of interest in the Salina's stocks and the total number of its stockholders was eight. The Salina attracts Europe's attention and gets involved in the TAM Program (Turn Around Management Program) which represented a program of the European Bank for Reconstruction and Development from London together with UN Development Program and European Union. The harvest's success was still not being constant; the year of 2002 counted great financial losses, the following year made unexpected success.²⁶

The Salina slowly caught the eye of nature activists that recognized its great ornithological and natural value; in 2004 the Board of Salina made the decision to ban all of hunting and fishing activities on its property. „Park of nature“, as an operational unit was established in order to increase touristic activities; it was done in cooperation with German non-governmental organisations like „Euronatur“, „Republic Institute for nature protection“ and „Centre for birds' protection and research“ (CZIP). This was all showing a good development, but the financial status of the enterprise was getting worse and worse.²⁷

²⁵ ibid., 105-113

²⁶ ibid., 105-113

²⁷ ibid., 121-123



Fig.27 Manufactory in the 2000s



Fig.28 Manufactory in the 2000s



Fig.29 Salt pans in the 2000s



Fig.30 Banknotes from the inflation time on the Salina's walls



Fig.31 Employees on strike



Fig.32 Forgotten salt packagings

In 2005, the company has gone under privatization. A company called „Eurofond“ has become a majority owner, owning up to 2/3 of the Salina. An important thing to mention is that the company has made ownership over the manufacture, but not over the land, which still provokes conflicts and unresolved questions until today. The Emerald network, which is a network for areas in special need of conversation, recognized Salina as a potential Emerald area in 2006. Regarding the manufacture, the company has only deteriorated in the years following the privatization; it culminated in 2013 with the last harvest with all the workers losing their jobs.²⁸ The workers did everything in their power to prevent Salina from shutting down and getting fired and have gone on many strikes (even hunger strikes) in order to have their basic human and working rights fulfilled, but haven't made any success. Embankments and machinery are being destroyed by time and weather, and the degradation of the entire space is visible everywhere. Since then, the question of what should be done with the Ulcinj Salina has divided the country. The majority owner, a private company called „Eurofond“ has tried to sell the enterprise in several attempts in order for the site to be used as a luxurious hotel complex. Luckily, this intention was stopped in 2012 where a large petition was organized to prevent these actions. Other European NGOs had to interfere when the decision from Constitutional Court has been made not to recognize the Salina as a protected area in 2015, but the biggest impact made the involvement of a German Embassy in Montenegro which urged the European Commission to interfere. The resolution of Salina's conflict became also one of Montenegro's conditions to enter the EU (Chapter 27) since its biodiversity is of great importance not only for Montenegro itself, but for the whole Europe.²⁹

²⁸ Jana IkoVIC, CZIP, „Ulcinjaska Solana-analiza pravnih I institucionih izazova u procesu EU integracija I zatvaranja poglavlja 27“, Podgorica, 2020, 12.

2.4 The Ulcinj Salina Today

Since the 24th of August 2015, the Salina has been under the management of „National parks of Montenegro“ and still is until this day. The contract has been renewed again and it is not clear until it will stay this way. The year 2019 was extremely important for the Ulcinj Salina, as the council of the city of Ulcinj has made an official decision in declaring the Salina as a nature park. This milestone has been of vital significance for Salina's future destiny as it precisely shows the reasons why it became a protected nature park and what can and cannot be done on Salina's grounds. Reasons for the putting the area under protection are following: Salina did not have any special protection status; it represents one of the last salt pans on the East Adriatic coast and is considered as an authentic Mediterranean region; the Ulcinj Salina represents an extremely rare and unique artificial ecosystem in the Mediterranean regarding its landscape; its traditional identity has a large impact on cultural heritage and ambient space; traditional salt pans such as Ulcinj Salina are considered rare and represent one of the few sustainable industries that have positive impact on the nature; the biodiversity of Ulcinj Salina is considered one of the richest in the region especially regarding the birds; from the total of 526 bird species that inhabit the EU, around 150 of them have been registered in this Salina; there have been registered around 17 globally endangered and 69 rare bird species in this area; the most significant bird species of the Salina is the flamingo (*Phoenicopterus roseus*); this space is also very important for the migrating species, especially waterfowls and ducks; apart from salt, the harvest produces also the brine and salt pan mud which could be used in medical purposes because of its high concentration of iodine, magnesium, bromine and other; the halophyte organisms that inhabit the Salina are considered very rare; the population of Mediterranean killfish (*Aphanius fasciatus*) in this area represent the most important for the East Adriatic coast; the European pond turtle (*Emys orbicularis*), the Eurasian otter (*Lutra lutra*) and Golden jackal (*Canis aureus*) have been registered on the Salina grounds and the last one is that the ecological values complement cultural values represented by the traditional salt

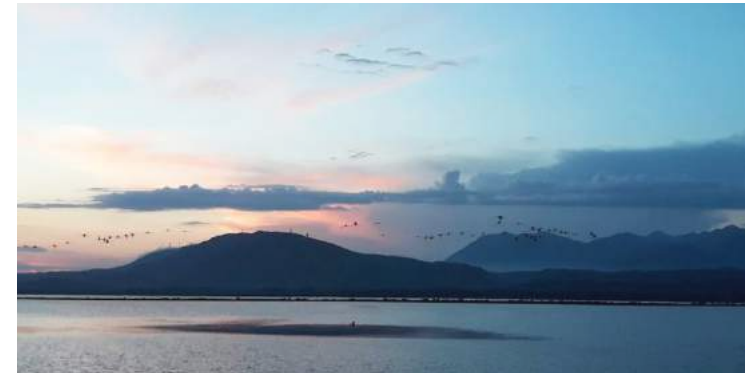


Fig.33 Saltpans and flamingos in the sunset



Fig.34 The Salina landscape today



Fig.35 Decaying sat warehouse



Fig.36 Rusty harvesting equipment



Fig.37 Post-apocalyptic atmosphere



Fig.38 The old railway for salt transport

manufacture and could be of great help with raising local awareness, education and scientific research.³⁰ This declaration divides the Salina into three different protection zones where each zone has each own protection regime.

Zone I

The first zone covers the following salt pools: Lake 1 and 2, Štojski 1 and 2, Zoganjski 1 and 2, Evaporation 1-pools 17, 18, 19, 20, 21, 22, and 24, Evaporation 2, and meadow. The salt concentration in these pools enables life in the water and benthos. This zone is also vital for the feeding, nesting, and wintering of the birds; around it goes the path that divides the Salina from the sweet water. The first zone is under the first level of protection- the „strict protection” regime. It is strictly forbidden to exploit natural resources and building construction. Scientific research and monitoring are allowed in a certain amount, as well as tours with educational, recreational, and cultural purposes; the implementation of security measurements in case of fire, natural disasters, cases of plant or animal diseases as well overpopulation of pests is obligatory.³¹

Zone II

The second zone covers following salt pools: Knetas 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 and 13, Evaporation 1-pools 25, 26, 27, 28, 29, 30, 31 and 32, Crystallization zone, Accumulation 1 and 2, Evaporation 3 and 4. These pools have an important role in water evaporation during salt production and could be significant in migration and winter periods when the salt manufacturing activities are rather limited. The salt concentration here is high, so these pools are not as appropriate for feeding and the biodiversity in general (except for halophytes), but they are vital for salt production. The second zone is under the second level of protection- the „active protection” regime. It covers possible interventions with the purpose of restoration, revitalization, and

³⁰ Skupština opštine Ulcinj, „Odluka o proglašenju parka prirode ‘Ulcinjnska Solana’ ”, Ulcinj, 2019, 1-3

³¹ ibid., 3-4.

general advancement of the protected area. The goal is the controlled exploitation of natural resources. The group of allowed activities in this zone considers activities such as controlled water regime with the purpose of salt production; controlled scientific researches and monitoring; controlled tours with the educational, recreational, and touristic purpose (only along with well-defined paths and during allowed time of the year); protective and other measurements for the needs of salt production and special measurements that focus on the protection of the ecosystem. The group of non-allowed activities includes hunting or any other way of exploiting natural resources; building constructions; repurposing existing constructions; dispersing, capturing, harassing, and killing animals; to deliberately populate the area with allochthonous and invasive species; any movement outside the defined paths; damaging of the vegetation; damaging and endangering park's fauna; using any substances that could cause pollution of the earth, water or air; driving or parking any vehicles inside the park except for the vehicles that belong to the park or maintenance vehicles; waste disposal; damaging park grounds in any possible way; depletion of the wild species in any possible way; decreasing biological diversity; pollution or endangerment of surface- and groundwater and lastly the fire ban that applies for the whole area.³²

Zone III

The third and final zone covers the industrial area of the Salina-administration building, warehouses, and other constructions. The third zone is under the third level of protection- the „sustainable protection” regime. Allowed activities in the third zone consider interventions with the purpose of restoration, revitalization and general advancement of the protected natural area; salt manufacture and all the technical activities that go with it; scientific researches and monitoring; implementation of security and remediation measurements; controlled tours with educational, recreational, touristic and cultural purpose and interventions

³² ibid., 3-4.



Fig.39 Old salt transport wagons



Fig.40 Rusty harvesting equipment



Fig.41 Post-apocalyptic atmosphere

in the protection of the ecosystem in case of natural disaster. The non-allowed activities in this zone are new building constructions that don't have a purpose of salt production; dispersing, capturing, harassing, and killing animals; to deliberately populate the area with allochthonous and invasive species; any movement outside the defined paths and lastly the fire ban that applies for the whole area.³³

After the Declaration of protection, another success for Salina came in 2019; on the 9th of September, the Ulcinj Salina has officially been listed as a Ramsar site. In 2020 the contract for the temporary management of Salina under the „National parks of Montenegro“ has been extended until the August of 2021. The future is not completely clear as the majority owner is still fighting for it, but the hope remains that it will be proven that the area of such natural value could not be private as its greatness goes beyond any personal economical interest. This needs to be resolved as soon as possible as Salina's state has only decreased in the period since the salt production has been stopped. The water management has not been as „clean“ as before, resulting in decreasing number of certain species. One of the other threats for the Salina is the always-growing vegetation that with each day covers more and more of the pool area and threatens to change the habitat and Salina potentially losing the position in Natura 2000 site list.³⁴

Whatever the future holds, one must be clear, Ulcinj Salina is to be treated as an extraordinary and unique habitat it truly is.

It is extremely important to mention the commitment and hard work of Montenegrin organizations and NGOs like „Centre for birds' protection and research“ (CZIP) and „Dr. Martin Schneider-Jacoby Association“ whose hard work and commitment is possibly the only reason the Salina has survived until today.

³³ Skupština opštine Ulcinj, „Odluka o proglašenju parka prirode 'Ulcinjaska Solana'“, Ulcinj, 2019, 4-5

³⁴ Jana Ikoćić, CZIP, „Ulcinjaska Solana-analiza pravnih I institucionalnih izazova u procesu EU integracija I zatvaranja poglavlja 27“, Podgorica, 2020, 14-15.



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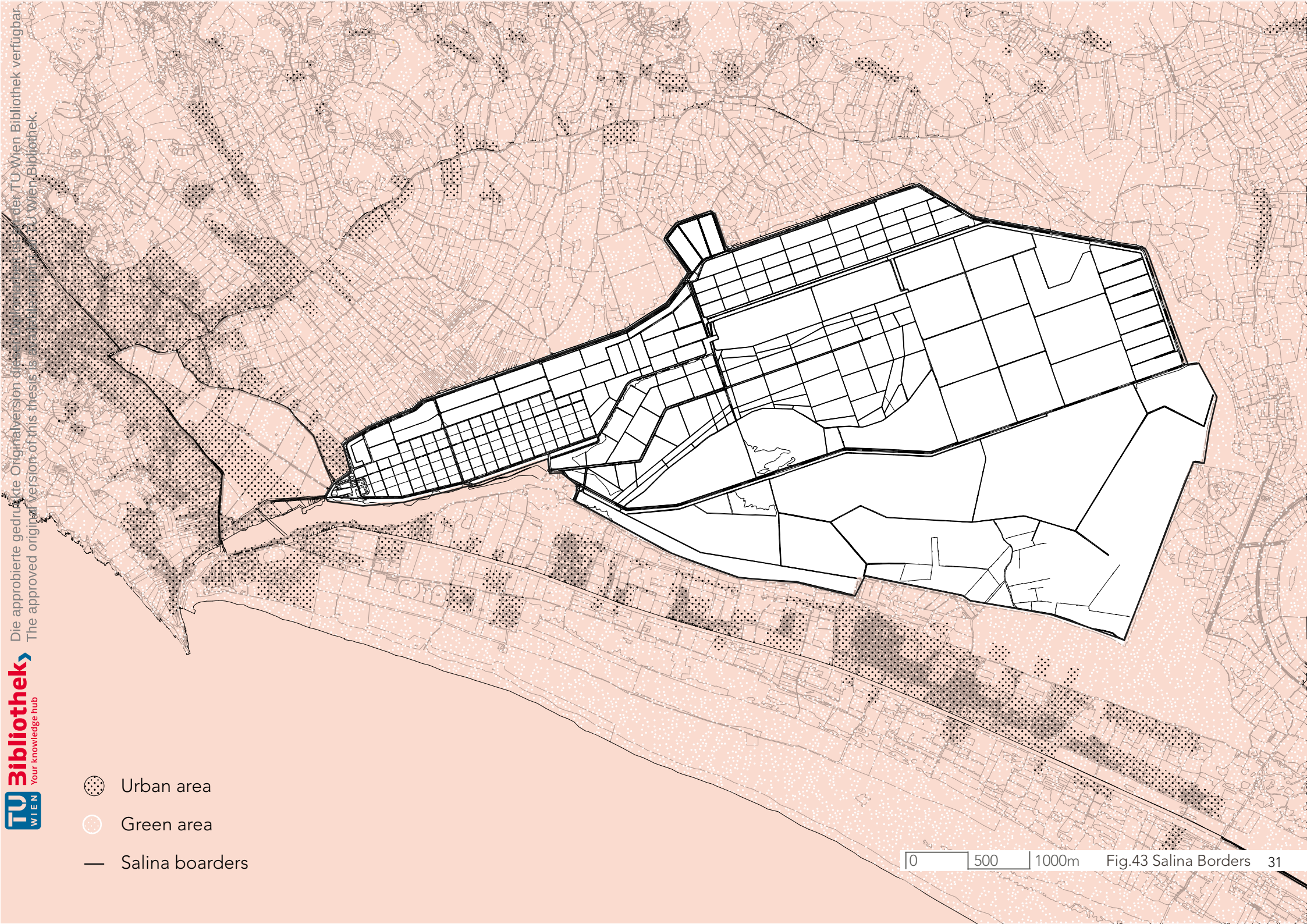
Fig.42 Administration building and salt warehouse 27

3.THE SITE ANALYSIS

3.1 Urban Analysis

The nature park Ulcinj Salina is situated on almost the southernmost point of Montenegro in the Ulcinj Municipality with an area of approximately 14,5 km² of saltwater pools, and a total area of around 1 492 hectares. It represents a magnificent habitat in Zoganj Field which is surrounded by the mountains Rumija and Taraboš, the dunes of Velika plaža (the Long Beach), Štoj settlement, and the city of Ulcinj. It is just 1 airline kilometre away from both Ulcinj on one side and the Albanian border on the other, which shows its good urban connection. The „Salina road“ is Salina’s main traffic connection and leads to one of the main streets and from then the city center in just short time or to other important Montenegrin seaside cities like Bar, Budva, and others. Because of the center’s vicinity, you could almost say it is part of it. Being mostly a summer destination, the city’s population grows several times during the summer months and tourism becomes its main financial source. Many of the private housings offer in the summertime touristic accommodation, so the dominant part of the urban morphology in the Saline’s area make the one-storey family houses with mixed-use. There are also a large number of hotels that are open year-round, but the main working season is the summer. Alongside the Salina road, there are a few industry units such as warehouse, trade dealership, and similar, but it doesn’t make the area’s dominant structure. The northern area is a mostly green area with large agricultural surfaces and residential units. The southern area of Donji Štoj and Velika Plaža is also mainly one-family houses with mixed-use as well as hotels and apartments. Velika Plaža is 13 km long and represents the longest beach in Montenegro as well as one of the main summer tourist attractions. It has a number of beach bars and is a very popular camping location. East from the Salin there is mainly wetlands and river Bojana which represents a kind of border between two countries.

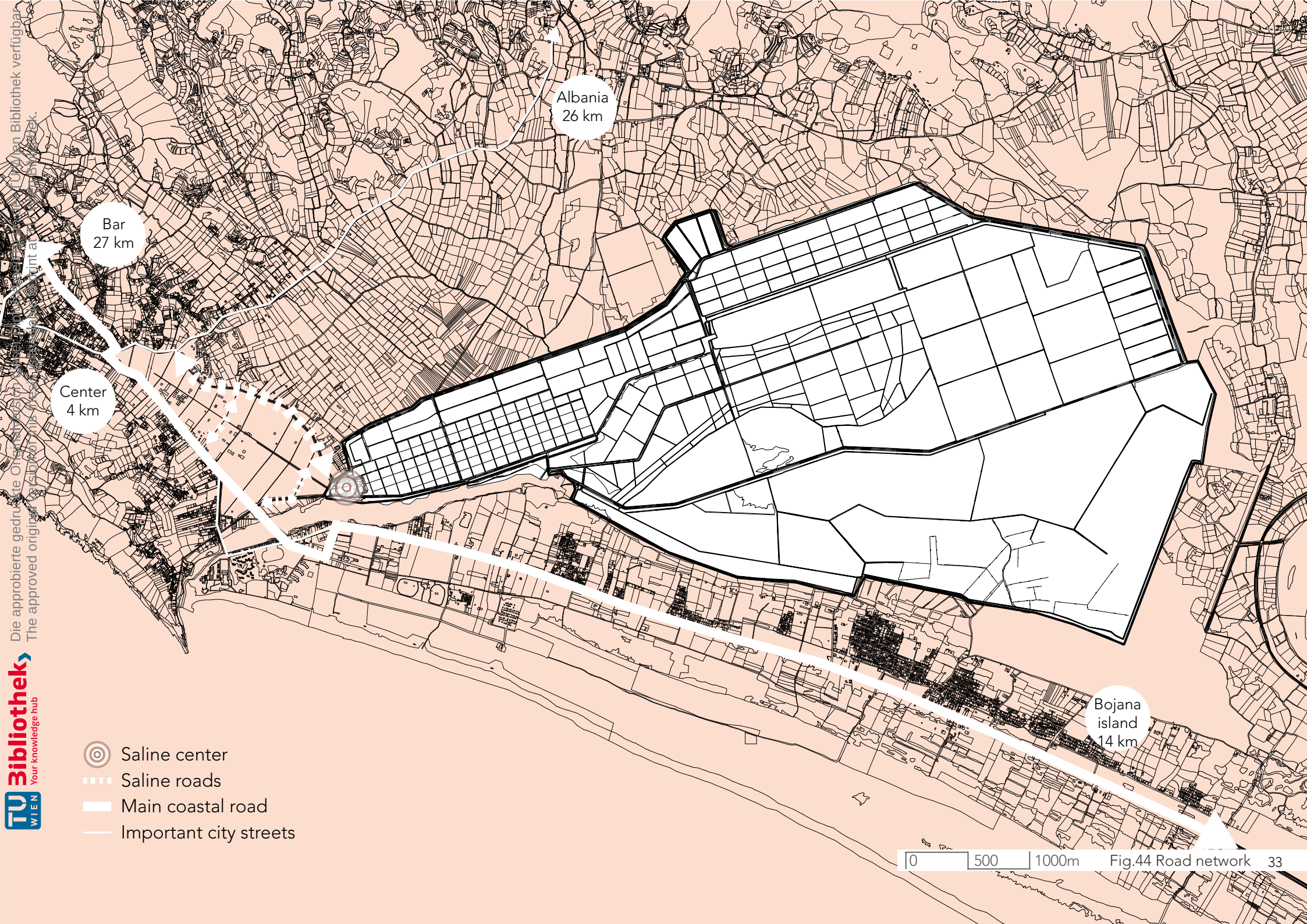
- Urban area
- Green area
- Salina borders



3.2 Location and Landscape

The park of Ulcinj Salina is divided from the Adriatic Sea by hills and Velika plaza, and from Bojana River by channels and embankments against floods. Salina is an important part of Skadar Lake and Bojana's basin, which makes a total area of 1000 km². The Salina park, the whole delta of Bojana together with Skadar Lake make a unique ecosystem, which takes in a total amount of 20% of Balkan peninsula water which come with Bojana and Drim, including also water from two large lakes- Ohrid and Prespa Lake. The natural development of river Bojana's delta was influenced by different factors such as high sedimentary deposits that come from the mountain area of Drim's (river in Albania) basin, hydrographic variability of Skadar Lake and Drim, marine variability, and short-term and long-term processes like storm waves and marine transgression and tectonic shifting. What's very typical for the Mediterranean is that the level of water is changing with every season. In the winter, from November until April, flooding is very common; in the summer, from June until August, that level will significantly fall. Normally, Drim would have a really high water level and would block running off of Skadar Lake and for that reason cause even higher water levels in the lake itself. When the water lowers down, the Bojana river would run the water with itself off and at the same time decrease water level in the lake; because of these events, the hydrographic situation in the area is extremely dynamic, which created a true mosaic of this ecosystem which can be seen even today. Bojana flows in the lowland area and takes a great amount of sediment with it and in that way created the swamp area of Zoganj blato; this was a very interesting natural creation with wetlands area next to the windy dune fields right on the coast. This swamp area caused a lot of trouble in the past since it was a settlement for malaria mosquitos; that is when the swamp was connected to the sea via Port Milena and enclosed by Bojana with the help of embankments. The whole area characterizes a fine river organic sediment and inorganic sand base; it holds still some of the former swamp features such as muddy coast, reed, an open-water surface, halophytic vegetation, etc. The Salina park also protects some of the surrounding forests,

wetlands meadows, and pastures because this field can't dry out because of its special position. This area characterises „extreme“ habitats that are called „kmeta“ and represent a gradient between brackish and freshwater marsh. From the Salina's total area of 1 492 hectares, 1 383 hectares (92,2%) take the salt pools; less than 50 hectares take the artificially made embankments between pools. The crystallization pools are surrounded by embankments that are less than a meter wide; the ones in evaporation pools could be up to 10 meters wide. They are made out of waterproof loam. Meteorological conditions in the Ulcinj Saline's region could not be understood as a single one; they have characteristics of many different ones which is a consequence of things such as geographical position, terrain, sea level, and influence of the Adriatic Sea. It represents a clash of a warm Mediterranean climate, and a cold continental one; the summers here are pretty hot and dry, and winters are mild with a large amount of rainfall. Ulcinj is also the city in Montenegro with the most sunny hours per year (2571 h/year).



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

-  Saline center
-  Saline roads
-  Main coastal road
-  Important city streets



Fig.45 The Bojana-Buna Delta



Fig.46, 47 Ulcinj salt pans

3.3 Water

The former Zoganj swamp changed its water regime through time, especially when the Salina was built; nevertheless, it still kept some of the attributes. The Salina gets its water from the sea and the process starts in April. It fills out the pools and is about 20-30 centimetres high. From its start point-the sea, until its target-salt pool, the water travels tens of kilometres, and when it reaches endpoint, under the influence of the sun and the wind it evaporates and creates salt. From the initial 3,8 g/l the water reaches 235 g/l at the end of the process in the crystallization pools. To prevent mixing fresh- and seawater, the whole Salina has been surrounded by the system of channels that transfer the freshwater through the Port Milena channel until the sea. This path is not only crucial for salt manufacture, but also for the nesting of the numerous bird species that come to this park. The Ulcinj Salina could be marked as a cultural lagoon, an artificially modified water surface. The numerous values of these salt pools vary in salt and algae concentration, different vegetation, etc. The seawater, with a salinity that goes over 29 g/l NaCl (3.5 ° Bé), is pumped via powerful water pump with a capacity of 300 l/s at the beginning of April. It enters on the Djerani cape and gets transferred to the salt pools via 3 kilometre long channel. It enters the Kneta pool (I. evaporation) with an area of 4,2 km² which takes up to 15 days to be completely full with water. The depth of the pools is around 20-60 cm (maximum 1 meter), and the water flows through them with the help of gravity; these are the pools that make the „new saline“. The Štojski 1 and 2 pools are the older ones and have a total area of 3,20 km² and a depth of 30 centimetres. After being done, the water from evaporation I goes to evaporation II which is known in this technological process as Zoganj Lake 1 and 2 and has a surface of 3,24 km². The total amount of time in which water stays in these pools is between 12 to 15 days; the water here is 30 cm high and the salinity is around 115g/l NaCl (12-14° Bé). The pools are known as „Evaporation III“ have an area of 0,55 km² and increased water salinity of 172 g/l NaCl (19° Bé). From there, the water flows into „Evaporation IV“ pool with 0,20 km² surface and 218 g/l NaCl (24° Bé) salinity;

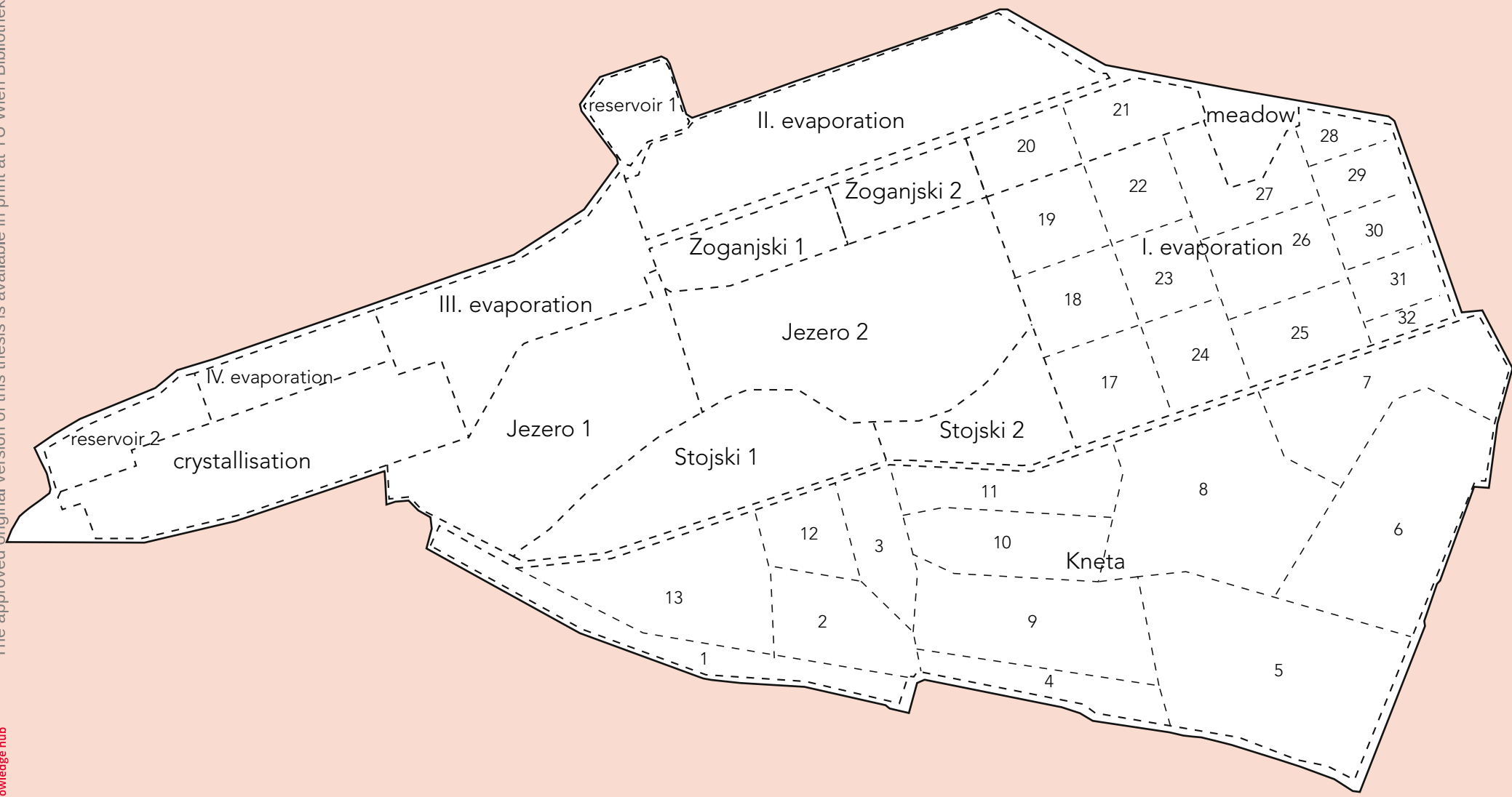


Fig.48 Salina salt basins 35



Fig.49 The Long Beach and Salina landscape in the background

both evaporation pools have similar water level height of about 10-20 cm. With the help of pumps, the water path leads to crystallization pools which are 0,76 km² big and 235 g/l NaCl (25.8-27° Bé). These pools have not a water level that high, only a few centimetres and are under a strong influence of sun and wind. During production, the process of pumping the water in goes on constantly; it stops only during rain. On the north area of Saline's pools, there are two accumulation pools with water salinity of 74 and 174 g/l NaCl (8-9 and 17-23° Bé); their task is to preserve unused water and use this water that already has high salinity concentration for „Evaporation III' pool for a quick crystallization start. The goal of this whole process is to provide a long water path. The overall length of Saline's narrow channels is 130 km, and the wider take around 78.6 km.³⁵ In order to protect the rich biodiversity of Ulcinj Saline, the correct water flow is extremely important; the water needs to be pumped in from the sea as well as pumped out and there are several pumps positioned in the park that are in charge of this, but sadly not all of them function anymore. It is of great significance that the pumps are maintained and repaired so this unique ecosystem can function properly.

³⁵ „Studija zaštite Ulcinjske Solane“, Agencija za zastitu zivotne sredine, Podgorica, 2015, 18-20.

3.4 Vegetation

The nature park of Ulcinj Salina is part of the Mediterranean forest biome, which spreads along the biggest part of the east Adriatic coast to the Aegean Sea. The Saline's area is slightly more different than its environment and represents a unique system. Over the course of time, it has been modified by various geographical, hydrological, but also human influences, and have created a natural system with predominant vegetation forms like meadows, alluvial forests, marshes, and pastures. The flora and fauna are typical for the Mediterranean and have cosmopolitan distribution living in it. Because of the swamp history, this area has also its unique species that have adjusted to the high-salinity environment.³⁶ The total amount of Montenegro's plant species known to scientists is around 3600; the number of those along the seacoast from Croatian until Albanian border is 1500. In the course of time in which the manufacture in Ulcinj Salina has been going on, the ecological system has been under major influence from the processes that were necessary for the salt production; still, in this period it has developed lagoon-like conditions, where the seawater enters a bay-like area and gets warm and evaporates. The total number of plant species that have been discovered in this nature park is 201 (May 2017).³⁷ The Salina area does not only consist of salt pans; pastures take around 122 ha in the dams and levees, on the surface of the basin there is about 60 ha of halophyte vegetation; 8 ha takes the reed beds. Softwood forest and Tamarix take up to 13 ha. Pioneer vegetation on dams and levees has a total are of 55 ha. Spacious marshes and forests with reeds, Tamarix, alluvial forests cover the western part of the Salina; the eastern part is covered with meadows and pastures that tend to flood.³⁸ The conditions that have developed in this park are considered to be extreme for many of the species because of the salt concentration, so the

³⁶ Andrej Sovinc, Davorin Tome, Michael Hosek, „Studija zaštite Ulcinjske Solane-nacrt“, 2017, 36.

³⁷ *ibid.*, 36.

³⁸ Vaso Radovic, „Ulcinjaska Solana“, Centralna narodna biblioteka Crne Gore, Ulcinj, 2008, 241-242.

