A MIXTURE OF FRAGMENTAL MEMORY

A study about reusing an oil platform dismissed by its original function

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01/ Introduction

1.1/ Premise

The oil and oil-gas platforms, more than 8000 present all over the planet until a few decades ago, have gradually been dismantled to free the seas from the strong pollution they cause. The so-called decommissioning process of fixed platforms is usually carried out by removing them entirely from the marine environment. This involves bringing them to the ground and then demolishing or disassembling them to sell valuable equipment or, in some cases, revamping the best pieces for later reuse in other fields.

Fig.1.1/
The old offshore picture; from fircroft.com

1.2/ Issue

One of the biggest problems caused by the dismantling of these structures is the costs. Recent studies have validated that a re-use and redevelopment are much cheaper than a completely new construction. It is partly even more economical in reference to the resale of disassembled parts.

1.3/ Project brief

This thesis is based on this background, with the design of an abandoned oil rig close to the coast area of Ravenna in eastern Italy. It will utilize the digital tool and combine the "Adaptive reuse, Deconstructivism and Spatial narrative theory" to achieve the site context translate into spatial design language. It is dedicated to bringing a possible solution for how to reuse the abandoned offshore in worldwide. On the other hand, this project is purposed to explore a design method that make a bridge between realistic environment and virtual digital art and architecture space.

02/ Research

Architectural design always starts from restrictions (procedures, site, fraud, background, etc.) or some specific purposes. In response to these things, architects create design concepts or architectural ideas and then transform them into physical space. Full consideration and in-depth study of these elements is a necessary part of the design work. This chapter will focus on three aspects of research: the status of offshore drilling platforms, field research and theoretical research on space design.

Research on the status of offshore drilling platforms: including data research on the worldwide distribution of offshore drilling platforms, the status of decommissioning, and dismantling costs. As well as the classification of offshore drilling platforms, the included facilities, and the study of functional systems. Understand the lifestyle in an isolated ocean environment and explore the meaning and value of this design.

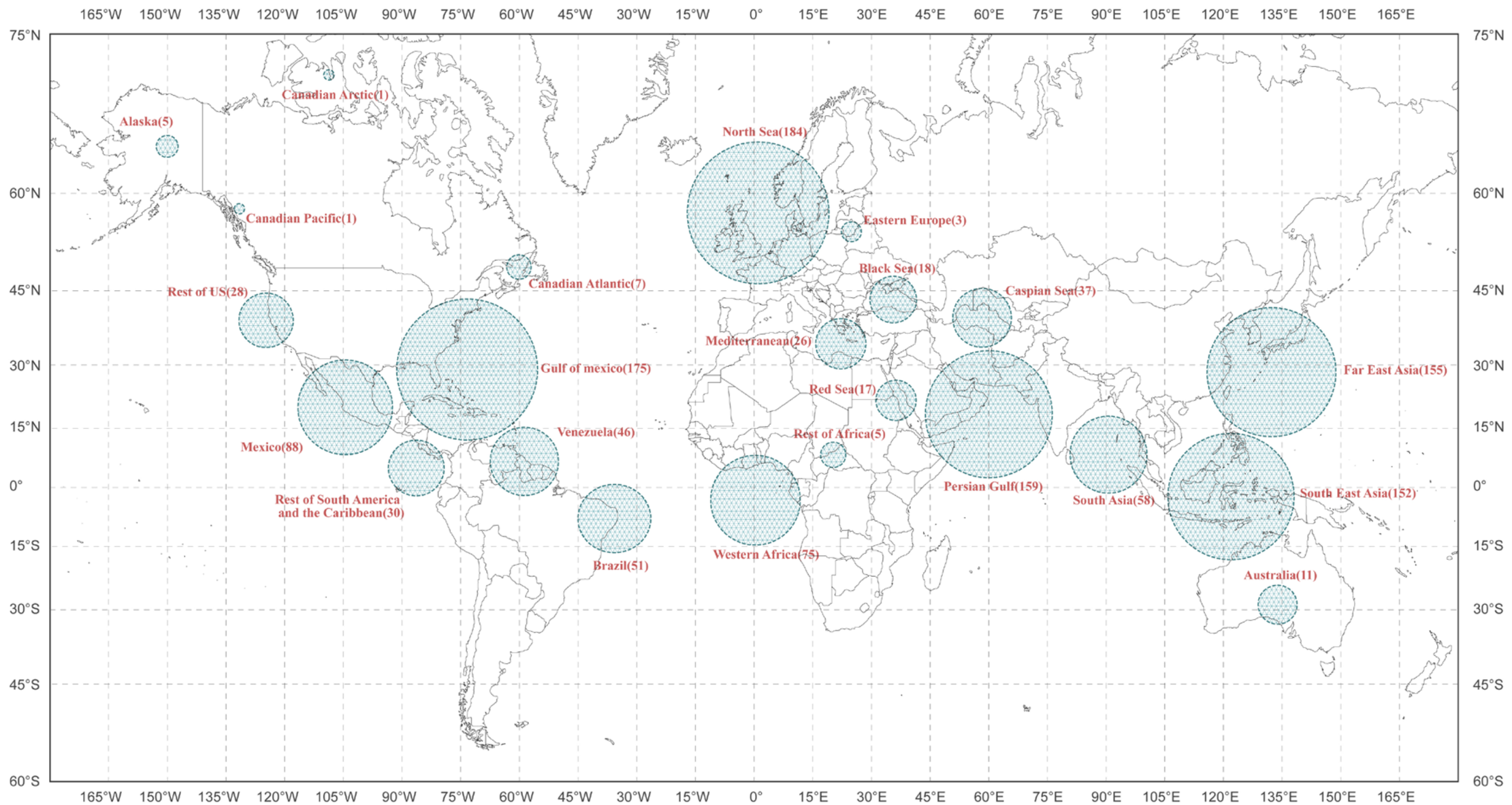
Site survey: This part mainly studies the location conditions, climate environment, historical and cultural background of the project site (Ravenna). The purpose is to improve our knowledge of the project's geographical location, culture, nature, history and other factors, and to find support for the source of the concept in the subsequent design phase.

Theoretical research: Corresponding to our design purpose (offshore drilling platform transformation) and integrating the three spatial design theories (Adaptive Reuse, Deconstructivism, Spatial Narrative), to prepare for further design concepts.

2.1/ Offshore Current Situation

Fig.2.1/

Number of offshore Rigis by region 2018; data from "Rigzone.com"



2.1/ Offshore Current Situation

2.1.1/ Worldwide Distribution

In 2018, there were approximately 1,300 offshore oil rigs in the world, and the North Sea and the Gulf of Mexico (the United States) are the locations with the largest number of offshore rigs. In January 2018, there were a total of 184 and 175 rigs (Figure 2.1.1 /). Offshore oil rigs enable producers to extract and process oil and natural gas through mining. Although Fossil energy has brought a huge impact, the oil output is still rising and it has lead to overcapacity, while the oil prices has gradually decline and the marketing value has shown a downward trend. (Picture 2.1.2 /)

2.1.2/ Offshore Development trends

With the development of clean energy, the demand for traditional petrochemical energy is decreasing and because of the high cost of maintaining the operation of offshore platforms and the negative influence on the environment, more and more companies choose to abandon and decommission offshore platforms.The average number of oil rigs worldwide has decreased between 1975 and 2019. In the latter year, figures averaged 2,177 units, of which the majority were located in the Middle East. The peak number was recorded during the oil boom in 1981, at 5,624 units.(Fig.2.1.3/)

Fig.2.2/

Offshore Drilling Market(USD Billion); data from "Rigzone.com"

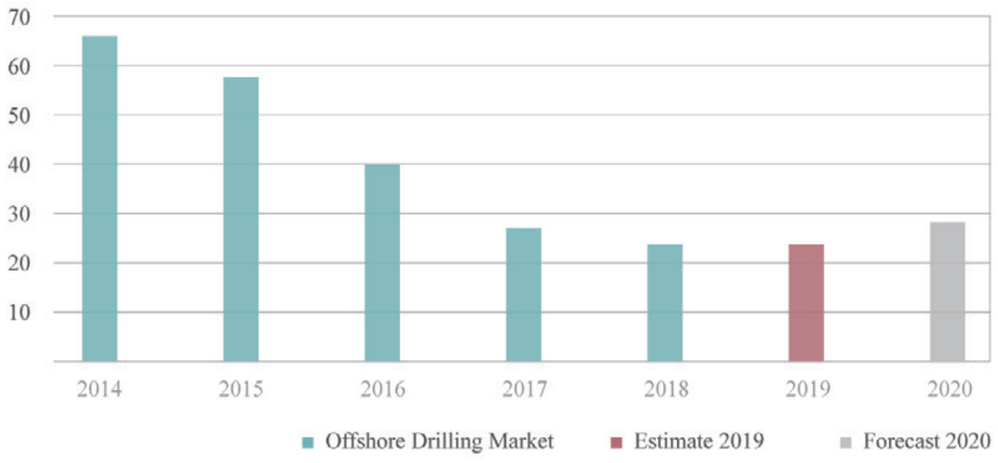
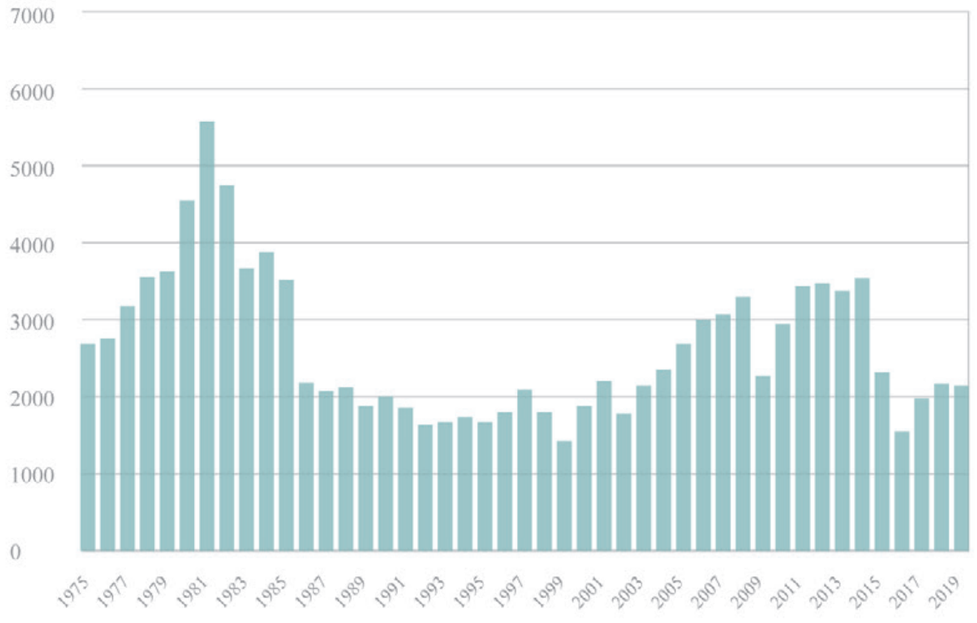


Fig.2.3/

Number of average annual oil rigs worldwide from 1975 to 2019; data from "Rigzone.com"



2.1.3/ Offshore Decommission Situation

The shrinking demand in the global petro-energy market has resulted in insufficient profits from offshore drilling platforms to support production costs. About 9,000 oil wells in the world are currently in a state of being difficult to maintain profitability. On the other hand, many platforms have been used for too long and the equipment has aged. Under such circumstances, more and more oil rigs will be dismantled and abandoned. During 2000-2016, a total of 219 offshore drilling platforms worldwide were retired, and it is estimated that this number will reach 470 by 2040 (Figure 2.1.5 /). The cleaning and dismantling of oil rigs not only consumes time but also causes huge economic costs to enterprises or governments. An offshore decommissioning industry emerged at the same time, the offshore decommissioning market size is projected to grow at a CAGR of 4.8%, from 2019 to 2027, to reach a market size of USD 8.9 billion by 2027. (Figure 2.1.5 /). According to the current research on reusing these abandoned offshore, reusing is more economical and sustainable than dismantling them.

Fig.2.4/

Annual average decommission need for offshore oil and gas assets by region, 2000-2024

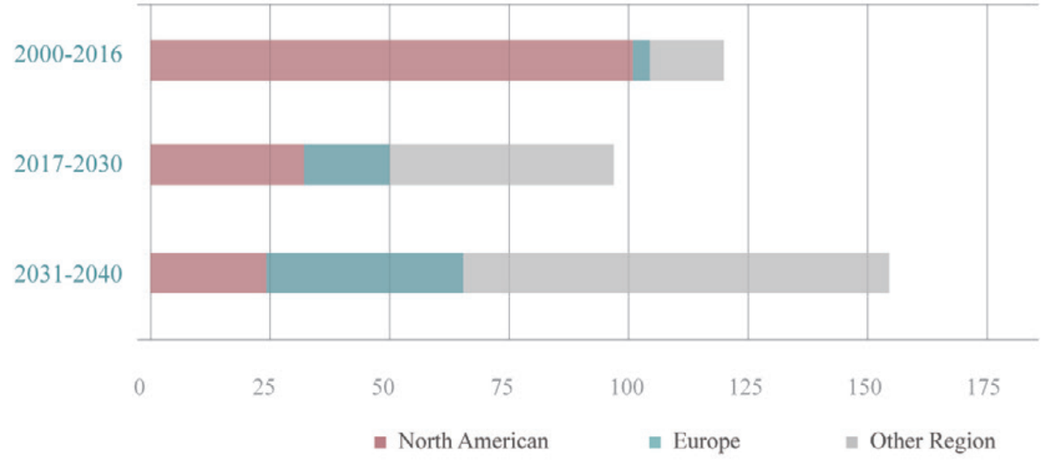
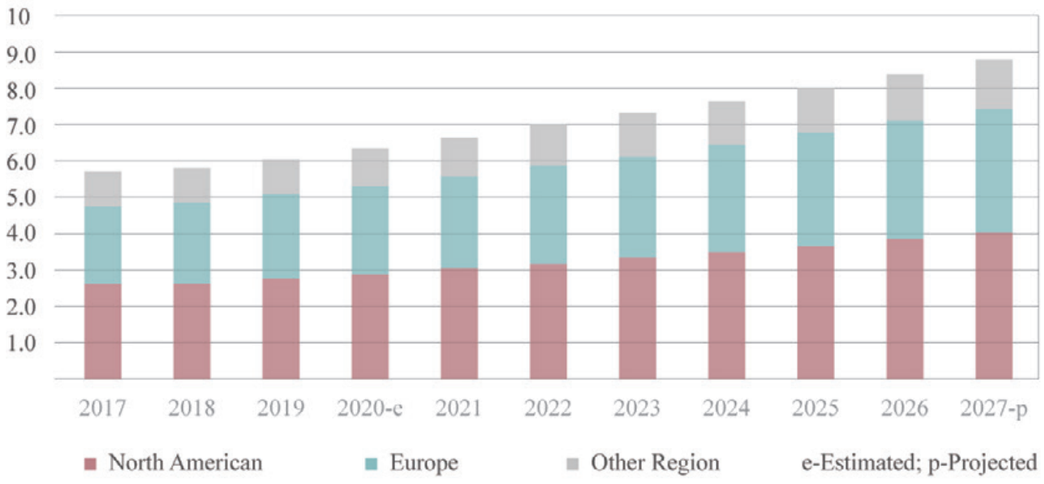


Fig.2.5/

Offshore decommissioning market by region(USD Billion); data from "data from "marketsandmarkets""



2.1.4/ Offshore Typology

Offshore drilling platforms are offshore structures mainly used for drilling wells. The platform is equipped with drilling, power, communication, navigation and other equipment, as well as safety life-saving and personnel living facilities, which are indispensable means for offshore oil and gas exploration and development. Mainly divided into two categories: mobile platforms and fixed platforms. According to the structure, it can be divided into:

(1) Mobile platforms: bottom sitting platform, jack-up platform, drilling ship, semi-submersible platform, tension leg platform, lanyard tower platform

(2) Fixed platforms: jacket platform, concrete gravity platform, deep water compliance tower. Platform-fixed drilling platforms are mostly built in shallow water. It is a device that is fixed on the seabed with the help of a jacket and does not move above the sea surface. A deck is laid on the platform for placing drilling equipment. The legs supporting the fixed platform are driven directly into the seabed, so the stability of the drilling platform is good, but because the platform cannot be moved, the drilling cost is high.

Our site is a typical fixed jacket oil drilling platform. Once this platform is established, it cannot be moved, so it is a disposable product. Its structure is mainly steel frame. Due to its low cost, this type of platform is currently the most widely used drilling platform in the world, with the longest history and the most serious aging.

Fig.2.6/

Jacj-up Platform

Fig.2.7/

Fixed Platform

Fig.2.8/

Drill Ship

Fig.2.9/

Semi-submersible Platform

Fig.2.10/

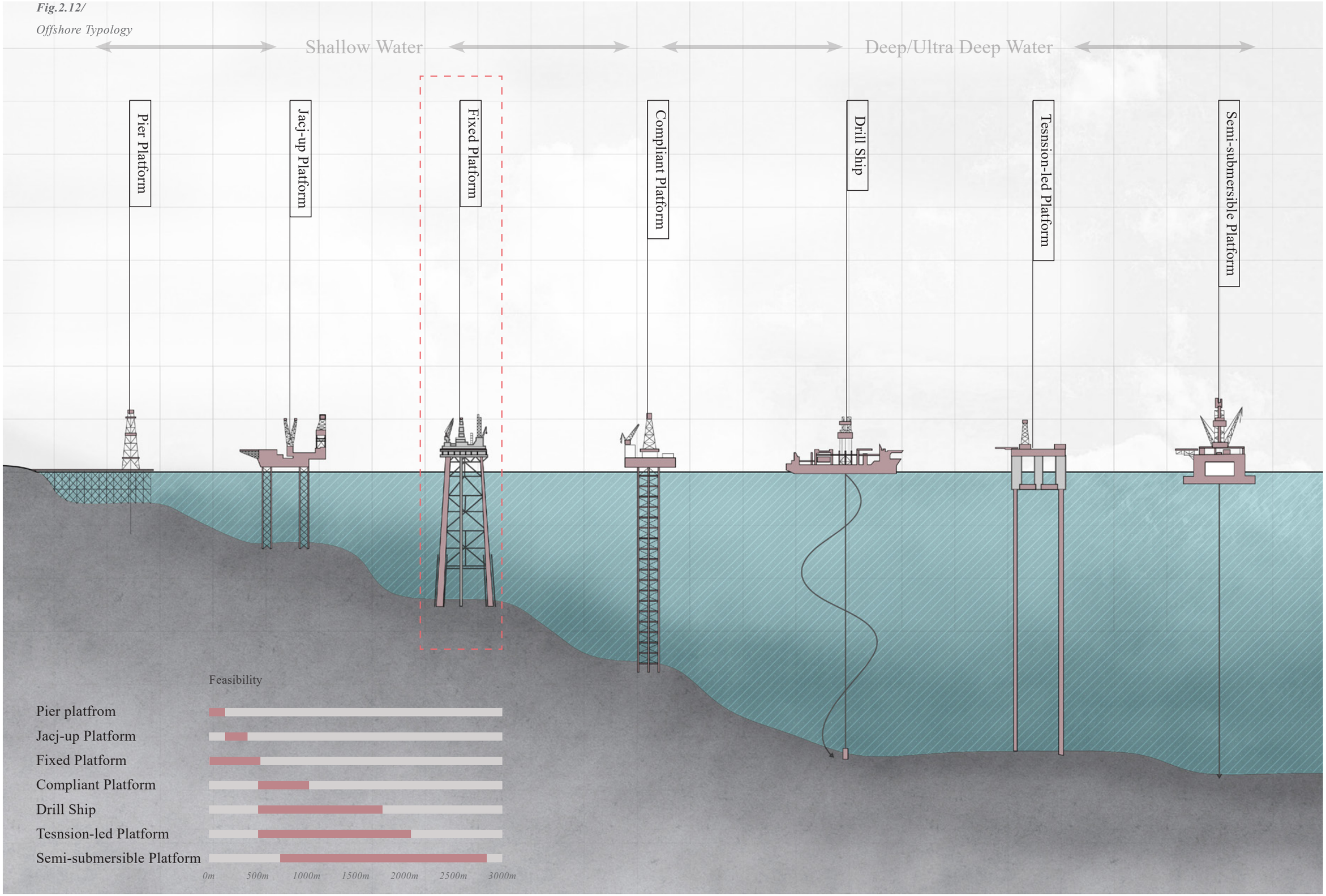
Tesnsion-led Platform

Fig.2.11

Compliant Platform

Fig.2.12/

Offshore Typology



2.1/ Offshore Current Situation

2.1.5/ Offshore Facilities

Offshore Facilities means platforms and support systems such as oil and gas handling facilities, living quarters, offices, shops, cranes, electrical supply equipment and systems, fuel and water storage and piping, heliport, marine docking installations, communication facilities, navigation aids, and other similar facilities necessary in the conduct of offshore operations.

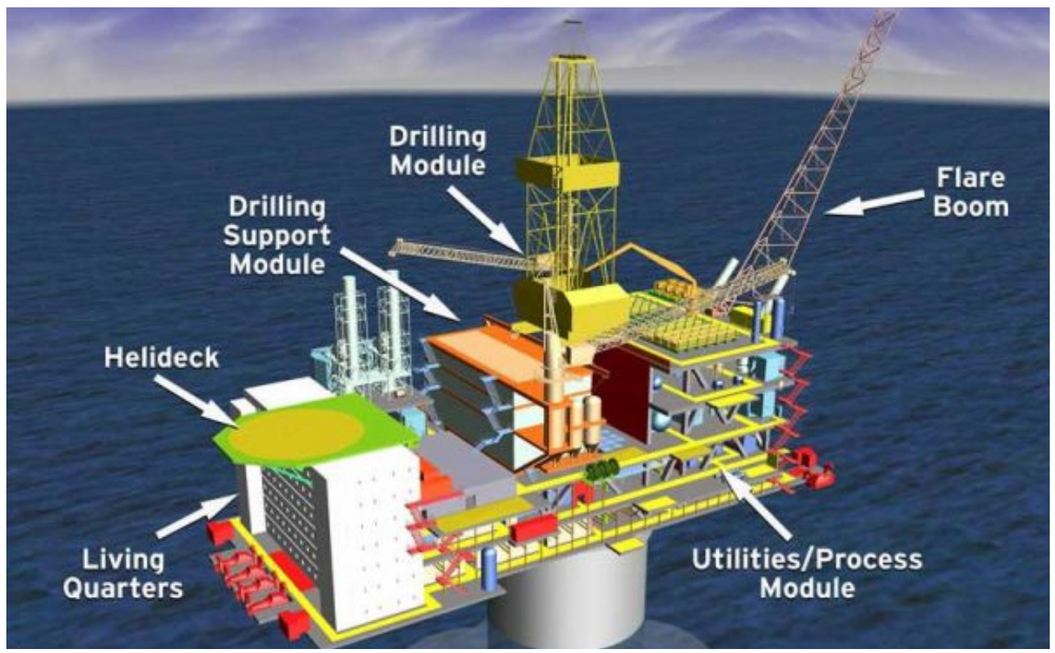


Fig.2.13/
Module of Offshore

Accommodation facility: Cabins assigned are just like very nice one found on cruise ships which may be single / twin sharing depending on ranks and availability. Indivisual bunks with comfortable mattresses for sleeping closet, large bathroom and shower,satellite television,DVD player and a phone for internal and external calls. And rooms are cleaned and beds made daily by house keeping staff, There is a 24hs laundary service to clean work clothes of crew.

work shifts&breaks: A typical work day consist of a 12hour shift, which starts with daily safey pre tour meeting to discuss the activities of a day. During the work day the staff will be allowed some time for coffee beak and meal. Smoking, Although allowed on rigs, that is restricted to designated area only.

Canteen: while aboard there is a 24 hour mess room with meala are provided at 6pm,11pm,6pm,11pm.(breakfast, lunch, dinner&supper). All meals consist of multi cultural cuisines and wide variety of healthy menu choice available round the clock. Menus vary for vegetarian or non vegetarian from indian / continental / chinese etc... also from american burge and have a weekly open air BBQ lunch.

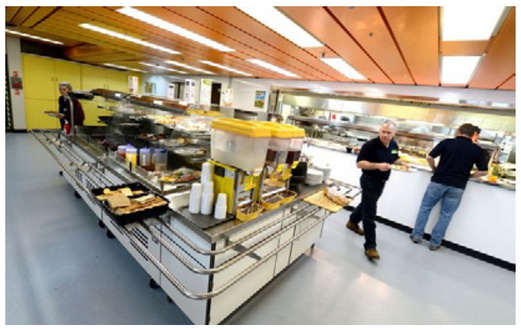


Fig.2.14/
Offshore Daily life Facility

2.1.5/ Offshore Facilities

Recreation facility on board: Common recreation area which have a big screen television with satellite channel. In gaming zones consisting of table tennis, snooker-pool, carrom, chess...etc, and gymnasiums/ work-out facilities with high end equipment. Communication from offshore have improved over the years, access to the internet and personal e-mail is available alone with regular telephones to call home. All of the work is aimed to promote work and life balance.

Emergency and medical care: A well maintained clinic with trained physician on call 24hrs and medical equipments to stabilize and manage all emergencies onboard as per medical protocols and follow MEPP. Doctor is responsible to take care general health of the crew, provide referral, emergency fist aid care in case of memergency, healthy talk, stretcher team trainings, vaccinations, OH programs. All offshore crews are trained to handle emergencies via regular drills and emergency drills are conducted every week.

(Medical emergency, man over board, fire & explosions, abandon ship, environmental events, natural disasters, gas leaks.)

Transportaion system:

Helicopter
Each platform will be equipped with helicopter services, with pontoons installed on board, carrying life jackets, lifeboats, desalination agents, medicines, shark repellents, emergency radio stations and other rescue equipment for emergency use. Their main task is to transport workers, equipment and other logistical support for the work platform to and from work.
Watch ship: For safety and transportation considerations, each drilling platform and fixed platform must have a watch guard ship (when not in operation, a guard ship can be shared in close proximity)

Security system: Drilling platforms will be equipped with safety fire-fighting and pollution prevention facilities, including fire-resistant lifeboats or life-saving bulbs, work boats, lifebuoys, life jackets and other life-saving facilities, water fire extinguishing systems, chemical fire extinguishing systems, and recovery and treatment devices for waste oil, sewage and exhaust gas.

Fig.2.15/
offshore medical care

Fig.2.16/
Entertainment facility

Fig.2.17/
Offshore Lifeboat

Fig.2.18/
Offshore Helipad

2.1/ Offshore Current Situation

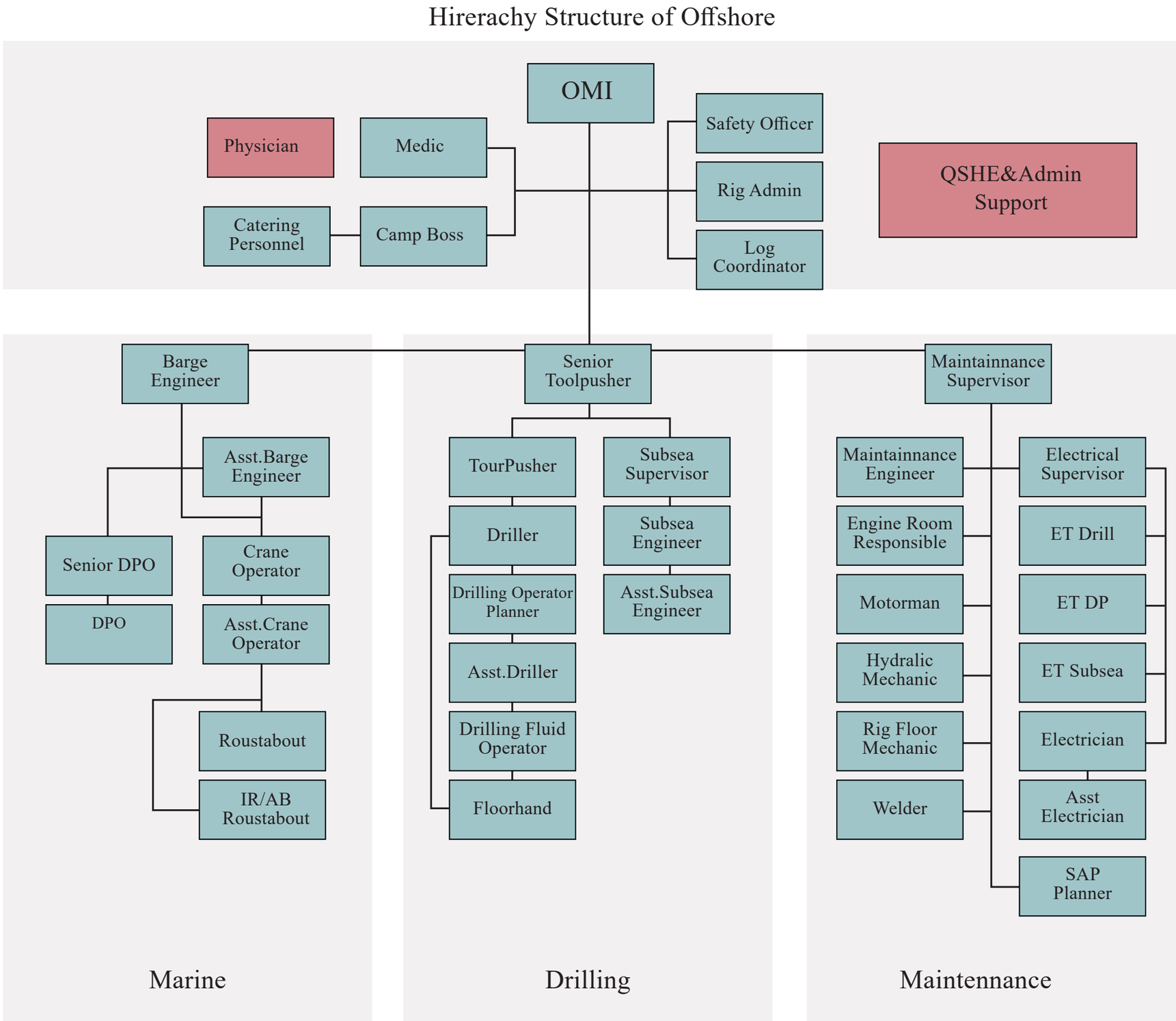


Fig.2.19/
Hirerachy Structure

2.1/ Offshore Current Situation

Structure System:

Typical Structure: Fixed Platfrom Structure System

The steel jacket type platform on a pile foundation is by far the most common kind of offshore structure and they exist worldwide. The "substructure" or "jacket" is fabricated from steel welded pipes and is pinned to the sea floor with steel piles, which are driven through piles guides on the outer members of the jacket.
The piles are thick steel pipes of 1 to 2 metres diameter and can penetrate as much as 100 m into the sea bed. The jacket can weigh up to 20,000 tonnes.

To ensure that the installation will last for the required service life, maintenance must be carried out including the cathodic protection used to prevent corrosion.

These structures can withstand immense vertical loading and overturning moments as they are designed to be resistant to toppling from very large wave fronts. It can be assumed that many fixed offshore installations can withstand vertical loadings and the overturning moment imposed by many renewable energy devices. It is not advisable to impose any further lateral loading on the offshore installation as this may affect the overall strength of the platform which could create a potential safety hazard.
An individual structural analysis will however have to be carried out to determine the suitability of re-using each fixed installation as OREC.

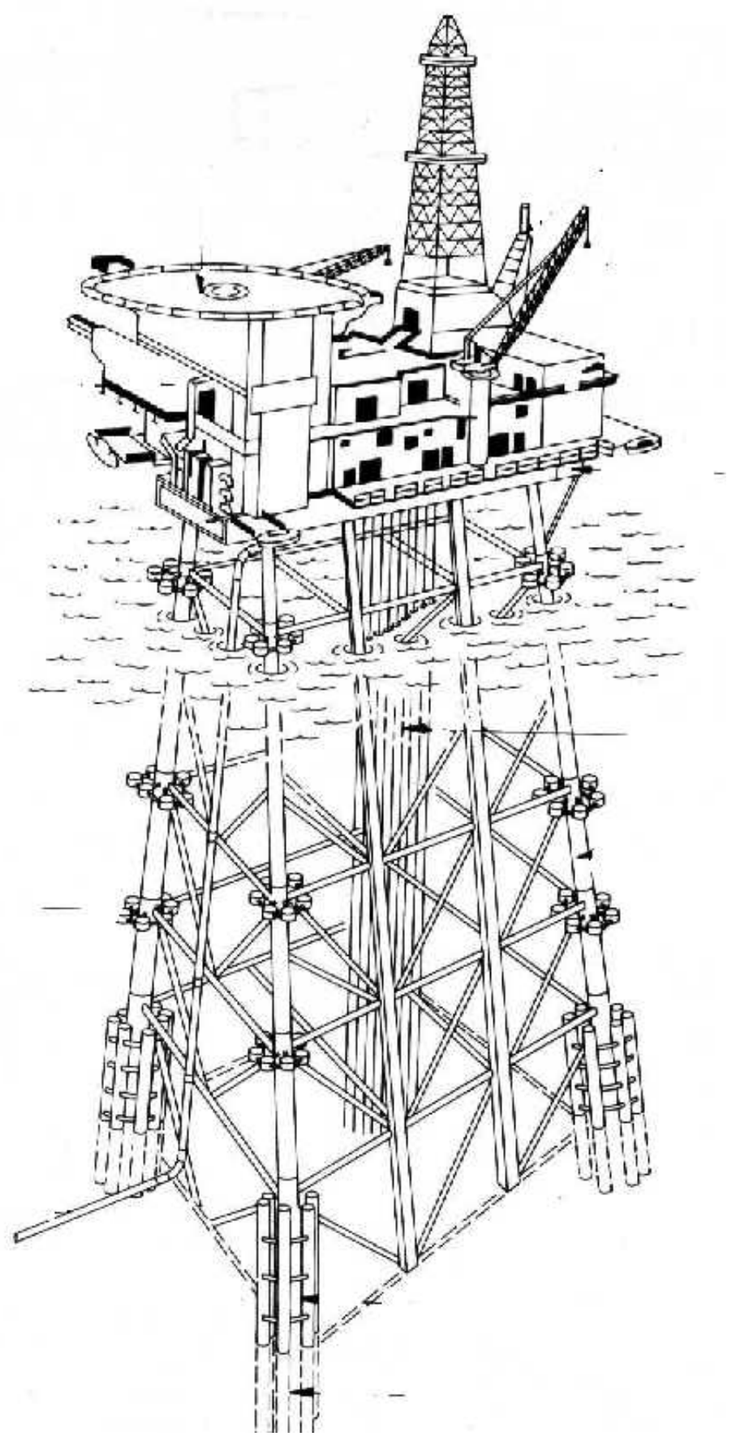


Fig.2.20/
Offshore Structure System

2.1/ Offshore Current Situation

2.1.6/ Offshore Security Issue

Security accident:

In addition to withstanding the effects of weather like land, offshore platforms also have to withstand the special environment of the ocean. The combined effects of sea waves, sea ice, typhoons, and monsoons will cause huge damage to oil and gas field production facilities, especially hurricanes, which seriously threaten the safety of offshore platforms.

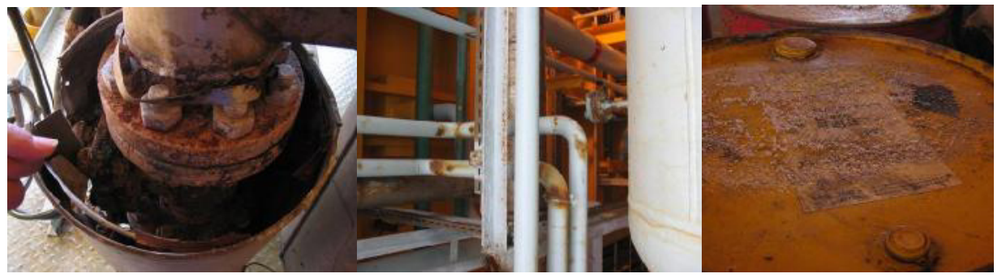
Marine drilling equipment itself is a machine full of potential threats. The accident rate of offshore drilling platforms is very high: blowouts, helicopter crashes, diving accidents and daily platform injuries are very common. In the past 100 years of offshore oil and gas drilling history, there have been countless large and small safety accidents in the world. The types of accidents include oil and gas leaks, explosions, fires, overturning and sinking. More than 60 drilling platforms have sunk due to accidents worldwide. In only 6 years from 2001 to 2007, there were 1443 serious offshore oilfield drilling accidents in the United States, resulting in 41 deaths, 302 injuries and 356 crude oil spills.

Fig.2.21/

1979.11.25 BOHAI CHINA Oil Pltaform Accident

Fig.2.22/

Oil Pltaform Structural Corrosion



Structural corrosion:

The marine environment has a serious corrosive effect on steel, which will affect the service life of the steel structure platform. The impact of ocean waves mainly caused by wind exacerbates the corrosion of the structure. Tropical cyclones, typhoons, and tsunamis can set off huge waves. High-intensity waves will not only accelerate the corrosion of the platform, it is even more likely to directly destroy the platform and cause a series of safety issues to threaten the lives and health of the staff.

2.1/ Offshore Current Situation

People Psychological Problem:

In addition to paying attention to the life safety issues of the personnel on the platform caused by the offshore drilling accident, the mental health of the personnel should also not be ignored. Drilling platform workers have long been in a closed, monotonous, high-risk, and high-pressure working environment. They are far away from their hometowns and are under psychological pressure that is difficult for outsiders to understand.

Being in such a space for a long time will cause people to feel closed and depressed, unwilling to communicate with others, and avoid social behavior. In most cases, the offshore drilling platform is a purely male small society. Due to the single gender and space constraints, it is easy to cause emotional reactions and interpersonal tension.

The offshore drilling platform is still a high-noise, strong-vibration working environment, and relatively monotonous, repetitive work, 20-day rest period, lack of family life, away from the social environment, etc., which are a great test for employees' sleep, physiology and psychology. Easily produce occupational burnout.

Fig.2.23/

The worker in offshore

2.2/ Site Research

2.2.1/ Site Overview

Italian's company fabricated and installed Europe's first offshore, exactly in 1959 and since then, almost 200 of the various Mediterranean oil platforms have been installed during the economic boom. The Adriatic Sea region also has rich oil and gas resources, and also has various Various platforms. Our site is an aging oil rig located in the Adriatic Sea, 50 kilometres east of Ravenna, Italy.

Ravenna has an ancient origin and a prosperous history. It was once the capital of the Western Roman Empire, the Eastern Gothic Kingdom, and the centre of the Eastern Roman Empire in Italy. It has eight famous cultural heritage buildings whose style is mainly influenced by the architectural style of the Eastern Roman Empire.

The oil rig, symbolizing modern industrial civilization, meets Ravenna with a long history, just like the collision between modernity and history. Our design is committed to evolving the design language of the two eras into the spatial reshaping process.

Fig.2.24/

Oil platform near Ravenna

Fig.2.25/

Museo Arcivescovile, Ravenna

2.2/ Site Research

Fig.2.26/

Site map

01/ Relation betwwen Water and Land

River

02/ Urban Landscape Area

Landscape&Forest *Wetland*

03/ Tourist Attraction

Historical remains *City area*

04/ Transportaion Typology

River route *Harbor*

Railway route *Bus identity*

Fig.2.27/

Site typology

Ravenna is located on the coastal plain 10 kilometres from the Adriatic Sea, 111 kilometers east of Bologna. It is a distribution center for agricultural products, and its industries are mainly oil refining, synthetic rubber, textiles, chemistry, sulfur refining, shoemaking and food.

Since Ravenna was previously established on the coastal lagoon above the lagoon, there are a large number of wetlands and canals in the urban area. Wetlands are mainly concentrated in the eastern and north-eastern regions. Among them, Po Delta Park is a famous nature reserve where visitors can visit precious birds, ride bicycles to enjoy the natural scenery or visit guided tours. There are large areas of forest landscape in the east and in the urban area.

Ravenna is a famous ancient city. From the 4th to 6th centuries BC, as the capital of the Western Roman Empire and the capital of the Eastern Roman Empire in Italy, it experienced glorious times. Today, there are eight splendid world cultural heritages in this city.

Its transportation modes are mainly railways, road hubs, and canal transportation. Its canal is connected to the sea port of Marina di Ravenna (Portuale Di Ravenna) 15 kilometers northeast. It is also an important crude oil import port in Italy.