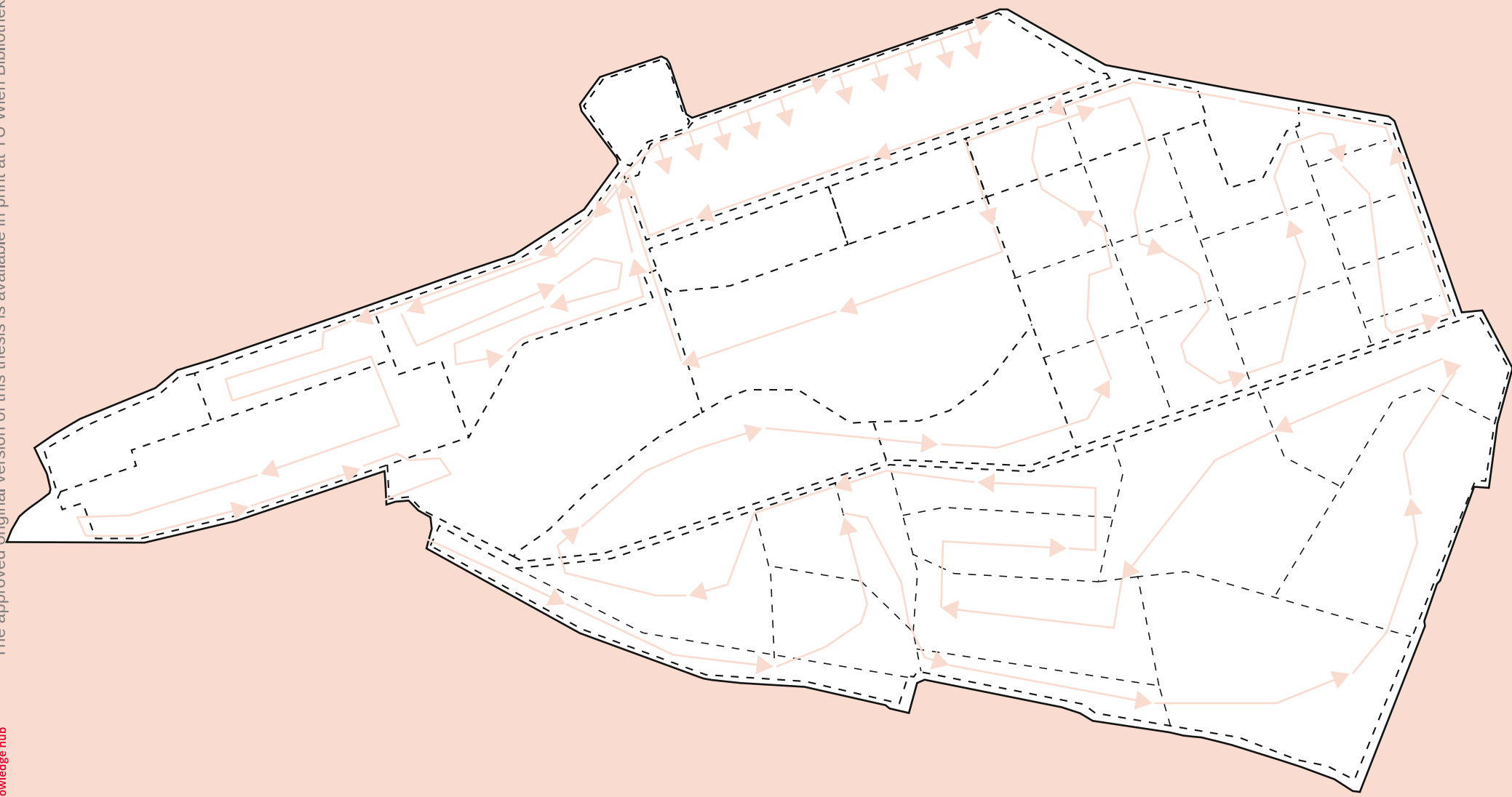


Fig.50 Water direction in the basins 37

one that evolved here had to be special; they are known as halophytes and thrive in high-salinity and moist environment. This type of vegetation is considered rare in both Montenegro and the overall east Adriatic coast, so its preservation should be important. Many of the world's halophytes can be found on different red lists of endangered plant species, so the ones in Salina's habitat should maybe also be considered since it is the most important halophyte region in Montenegro. There are three different habitats for different halophyte groups; the annual vegetation of *Salicornia* on mud and sand, Mediterranean and thermo-Atlantic halophytic communities (*Sarcocornetea fruticosi*) and Mediterranean salt marsh meadows (*Juncetalia maritima*).³⁹ Typical or „real halophytes“ (euhalophytes) can be found all over Salina and they represent the most dominant vegetation species and tend to grow from the shallow waters. The congregation of *Salicorniteum herbaceae* has found Salina's high salinity environment as a perfect circumstance for development. It has become the most preeminent species and one of the most recognizable characteristics of the park. It starts to show in May, and in the autumn it starts to blossom and the whole area receives a unique red tone. Next to the *Salicorniteum herbaceae*, another common inhabitant of the area is *Arthrocnemum fruticosum*, and in a more dry and lower-salinity regions there is *Limonium angustifolium*. In other parts of the park such as „Lake II“, embankments and „evaporation I“, there could be found two halophyte zones where the typical vegetation is widespread in the same way; in the crystallization pools, individual examples could be found. . Further away from water, the ground is getting deeper and terrain higher; the salinity and moist is getting lower so the vegetation type is also different; species such as *Spergularia salina*, *Plantago coronopus* L. and *Coronopus squamatus*. The deeper grounds have also another dominant type-meadows and pastures, and they tend to be located on the elevated areas alongside channels that lead to „Lake I“. The period of the year is a strong influence on the

different flora that lives here; in March there is *Narcissus tazetta* L., *Romulea bulbocodium*, *Hyacinthus orientalis* L., *Ornithogalum* sp.; in the summer period *Avena barbata*, *Dactylis glomerata* L., *Phragmites communis* Trin., *Carex* sp. Could be spotted; and in the autumn-*Limonium angustifolium* L. As every wetland, this region is also full of reeds; which especially finds muddy grounds with a water height of around 60-80 cm very favourable. Because of this, the dominant kind is *Phragmitetum communis*; *Tamarix africana* is also quite common, but the *Juncetum maritime-acuti* conglomeration is not that often to be seen. Despite of its harsh conditions and much more variety with fauna species, Ulcinj Salina's flora also shows its variety and has with justification been a very interesting vegetation habitat.⁴⁰



Fig.51 *Salicornia*



Fig.52 *Salicornia* overtaking the bottom of crystallization pool

³⁹ Andrej Sovinc, Davorin Tome, Michael Hosek, „Studija zaštite Ulcinjske Solane-nact“, 2017, 39-40.

⁴⁰ „Studija zaštite Ulcinjske Solane“, Agencija za zastitu zivotne sredine, Podgorica, 2015, 20-26



Fig.53 The salt manufactory complex



Fig.54 Porter's lodge

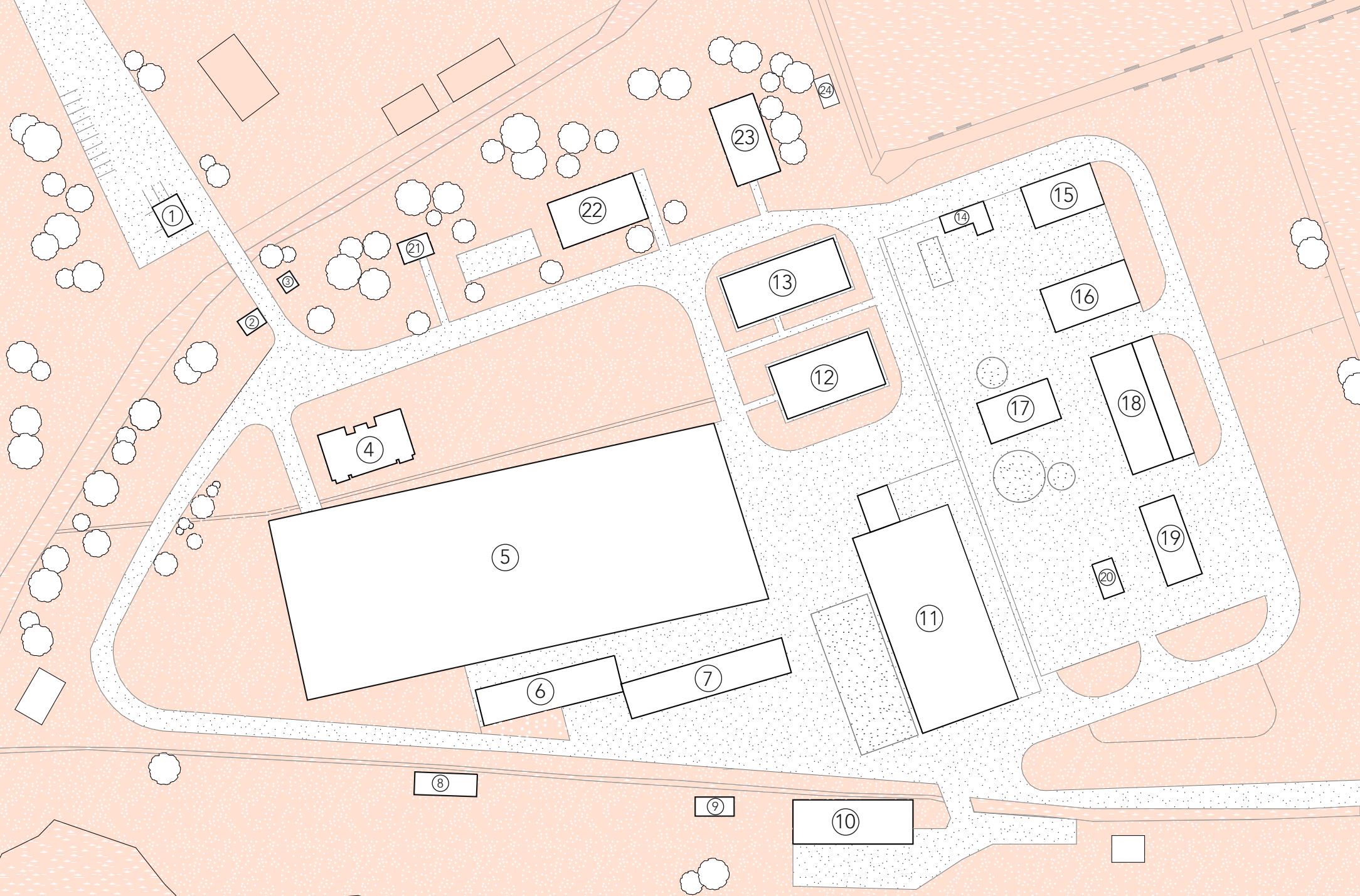


Fig.55 View from the entrance

3.5 Building complex description

The gates of the complex are remoted around 3-4 kilometres from the Ulcinj center and are connected to it via „Saline road“. The main industrial site of this park has an area of around 4 square kilometres and makes a building complex which nowadays counts around 25 from the former 37. Some of them were planned but not realised, and some of them were destroyed by time and earthquakes. The complex does not have a visible centre around which all the buildings are concentrated. The different parts of the Saline's complex are connected via car and on-foot roads. They were used for both human interaction and salt transport. At the gate, there is a porter's lodge(1) which is now used as a type of the info-center with Salina's guards/employees who give you directions, maps and if wished so-a bike. After entering the gate, the view falls directly on the main building-the administration building(4). Behind it, there are remains of a (5) large warehouse (Warehouse I) which was used mainly for packing and shipping of salt. The time has done its part and the warehouse is in very bad condition as only the concrete brick walls and steel columns, beams, and roof construction is left. The remaining roof construction as well as the eight columns placed on the central axis are made from steel. The roof is only partly covered in plastic corrugated sheets as time has wiped most of them off. On the backside of Warehouse I there are two other warehouses (Warehouse II and III) (6 and 7), which were also used for packing the salt. Like every other construction in this complex, these two are also pretty much destroyed. From the remaining parts, it is visible that the warehouse is brick construction with plastered walls. The roof construction is a gable made from wooden beams and covered with chipboard panels. It has two door openings and along both long sides a line of skylight windows. East of the three warehouses, there are two one-storey brick buildings that are in slightly better condition which had the function of a laboratory (13) and cloakroom (12). The laboratory looks from inside totally abandoned and is used today as a storage for all the paperwork from the former famous manufacture.

- ① Porter's lodge
- ② Bicycle lodge
- ③ Souvenir shop (closed)
- ④ Old administration building
- ⑤ Warehouse I
- ⑥ Warehouse II
- ⑦ Warehouse III
- ⑧ Workshop
- ⑨ Wardrobe
- ⑩ Salt packaging
- ⑪ Drying, packaging and shipping of salt
- ⑫ Former wardrobe/Museum
- ⑬ Laboratory
- ⑭ Unloading, storage and transport of heating oil
- ⑮ Boiler room
- ⑯ Warehouse for spare parts
- ⑰ Air compressor station
- ⑱ Maintenance workshop
- ⑲ Substation
- ⑳ Diesel generator
- ㉑ New administration buildings
- ㉒ Warehouse
- ㉓ Oxygen and acetylene bottles warehouse



0 10 20m Fig.56 Salina current site plan 41



Fig.57, 58, 59 Salt Warehouse

The cloakroom unit is used as a bird museum with an idea to activate the area, and is opened from time to time. Behind it, there is yet another larger unit that has suffered decay and was originally used for drying, packaging, and shipping of salt and (11). The group of units on the western part of the Salina's industrial complex were mainly technical ones. So next to the laboratory there is a unit for unloading of heating oil as well as its storage and transport (14); next to it a boiler room (15). Behind the boiler room, there is a warehouse for spare parts (16) and three more units which were used as an air compressor station (17), maintenance workshop (18) and a substation (19). The buildings are in a generally bad state as they have been almost totally abandoned for years. In order to be revitalized, they have either have to be back in the production process or be re-purposed. They are all connected via paths that can be reached by foot or by car.



Fig.60 Inside of the Warehouse II



Fig.63 Inside of the Warehouse II



Fig.61 Warehouse II



Fig.64 Warehouse II and III



Fig.62 Former Cloakroom, nowadays a Museum



Fig.65 Laboratory



Fig.66 Unit for drying, packaging and shipping of salt



Fig.67 Boiler room



Fig.68 Spare parts warehouse



Fig.69 Unit for unloading, storage & transport of heating oil



Fig.70 Maintenance workshop



Fig.71 Air compressor station



Fig.72 Air compressor station



Fig.75 Substation



Fig.73 Salt packaging unit



Fig.76 Cloakroom



Fig.74 Unit used as administration building after the earthquake



Fig.77 Cloakroom inside

The Administration building



Fig.78 Administration building in 1965

Exterior

The most important building—the Administration building appears as soon as the gate is passed. This building was built in 1934 and was the first building in Ulcinj. It has suffered a great deal of damage and breakage throughout time; especially because of the strong earthquake that hit Ulcinj in 1979 after which it wasn't used anymore due to the enormous damage. The Administration building has elements of Secession; it has a very simple and symmetrical form and is consisted of the ground level, first level, and attic. The thick foundation can be read from the external image of this building. The window openings could be seen on every side of this building construction and follow a constant rhythm of the façade. Both external doors and windows could be noticed to have a skylight and are the old double wooden windows; they were all painted white. The front façade is facing north and has two slits that are pulled inside and look like small atriums that have the front side opened; the middle part of the façade pops out in the front like a kind of tower where the building's main and only stairway is located.

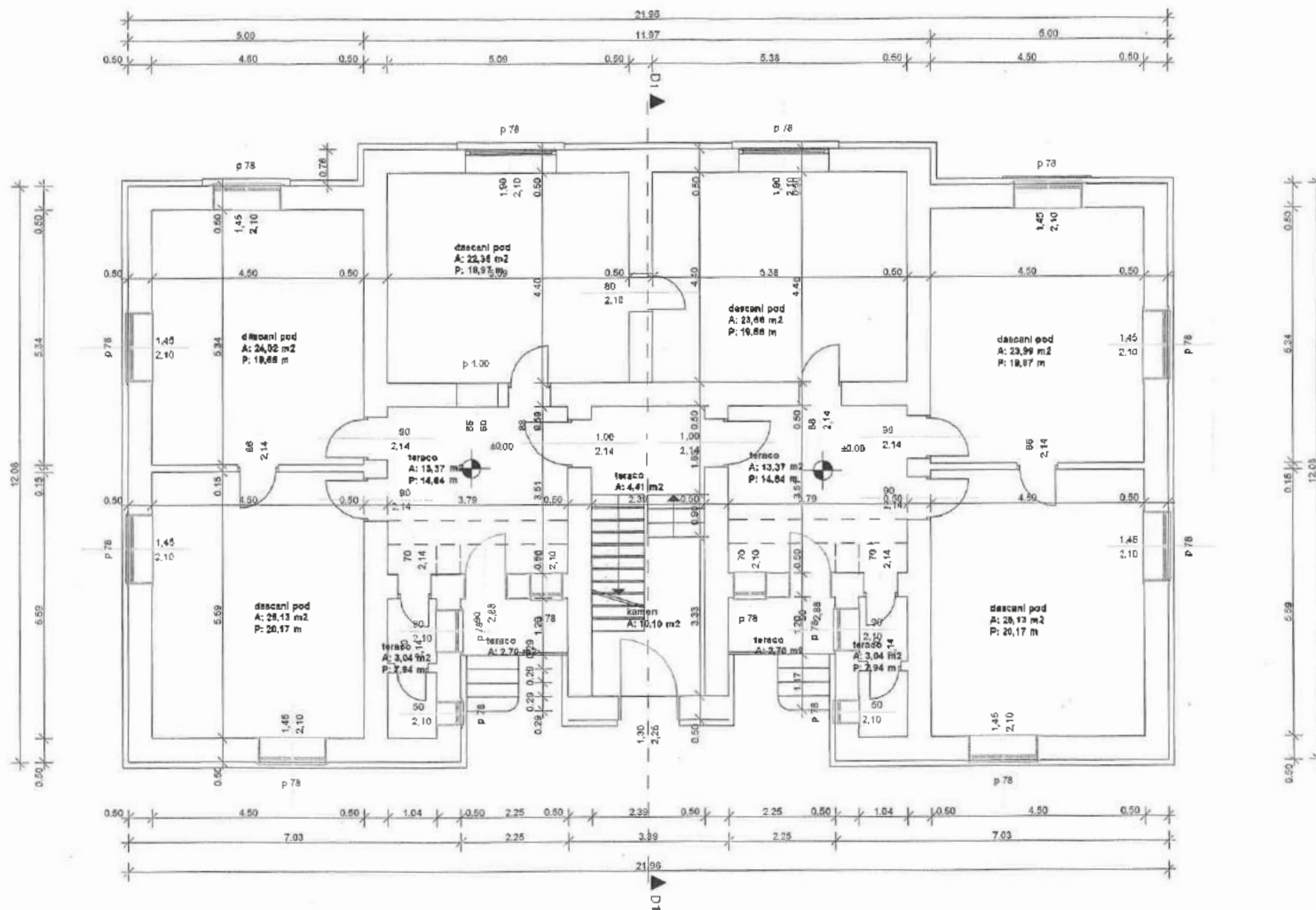
The stairway tower has the main entrance on the ground level, a large window between the ground and first floor, and a window in the attic. Two side entrances could be seen from each side of the main entrance which is accessible via stairs and a small landing; beside the doors, there are windows next to each side entrance. The inner parts of the two façade slits have both symmetrical windows which are toilet/bathroom openings. The main façade has on the ground level from each side identical windows; the same ones were integrated into the east and west ground floor façade with each side having a pair of windows. The south side has not been constructed to be completely flat. It has a small façade jump in the middle part with two slightly bigger windows and one from each side that resembles the ones on the north, east and west side. The façade of the ground level is emphasized with horizontal fugues that end with façade profile which accentuates the end of the ground and beginning of the first level. The whole building is painted in a bright rose colour, but it is not known if this resembles the original façade colour. The first storey of this unite quite resembles the previous one; except the first storey is enriched with balconies which are held by wreath ornaments and with wrought iron railing. On the main façade, the balconies are noticeable in the same place where the side entrances could be seen on the ground floor; the doors and windows are identical to the ones under them. The windows on the left and right side of the façade slit are slightly smaller in dimension than the ones located on the ground floor. The east and the west side are the same when looking from outside. The back, the south side looks the same in the middle part; but the left and right parts have two windows and a door that leads to the balcony with the same iron railing on each side. The last floor is visually separated from the two lower via façade profile which has been constructed slightly deeper than the one that separates the ground from the first level. All main attic windows are gabled dormer windows and have been placed in one line with the lower ones; few smaller ones are constructed as diagonal roof windows. The roof is darker coloured with visible rhomboid fugues pattern.



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Fig.79 Administration building facade 47



osnova prizemlja / postojece stanje/
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Fig.80 Administration building - Original floor plan



prednja fasada
r 1 / 100



Fig.82, 83, 84 Administration building



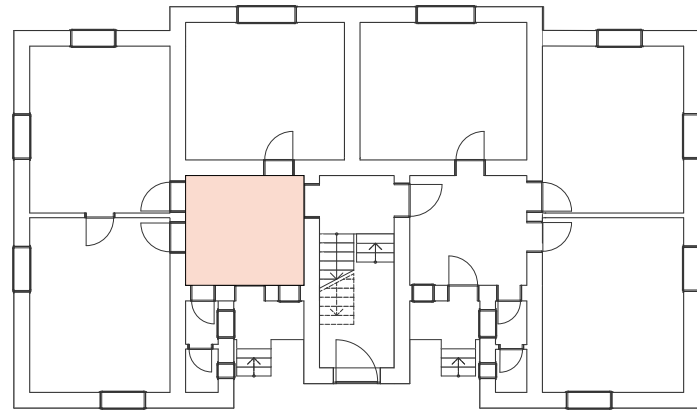
Fig.85, 86, 87 Administration building details

Interior

After entering the main entrance of the building which is located just below the ground floor on the northern side, the inside of the staircase is immediately visible. In order to access the ground level, a small staircase consisted of four stairs has to be climbed which have a height difference of 69 cm and separate the ground level from the main entrance level. The first hall with a terrazzo floor that is reached on the ground level is the one that separates the building into two symmetrical parts. From each side of this hall, there is an entrance to the second bigger one. Each of the two bigger foyers, with the same terrazzo floors, has entrances to the three rooms, toilet unit, and the side entrance to the building. The first room to be entered has a surface of around 20 m² and has windows on both the north and west (east) side; the floors were wooden. From each of these rooms, the next one could be accessed via a door with the central position in the thin wall; this room is almost similar to the last one, with also two windows on the south and west (east) façade and a similar amount of surface. In order to get to the next room, the bigger foyer has to be entered again and from there the south-facing window room could be seen with the surface of around 19 m²; the identical room can be accessed directly from this one and then onto the other bigger hall which has the same room layout as the other one. Back from the smaller central hall, the staircase must be used in order to get to the first floor. The landing of the stairs has a big window which could be seen on the main side of the building. The first floor has the same central smaller hall as the ground floor, as well as the same bigger symmetrical ones. The difference from the lower one with this hall is that on the place where the side entrance on the ground floor is, there is a small balcony with the terrazzo floors and around 3 m² surface from each side. The toilet and lavatory units are located in the same place as the ones on the ground floors. The eastern wing of the building is almost identical except the south-facing room has a balcony. Unfortunately, with the next building being directly next to the administration one, the beautiful balcony does not have a bright open view. The same situation is with the south-facing room in the western wing.

The third room that can be accessed from the bigger foyer slightly bigger on this floor with a surface of around 22 m²; it has also only one window as the room under it. The room next to it can be accessed from the other bigger symmetrical foyer in the west wing and is not as big as the previous one (around 16 m²), but has an identical window. The room facing north and west in the western wing is different than the one in the eastern wing because of its subdivision in two additional smaller rooms. The smaller of the two could be accessed from the room itself and has an area of around 3m² and the other one with 10 m² can be accessed from the lavatory. All the main load-bearing walls are 50 cm thick on the ground as well on the first ones. The thinner ones which separate the rooms that are located on the east and west façade are a lot thinner with being only 15 cm thick.

Using the same stairs from the central main hall the final floor/attic could be entered. From the same-sized central hall on this level not only the eastern and western foyer can be accessed, but also a narrow room with a wooden floor and 14 m². The room layout from both wings is completely symmetrical; from the foyer the same lavatory from which two smaller rooms on the northern façade can be entered with one being 11 m² and the other one only 3 m². The north balcony is slightly larger on this level with 5 m². There are two more rooms that can be accessed from the foyer; the one being the one with the more central position and 20 m²; and the other one with almost 40 m² and two windows on the west (east) side as well as the south one. The whole floor has a unique attic atmosphere with a sloping roof and gabled dormer windows.