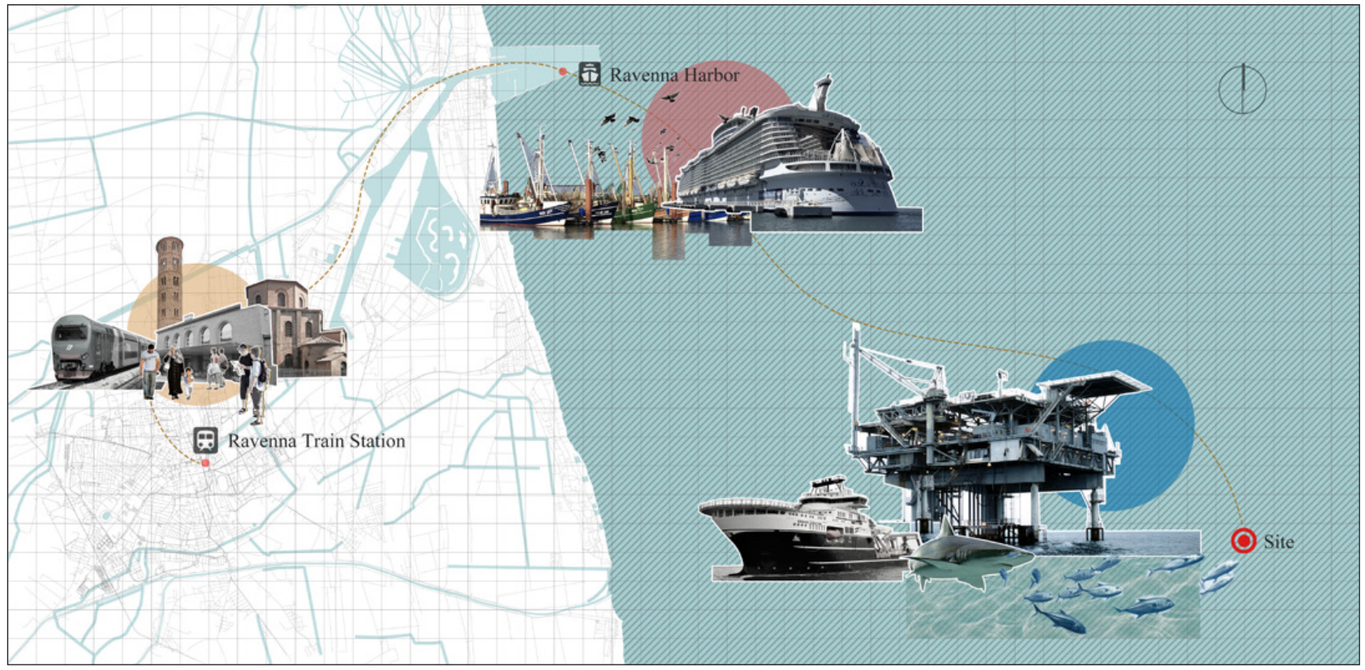
3/ Entrance mode

Since the project is on sea level, the most common method of transportation to the site is by boat. In addition, the drilling platform will set up a helicopter landing pad as a secondary rapid emergency transportation method.

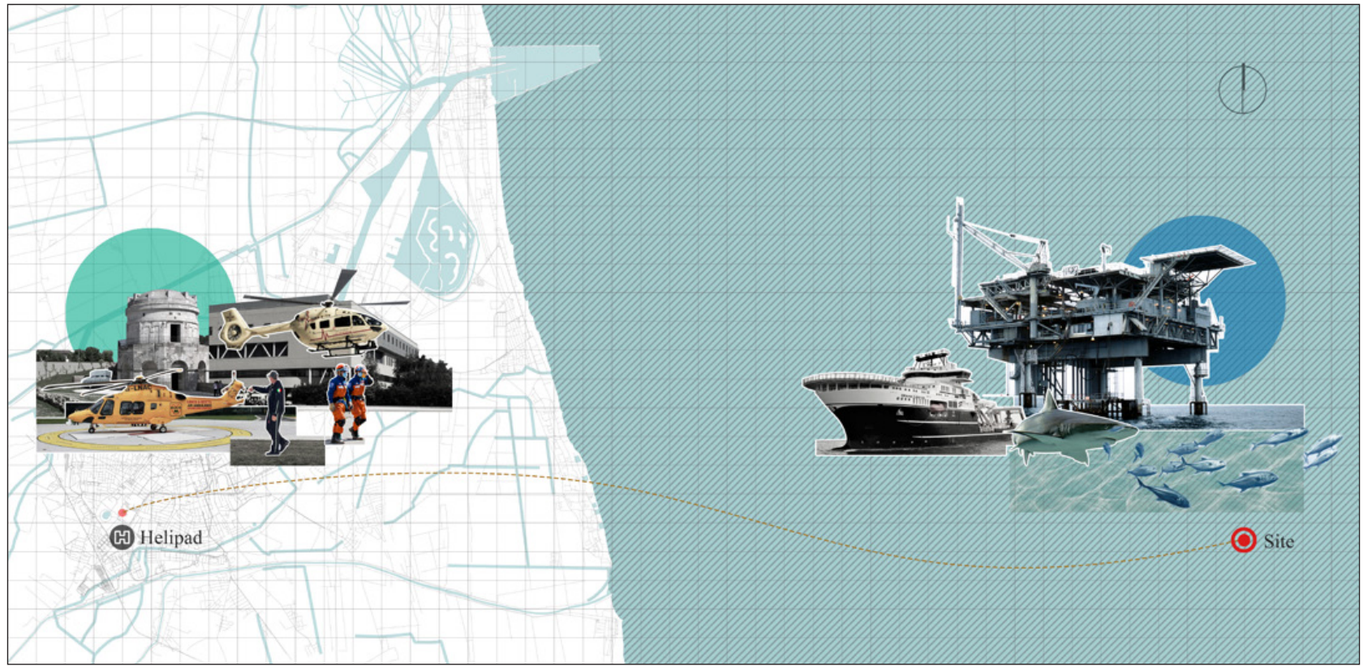
Therefore, based on the above survey, we simulated two traffic routes to the site. The first is the tourist route. When tourists arrive at the Ravenna train station from outside, they can take the subway or bus to Portuale Di Ravenna in the northeast and then buy tickets and take a passenger ship to the project site. The second type is safety rescue and office routes. Relevant personnel can take a helicopter directly to the project site from Eliporto Ravenna located in the east of the city.

Fig.2.28/
Entrance mode.

01/ Visitor route



02/ Security&Working route



2.2.2/ Culture&History introduction

1/ Historical background

Ravenna was the seat of the Roman Empire in the 5th century, and it became the seat of Byzantine Italy until the 6th century. The city has a unique collection of early Christian mosaics and buildings. All 8 buildings Mausoleo di Galla Placidia, Basilica di San Vitale, Mausoleo di Teodorico, Basilica di Sant'Apollinare in Classe, Battistero Neoniano, Museo Arcivescovile, Basilica di Sant'Apollinare Nuovo, Arian Baptistry are all from the 5th to the 6th century Built during the period. All the buildings show a very high level of art, including Greek and Roman traditions, Christian illustrations, and the perfect blend of Eastern and Western styles. Dante's Tomb in the city contains the remains of Italy's greatest poet Dante, and various important cultural events will be held in the city to commemorate this great poet.

Fig.2.29/
Dante's Tomb

Fig.2.30/
Mausoleo di Galla Placidia

2/ Mosaic culture

Ravenna is most famous for its mosaics. In the 5th century, the city became the center of late Roman Christian art and was incorporated into the Byzantine Empire in 540, with the revival of biblical Byzantine mosaics in the second half of the 6th century. This revival included later mosaics in the Basilicas of San Vitale and San Apollinare Nuvo. For example, after the Byzantine conquest, mosaics of Emperor Justinian I and Queen Theodora were built in the church of San Vitale. The mosaic of the Basilica of Sant'Apollinare in Classe was executed around 549. The final collection of Ravenna's Byzantine mosaic art was ordered by Bishop Reparatus of Sant'Apollinare of Classe in the 670s. Other important surviving mosaics include: Christ as the Good Shepherd (450) (Gala Placidia Mausoleum); Baptism of Christ (6th century) (Arian Baptistery); Christ before Pilate Pilate (550) and the Transfiguration of Christ (550)

Fig.2.31/
Basilica di Sant'Apollinare in Classe - The mosaic meadow of the apse

3/ Introduction of historical remains

04/ Basilica of Sant'Apollinare in Classe

02/ Basilica of San Vitale

03/ Mausoleum of Theodoric

01/ Mausoleum of Galla Placidia

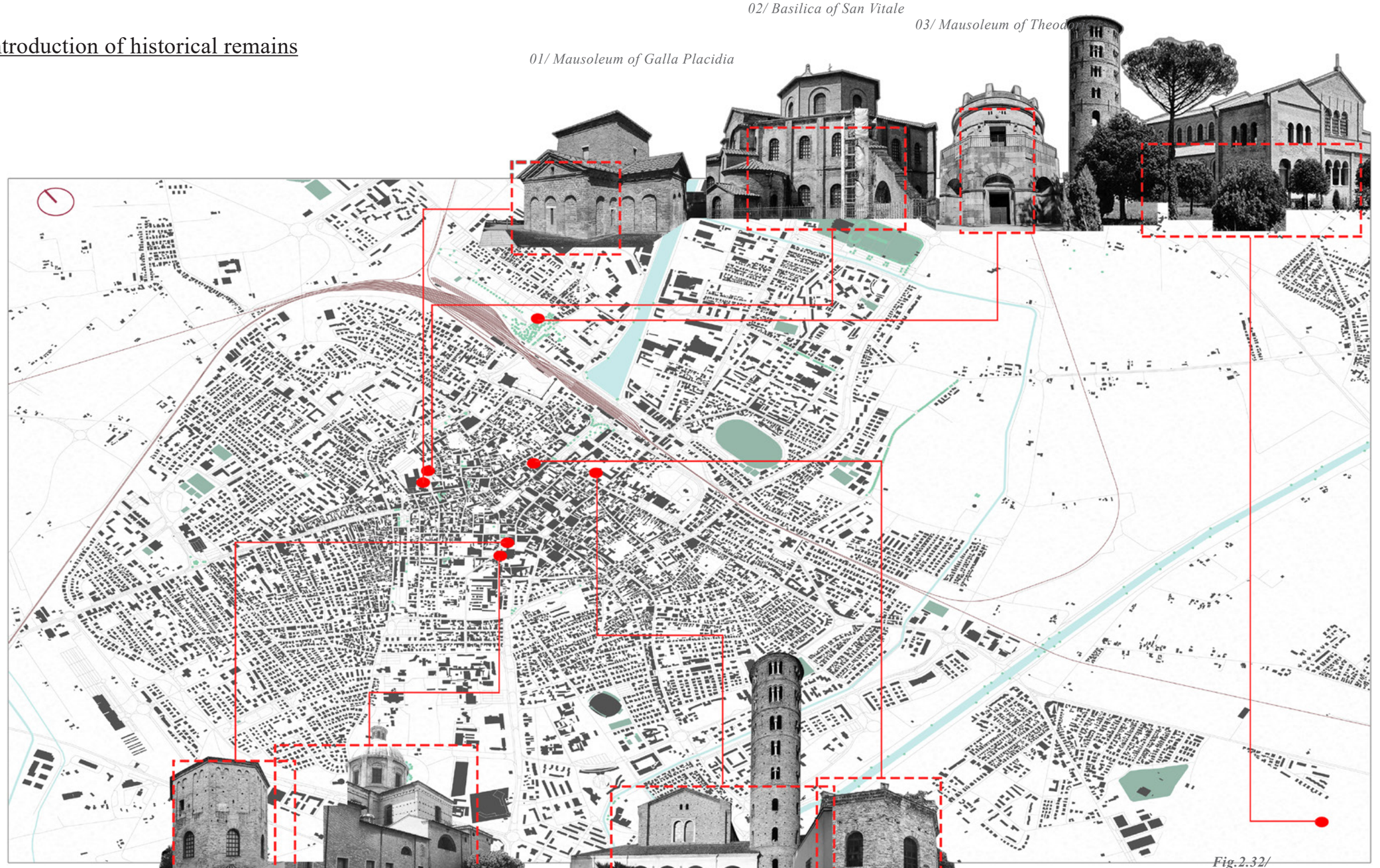


Fig.2.32/
Position of historical remains

08/ Arian Baptistry

05/ Neonian Baptistery

06/ Chapel of Sant'Andrea

07/ Basilica of Sant'Apollinare Nuovo

01/ Mausoleum of Galla Placidia

Alla Placidia (386 - 450 AD), sister of the Roman Emperor Honorius who had transferred the Capital of the Western Empire from Milan to Ravenna in 402 AD, built this little Mausoleum with a Latin cross plan around 425-450 as her own resting place. However, the mausoleum was never used for that purpose, because the empress died and was buried in Rome in 450.

Now a separate building, the mausoleum was once connected to the south side of the narthex of the closed Church of Santa Croce, erected by Galla Placidia in the second quarter of the 5th Century.

The outside of the building is very sober compared to the magnificence of the inside, decorated with mosaics made even brighter by the golden light filtering through the alabaster windows. The lower surfaces of the interior are covered with marble slabs, while the upper part of the building – including the walls of the vault, the lunettes, and the cupola - is entirely decorated with mosaics. The themes represented in the mosaic decoration show traces of the influence of both Hellenic-Roman and Christian tradition and aim at representing the victory of eternal life over death from different perspectives.

The atmosphere of the Mausoleum of Galla Placidia is undoubtedly magical. The countless stars of the dome have deeply stirred the imagination of many visitors of Ravenna, for instance, Cole Porter who, during his honeymoon in the city, was so impressed by the starry sky of the small mausoleum that he wrote his famous song Night and Day.

Fig.2.33/
Mausoleum of Galla Placidia

02/ Basilica of San Vitale

The Basilica of San Vitale is one of the most important monuments of Early Christian art in Italy, especially for the splendour of its mosaics. Founded by Julianus Argentarius and commissioned by Bishop Ecclesius, the octagonal church was consecrated by Archbishop Maximian in 548.

The influence of oriental art, a typical feature of Ravenna buildings, plays a dominant role both for the architecture of the basilica, where elements of Eastern art merge with Western tradition and for its mosaic decoration, which expresses the ideology and religious beliefs of the Justinian era. The typical division into nave and two aisles is replaced here by a central, octagonal plan, topped by a cupola that rests on eight pilasters and arches. The cupola and the niches were frescoed in 1780 by Bolognese painters Barozzi and Gandolfi and Guarana from Veneto.

On entering the Basilica of San Vitale, the eyes are captured by the elevation and width of spaces, by the stunning mosaic decorations of the apse and by the baroque frescoes of the cupola. It is probably due to this upward thrust that a small and lesser-known treasure often goes unnoticed: a labyrinth is represented on the floor of the presbytery, right in front of the altar. Small arrows start at the centre of the labyrinth and lead towards the centre of the basilica, going through a winding path. In the early years of Christianity, mazes were often the symbol of sin and of a possible purification. Finding the way out of the maze thus represented an act of rebirth. Once followed the path of the labyrinth, the eyes may contemplate the altar of San Vitale and some of the most beautiful mosaics of Christendom.

Fig.2.34/
Basilica of San Vitale

03/ Mausoleum of Theodoric

This is the only historical remains without mosaic art in Ravenna. The Mausoleum was built by Theoderic in 520 AD, as his burial place. Entirely made of Istrian stone, its structure is divided into two decagonal orders placed one on top of the other. The upper level is topped by a big monolithic dome with twelve square arches bearing the names of eight apostles and four evangelists. Its dimensions are surprising: it measures 10,76m in diameter and 3,09m in height. According to recent calculations, it weighs 230 tons.

A niche leads to the inferior order which was probably a former cruciform-plan chapel, originally used for religious services. An external staircase leads to the upper floor, that houses a circular porphyry tub where Theoderic was presumably buried. After Justinian's edict in 561, during the Byzantine domination, his remains were removed from the Mausoleum that was turned into an orthodox oratory.

Fig.2.35/

Mausoleum of Theodoric

04/ Basilica of Sant'Apollinare in Classe

The Basilica of Sant'Apollinare in Classe rises in all its solemn grandeur at a distance of 8 kilometres from the centre of Ravenna. Commissioned by archbishop Ursicino, the church was built by Julian Argentarius during the first half of the 6th century, on an ancient burial area used in the late 2nd or early 3rd century. Apparently, Saint Apollinaris - one of the first bishops of Ravenna - was buried here.

Sant'Apollinare in Classe has been described as the most impressive Basilica of the Early Christian period. Despite the plundering it suffered over the centuries, the basilica has preserved the splendour of its original building. It is now admired for its beautiful polychrome apse mosaics and ancient marble sarcophagi of archbishops, placed along the aisles.

Fig.2.36/

Basilica of Sant'Apollinare in Classe

05/ Neonian Baptistery

The Neonian Baptistery is one of the most ancient monuments of the city of Ravenna. It was commissioned by Bishop Urso and probably built at the beginning of the 5th century like the nearby cathedral. During the episcopacy of Neon (450 - 475), the baptistery underwent many restoration works that ended with the reconstruction of the cupola and the realization of the interior decoration, still present today.

The brick building is octagonal in shape and has four big external niches. On every side, rounded windows and underground doors can be seen from the inside of the church.

The interior of the baptistery consists of two rows of arches put one above the other. Its decoration is divided into three tiers, the lower one covered with marble pieces, the middle one with stucco-works, while the upper section is adorned with mosaics of Hellenic-Roman influence. At the centre of the dome, a big medallion frames the Baptism of Christ, depicted as a young man immersed in the hips in the sheer waters of the river Jordan.

06/ Chapel of Sant'Andrea

The Chapel of Sant'Andrea or Archiepiscopal Chapel is the only existing archiepiscopal chapel of the early Christian era that has been preserved intact to the present day. It was erected by Bishop Peter II (494-519) during the reign of Theodoric as a private oratory for Catholic bishops when Arianism was the main religion of the court. Originally dedicated to Christ, the chapel was then renamed and dedicated to Saint Andrew, whose relics were transported from Constantinople to Ravenna around the mid-6th century AD.

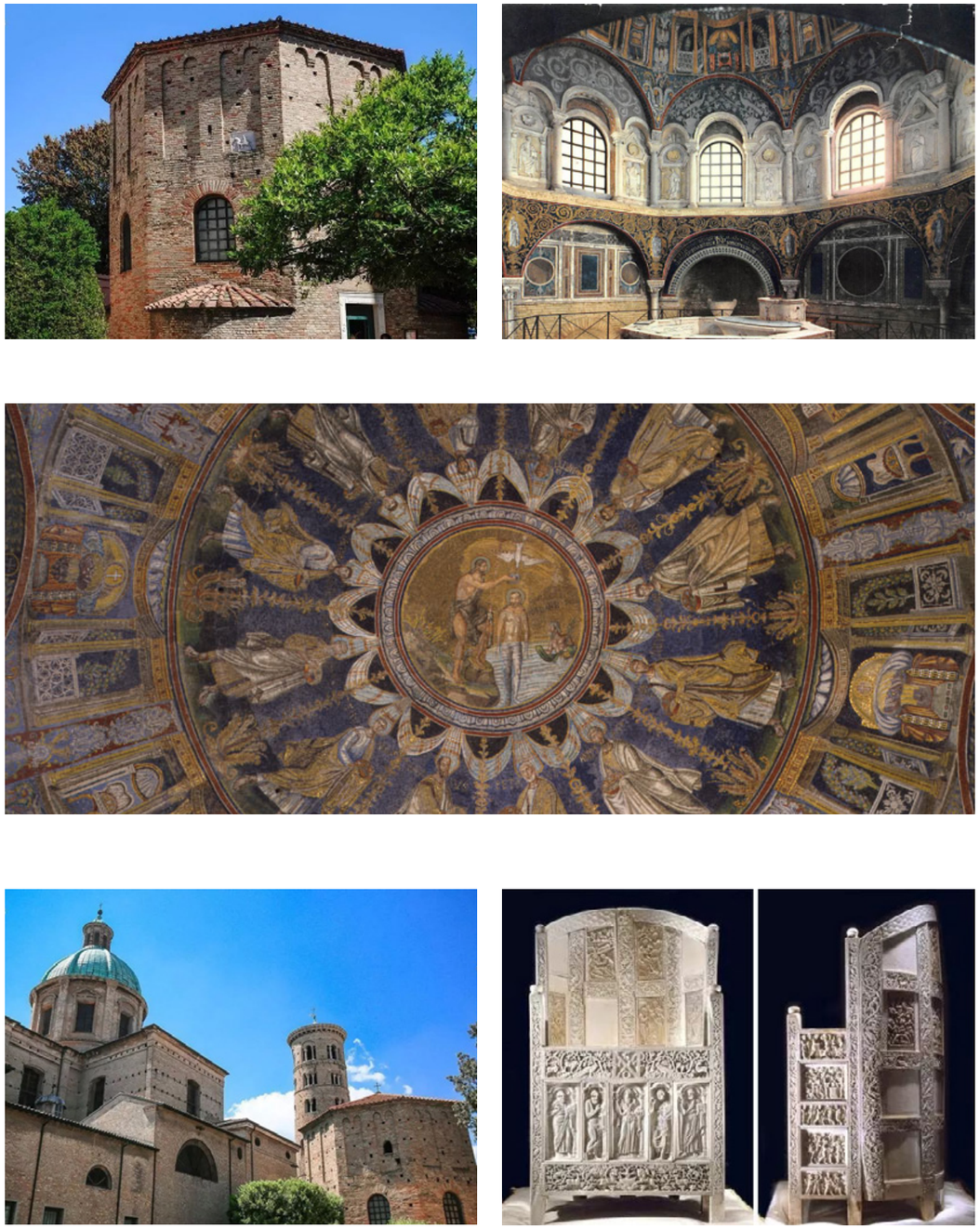


Fig.2.37/
Neonian Baptistery

07/ Basilica of Sant'Apollinare Nuovo

The Basilica of Sant'Apollinare Nuovo, built by Theoderic (493-526) next to his palace, was originally used as a Palatine Church of Arian religion. After the Byzantine reconquest and consecration to the orthodox faith (mid-6th century), the Basilica was dedicated to St. Martin, bishop of Tours. Tradition has it that in the 9th century the relics of St. Apollinaris were removed from the Basilica of Sant'Apollinare in Classe and transported here. On that occasion, the church was dedicated to Saint Apollinaris and called "Nuovo" (new) in order to differentiate it from the church of the same name in Classe.

The gabled façade of the Basilica is marked by two side pilasters and provided with a mullioned window, topped by two small openings. Originally, it was probably delimited by a four-sided porch; today it is decorated with a simple but well-balanced 16th-century marble porch. On the right side of the façade rises a cylindrical bell-tower dating back to the 9th or 10th century.

Inside the building, you can admire the magnificent mosaic decoration of the original church documenting the stylistic, iconographical and ideological evolution of Byzantine wall mosaics from the era of Theoderic to that of Justinian.

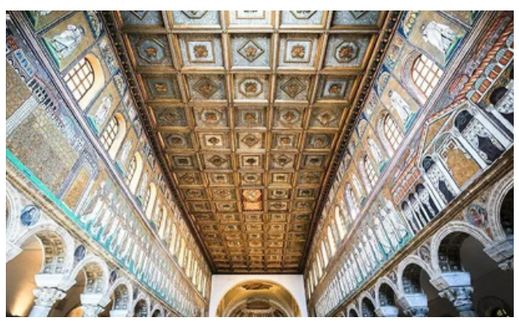


Fig.2.38/

Basilica of Sant'Apollinare Nuovo

08/ Arian Baptistry

At the end of the 5th Century, when Theoderic had already consolidated his dominion and Arianism had become the official religion of the Court, the Arian Baptistery was built in the small square of the church of the Holy Spirit, the former Arian cathedral.

The building, octagonal in shape and with four small external apses, has sunk about 2.3 metres into the ground. Nothing remains of the various stuccos and decorations which certainly covered the internal walls. The cupola, instead, is adorned with mosaics depicting the procession of the twelve Apostles and the baptism of Christ, whose naked and young body is immersed in water to the hips.

Although it shows the same iconographical structure of its model, the Baptistery of Neon, the mosaics of the Arian Baptistery are an evidence of the religious beliefs of Theoderic's court, based on Christ as both an earthly and divine figure.

While in the Orthodox Baptistery the 12 apostles hail the image of Christ on the central medallion as God's son, in the Arian Baptistery they pay homage to a big throne decorated with gems and topped by a cross, from the arms of which hangs a purple cloth, symbol of Jesus' corporeity and human suffering.

Fig.2.39/

Arian Baptistry

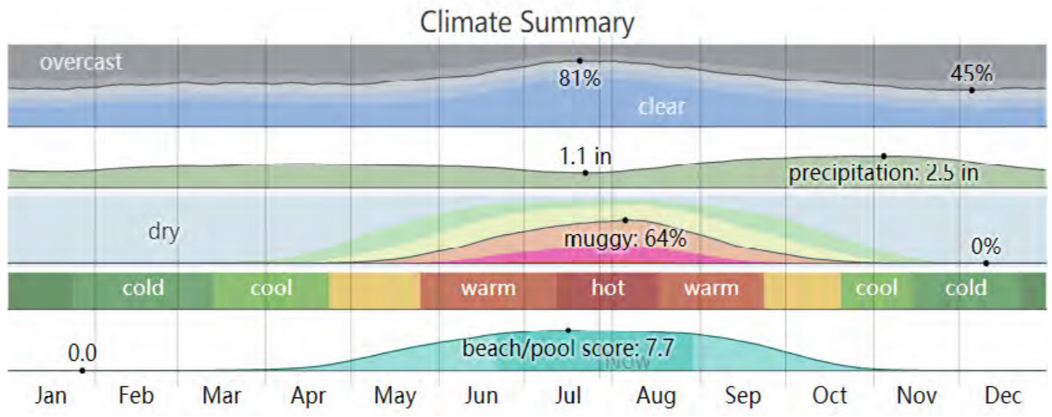
2.4.3/ Geographic Climate Research

1/ Average Weather Data in Ravenna

In Ravenna, the summers are warm, humid, and mostly clear and the winters are very cold and partly cloudy. Over the course of the year, the temperature typically varies from 32°F to 86°F and is rarely below 25°F or above 93°F.

Based on the beach/pool score, the best time of year to visit Ravenna for hot-weather activities is from late June to late August.

Fig.2.40/
Ravenna Geographic Climate Data 01



2/ Temperature

The hot season lasts for 3.2 months, from June 5 to September 12, with an average daily high temperature above 78°F. The hottest day of the year is August 1, with an average high of 86°F and low of 67°F.

The cool season lasts for 3.4 months, from November 22 to March 3, with an average daily high temperature below 52°F. The coldest day of the year is January 13, with an average low of 32°F and high of 44°F.

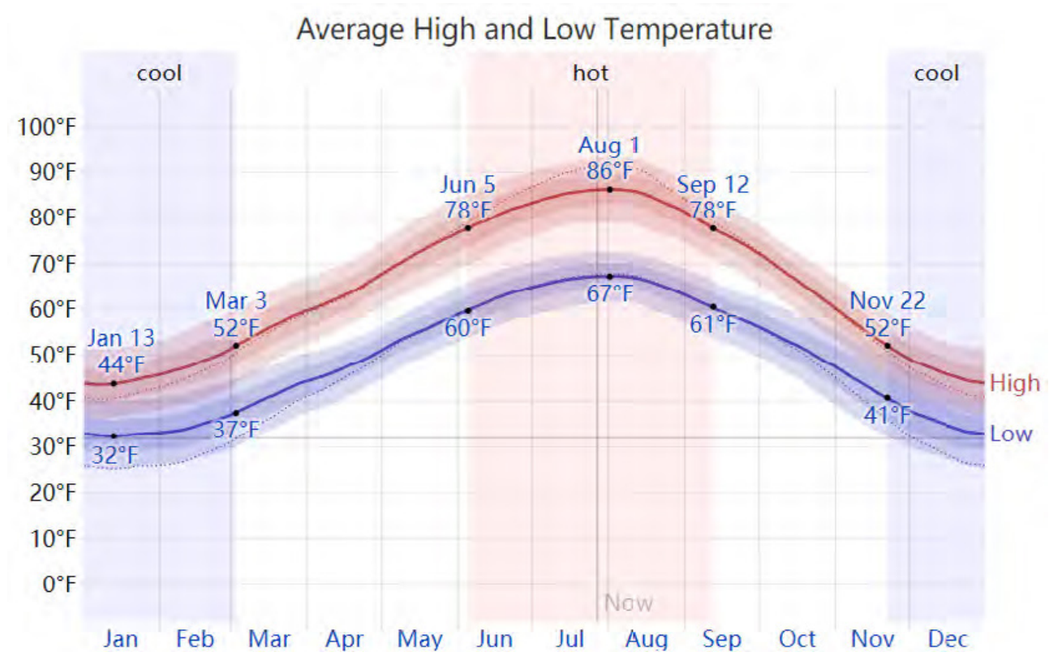
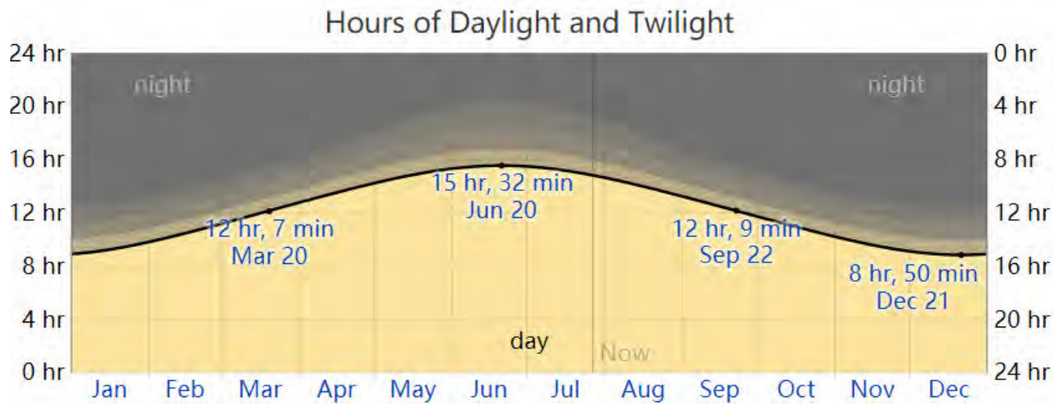


Fig.2.41/
Ravenna Geographic Climate Data 02

3/ Sun

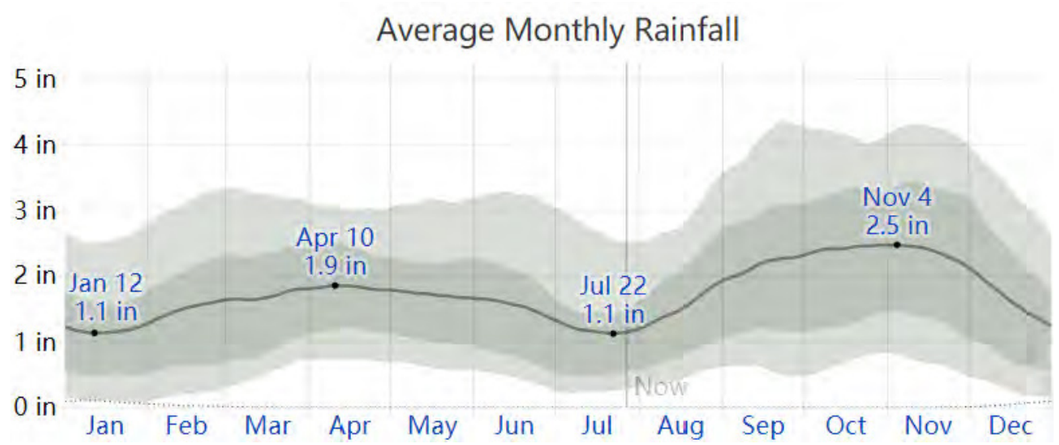
The length of the day in Ravenna varies significantly over the course of the year. In 2020, the shortest day is December 21, with 8 hours, 50 minutes of daylight; the longest day is June 20, with 15 hours, 32 minutes of daylight.



4/ Rainfall

To show variation within the months and not just the monthly totals, we show the rainfall accumulated over a sliding 31-day period centered around each day of the year. Ravenna experiences some seasonal variation in monthly rainfall.

Rain falls throughout the year in Ravenna. The most rain falls during the 31 days centered around November 4, with an average total accumulation of 2.5 inches. The least rain falls around July 22, with an average total accumulation of 1.1 inches.



5/ Wind

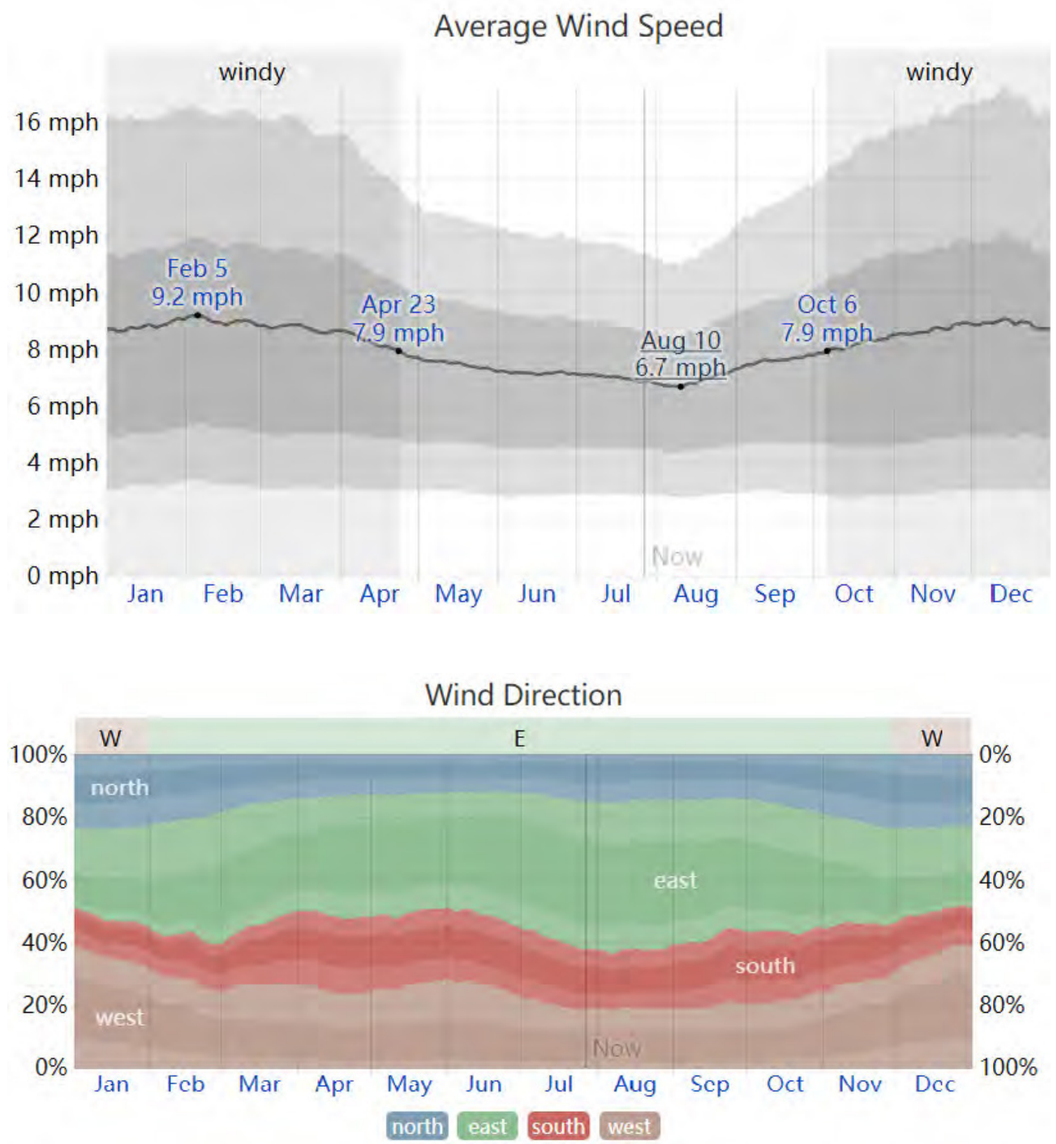
This section discusses the wide-area hourly average wind vector (speed and direction) at 10 meters above the ground. The wind experienced at any given location is highly dependent on local topography and other factors, and instantaneous wind speed and direction vary more widely than hourly averages.

The average hourly wind speed in Ravenna experiences mild seasonal variation over the course of the year. The windier part of the year lasts for 6.6 months, from October 6 to April 23, with average wind speeds of more than 7.9 miles per hour. The windiest day of the year is February 5, with an average hourly wind speed of 9.2 miles per hour.

The calmer time of year lasts for 5.5 months, from April 23 to October 6. The calmest day of the year is August 10, with an average hourly wind speed of 6.7 miles per hour.

The wind is most often from the east for 10.0 months, from January 30 to November 29, with a peak percentage of 48% on August 8. The wind is most often from the west for 2.0 months, from November 29 to January 30, with a peak percentage of 39% on January 1.

Fig.2.42/
Ravenna Geographic Climate Data 03



2.3/ Theory Research&Case Study

Being based on the cultural environment, geographic property and building style of the project where the offshore drilling that we plan to rebuild is located, we will conduct design theoretical research from three aspects.

1.Adaptive reuse: Learn about the design methods and strategies of renovation projects, gain experience through relevant renovation design cases and apply them to the next design stage.

2. Deconstructivism in architecture: To understand the process from structural objects to dismantling elements to reorganization into a new spatial order.

3. Spatial narrative: The narrative technique of learning space applies this theory to the organization of spatial elements and flow lines.

2.3.1/ Adaptive reuse

1/ Definition:

Adaptive Reuse is defined as the aesthetic process that adapts buildings for new uses while retaining their historic features. Using an adaptive reuse model can prolong a building's life, from cradle-to-grave, by retaining all or most of the building system, including the structure, the shell and even the interior materials. This type of revitalization is not restricted to buildings of historic significance and can be a strategy adopted in case of obsolete buildings.

2/ Purpose:

Adaptive reuse is dedicated to repurpose buildings that have outlived their original purposes for different uses or functions while at the same time retaining their historic features.

3/ Value:

1.Cost savings on building material, demolition.
2.Saves time; faster than brand new construction.
3.Conserves energy.
4.Avoid the generation of construction waste.
5.Protect the value of local history remains or culture memory

Fig.2.43/
Markthal Rotterdam MVRDV

Typical Cost per Square Foot Range:
New Build vs Historic Adaptive Reuse

(for a >50,000 SF building in the US Mid-Atlantic Region)

Building Type	New Build	Historic Adaptive Reuse*
Higher Education Classroom	$425 - $550 SF	$325 - $475 SF
High School Classroom	$300 - $500 SF	$275 - $375 SF
Commercial Office	$250 - $300 SF	$225 - $300 SF
Museum	$700 - $1,300 SF	$600 - $900 SF

Fig.2.44/
Cost Comparision Between New Building And Reuse Building

4/ Strategy:

1.Reprogramming: Reprogramming refer to using an item again, whether an object, edifice, or an idea, that has been repurposed with a new use. It is a deliberate and selective process in which the elements are withdraw from their current context and placed into an new one, often in a way for which they were never originally intended. Reprogramming is an approach that can be used when a building no longer fits its purpose. Its is a strategy that can be used to recolonize space that may had a difficult or unusual past.

2.Invention: Invention is a strategy that can integrate the existing building with the element of new use but always in a very distinct and clear way. It is a strategy that involves the robust imposition of the new into the old yet with a subtlety that creates a harmonious space and one where both are often integrated. It can result in a type of methodology or process, one that may involve repair and selective demolition, in order to create a suitable and appropriate basis for intervention.

3.Superuse: Superuser is a strategy that involves the recycling of wast and its incorporation into new objects and edifices. It is included three flows. One is the utilization of product waste, which included reworking cut-offs, leftovers, and elements that cannot be recycled back into the flow of production. The second is utilization of materials that can be withdraw from their production process and reused in another context. The third process is place the product when it has reached the end of its lifecycle into a context.

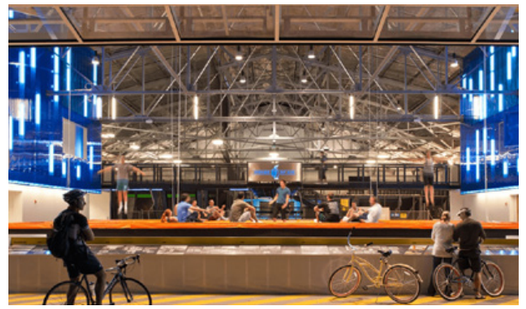


Fig.2.45/

Reprogramming: House of air

Fig.2.46/

Invention: Astley Castle

Fig.2.47/

Superuse: Villa Welpeloo

Fig.2.48/

Artifice: Portrait pavilion

Fig.2.49/

Installation: Duomo cathedral museum

Fig.2.50/

Narrative: shoah memorial in milan

4.Artifice: Using an artifice-based approach to design of an anything ensures that matter to be adapted will be crafted an assembly in such a way as to create an understanding with the intention to deceive, seduce, ot misinform its user.

5.Installation: An installation can be single object or a series objects; It might be concept, a performance, or a temporal or permanent space. The fundamental aspect of this approach is that an installation-based strategy will usually do two tings: It will set out to heighten the drama between itself and the environment and it will emphasize its content rather than the way which it was constructed. If it is site-specific, It will enhancement of the environment though distillation of its qualities

6.Narrative: The narrative design have emphasized the importance of visitor experience. A range of technologies, ideas and designs can be used to create immersive, interactive narrative environment where the visitor can adjust or edit his or her own vision of the story that is being communicated. Narrative is used as an approach to adapting the existing environment, it enhances the continuous stories of building's pat, present and future.

7.On/Off Site: The strategy of on/off site is often used when it is more convenient to complete the construction of the new interior remotely to the host building. This approach involves the fabrication of objects, elements, rooms or even buildings in a long distance factory or the adjacent filed and they are transported to the site and fitted. The on/off site production is often formulated as one or two construction method: one-off and batch.

Fig.2.51/

On/Off Site: Dovecote Studio

8.Insertion: Insertion is a strategy that is used when a building that is to be adapted for a new use requires and some kind of auxiliary construction. In general, old building do not always fulfill contemporary requirements for comfort, space, new function, and technical requirements. Therefore, if they are not to be demolished, their will be adaptively inserted new and different spatial form or element for fulfill the requirement, as well as the upgrade and modernization of building services and technical standards.

Fig.2.52/

Insertion: Medialab-Prado

Fig.2.53/

New Tate Modern, 2006, Herzog & de Meuron

Case Study 01_New Tate Modern

01/ Introduction:

Tate Modern was converted from the Bank Side Power Plant. In 2000, Herzog & De Meuron completed the first renovation. In 2005, Herzog & De Meuron once again won the competition for the expansion of this museum. New Tate Modern opened to the public on June 17, 2016, becoming a model for 21st century museums. After the expansion, the Tate Modern Art Museum has undergone significant changes. It was designed by Herzog & de Meuron and added another spectacular building to bring 60% of the additional space to the museum and at the same time make the museum more open to the surrounding environment .

02/ Value:

Since Tate Modern opened to the public in 2000, its influence has spread throughout London. Through the renovation and transformation of the abandoned Bankside Power Station, it was transformed into a collection of international modern and contemporary art in the UK. The new building activated the revival of the area and shaped a new landmark along the Thames. The completion of the new building will make the museum the most important cultural building in the UK in 20 years, and also complete the transformation of the area into a highly accessible public platform.

03/ Strategy:

Herzog & De Meuron has always maintained an idea of "adaptive transformation based on respect for the original": their actions are "simple and pure", "almost keeping the site and building intact", and "retaining a shell that can be recalled." On the basis of ", the interior has been highly adaptable through sophisticated architectural techniques of repeated scrutiny.

The original Boiler House of the power station was transformed into an art gallery, learning studio and social space, while the Turbine Hall was transformed into a large public open space to host special festivals.

On the south side of the Turbine Hall, the original Switch House of the power station was transformed into a 10-story building. The new Switch building is composed of 330,000 bricks and forms the surface of the Kongge and echoes the masonry structure of the original power plant. Its foundation is composed of cylindrical underground tanks, each more than 30 meters long, creating a world-class museum. A series of spaces that serve on-site art, installations and movies. These spaces not only lay a solid physical foundation for the Switch Building, but also the origin of the design concept, providing diverse spaces for the new museum. Above it is a three-story world-class art gallery, creating a flexible space that not only provides a small-scale environment, but also an art space with giant top lighting.

In addition, the ancillary space carries functions such as learning and performing arts, as well as a new restaurant, bar and membership center. The top floor has a public terrace with a 360-degree panoramic view of the city. On the 4th floor of the existing Boiler Building Art Gallery, a bridge corridor leading to the new Switch Building Art Gallery is erected, and the Turbine Hall serves as the connecting core of the two buildings.

Fig.2.54/

Switch House,New Tate Modern,2006, Herzog & de Meuron

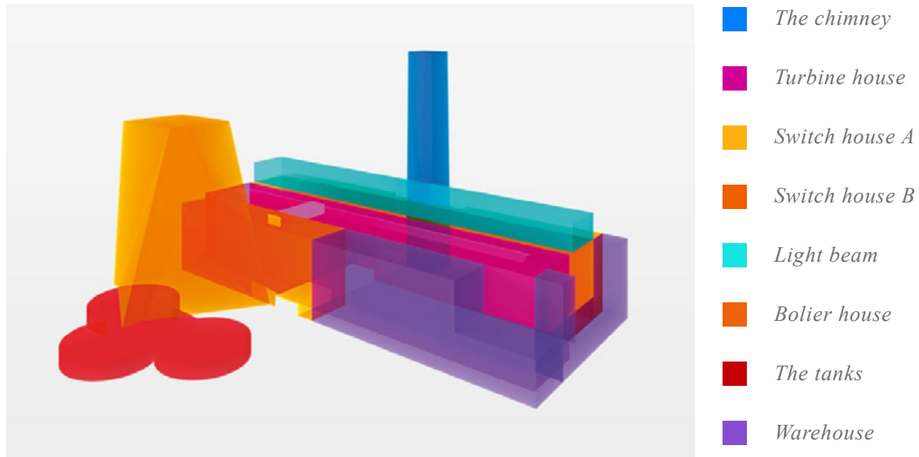


Fig.2.55/

Function Distribution,New Tate Modern,2006, Herzog & de Meuron

Fig.2.56/

Antwerp Port House, 2016, ZAHA HADID Architect

Case Study 02_Antwerp Port House

01/ Introduction:

Antwerp is the second largest shipping port in Europe. In 2007, the Antwerp port could no longer meet the demand for use, so an abandoned fire station was turned into the new headquarters of the port. The old fire station on the island was originally built after a Hanseatic mansion. This abandoned fire station must be coordinated with the new building. In 2007, the construction department of the Flemish government, the city authorities of Antwerp, and the Port Authority jointly organized an architectural design competition for the new headquarters. There was only one rule: the original building must be retained. Thanks to its detailed historical research and in-depth analysis of the site and existing buildings, the design plan of ZAHA HADID Architect was finally selected.

02/ Value:

The cooperative building will provide comprehensive services for the future development of the port. The new port headquarters can accommodate 500 employees who were previously scattered throughout the city. Thanks to always considering the latest developments in the Scheldt River, Antwerp city and port; and the successful renovation and reuse of the abandoned fire station as an integral part of the new headquarters.

01/ Introduction:

The study of site history and cultural heritage is the basis of architectural design. The design first emphasizes the north-south axis of the site, which is parallel to the Kattendijk port area connecting the city center and the port. Secondly, because the site is surrounded by water on three sides, the four facades of the building are equally important, and there is no main facade. The design of ZHA is to raise and extend, rather than an adjacent volume that inevitably blocks the existing facade.

The combination of new and old parts in the design is defined by the following three key principles:

A new volume "floating" on the old building

Respect each original facade

Reproduce the vertical form of the original design without a tower.

The water area around the new volume is vast, and the facade uses glass curtain walls, like ripples, reflecting the changing colors of the sky. Triangular cutting makes the flat glass merge into a smooth curve at both ends of the building, realizing a smooth transition from the flat facade at the south end to the corrugated facade at the north end.

A glass roof was built above the central courtyard of the old fire station, which was transformed into the main reception area of the new port building. Visitors can enter the historic public reading room and library from this atrium; this was once an abandoned fire station garage, which has been carefully restored and protected. Through the panoramic sightseeing elevator, you can directly enter the interior of the new block. There is also an outdoor bridge between the original building and the new block to enjoy the panoramic view of the city and the port. The client's requirements for "active office" were integrated into the design. Related areas, such as restaurants, meeting rooms and auditoriums, are located in the upper center of the original building and the bottom of the new extension area. There are open-plan offices on the remaining floors further from the center.

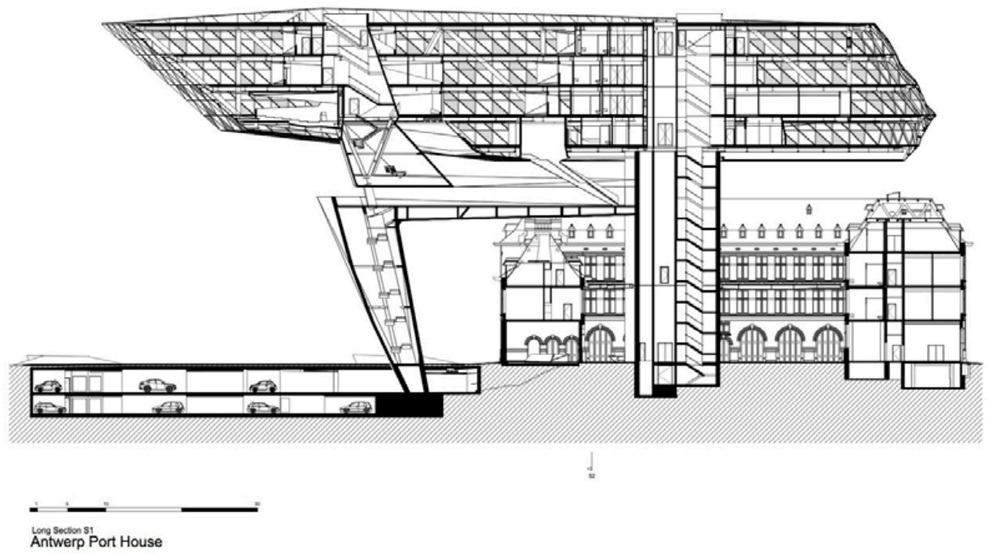


Fig.2.57/

Section picture, Antwerp Port House, 2016, ZAHA HADID Architect

Fig.2.58/

Interior space, Antwerp Port House, 2016, ZAHA HADID Architect

2.3.2/ Deconstrcutism in architecture

1/ Background:

During the First World War, Russia's constructivism developed rapidly. These Constructivists (Russian Constructivist) destroyed the composition laws of classical architecture and proposed a series of drawings that violated the “geometric norms” of the time. Their critical views and experiments on form destroyed traditional architectural concepts and allowed people to see the infinite possibilities of breaking architectural rules. Whether in art or architecture, the geometry becomes irregular.

At the same time as the Russian Constructivist movement, the modern movement is laying its own way. Perhaps because of the background of the times, people at that time blindly chose modernism. The decoration is stripped, leaving only clean, elegant and naked functions to go with people.

Modern architecture effectively solved the needs of human life and played a huge role in promoting the recovery of human civilization after the war. But it overemphasizes function and rationality, ignoring the regionality of architecture and human pursuit of diverse spiritual aesthetic needs. Its indifferent and single formal language has created a scene of square boxes with no individuality everywhere in the world.To resist this situation,the architect and architectural historian Robert Venturi led the attack in 1966 in his book, Complexity and Contradiction in Architecture. Venturi summarized the kind of architecture he wanted to see replace modernism:

“I speak of a complex and contradictory architecture based on the richness and ambiguity of modern experience, including that experience which is inherent in art. ... I welcome the problems and exploit the uncertainties. ... I like elements which are hybrid rather than “pure”, compromising rather than “clean”, ... accommodating rather than excluding. ... I am for messy vitality over obvious unity. ... I prefer “both-and” to “either-or”, black and white, and sometimes gray, to black or white. ... An architecture of complexity and contradiction must embody the difficult unity of inclusion rather than the easy unity of exclusion.”

This style flourished from the 1980s to the 1990s, especially the works of Venturi, Philip Johnson, Charles Moore and Michael Graves. In the late 1990s, it was divided into a variety of new trends, including high-tech architecture and deconstruction.

Fig.2.59/

Villa Savoye Le Corbsier,1928-1930

Fig.2.60/

Tatlin's Tower, Vladimir Tatlin,1919–1920

Fig.2.61/

AT&T Building(1984),Philip Johnson&John Burgee

Fig.2.62/
Walt Disney Concert Hall, 2003, Frank Gehry

Fig.2.63/
Jewish Museum Berlin, 2001, Daniel Libeskind

2/ Definition:

The theory of Deconstructivism originated from the French philosopher Jacques Derrida and Russian Constructivism in the 1920s. Deconstructivism is an architectural movement in the postmodern era that emerged in the 1980s. Derrida is a friend of Peter Esenman. He proposed the idea of architecture decentralization and was influenced by Russian Constructivism to explore the asymmetry of geometric shapes.

"Deconstruction" corresponds to "structure". Deconstructivism is to break the existing unitary order, emphasizing breaking, superimposing, and reorganizing. It values individuality and change, and opposes unity and fixation. Deconstructive architecture gives people a feeling of fragmentation, it lacks the harmony, sequency and symmetry of traditional architecture. In addition, deconstructionism often manipulates the architectural skin, combined with non-linear manipulation techniques, through the distortion and dislocation of architectural elements, to complete the unpredictability and controllable chaos in the visual appearance.

3/ Purpose:

Deconstructivism is not an architectural style or design movement, it is an idea. While maintaining the functionality of the building (influenced by modernism), it explores the asymmetry of architectural geometric forms (influenced by constructivism), trying to break the inherent order in the traditional architectural system and then release the infinity of volume and form possibility. It uses rational elements to express irrational connotations. Through the process of dismantling to reorganization, the original order and mindset are destroyed and reconstructed.

4/ Value:

Deconstructivism is a design method that breaks the modernist design rules, ignoring the result and emphasizing the process. The law of form following function is ignored, but the exquisite elegance of modernism and the emphasis on function are also reflected. Most architects refuse to label themselves deconstructivism and keep themselves away from any kind of movement

5/ Feature:

Resolve opposition, oppose authority, no fixed form

6/ Event:

Deconstructivism attracted public attention in the 1982 "La Villette Park" architectural design competition (especially the entry works of Jacques Derrida and Peter Eisenman and the award-winning works of Bernard Tschumi) and the 1988 MoMA Deconstructivism Exhibition. New York is organized by Philip Johnson and Mark Wigley. The exhibition features Frank Gehry, Daniel Libeskind, Rem Koolhaas, Peter Eisenman Samman), Zaha Hadid, Coop Himmelblau (Blue Sky Group) and Bernard Tschumi (Bernard Tschumi).

As a design mode, deconstructivism is more difficult to define than many previous and contemporary architectural design theories. Like later modernism, Deconstructivism is a rejection and response to modernist architecture. It protested the scientific rationalism in the architectural world from the First World War to the 1970s with its irregular geometric forms and dynamic forms. It also distinguished from postmodernism, and finally got a kind of modernism and postmodernism. Something in between.

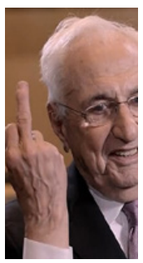
Fig.2.64/

1988 MoMA 'Deconstructivism' exhibition

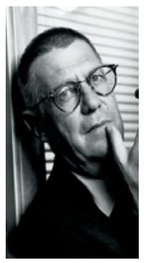
Fig.2.65/

"Deconstructivism Seven Architect"

Daniel Libeskind



Frank Gehry



Coop Himmelblau

Rem Koolhaas

Peter Eisenman

Bernard Tschumiry

Zaha Hadid

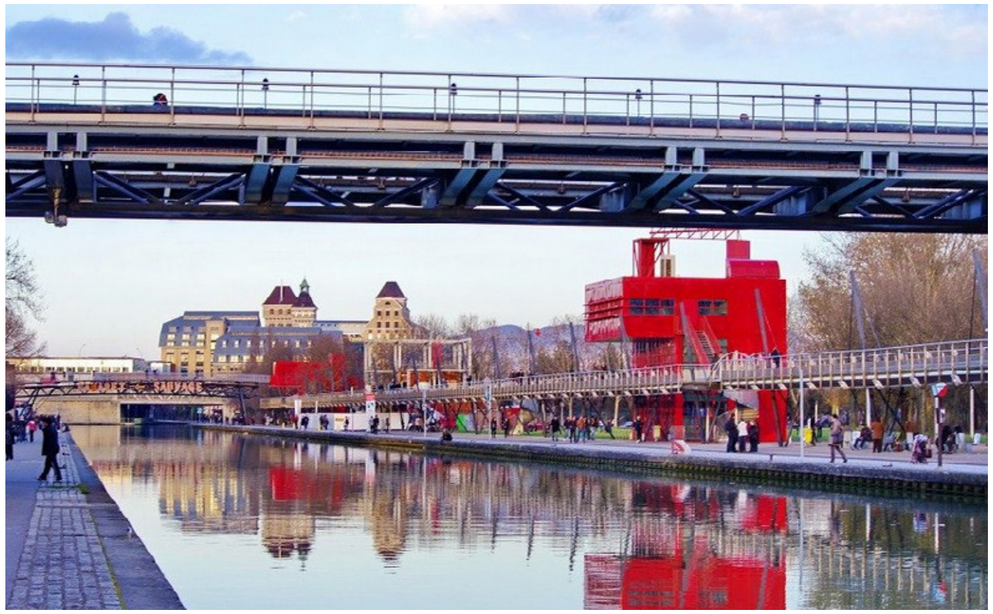


Fig.2.66/

La Villette Park, 1987, Bernard Tschumi

Case Study 01_La Villette Park

01/ Introduction:

La Villette Park was designed by Bernard Tschumi in 1987 to commemorate the 200th anniversary of the French Revolution, setting off a wave of deconstruction in the world. La Villette Park, built in 1987, is located in the northeast of the center of Paris, France. It covers an area of 55 hectares. The city canal runs through it. It is the largest public green space in Paris. It is open 24 hours a year for free. La Villette Park is an open urban green space. The park is always full of tourists of all ages and backgrounds from all over the world. Young people play football on the grass, rollers on the pavement, children play in the theme park, and the elderly enjoy coffee under the big umbrella outside the coffee shop. Tourists from all over the world may wander in the shade and sunshine. The theme park brings surprises, or participates in the rich activities arranged by the park. The park is full of fun and vitality for city residents and tourists from all over the world to see each other and enjoy each other.

02/ Strategy:

The basic design principle of the project is the superposition of three basic morphological systems: point, line and surface. The lattice system consists of a grid of 10m square. The linear system is a set of basic coordinate systems. The area system is a set of pure geometric figures: circles, squares and triangles. Independently, each system begins with an idealized traditional order mechanism. However, when they are superimposed together, they will produce distortions, hedges or mutual respect and integration. Sometimes they reinforce each other and sometimes they oppose each other. This creates a space of chaos and impurities in absolute purity. All three systems were disturbed and torn apart by other systems. The elements are not combined in the same orthogonal system, but embedded in each other in an orthogonal system that is unstable relative to another system. The assembly has produced many new stable forms after scrutiny and thinking. The basic form of the building is a cube, which is decomposed in the mutual embedding of the system to adapt to different functional requirements (restaurants, arcades, etc.) through further deformation and refinement.

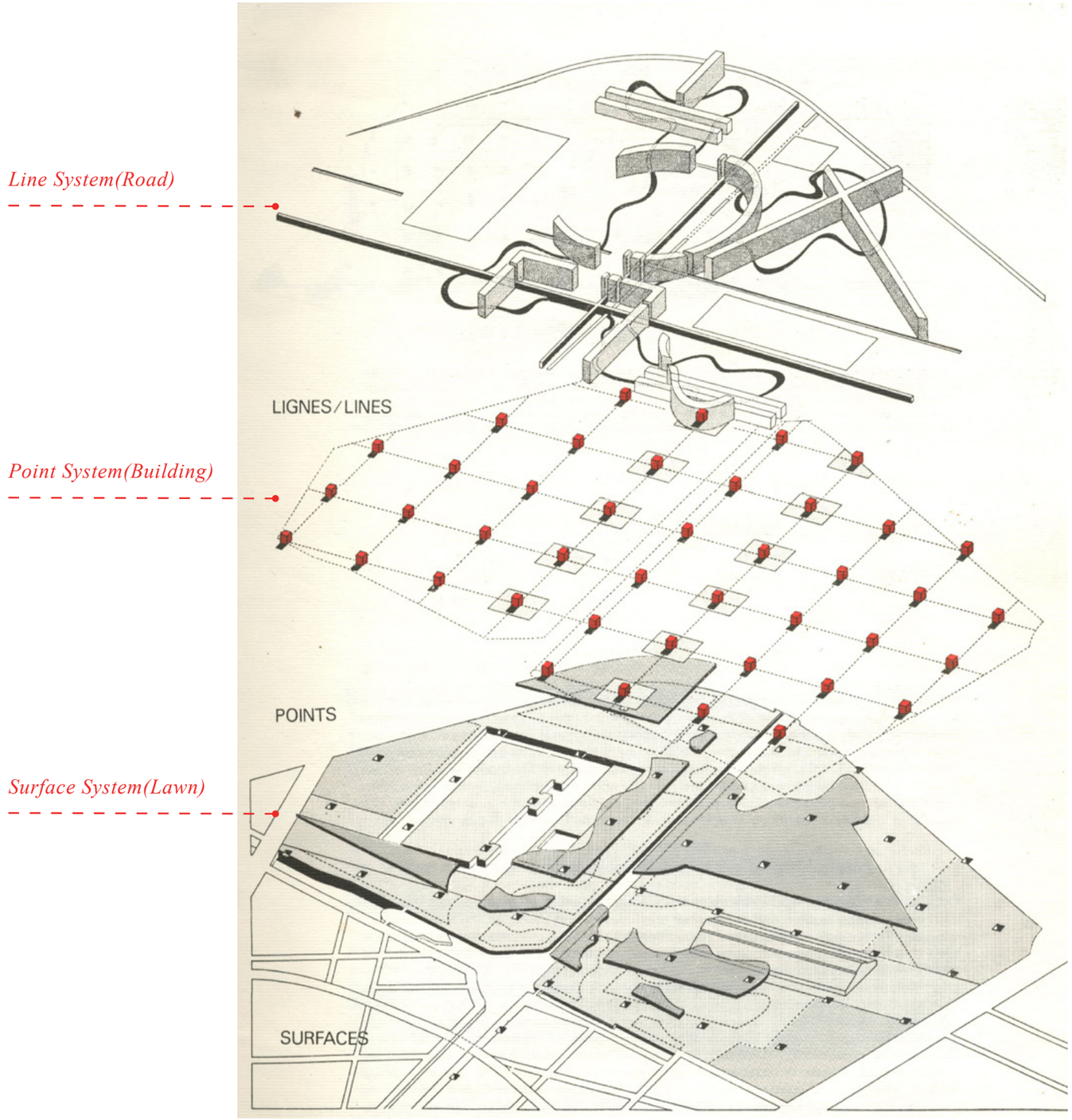


Fig.2.67/

Exploring Digram of La Villette Park

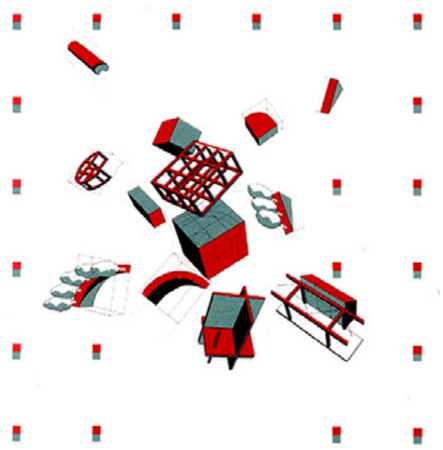


Fig.2.68/

Folies Deconstruction

1.Derived from basic geometry

2.Deconstructed into broken elements

3.Reorganized into a discontinuous building system

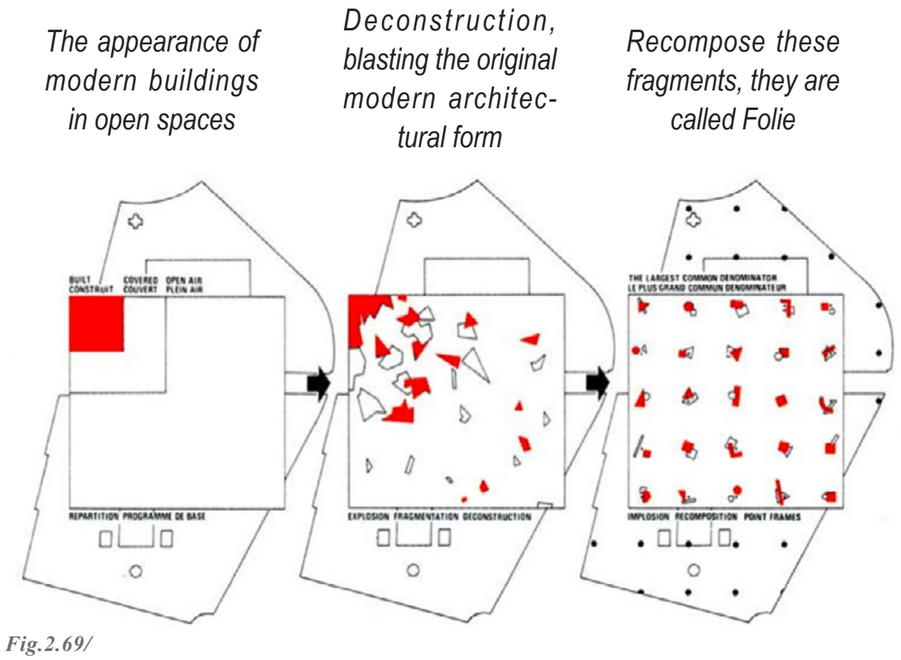


Fig.2.69/

The Process of Red follies

Point system:

Tschumi first constructed a 120mx120m grid on the base site, and set up a dazzling red building at about 40 intersections in the grid. Qumi called it Folie (crazy thing), which constitutes an element of the "dot" system in the park. The basic form of the building is a cube grid with corresponding accessories. According to the different themes of Folies, this cube will not only be decomposed but also embedded in different components through further deformation and refinement to adapt to different functional requirements (restaurant, Arcades, etc.).

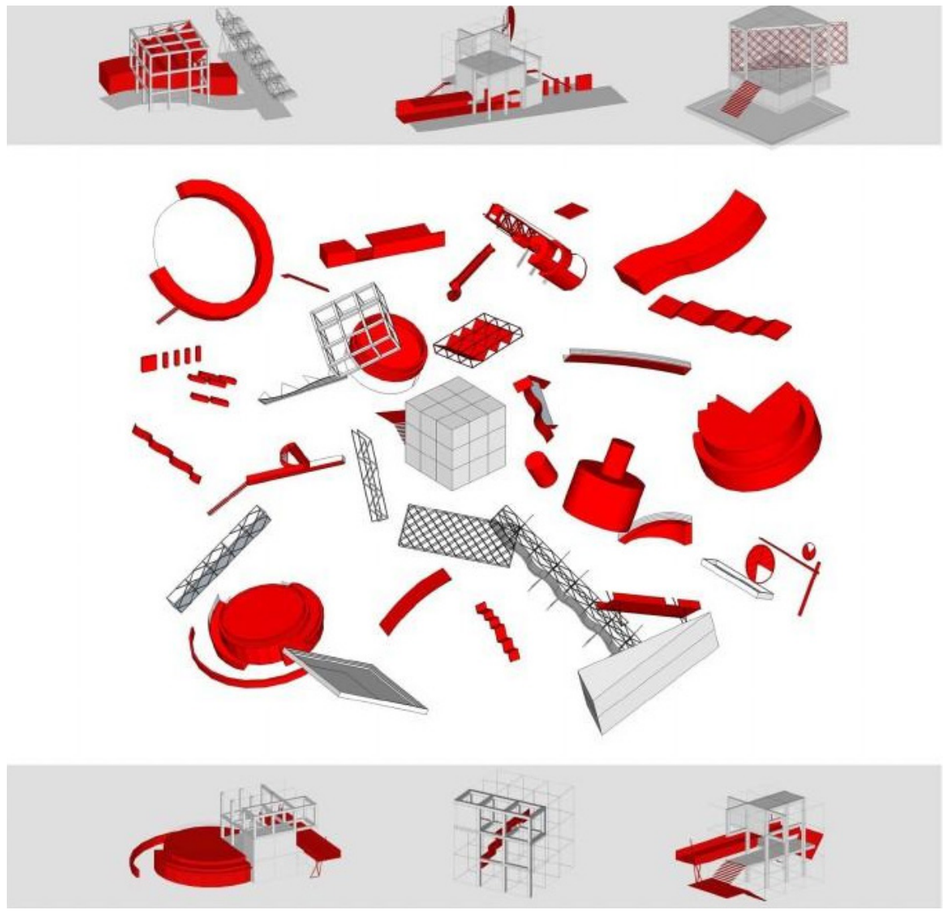


Fig.2.70/

Cube&Component in Folies System

Line system:

The line system represents the road system in this project. What the road system deconstructs is the level of park roads (essential), not the simple superposition of road forms (surface). From the beginning of the initial plan in 1982, Jumi constructed roads of the same level (square, round, Triangle, curve). After three rounds of adjustments in the later period, the road layout of La Villette Park we see now was formed in 1986:

·Two roads (elevated) from north to south and east to west (parallel to the canal)

·The two sides of the triangle are used as boulevards

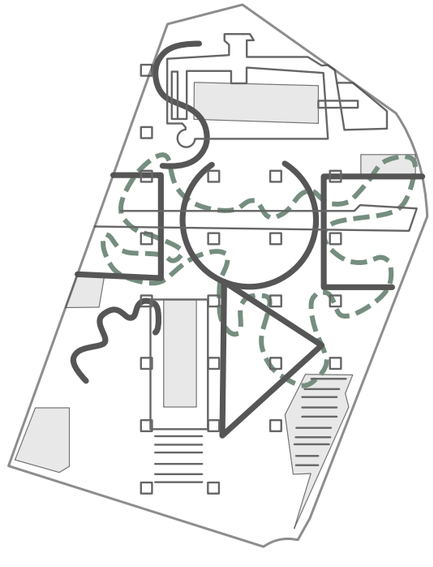
·Circular road, enclosing lawn space, accepting canal

·A curvilinear walking trail that connects the scattered nodes

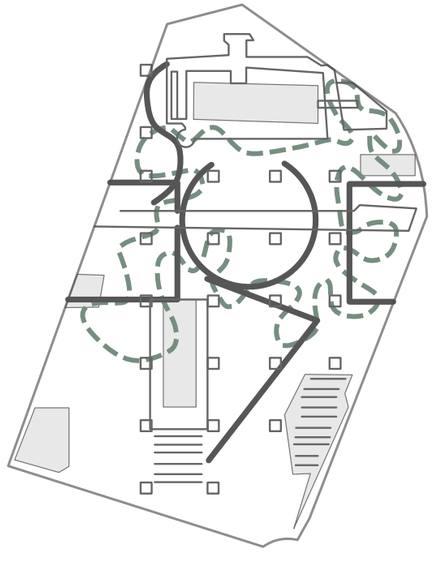
These roads are not classified, have the same width, and are connected

Fig.2.71/

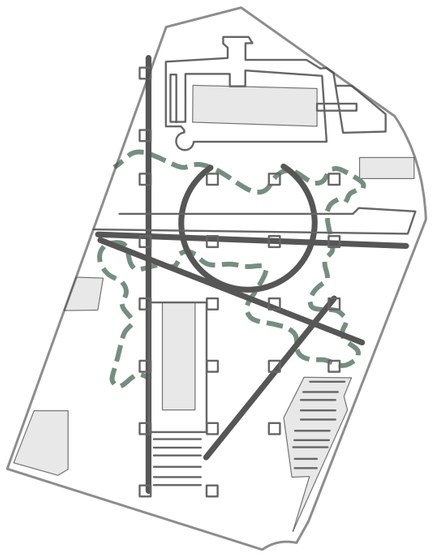
La Villette Park Line system



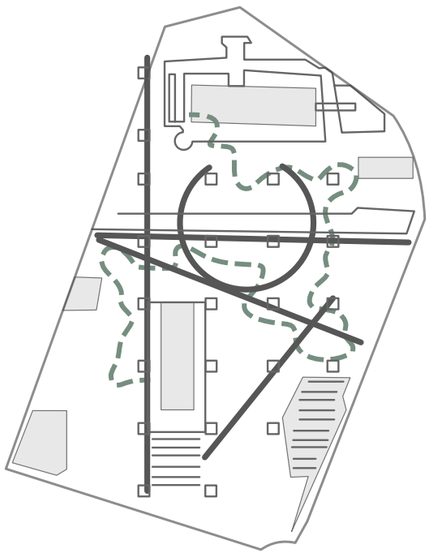
Road Scheme in 1982



Road Scheme in 1983



Road Scheme in 1986



Final Scheme in 1983

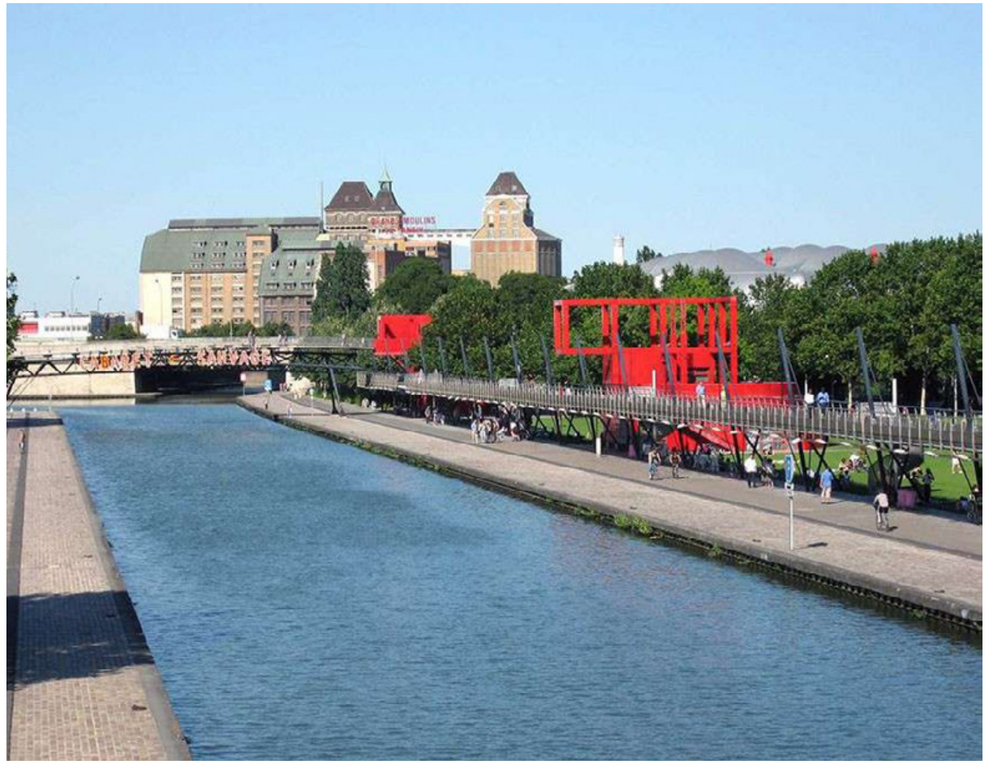


Fig.2.72/
La Villette Park Riverside View

Fig.2.73/
La Villette Park Birdview

2.3.3/ Spatial narrative

1/ Definition:

Narrative has many manifestations in architecture, which can be roughly divided into narrative architecture and architectural narrative, which are two different concepts. If it is a narrative building, it must finally be implemented in the form and performance of the building. This methodology can be embodied in the deconstruction and translation of the narrative text, and finally embodied in the built space; but the narrative of the building is not necessarily Existing in the form of an entity, it can be text, hand-painted, or a video showing a certain space. Whether in architectural conception, design, construction or experience, we can see the narrative of architecture.

2/ Origin:

As a representative of the narrative architecture school, Nigel Coates said that “every culture expects architecture to carry and continue information, and to exist as a link between life”. The modernist architecture of the twentieth century pursued the minimum functional requirements and production efficiency, and tried to free the architecture from the shackles of decorativeism. However, any built space will inevitably produce cultural "communication" with the crowd. Every ordinary person has his own story, has a unique growth environment and background, these differences will create a different understanding of space. A perceptual person can trigger the narrative of space in any environment. From the individual to the public, from the inside to the outside, from individual growth to collective memory, and even in the process of architectural conception to completion, narrative takes place naturally.

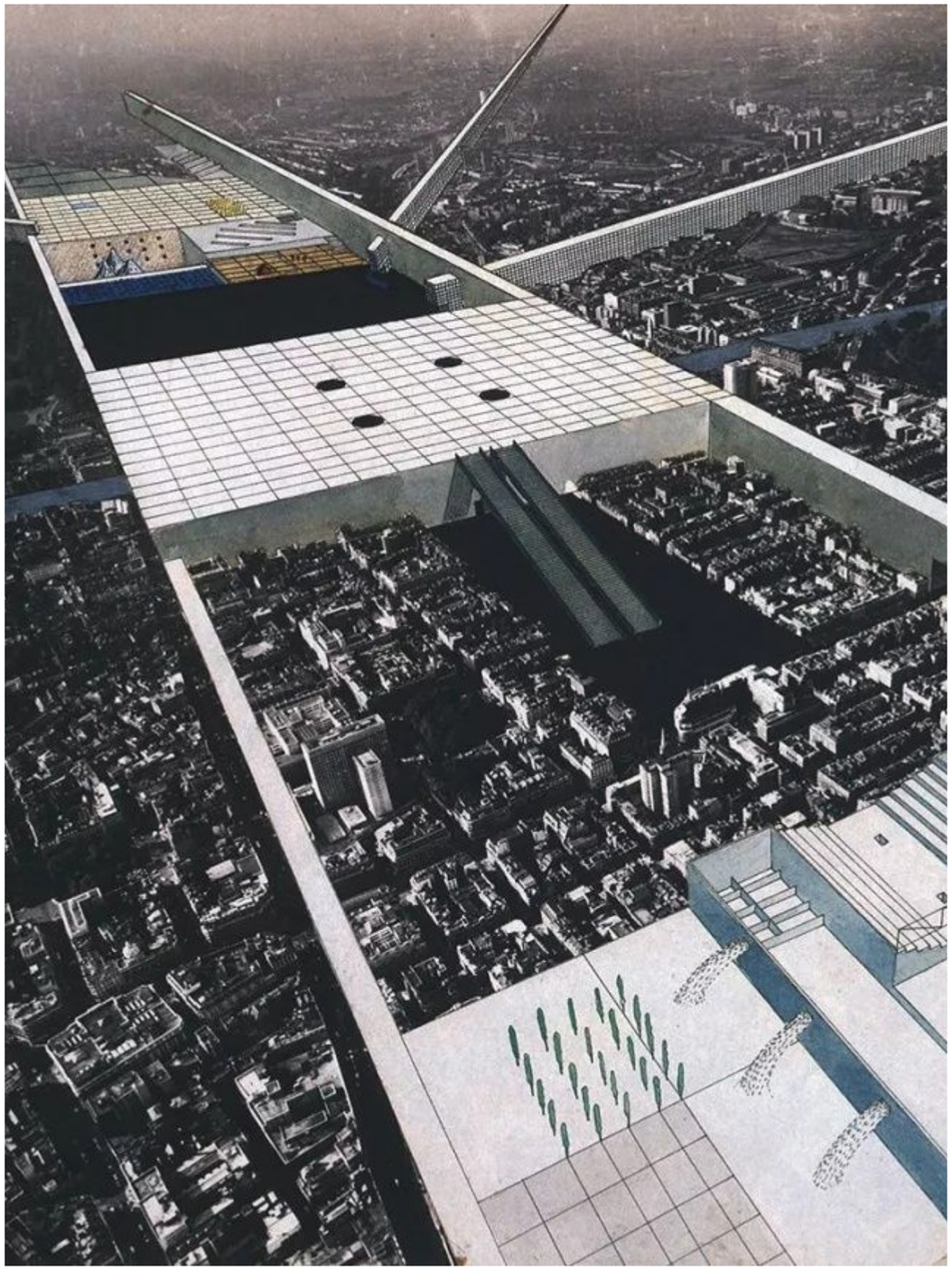


Fig.2.74/

Exodus,or the Voluntary Prisoners of Architecture, Rem Koolhaas,1972

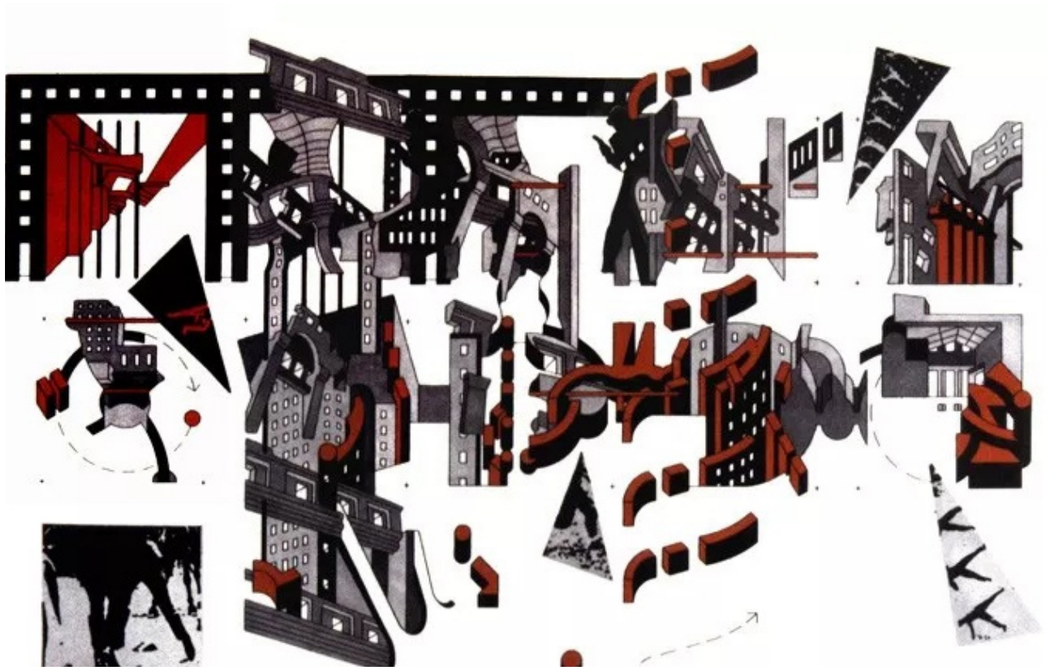


Fig.2.75/

The Manhattan Transcripts, Bernard Tschumi, 1976–1981

3/ Strategy:

1. Translation: Analyze the narrative script and visual elements, and re-express it with abstract mapping or space.

2. Intervention: Transplant the fable/movie/fiction into the existing space, and borrow the organizational design of the space to construct a new narrative.

3. Imagination: In order to express or question a certain social phenomenon, use space as a medium to express these views.