52 Fig.88 Ground Floor Plan, Position



Fig.89 Current hall situation

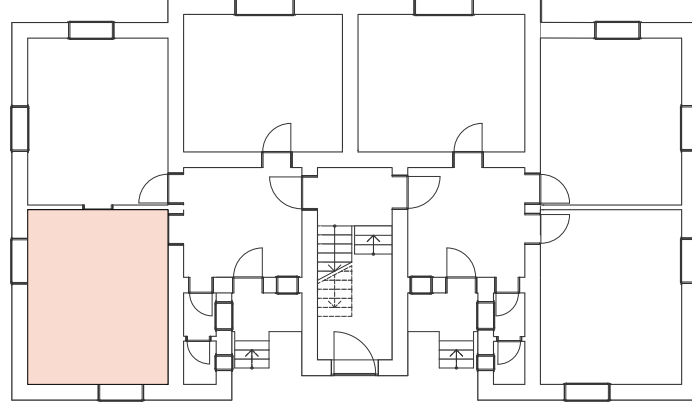




Fig.90 Current room situation

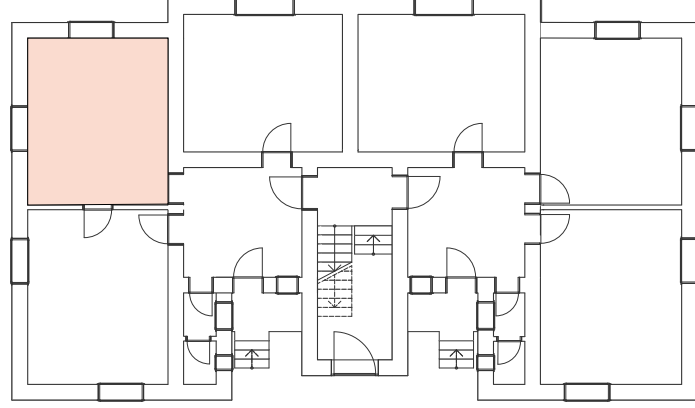




Fig.91 Current room situation

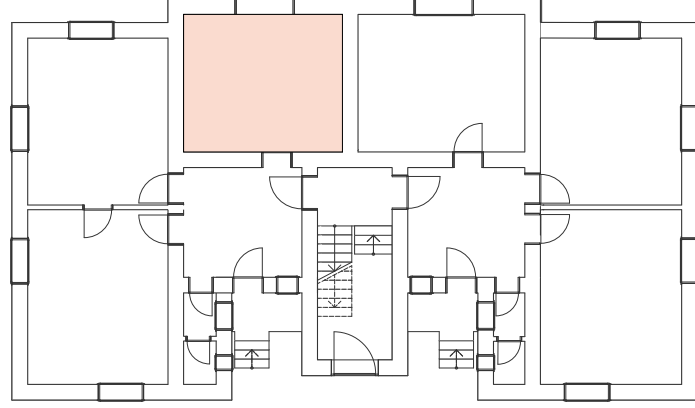




Fig.92 Current room situation

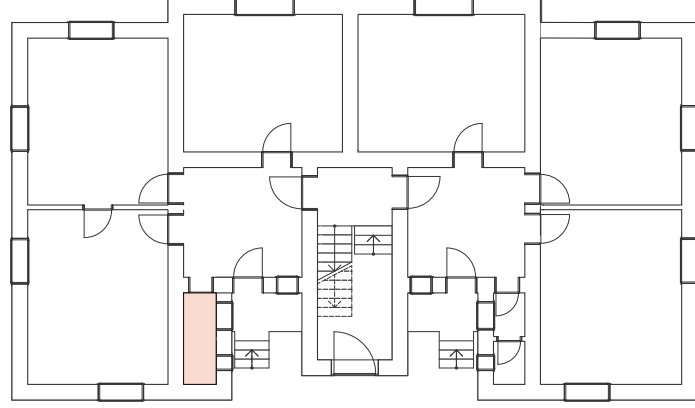




Fig.93 Current toilette situation

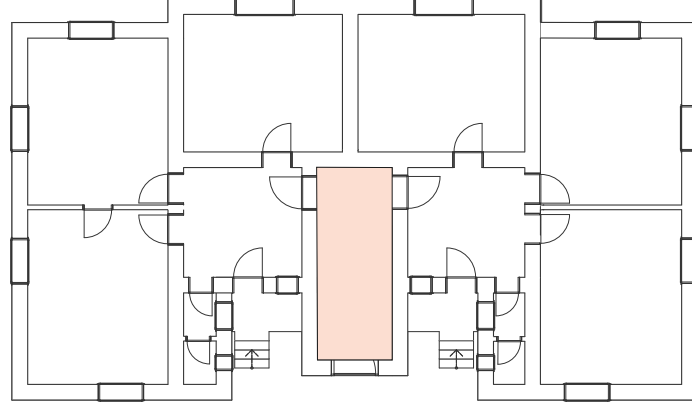




Fig.94 Current entrance hall situation

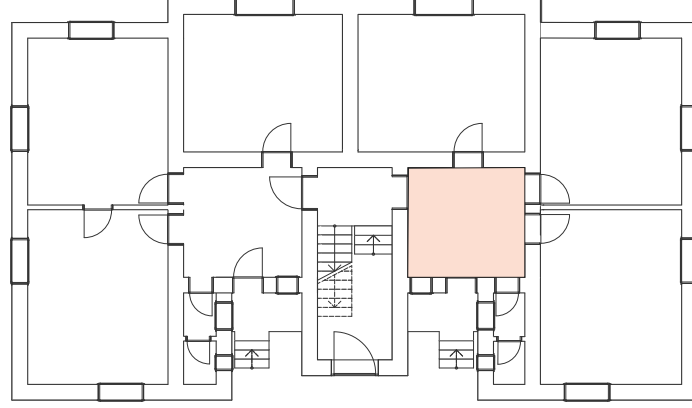




Fig.95 Current hall situation

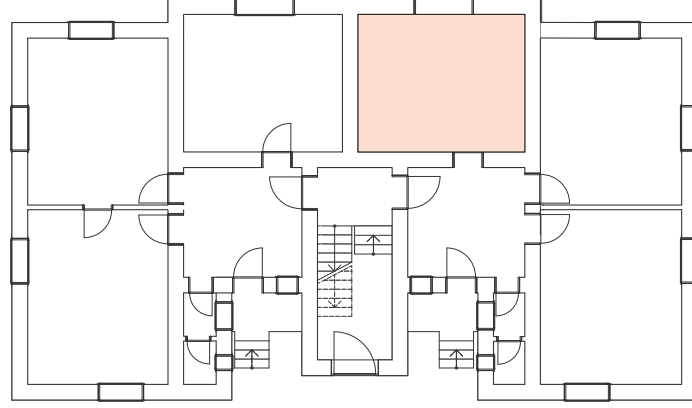




Fig.96 Current room situation

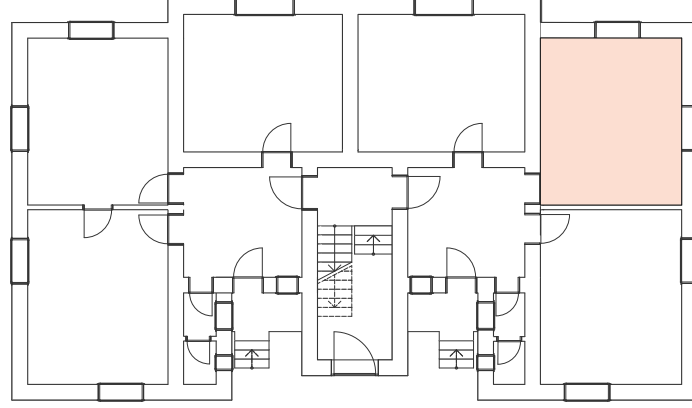




Fig.97 Current room situation

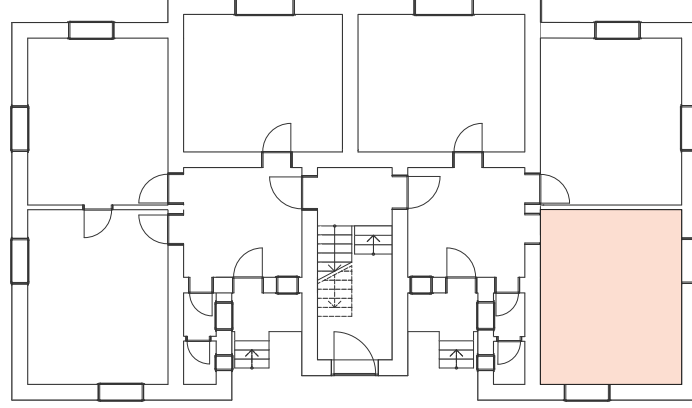




Fig.98 Current room situation

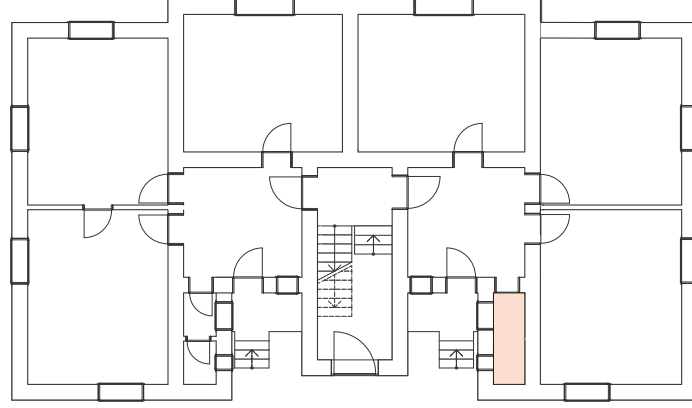




Fig.99 Current toilette situation

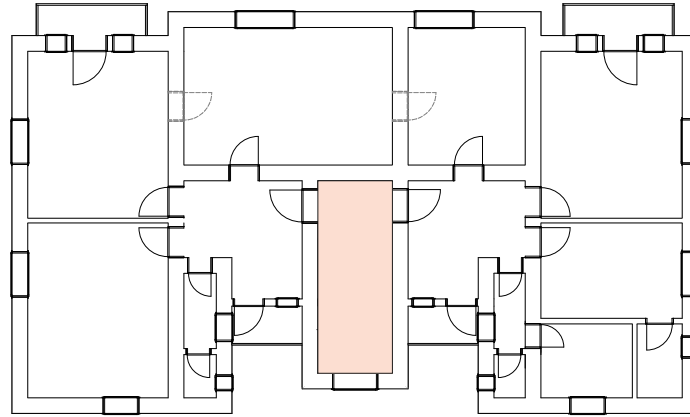




Fig.100 Current staircase situation

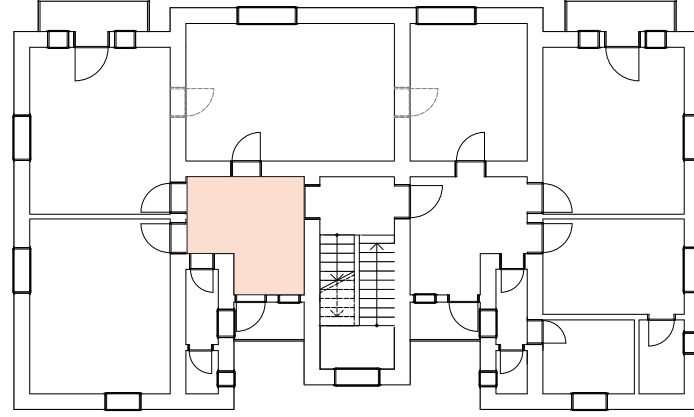




Fig.101 Current hall situation

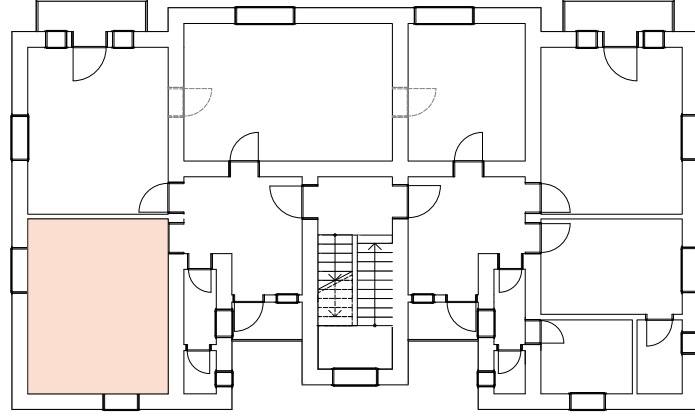




Fig.102 Current room situation

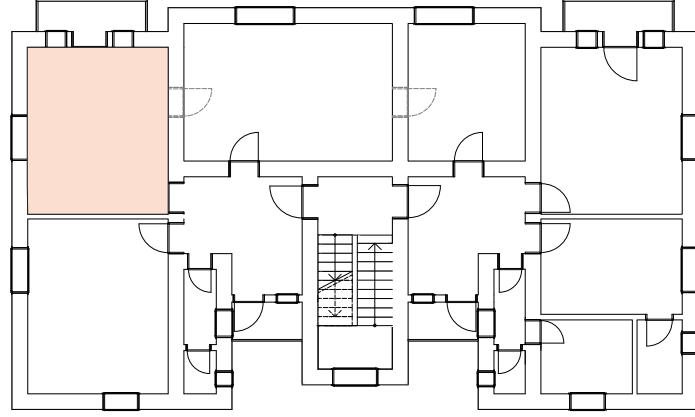




Fig.103 Current room situation

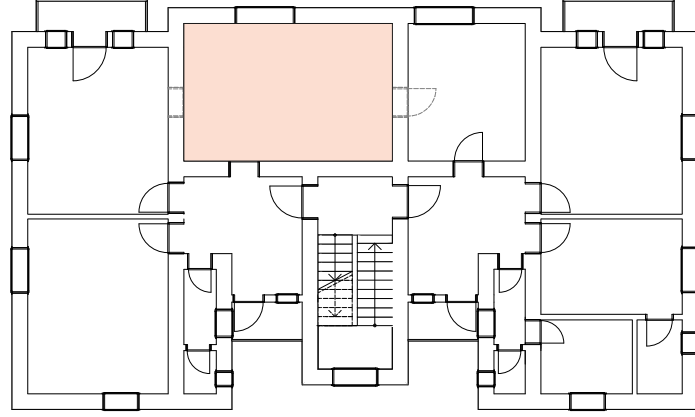




Fig.104 Current room situation

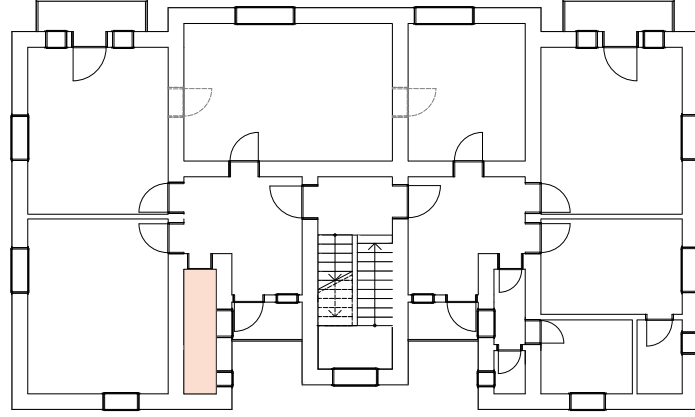




Fig.105 Current toilette situation

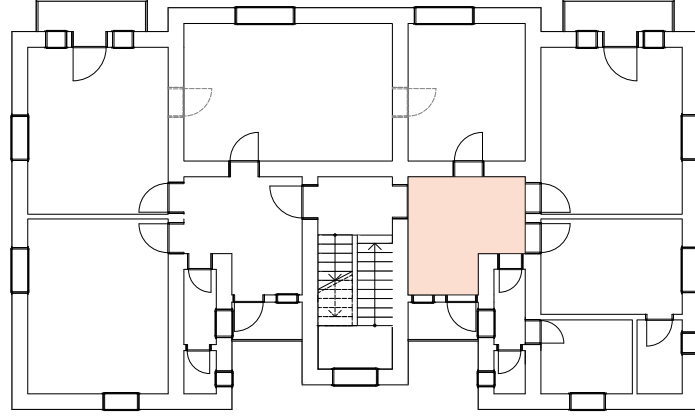




Fig.106 Current hall situation

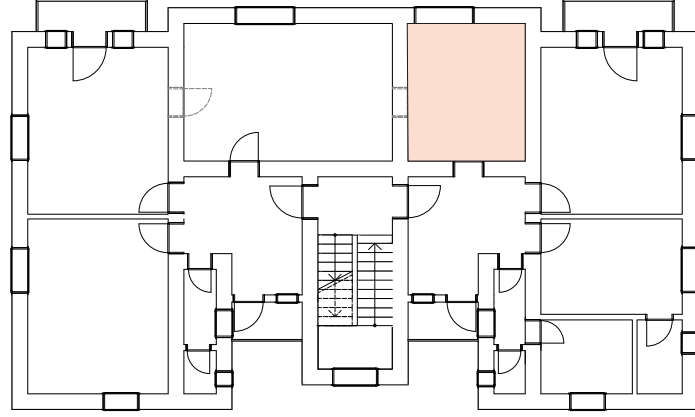




Fig.107 Current room situation

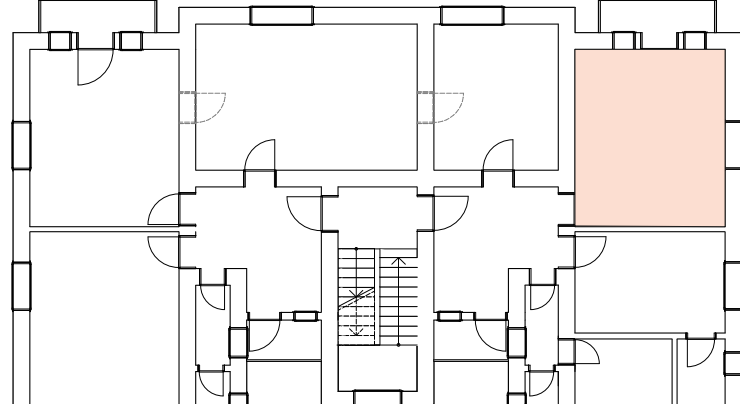




Fig.108 Current room situation

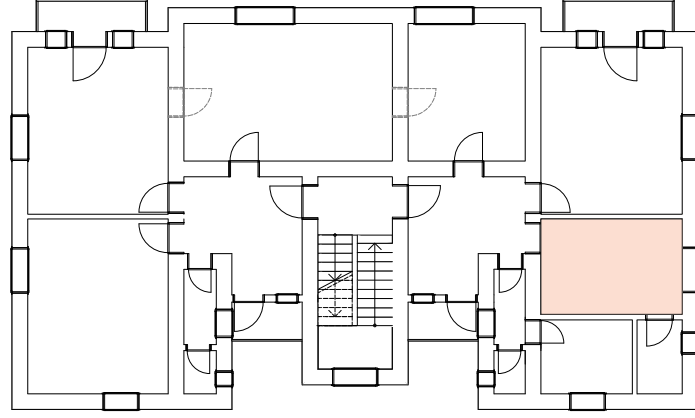




Fig.109 Current room situation

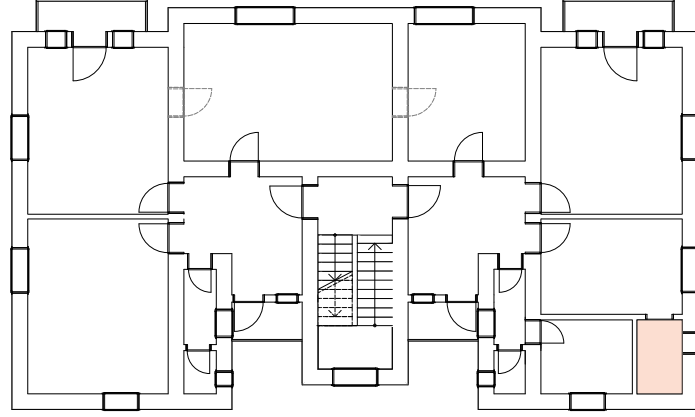




Fig.110 Current room situation

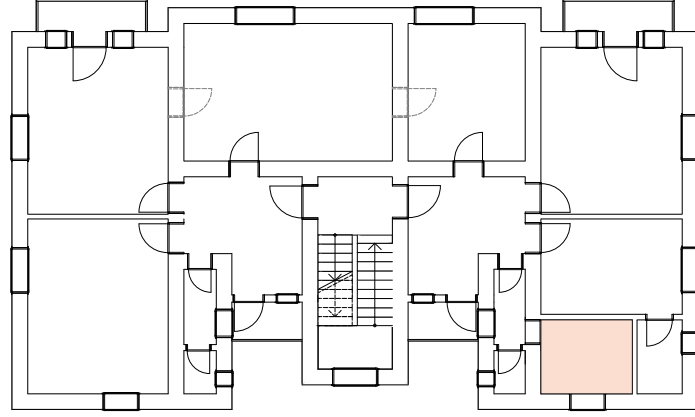




Fig.111 Current room situation

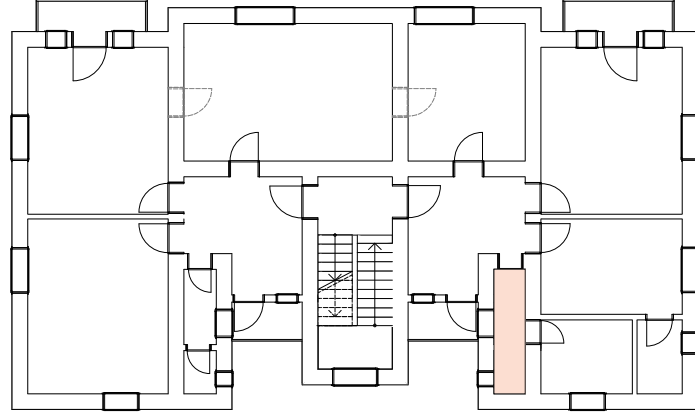




Fig.112 Current toilette situation

Materials and construction

The external walls are made of crushed stone in the mortar with a thickness of 50 centimetres and the façade surface is a plaster one. The inner walls are a full-brick construction and plaster surface. The flooring in the rooms is wooden, and floors in the toilets, halls, and balconies are made of terrazzo. The doors and windows are made of fir or spruce wood, as well as their frames. The railings on the balconies are made of iron and have a unique appearance. The ceiling is a combination of concrete slab with wooden construction, reed, and lime mortar; with a sound attenuator layer. The flooring is wood and terrazzo. The main core, the stairs, are made out of prefabricated stone elements. The roof is a wooden construction finished with asbestos cement boards/eternity in diagonal raster.



Fig.113 Ceiling detail



Fig.114 Wooden floor

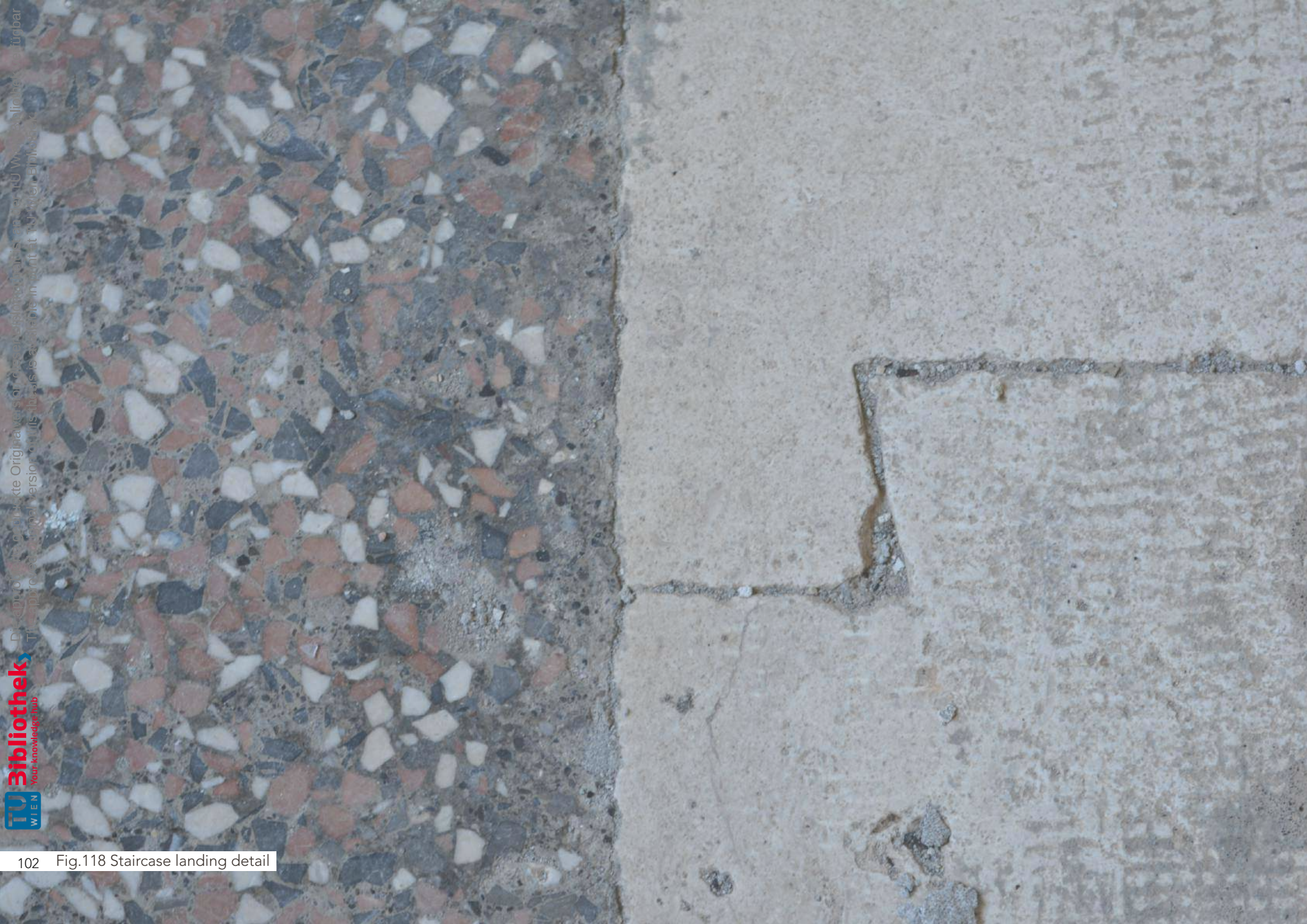


Fig.115 Handrail detail



Fig.116 External wall







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Fig.119 Indoor wall detail 103

3.6 Ornithological significance and birdwatching

Although there are various living organisms living in it, this park is especially known for its fantastic bird diversity, therefore they have especially caught the eye of the public. Montenegro counts around 350 registered bird species; 250 of them have been registered as a part of Ulcinj Salina habitat. In the migration period, the birds are not permanently stationed like in the wintertime; they stay in certain areas for a short break of few days and continue their journey to the goal destination where they nest (in the springtime), or spend winter (in autumn). Birds that leave are constantly replaced by the newcomers; this makes the overall number of birds that stay in this area in the migration time much bigger than the number based on the daily bird counting, which is in ecology known as „turnover effect“. Still, the exact number of birds on Ulcinj Salina could not be precisely determined as the birds are not marked and the number of migrating birds could be multiplied within one day.⁴¹

3.6.1 Main characteristics

There are about 470 birds with constant residence and over 300 migrating birds in the whole European Union. The Ulcinj Salina park counts about 250 of them, which makes more than half of the birds that are constant and about one-third of the birds that naturally inhabit the EU and more than 60% of the overall number of registered birds in Montenegro. Saline's 63 species are listed in Annex I of the Birds Directive and 10 of them are listed as priority ones; 68 of them are specified as Species of European Conservation Concern (SPECs). SPEC 1 group counts 17 of park's species, which stands for European species of global protection significance, classified as critically endangered, endangered, vulnerable, or almost endangered species on a global level. SPEC 2 contains 12 of them and stands for species that are concentrated in Europe and classified as regionally extinct, critically endangered, endangered, almost endangered, reduced in number, or rare in Europe.

SPEC 3 has 39 Salina's birds, and stands for species that are not concentrated in Europe, but are classified as regionally extinct, critically endangered, endangered, vulnerable, almost endangered, reduced in number, or rare in Europe. In the winter and springtime or autumn migration there are between 5 000 and 30 000 birds in the area of saltworks in the mating period on average; in the summer around 5 000. There are three groups in which Salina's birds are divided—birds common for the park or are present in larger groups; this group is the most important for the park's ecological significance. The second group makes the birds who are periodically present in this area, for a short period of time or in small groups. The third group are the birds that visit Saline once in a while, and their presence is not of the biggest importance for the park. Every important species has a status of Natura 2000, which shows all the birds listed in Annex I of the Birds Directive; they also have the SPEC status.⁴² The Ulcinj Salina does not have at the moment the proper infrastructure for successful bird-watching and cannot be recognized as a proper centre for bird watching because of the lack of facilities, observation desks, well organized paths, enough info tables, and so on. This nature park needs good planning in order to be functioning correctly and also attract tourists to become one of the main points of Montenegrin natural/eco-tourism.

⁴¹ Andrej Sovinc, Davorin Tome, Michael Hosek, „Studija zaštite Ulcinjske Solane-nacrta“, 2017, 48

⁴² Andrej Sovinc, Davorin Tome, Michael Hosek, „Studija zaštite Ulcinjske Solane-nacrta“, 2017, 48-50



Fig.120 Flying flamingos 105



106 Fig.121 Flamingo



Fig.122 Group of flamingos at Salina 107

3.6.2 Flamingos - the symbol of Salina

Almost every nature park has its flagship species, species that are mostly identified with this certain area. This concept can be profile-raising for this explicit species and increase the significance of that area in that way and at the same time help with its preservation; it joins conservational, ecological, and sociological importance.

The one species that should be chosen as the flagship species for Ulcinj Salina is the flamingo (*Phoenicopterus roseus*); it has been used for many other habitats as well. Flamingos can make a great impact on the park as they are beloved and easily recognized. They are seen as the most unique species in this part of the Mediterranean. They are not the most common birds in the European Union-only 10 nesting sites, and all of them on the Mediterranean. The closest one to the Ulcinj Salina is in Bari, Italy. In the year 2010 for the first time, a flock of flamingos was noticed (over 100). Over the course of years, the number of individuals varied; for example in 2014 there were seen over 2500 individuals, and in 2016 around 100. The first nesting was in 2013 (around 350 nesting pairs), but in the next few years, it was prevented because of the changes in water level or they were disturbed. It seems that the number of flamingos since 2012 has been around 700 individuals per year; which shows that this number has exceeded the 1% threshold for determining an internationally important region.⁴³

This species, better known as Greater Flamingo, makes the only one that breeds in the EU. This bird has a very characteristic look; extraordinarily long thin legs with long necks covered in mostly pink feathers. Their weight can vary from 1.9 to 3 kg; length from 80 to 150 cm and range wingspan from 140 to 170. Flamingos have a very specific beak that helps filter during feeding; their main food consists of algae, diatoms, insect larvae, mollusks, and crustaceans. Their recognizable pink colour is maintained by feeding with larvae. Their main habitat is shallow water of lagoons, lakes, and wetlands.

One of the main things they do is that they tend to travel in large flocks; they also mate in the same period, have a non-specific breeding season, and breed not more than once a year. A nest is usually built of mud by a pair of flamingos; the nest is hardened by the sun and has room for a single egg, which has an incubation time of 27 to 31 days and is done by both females and males. While the one lays on the egg, the other looks for food. The young ones take from 65 to 90 days in their fledging period; they are fed with crop milk by both parents and are usually put in a „crib“ with other young ones and being watched by other non-breeding flamingos. Flamingos take up to 5 to 6 years to reach their sexual maturity. Since they have very few predators, Greater flamingos have a life span of an average of 20 to 30 years. These birds are marked as very loud, but very good communicators that can also recognize differences within their various calls. They are extremely social species and tend to travel throughout their nomadic life in larger groups constantly looking for a place that offers better conditions. These birds are marked as very loud, but very good communicators that can also recognize differences within their various calls.⁴⁴

Nesting birds

The six of the most important nesting birds for the Ulcinj Salina, among all the others that inhabit this area, are the Black-winged stilt (*Himantopus himantopus*), Eurasian stone-curlew (*Burhinus oedicephalus*), Collared pratincole (*Glareola pratincola*), Kentish plover (*Charadrius alexandrinus*), Little tern (*Sternula albifrons*) and Common tern (*Sterna hirundo*). Shallow waters and muddy shores find some of them very appropriate as a habitat because it is good for feeding or as a shelter. It could be achieved, with proper management, an increase in the population of nesting birds. This strategy would also influence its protected status and improve it greatly. One of the examples for that is the Secovlje Saltworks in Slovenia, which could be used as a model since it has

⁴³ *ibid.*, 55-56

⁴⁴ Holle' Draugn, „*Phoenicopterus roseus* greater flamingo“ https://animaldiversity.org/accounts/Phoenicopterus_roseus/



Fig.123 A group of cormorants and pelicans 109

shown a good approach with managing bird populations.⁴⁵

Important birds with year-round presence

The Ulcinj Salina represents a very attractive habitat for various birds that tend to stay there during the whole year. The five of the most important ones are: Little white egret (*Egretta garzetta*), Eurasian spoonbill (*Platalea leucorodia*), Pygmy cormorant (*Phalacrocorax pygmeus*), Common redshank (*Tringa totanus*), and Spotted redshank (*Tringa erythropus*). These birds could also improve the park's birdwatching potential as they inhabit the area during all seasons and could be always observed since their presence is stable and numerous.⁴⁶

Important birds during migration- and wintertime

Between all the birds present in migration and wintertime, two of them are especially significant, and those are ducks and waterfowls

Ducks

Birds like Eurasian wigeon (*Anas penelope*), Gadwall (*Anas strepera*), Eurasian teal (*Anas crecca*), Mallard (*Anas platyrhynchos*), and Pintail (*Anas acuta*) have a pretty large population during winter time; their number increases in October and they stay in this region until February. The species like Mallard, Eurasian teal, and Pintail are especially numerous; their number could go up to 2000 individuals in one day, which can be compared to some protected wetlands parks in Albania. Garganey (*Anas querquedula*) varies from other duck species as it is the only one spending winter in Africa, and is only present in the area of Ulcinj Salina during spring migration, particularly in February and March (over 2000 individuals). The species Northern shoveler (*Anas clypeata*) are also present during winter, but their most numerous population was registered during spring migration in March (around 1000 individuals).⁴⁷

⁴⁵ Andrej Sovinc, Davorin Tome, Michael Hosek, „Studija zaštite Ulcinjske Solane-nacrt“, 2017, 56-57.

⁴⁶ *ibid.*, 61.

⁴⁷ *ibid.*, 67-69.

Waterfowls

In the group of Ulcinj Salina's waterfowls three different phenologies could be observed. Northern lapwing (*Vanellus vanellus*), European golden plover (*Pluvialis apricaria*), Common snipe (*Gallinago gallinago*) represent typical winter birds with their most numerous population being in December and January. Curlew sandpiper (*Calidris ferruginea*), Black-tailed godwit (*Limosa limosa*), Ruff (*Philomachus pugnax*) and Common greenshank (*Tringa nebularia*) are species with the largest number in Ulcinj Salina during spring migration; mostly late February and March. Grey plover (*Pluvialis squatarola*) and Dunlin (*Calidris alpina*) are the birds that spend their winter in saltworks, but their number is at its peak in the time of spring and autumn migrations.⁴⁸

Globally endangered species

Groups of birds that qualify as globally endangered ones are those fall under categories of the International Union for Conservation of Nature - the IUCN as critically endangered, endangered, vulnerable, or almost endangered; which means they are globally endangered. In the area of Ulcinj Salina there have been 17 endangered species registered; most of them are not present here in a large number, and the others have been considered to have a certain number that shows that the Salina represents an important habitat for them. The most important ones in the Ulcinj Salina are Common pochard (*Aythya ferina*), Dalmatian pelican (*Pelecanus crispus*), Northern lapwing (*Vanellus vanellus*), Curlew sandpiper (*Calidris ferruginea*), Black-tailed godwit (*Limosa limosa*), and Eurasian curlew (*Numenius arquata*).⁴⁹

⁴⁸ Andrej Sovinc, Davorin Tome, Michael Hosek, „Studija zaštite Ulcinjske Solane-nacrt“, 2017, 70-71

⁴⁹ *ibid.*, 75-82.



Fig.124 Pelican 111



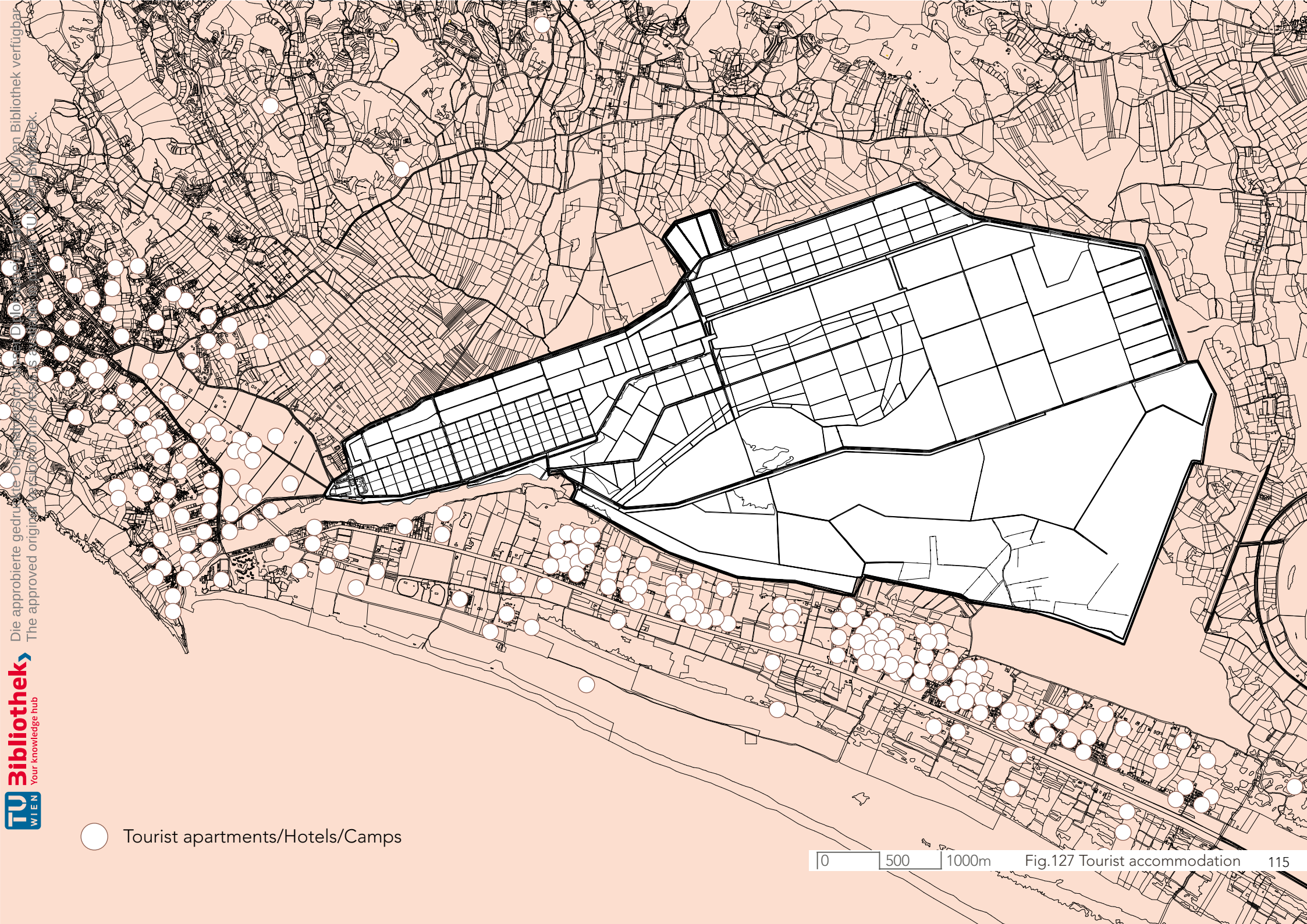
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3.7 Tourism

Being located on the Montenegrin seaside, the focal point of Montenegro's touristic life, it could be said that the Ulcinj Salina is part of a very active touristic region. The economy of the Ulcinj municipality is highly dependent on tourism as almost 17,5% of the population is employed in this sector and approximately 90% of households offer private accommodation.⁵⁰ The city has a large number of hotels of various categories, apartments, and touristic settlements; in the area of Velika Plaža camps and auto-camps are popular. The main season is summer as all the visitors tend to take advantage of the Mediterranean sea and climate, as the sea and beach are the main reason for visiting. Being in this area, the Ulcinj Salina represents a touristic point with great potential, as it can offer various forms of tourism. Until 2006 the salt pools could not be visited, only the factory. With the cooperation of the Salina and Montenegrin bird protection centre (CZIP), the foundations of Salina's eco-tourism have been laid. Trails have been established, info points, gift shop, renovation of the Salina's museum,... Unfortunately, the current state of ownership conflicts made it, even more complicated to fulfill the real touristic needs of this nature park even though it is much wanted by many organisations. When they enter the factory's gate, the visitors are welcomed by guards at the info-point where they get a leaflet with a short description of the park and its history. The visitors can rent a bike for free if they prefer it to walking. The whole tour takes a length of around 16,5 km and it takes 4 to 5 hours on foot and 2 to 3 hours by bike to complete it. In a couple of places, there are info tables with information on birds. There are no toilet facilities, shelters, or trash bins. The lack of proper management and organization has obstructed this very important bird sanctuary from reaching its full potential. Many of Montenegro's citizens are not aware of the fact what this area has to offer because of its recent infamous problems, so the marketing strategy should be one of the focal points of the nature park in order to attract domestic visitors as well as foreign.

The tourism form that would fit the most to Salina would be ecotourism where the nature-preserving conscience should be emphasized as well as learning on a sustainable environment. In order to preserve the nature of the park itself, the mass-tourism should be avoided. The centre of attention would be on ornithological tourism with observation and study of the birds in the middle; there should be access to proper equipment if visitors want any. The trails should have more info points with information on birds, as well as watchtowers. Organized tours with proper guides would also elevate the park as an important ornithological centre. Hiking and bicycle tourism should also be boosted with proper trails and infrastructures and functioning camping should be offered for nature lovers. Cultural tourism should also be a part of the Salina's permanent content; a museum that exhibits history and life of Salina should be brought back to life in order to confirm and enlarge the identity of the area. This park could also be the place of various scientific meet-ups and camps for biologists and birds and nature enthusiasts as well as locals to elevate the consciousness. The whole strategy requires a large amount of time, management, and financial support but it is much needed in order for Salina to be recognized as a true natural jewel as it is.

⁵⁰ Ministarstvo održivog razvoja i turizma, „Prostorno-urbanistički plan opštine Ulcinj 2020-Knjiga 1“, 2013, 87.



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○ Tourist apartments/Hotels/Camps

0 500 1000m

Fig.127 Tourist accommodation 115

4. MONUMENT PRESERVATION AND CONSERVATION

4.1 Monument preservation in Montenegro

The monument preservation in Montenegro is one of the sub-administrations of the Ministry of Culture of Montenegro; it is under the leadership of the Administration for the Protection of Cultural Properties and is based in the Old Royal Capital of Montenegro-Cetinje, and has two other branches in Kotor and Mojkovac. This administration is in charge of various tasks regarding all the cultural heritage questions in Montenegro and has a total number of 33 employees. It is divided into four sub-administrations; Sector for the Establishment of the Protection of Cultural Heritage, Sector for the Implementation of Measures for the Protection of Cultural Heritage, General Affairs and Finance Service, Regional Unit Kotor, and Regional Unit Mojkovac.⁵¹ The Sector for the Establishment of the Protection of Cultural Heritage performs different activities: research, study, documentation and recording of cultural property collection, processing and storage of documentation on cultural assets; establishing prior protection and recording objects, facilities, sites and other assets believed to be of cultural significance; determining the cultural value of goods by preparing expert studies for each cultural property; determining the status of cultural property and establishing permanent protection of cultural property; continuous monitoring of the condition of cultural goods and evaluation of their cultural value; determining the reasons and making a decision on the termination of the cultural property status; formation of files of cultural goods; establishing and maintaining the Register of Cultural Heritage, establishing and managing the information system of cultural goods and its connection with other information systems; cooperation with owners and holders of cultural goods and non-governmental organizations dealing with the protection of cultural goods; international cooperation and European integration, appointment of a temporary guardian of the cultural property.⁵²

⁵¹ "The Administration for the Protection of Cultural Properties of Montenegro-Organisation", <http://www.uzkd.mku.gov.me/organizacija>

⁵² *ibid.*, - The Sector for the Establishment of the Protection of Cultural Property"
http://www.uzkd.mku.gov.me/organizacija/Sektor_za_uspostavljanje_zastite_kulturnih_dobara

The Sector for the Implementation of Measures for the Protection of Cultural Heritage performs activities related to: issuing permits for archaeological and conservation research; suspension of research and revocation of research approval; giving consent for geological research in the vicinity of cultural assets; determining the value and status of random findings; preparation and adoption of a study on the protection of cultural property for the purposes of drafting state and local planning documents; cooperation with holders of preparatory work and processors of planning documents; reviewing and giving opinions on planning documentation; issuing conservation conditions and giving consent to conservation projects; temporary or permanent suspension of the implementation of conservation measures or the performance of works on cultural property; acceptance of performed works on cultural property after implemented conservation measures; suspension of works on a cultural property performed without or beyond an approved conservation project; giving opinions for temporary export of cultural goods; care for imported cultural goods; return of cultural objects that were illegally taken from Montenegro; taking care of the timely return of the temporarily presented cultural property and determining the condition in which it was returned; determining the purposes and manner of use of cultural property for the purpose of sustainable development and granting approval for the use of cultural property for commercial purposes; providing professional assistance to owners and holders of cultural property; performing inspection supervision in relation to the condition of cultural goods, respecting the established regime and implementing protection measures on cultural goods; exercising the rights and obligations of owners and holders of cultural goods, as well as continuous monitoring of the condition of cultural goods.⁵³

⁵³ „The Administration for the Protection of Cultural Properties of Montenegro-The Sector for the Implementation of Measures for the Protection of Cultural Heritage”
http://www.uzkd.mku.gov.me/organizacija/Sektor_za_sprovođenje_mjera_zastite_kulturnih_dobara

Unfortunately, cultural heritage in Montenegro is strongly influenced by politics and certain individuals. The country's small size makes it even easier to navigate certain projects in the wrong direction. Tourism in Montenegro, being its main resource, has often been guilty of neglecting the cultural heritage instead of promoting and helping it. The main focus has been the large-scale hotel resorts, apartment buildings, and luxurious ports; these often non-legal privatizations have put jewels such as Austro-Hungarian fortresses on the Adriatic coast of Montenegro and other cultural monuments and sites in the second plan; profit over culture. Regarding the industrial heritage, Montenegro hasn't developed any special sections or strategies that should have this as the main topic; the Administration for the Protection of Cultural Properties is also not in possession of any documentation of Montenegro's industrial cultural property.