4. Reconstruction: Reappear a certain narrative in the site, present it to the viewer with specific spatial clues, and evoke collective memory.

"Translated, connected, imagined" are mainly academic and theoretical projects, all of which reflect the broad architectural narrative. "Reconstruction" is mainly the practical part of architecture. At the same time, "translation" can also become the starting point of architectural entity projects under certain circumstances, that is, narrative architecture.

Case Study 01_Spatial Translation from Movie "Rankenstein"

01/ Introduction:

Bernard Tschumi published the theory "movie script" in 1978. Its starting point was the movement of the body in space, using movie clips as the entry point, and the trajectory of the body became the protagonist. Take the selection screen of the bridge movie "Rankenstein" in the book "Red is Not a Color" as an example. He uses arrows to record the trajectory of the two people, and then fixes the trajectory coordinates to make it into a cube block, and then forms a decorative space .

02/ Value:

Through this technique (the movement along with the movement in the event affects the change of the spatial form) to obtain a possible architectural layout. In this way, we can get rid of the limitations of functions, conditions and venues. In other words, this is a method of scrutinizing form through more abstract concepts. The architectural technique originated from the movie, which is not unreasonable. This kind of abstract attempt links architecture and literature together, and architecture will no longer be a limited object whose function follows form.

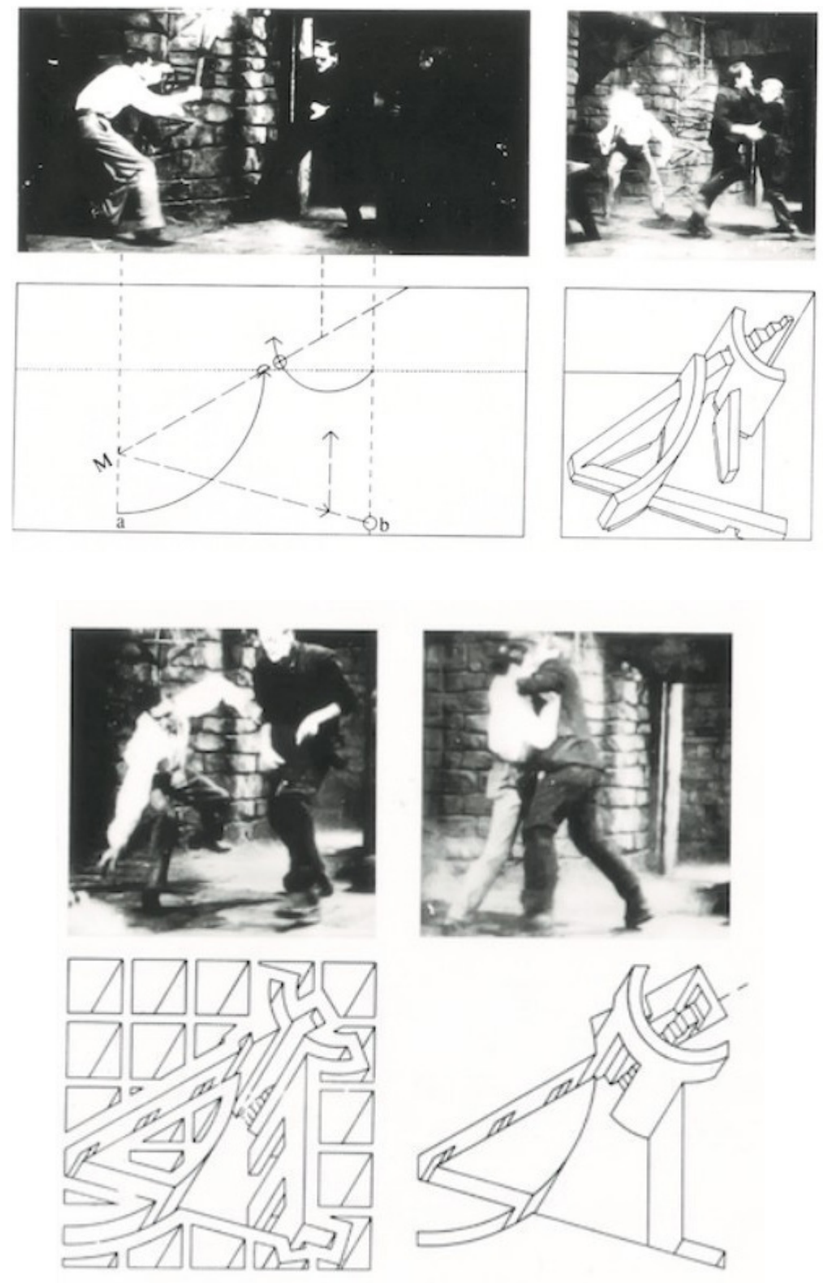


Fig.2.76/

Movie Rankenstein script from "Red is Not a Color", Bernard Tschumi, 1978

Fig.2.77/

Jewish Museum Berlin, Daniel Libeskind, 2001

Case Study 02_Jewish Museum Berlin

01/ Introduction:

The Berlin Jewish Memorial designed by Daniel Libeskind is a "talking" building that reshapes history to visitors in the form of space. At first, the Berlin city government sent him two large bundles of files containing the names, birth dates, expulsion dates and addresses of Berlin Jews. He personally inspected these historical sites, marked and connected them on the map, and got the prototype of his building: a tortuous path.

The overall trend of winding and disorder, and there is almost no horizontal and vertical structure in the museum. All passages, walls, and windows have a certain angle, and it can be said that no one is straight. The designer used this as a metaphor to illustrate the unusual history and suffering of Jews in Germany. Although there is no intuitive reproduction of the persecuted documents and scenes in the internal exhibits, the tortuous passages, heavy colors and lighting in the museum all give people a spiritual shock and a spiritual impact.

02/ Strategy:

Daniel Libeskind designed three spatial plot lines that are parallel in time. They imply parallel events in different spaces at the same time, indicating the different destinies of Berlin Jews.

1. "Road to Destruction": the tower leading to the Holocaust. When you walk towards the black wall through the corridor, you push open the black heavy metal door. Inside is a dark, claustrophobic space. It is an annex building independent of the museum body. A small opening is opened in the corner of one side more than ten meters high. A vertical slit leaks a ray of light, which makes people feel An unspeakable depression, as if the massacre victim was locked in a gas chamber before his death, waiting for death.

2. The "Road of Exile" leads to the Hoffmann Garden. This plot line has a bright glass passage to the outside garden. It shows the scene of the Jews fleeing Germany. This line is like the first "Road of Destruction" "The same is a dead end.

3. The "Road to Continuation" leads to the main exhibition hall. The last of its three plot lines, it is the real entrance to the exhibition hall and the longest of the three passages, symbolizing the difficult life continuation of the Jews. This passage has six "nothingness" exhibition halls. And famous.

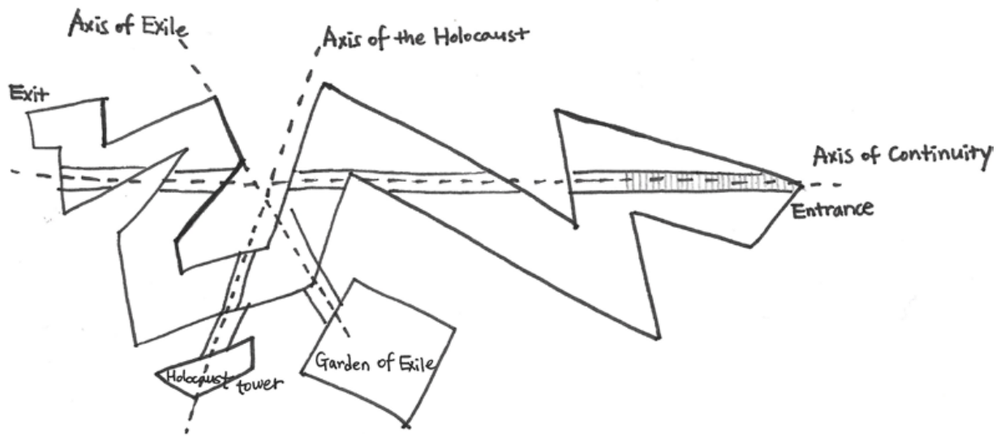


Fig.2.78/

Jewish Museum Berlin 3 Circulations, Daniel Libeskind, 2001

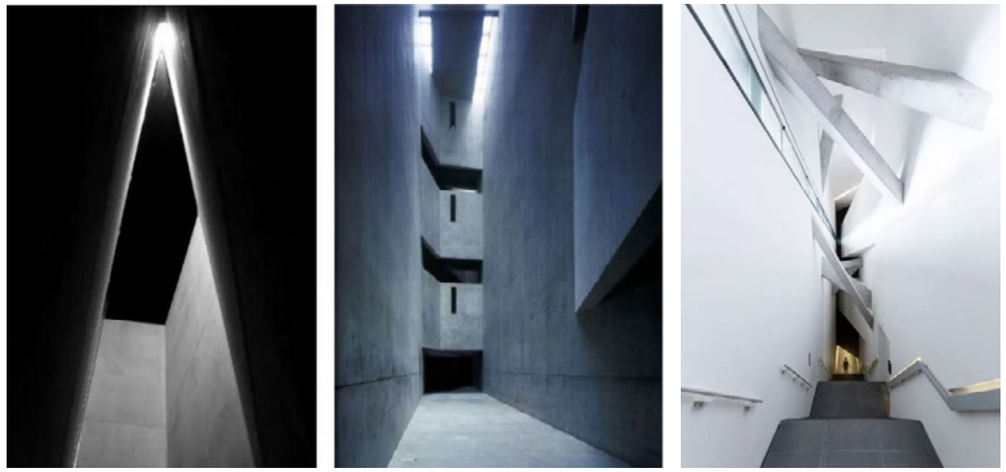


Fig.2.79/

Jewish Museum Interior Space, 2001

03/ Concept

3.1/ Theme- The Mixture of Memory Fragment

3.1.1/ Theme Introduction

The ocean is the starting point of all life, and human civilization is an expansion process from the ocean to the coast and then to the inland. After thousands of years of development, human life has been closely surrounded by unnatural and industrial civilization, we have gradually lost contact with nature and have forgotten our original memory of the marine impression. This building standing on the sea and provides a place for human beings to be completely immersed in the natural environment. It is a kind of mixture of human memory about the marine environment. Its purpose is to reproduce the circumstances of people at the beginning of exploring nature and bring humans back to the starting point of civilization. It promotes humans to rethink their relationship with nature by creating a place completely isolated from social civilization.

3.1/ Theme- The Mixture of Memory Fragment

Fig.3.1/
Manifesto-The Mixture of Memory Fragment

3.1.2/ Manifesto

The broken elements of industry, culture, and nature are overlaid on a person who is closing his eyes and thinking something, which symbolizes human reflection on the relationship between civilization and nature. These pieces build an abstract “object” together with characteristics of context, which also metaphors the content (form, function, order) that the building will describe.

Fragmentation, memory, and reorganization are used throughout the entire design project including the design method of this manifesto . By disassembling the historical elements of Ravenna and the industrial elements of the offshore drilling platform and then reconstructing these elements through imagination, replacement, and embedding, an aggregate with clear site characteristics is finally obtained.

3.2/ Keywords

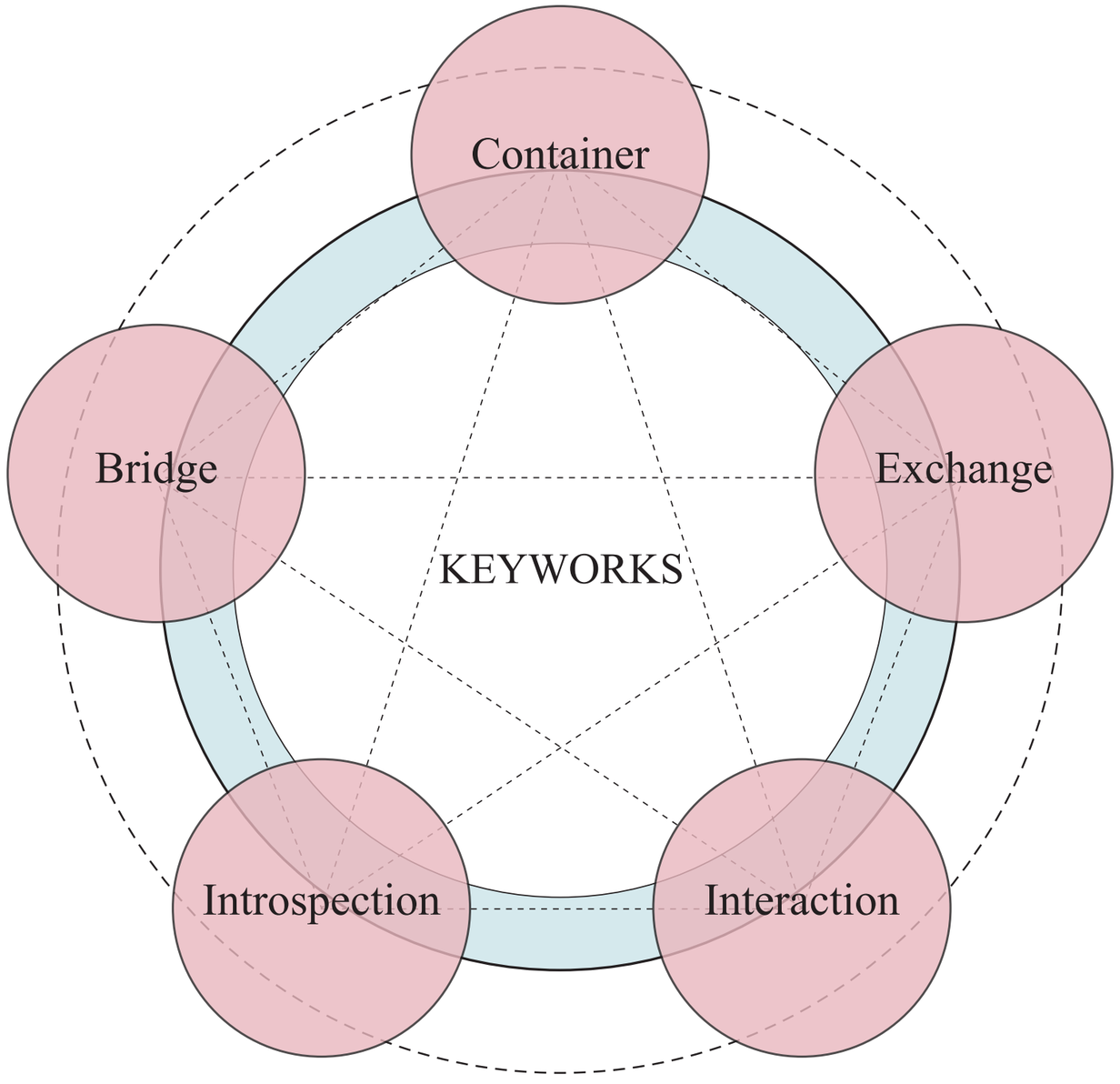


Fig.3.2/
Keywords

3.2/ Keywords

3.2.1/ Container:

You can think this is an immobile ship, a beautiful utopia, a carrier of natural and civilized element. It is a condensation of the achievements about mankind's exploration of the vast ocean world for thousands of years, where people can embrace the memories that is related to the ocean for thousands of years. It is not only like a kind of container that conclude ocean memories, but also like our memories, it always appears in this world vaguely and abstractly, and is usually modified by our subjectivel mind.

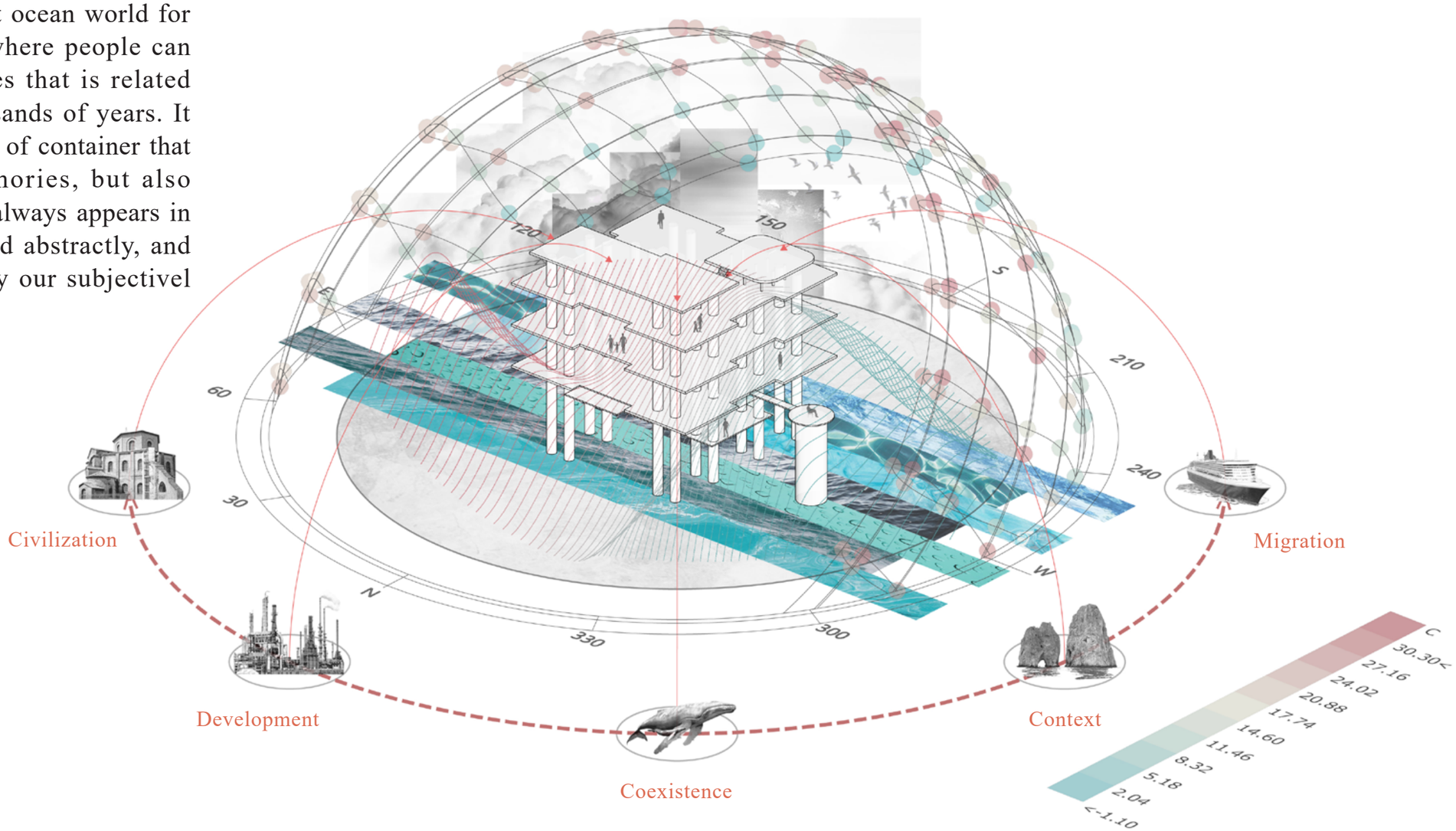


Fig.3.3/
Keywords-Container

3.2/ Keywords

3.2.2/ Introspection:

Humans come from the ocean that is the starting point of human civilization. During the process that human beings' is continuous to developing civilization, they have gradually lost their connection with the ocean or nature, just like in this contemporary world, humans have gradually lost themselves in the modern city with the cold steel and solid concrete. In this background, this project is dedicated to creating a space completely isolated from social civilization to help humans rethink their relationship with nature.

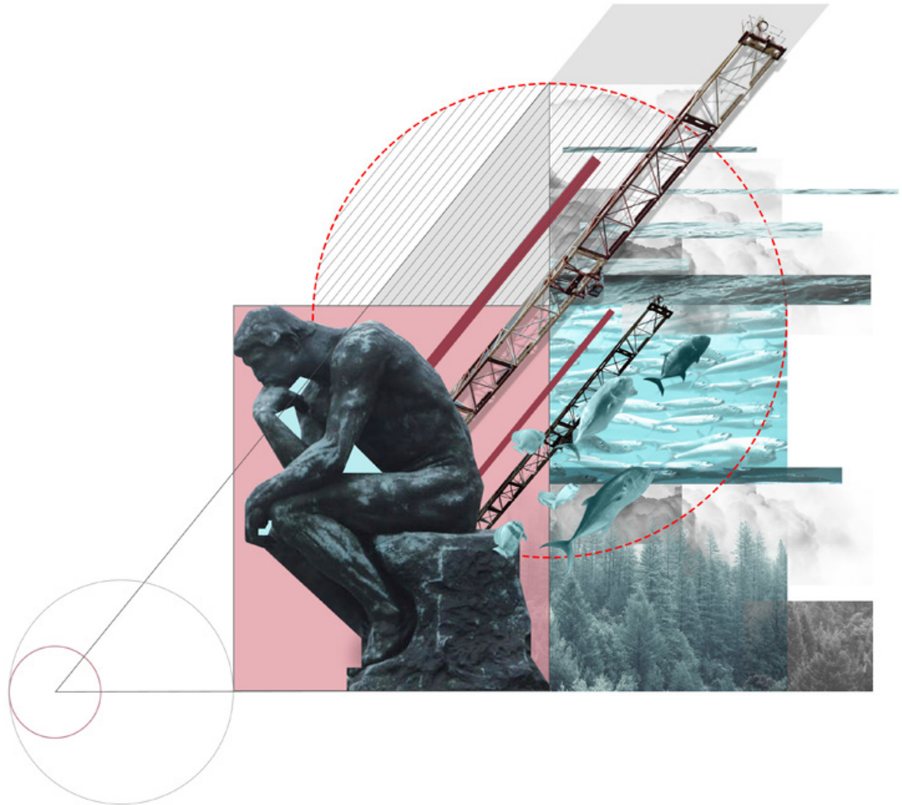


Fig.3.4/

Keywords-Introspection

3.2.3/ Bridge:

This site can be seen as a bridge connecting nature and industrial civilization, or it can be seen as an extension of human civilization on the ocean. It is located at the boundary between the ocean and human society. It should be an transit area to promote humanity to understand and merge into nature.

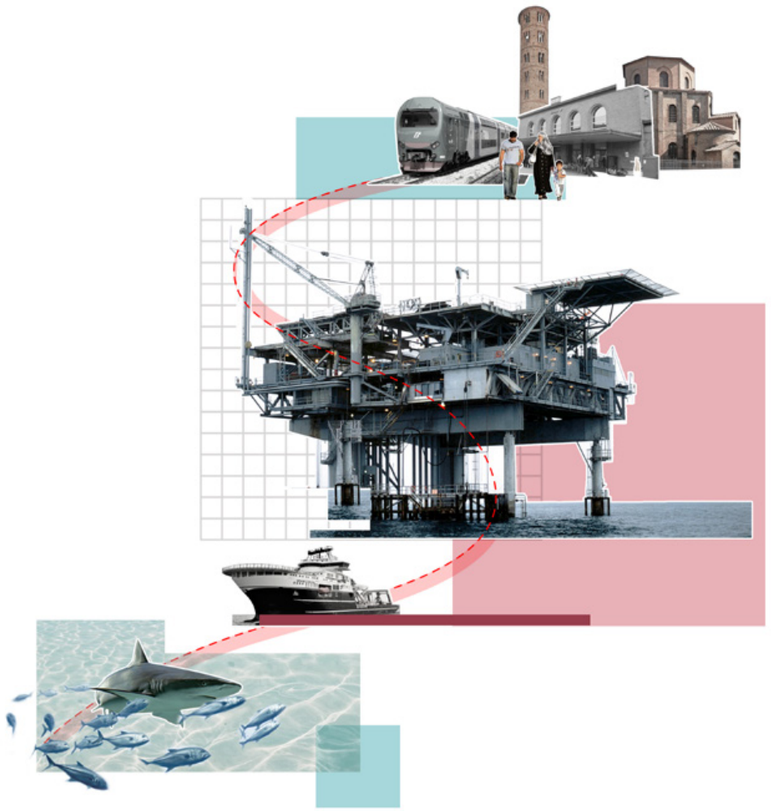


Fig.3.5/

Keywords-Bridge

3.2.4/ Exchange:

It is a museum in a secular sense, and the functional attribute of "exhibition" will be imposed inevitably. Actually, the exhibition is an essential process of exchanging information. The architectural space serves as a medium to provide visitors with knowledge, information, and art. In this process, people leave feelings, reflections, and some new experiences and memories to this space.

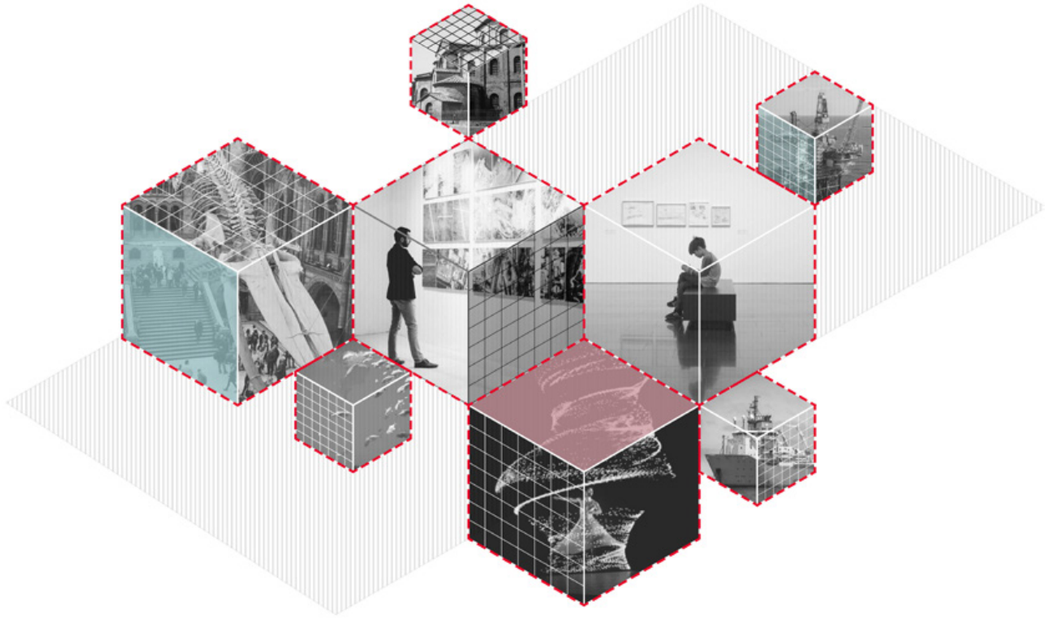


Fig.3.6/
Keywords-Exchange

3.2.5/ Interaction:

This building stands in the marine environment. It not only provides a place for humans to living, entertainment, learning and meditation, but also provide a habitat for marine creature. It is committed to achieve the communication and interaction between human beings, architecture and nature through a series of technical means.

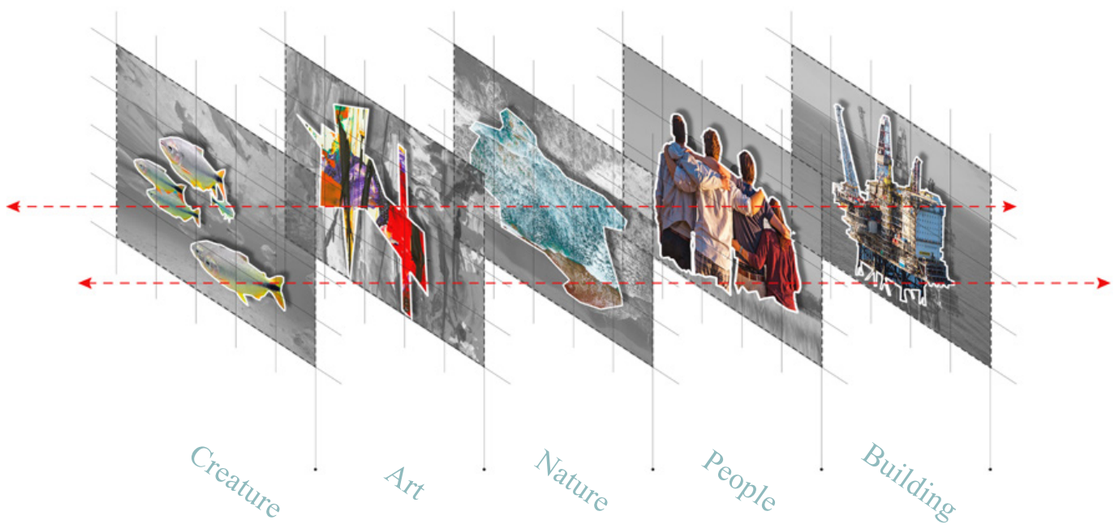


Fig.3.7/
Keywords-Interaction

3.3.1/ Extraction of Element

Ravenna is an ancient civilized city with a long history. It has experienced a long time and left many brilliant cultural heritages in the city. The site of this building is located in the offshore area near the coastline of Ravenna. Then the history of the city, marine elements and surrounding environmental texture must not be ignored by us.

The main strategy at this stage is to extract as much as possible of the industry, history, and ocean elements related to the site and to evolve and refine them.

It is true that simple words can convey information efficiently and clearly, but it is not enough to explain or show the complex characteristics of this project (long site history, hazy ocean memory, declining oil industry), the design process of this project is inevitable Will go to emphasize the coexistence of multiple elements. Therefore, it is necessary to adopt a complex, uncertain, and diverse spatial design method, which is why I chose three spatial design theories (Adaptive reuse, Deconstrcutism in architecture, Spastial narrative) to practice this project.

Rich vocabulary combined with rigorous and varied grammar can convey more content and richer emotions, it can stimulate people's imagination and solve more problems. Therefore, sorting out as many elements as possible and evolving into the spatial vocabulary in the architectural design is a necessary preparation in the early stage of this design project.

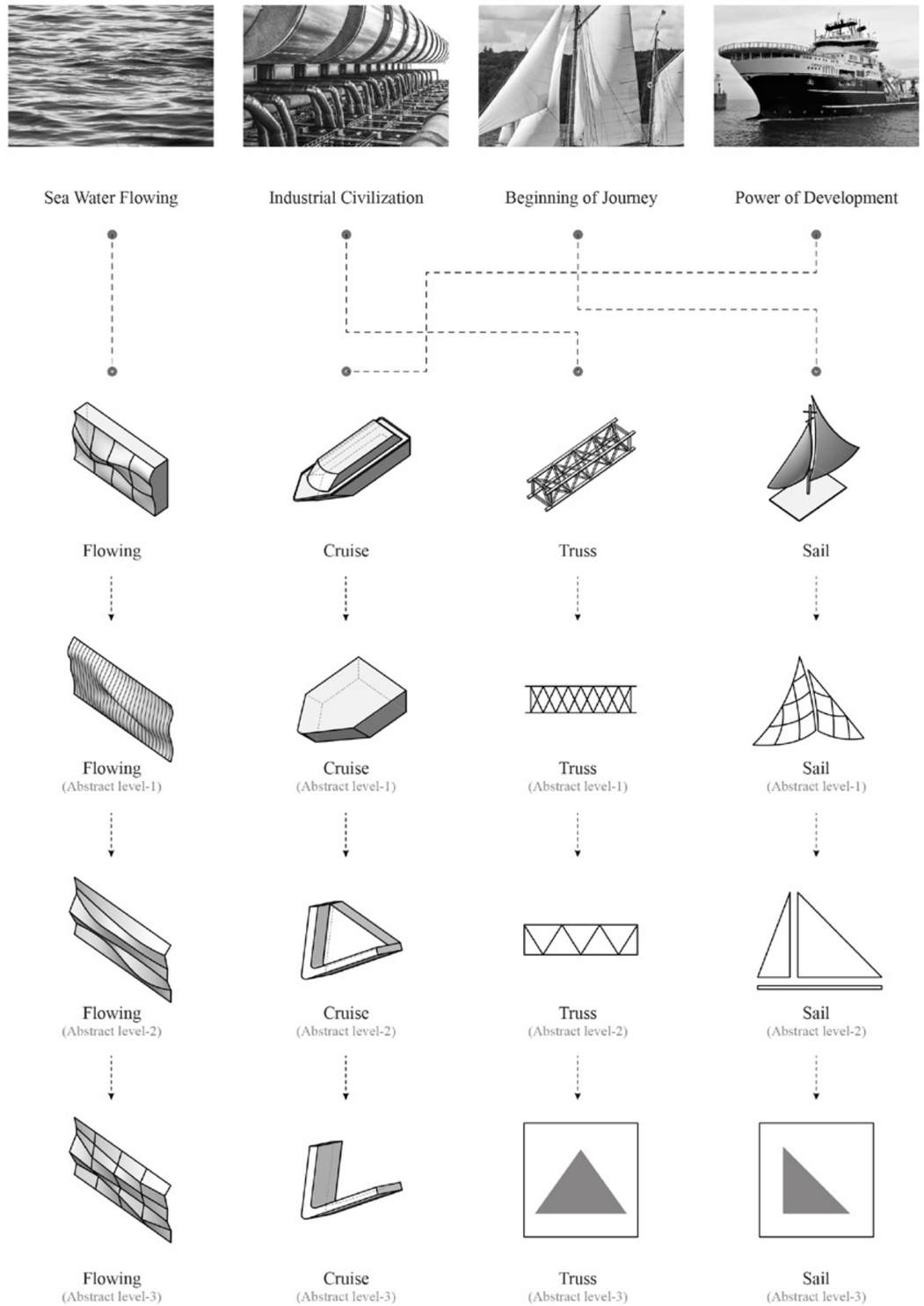
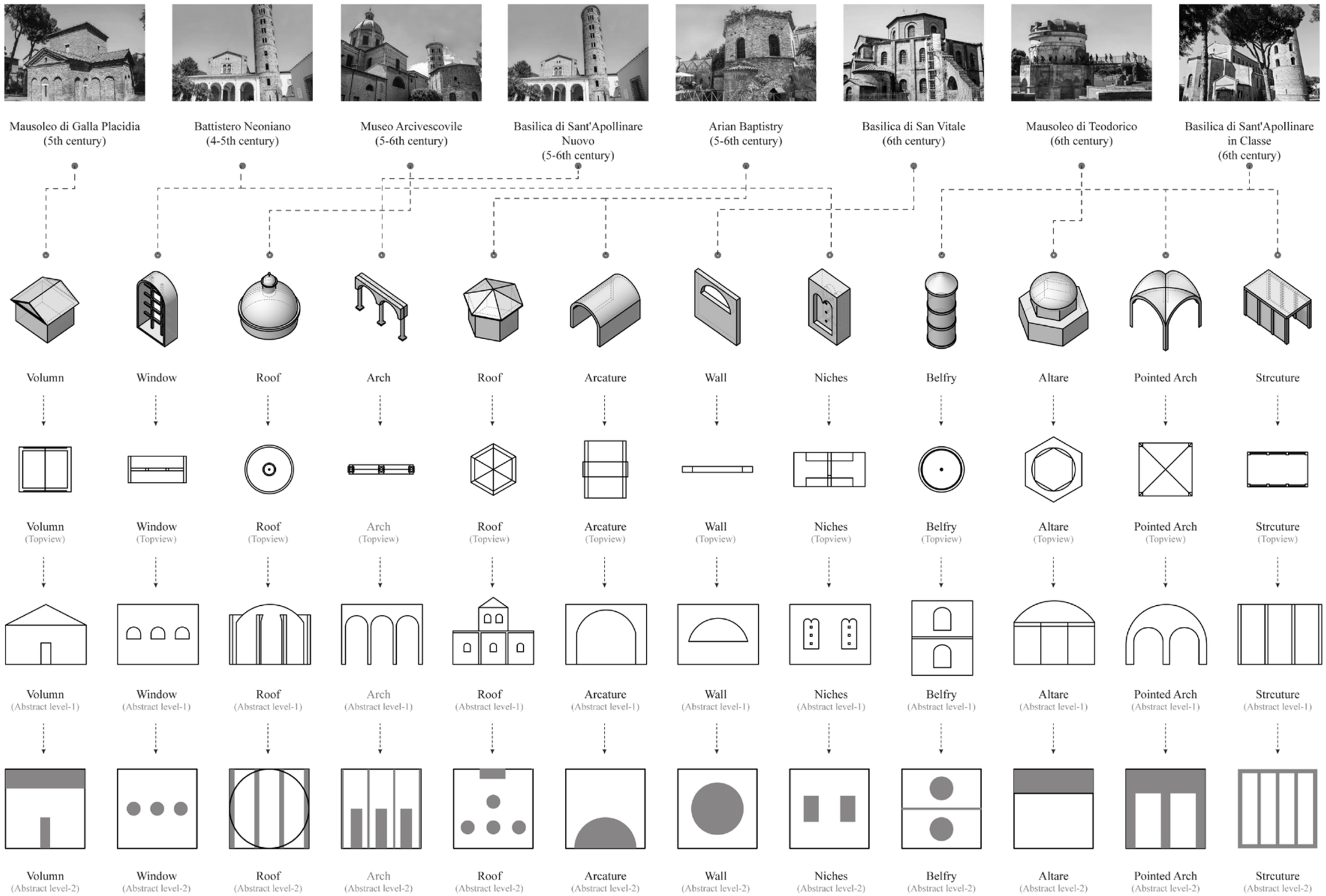


Fig.3.8/

Extraction of Element

3.3.1/ Extraction of Element



3.3.2/ Habitat Program

I hope this building is like a beautiful poem, that will tell people the glorious history of the city of Ravenna, and show people the fading and vague ocean memory. This poem does not use words to express content, but to convey ideas through spatial method. But it has all the elements of traditional poetry: rich vocabulary (the spatial elements extracted in the previous section), diverse grammar (the organization of various spatial elements, detailed in Chapter 5), rigorous paragraphs structure (that will be introduced in this section).

The picture "Habitat program" is dedicated to introducing readers to the spatial activities that will happen in the building space. It has nothing relationship with the specific spatial layout, spatial form, material, color and other resultant elements. It only explains how the building is used—" Content in the space". It uses Collage as an expression method, with the visual purpose of people's behaviors in the space in a way of displaying multiple scenes in parallel perspective(inspired by the poster of "Rear Window").

The entire building is divided into five floors:

Ground Floor: It is the first space that people experience when they get off the boat and enter the building. It belongs to the public space in terms of spatial attributes. On this floor, people can deal with related matters in the reception area and enjoy a quiet leisure time in the book bar and coffee shop.

First Floor: On this floor, people formally enter the exhibition area of the museum, where visitors can learn about the culture and history of Ravenna, and they can also visit the remains of marine life unearthed in this area to share the ancient memories and build connections with his sea area.

Second Floor: It is still an exhibition space, but the content of the exhibition on this floor is mainly image and digital media art. Regular artist salons will also be opened on this floor.

Third Floor: The space on this floor is divided into office space and public resting area, which is dedicated to providing a comfortable working place for the staff on this museum.

Top Floor: The roof area provides an open roof plaza for visitors and employees, where people can enjoy the beautiful ocean scenery, and also exchange and interact to the surrounding or enjoy some of physical exercises.

Fig.3.9/

Rear Window Poster, 1954

3.3.2/ Habitat Program

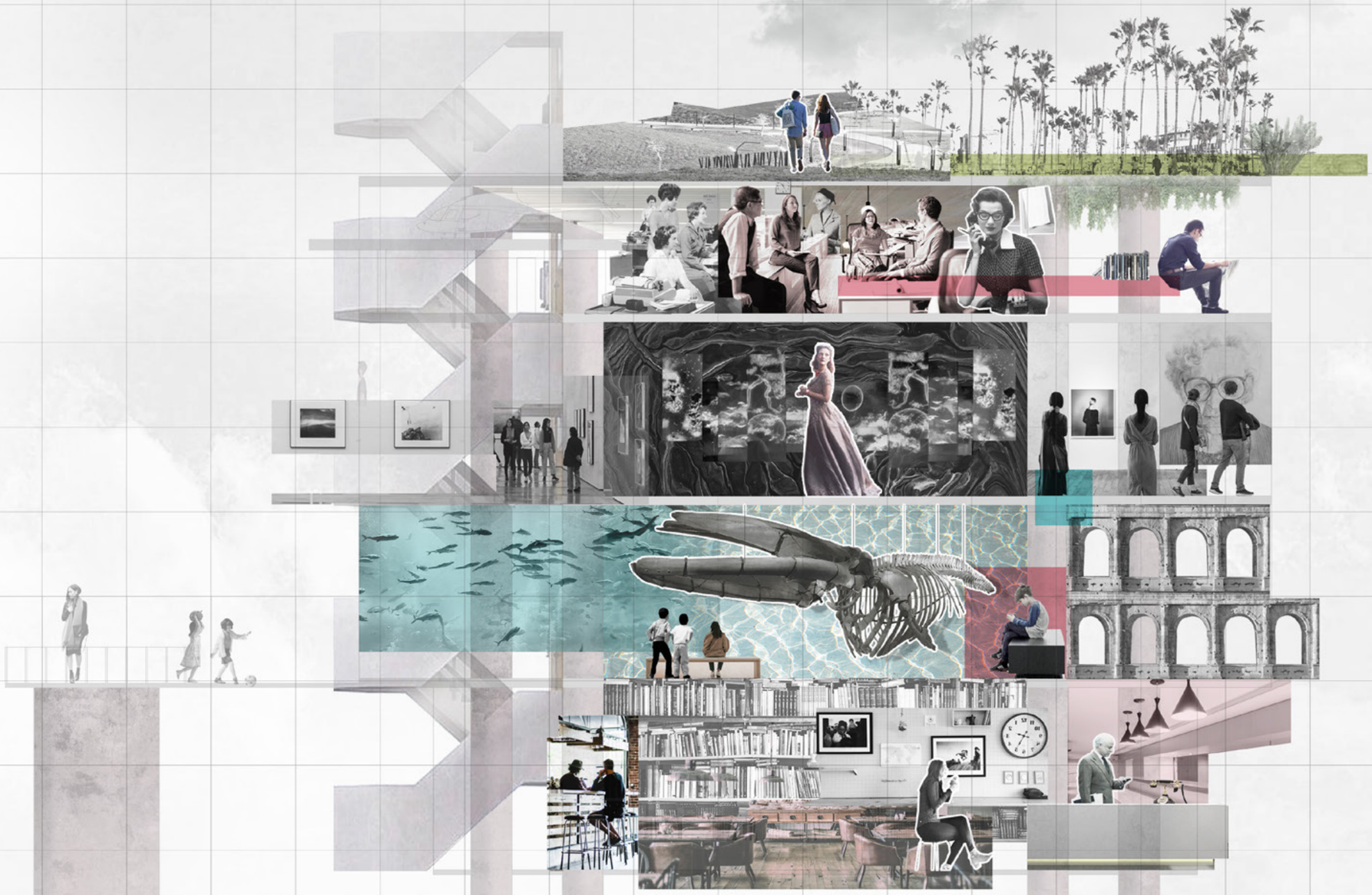


Fig.3.10/
Habitat Program

3.3.2/ Habitat Program

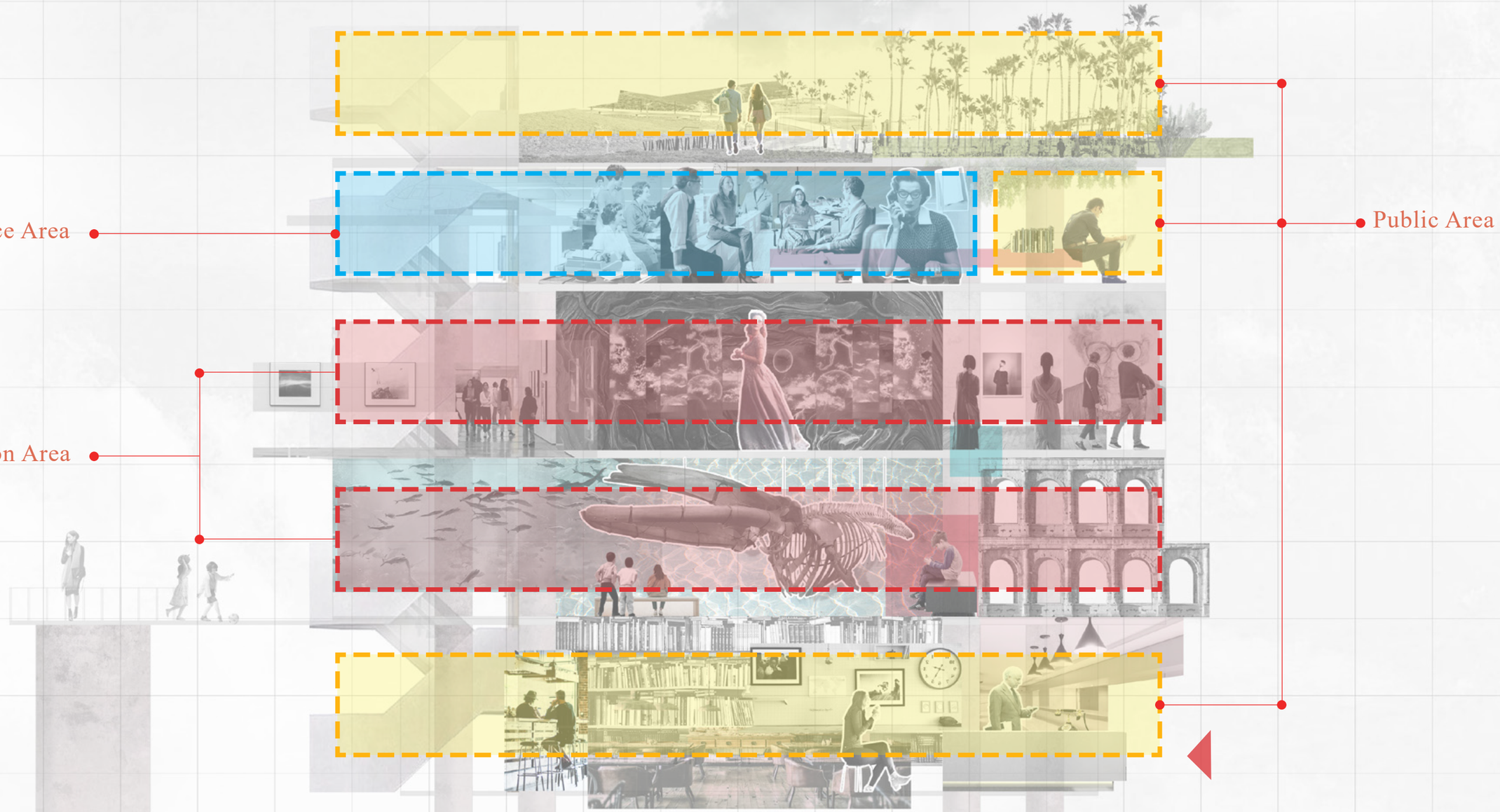


Fig.3.11/

Typology of Habitat Program

3.3.3/ Demand Classification

According to the content of the previous stage, I converted all the human activities that will be taken place in this building to the corresponding functional requirements and classify. This part of the analysis will be the content advantage of the building layout in the following chapters. basis.

The functional space of this building project can be divided into many types:

Exhibition space: it contains different types of display methods.

Public space: provide people with a place to relax and communicate.

Facilities space: Provide basic service facilities to satisfied the basic requirements.

Work space: Provide a comfortable working place for the staff on the platform.

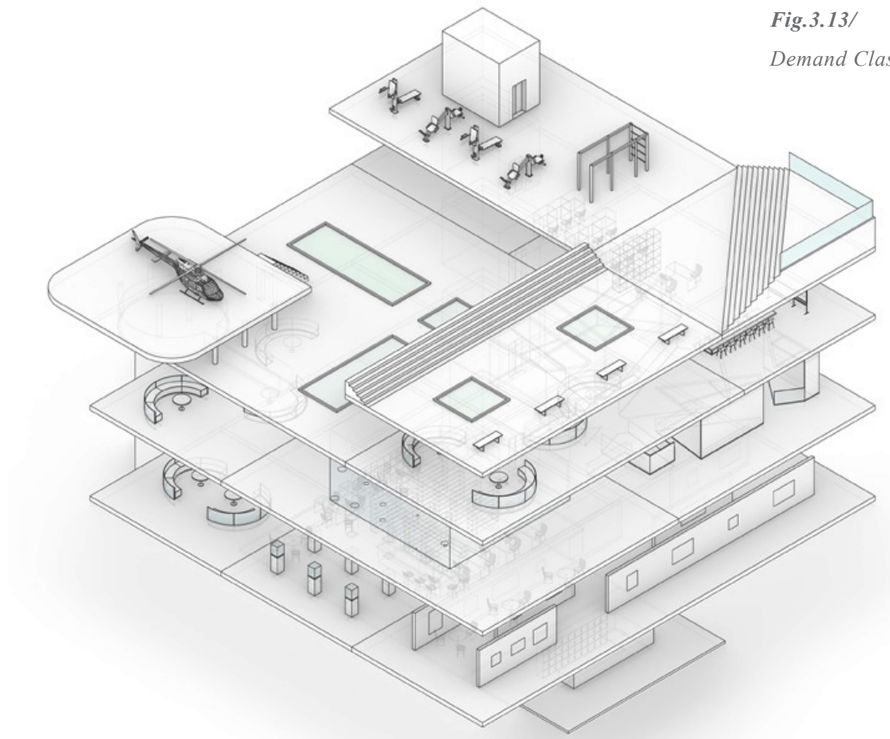
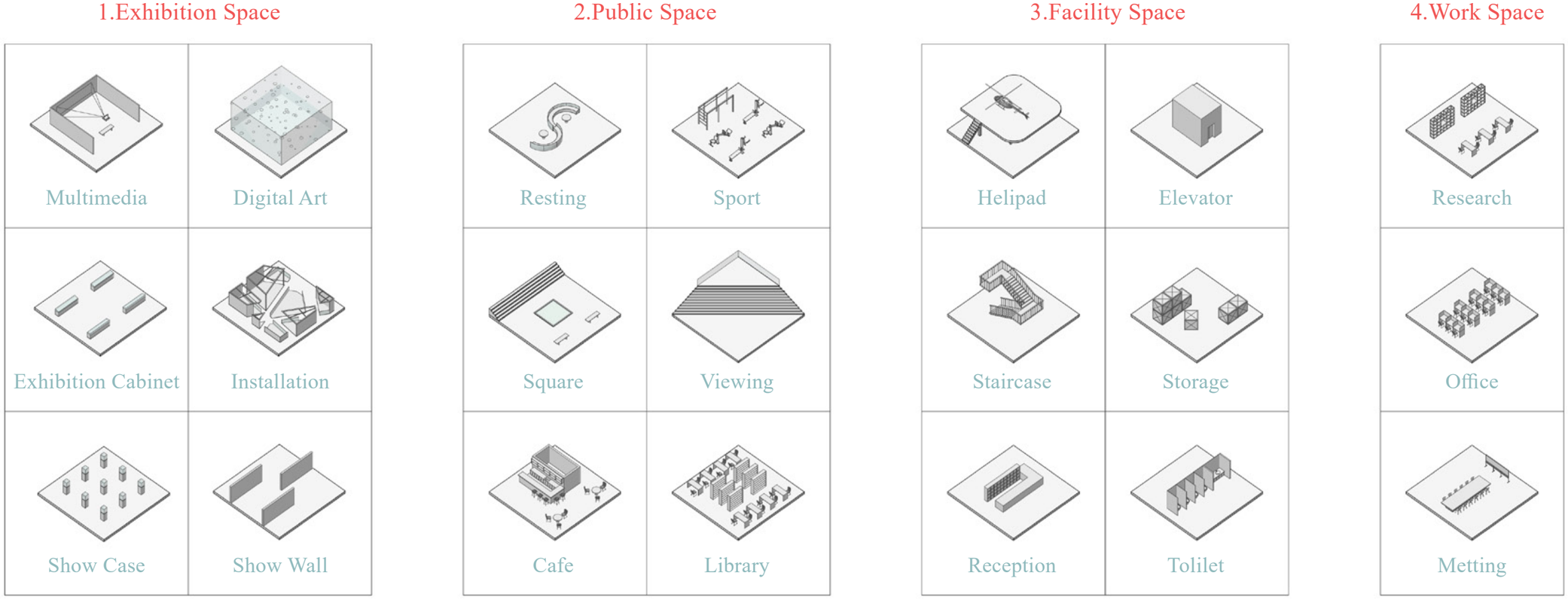


Fig.3.13/
Demand Classification



3.3.4/ User Experience

The work at this stage is dedicated to integrating these functional requirements into a three-dimensional space, but it is not a specific functional layout or spatial circulation, it is more about to explore the abstract relationship between different functional activities during the same floors. This part of the work still belongs to the conceptual stage, but it represent that the project has been moved from a single and isolated function to the comprehensive spatial design.

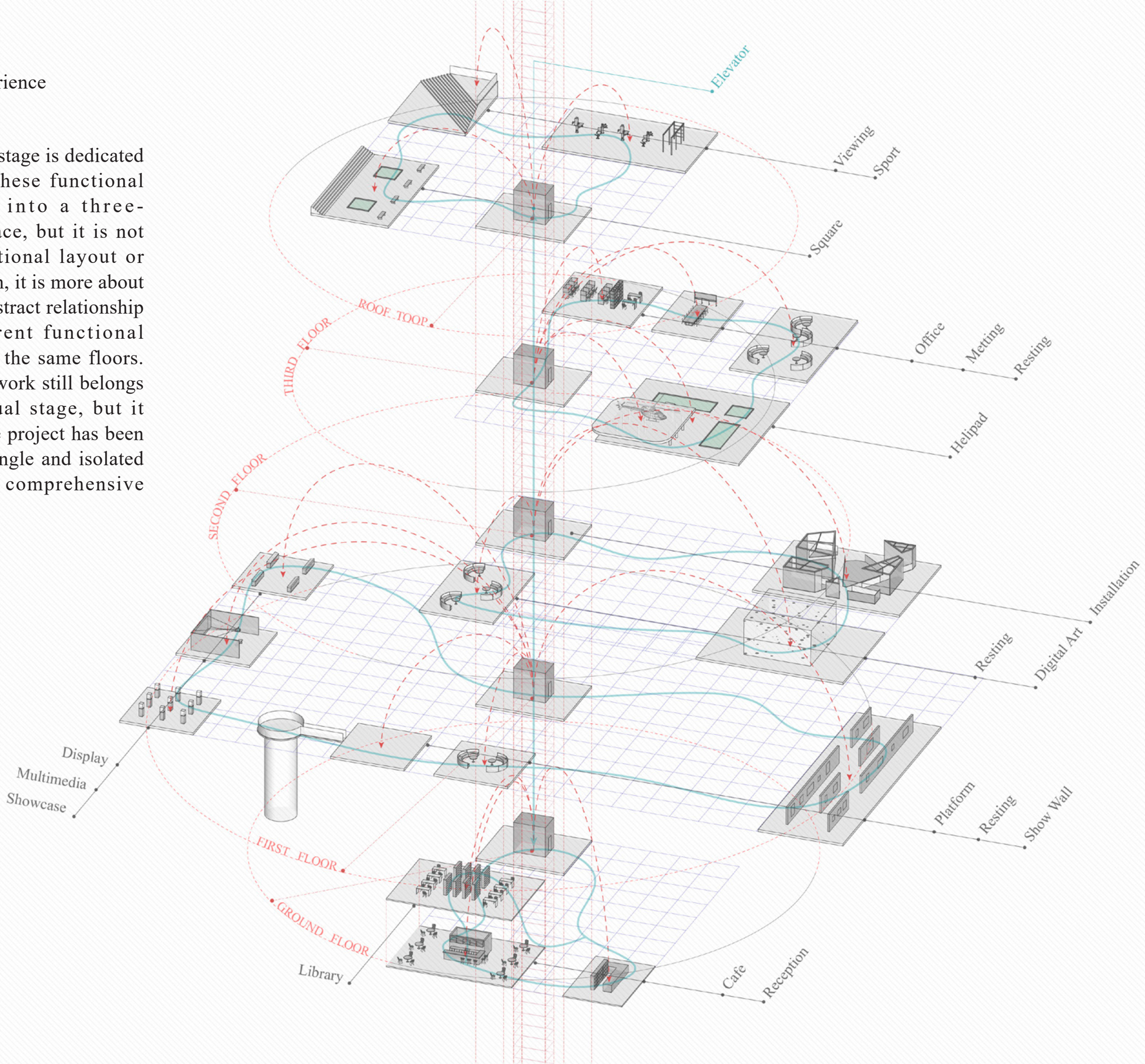


Fig.3.14/
User Experience

3.3.4/ User Experience

Public Space

Work Space

Exhibition Space

Facility Space

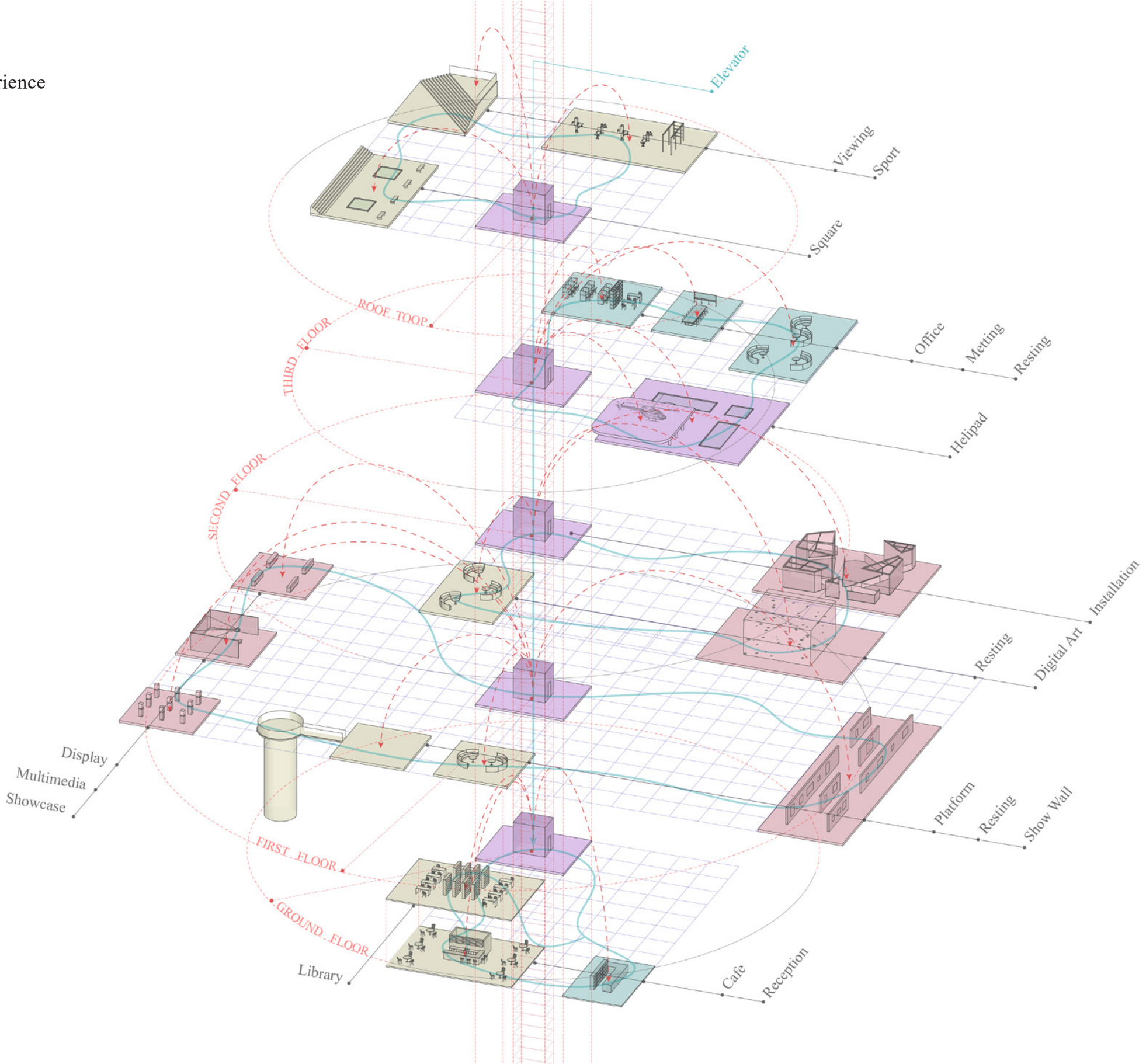


Fig.3.15/

User Experience Typology

3.3.5/ Sensitive experience

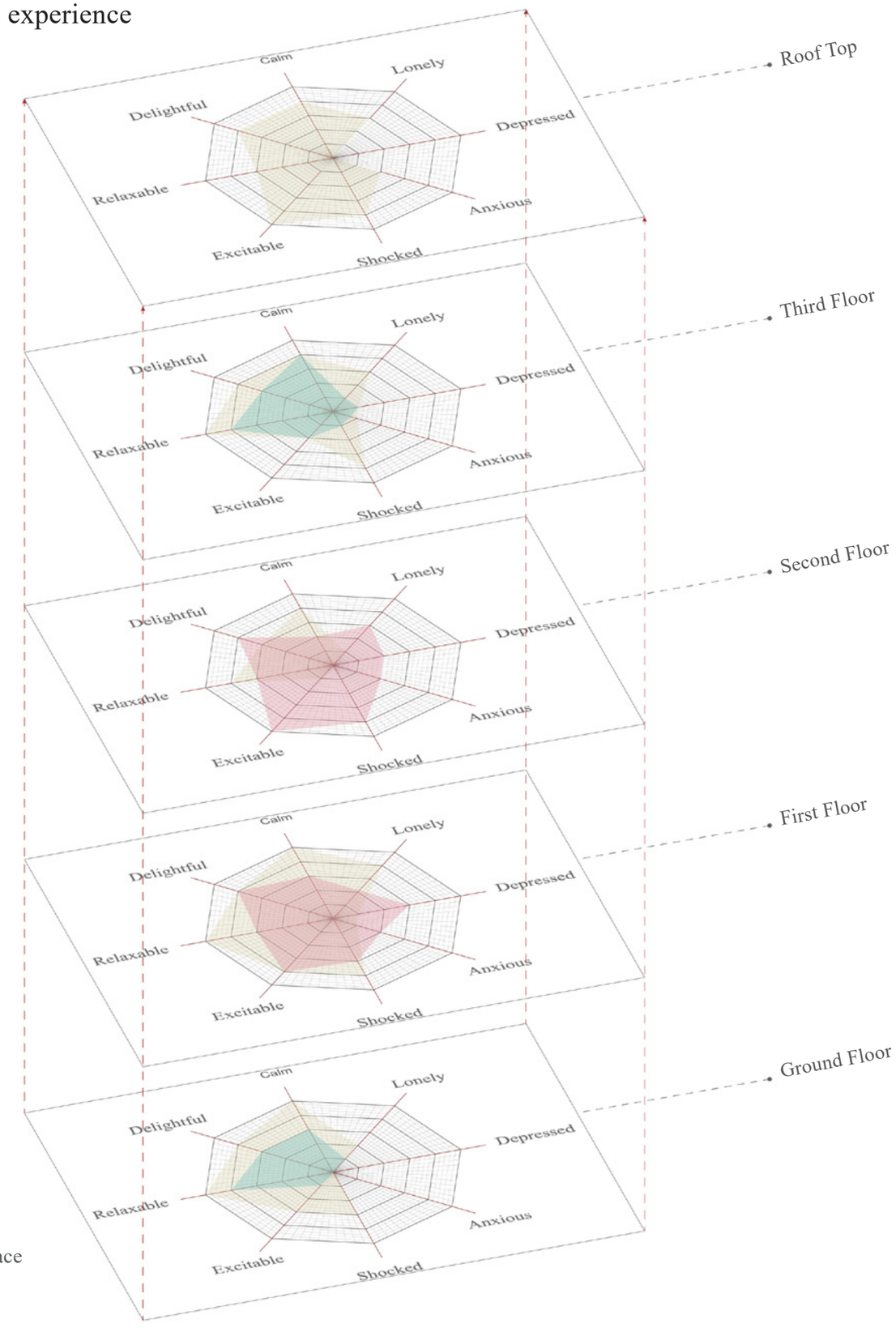


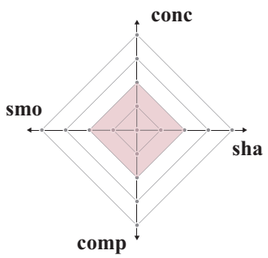
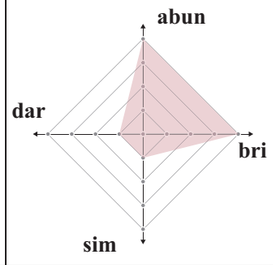
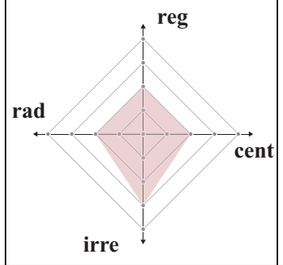
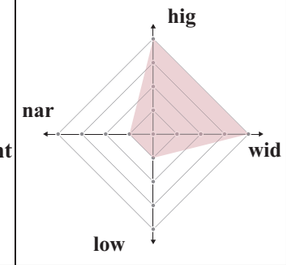
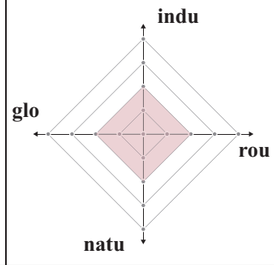
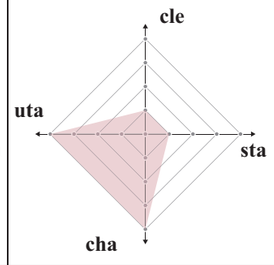
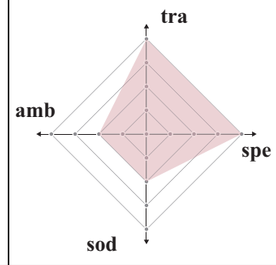
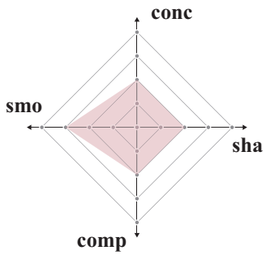
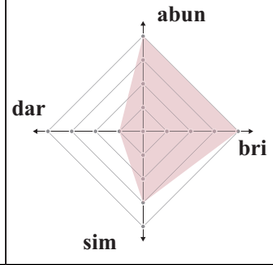
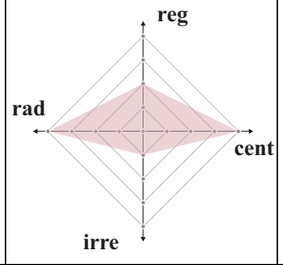
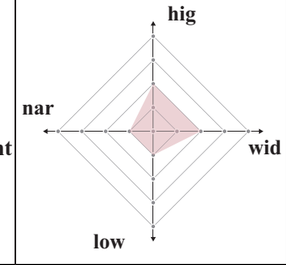
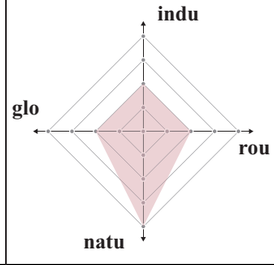
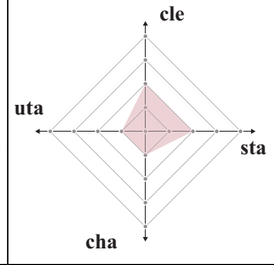
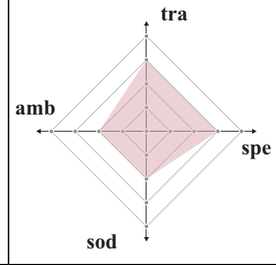
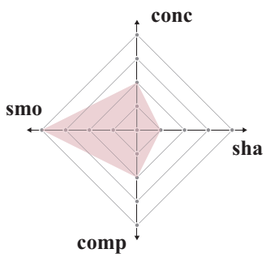
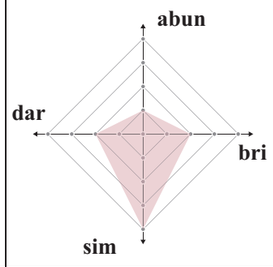
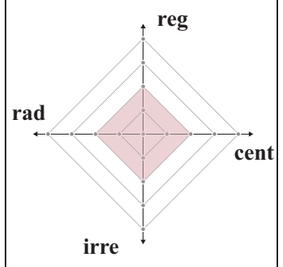
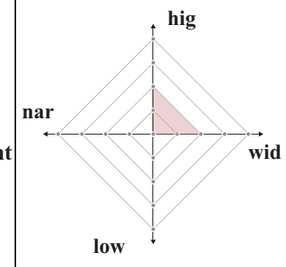
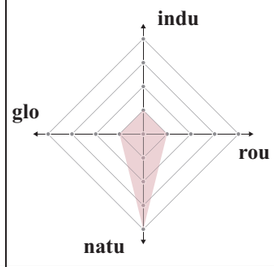
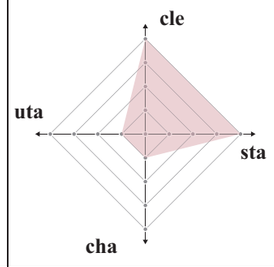
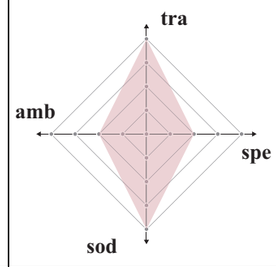
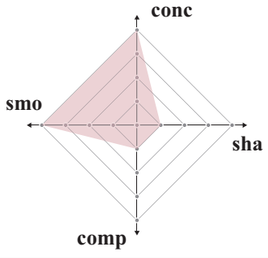
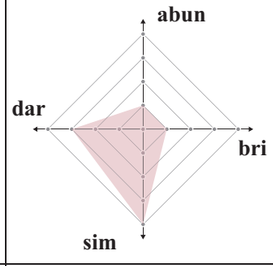
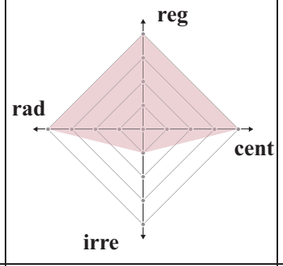
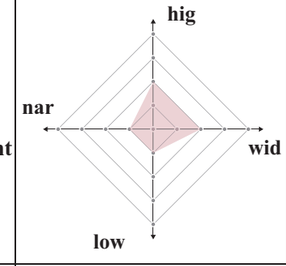
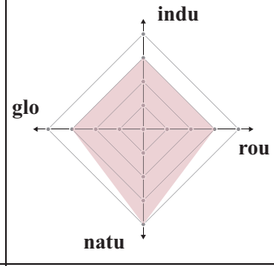
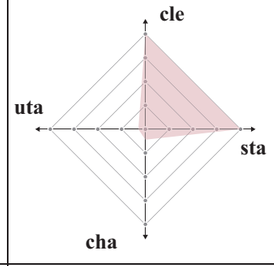
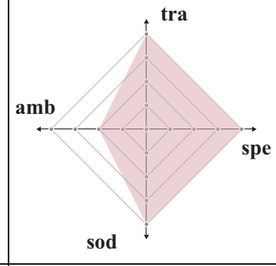
Fig.3.16/
Sensitive Experience

Space psychology is actually "the study of human relations and behavior in the context of architecture and natural environment". Architectural design controls the elements in the space to allow special parts of people's brain to respond to them, directly affecting the individual's subconsciousness, emotions and perception, and becoming an inherent part of people's psychology. Although not the only factor, the various elements in the space, such as lighting, color, configuration, proportion, acoustics and materials, do have a significant impact on people’s psychological feelings. Architects have the responsibility to provide users with practical solutions and integrate these Ideas are incorporated into the design plan.

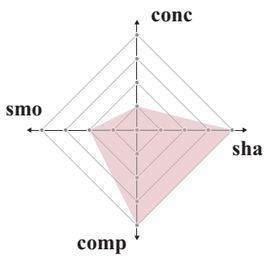
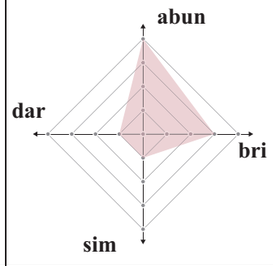
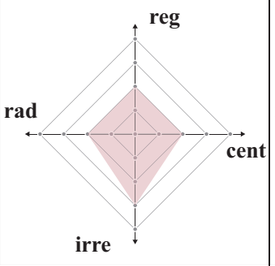
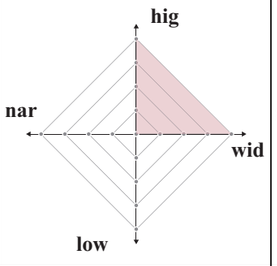
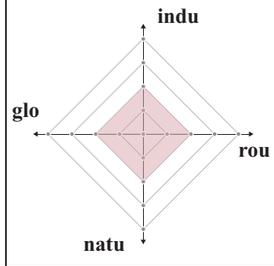
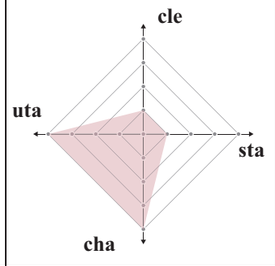
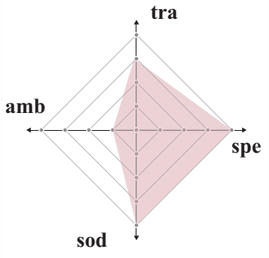
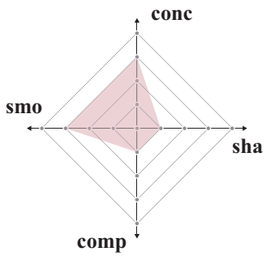
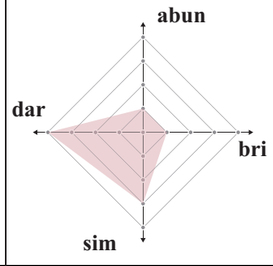
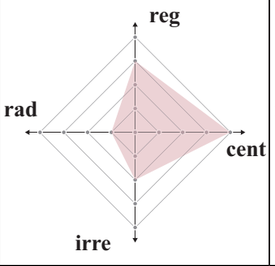
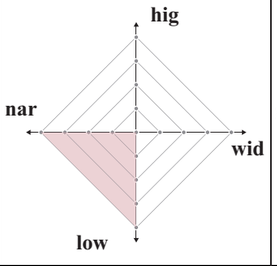
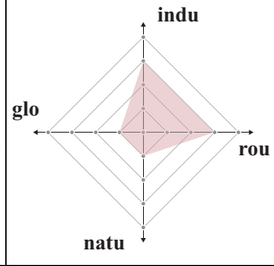
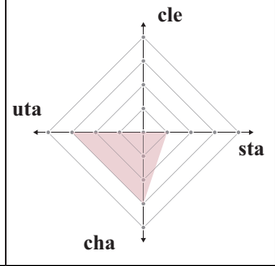
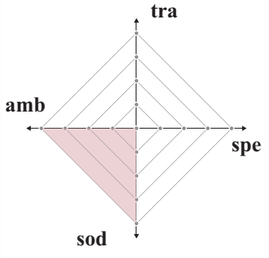
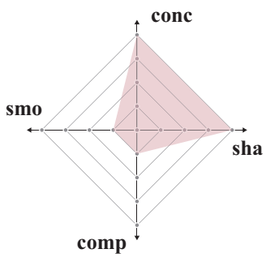
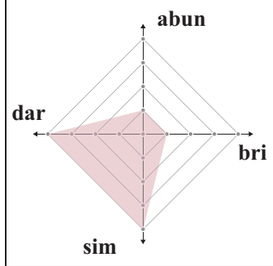
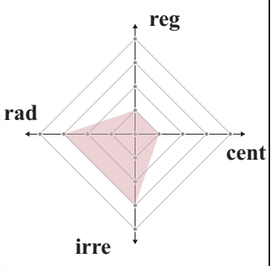
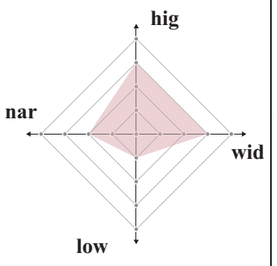
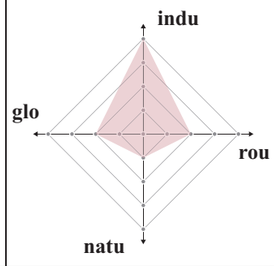
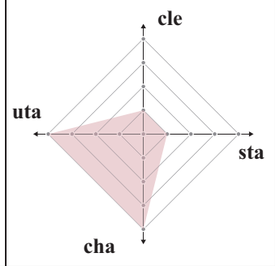
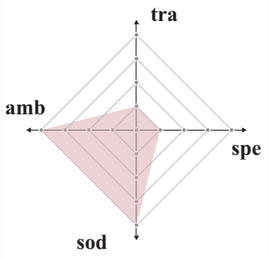
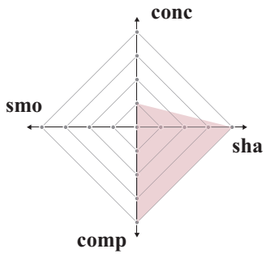
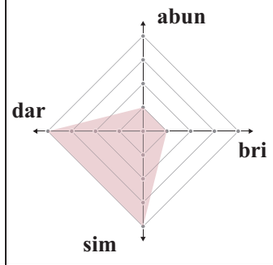
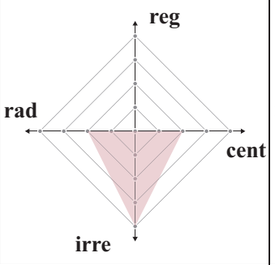
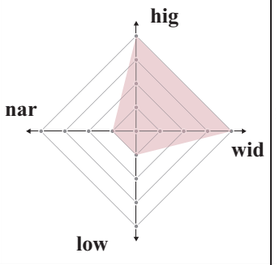
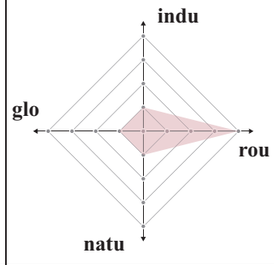
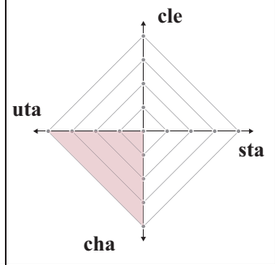
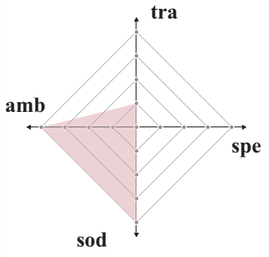
The content of this part is mainly to study the relationship between the various elements of the architectural space and human emotions, and summarize the spatial characteristics corresponding to various emotion types, and provide guidance for the next design direction.

First, I analyzed the emotional state of people when they experience an architectural space, and sorted out eight types of emotions according to the positive and negative characteristics of emotions: Calm, Delight, Relaxable, Excitable, Shocked, Anxious, Depressed, Lonely .And predict the emotional reaction that people will have when they experience the various floors of the building space in this project, and finally get such a set of analysis charts.

3.3.5/ Sensitive experience

FEELING	PROPERTIES OF FORM						
	Shape	Color	Layout	Size	Texture	Orientation	Permeability
Excitable							
Delightful							
Relaxable							
Calm							
	conc (*concise*) **comp** (*complicated*) **sha** (*sharp*) **smo** (*smooth*)	**abun** (*abundant*) **sim** (*simple*) **dar** (*dark*) **bri** (*bright*)	**reg** (*regular*) **irre** (*irregular*) **rad** (*radial*) **cent** (*centralized*)	**hig** (*high*) **nar** (*narrow*) **wid** (*wide*)	**indu** (*industrialized*) **natu** (*natural*) **glo** (*glossy*) **rou** (*rough*)	**cle** (*clear*) **cha** (*chaos*) **uta** (*unstable*) **sta** (*stable*)	**tra** (*transparent*) **sod** (*solid*) **amb** (*ambiguous*) **spe** (*specific*)

3.3.5/ Sensitive experience

FEELING	PROPERTIES OF FORM						
	Shape	Color	Layout	Size	Texture	Orientation	Permeability
Shocked							
Depressed							
Lonely							
Anxious							
	conc (*concise*) **comp** (*complicated*) **sha** (*sharp*) **smo** (*smooth*)	**abun** (*abundant*) **sim** (*simple*) **dar** (*dark*) **bri** (*bright*)	**reg** (*regular*) **irre** (*irregular*) **rad** (*radial*) **cent** (*centralized*)	**hig** (*high*) **nar** (*narrow*) **wid** (*wide*)	**indu** (*industrialized*) **natu** (*natural*) **glo** (*glossy*) **rou** (*rough*)	**cle** (*clear*) **cha** (*chaos*) **uta** (*unstable*) **sta** (*stable*)	**tra** (*transparent*) **sod** (*solid*) **amb** (*ambiguous*) **spe** (*specific*)

3.3.5/ Sensitive experience

Then, I sorted out seven basic elements in space design: Shape, Color, Layout, Size, Texture, Orientation, Permeability. In space design, each element will be defined by different characteristics, so I listed four different characteristics for each element and distributed them in the four directions of the cross axis. After that, I drew this icon according to the characteristics of the elements corresponding to each emotion, and finally got this set of charts. It can provide the basis and direction for the next stage of the specific spatial form design.

04/ Project Schematic

From this chapter, the work will be focused on the discussion of "space" itself.

Firstly, it is purposed to analyze the various possibilities of spatial layout through the deduction and combination of massing. The most important part is to determine the position of the Building Core in the volume because it is related to the distribution of the functions in the space and the organization of the traffic flow. I will launch three directions at the same time to derive the building core in different positions. Then the shape and space are divided and the visual relationship is affected and the optimal solution is selected. After that, the functional layout is performed.

Then I began to organize the vertical traffic system of the space based on the above deduction results. The purpose is to effectively organize the "Program" in this building by a kind of rational way, and to carry out the spatial route from the three aspects: "Exhibition, Office and Security". Finally the result will be showed through relevant diagram.