Note: This part of the research has been written before Montenegro's government has made general reform in the ministry department, and it describes the management model of the previous government which was valid until the December of 2020. It is still not known how will the new government solve the issue of monument preservation in Montenegro.

4.2 Industrial heritage in Montenegro



Fig.128 Ironworks „Boris Kidric“ in Niksic

Montenegro's bright industrial history begins mostly after World War II, as the country has not had a developed industry before it; the growth occurred mostly in the years from 1949 until 1989 and happened not only in industry, but in population, education, healthcare system, etc. Most of the cities had been struck by industrialization and took part in it with new industrial constructions. Some of them are the Aluminium Plant (KAP) in Podgorica, Ironworks „Boris Kidric“ and „Trebjesa“ brewery in Niksic, brick and tile factory in „Rudeš“ in Budimlje, the plant timber industry „Lim“, fridge factory „Obod“ and shoe factory „Košuta“ in Cetinje and many others. The 1990s were a dark time for the Balkans, but also tragic for Montenegro's industry. Some of them are still in business but had undergone even several privatization processes and have constant financial issues; but most of the factories and facilities have been shut down and until this day are just standing as nostalgic ghosts of the former bright times. It has shaped a new expression of cultural heritage, this „post-industrial“ monuments that are mainly presented in form of abandoned industrial zones. There are various typologies of industrial heritage in Montenegro. Some of them are



Fig.129 The old dairy factory in Podgorica



Fig.130 The new residential building that has taken its place



Fig.131 Factory „Radoje Dakic“ in Podgorica



Fig.132 The new „City“ block in Podgorica



Fig.133 „Obod“ factory in Cetinje



Fig.134 Dock of the millitary shipyard in Tivat



Fig.135 Military shipyard „Arsenal“ in Tivat, 2004



Fig.136 Porto Montenegro Marina



Fig.137 Porto Montenegro Museum

still functioning; some are still operating, but not in the former way; some changed their functions through a renovation process; a good part has been removed and formed a new housing or touristic settlement and the others are just waiting for their time to be looked at and finally reused. A typical example of the country's way of dealing with industrial heritage could be seen on the example of Podgorica, Montenegro's capital, which completely erased former star factories in order to create more residential building units, like with the town dairy factory or the former smelting and construction machinery factory „Radoje Dakic“.⁵⁴ The most „aggressive“ example could be seen on Montenegro's coast, the town of Tivat where the old military shipyard Arsenal has been totally demolished and given a completely new look - an elite yacht harbour „Porto Montenegro“ with high-class stores, apartment buildings and „Regent“ hotel. The shipyard was a very important point for the Kingdom of Serbs, Croats, and Slovenians, as well later for Yugoslavia. It was also one of the first industries in this area. In 2007 it was privatized and decided that the elite settlement should be constructed. Although a very few things were left as a reminder of the arsenal, like the old crane and a submarine that serves as the arsenal museum, the whole complex looks foreign and as an „alien settlement“ as it primarily serves to high-class tourists and not the residents.⁵⁵ Although revitalization and repurpose of the industrial heritage monuments requires a complex strategy and good financial sources, they also offer a lot of existing space which provides a variety of solutions for different typologies. With their often open-floor plans they could be ideal as spaces that can connect and integrate; improve cultural offer; revive forgotten times and other possibilities. Another reason to preserve these spaces is because they are not only architectural, but also time monuments; they represent memories of better and happier times.

⁵⁴ Slavica Stamatovic Vuckovic, „Post-industrial Montenegro: Potentials of Industrial Heritage, In: Protection and Reuse of Industrial Heritage: Dilemmas, Problems, Examples Monographic Publication of ICOMOS Slovenia“, ICOMOS Slovenia, Ljubljana 2017

⁵⁵ ibid.

4.3 Recording measures for the Administration building

The general state of the building

The Administration building has been abandoned for several decades; it suffered major damages after the earthquake in 1979 and hasn't been used since then which is very noticeable. The general state of the building interior is pretty bad and probably not completely safe. The whole external state of the administration building is not in an ideal shape as the part of the façade has fallen out and has cracks in some parts. Some of the doors and windows are missing as well as the rain gutter.

The surface layers of the walls have almost completely peeled off; both exterior and interior walls have often significant cracks and holes which bring into question the building's load capacity. The glass on the windows is almost completely gone, and the wooden window and door frames are either torn down or destroyed by the weather and time. The floors in certain rooms are gone or also not stable and the ceiling has holes in it or has completely broken down in some areas. A lot of the former building inventory is to be seen in the rooms; chairs, books, tires, and old fire extinguishers fill out the empty rooms. The roof is also in a bad condition and the core can be seen in many places; the wooden roof construction has also suffered a great deal of damage due to weathering.

Preliminary inspection

In order to determine the best possible solution for the restoration, preservation, and renewal of the building, it is of major significance to execute a proper preliminary examination of the whole space so that the right measures could be implemented. The most important investigations are the structural and constructive, thermal-energetic, indoor climate, moisture and harmful salts, biological infestation as well as pollution and harmful substances exposure investigation. It is very important to say that the inspections must be carried out by people and companies who are appropriately qualified to perform them. A type of „room book“ is to be produced where all the different types of evaluations are documented together.

The goal of these evaluations is to come up with a concept of measures that are object-specific and have the least possible negative effects on the mentioned object as well as the environment.

Examination of structural elements

The building's supporting structures are one of the essential parts. Monuments are especially sensitive because of their age that affects the structural system and causes damages. The causes could be various, from natural environment influences such as earthquakes and floods to the changes in the surroundings like building a site in the neighbourhood and others. The investigation could be done properly only with proper recordings of the structural context of the monument, the historical development of the building, and recognition of the damages. Making quality evidence photos, building plans, reports, arithmetic validation, and room analysis (room books) are extremely important for genuine recordings of the monument. Some of the essential parts of the analysis would be a geo-mechanical and soil-mechanical examination of the building like sample taking from the soil for the strength testing in the laboratory. Due to the frequent earthquakes in this area, a very important examination would be the seismological examination of the building as well as deformation and settlement measures. For a legitimate understanding of the structural state of the building, the structural analysis should contain a detailed description of the general state, material characteristics, models with load- and deformation state simulations, finding cavities, etc. The damage analysis is also a significant part where the scope, degree, cause, and dynamic of the damage should be described. Along with this, the „damage biography“ should also be added where the observation and dating of plaster stratigraphies to assess crack patterns, additions, or secondary fillings recognition as well as the cause of the current construction defects should be described.⁵⁶

⁵⁶ Bundesdenkmalamt, „Standards der Baudenkmalpflege“, 2015, Wien, 41-45

Thermal-energetic examination

A thermal and energetic investigation is important for the preservation of historical monuments if the building should be alongside general restoration and repairment implement thermic measures, a change in usage is being planned and room climate must be adjusted to it or thermal-energetic aspects were the cause of certain structural defects. The goal of the examination is to try to create a basis for an energetic optimization within the building's compatible framework. Good overall knowledge of the historical construction, building physics, and technology is very important for the inventory of energy efficiency, as well as an overall building survey and plans that are up to date. If multi-layered structures are present, it could be necessary to inspect and precisely determine the type of materials with the help of sampling and inspection openings. Understanding the monument's history and events that occurred is also important in order to determine damages and structural anomalies. The condition and type of damage should be controlled generally for all building components (cracks, moisture, leaks, outdated isolation). If possible, the building consumption values (annual billing) would also be helpful. When observing the building envelope it should be generally examined in order to identify any possible thermal bridges; the surface temperature, indoor climate, and air exchange rate should also be carefully inspected- thermographs (thermal imaging camera) and airtightness measurements (blower door test) could be really helpful in the examination, but are not to be used as the main foundation of the investigation. The thermal-energetic examination also includes overall weather and environmental conditions; alongside mentioned structural damage, regional climate influences historical climate shifts, local weather conditions, the building situation, terrain, location, neighbour buildings, etc. They are helpful and important for both interpretations of the current state and the development of possible alternative solutions.⁵⁷

⁵⁷ *ibid.*, 45-49

Indoor climate examination

The aim of a room climate study is to examine the development and access of given problem-oriented approaches to solutions with the understanding of technical framework conditions. This examination includes the temperature measurement as well as relative humidity. The best way to obtain the right values is that the measurement should be carried out throughout the entire year and that the measure intervals, depending on the problem, could be displayed in close time intervals. Longer time intervals carry the risk of overlooking certain climate peaks and should be avoided. Any conclusion about the indoor climate could be hardly drawn from the measurements that are only carried out isolated in terms of location and time. Aside from the outside temperature and relative humidity, the evaluation should also include the absolute humidity in the outside area. The climate evaluation includes also conditions like construction method, groundwater, moisture, salt concentration, technical infrastructure, etc.; it must be adjusted and changed especially if there is an infestation by wood pest or microorganism. There are several parameters that are important for measuring room climate: surface temperature, absolute humidity, air change, air-flow, CO₂ content. Spatial conditions like room heights, room volume, heating system, type of heating and ventilation, the usage and function of the space, visitor frequency etc., as well as outside climate, must be also considered. Basically, all forms of hygrometers and thermometers are permitted during measurement and examination of indoor climate; but they are to be verified and calibrated. Devices are to be positioned and the numbering is to be chosen according to the room size and parameters like vertical temperature distribution, height of the measuring points, incidence of heat and light, lightning, airflow through leaks or heating, etc.) Surface temperature is to be measured through special sensors that are put directly in contact with the surface or by infrared (IR) technology. For indicating visitor frequency and user behaviour a CO₂ measurement is to be carried out and by sensors that are appropriate for that. Building's biological air measurements concerning dust,

pollutants like asbestos, or wood pest and mold spore contamination should be carried out by laboratories who are qualified to do it. The positioning and exact documenting of measurement devices are extremely important for this process and end result; image, graphics with mapping and diagrams, texts are to be correctly done.⁵⁸

Moisture and harmful salts examination

Historic buildings usually consist of often sensitive or porous materials. During a longer time period appearance of salt and moisture in stone, bricks, and mortar can occur and sometimes it doesn't need any moisture or salt reduction measures. Other times, reduction measures are necessary because there is a threat to the existing building or it raises the question of possible usage. Detailed knowledge of building physics and materials is required in order to determine this kind of damages as well as detailed scientific research. The overall analysis and salt and moisture examination level depend on the future usage, the importance of the object, damage dimensions, and the complexity of circumstances. The presence of moisture and salt in the construction and its amount is also very important in order for systems like plastering and painting to be determined, especially if there is a historical value of certain surfaces. The examination includes exploration of environmental conditions like room climate, function, lack of maintenance, etc., and it connects the object's usage history with damage assessment. It is also very important to include the evaluation of potential wood pests and microorganism infestation. Specialized laboratories are to carry out these examinations; conservation and material scientists, as well as building physicists are to participate in the process. „Darr methode“, a gravimetric method is to be used for moisture determination. There are other non-destructive methods such as the dielectric constant/ high frequency measurement principle or the microwave method could also be used to determine the relative humidity but they should be calibrated using at least one gravimetric measurement. Determination of salt

presence in the construction could be done with help of classical methods or via ions chromatography (IC); the analysis includes the determination of the amount and type of salt. For the analysis, the sampling is extremely significant and should be carried out by experts. . The sampling documentation is also important and should include the date, relative humidity, temperature, sampling height, and type of sample. Salts could also be identified with the help of X-ray technology; the quantitative analysis should be done with the help of either compress analysis or direct sampling. The overall documentation of the evaluation consists of images, graphics, images and should be done properly in order to get the best possible results.⁵⁹

⁵⁸ Bundesdenkmalamt, „Standards der Baudenkmalpflege“, 2015, Wien, 50-53

⁵⁹ *ibid.*, 41-45

Biological infestation examination

Aside from physical and chemical environmental influences, the degradation process of the historical building is also largely influenced by biological processes and they can often have negative effects on the health of the users. Both organic materials such as wood and inorganic materials such as concrete walls are affected by pest infestation. Bacteria, fungi, algae, lichens, and mosses are common causes of damage in architecture in the field of microbiology. The goal of this examination is to determine the type of pest/infestation and to come up with the best possible solution concept. IPM (Integrated Pest Management) is a method that includes the examination of surrounding conditions like humidity, room climate, materials, etc., and makes the connection with the damage itself. Pest infestation analysis is to be carried out as on-site diagnosis or laboratory examinations. With the examination, the following questions should be determined: whether or not the infestation is still active; the primary cause of infestation and the elimination plan; treatment concept; biocides usage only by licensed companies; fulfilling environmental requirements and replacement of endangered load-bearing elements and assessment by structural engineers. By influencing the environmental conditions, sustainable prevention of microbiological infestation could be prevented; some biocidal treatments are often only short-lived and it should strive for a long-term solution. Some of the convenient conditions for the growth of microorganisms are temperature, humidity, water, salt, etc. Specialists and qualified laboratories should carry out the general observation of the object with mapping, optional laboratory examination, the prognosis of the damage potential, climate measurement like temperature, humidity, light, airflow, etc., make a recommendation for a solution method and after the finished method to do a control of the success. The mapping should include the cause of damage, damage description, and definition of damage classes.⁶⁰

⁶⁰ *ibid.*, 57-60

Contamination and harmful substances exposure examination

Many pollutants like asbestos, wood preservatives, polycyclic aromatic hydrocarbons, etc., are found in building materials from the 20th and 21st century; they are also often to be found in historic objects and their building materials. It could represent a serious health and environmental hazard and there are numerous legal regulations for handling such materials, especially in the area of cultural and monument protection. An initiated investigation results from the determination and type of contamination by a poisonous substance. The disposal process, rehabilitation method, and usage strategy are all to be done in accordance with the object itself; sampling must be done properly and only by specialists. Environmental conditions like exposure, room usage, previous measures, processing guidelines, etc., are included in the contamination investigation. All of the tests are to be carried out by special laboratories qualified for that such as University institutes, Federal Environmental Agency, municipal and state offices, environmental laboratories, etc. . Environmental measurements in the field of monument protection primarily include some heavy metals like cadmium [Cd], lead [Pb], mercury [Hg]; polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons as well as asbestos and artificial mineral fibers. . The standards determine analysis regulations as well as methods of investigation and allow the hazard potential to be classified (national and European standards and legal provisions are to be followed). The test reports do not only have to contain the risk classification but also a concept of measures and information on safe handling and work safety.⁶¹

⁶¹ *ibid.*, 61-62

4.4 Preservation measures for the Administration



Fig.138 Mould and moisture damage on interior walls and ceiling

General repairs

General repair measures make the essential basis for the conservation and preservation of a historic building or monument. The most important is the moisture reduction of structures that are in close contact with soil, harmful salts reduction, indoor climate measures as well as measures that are against microbiological infestation and reduction of pollutants.

Moisture and harmful salts reduction measures

Materials from which historic buildings are made often consist of some porous material and absorb water in various degrees (e.g. brick, stone, mortar), so moisture is a regular occurrence. Very often it is accompanied by harmful salts that are primarily responsible for construction damages. A proper moisture reduction should be reduced to those occasions when there is a potential risk to the object or its users. All measures that are to be used must be based on the least possible intervention with the greatest possible reversibility to protect the historic objects themselves. The measures for moisture reduction are extremely complex building physics-chemical processes; they are to be

determined only individually and object-specifically. Moisture can never be eliminated. Because the measures often turn out to be technically and economically unattainable it is very important that before each operation there is a detailed professional assessment of all relevant aspects. Moisture reduction measures do not always have positive effects; they can often affect the structural components such as building settlements through the digging of drainage channels, surface damages due to death; that is why an examination of load-bearing structure is necessary before any realisation. Moisture reduction goal is not the maximum achievable moisture reduction, but the lowering of moisture concentration according to the appropriate building physics parameters. The primary goal is the clearing of maintenance defects and to restore or improve the original state and properties such as drainage of roof and surface water, winter protection measures for streets and roads, etc. The administration building has moisture damages that noticeable from both inside and outside; some of the wall areas are particularly struck by it. Larger interventions may be needed in order to restore the state of the building where it can be used again. In fighting moisture damages, two basic concepts are to be followed; moisture-lowering (maintenance measures, dehumidification ditches, and electrophysical processes) and moisture barrier systems (injection methods, wall separations, wall replacements). The simplest measures could often be the most effective; controlling the roof drainage system, maintenance of existing building drainage system, removing ineffective moisture barriers. Not rarely is a moisture problem actually a problem of harmful salts; a rational replacement or repair of plaster combined with salt reduction measures and regular maintenance of the plinth area could maybe be the solution. A dehumidification ditch is basically a drainage ditch that lied directly on the building; it should reduce the wall moisture by reducing the entry of moisture. For this measure, the primary analysis must be done because it cannot be applied in any case; it be must be done properly otherwise it could cause lasting negative impacts on the existing building. If done correctly, dehumidification ditch

can bring long-term freedom of moisture damages. Direct application of barrier layers on the outer surface of the masonry is to be avoided for both diffusion and reversibility reasons. One of the favourite moisture-lowering systems is the drainage ditch; it enables the lowering of capillary humidity. It can also be combined with a dehumidification ditch. Another method is the exchange of the floor substructure which also leads to the lowering of capillary moisture. Changing floor substructure is not an insignificant method, especially with structures that are in contact with the ground. This method must be carefully planned both with the concept itself as well as with the implementation; if done properly it can be very useful. Injection method is based on filling out or „clogging“ the pore volume. Advantage of this method that there are no structural side effects; the disadvantage is that the clogging substance is not easy to apply and cannot be carried out with 100% certainty. Wall separation method is used to separate components from moistened elements; it is usually done using a wire cutting machine. Its advantage is that is highly efficient for dehumidification; its disadvantages are that is often not accepted in the field of monument preservation. With implementation, it should be done below the ground level and structural side effects must be taken into account. The core drill process could be very useful as a horizontal moisture barrier system with stone ore mixed masonry. The benefit of this method is that there is a systematic division being made between moistened components with very low structural side effects; unfortunately, with this process there is a risk of introducing harmful salts through the mortar. Wall replacement and underpinning are very useful methods in fighting moisture damages; they represent massive interventions in the historical object. A complete wall replacement is not a desirable method from the monument protection point of view and should only be applied if there is no other solution. Soil improvement could also be considered as it is a very helpful solution; it improves the soil through cement and strengthen its structure. It can be very successful when done correctly as it reduces moisture transport to soil and it doesn't have any structural side effects.



Fig.139 All radiators have been removed

Unfortunately, the costs for this method are pretty high and there is no long-term experience for soil improvement as a dehumidification method. Before deciding on any particular method, a thorough analysis must be done; otherwise, there is a big risk of irreversible damages.⁶²

Indoor climate improvement measures

Every building's interior has an indoor climate of its own; it is mostly determined by size, room function, location inside the building, and material and technics used for construction. However, it happens that over a longer period, indoor climate conditions change negatively and cause damages to space and its interior; this is often the case in the field of monument preservation. The administration building has no visible heating system left in it. However, there are niches under every window ledge so it is almost certain that heaters were placed under it and were removed after the building was abandoned. For the ventilation system, a large number of windows were used. When doing the concept for new heating and ventilation system, the original system must be

⁶² Bundesdenkmalamt, „Standards der Baudenkmalpflege“, 2015, Wien, 67-82

considered as well as an air conditioning solution since summer temperatures in Ulcinj are often very high. When working on improving indoor climate on a historic object, a method with minimal interference must be chosen; preference should be given to the passive (usage behaviour) over the active (air conditioning) process. Alongside usage behaviour, great attention should be given to the building's heating system; it is to be organised in such a way where temperature stability is guaranteed. Passive climate stabilization can be achieved through the combination of manual or mechanical controlled air exchange, controlled humidity, and passive solar and thermal protection. Monument protection favours passive methods that include ventilation that is adapted to the local climate conditions, water- and windproof membrane systems on doors and windows, appropriate insulation that is object-specific, temperature control measures on building envelope, and others. Active methods for ventilation and dehumidification are dehumidifiers, and air conditioners that are electronically controlled. They include heating systems-air heating and temperature control system.⁶³



Fig.140 Vegetation overtaking the construction

⁶³ Bundesdenkmalamt, „Standards der Baudenkmalpflege“, 2015, Wien, 85-90

Measures against biological infestation

Not only do physical and chemical environmental influences cause damage to architectural objects, but also biological organisms. Organic materials are often attacked by pest infestation, but inorganic as well. Damage processes can be triggered by infestation, in term of health, aesthetic and material aspects. The monument protection field aims to treat and remove the infestation through the concept of appropriate measures that preserves the historic structure as well; it includes monitoring, prevention and control (IPM-Integrated Pest Management). Insect infestation often happens in isolated areas (wasp nest in the attic) or it can be a direct infestation (parquet beetles, woodworms). Wood pest infestation is related to changes in the indoor climate, temperature and humidity; majority of these insects prefer moist and warm environments. Combating insects with biocides represents a short-term solution; establishment of appropriate ventilation and air circulation as well as temperature control, appropriate humidity are vital as long-term concepts. From a monument protection point of view, methods like hot-air process, humidity-regulated warm air and microwave process; high-frequency process and IR-radiation are rarely used. The fumigation process also represents a successful method, but substances like ethylene oxide, formaldehyde and ozone are not allowed in the field of monument preservation. IPM is an essential part of pest control as it incorporates care, maintenance and monitoring concepts; it must be carefully planned. Plants can also be a burden for historic objects; especially through their roots. It is not always regarded as harmful although its removal is often necessary. Sustainable prevention measures for plants are mostly achieved through herbicides and biocides; but manual removal and maintenance are also needed. Microbiological infestation (mold, algae) are hazardous for both human health and historic surfaces. Biocides are the most effective method as they are UV and pH stable and are non-toxic for humans and environment. Biocides must be chosen carefully and object-specified. Mold and fungus growth is deal in areas with high humidity and nutrients supply. Fighting them

must be a priority not only because of the monument preservation but for health reasons. Any fungicide surface treatment (UV light, microwave process, etc.) is unsuccessful in the long term without accompanying preservation measures like ventilation or temperature control.⁶⁴

Measures against contamination and harmful substances

Harmful substances and contamination affect both human health and the environment; they can be broken down into materials introduced during construction and secondary use-related load. Both organic and inorganic materials can be affected. Various building standards and norms have this as their main topic. Removal of these substances has priority over any historic aspects due to the health hazards. One of the main hazardous materials that can also be found on the administration building is asbestos; it was a common material in the previous century due to its favourable properties. There is a difference between weakly bound asbestos products (spray asbestos, mortar and plaster, cardboard, foam and fabric), and firmly bound asbestos (roof coverings, floor panels, insulation) which have different hazard potential. It must be individually determined and possible risks must be determined.⁶⁵

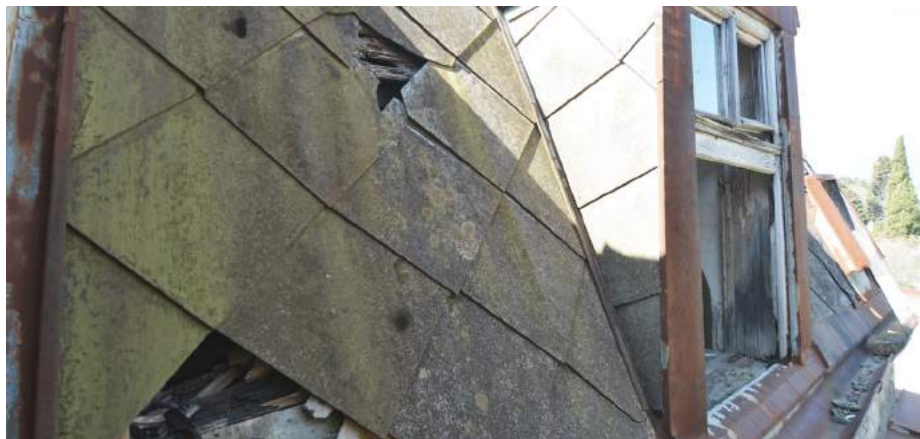


Fig.141 Roof covering

⁶⁴ Bundesdenkmalamt, „Standards der Baudenkmalpflege“, 2015, Wien, 90-100

⁶⁵ *ibid.*, 100-102

Materials and surfaces

The appearance of a historic object is deeply influenced by its materials and surfaces. Via its structure, colours, and imperfections the history itself is portrayed. Not only it has aesthetic significance, but it also tells the story about the development of various structures, materials and building technologies. The materials that coats the architecture are mainly plasters, paints, stone, wooden, and metal surfaces, glass elements, and others. Because they play this important role in the object's physical appearance, their preservation are in the foreground of the cultural and monument protection. The aim of the restoration and conservation measures must be synced with the condition of the traditional construction, the relevant period of the building exterior, and the future and possible usage. Following methods are to be used in order for a restoration goal to be achieved:

- documentation of the existing inventory as well as the examination of the finding with the damage cause and pattern
- restoration goal must be defined with the conservation need and general concept of monument preservation taken into account
- sample work must be included and taken seriously; they serve as specification and comparison so that the measures are done in correspondence to the original state of the historic object
- there is a concept of measures that secures the existing state of the building and restoration itself
- interdisciplinary cooperation of all the different teams working on the historic object
- proper documentation/restoration report where the whole process, materials and work methods are described and the maintenance concept is also pointed out.⁶⁶

⁶⁶ *ibid.*, 107-109



Fig.142 Interior wall decaying

Plaster/Mortar

Plastering is a very significant part of a historic monument. The external image of the building reflects different design epochs and the development of building material technologies; the historic interior plastering tells the same story. With its material, shape, construction, design, structure, colour and ornamentation, plastering forms the perception and appearance of a monument. Therefore, it is very important to preserve historic plastering and to supplement it if necessary; but only in a way that secures the original image. The continuity of the materials must be applied in both consolidation and in the addition. Building physics properties are also to be fulfilled; the new materials added to the existing structure must be such that no negative effects are to happen long term. The plaster condition of the administration building is in a pretty bad condition. It can be easily noticed from both the outside and the inside. Large chunks of plaster are missing from the façade and the underneath construction is often visible. It is a very similar situation with the plastering on inner surfaces; it is falling on the majority of places.

The focus should be on the preservation of the plastering if it's possible and to repair it so the traditional appearance is kept. From the point of monument preservation, it is allowed to apply changes like removing the old plaster and renewing if there are technical and historical reasons in favour. The concept of measures must be well-thought applies solely for the administration building; maintenance measures are preferred to the massive restoration measures. The irreparable damages can be removed after they have been properly marked on the existing structure. The planned added plaster must correspond to the existing one as much as possible in terms of composition (colour, grain size, binding), strength, and elasticity. Parts with cracks and flaws must be repaired and matched to the surrounding materials. Because of the overall state of plaster and mortar on the administration building, it could be said that larger additions and repairs are unavoidable. In that case, all the newly added plaster and mortar is to be carried out using traditional craftsmanship. The supplementary mortar must be identical in the grain type, grain size, grading curve and colour, binding substances, hydraulic components as well as surface, tool marks and really often traditional multi-layer mortar application with a trowel. For the purpose of better matching, supplementary mortars are often mixed on-site. With newly added materials, it is important to see to what extent the added elements should be a replica of historical material, or if it should be a reinterpretation of the material with regard to the context itself. Possible salt reduction measures and water repellent methods (hydrophobization) should only be done in correspondence with the monument preservation. There is also a possibility of antigraffiti coatings for the surfaces in order to protect them on another level.⁶⁷

⁶⁷ Bundesdenkmalamt, „Standards der Baudenkmalpflege“, 2015, Wien, 109-115



Fig.143 Facade falling off 131



Fig.144 Damaged facade

Stucco/Façade structure

Although they are not the most important elements in terms of construction, the stucco, and façade structuring influence the shape and appearance of the historic building greatly. The choice of material, design and technologies tells a story of design and artistic developments of that epoch as well as the material technologies of the time. The goal of the stucco and façade structure preservation is the protection of the traditional substance. The beauty of it is the plastic form, the difference in the constructed surfaces with its tool marks and reliefs, and its framing which can be richly designed using different techniques and layering. The restoration goal of these elements is an appropriate concept of measures and examination of the existing elements and their characteristics; a corresponding scientific analysis is to be done in order to find the best possible solution that fits the building. All actions like maintenance, removal of repairs, consolidation, additions, and similar are to be determined prior to realisation and must be done in original execution technique. The stucco that is present on the administration building is especially noticeable on the exterior; the façade profile that

separates the ground and the first floor and also the first and second/attic floor. Decoration wreaths underneath balconies are also designed in the same manner. The overall state is not the best one, but it seems that the structure itself is maintained. There are moisture damages in some areas, as well as the plastering that has fallen off from the surface. The stucco elements of the administration building are important and must be preserved as they form the building's appearance. Qualified specialists like restorers and plasterers should be in charge of the consolidation and restoration of stucco decorations. The consolidation itself should be done with materials that correspond to the existing materials and their characteristics like elasticity, structural robustness, and binding components; cracks and edges are also to be carried out in harmony with the surrounding structure. If there are any visible cracks, they are to be checked for static causes of damage. The stucco support structure should remain flexible for it to be able to absorb movements of the structure and avoid the creation of cracks and cavities. The original stucco technique in material, structure, and execution should be used. The mortar used for stucco should be preferably mixed directly on the site so that the most possible resemblance is achieved. It should be looked after that the adjusted mortar has similarities in the grain size, grading curve, colour of the sand, binder substances, additives, surface structure, and tool marks and traditional application.⁶⁸

⁶⁸ Bundesdenkmalamt, „Standards der Baudenkmalpflege“, 2015, Wien, 115-119





Fig.146 Wooden door detail

Wood

One of the most important building materials that affect the image of a certain construction is definitely wood; it gives a unique look to both exterior and the interior. It is often used as an elementary structural part for elements like roof trusses, framing, between-ceiling construction, and others; it is also used as the basic material for elements like doors, windows, stairs, etc. The measures for preserving wooden elements vary from simple maintenance, and small repairs to well-thought conservation and restoration strategies. The foreground of restoration of structural timber elements are issues like pest and microbiological infestation, room climate, and water protection. The acquired repair concepts and maintenance and supplementary measures are to be individually determined. The most significant wooden elements on the administration building are windows and doors that give it a special look. The flooring in all the bigger rooms is wooden and the roof truss is a timber construction. Unfortunately, the major part of all these elements is in a really bad state and they would have to be completely renewed or exchanged. When exchanging old and broken parts,

it is crucial that the static requirements are considered and it is to be done by specialists. A very large part of timber construction preservation is pest control; the pest type is to be determined, level of damage, determination and elimination of cause, fight and maintenance concept as well as monitoring strategy. These actions mustn't harm the wooden structures that can be preserved.

In the case of replacing damaged parts, the added parts are to be made of the same type of wood and have the same staining pattern so the original appearance could be maintained.⁶⁹

⁶⁹ Bundesdenkmalamt, „Standards der Baudenkmalpflege“, 2015, Wien, 139-143



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Fig.147 Wooden window construction 135



Fig.148 Spider web overtaking the window surface

Glass/Window glass

The type of glass that is often mentioned in monument protection is the window glass; they are usually part of the window construction or sometimes they represent an independent element. Various shapes and designs mostly tell about the structural and artistic development and history of the existing object. The measures of the rehabilitation are to be developed object-specifically and in the context of existing subject. The existing state of the glass surfaces on the administration building is not ideal; due to the weathering and many years that have passed by, a lot of glasses did break or they have been removed. From the window glass that is still standing in its position, we can notice that it is the standard transparent window glass. It has not been known that the window glass on the administration building has any special specifics and a great historic value. Because of it, it is possible that the renewal would not be as complex as the one with historic important glass. The window frames on the building are wooden; they have been heavily struck by weathering so they should be exchanged together with the glass surfaces. The main role of the window glass is its

technical function, especially as protection from the outside effects and weather. Building physics elements of glass should also be taken into account, as well as the condensation, original construction, room climate, room usage, and room function; especially if a new use is planned. With the planning of adding new elements, the material thickness, surface structure, and colour effect is to be considered. The usage of proper fire protection glasses is also a very important characteristic especially if the future building function is going to have a public character. In the case of adding insulating glasses, a bigger change is to be expected because of the required frame profiles and it can affect the appearance greatly.⁷⁰



Fig.149 Window 137

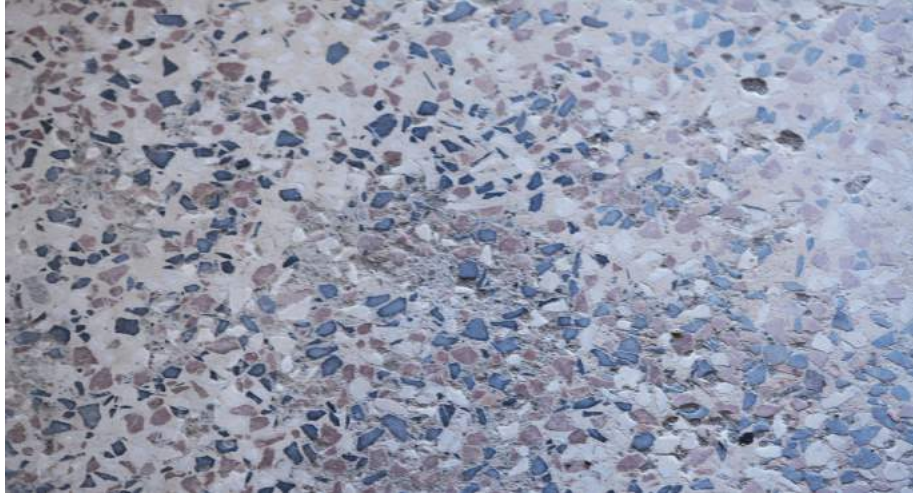


Fig.150 Terrazzo in the hall

Terrazzo

Terrazzo elements are one of the essential, often high-quality components of a historic structure and their different appearances, colour and structure influence historic interiors greatly. Preservation of historic floor surfaces is in the foreground of every restoration. The field of monument preservation justifies the addition of new floor structures, installations, and coverings only if the existing ones are secured or they cannot be repaired in any way. When restoring floor surfaces, a proper analysis of its specifics like room climate and insulation, material-technical requirements are to be considered. The sub-layer and the cover layer is to be observed as one thing and their building physics qualities are to be incorporated into the restoration. The continuity of material is always to be aimed for. The administration building has terrazzo floors in its halls, toilets and on its balconies. Luckily, the general state of these floors is good and it doesn't seem it has any severe damages. However, all the rooms are quite full with the old inventory so a great deal of surfaces is covered with it. It is very important to remove all the waste material at first, so the surface can be approached and then

come up with a proper concept of measures.

If there are any cavities, flaws and cracks, they are to be repaired with materials that correspond to the existing one; the traditional application technique must also be carried out. With terrazzo, the additions must be carefully chosen because of its surface structure and pattern, colour and design; the appearance of the existing structure must be aimed for. A thought-out concept of maintenance is essential for reviving the material's old glory.⁷¹

Structural components

The base core of every architectural object is the structural system. In monument preservation, they tell a lot about the constructional technologies and creative achievements of a certain historical epoch. They shape the monument and have an enormous value as they testify about historical norms, building rules, material technologies, and construction methods. In the field of monument preservation a great importance has been given to the existing structural elements that have to stay authentic and unchanged as much as possible. Due to the natural sequence of events, it is very often the case that these elements have suffered great losses or damages due to the weathering and decaying; the cause could also be some of the previous interventions. The concept of measured must be individual and both technically, and aesthetically subordinate to the existing structure. It must always be aimed for the material continuity to reach the original appearance; it is also crucial to determine if the current building standards can be achieved with the sum of selective changes or a bigger modification needs to be done.⁷²

⁷¹ Bundesdenkmalamt, „Standards der Baudenkmalpflege“, 2015, Wien, 154-157

⁷² *ibid.*, 169-171



Fig.151 Terrazzo on the balcony 139



Fig.152 Interior wall cavity

Walls

Methods of historical solid constructions consist of different types of masonry structures as well as concrete ones. Regardless of it is about stone pillars, masonry with a particular aesthetical appearance, high-quality exposed masonry (like stone, brick, concrete, etc.), or masonry with high-quality surfaces (wall paintings, stucco, plaster, etc.), changes against the rules of monument preservation are not allowed. Addition and changes that affect the spatial character and primary load-bearing structure are not justified from the side of monument protection unless there are good reasons in a structural sense. The existing load-bearing structure can be strengthened with measures like wall doubling, injecting, needling, or partially replacing the affected element; the measures must be made individually and are object-specified. Both exterior and interior walls of the administration building are decaying, that the general security load capacity of the building is put in question. The weathering and years have done a great deal of damage, but the biggest cavities come from the strong earthquakes that are common in this area. A proper inspection and analysis made

by civil engineers and qualified are strongly needed; especially by earthquake specialists. Almost every wall has a crack or holes in it and the inner structure is often exposed. Some parts of walls may be completely exchanged to retrain the building's full load capacity and to fulfill today's building norms and standards. In order for the load-bearing capacity to be stabilized and increased, cavity and gap injections, needling, and anchoring are often used today; with porous materials like stone and brick, it should be paid attention to vapor diffusion compatibility of the cavities. During this process, holes and cavities should be drilled as dry as possible and with the least vibration. Changes like the lining of imperfections, lining of breakthroughs and openings, support reinforcement, etc., should be done in correspondence to the existing structure; if that is not possible in any way, it is important to mark and identify it as such. Laying out new technical installations in the existing wall structures is to be avoided; if it is not possible to use the existing pipeline routes, a maintenance-friendly solution is to be found without interfering with the historic structure.⁷³

⁷³ Bundesdenkmalamt, „Standards der Baudenkmalpflege“, 2015, Wien, 176-180



Fig.153 Exterior wall cavity 141



Fig.154 Exposed ceiling construction

Ceilings

Besides being an important structural element, ceiling constructions also have great historical value in monument preservation as they testify about the structural and material technologies of their time. If there is no reason for improving the load capacity, constructive changes on historic ceiling elements are not desirable in the field of monument preservation. Any additions or changes to the existing ceilings, such as repair of cavities or imperfections, structural and support reinforcements, corrosion protection it must be matched to the existing elements. If there is a substantial renovation planned, interventions like structural, thermal insulation, or pipeline installations changes, it all must stay true to the previous and existing construction. The state of the ceiling constructions in the administration building is partially in an extremely bad state; in one room the ceiling completely broke down and in a large number of other rooms it is not safe to walk on the floor construction. A big percentage of the ceiling surface has a number of cavities and holes in it so the inner construction is visible. The wooden beam structure which is the in-between ceiling construction here is

often exposed and the damages are visible; the thermal-acoustic reed layer is also very often visible together with it. It is clear that almost a number of these structures need a heavy or total set of repairs. For the supplementary or repair options, it could be chosen from a replacement, partial replacement, additional elements, and reinforcing materials. When there is a case of necessary structural repairs and reinforcements, there should be invested enough time in coming up with a proper solution that is individual and object-specified; whether or not to choose between system-compliant, material-appropriate upgrading of the existing load-bearing system or to introduce a parallel constructive system. All of these decisions must be made by specialists and in correspondence with the process of restoration. Putting through pipes and other technical installation through historical ceiling structures is not desirable from the monument protection point of view; existing installation openings and maintenance-friendly new constructions like suspended ceilings are to be used for it.⁷⁴

⁷⁴ Bundesdenkmalamt, „Standards der Baudenkmalpflege“, 2015, Wien, 186-190



Fig.155 Collapsed ceiling 143



Fig.156 Staircase

Staircase/Balconies

Staircase and balconies have always made an important part of an architectural object and have had many different appearances throughout history. Like with other structures and elements, from the monument preservation point of view, neither staircases nor balconies should be strongly modified without any good reason. Unlike with other elements, the technical specifications and building norms have not changed so drastically like with stairs, especially with fire protection regulations and users security. Because of the new norms and requirements, it can happen that the staircase must be adjusted to new standards, but everything in the frame of monument preservation of course. Since that can't always function, sometimes situations like these are solved in a way where the historic building is going to be preserved, but the new function is going to be relocated (new external fire escape). The state of the staircase in the administration building is from pre-fabricated stone elements. It is in fairly good shape; still, maintenance concept must be created in order for it to preserve its original shape and look. At the moment the whole staircase is covered in the old inventory and it needs



Fig.157 Balcony

to be removed. The surface of the stairs could have minimal surface damage, so an appropriate surface treatment and cavities correction is needed. Administration building adorns balconies on the front and on the back. Because of the mentioned earthquakes, there are some structural damages on the floors; it could be possible that the existing load-bearing structure must be strengthened. A possible supplementary and repair option would be a replacement or partial replacement, additional beams or using reinforcing materials; all of this is to be done according to monument preservation standards and within the historical context. It is also clear there is some microbiological infestation present as well as vegetation so the proper measured for removing it need to be done; there are also serious moisture damages visible that need to be eliminated.⁷⁵

⁷⁵ Bundesdenkmalamt, „Standards der Baudenkmalpflege“, 2015, Wien, 190-192



Fig.158 Balcony 145



Fig.159 Timber

Timber construction/Roof trusses

Roof structures and trusses are highly appreciated in the field of monument protection because of both their aesthetical as well as functional and structural values. They can be often hidden underneath the cladding so an additional intervention could be necessary in order to determine the existing state of the construction. The roof truss of the administration building is visible in some of the rooms second floor where the ceiling has fallen of the truss can be observed; it is almost completely present but the state of the timber is not great. The concept of measures for wood protection should be applied if the estimation analysis says it is going to be sufficient. In another case, unrepairable parts need to be replaced; it should be chosen between introducing a parallel constructive system and upgrading the existing load-bearing structure with the help of additions that are adapted to the existing system. Usually, any additions that are made should be recognizable, but the monument protection analysis chooses to which extent. Any changes and upgrades made must be as identical as possible regarding building technologies and materials. Changing the roof structure

means changing the appearance of the historical object itself, so it must be done according to the rules and standards of the monument protection. Like with other structural components of historic objects, installations like pipeline routes and similar are to be considered but they must not interfere in a way that hurts the historic structure.⁷⁶

Roof coverings and carpentry elements

Aside from the structural components of a historic object, its roofing, carpentry, and finishing elements shape the appearance and determine the character. Design, constructional techniques, material developments, craft traditions and local traditional material building tell a very important story.

⁷⁶ Bundesdenkmalamt, „Standards der Baudenkmalpflege“, 2015, Wien, 193-195



Fig.160 Timber roof construction 147



Fig.161 Roof tiles

Roof coverings

The roof and its covering make an important part of the external image of the building; it is also a façade of its own. The object's region determines which materials have been used as well as which building technique; climate and hazard aspects are also a big influence on the choice of the roof construction and covering. Aside from the type of construction, the roof aesthetic must be maintained and remain as unchanged as possible or upgrade with new technologies that correspond to the existing structure. The roofing of the administration building is made of rhomboid asbestos plates. Since the general state of the roof is not in a good state and has experienced weathering damages and because of the general hazardous status of asbestos, the whole roof construction should be replaced. There are also numerous holes on the surface and sheet metal constructions on the roof are completely rusted. Fiber cement panels have often replaced wood and stone coverings because of their availability as well as low eight and small formats. Small fiber cement panels as roof coverings should generally not be completely taken down and covered because of the risk of panel

breaking and the general asbestos exposure; both small- and large-format panels can be partially renewed. When covering and replacing the existing panels of the administration building's roof, it must be carefully decided which material is going to be used; it has to be a complement in the appearance, surface, colour, pattern, and design. The current roof and gable landscape must be preserved because without it, the original appearance will be lost; the regional characteristics must also be considered as the roof decking is constantly exposed to the weather conditions so its building physics characteristics must be considered as well.⁷⁷

⁷⁷ Bundesdenkmalamt, „Standards der Baudenkmalpflege“, 2015, Wien, 204-221





Fig.163 External metal framing and rain gutter

Sheet metal components/external plumbing elements

Sheet metal components have always played an important role in the external image because of the large surfaces they covered; often being building plumbing elements as gutters and roof drain. Although this material is known for its high durability, it has always been heavily impacted by the weather. Following the rules of monument protection, the preservation of sheet metal structures on historical objects has priorities over any additions. If the existing elements show an unrepairable state, the new elements and the concept must come from the historic aesthetic context of the building. The planned measures must be made as a detailed discussion that applies individually to the object and solves the problem in the best possible way; building standards and norms must be highly considered because of the general building usability. Sheet metal elements on the administration building could be mostly seen on the roof as building plumbing/roof drainage systems but also as external framing of the dormers. They are completely rusted and heavily destroyed due to the weather so they should be replaced together with the roof. Rain gutters are filled with stones and have

bent; large parts of downpipes are missing on the façade. Existing historical inventory and material, regional conditions, and current technical standards and requirements must be considered. The shape, dimensions, and attachments like gutter hooks must be respected and keep the existing route on the roof structure and eaves when adding any new elements. Technical characteristics like water volume and inclination must also be read from the existing historical structure when planning on adding new systems.⁷⁸

⁷⁸ Bundesdenkmalamt, „Standards der Baudenkmalpflege“, 2015, Wien, 221-223



Fig.164 Removed downpipe 151



Fig.165 Window sill

Windows

Like other external building elements, windows do give a lot of character to the architectural object; but besides that, they are also responsible for light exposure, outlook, sun and weather protection, ventilation, thermal insulation, sound insulation, solar input, etc. Because they had to fulfill all of these demands, it led to the development of the window structures over the centuries. Luckily, a large number of windows on the administration building is still present; there is enough material that could be used for producing possible replicas. These windows are wooden, double box windows with double wings and skylight windows; there is also an internal window sill in the depth of the wall niche where radiators used to be. These windows give a special charm to the historic object and should be preserved at all costs; the weathering has made an impact on the wooden window frames, but with proper measured, it could be possible to bring them back to life. Glass on the windows is often destroyed or in a bad state, so it might have to be replaced. The context of the existing elements must be put in the foreground when doing the preservation; wooden surfaces with traces

and marks should be kept if there is a possibility. Another big part of preserving openings such as windows are the technical requirements; whether it is the preserved historical elements or a replica, windows need to fulfill building regulations and norms, especially in the terms of fire protection. Energetic characteristics must be taken seriously, as well as the room and future building usage, room climate, and regional weather conditions. In order to improve some of these specifics, there are solutions like subsequent seals or changing the coated single glass; important is that the solution is developed for this individual case. Before any addition is being made, a detailed analysis of the existing windows must be made. Detailed drawing must be made according to an individual case, and working with samples is also a very important part. Material continuity, type of construction, functionality, dimensions, profiles, etc., must be respected; especially if a complete renewal is planned. If there are no reasons against it, the functionality of the windows openings such as ventilation function or opening directions should be maintained in order to keep the identity. If the historic window elements are managed to be preserved, a maintenance concept is to be made in order for them to keep their function and recognition.⁷⁹

⁷⁹ Bundesdenkmalamt, „Standards der Baudenkmalpflege“, 2015, Wien, 233-237



Fig.166 Window 153



Fig.167 Door detail

Doors

Together with windows, doors make an integral part of the architectural identity. As well as windows, doors are also responsible for many different parameters like accessibility, safety aspects, sound insulation, ventilation, thermal insulation, usability, and maintenance; because of different requirements, door technologies and designs have changed and developed a lot throughout the time. Sadly, almost none of the doors on the administration building is present today. From the external doors, there is only one still there on the left entering balcony; from this door we can understand a little better how did the rest of them look like. Even the main entrance doors have been removed and there are only wooden boards attached to the opening to keep the people off. Wooden frames on the balcony doors are still present, so it could be used as a model for future replicas. Balcony doors are done as double doors with skylight windows that suites windows greatly. Because none of the doors are present or can be preserved, it is certain that the additions are necessary. It is important to go on with material continuity and the overall context of the historic structure such as type,

construction, functionality, dimensions, profiles, etc. It is important to work with sampling in order to find the best replica; detailed analysis and drawings must be made so that the best possible solution is being found. Special attention must be brought to the possible public usage of the historic object and all the building requirements and standards that need to go along with it; especially fire protection and safety regulations. Energetic characteristics need to be assessed in terms of room/regional climate, future function, and building physics aspects.⁸⁰

⁸⁰ Bundesdenkmalamt, „Standards der Baudenkmalpflege“, 2015, Wien, 237-240



Fig.168 Main entrance 155



Fig.169 Railing detail

Railing

Whether it is a staircase or balcony railing, it has often merged the safety and aesthetical function. Throughout history, different types of materials and construction railing methods have been used on monument objects and it was always the reflection of the historical values and it was always in the interest of monument protection to preserve it. The preservation measures can range from simple cleaning and maintenance or surface treatments to the complete replacement of the railing if nothing else can be done. The railing on the administration building is made out of iron and has a unique design; the same pattern can be noticed on both balcony and staircase railing. It is completely present which helped with maintaining the building character. However, it is not in great shape. Severe surface treatment is necessary (e.g. setting in oil paint, corrosion protection by burning with linseed oil, minimal covering layers, etc.), as well as repairing or adding the top part since it has been distorted in some places or the wooden hand railing is missing. Another thing that should be considered is the current building norm of 1-meter height for railing for the buildings with a height lower of

12 meters; the current railing does not seem to complete this norm so an appropriate solution should be found. The top part for the hand railing could be added to the level of the required height. The space between the individual bars and underneath them must also be checked for safety norms. If it is decided that the railing should be completely replaced, a technical and material continuity must be obtained; the traditional craftsmanship should be aimed for.⁸¹

Flooring

The structural and artistic developments could be observed through different materials, construction methods, and surface treatments that have been used for flooring during various eras; the appearance of the floors was almost equalized with its function. Since floors can also be heavily struck by time and weather, the measured for conservation can range from cleaning and simple maintenance to repairing or special kind of preservation measures to complete replacement. The individual case must be thoroughly analysed and the right solution must be made within the context of the existing structure. The flooring in the administration building is wooden boards in all the bigger rooms; toilets, halls, and balconies have terrazzo floors. A lot of the old building inventory lays on the floor so it should first be removed in order to determine the real state of the surface. Terrazzo floors have mainly stayed without any bigger damages, which could not be said for the wooden floors. In some of the rooms, wooden boards have been removed and the load-bearing structure is unstable and unsafe. In other parts of the building, the wood has stayed which is very important because there are enough examples for possible future additions. The room-long wooden boards give special character and atmosphere to space. In one room the complete floor and ceiling construction has broken down; in others, there are a lot of holes and cavities. It is possible that most of the flooring should be completely replaced or heavily repaired.

⁸¹ Bundesdenkmalamt, „Standards der Baudenkmalpflege“, 2015, Wien, 240-243



Fig.170 Staircase railing 157



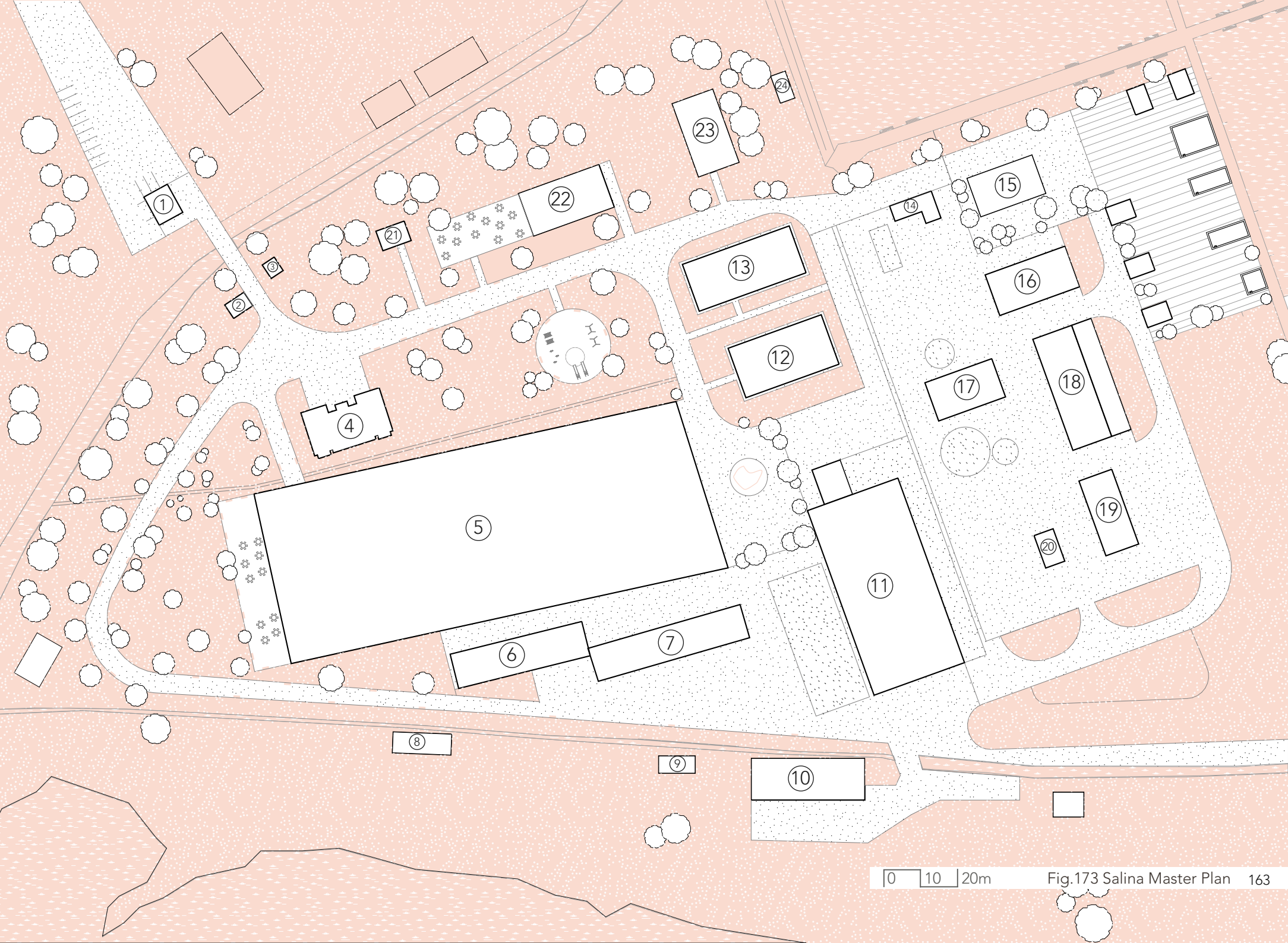
Fig.171 Floor cavity

In some rooms it could be possible for the floor surface to be saved and preserved; original and new floors must both be marked so it is known what has been added. Alongside the surface, the substructure must be examined and repaired as well to secure the load-bearing component; if it is going to be rebuilt, it must follow the original structure and be optimized in terms of structural parameters. With additions, the material and technical execution continuity must be respected; building physics parameters must be considered; new structures should be constructed to be damage-tolerant also improve the existing parameters with components such as floor heating and insulation- but it all has to be in correspondence with the historic structure.⁸²

⁸² Bundesdenkmalamt, „Standards der Baudenkmalpflege“, 2015, Wien, 240-243

5.DESIGN AND IMPLEMENTATION

- ① Porter's lodge
- ② Bicycle station
- ③ Souvenir shop
- ④ Salina Museum
- ⑤ Learning center/Event room
- ⑥ Salt production
- ⑦ Salt production
- ⑧ Salt production
- ⑨ Salt production
- ⑩ Salt production
- ⑪ Salt production
- ⑫ Bird Museum
- ⑬ Bird research center
- ⑭ Salt production
- ⑮ Spa center
- ⑯ Salt production
- ⑰ Salt production
- ⑱ Salt production
- ⑳ Salt production
- ㉑ Employees' lodge
- ㉒ Restaurant
- ㉓ Salt production
- ㉔ Salt production



0 10 20m

Fig.173 Salina Master Plan 163

5.1 The Salina Museum

The former administration building has been repurposed into the Salina museum. Since it is the building with the most historical value in the complex, it is the right place for a museum where the history of Salina and salt manufacture could be told. It was very important to preserve the original appearance and identity of the old administration building, but also to adapt it to its new function and current building standards.

However, some changes had to be done. Looking from outside, there are few alterations that one notices immediately, especially on the right side of the building. On the ground level, a change in the façade has been made. The former toilette vertical has been rebuilt into an elevator since the building has not had wheelchair accessibility. The ground level lays on the +0.69 m, so the direct connection to the elevator from the outside was much needed; in that way the ground level is reached without problems. Because of the elevator construction, the top floor also needed some alterations; the diagonal part of the roof has been replaced with the straight wall for the needs of the elevator shaft.

The first two floors of the museum represent the exhibition area, where photos of the Salina from its journey through time as well as salt harvesting tools are displayed. When entering the museum, you are directed to the left to the first smaller hall and then into the first room where the museum starts. The first bigger room on the left has been remodeled into a ticket and info desk; two separate toilettes have been made since the construction of the elevator required removal of the second toilette which left only one toilette unit.

From this room, the exhibition starts. The original layout of the administration building enabled the perfect clock-wise movement through the museum; but for this to be realized, the needed connections between the rooms had to be done in form of wall openings. From the last room you enter the second smaller hall and from there on you can access the second floor with either the elevator or the staircase from the „central vertical“.

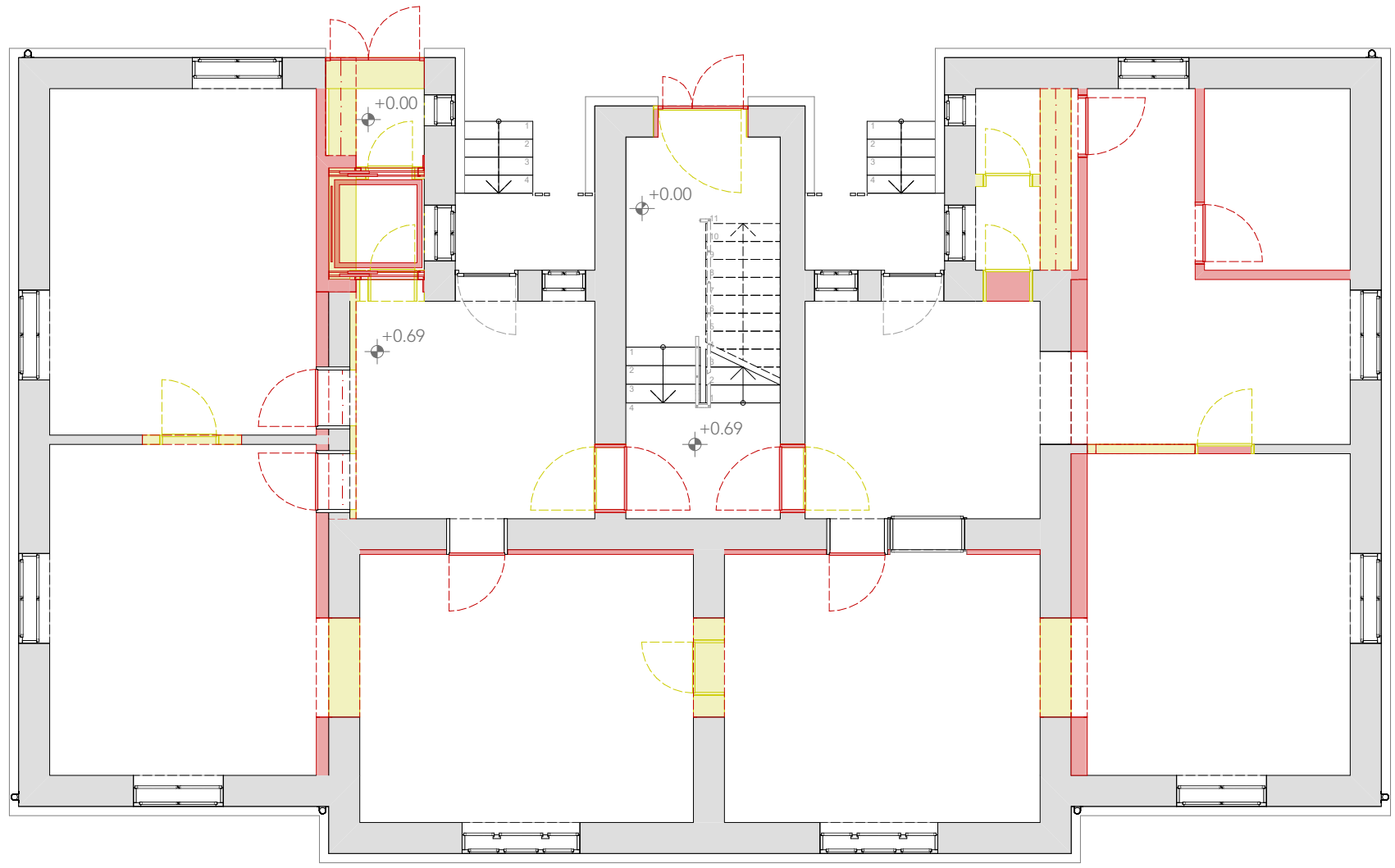
The first floor is very similar to the ground floor, with the same type of movement. The difference between the two is that on the second floor the first room is the part of the exhibition area, where else the last smaller room is used as an archive. The bigger corner rooms on the first floor have both double-door balconies and look on the learning center. The two smaller halls have also balconies that offer a view of the park's entrance.

The last floor of the museum has more of the administration building character than the previous two. The room that is accessed right from the staircase has been remodeled into a kitchen. Both rooms on the left and the right are made into offices for the museum's staff. What makes the top floor different is alongside its sloping roof are the two main rooms on each side together with smaller back rooms. The right room is made into a conference room with the archive in the back; the other one is made into a lecture room with storage in the back. Both rooms could be rented to other parties when the museum is in no need of them; this way it will be activated even more.

For the general design of the museum, the original image of the administration building was kept; wooden double windows have been reconstructed as well as doors and the railing. Since the administration building has no basement cellar, the whole technical elements and storage have been put into the opposite building-the learning center that has no issues with space storage.



Fig.174 Outside perspective museum 165



● Demolition
● New

● Original structure



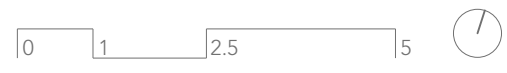
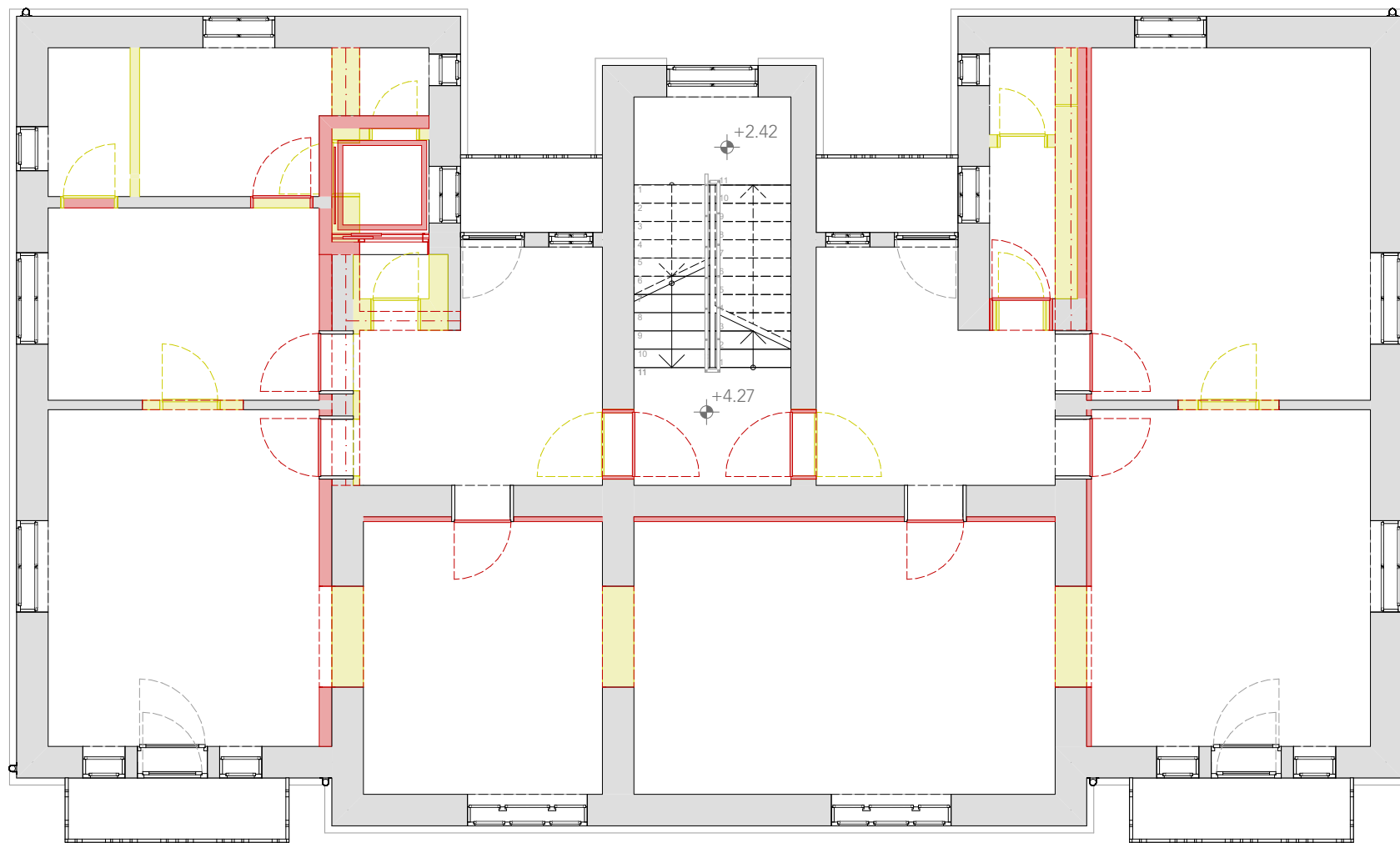
166 Fig.175 Ground Floor Plan Alterations, 1:100



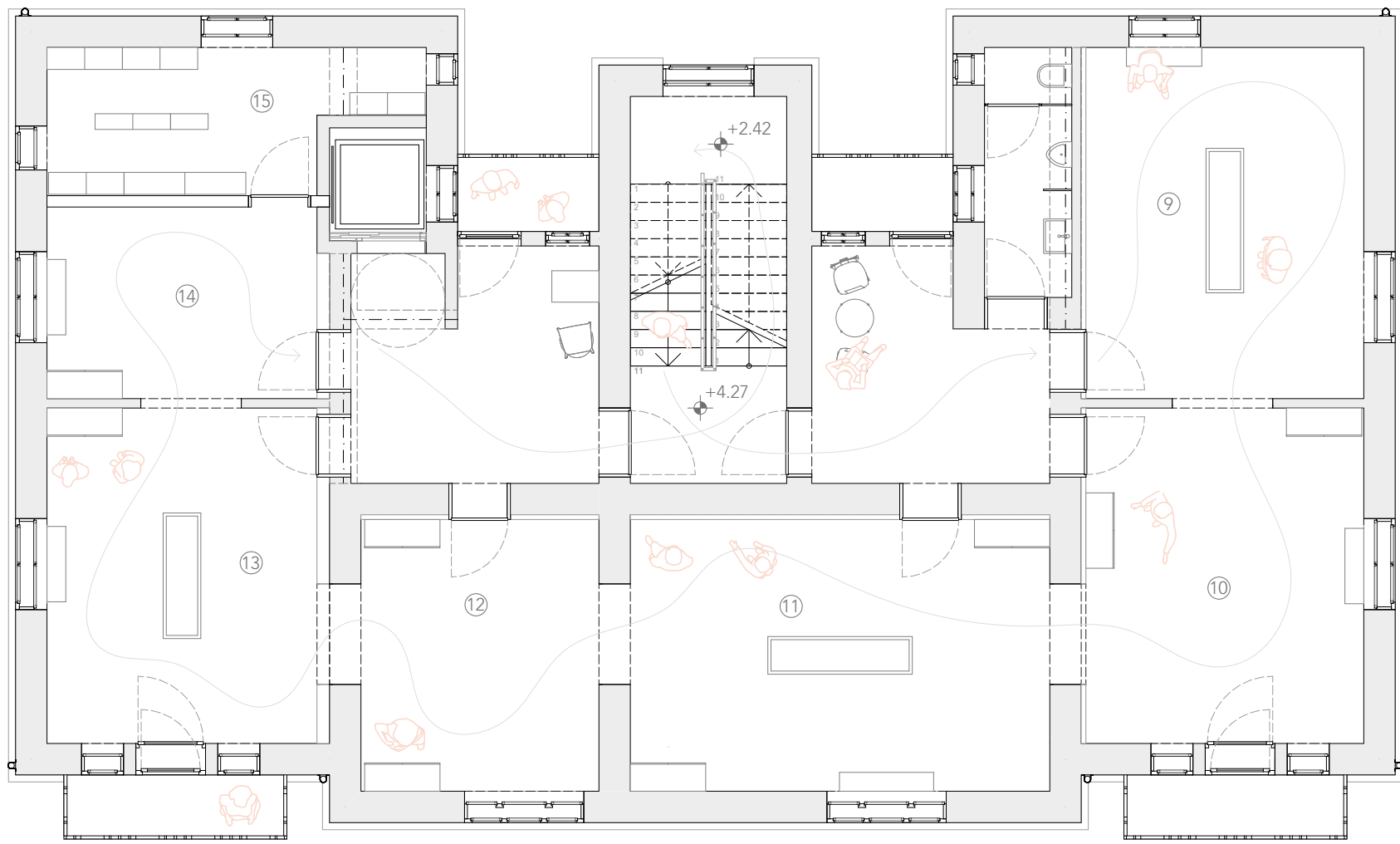
- ① Main entrance
- ② Wheelchair accessible entrance
- ③ Tickets/Cloakroom
- ④-⑧ Exhibition rooms