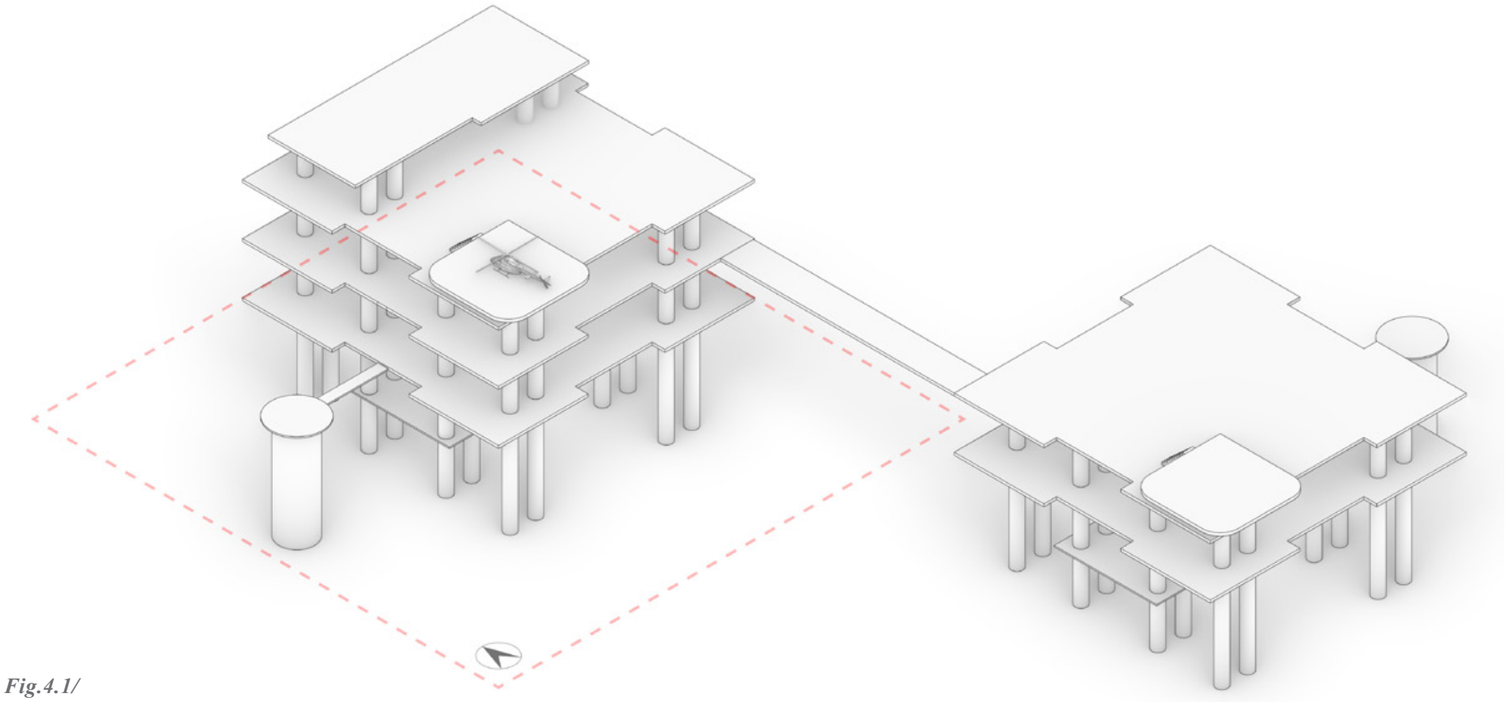


Fig.4.1/
Site Overview

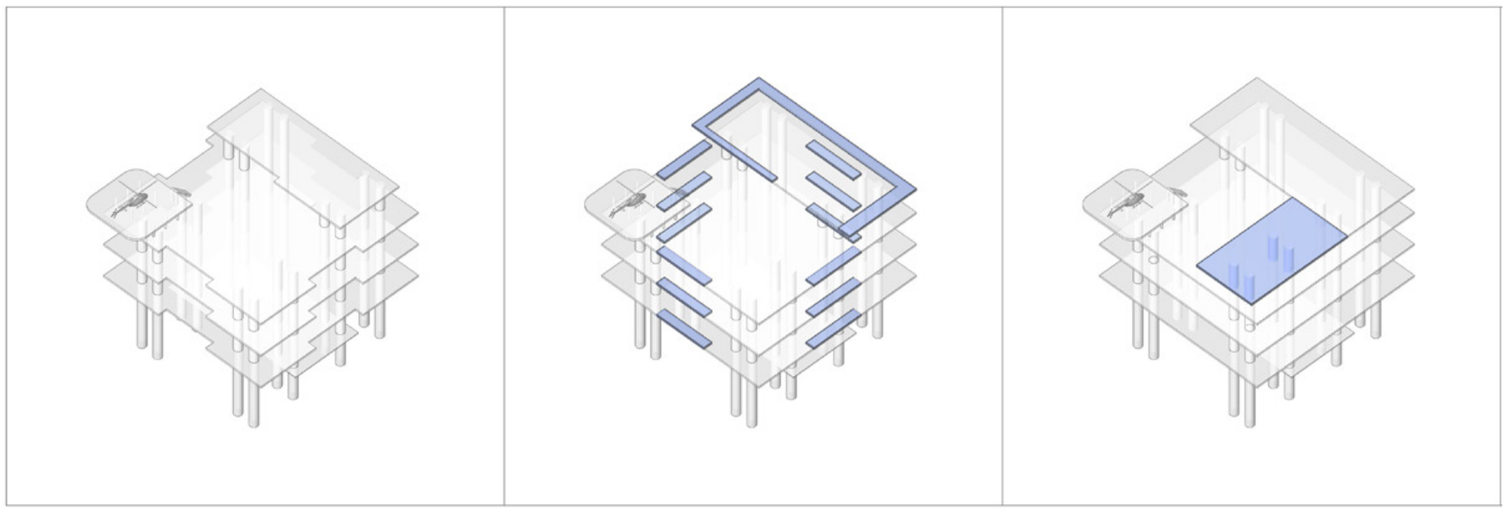


Fig.4.2/
Reconctruction of the Floor

4.1/ Massing organization

Oil platform in Ravenna:

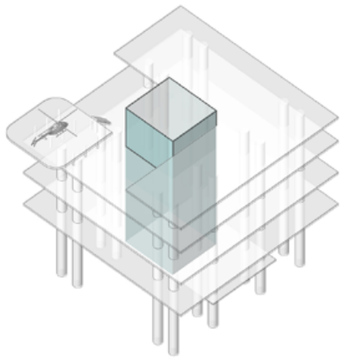
The platform used in this project is inspired by the Cervia A and B gas platform almost 7 km far from the coast. The platform is made by 2 part connected by a bridge but, however, must be conceived as unique. The original structure of the platform shall be retained. Structural parts can be added if the logic of the project requires it, but keeping the platform elevated from sea level will always be necessary. The connection with the coast will always be with boats.

Reconctruction of the floor:

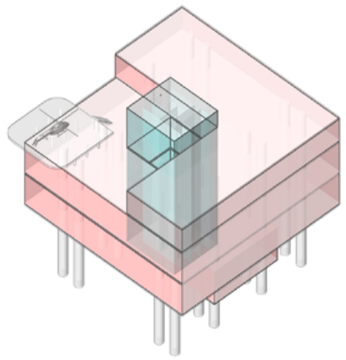
The orginal floor have so many gaps that will bring some negative influences to creating an integral and continious space. In this situation, I will patch up these gaps and supply the some new floor in this building to supporting the functional requirements.

4.1.1/ Massing Design

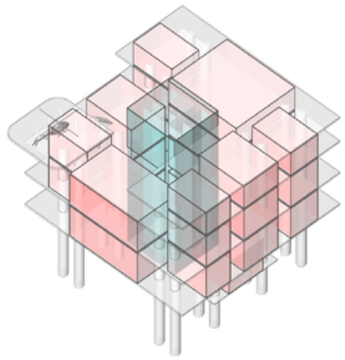
Fig.4.3/
Massing Design Step01



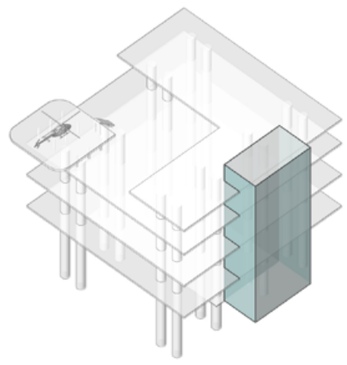
DIR (I)/ Step 01: Placing Building Core



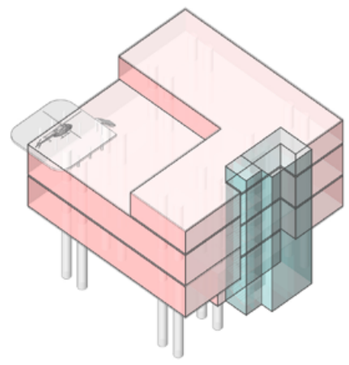
DIR (I)/ Step 02: Closed Volume



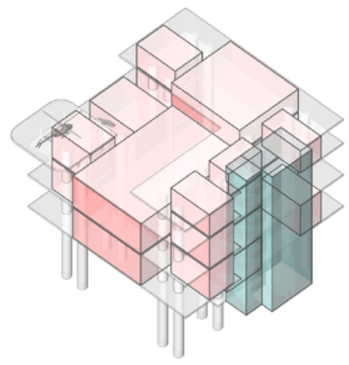
DIR (I)/ Step 03: Seperating Volume



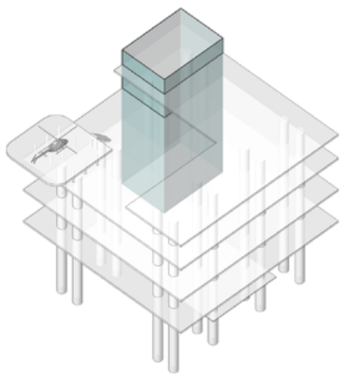
DIR (II)/ Step 01: Placing Building Core



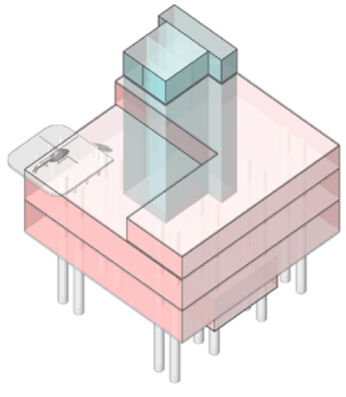
DIR (II)/ Step 02: Closed Volume



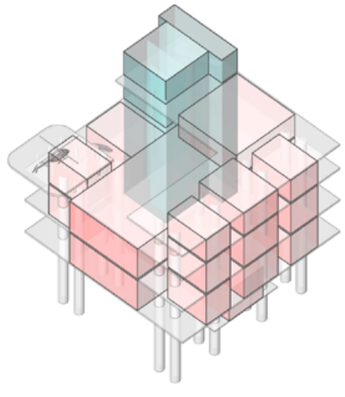
DIR (II)/ Step 03: Seperating Volume



DIR (III) / Step 01: Placing Building Core



DIR (III) / Step 02: Closed Volume



DIR (III) / Step 03: Seperating Volume

Direction (I)

The building core is composed of elevator, staircase and equipment room, it is placed in the center of the building, which leads to the decentralized layout of the interior space and is divided into several independent volumes.

Direction (II)

The building core is composed of elevator, staircase, equipment room and toilet is placed at the edge of the building, which leads to the layout characteristics that the interior space of each floor is made up of a main space and multiple subsidiary spaces.

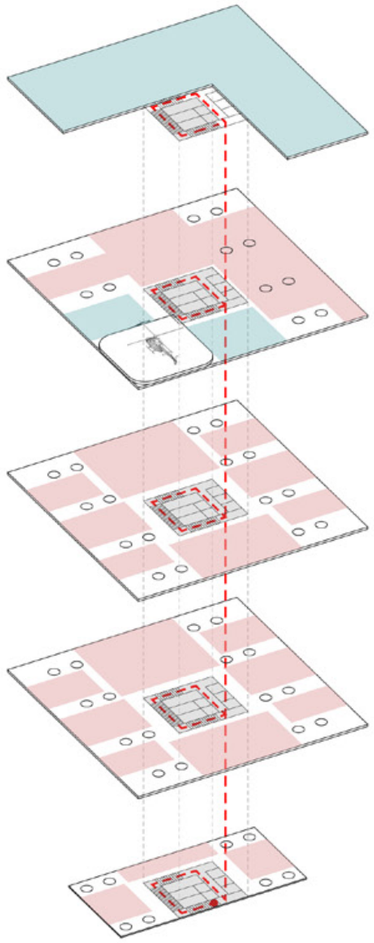
Direction (III)

The building core is composed of elevator, staircase, equipment room and toilet is placed at the edge of the building, which leads to the layout characteristics that the interior space of each floor is made up of a main space and multiple subsidiary spaces.

4.1.1/ Massing Design

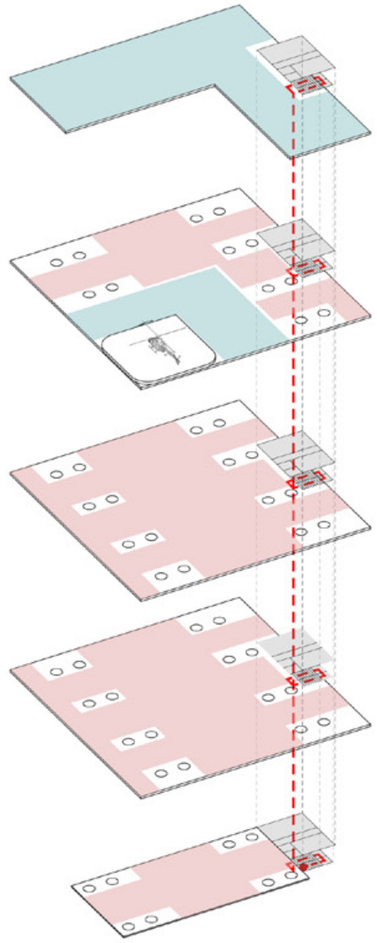
Fig.4.4/
Massing Design Step02

Direction (I)



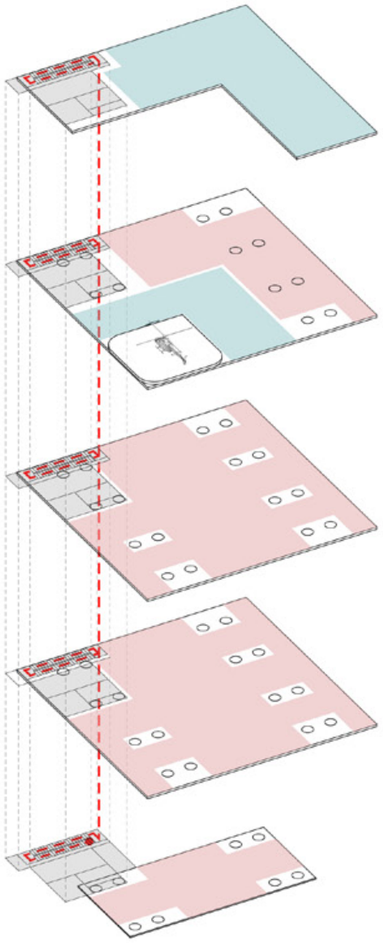
The spatial layout is relatively scattered, it is unable to build a kind of continuous and integral floor plan, and is also unable to flexibly divide the space in the next stage, which is not conducive to meet the multifunctional requirements.

Direction (II)



The interior floor of the whole building presents continuous and integral characteristics, which can be used efficiently in the stage of functional seperation.

Direction (III)

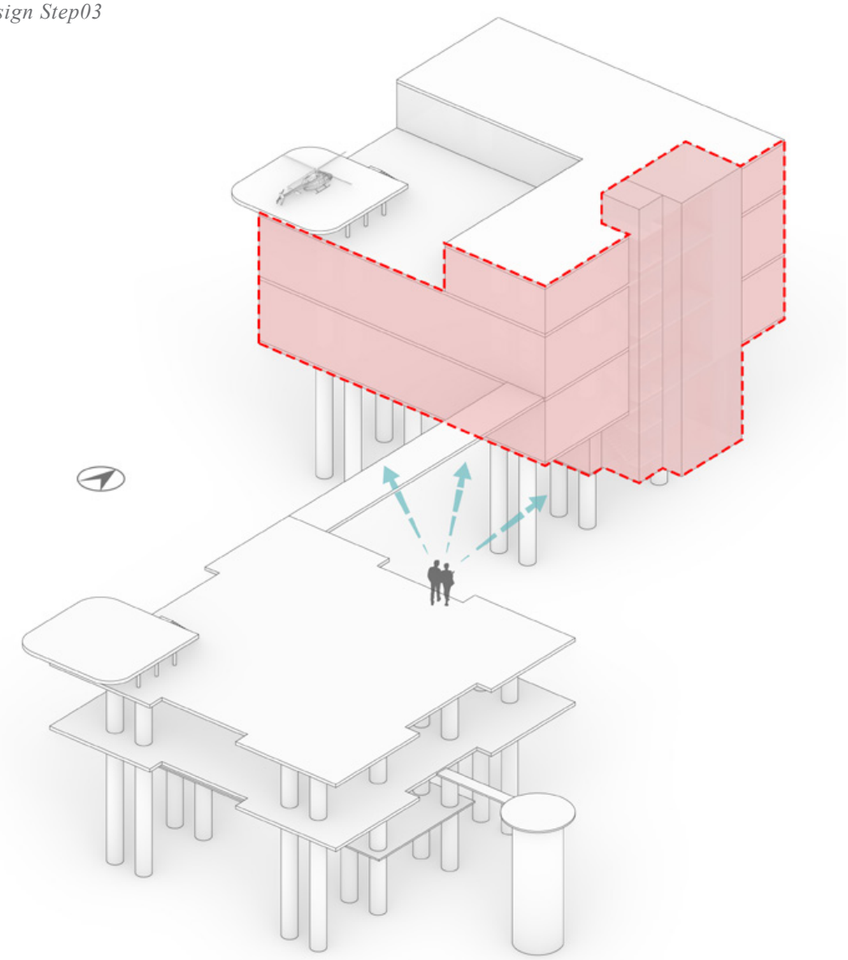


The interior floor of the whole building presents continuous and integral characteristics, which can be used efficiently in the stage of functional seperation.

Direction (II)

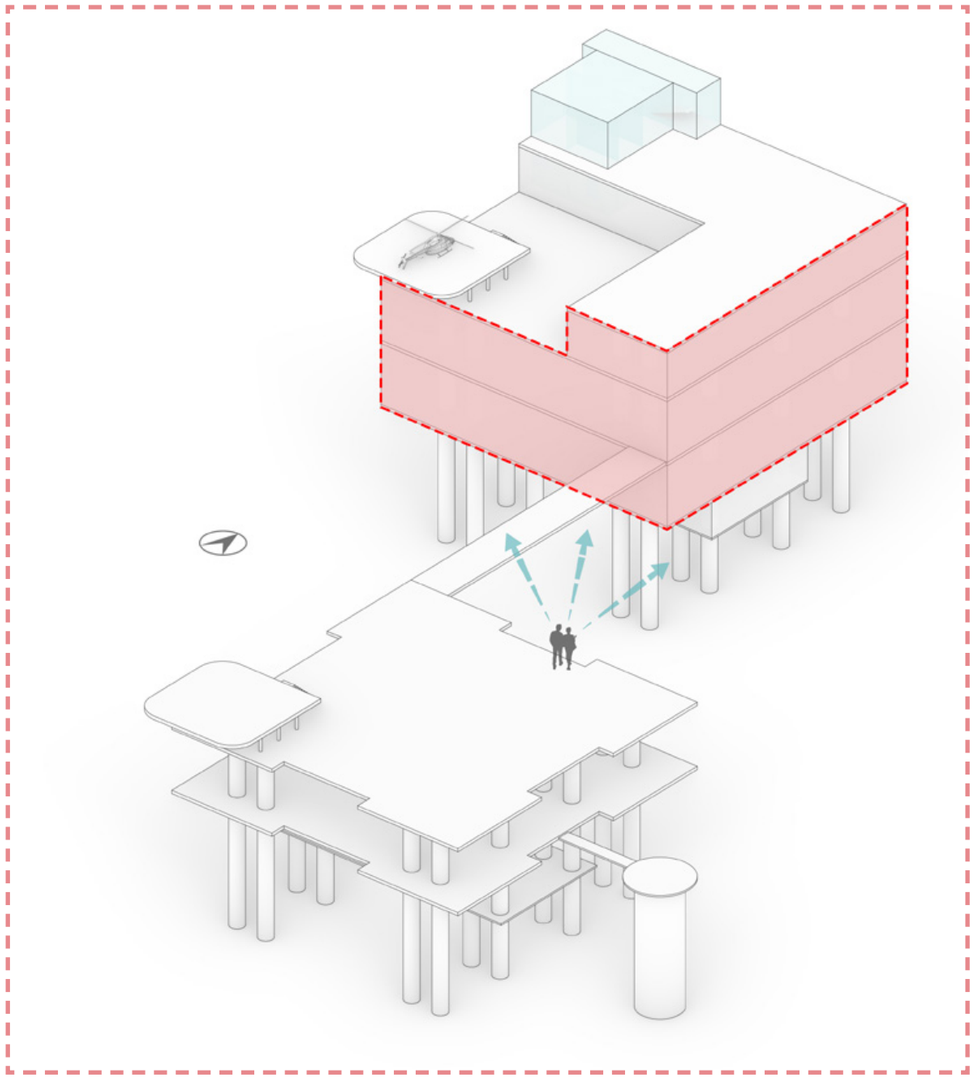
The site is made up of two single buildings, so it is necessary to consider the visual relationship between the two buildings. When the building core is placed on the edge of the building, which destroys the integrity of the facade and can not provide a good visual experience for the visitors who arewatching the building in another building.

Fig.4.5/
Massing Design Step03

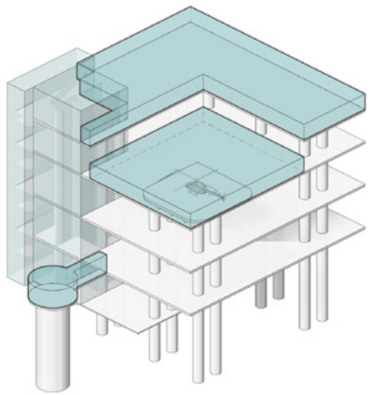


Direction (III)

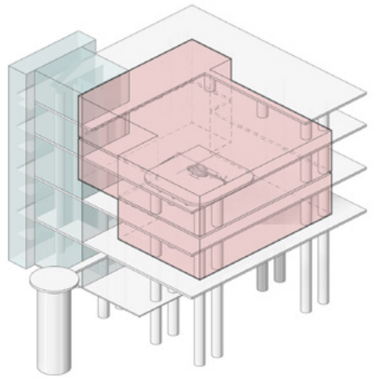
The building core is located in the northwestern corner, which provides an uniform and purify facade to the next stage, so that I will not be limited by the interpenetration between the blocks when I enbark on the stage of architectural form deduction. Therefore, I will choose "Direction (III)" as the basic massing to provide a prototype for the spatial design work in the next step.



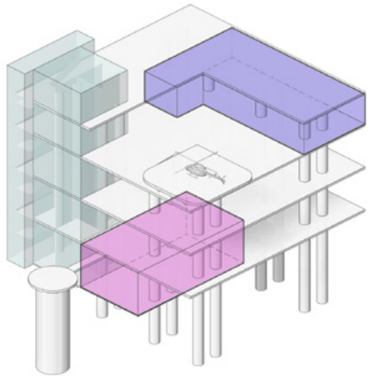
4.1.2/ Program Distribution



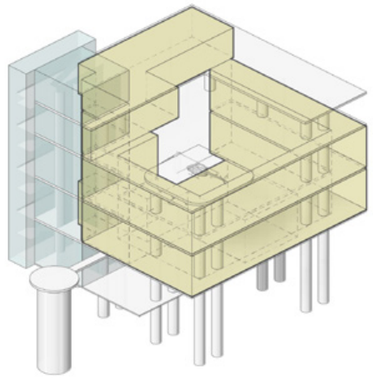
1/Outdoor Space



2/Exhibition Space



3/Office Space&Ratial Space



4/Public Space

Fig.4.6/

Program Distribution

The programs in this museum consist of six types of space:

Equipment space: the building core is composed of fire stair, facility room, elevator and toilet, which is placed in the northwest corner of the building.

Outdoor space: it is composed of the outdoor platform on the first floor, the helipad on the third floor and the roof square on the top floor.

Exhibition space: they are distributed in the middle area of the first and second floor, it contains different types of exhibition methods, which are used to present memories related to the context and Ravenna's history.

Office space: it is located on the east side of the third floor, providing a comfortable and private working environment for the official staff inside the museum.

Retail space: it is located on the west side on the ground floor, it is close to the lobby reception, the space provides a resting place for the interior of the building, where people can enjoy coffee, books and beautiful marine environment.

Public space: the original structure of the drilling platform is distributed on the East and west sides, so some narrow and long spaces are presented at the edge of the floor. The public space is placed in these areas and they enfold the exhibition space that is in the middle of the floor. This type of space is mainly composed of traffic space and rest area.

4.1.2/ Program Distribution

The entire building is divided into five floors:

Ground Floor: It is the first space that people experience when they get off the boat and enter the building. It belongs to the public space in terms of spatial attributes. On this floor, people can deal with related matters in the reception area and enjoy a quiet leisure time in the book bar and coffee shop.

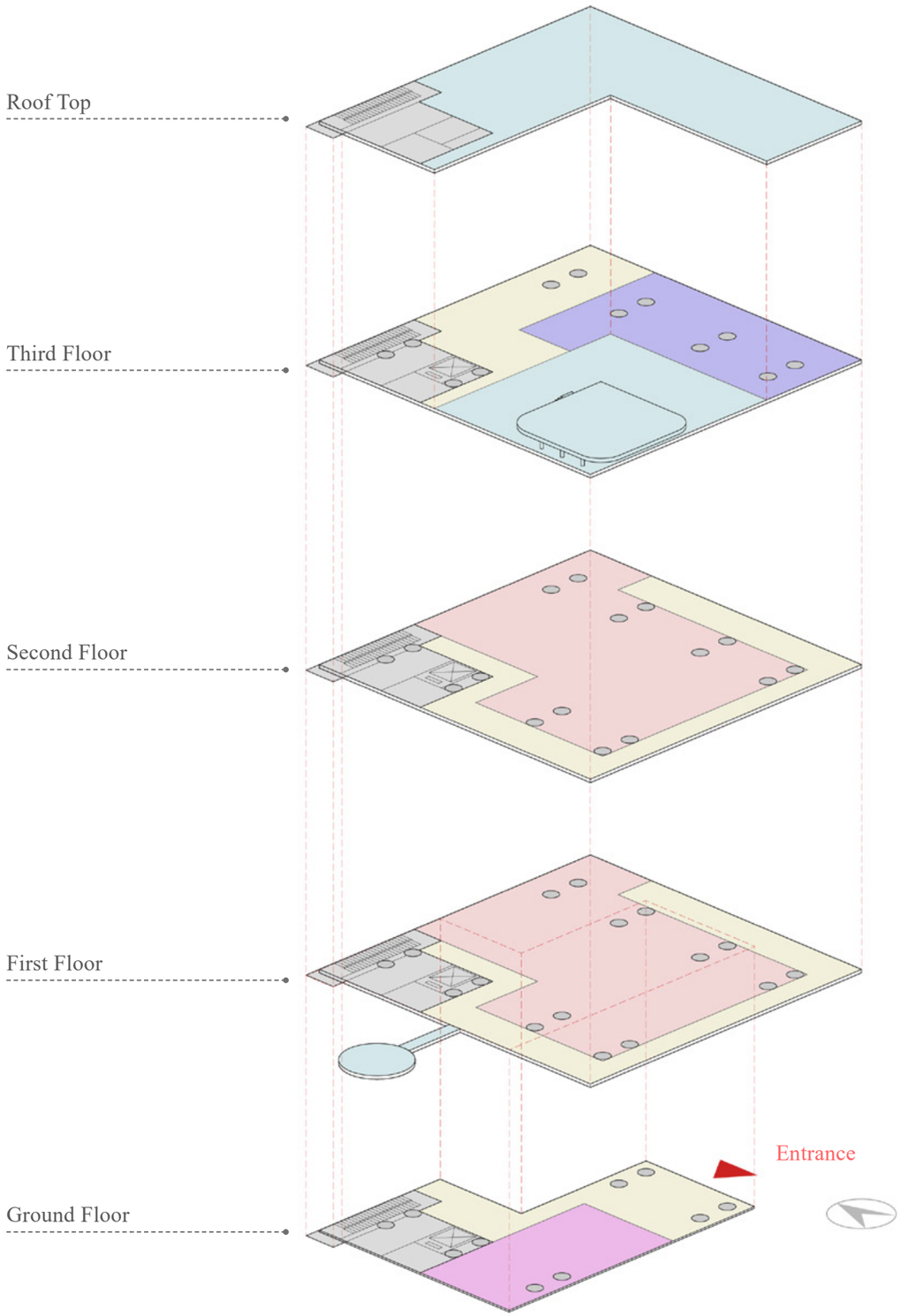
First Floor: On this floor, people formally enter the exhibition area of the museum, where visitors can learn about the culture and history of Ravenna, and they can also visit the remains of marine life unearthed in this area to share the ancient memories and build connections with his sea area.

Second Floor: It is still an exhibition space, but the content of the exhibition on this floor is mainly image and digital media art. Regular artist salons will also be opened on this floor.

Third Floor: The space on this floor is divided into office space and public resting area, which is dedicated to providing a comfortable working place for the staff on this museum.

Top Floor: The roof area provides an open roof plaza for visitors and employees, where people can enjoy the beautiful ocean scenery, and also exchange and interact to the surrounding or enjoy some of physical exercises.

Fig.4.7/
Program Distribution



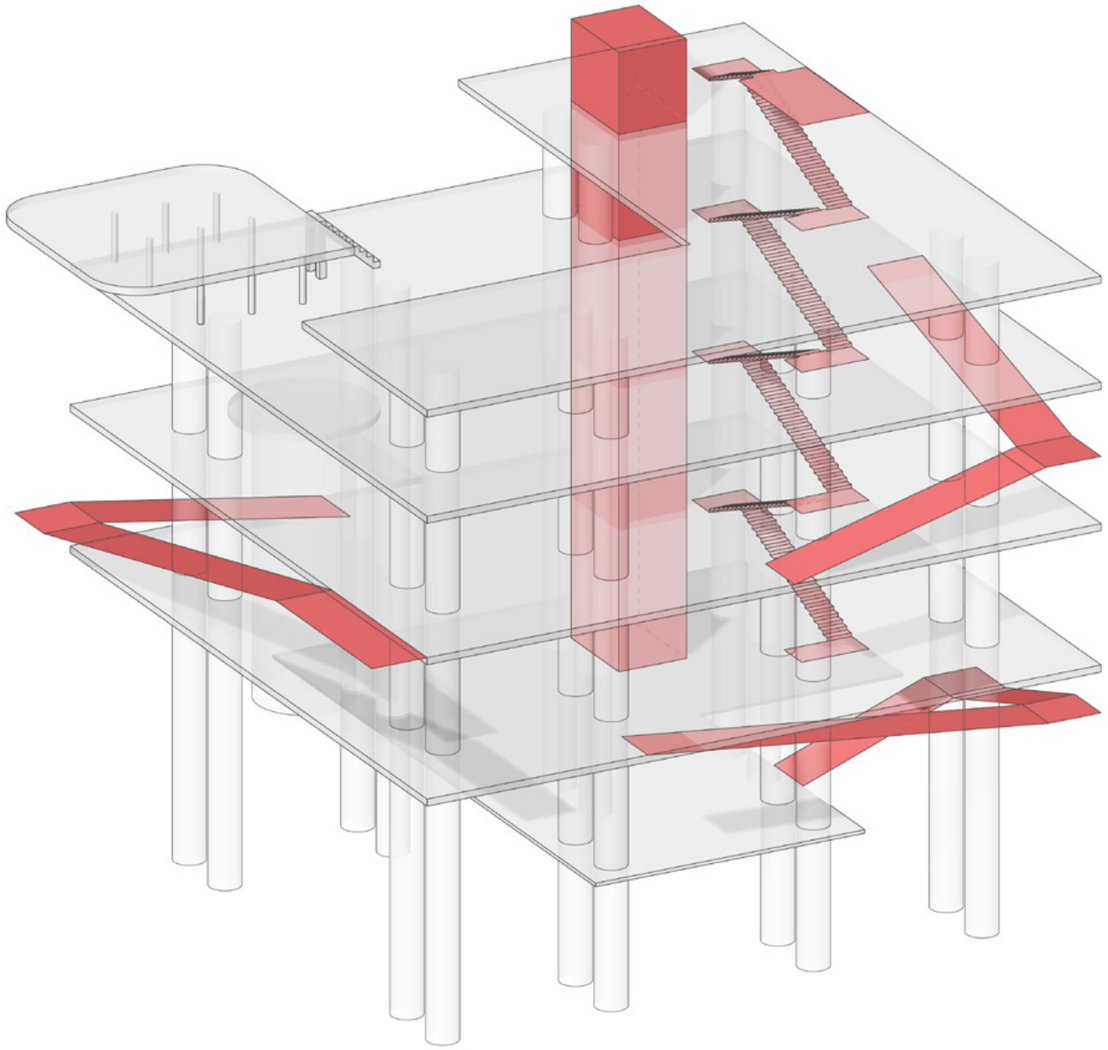


Fig.4.8/
Circulation Principle

4.2/ Circulation principle

The vertical traffic in a building plays an important role in connectivity between the functional massings. It will make the activities in the museum be effectively organized and make the whole building become vitality.

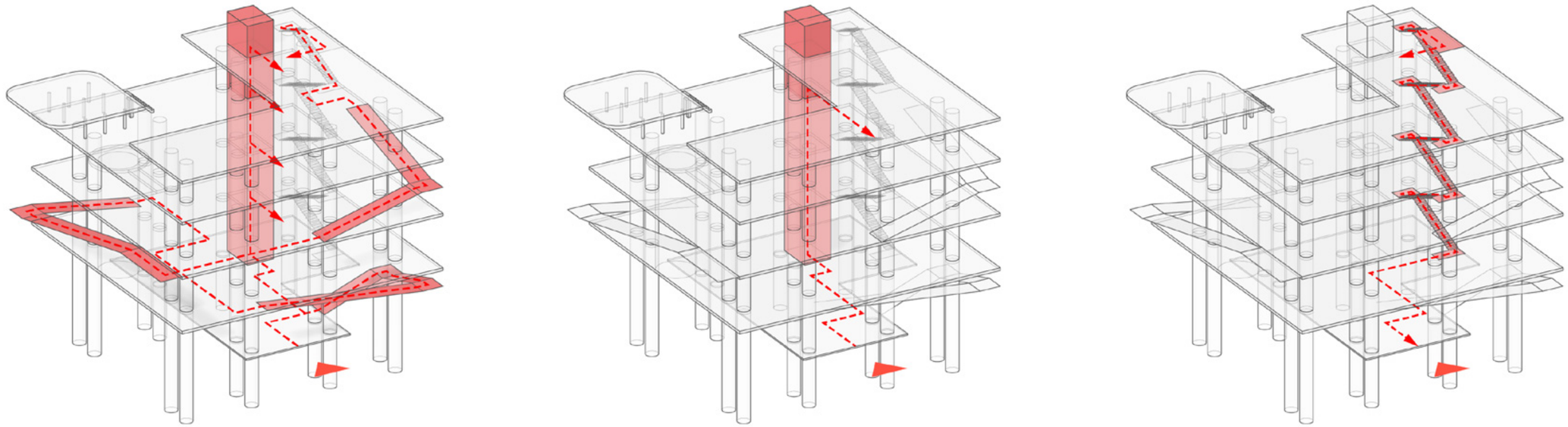
According to the work of the previous stage, I finally used "Direction (III)" to place the fire stairs and elevator in the northwest corner of the building, so as to create a integral floor plan. The task of this section is to effectively connect the various functional blocks inside the building through the placement of the vertical traffic space for visitors to experience the exhibition in order to create a complete space streamline.

The traffic space for visitors to the exhibition in the connecting building is distributed in the corner of each floor in a uniform way, so as to give way to the broad overall space in the middle of the floor, and provide a flexible divided floor space for the later exhibition space design.

4.2/ Circulation Principle

Fig.4.9/

Circulation Typology



4.2.1/ Visitor circulation

The visitors can enter the ground floor of the building by boat, and then walk through the commercial space choose to get inside the elevator directly and enter the exhibition space on the upper floor. They can also choose the stairs on the right side to enter the exhibition space of this museum

4.2.2/ Staff circulation

The internal staff of the museum go directly through the commercial space on the ground floor to the elevator, then go up to the third floor, and walk through the public space to enter the office area.

4.2.3/ Security circulation

The fire staircase is located in the northwest corner of the building, which is isolated from various functional spaces inside. In case of some emergency safety incidents, the people on each floor will enter the fire staircase to reach the bottom floor of the building, and leave the platform by lifeboat.

05/ Design development

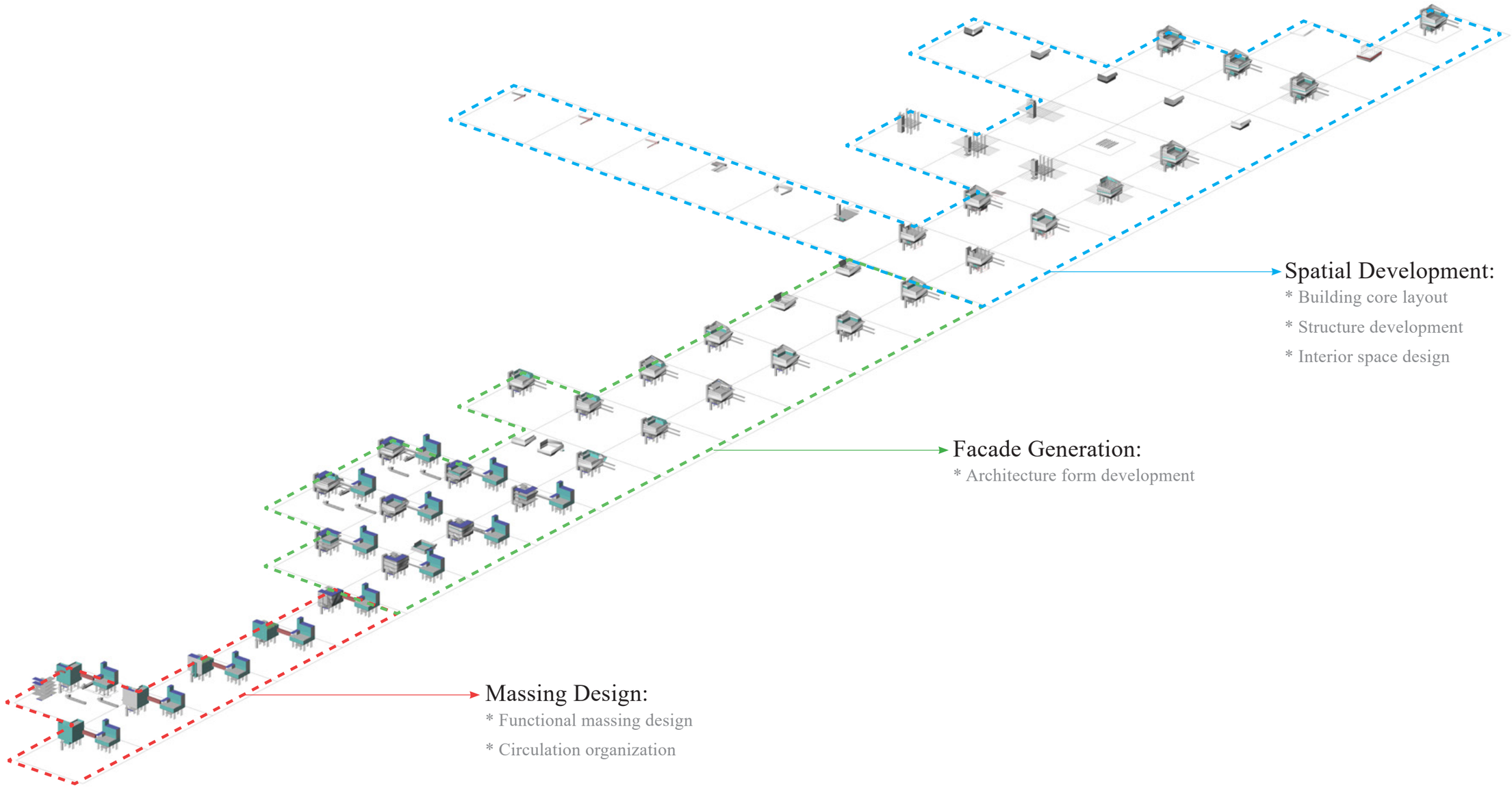
The content of this chapter is dedicated to combining the research results of the previous chapters: such as the translation of history, nature, and industrial elements, demand analysis, spatial emotion research, spatial volume design analysis, etc., based on these process, I transform them into specific architectural space design results .

In this chapter, the deduction process of the architectural form will be explained, the spatial form will be established, and I will use 3Dmodel and diagram to explain the relationship between the architectural form and the elements related to the site, and I will introduce the interior space especially the layout and human activities corresponding to each space. In the last section, it is about the discussion of materials and emotions, which is connect with the final space effect and construction details in the next chapter.