Fig.176 Ground Floor Plan New, 1:100 167



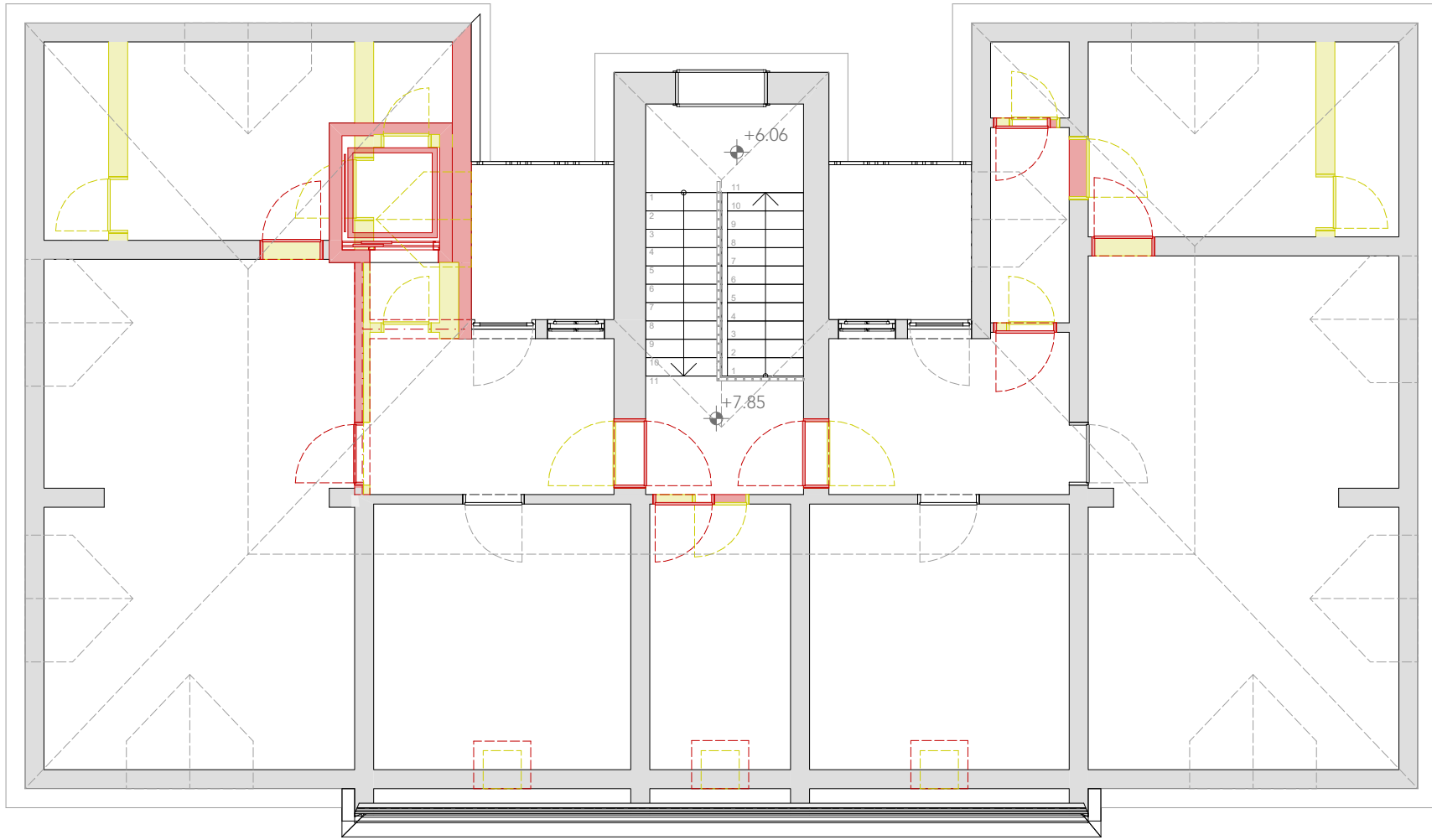
168 Fig.177 1. Floor Plan Alterations, 1:100



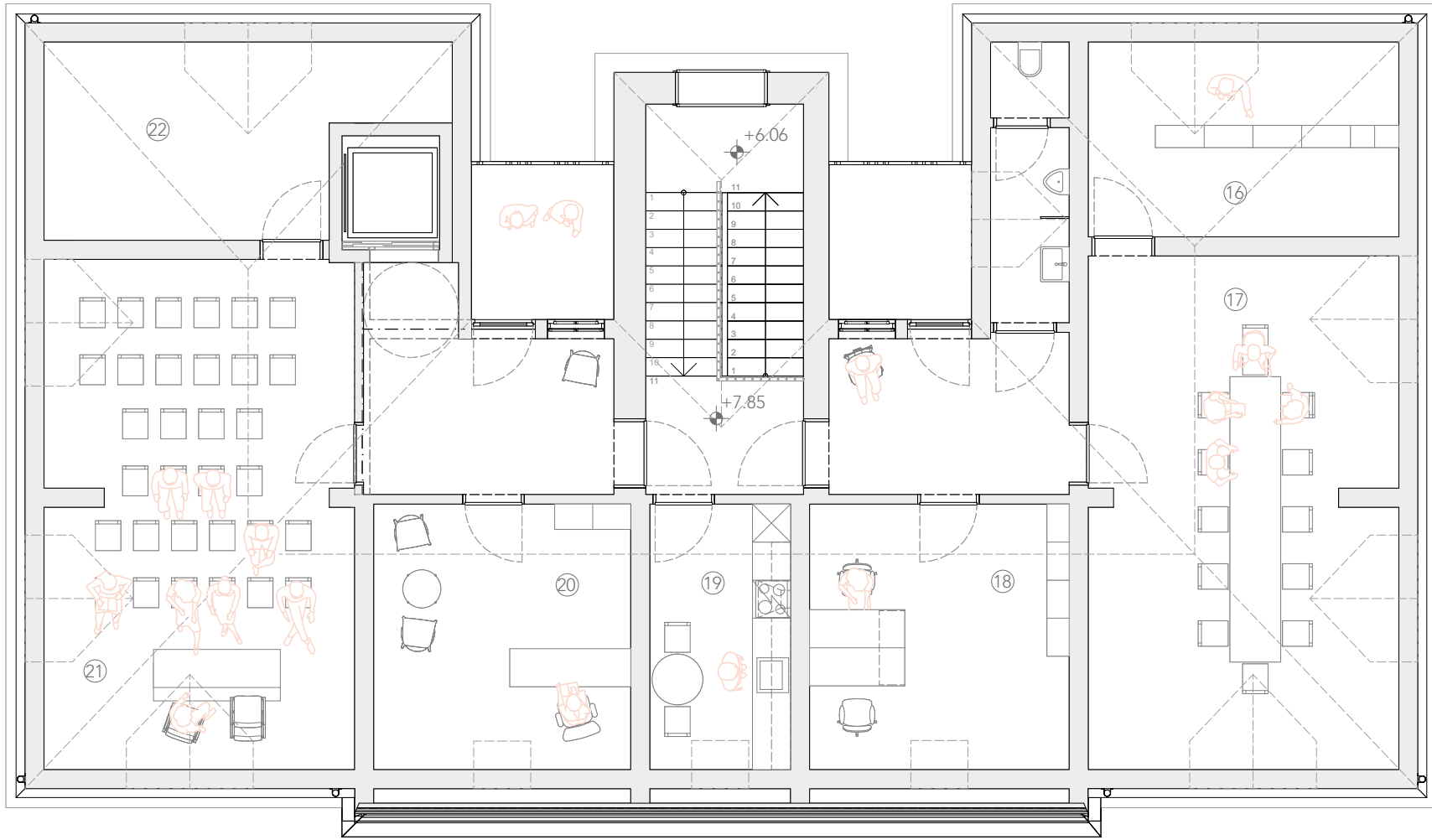
- ⑨ - ⑭ Exhibition rooms
- ⑮ Archive



Fig.178 1. Floor Plan New, 1:100 169



170 Fig.179 2. Floor Plan Alterations, 1:100



- ①⑥ Archive
- ①⑦ Conference room
- ①⑧ Office
- ①⑨ Kitchen
- ②⑦ Office
- ②⑧ Office
- ②② Storage room
- ②① Lecture room

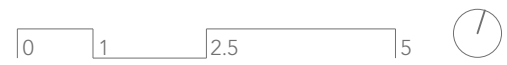
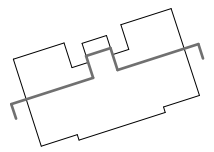


Fig.180 2. Floor Plan New, 1:100 171



172 Fig.181 Section A-A Alterations, 1:100

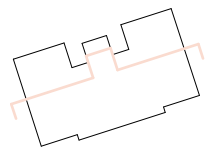
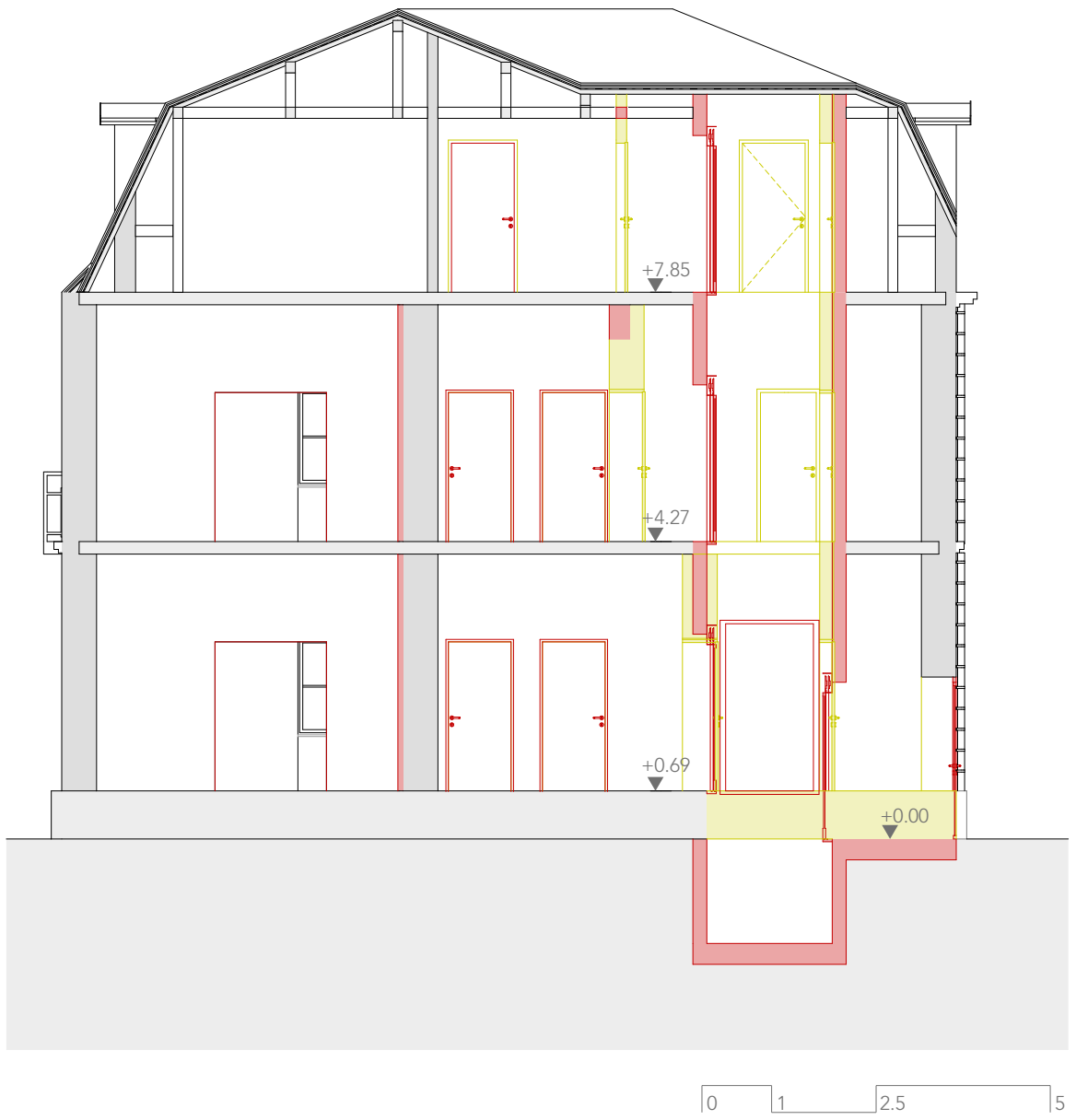
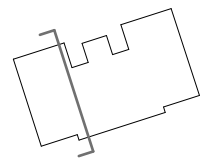


Fig.182 Section A-A, 1:100 173



174 Fig.183 Section B-B Alteration, 1:100

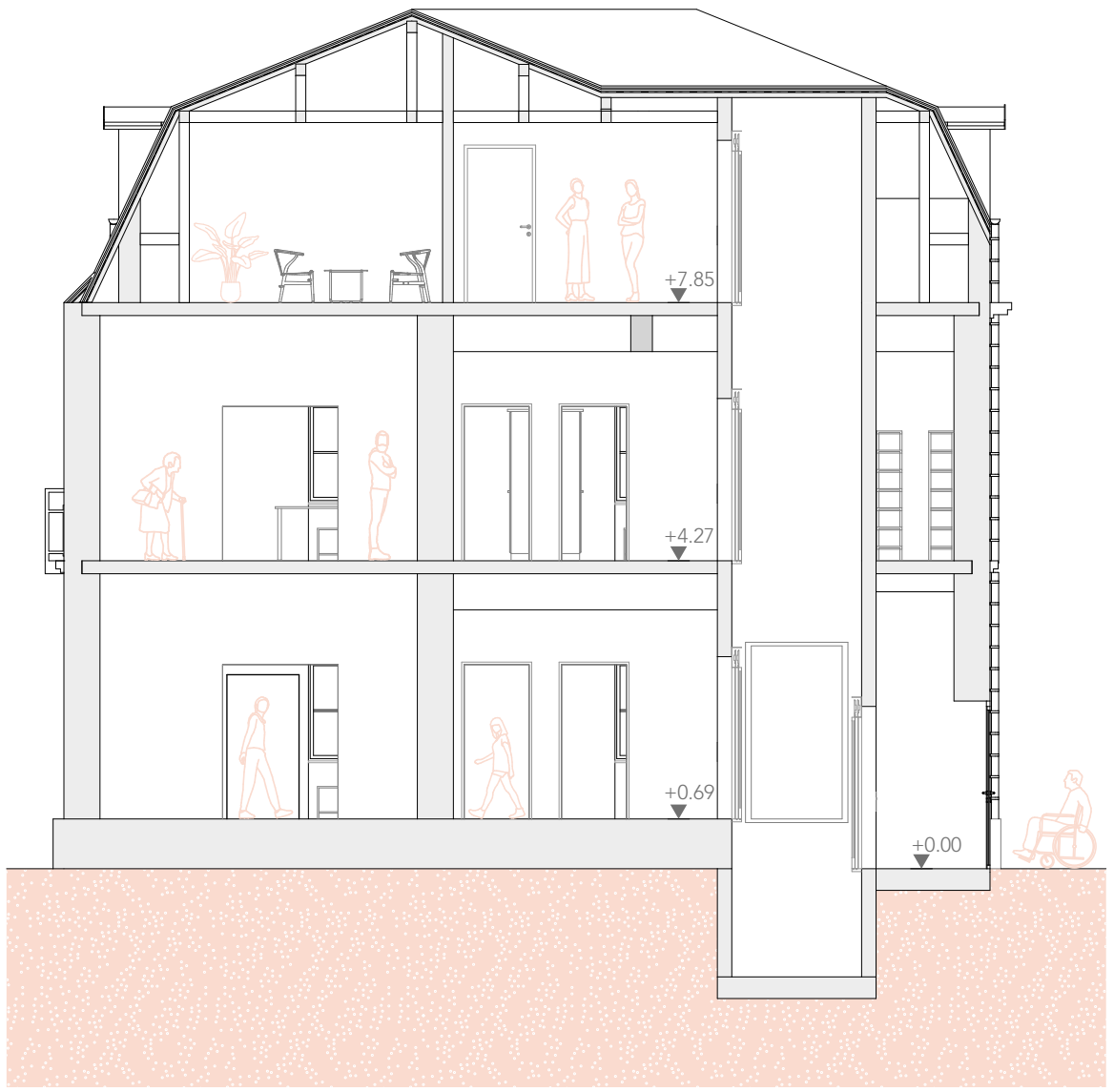
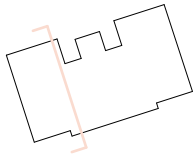
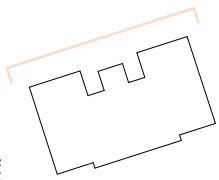


Fig.184 Section B-B, 1:100 175



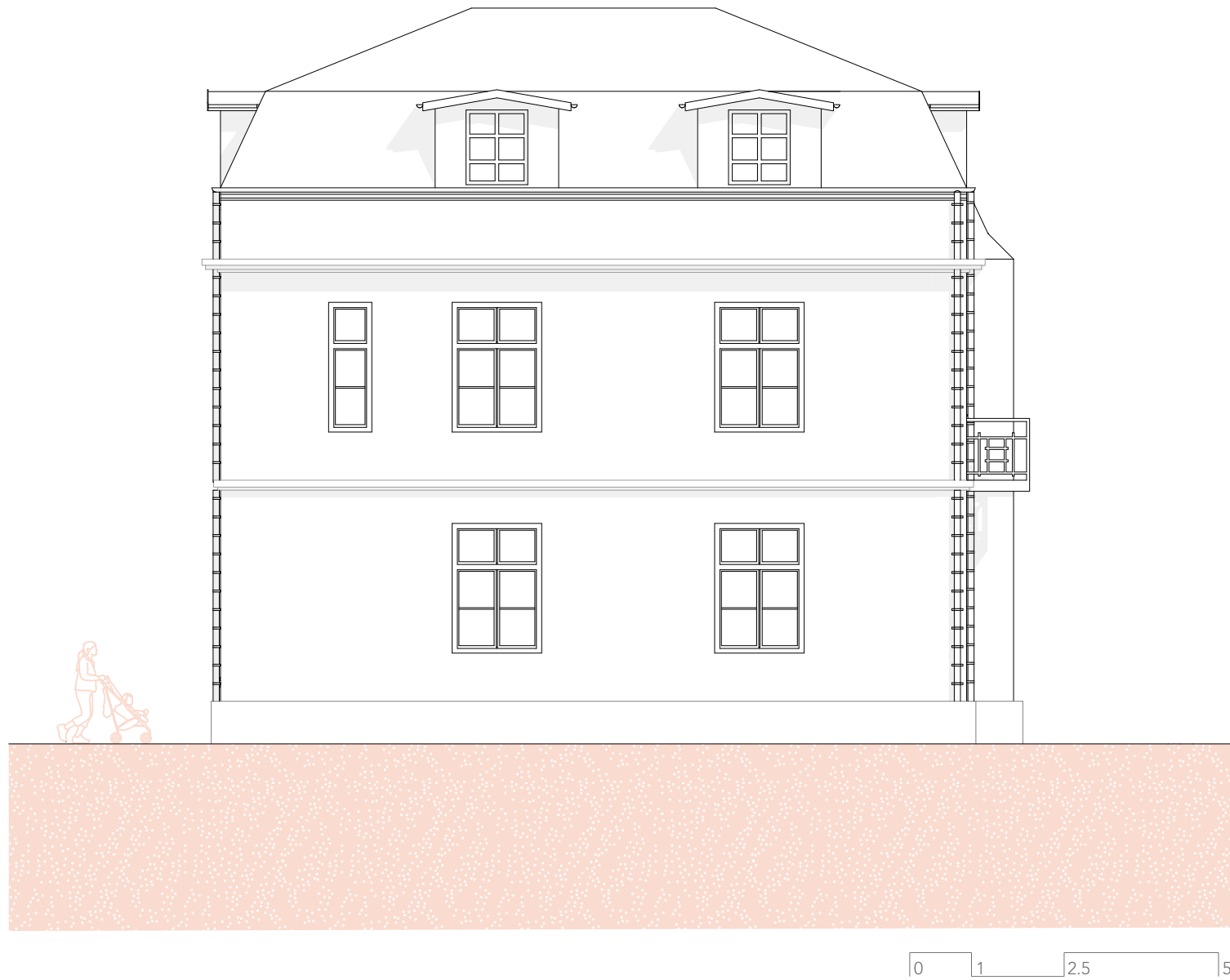
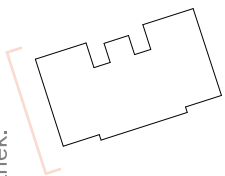
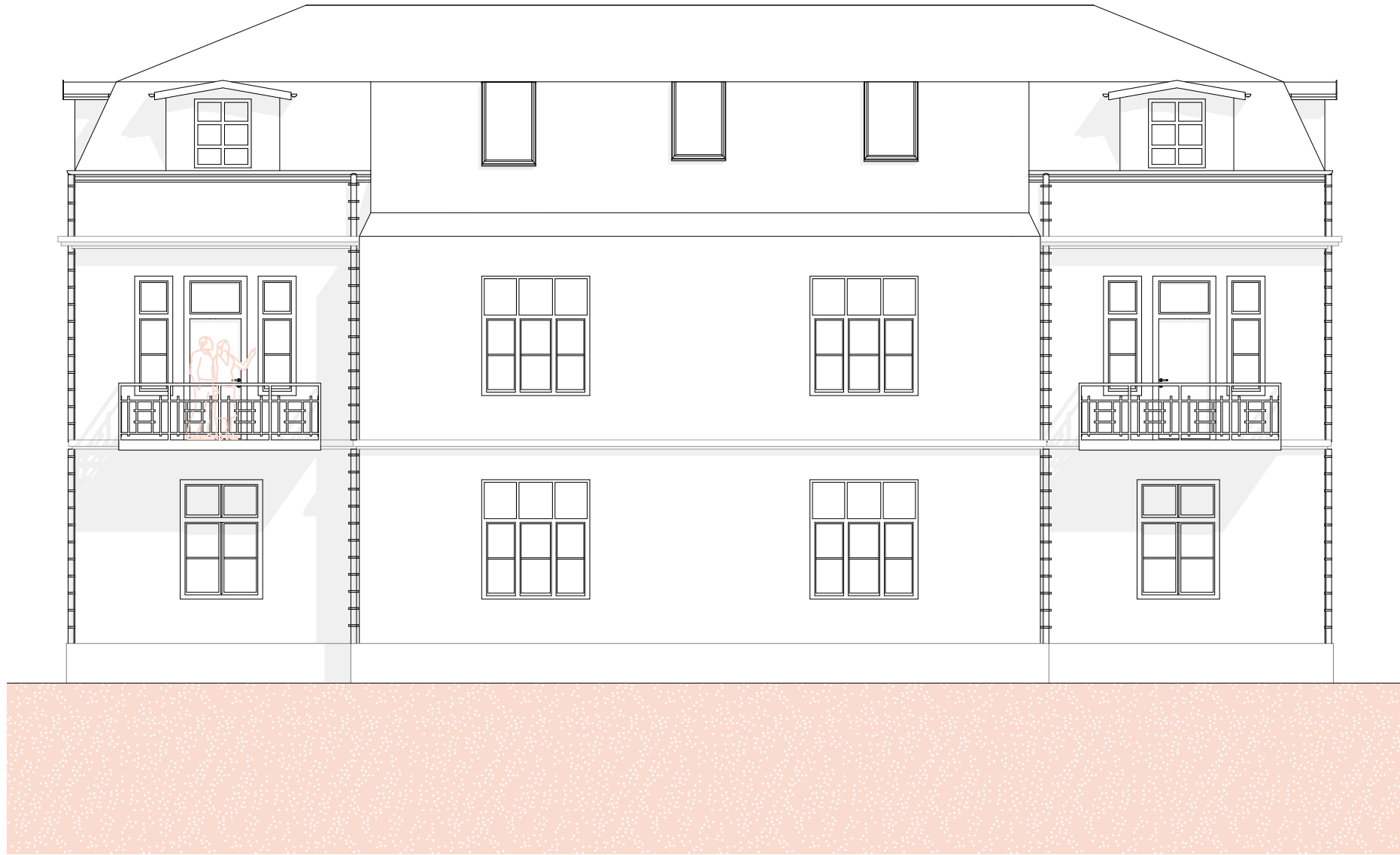
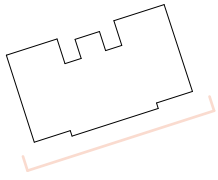
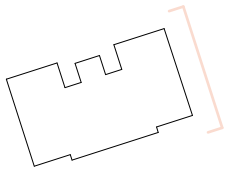


Fig.186 Fig.186 West elevation, 1:100 177

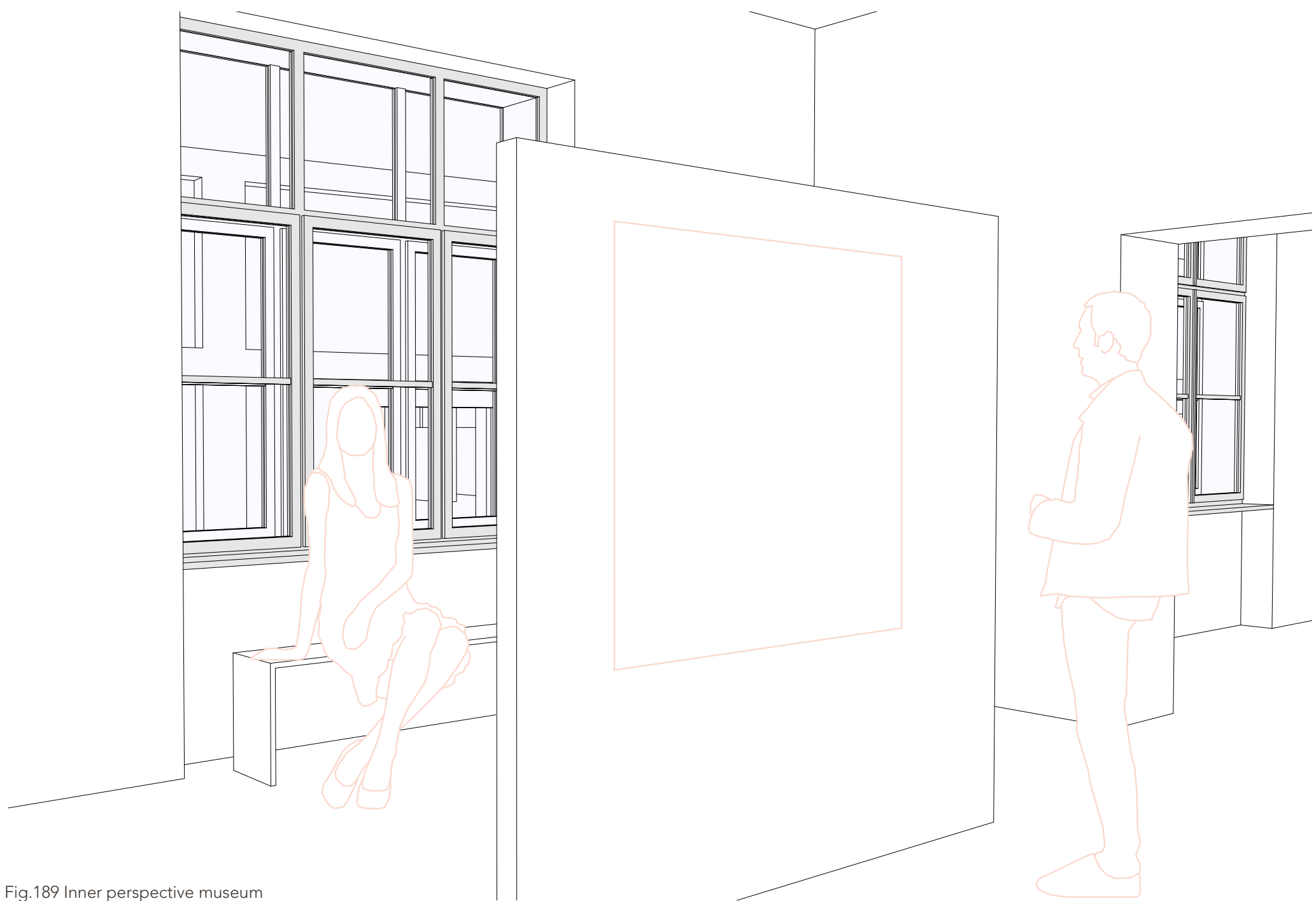


178 Fig.187 South elevation, 1:100



0 1 2.5 5

Fig.188 East elevation, 1:100 179



180 Fig.189 Inner perspective museum



Fig.190 Inner perspective museum 181

5.2 Learning Center/Event hall

The former salt warehouse behind the former administration building has also been repurposed. Because of its size, it has been divided into two parts- an Event hall and a Learning center. The event hall represents a multi-functional space that can be easily transformed for a specific event. It can be a place where concerts or plays can be held and bring culture to this nature park. For happenings of that kind, telescopic bleachers on the long back wall have been installed and can be easily pulled out. For other events bleachers can be pulled back to the wall; in that way, space is saved. The hall could also be a place for events like fairs which could be interesting along with its location; it could also activate the area and attract more people.

The Learning center is placed in the other part of the former salt warehouse. It represents a space where people can learn more about Salina and sea biodiversity and salt manufacture. The wish is to activate „educational tourism“ and attract science and biology camps, schools, universities, and generally, everyone who wants to learn more about this habitat; to learn and explore at the same time.

The ground floor of the Learning center represents an area with both closed and opened lecture and study spaces. On the first floor are mainly offices for the park staff as well as silent study rooms. The Learning center functions together with other facilities in this complex like Salina and Bird museum as well as salt manufacture so the visitors can have the full learning experience.

5.3 Flamingo nature park

The Flamingo park building complex is divided into two parts-touristic and salt manufacture. The touristic part offers visitors the possibility to learn more about the Salina nature park in the Salina and Bird museum, as well as the Learning center. It also offers some leisure activities like bird watching, riding a bike, visiting events held at the Salina event hall, or a visit to the spa center or restaurant. The spa center offers treatments with natural products that are produced here in the park-like salt-pan mud and brine which are well-known for their healthy features; they can also be bought in the souvenir shop.

Salt manufacture has kept most of its former objects; although the salt production has been reduced to „Fleur de sel“and is not produced like in Salina’s golden era, it is still very important for any kind of salt harvesting and production to function in this nature park. Although the amount of produced salt is smaller, it is more focused on producing high-quality salt. In that way, the identity of this area which is perfect for salt production has been kept; water pumps have been repaired and the water regime is controlled and functioning-which is important for both salt harvesting and birdlife of the Ulcinj Salina.

The most important part of the Flamingo park is, of course, the salt pans. In order to make bird watching and walking/bicycle tours more accessible, wooden platforms have been put on the places where the habitat allows it; in that way, some paths that are normally harder to reach in some months of the year can be accessed all-year-round. Enough rest areas with trash bins and info tables have been installed to be more user-friendly.

The adaptive re-use of the Ulcinj Salina should make it more attractive and opened to visitors; the most significant goal is to activate this underestimated area and create new jobs for the locals who suffered unemployment due to the events that occurred.

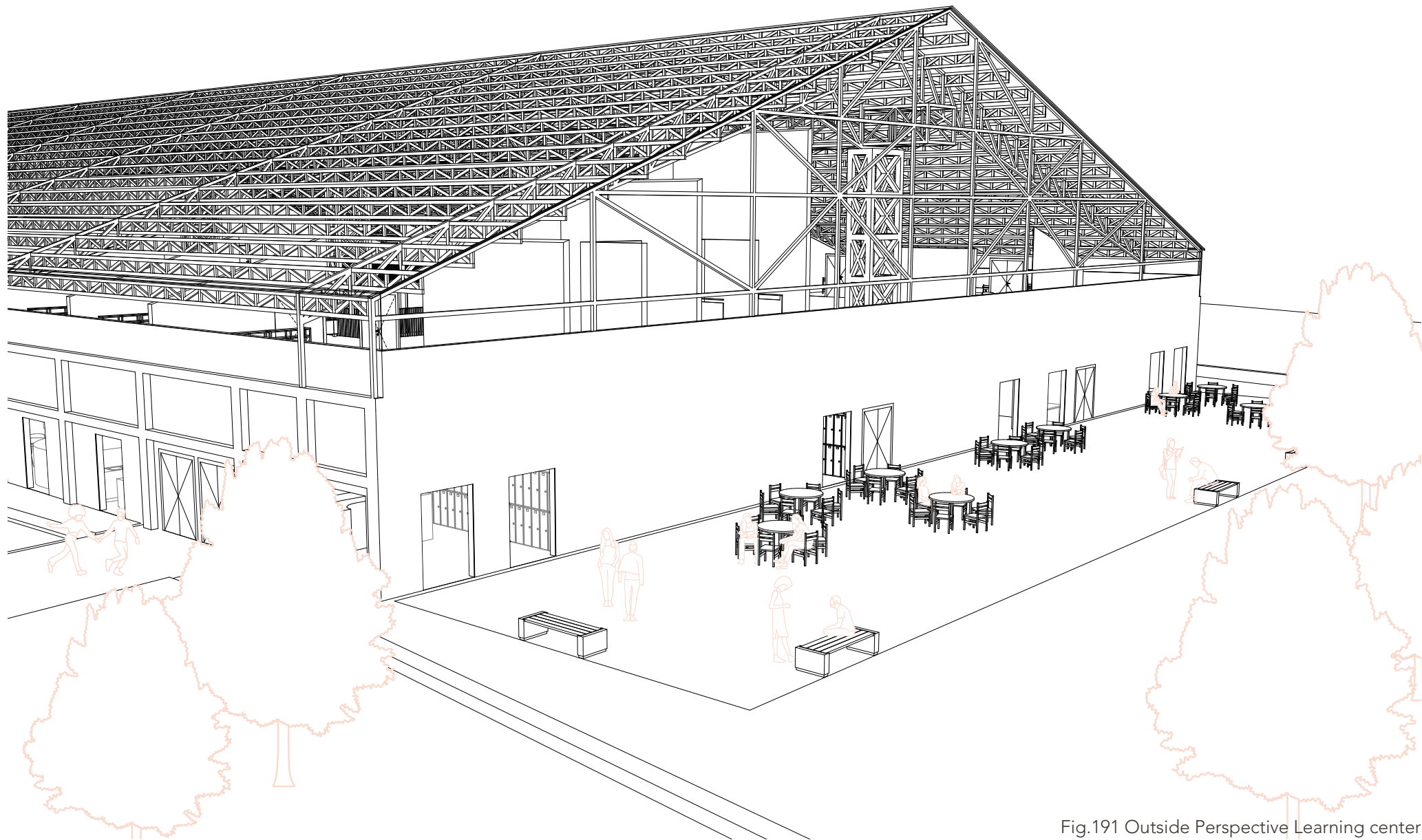
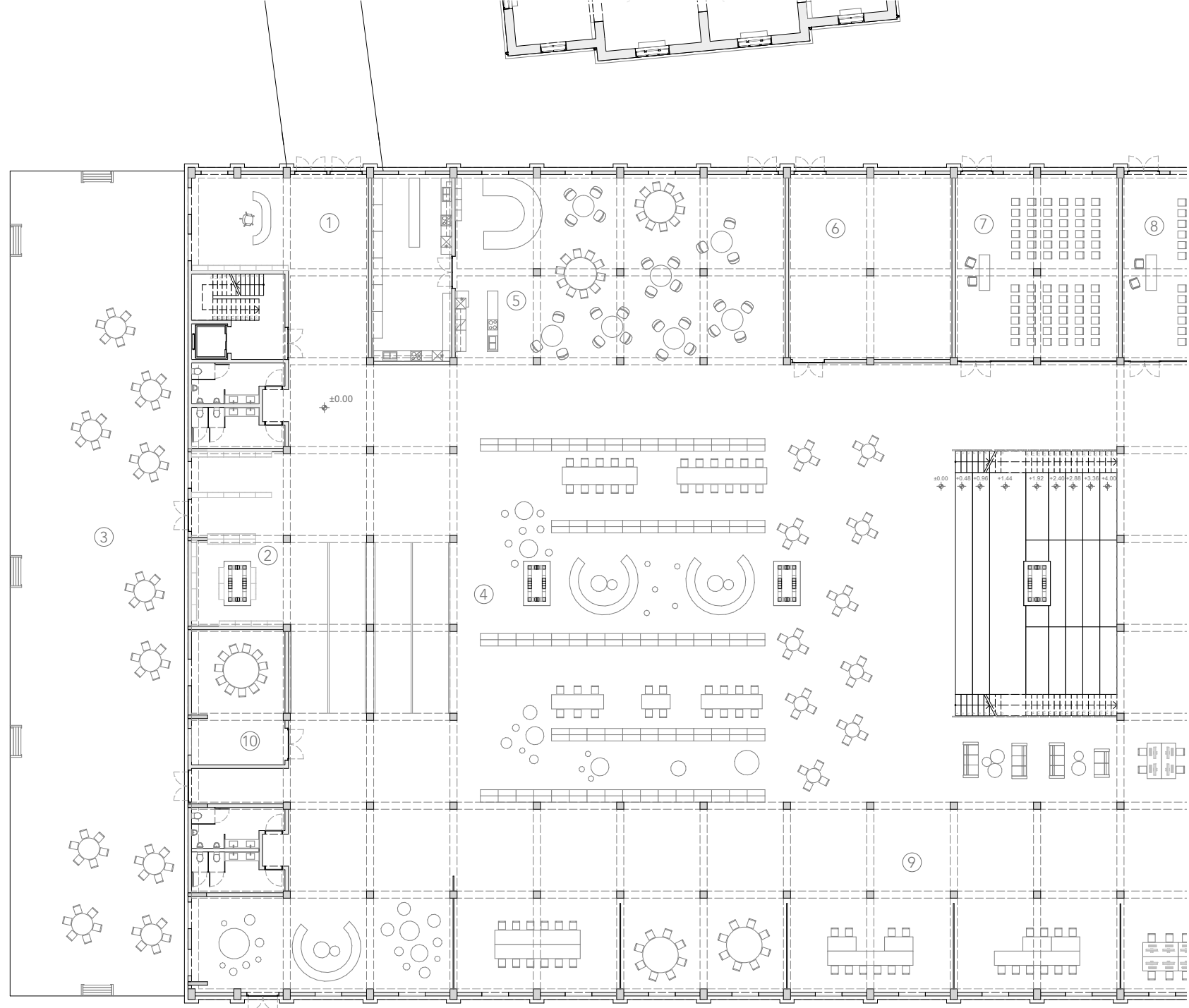
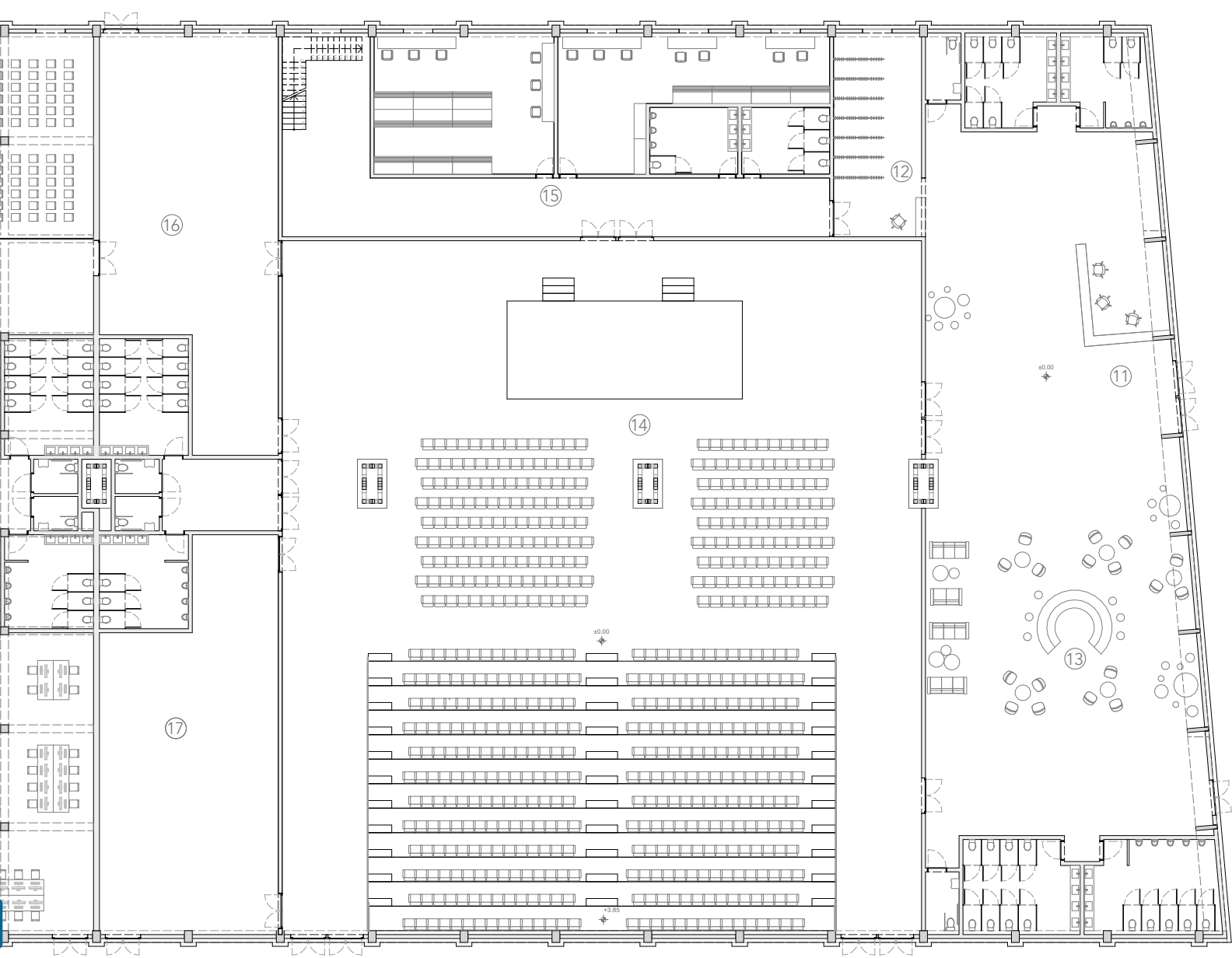


Fig.191 Outside Perspective Learning center 183

- ① Main entrance Learning center /Info desk
- ② Lockers
- ③ Outside area
- ④ Open library
- ⑤ Restaurant/Mensa
- ⑥ Technik/Storage room museum
- ⑦-⑧ Lecture rooms
- ⑨ Studying/Reading area
- ⑩ Meeting room





- ① Main entrance Event hall /Info desk
- ② Cloakroom
- ③ Cafe
- ④ Event hall
- ⑤ Dressing rooms backstage
- ⑥-⑦ Storage rooms

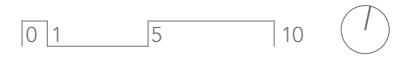
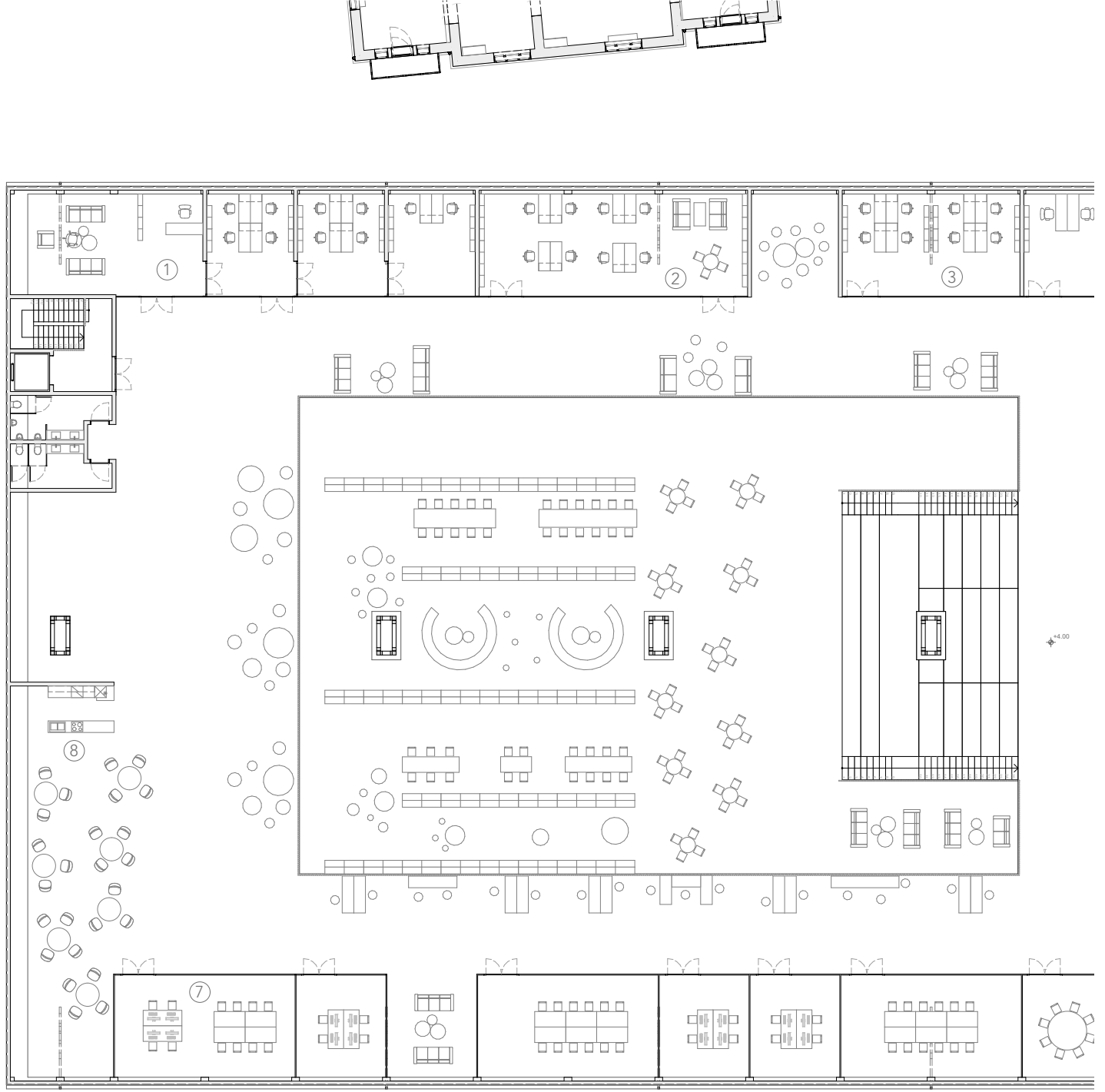


Fig.192 Ground Floor Plan, 1:300 185

- ①-③ Office
- ④-⑤ Archive
- ⑥-⑦ Silent rooms
- ⑧ Kitchen
- ⑨ Technik



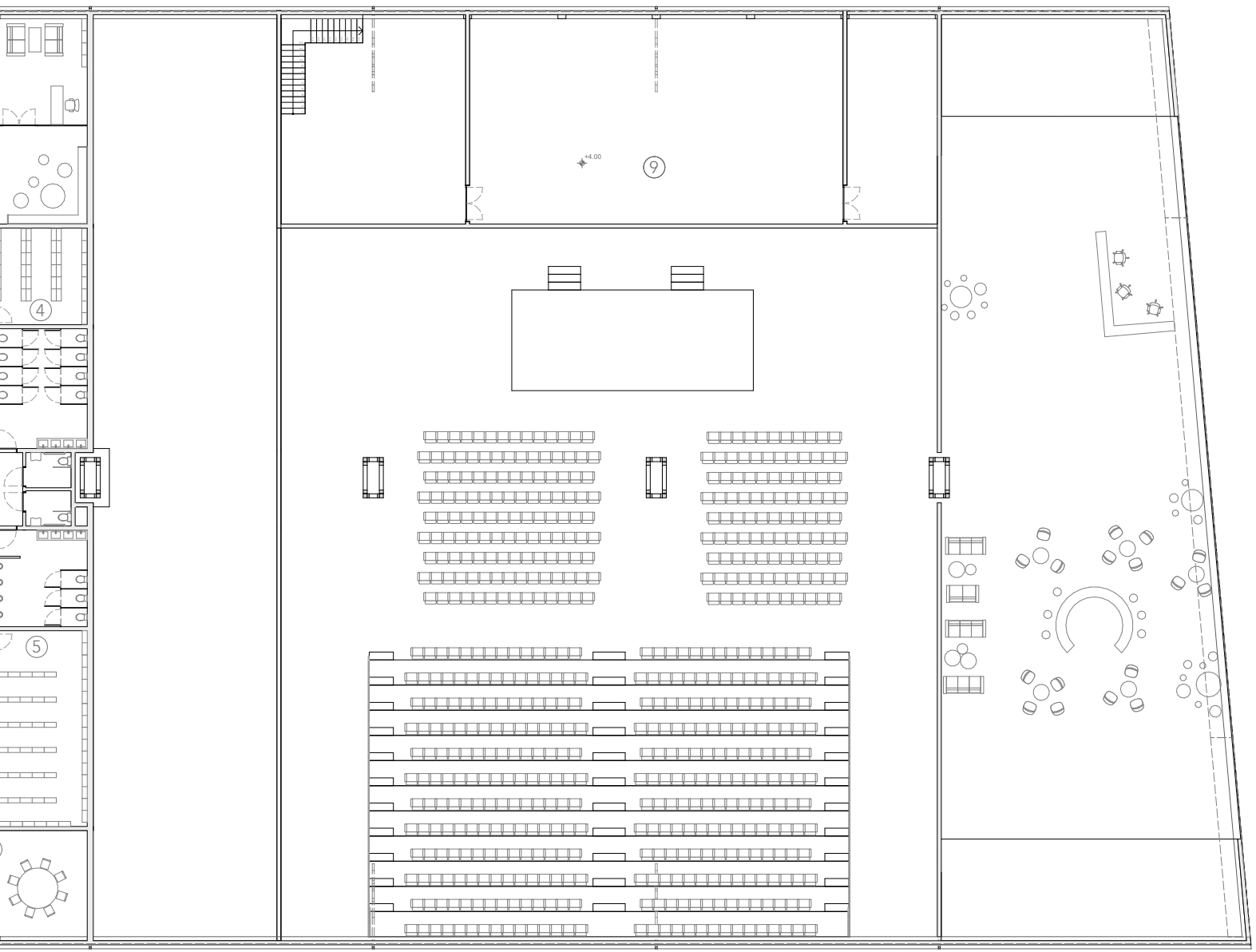
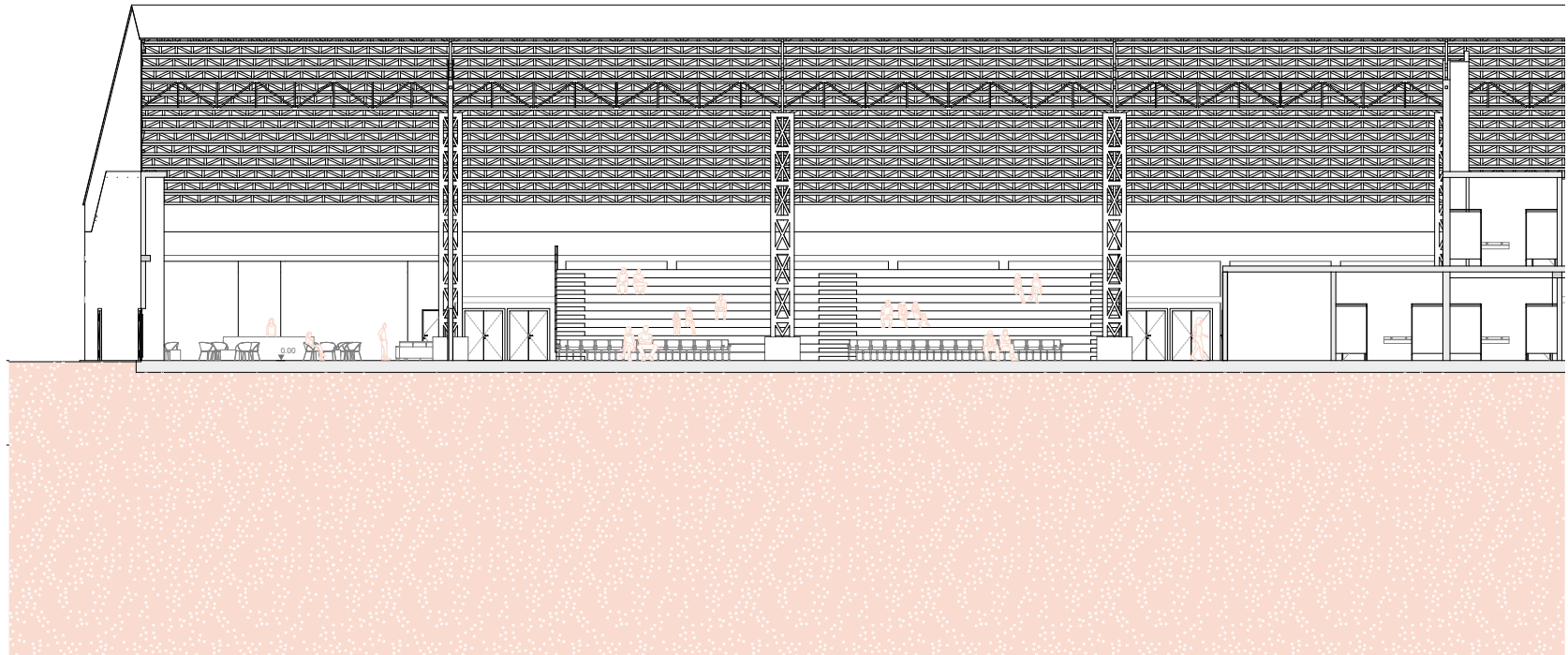
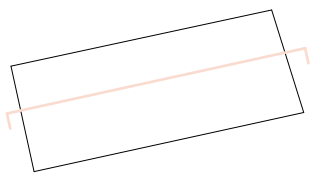
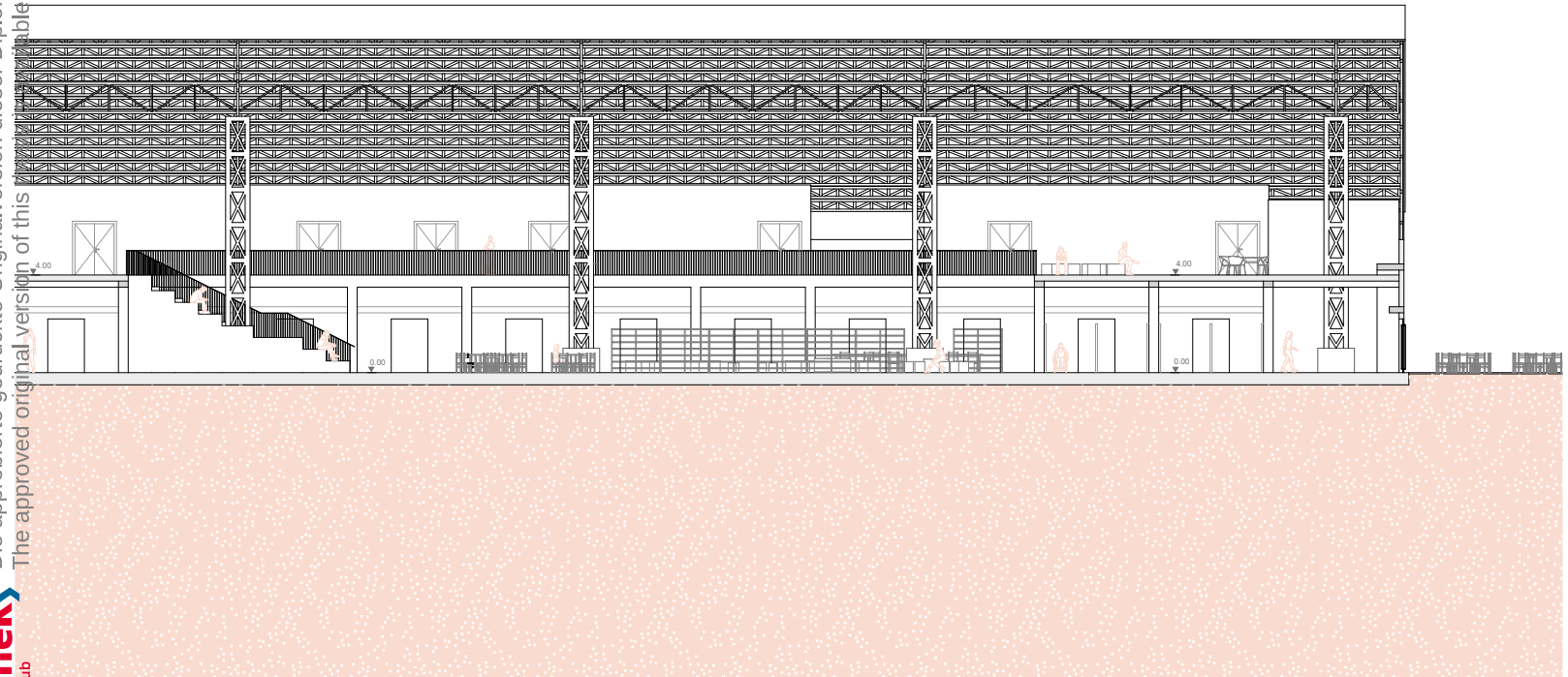
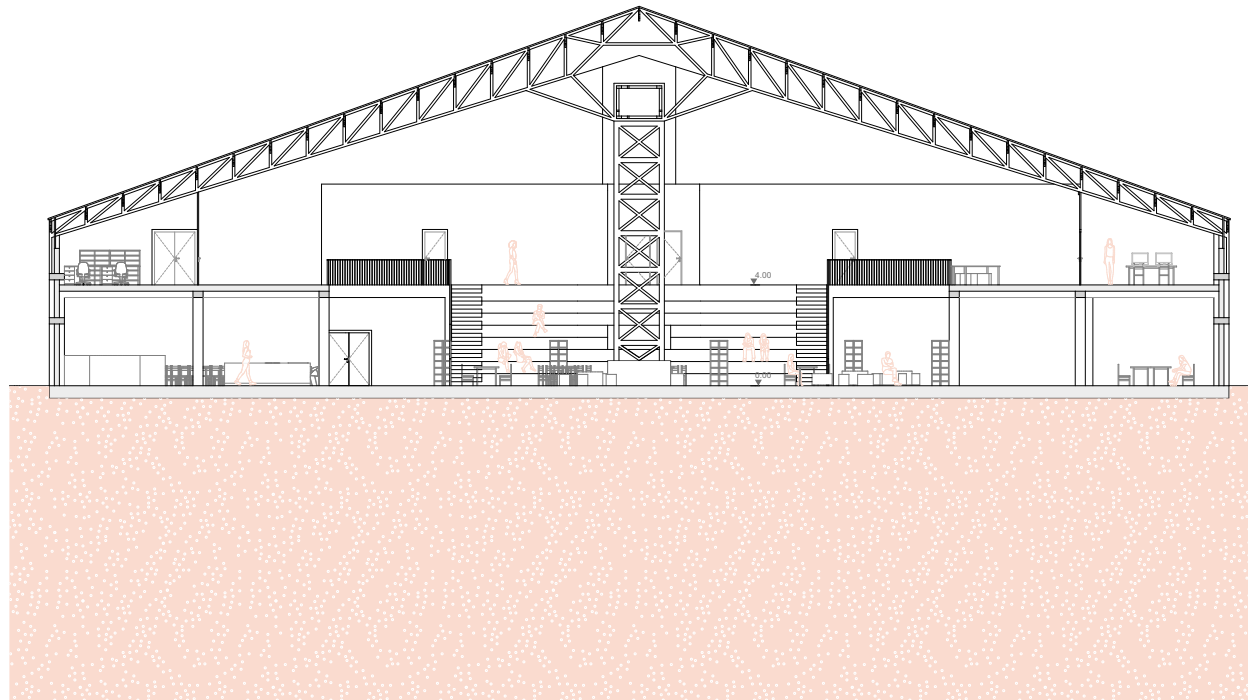
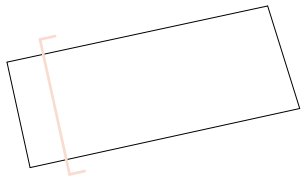


Fig.193 First Floor Plan New, 1:300 187

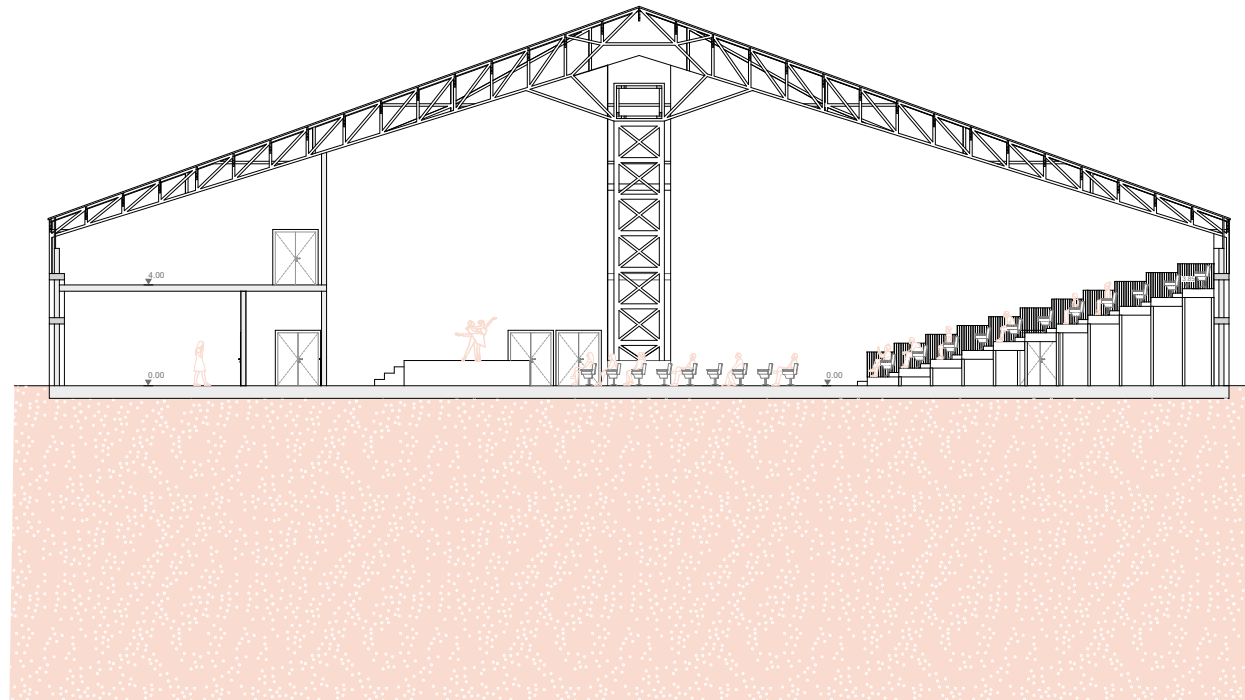
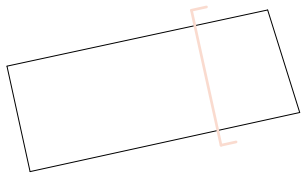




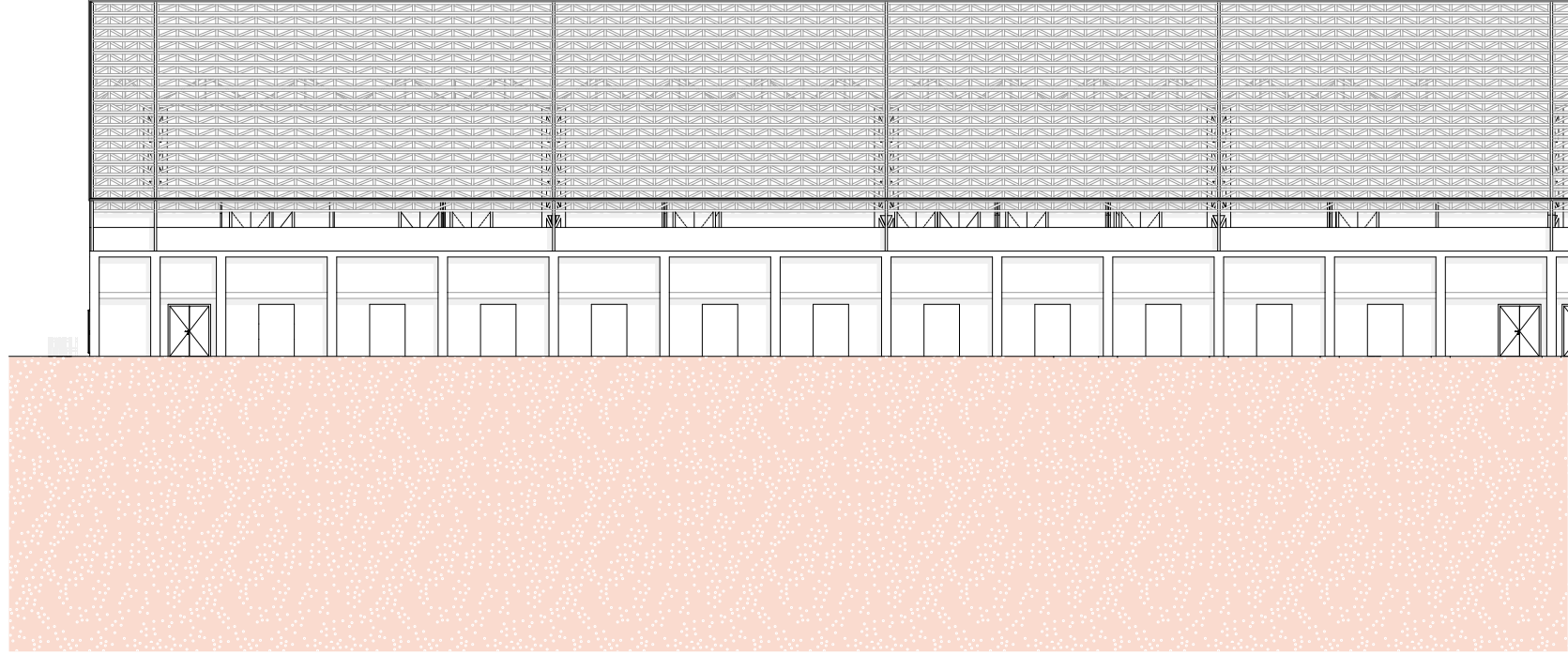
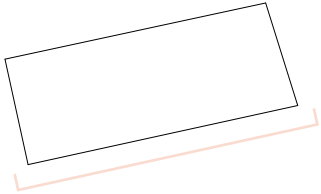
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0 1 5 10