5.1/ Form Evolution

Fig.5.1/

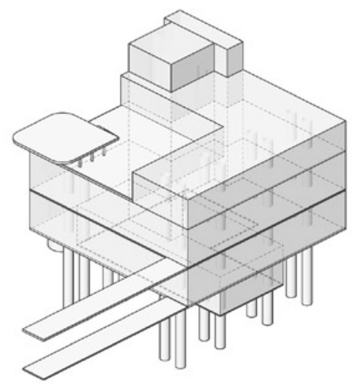
Schematic Design Process



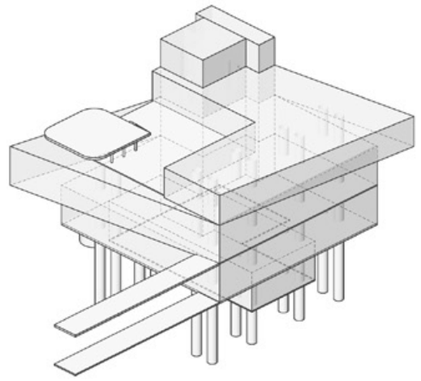
5.1/ Form Evolution

Fig.5.2/

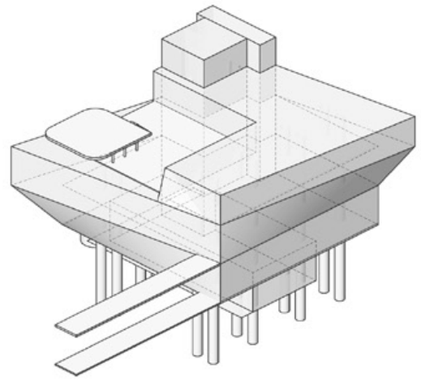
Form Evolution Process



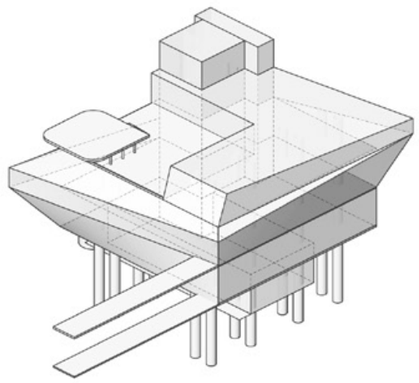
Step 01: Basic block



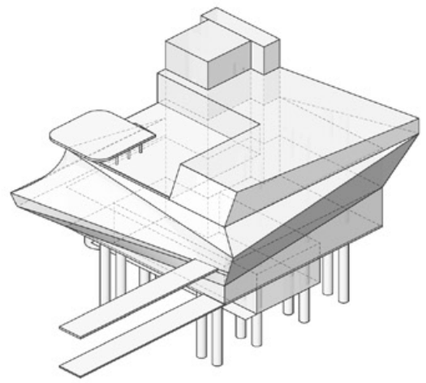
Step 02: Block Extension



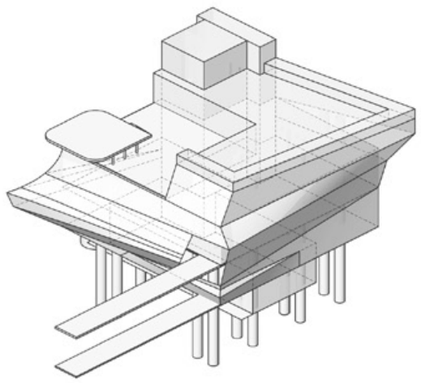
Step 03: Block Mergency



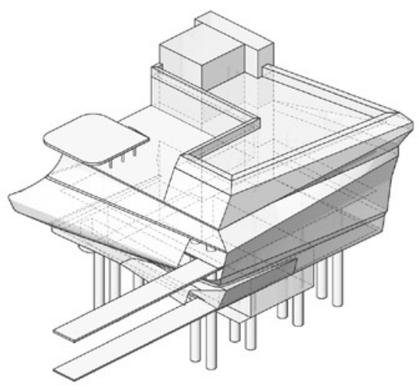
Step 04: Block Distortion



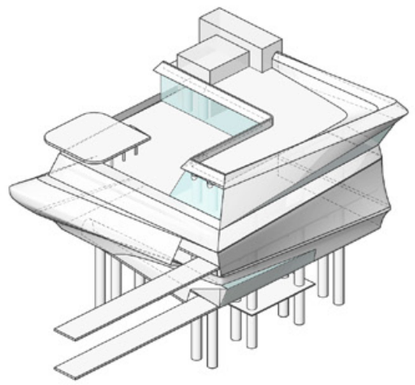
Step 05: Block Folding



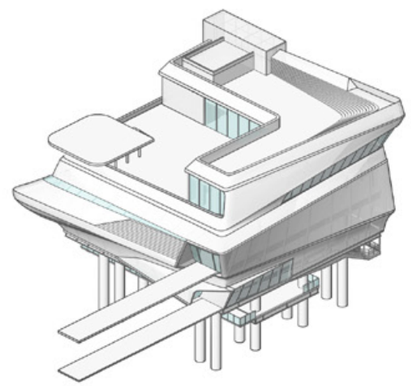
Step 06: Block Folding&Smooth



Step 07: Block Smooth



Step 08: Form Optimization



Step 09: Detail Optimization

5.1/ Form Evolution

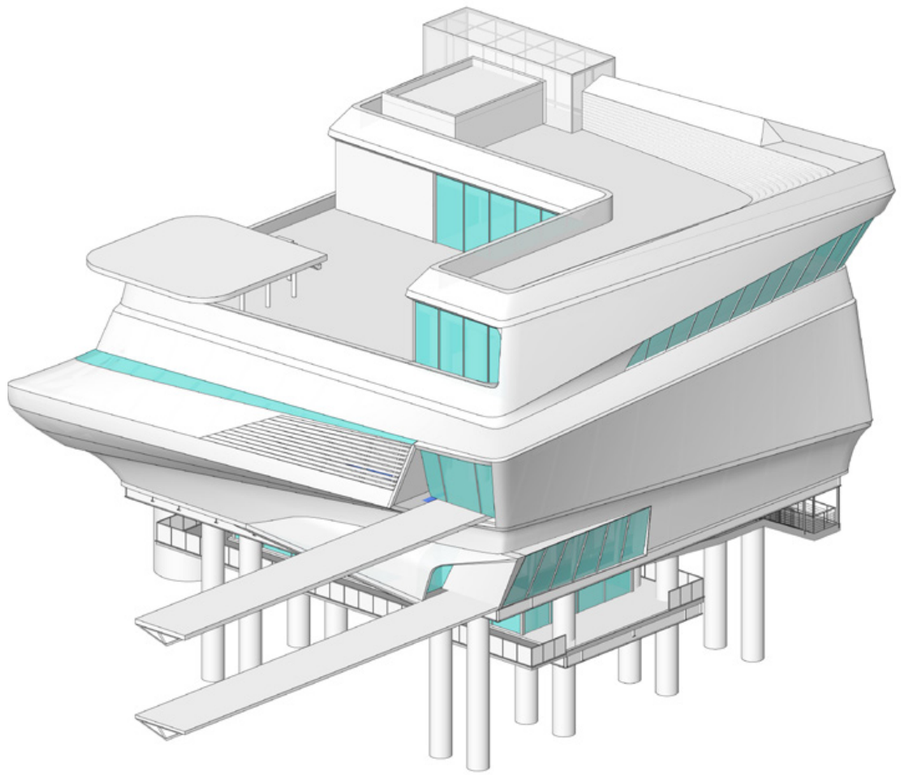


Fig.5.3/
Southeastern View

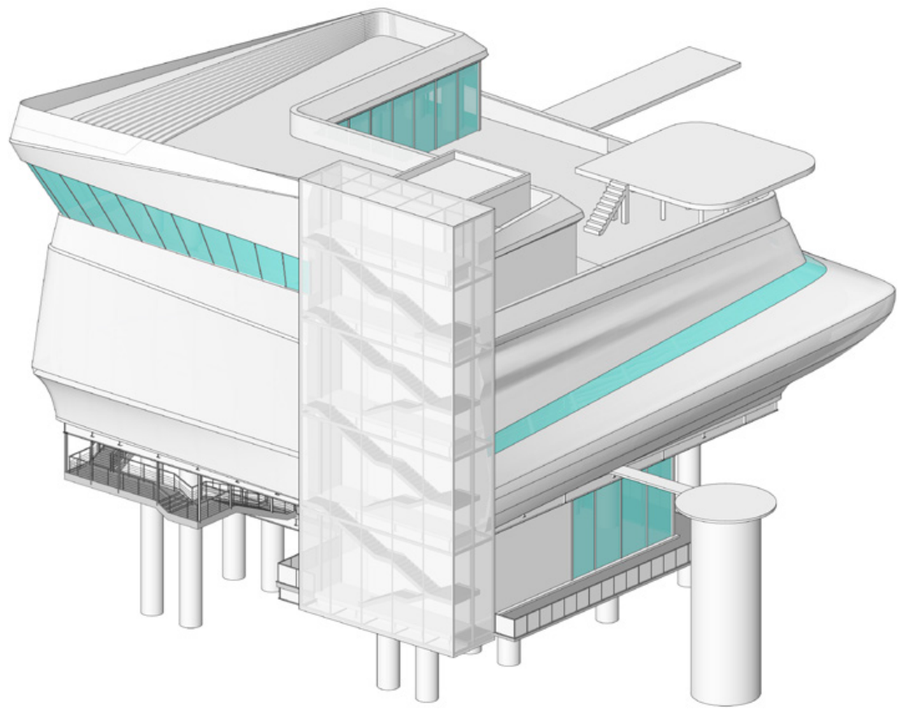


Fig.5.4/
Northwestern view

5.2/ Element Remap

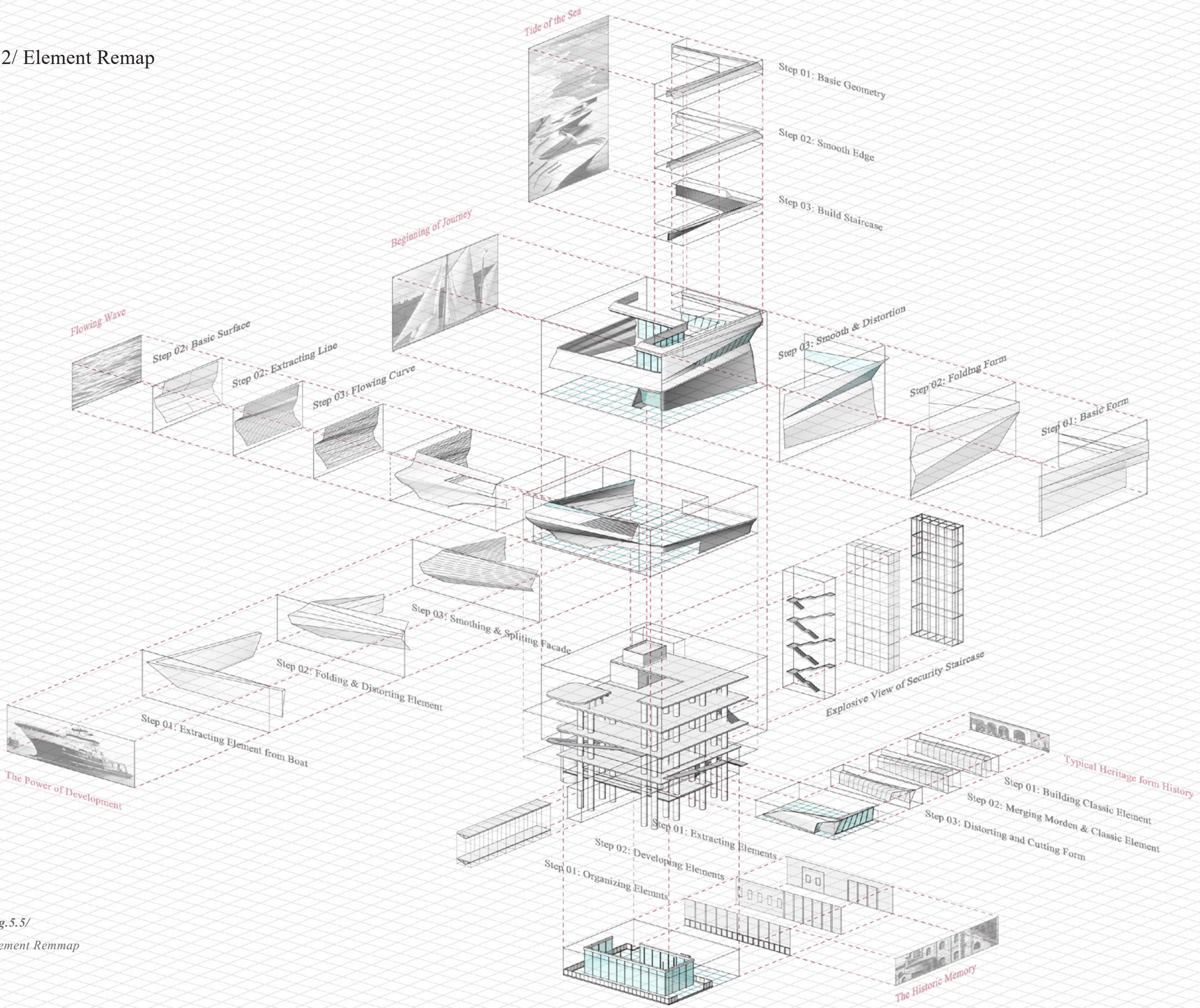


Fig.5.5/

Element Remmap

5.2/ Element Remap

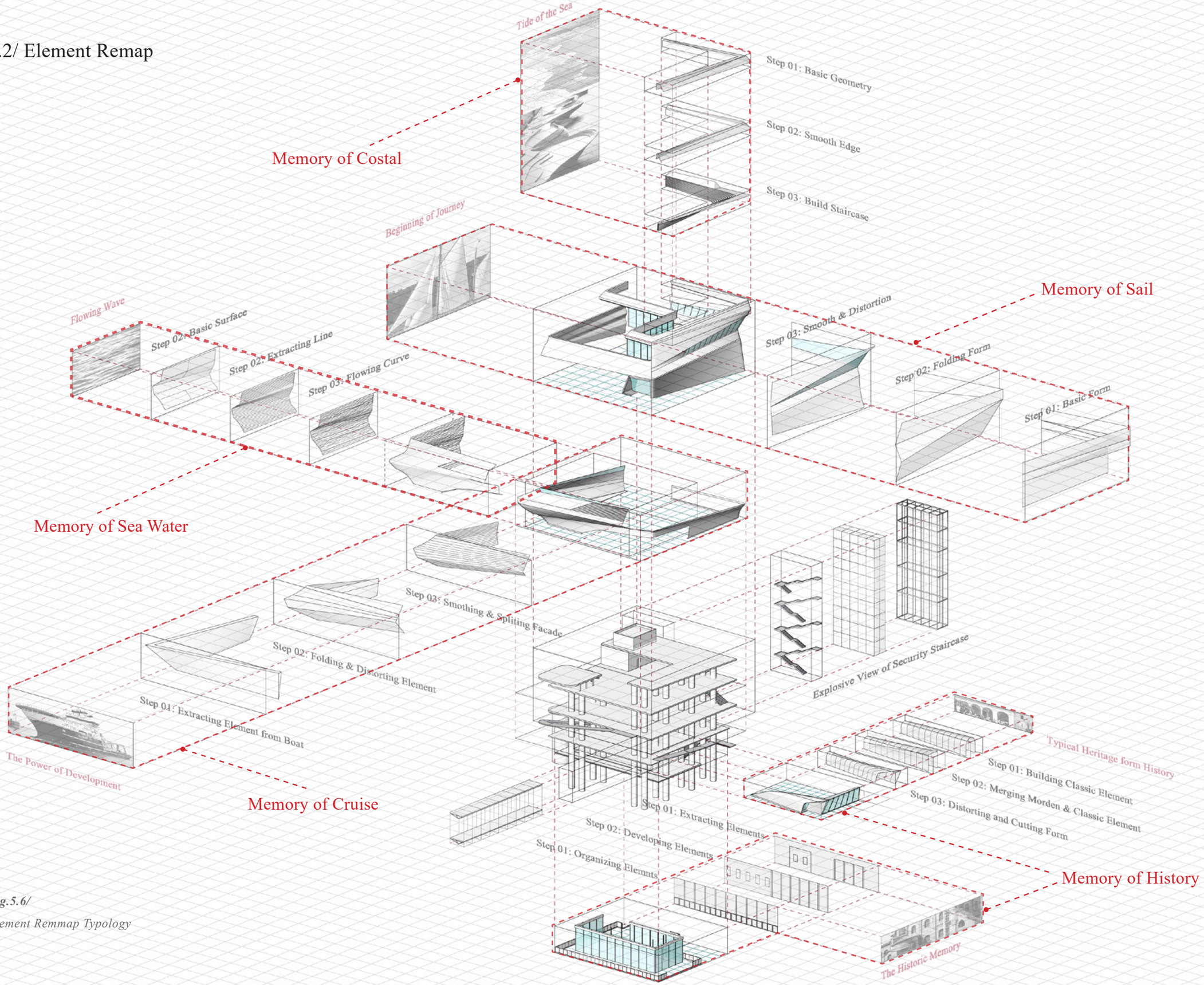


Fig.5.6/

Element Remmap Typology

The eastern facade have used some of the design methods like: mass dislocation, folding and deformation to create the intention of "sails". As an important tool for humans to explore the ocean world in the early days, sailing is a symbolic medium that represent the connection between humans and the sea. The sail has been evolved into many kinds of different forms and finally the basic form of triangle is extracted and used in the construction of the building facade.

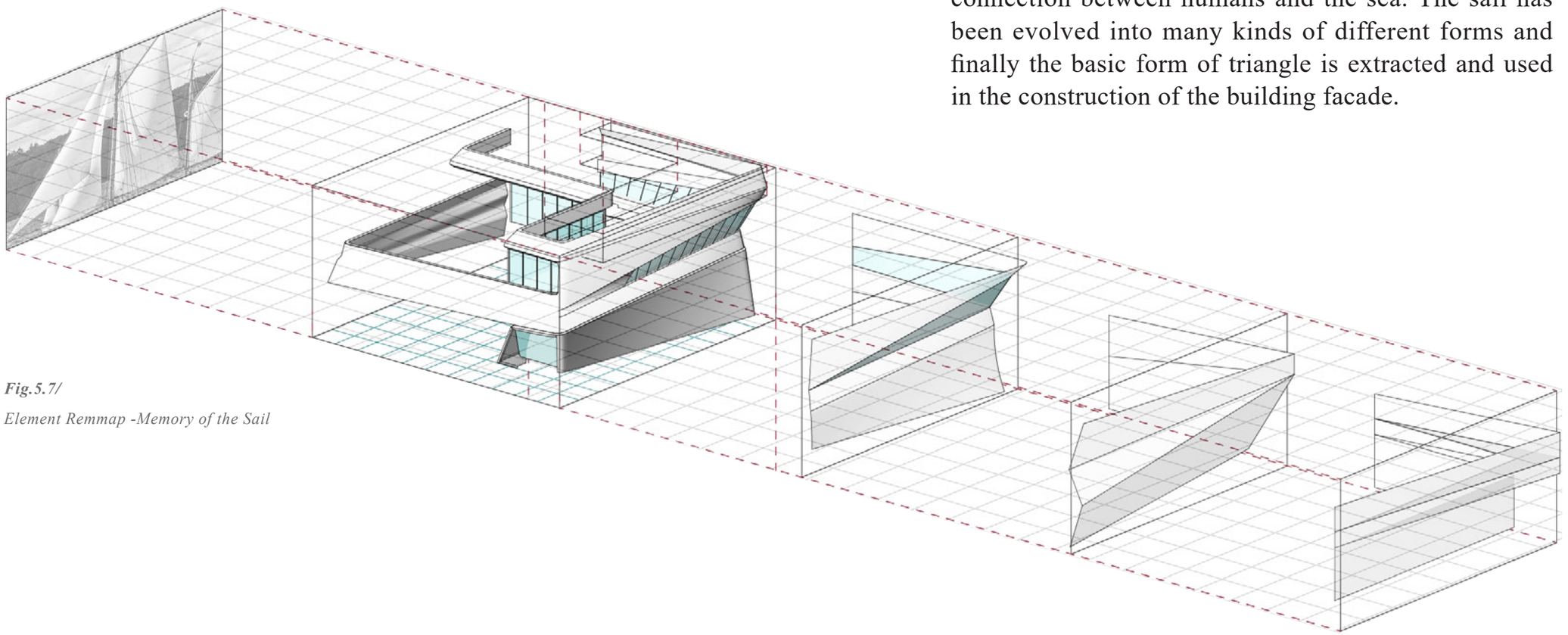
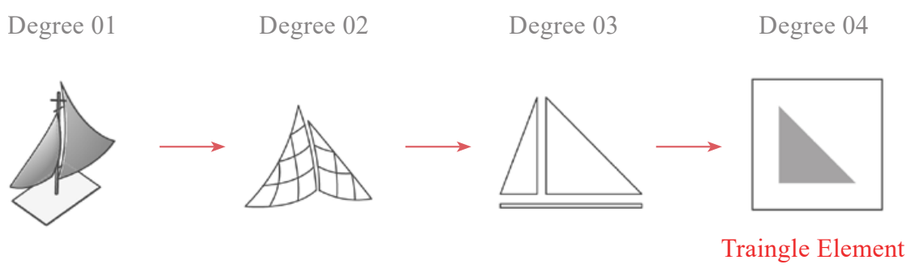


Fig.5.7/
Element Remmap -Memory of the Sail



5.2/ Element Remap

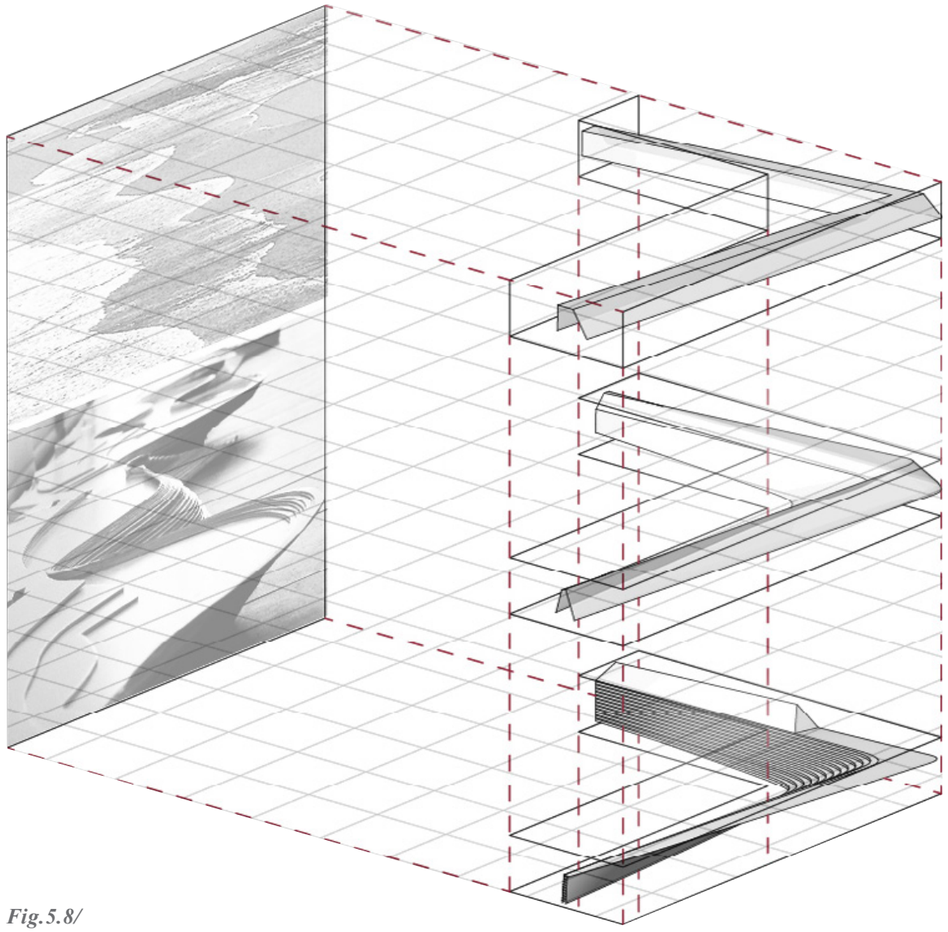


Fig.5.8/

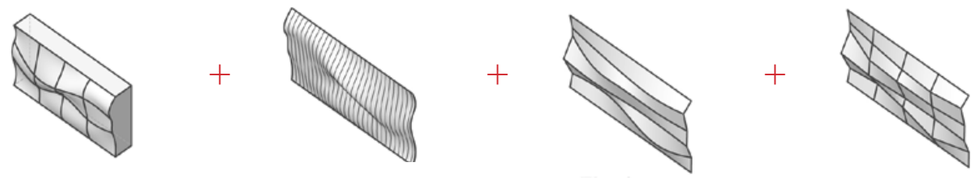
Element Remmap -Memory of The Costal

About my first memory of the ocean is that when I was a child, I was walking on the beach and addicted to collecting shells that were washed on the shore by the wave from the sea.

At the beginning of the process, I designed a viewing platform for people and the arc-shaped staircase connected to the wall, which was purposed to awaken this memory that happened on the beach.

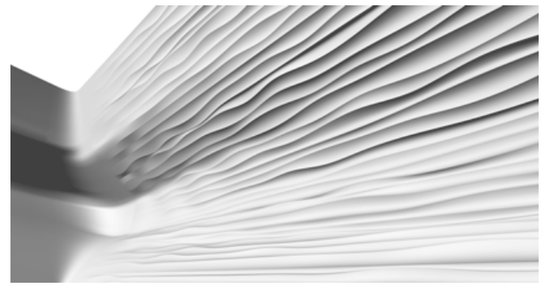
When we talk about the memories related to the ocean, the element of water is always appealed on our mind. The form of water represents endless change and continuous movement. I designed a wall that simulates the ripples of the sea near by the ramp between the first floor and the second floor. The purpose is to evoke people's impression of the ocean. When people experience this space, they will seem to be on the surface of the sea and stare at the endless ripples. .

Flowing Water Element



Model 01 + Model 02 + Model 03 + Model 04

Southeastern view



Southeastern view

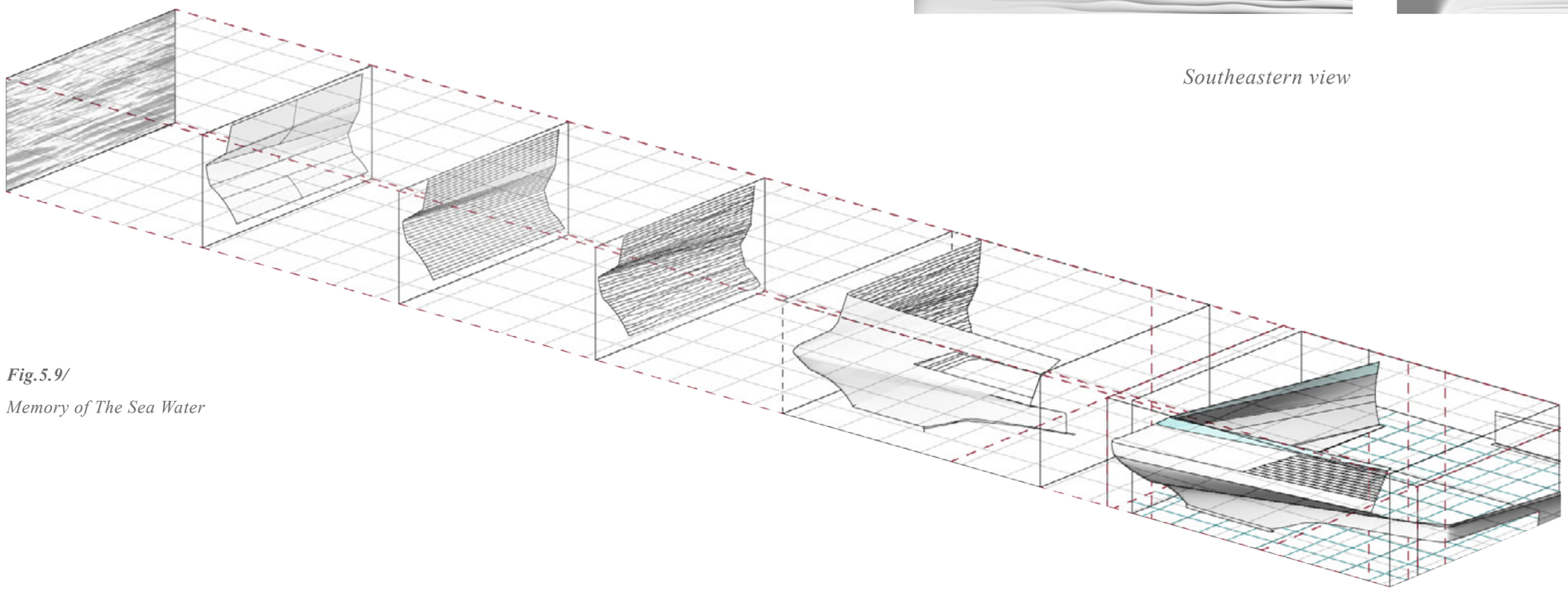
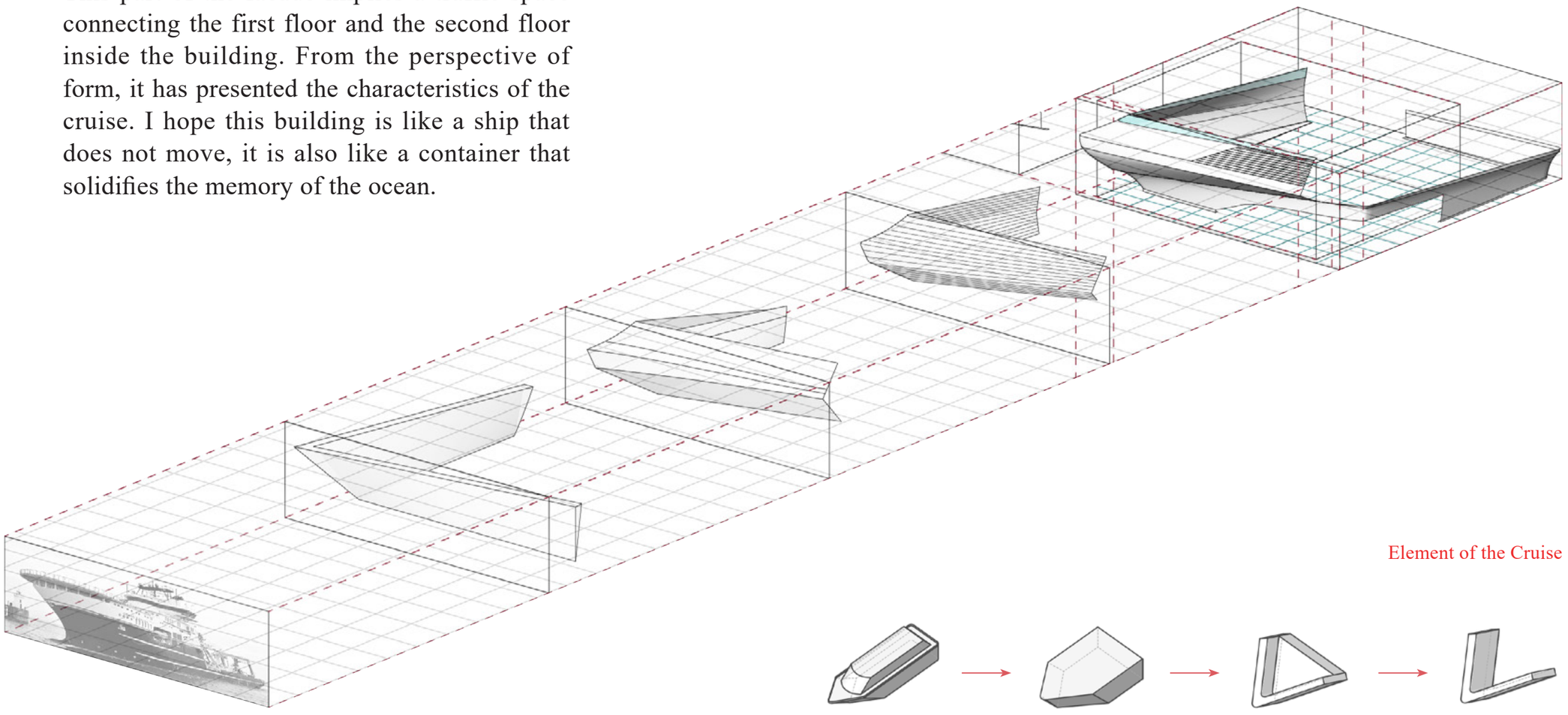


Fig.5.9/

Memory of The Sea Water

When people see this building, they will be attracted by the prominent form of its facade. This part of the facade implies a traffic space connecting the first floor and the second floor inside the building. From the perspective of form, it has presented the characteristics of the cruise. I hope this building is like a ship that does not move, it is also like a container that solidifies the memory of the ocean.

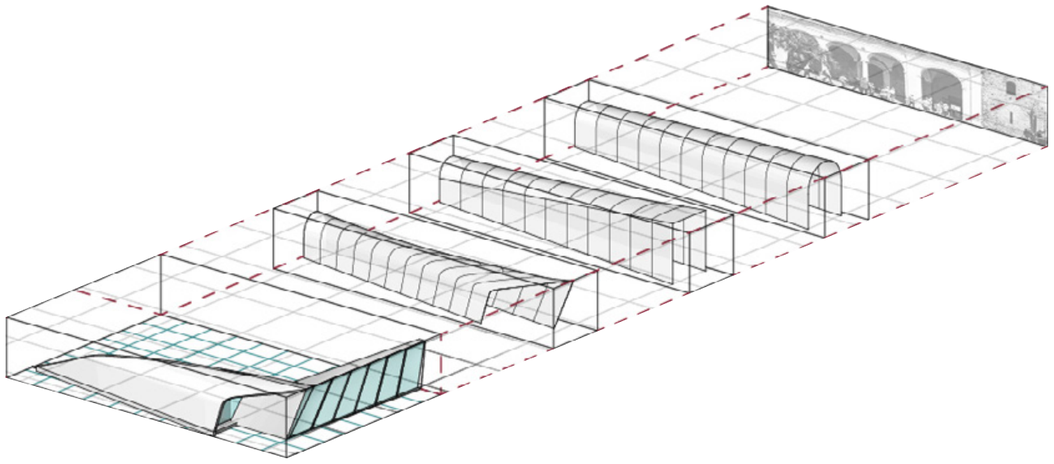


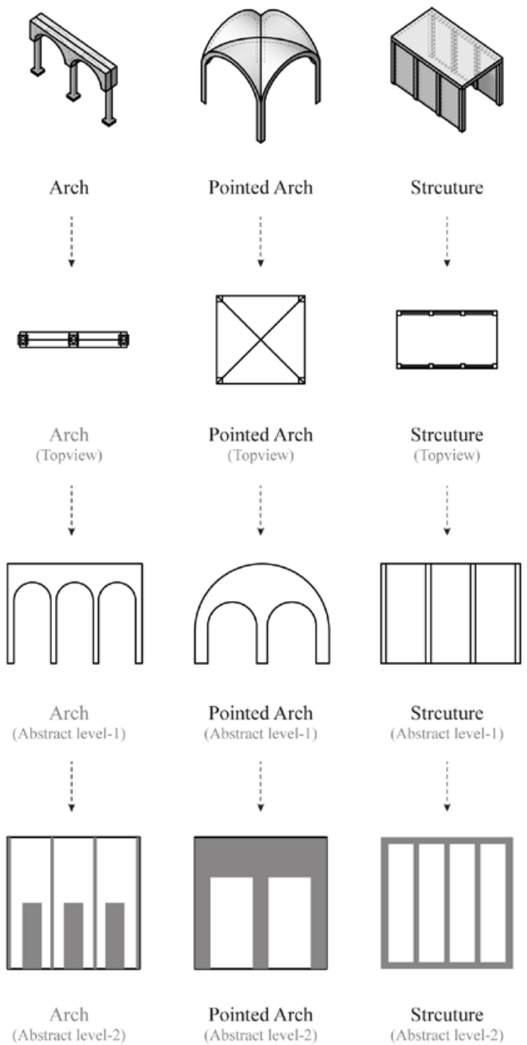
Element of the Cruise

Step 01 Step 02 Step 03 Step 04

Fig.5.10/

Memory of The Cruise





Through the translation of the historical relics elements in Ravenna, I applied these extracted geometric elements to the architectural form, which is purposed to metaphorize the cultural features related to the site culture, but I refused to use the element that did not be refined by our mind, because this building is type of a modern building, it is irresponsible to crudely combine the elements in the historical relics directly during this design process. The process of the evolving and translating the elements is just like the process of human civilization.

Fig.5.11/

Memory of The Ravenna History

5.3/ Activity Intervention

The work at this stage is to combine the obtained building skin with the results of the previous mass analysis and then to visualize the spatial layout of the entire building. This also means that the activities of the visitors in the space will be finally established.

The circulation inside the building is organized by stairs and ramps used to display visits, as well as elevators and safety stairs located in the northwest part.

The Ground floor is composed of a reception area and a coffee lounge. The transparent glass facade is dedicated to introducing the surrounding ocean scenery into the indoor space.

First floor and second floor are mainly used for exhibition activities. The marginal layout of the building core retreats a complete and open indoor space for flexible handling of exhibition activities of various scales. When entering the space of the first floor, you will experience two walls evolved from the historical elements of Ravenna, just like the fact that humans can only create the present and the future by experiencing history. On the ramp to the Second floor, visitors will see a wall with a surface texture like flowing water, which is like a space-time tunnel made of sea water connecting the upper and lower exhibition spaces. On the second floor, a screening hall is arranged to present the digital media materials related to the memory of this place.

In addition to providing visitors with a resting space, the third floor aims to provide a comfortable working environment with good ocean views for the office staff inside the museum. The helipad is placed in the outdoor space on that floor.

The top floor plaza provides a 360-degree viewing platform for building users, where people can enjoy the gentle sunshine and comfortable sea breeze of the Adri Sea and meditate on the connection between themselves and nature, history, and place.