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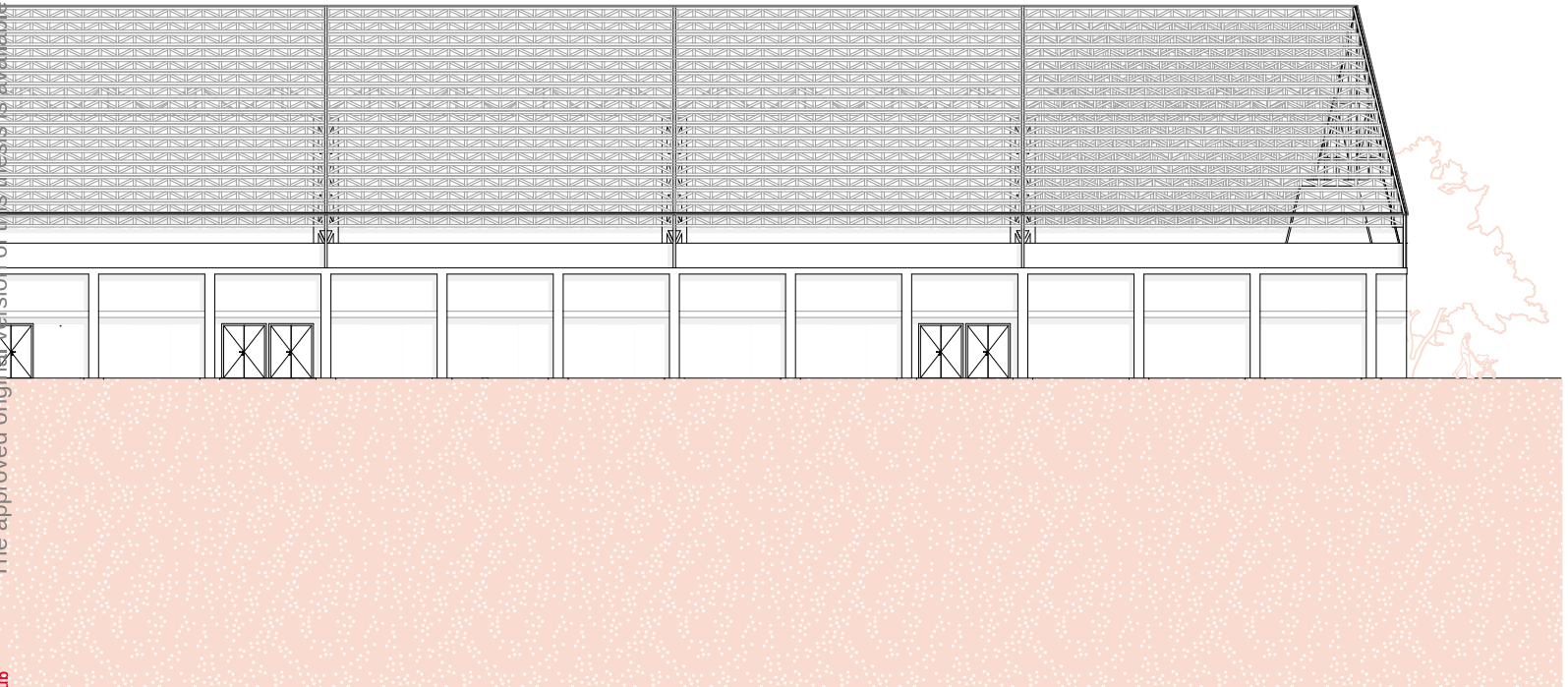
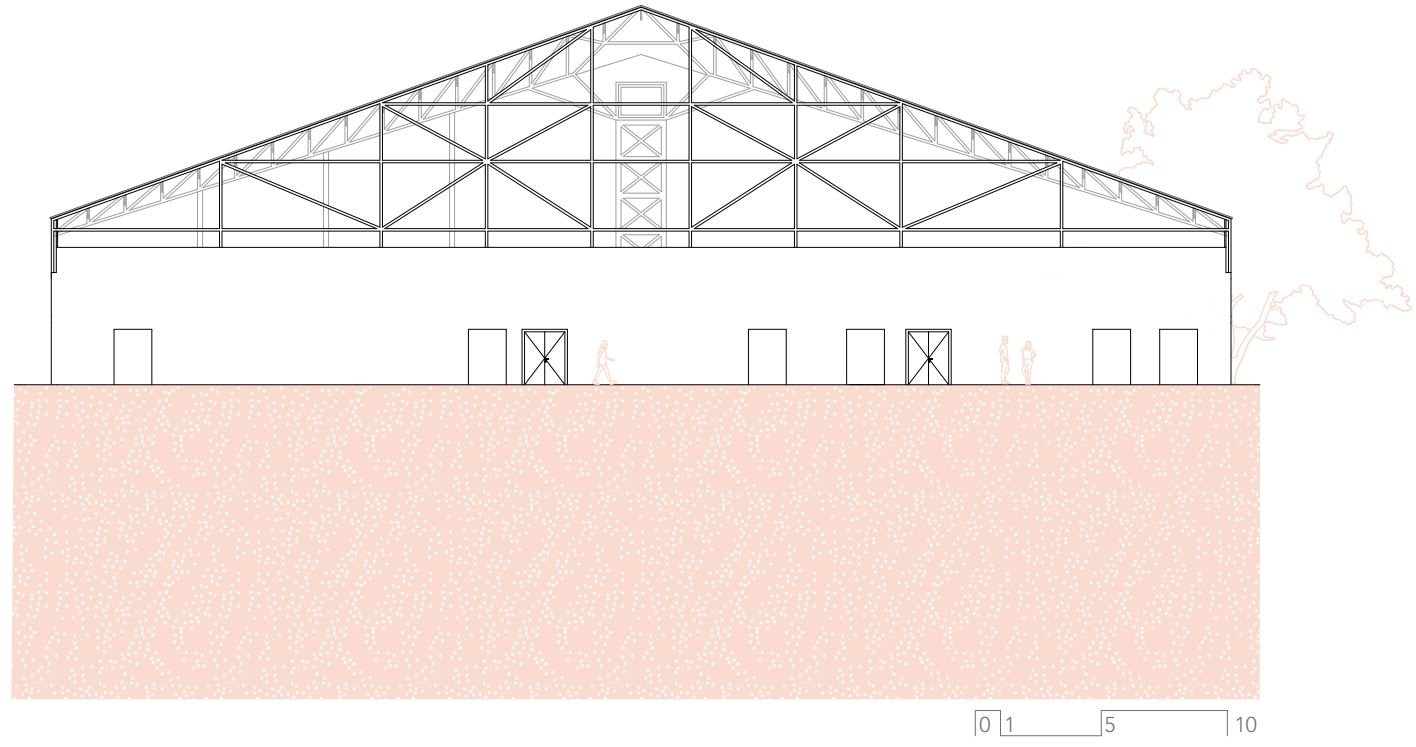
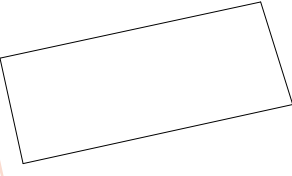


Fig.197 South elevation, 1:300 193



194 Fig.198 West elevation, 1:300

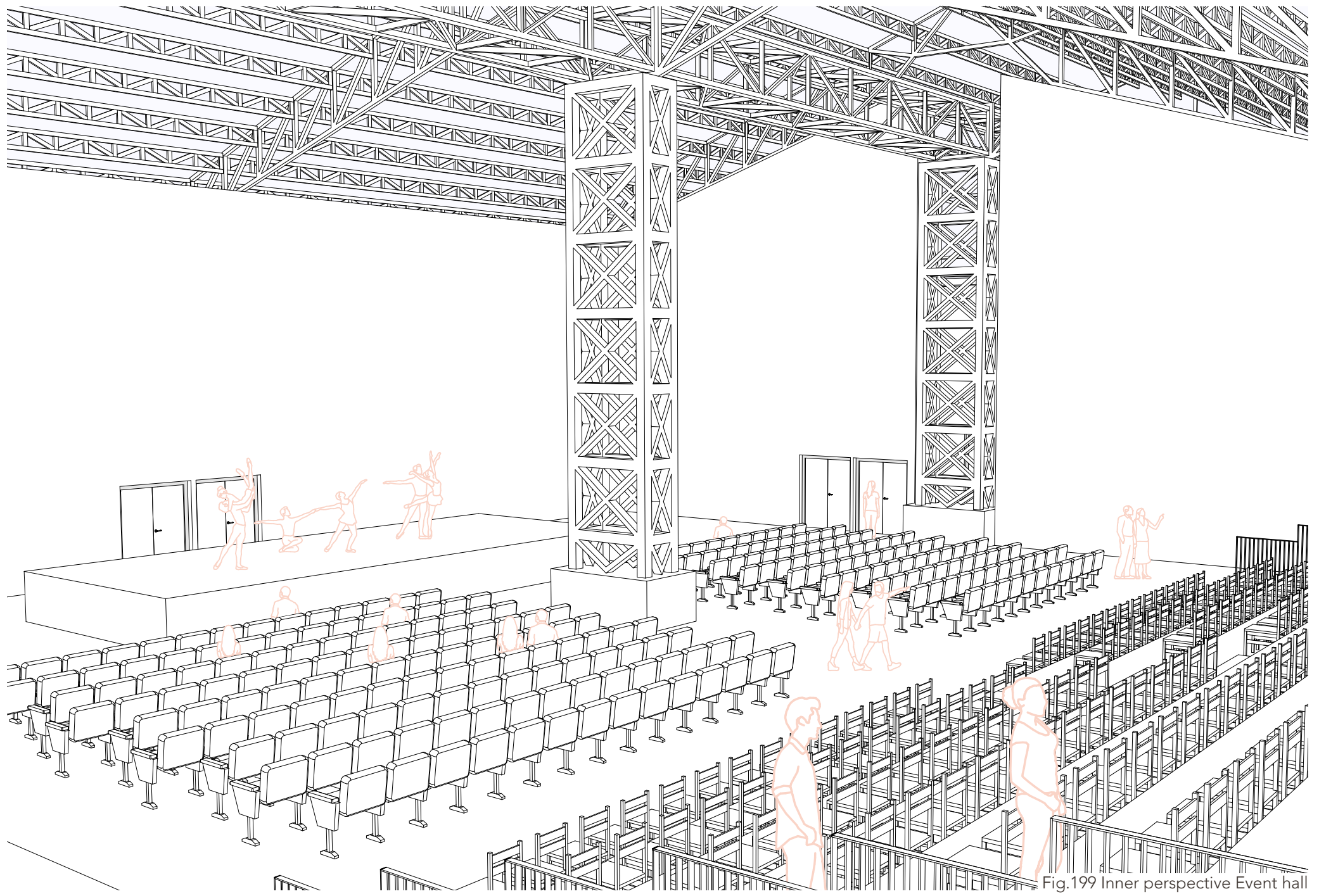
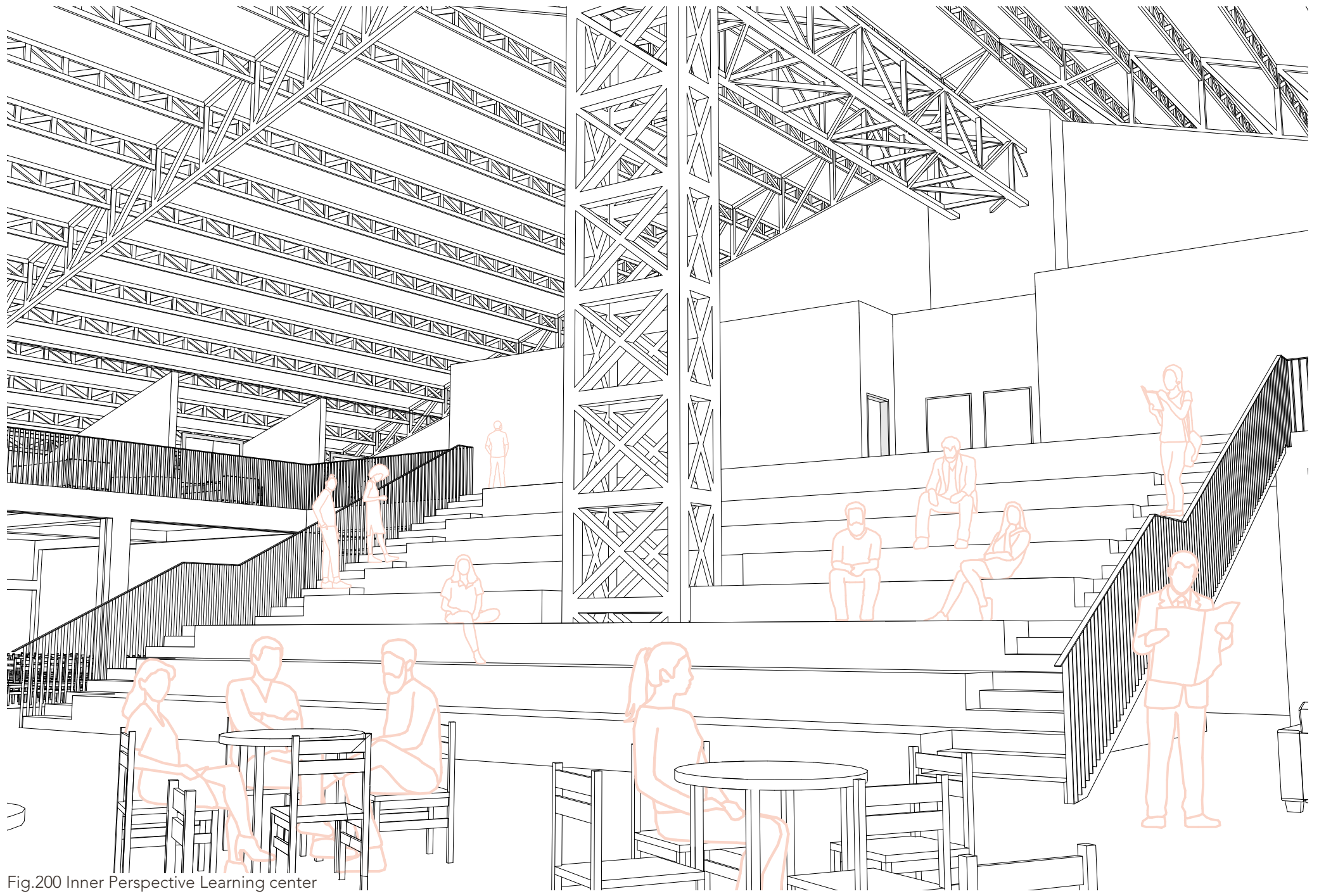


Fig.199 Inner perspective Event hall



196 Fig.200 Inner Perspective Learning center

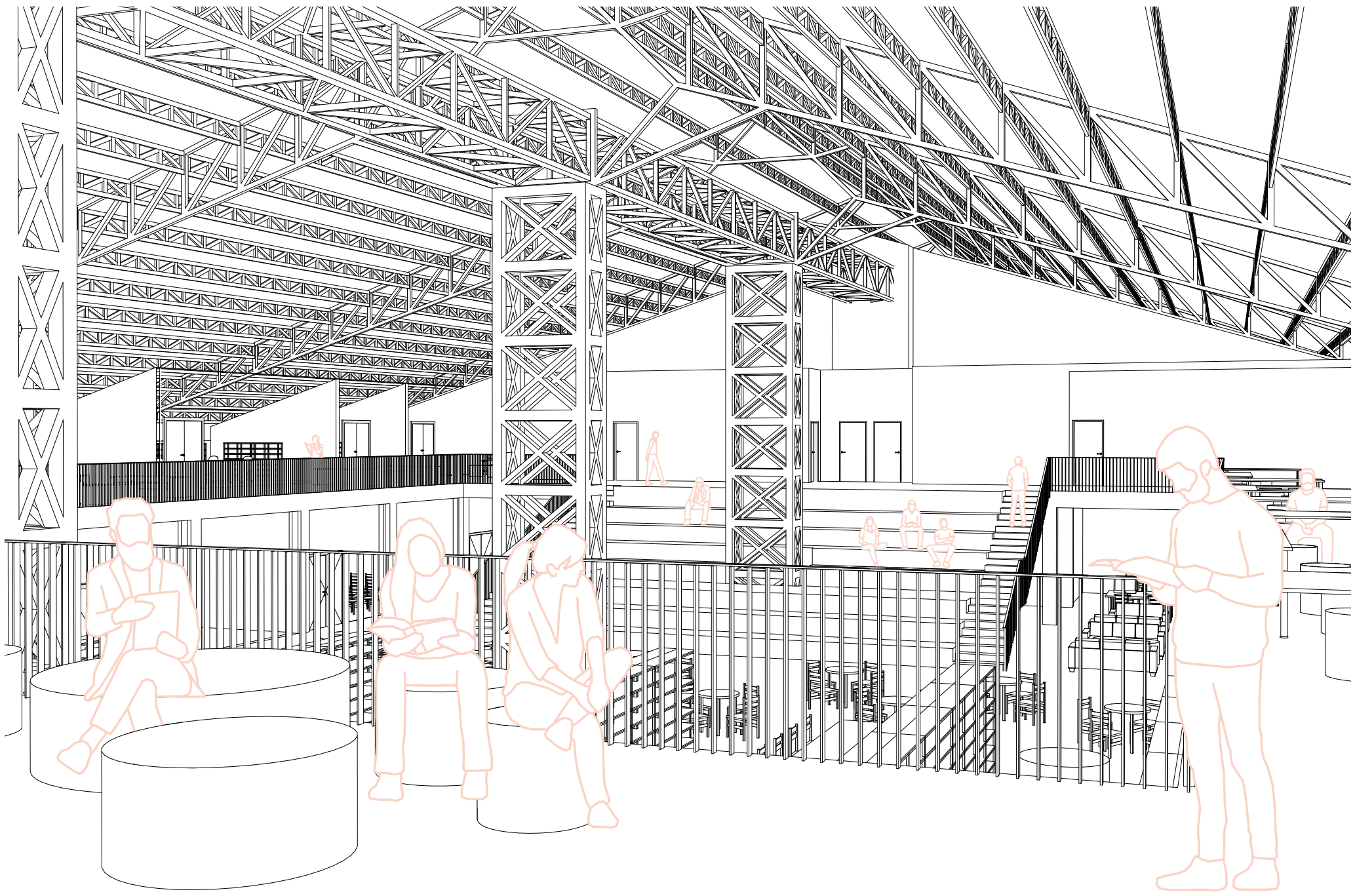
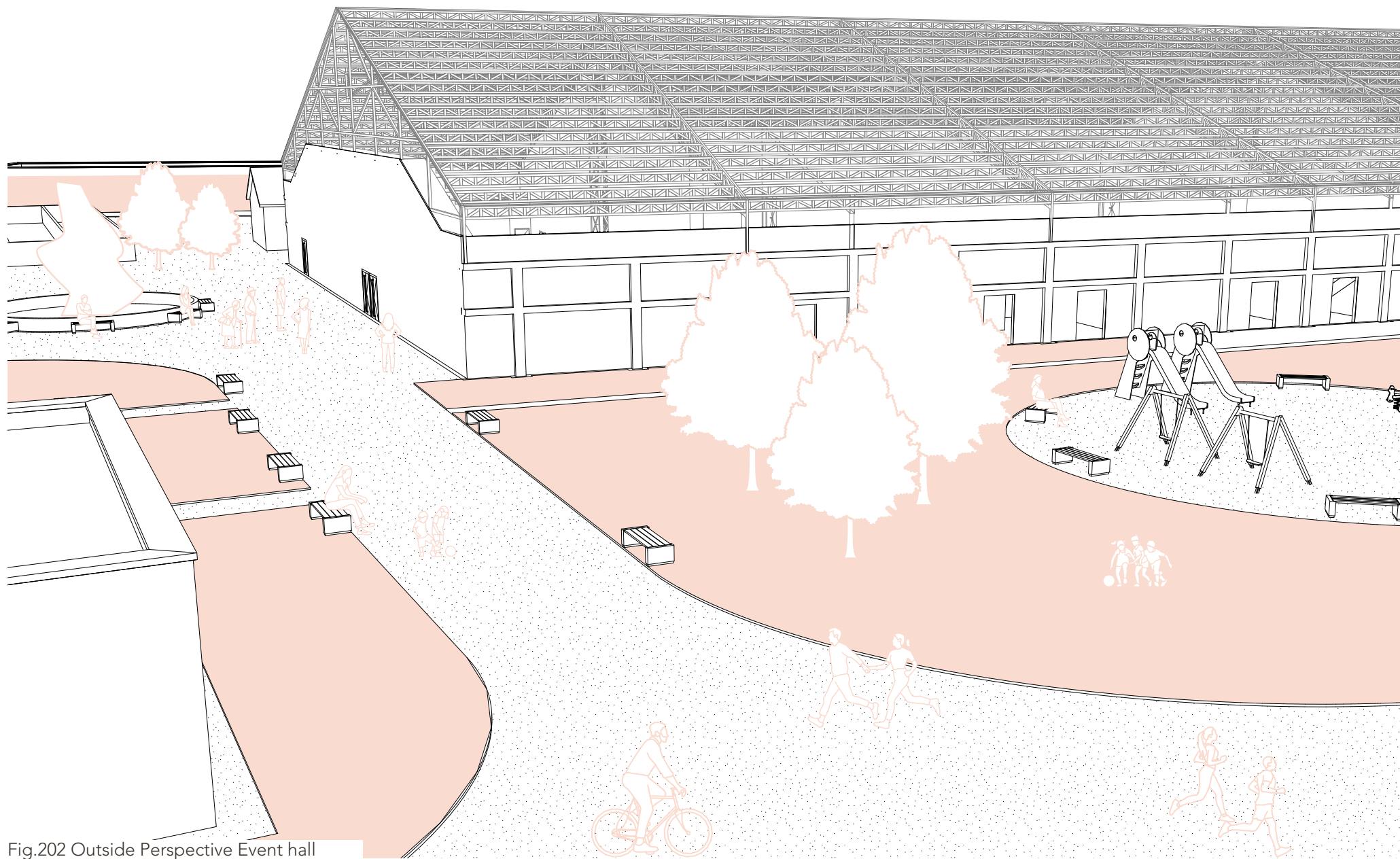


Fig.201 Inner Perspective Learning center 197



198 Fig.202 Outside Perspective Event hall

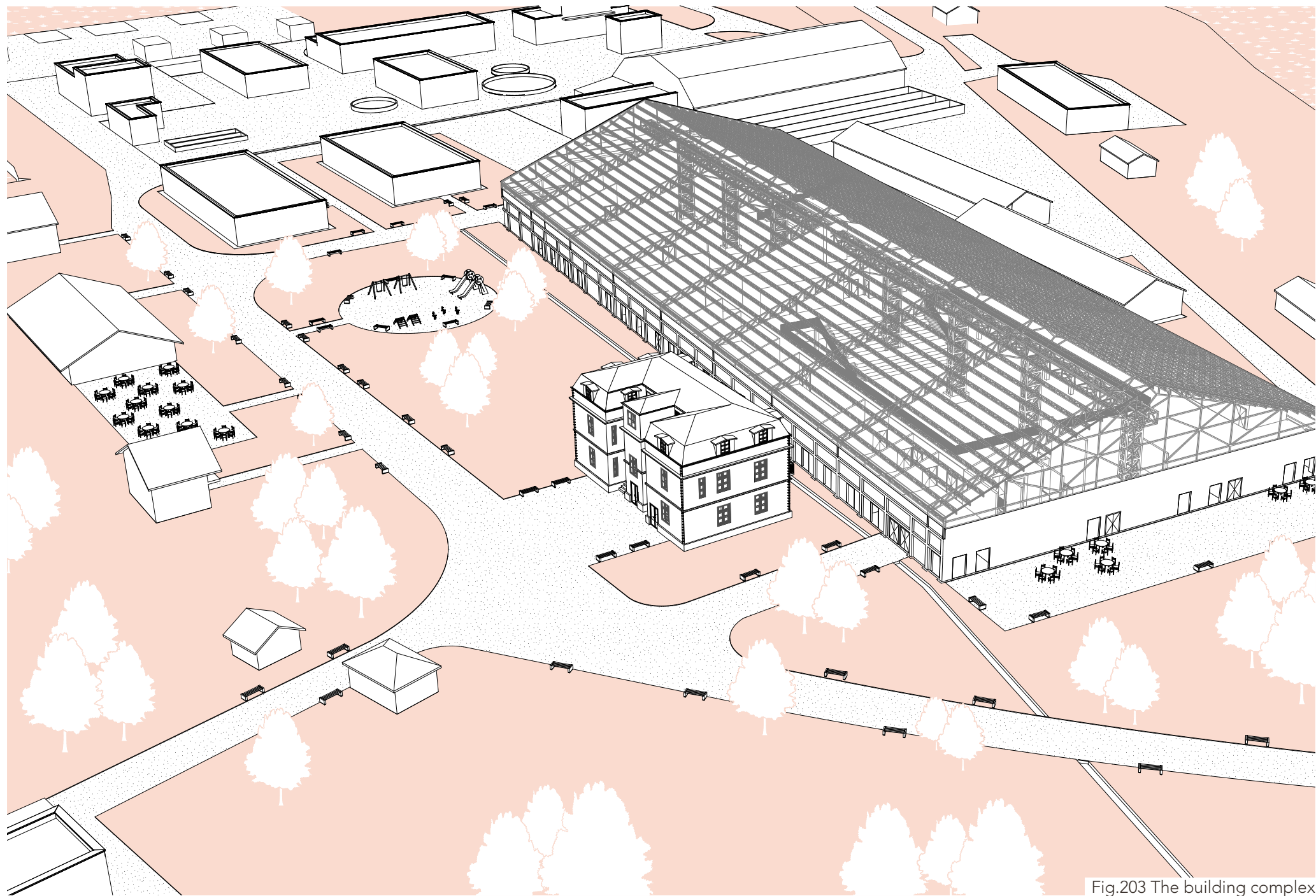
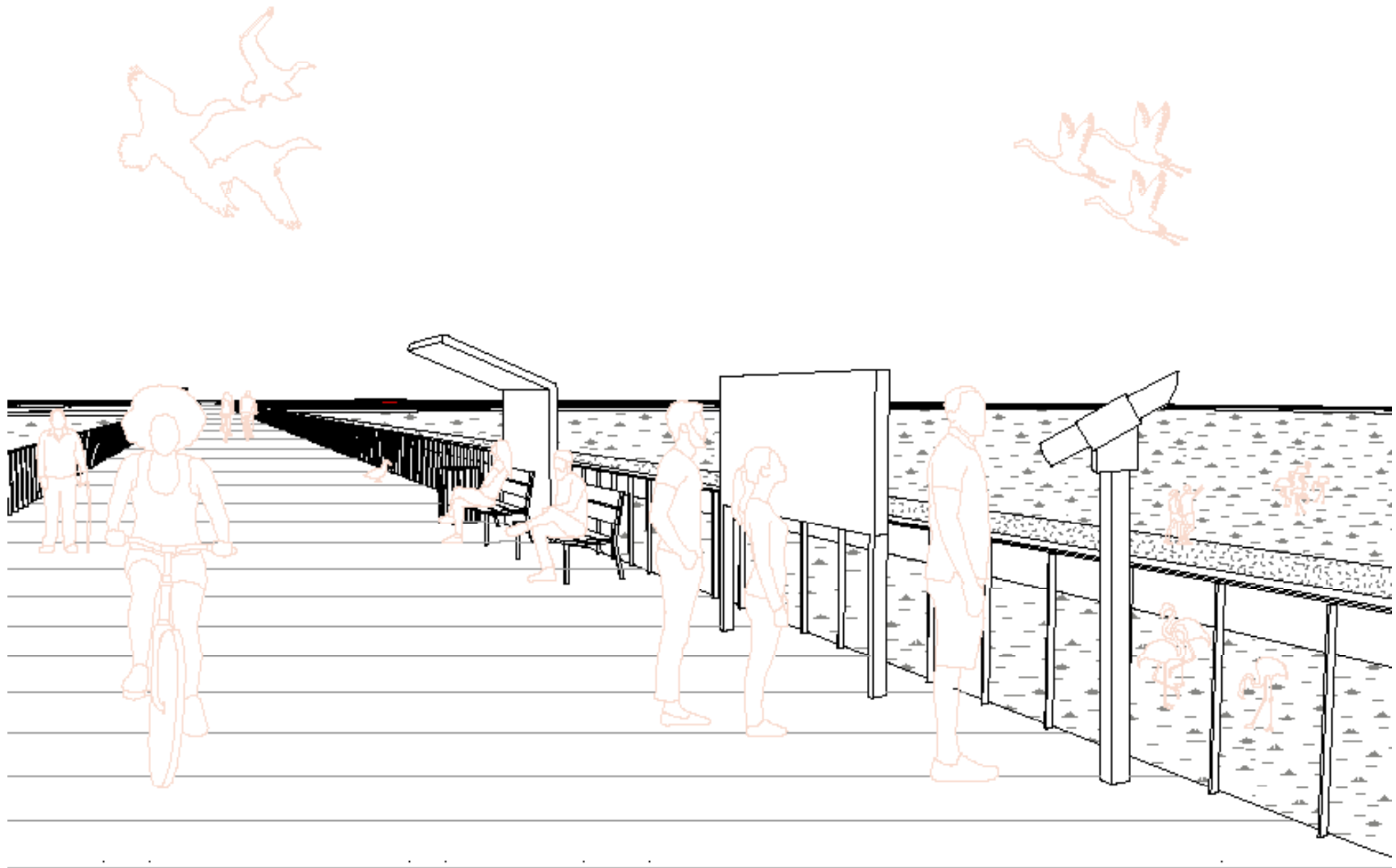


Fig.203 The building complex 199



200 Fig.204 Walking/Bicycle path

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List of Figures

All not listed Figures are the property of the author

0. Flamingos at Salina, by Adrian Perovic
2. Antique Ulcinj, "Ulcinj u srednjem vijeku", ul-info, <http://mne.ul-info.com/ulcinj-u-srednjem-vijeku/>
3. Old Ulcinj, Photo by J. Lika, <https://www.vijesti.me/vijesti/drustvo/130749/ljepsi-ulcinj-zivi-na-fotografija-ma>
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8. Ulcinj Saltpans, Vaso Radovic, "Ulcinjska Solana", Centralna narodna biblioteka Crne Gore, Ulcinj, 2008
9. Construction workers in 1932, Vaso Radovic, "Ulcinjska Solana", Centralna narodna biblioteka Crne Gore, Ulcinj, 2008
10. First buildings at Salina 1935, *ibid.*
11. Salt harvesting in the 1930s, *ibid.*
12. Salina workers during the harvest in 1930s, *ibid.*
13. Salina workers transporting the salt, *ibid.*
14. Salina in 1935, *ibid.*
15. Salt aggregation crane, *ibid.*
16. Crystallization saltpans, *ibid.*
17. The construction of the salt warehouse, *ibid.*
18. Celebrating the 13th of July together in 1961, *ibid.*
19. 20. Earthquake in 1979, *ibid.*
21. Collecting of salt, Archive Dr. Martin Schneider-Jacoby Association
22. Salina workers, *ibid.*
23. Salt packages, *ibid.*
24. Reconstruction of the Salt warehouse
25. Salt warehouse, Archive Dr. MSJA
26. 27. 28. Manufacture in the 2000s, *ibid.*
29. Saltpans in the 2000s, *ibid.*
31. Employees on strike, Samir Adrovic, <https://www.vijesti.me/vijesti/ekonomija/248681/po-CEO-strajk-u-solani-radnike-iz-uprave-niko-nije-obisao>
33. Saltpans and flamingos in the sunset, Zenepa Lika, <https://www.ulcinjsalina.me/en/ulcinj-salina-info/>
34. The Salina landscape today, Gregor Šubic, Tilen Basle
45. The Bojana-Buna Delta, Gregor Šubic, Tilen Basle, <https://www.youtube.com/watch?v=mY6Du7ERb-Q>
46. 47. Ulcinj Saltpans, *ibid.*
49. The Long Beach and Salina landscape in the background, *ibid.*
51. Salicornia, Credits: Zenepa Lika, <https://www.ulcinjsalina.me/en/ulcinj-salina-info/>
52. Salicornia overtaking the bottom of crystallization pool, "Studija zaštite Ulcinjske Solane", Agencija za zastitu zivotne sredine, Podgorica, 2015
53. The salt manufactory complex, Gregor Šubic, Tilen Basle, <https://www.youtube.com/watch?v=mY6Du7ERb-Q>
55. View from the entrance, Michael Bader, <https://www.youtube.com/watch?v=Rm3ZUYAVQns&list=LL&index=31&t=149s>
78. Administration building in 1965, Vaso Radovic, "Ulcinjska Solana", Centralna narodna biblioteka Crne Gore, Ulcinj, 2008
80. Administration building - Original floor plan, d.o.o. "Plan", Ulcinj
81. Administration building - Original front view, d.o.o. "Plan", Ulcinj
120. Flying flamingos, Photo by Adrian Perovic
121. Flamingo, *ibid.*
122. Group of flamingos, *ibid.*
123. A group of cormorants and pelicans, *ibid.*
124. Pelican, *ibid.*
125. Flamingos in the sunset, *ibid.*
128. Ironworks „Boris Kidric“ in Niksic, Facebook, <https://www.facebook.com/jna1951/photos/a.266741166724762/3031510553581129/>
129. The old dairy factory in Podgoric, Facebook, <https://www.facebook.com/PodgorickiCikotici/posts/mljekara/3567021186691473/>
130. The new residential building that has taken its place, Zetogradnja, https://zetogradnja.com/?avada_portfolio=mljekara
131. Factory „Radoje Dakic“, <https://www.pobjeda.me/clanak/za-hale-radoja-dakica-vrijedne-677000-ponudili-93000-eura>
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I wish to thank all of the people whose assistance was a milestone in the completion of this thesis; without their input this could not have been possible.

Firstly, I would like to thank and express my sincere appreciation to my mentor Ao. Univ. Prof. Dr. Gerhard A. Stadler for supporting me throughout this thesis, for his guidance and advices. I would also like to thank him for introducing me to HR. Arch. Dipl. Ing. Johannes Sima who I would also like to thank for his assistance.

I would like to show my gratitude to people who helped me find documentation and information on Salina, especially Dipl. biolog Slavica Djuricic and Dipl. Ing. Arch. Zenepa Lika. Special thanks to Thomas and Kati whose assistance and help with the thesis were of great significance.

Last, but not least, I would like to thank my parents and my friends for being constant support throughout my whole studies; I'm deeply grateful for all that you did.

ACKNOWLEDGEMENT