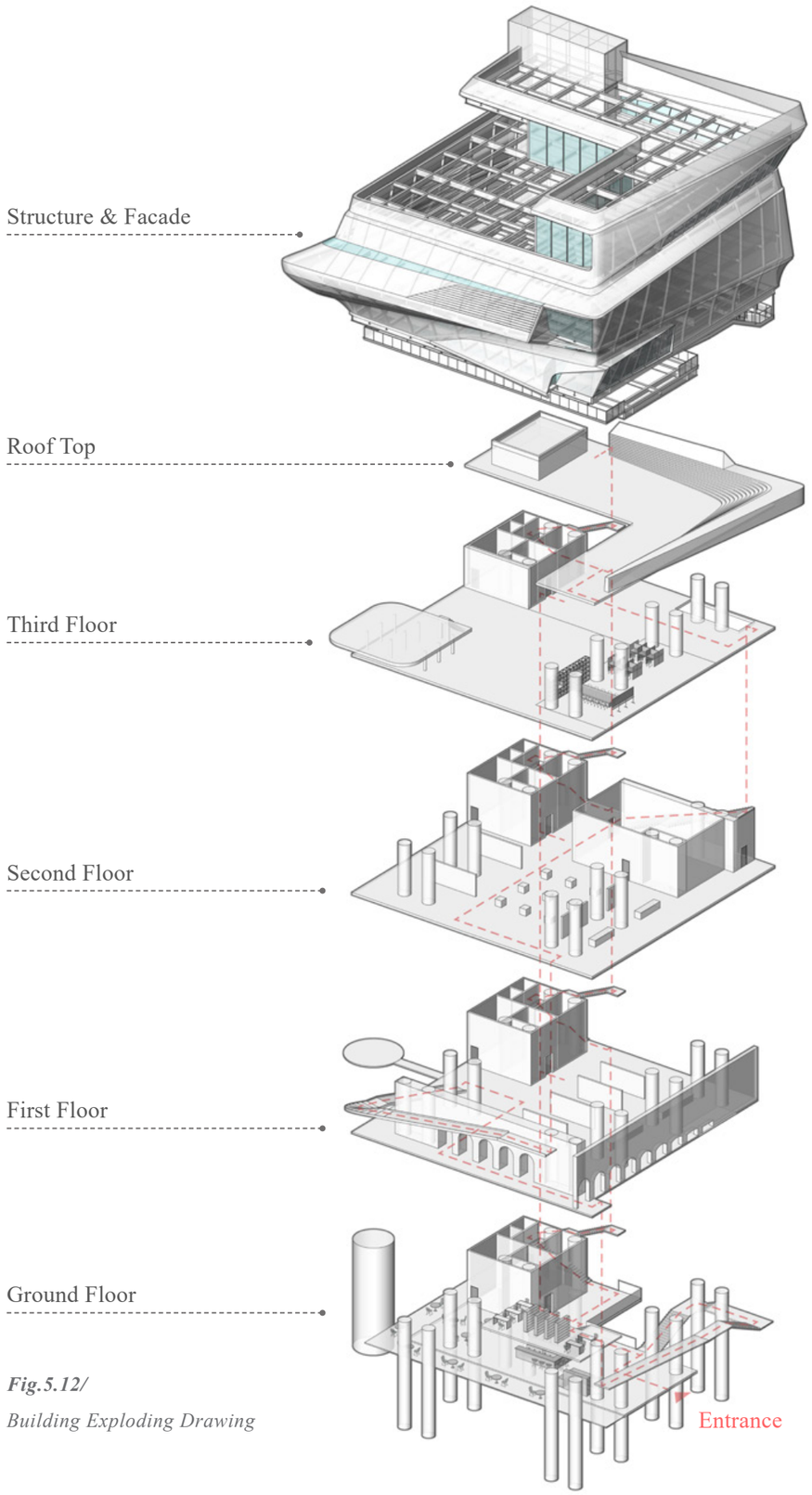
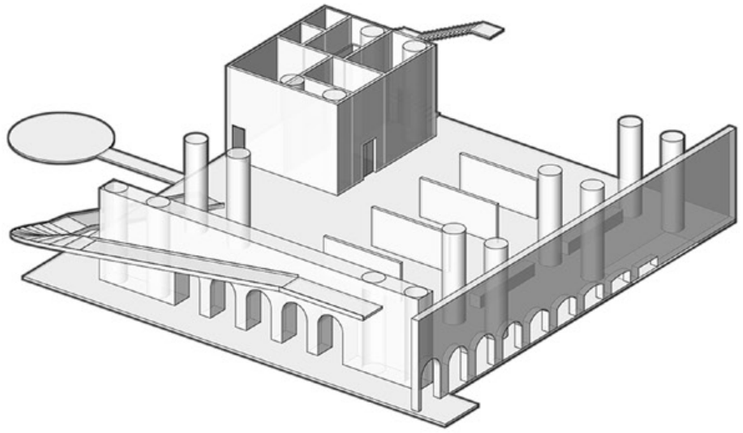
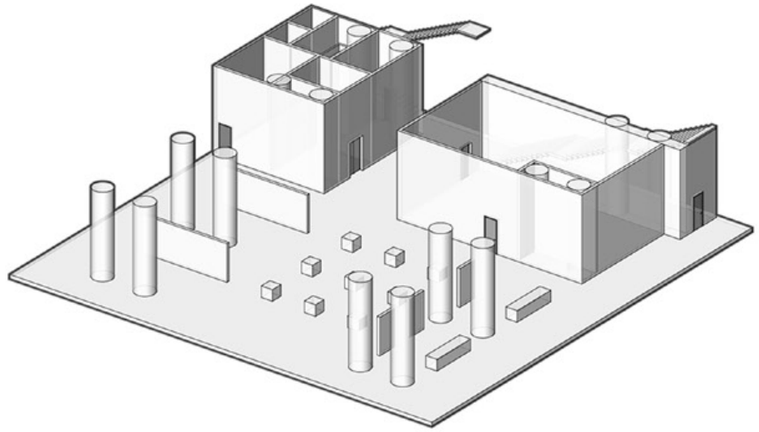


Fig.5.12/
Building Exploding Drawing

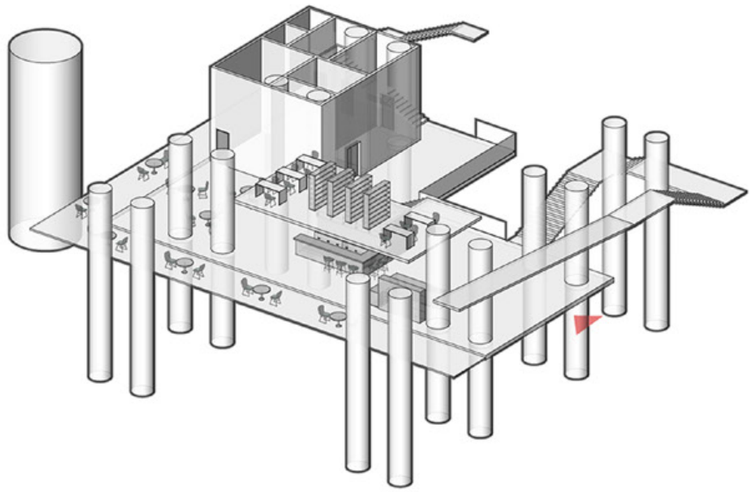
5.4/ Activity Intervention



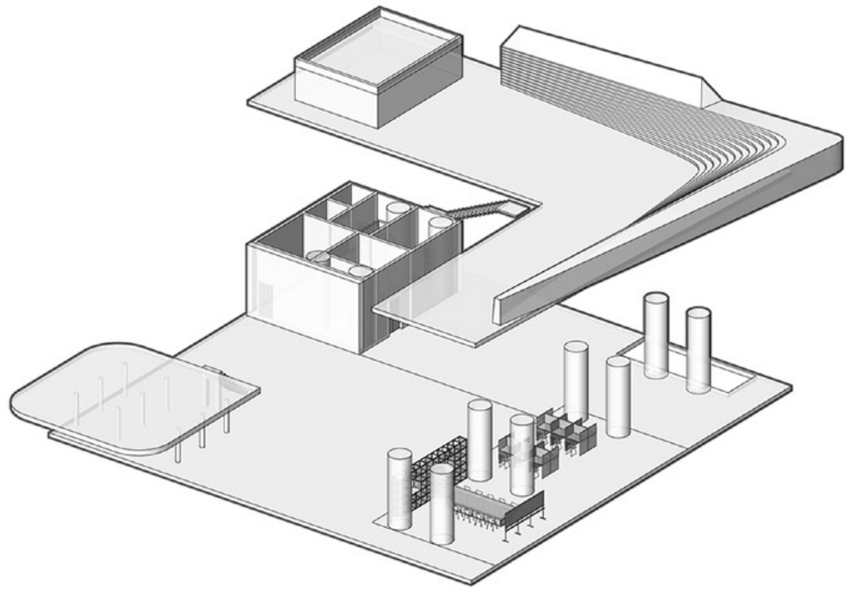
First Floor



Second Floor



Ground Floor



Third Floor & Top Roof

Fig.5.13/

Floor Axonomotric Drawing

5.4/ Material Mood Board

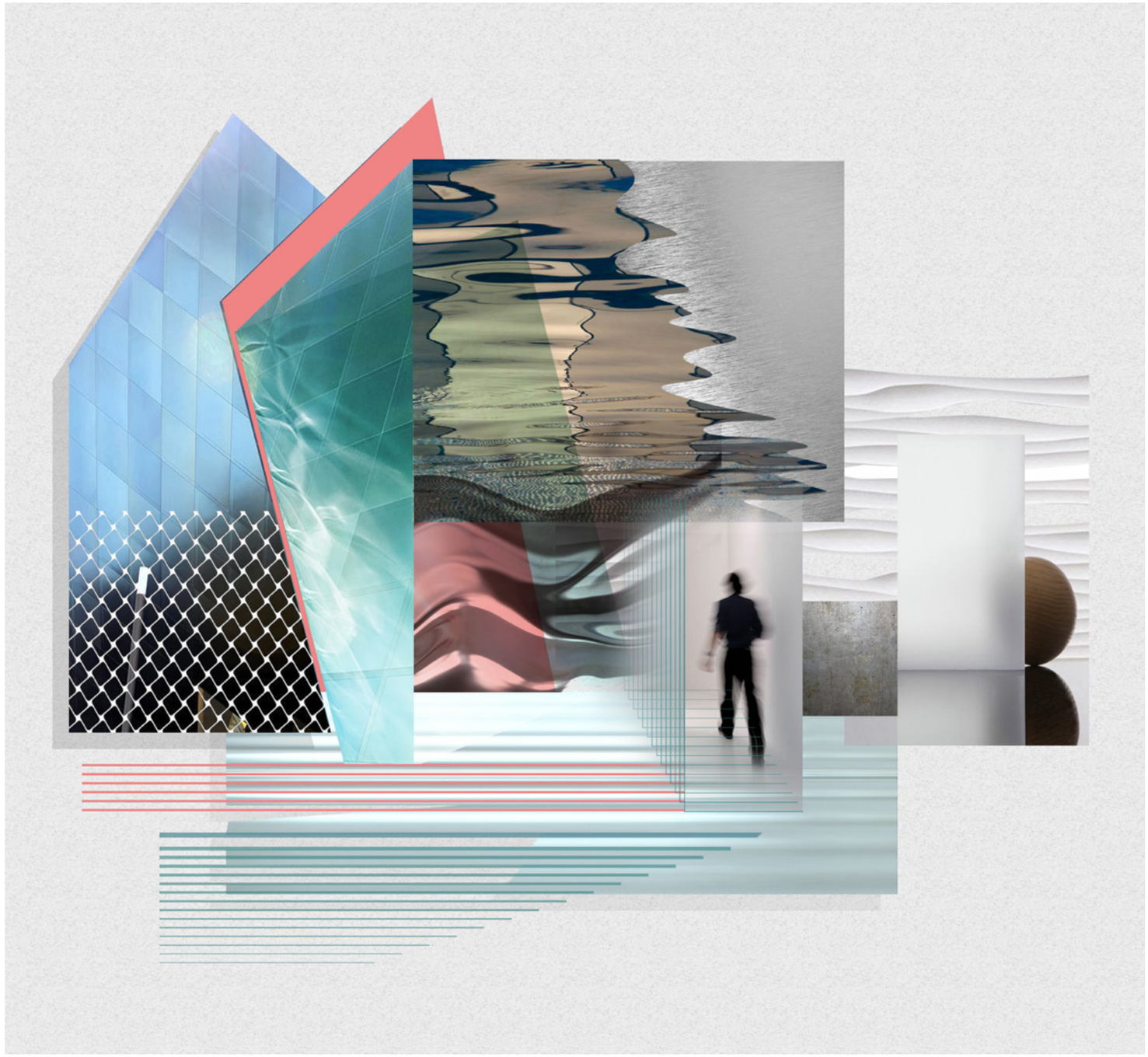


Fig.5.14/
Material Moodboard

A space without material and color is just a rational and cold volume. Materials and colors light up the mood of the space and it will provide the architectural space personality like human-being. To be honest, in this part of the content, I don’t want to arrange the colors and textures used in the space as usual and format them one by one. I hope to use these material elements to express a kind of vague and narrative feeling. The spatial experience and material elements in Mood Board are ultimately to make the architectural space more specific, and the goal of this building is to visualize the vague and fragmented memory related to history, industry, and nature behind this place. Then leave a unique emotion and impression in the hearts of someone who experience this space. I hope to use these materials to directly express the ultimate purpose of this building.

Creating the space by using these materials directly is abstract. It just like a kind of object between two-dimensional and three-dimensional, but it expresses the materials, color, texture, light and other elements that will be used in the space. At the same time, it also conveys a vague feeling, and this kind of feeling is deeply connected with the memory behind the site, and the "person" in the picture is embracing this memory.

06/ Design Outcomes

This chapter will finish the final space design results following to the research, analysis, concept parts and schematic design from previous chapters. It will express the design concept, space atmosphere, materials, colors and rationality of the construction through floor plans, elevations, exterior and interior renderings, and technical joints.

6.1/ Space Plan

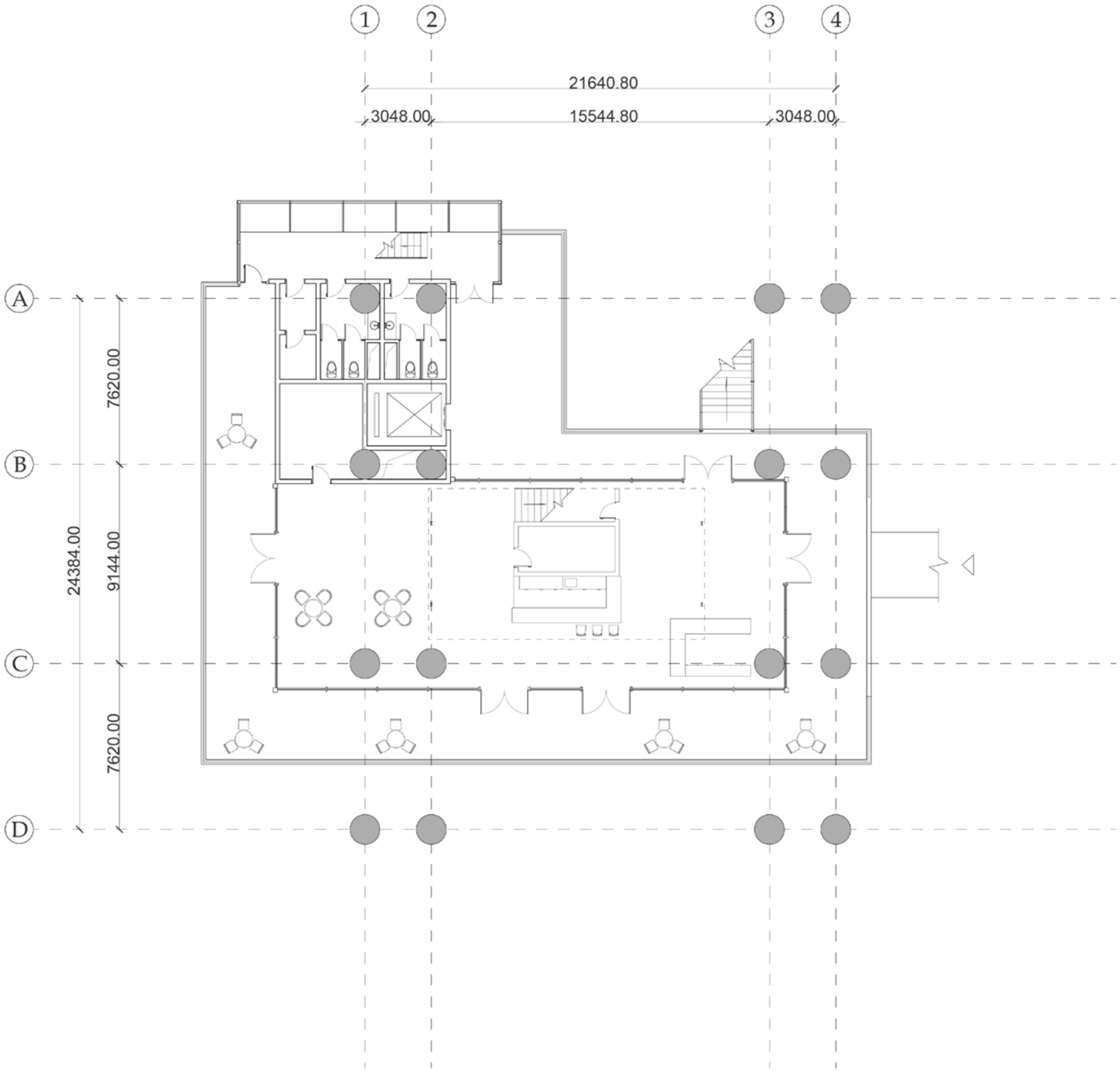


Fig.6.1/

Ground Floor Plan

6.1/ Space Plan

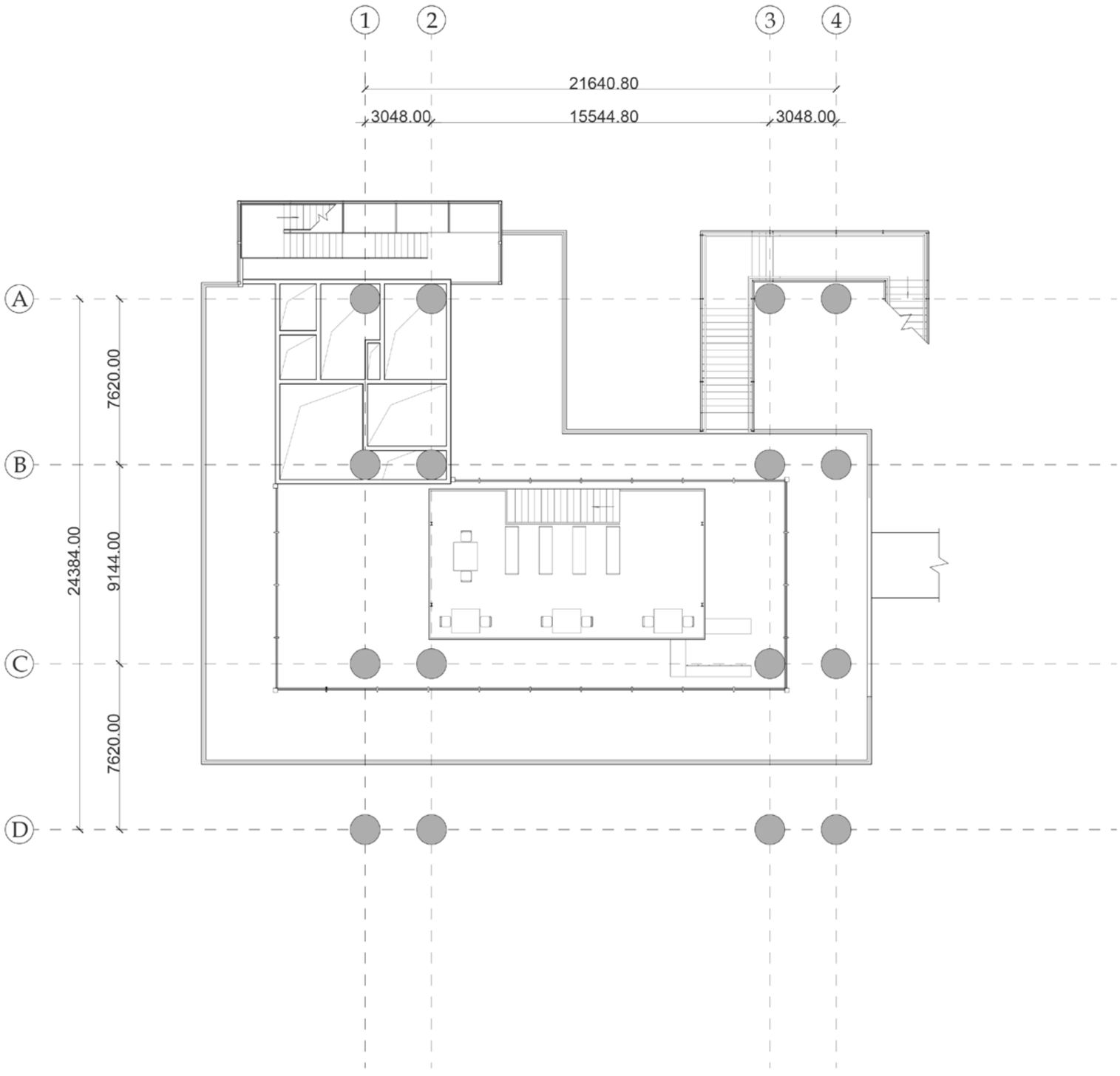


Fig.6.2/

Ground Floor Mezzanine Plan

6.1/ Space Plan

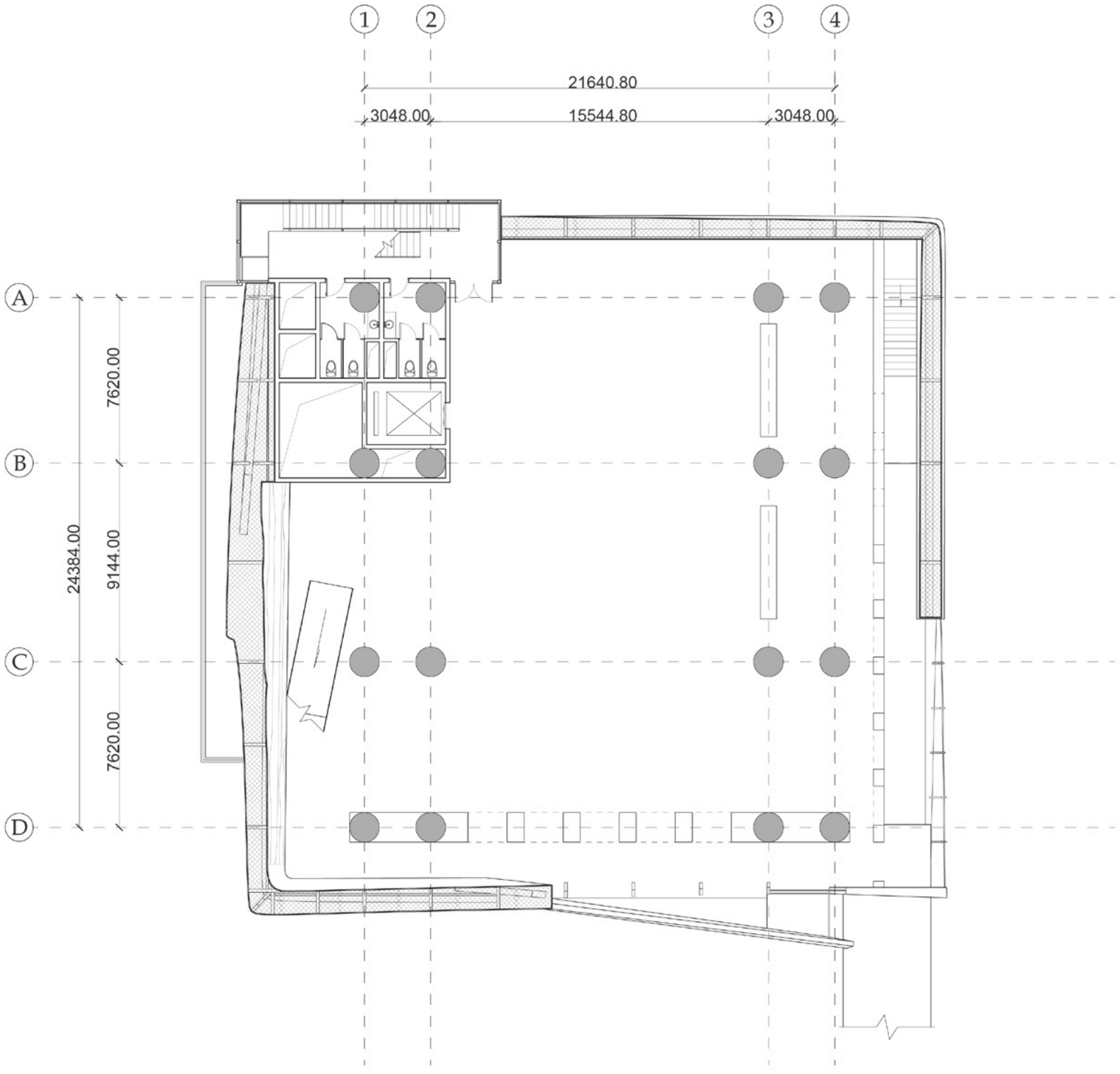


Fig.6.3/
First Floor Plan

6.1/ Space Plan

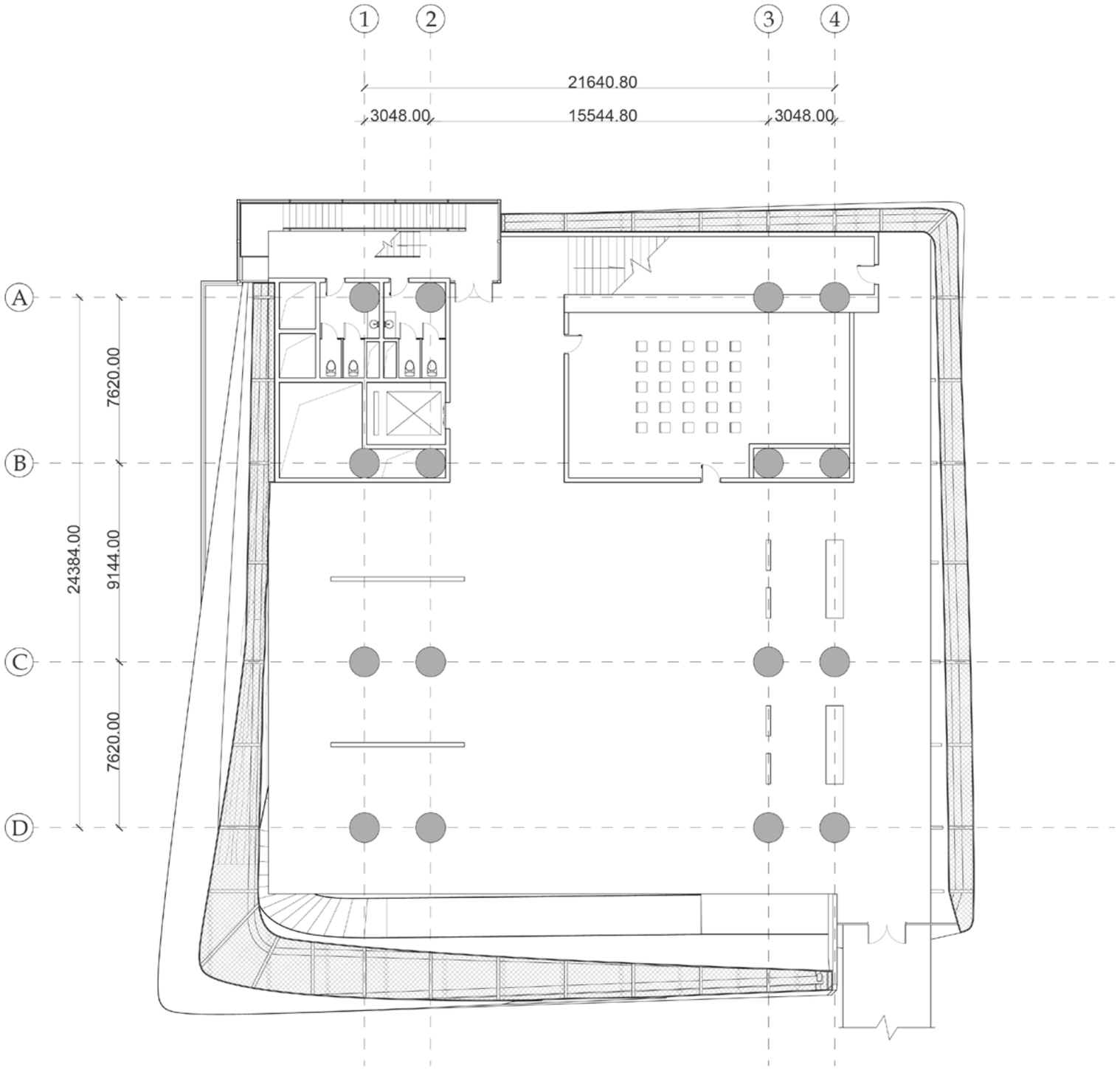


Fig.6.4/
Second Floor Plan

6.1/ Space Plan

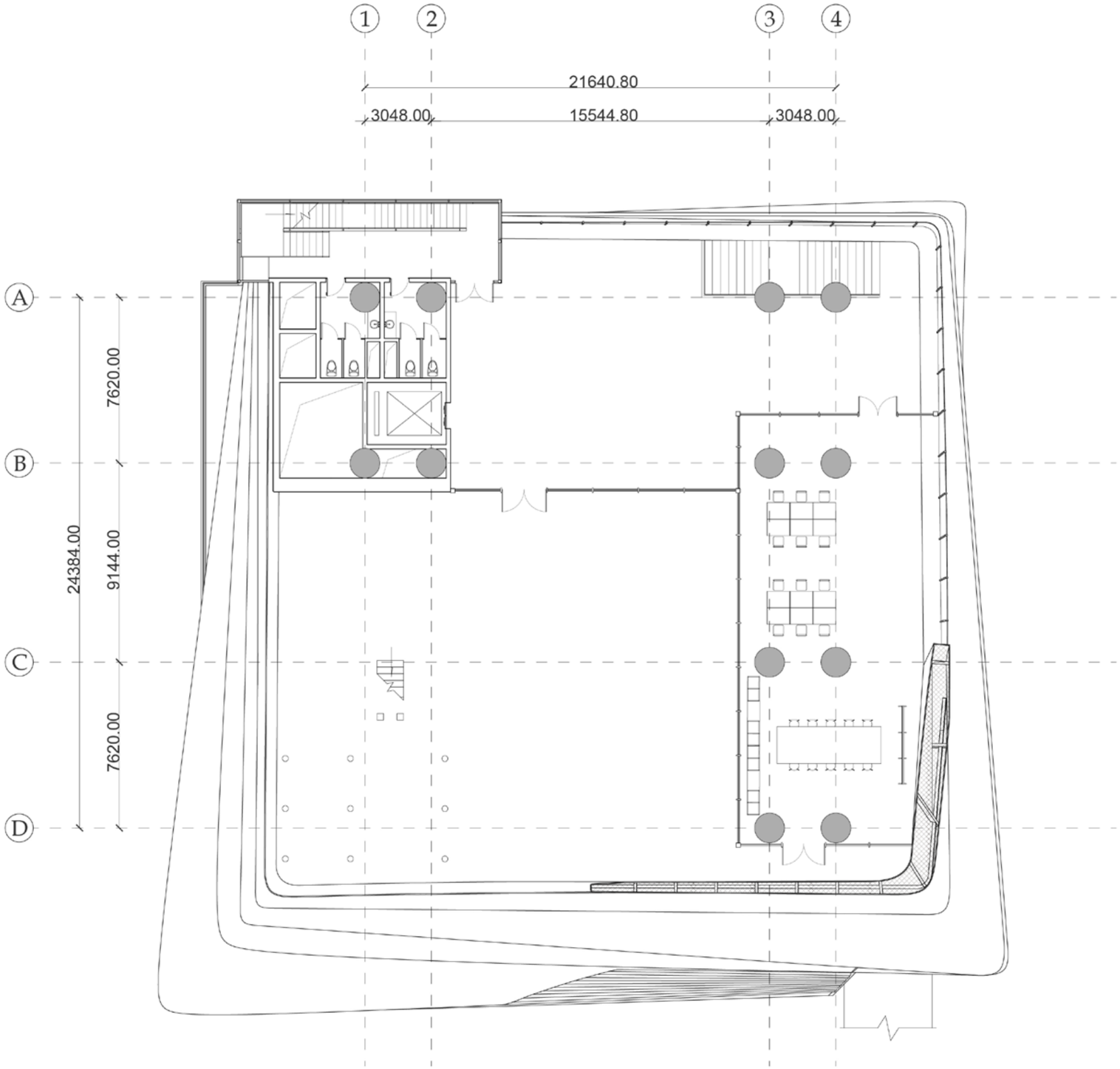


Fig.6.5/
Third Floor Plan

6.1/ Space Plan

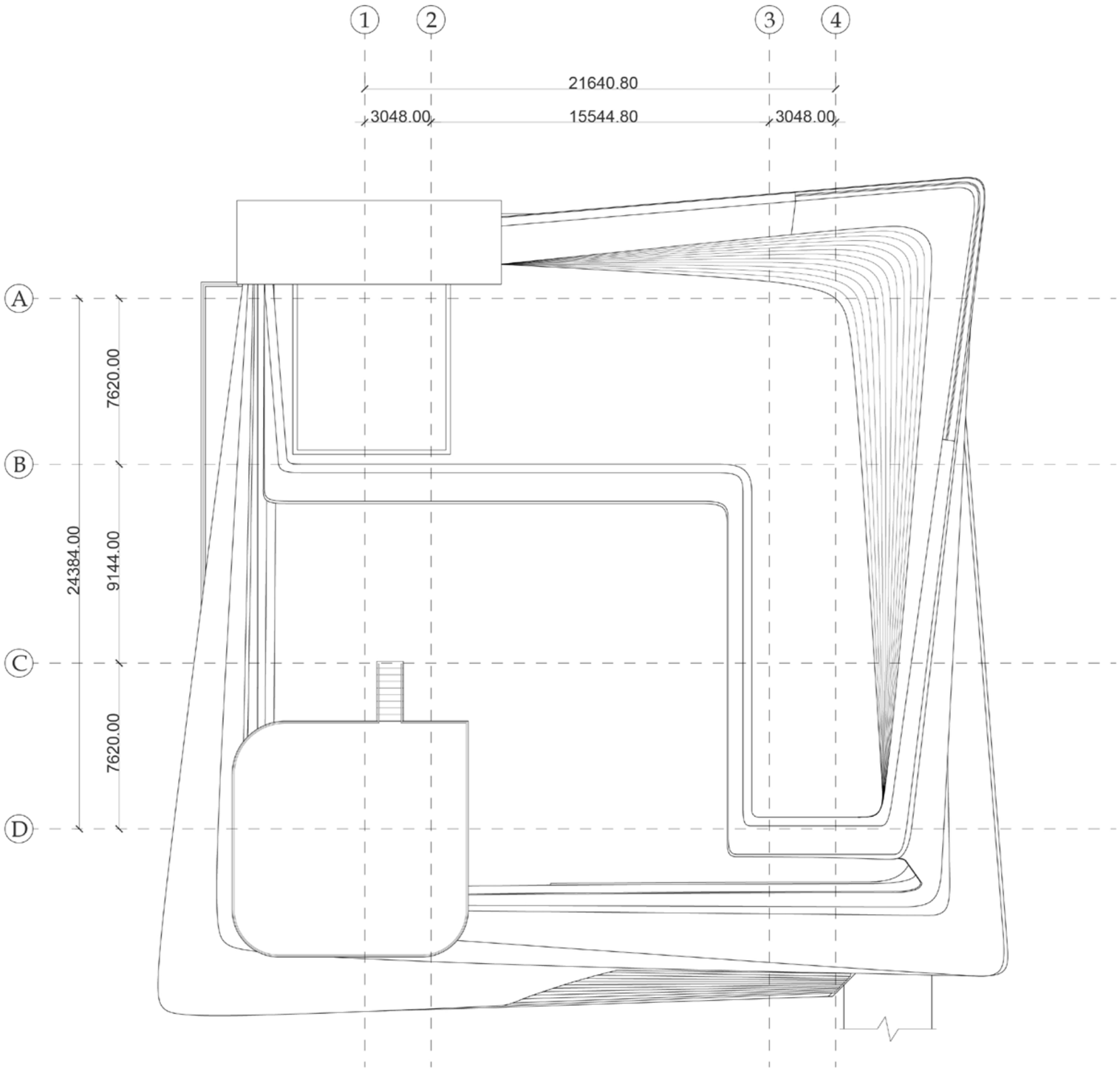


Fig.6.6/
Roof Plan

6.2/ Space Elevation

Fig.6.7/
Southern Elevation

6.2/ Space Elevation

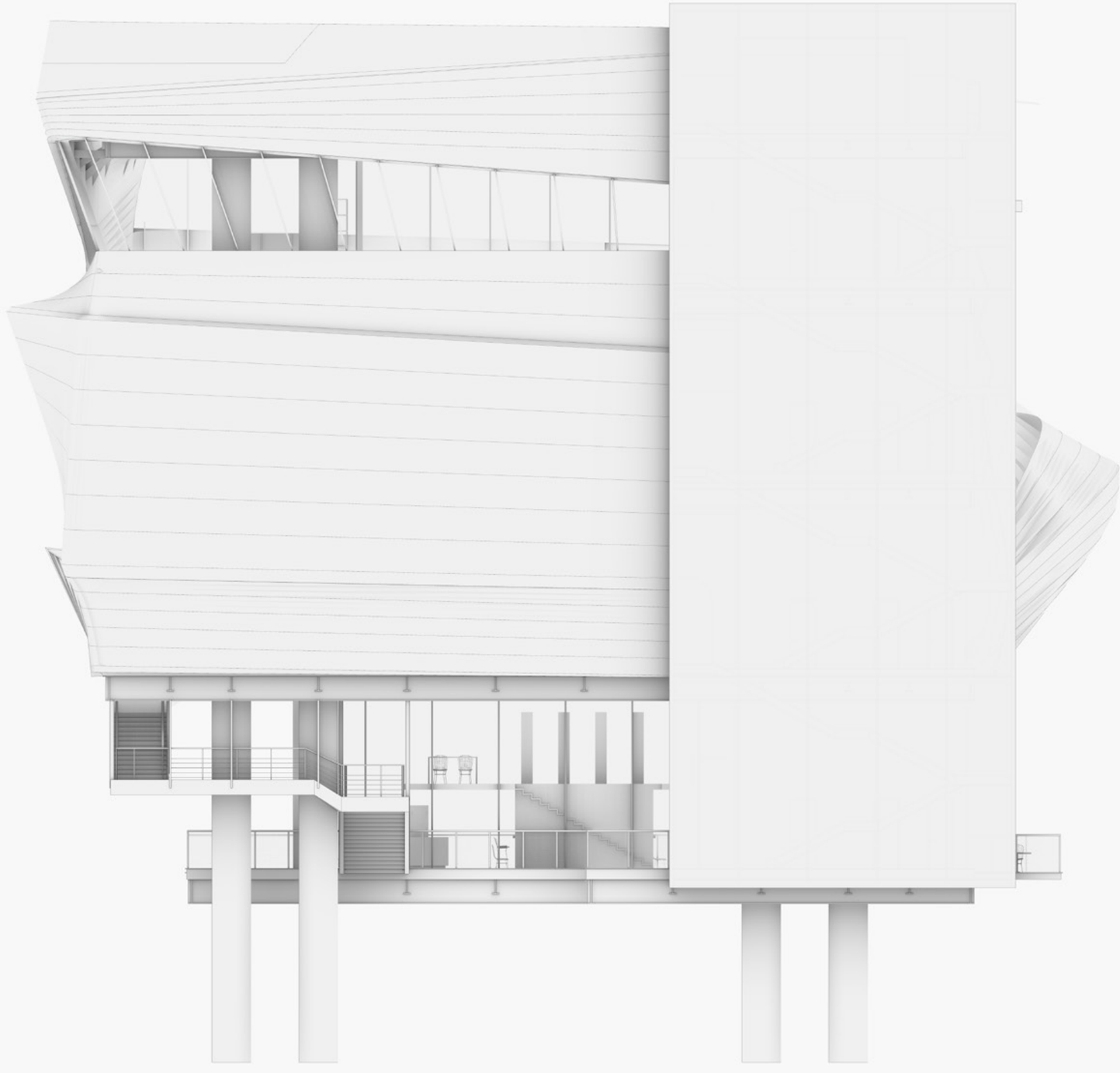


Fig.6.8/
Northern Elevation

6.2/ Space Elevation

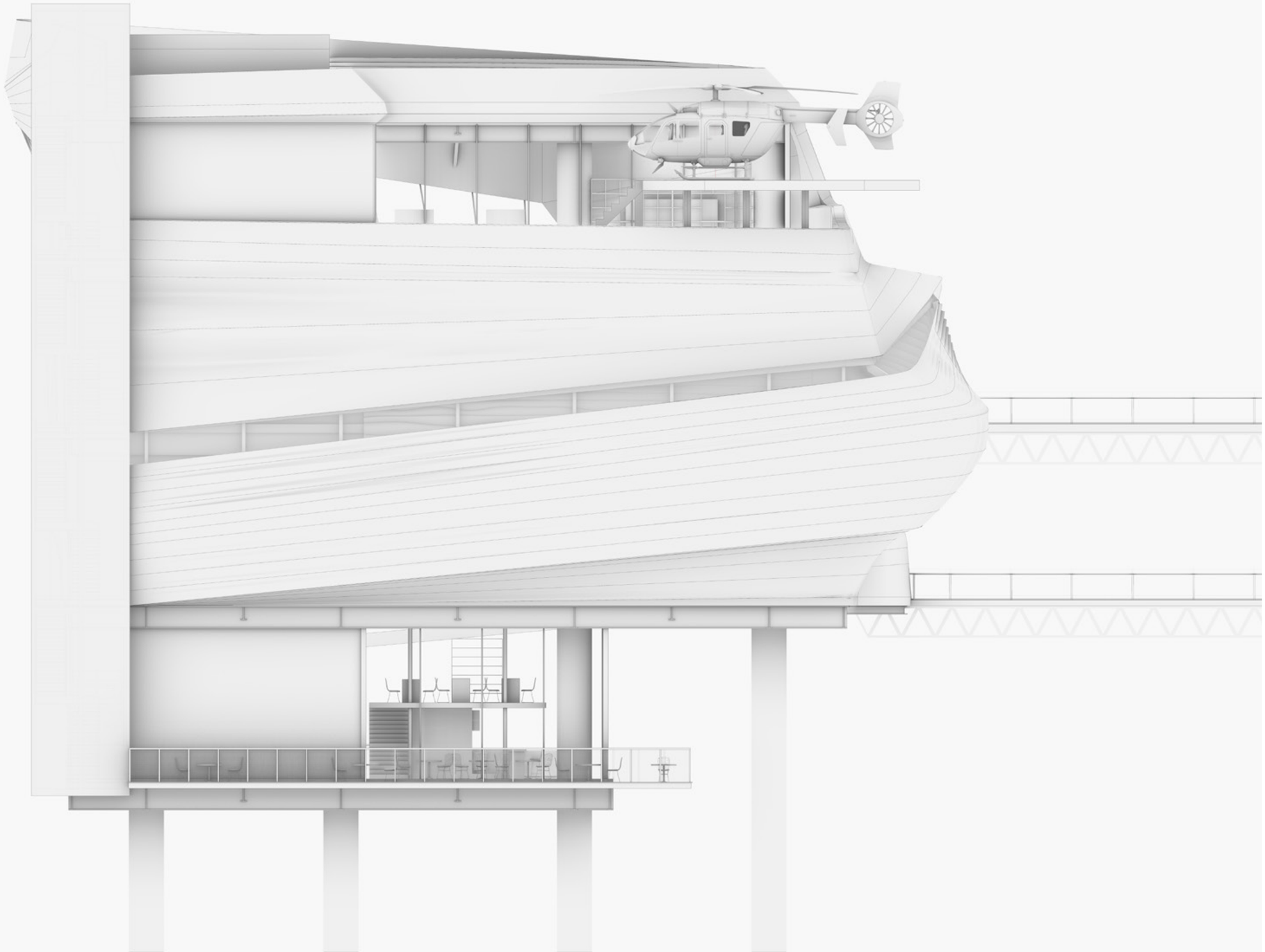


Fig.6.9/
Western Elevation

6.2/ Space Elevation

Fig.6.10/

Estern Elevation

6.3/ Exterior View

Fig.6.11/
Exterior View 01

6.3/ Exterior View

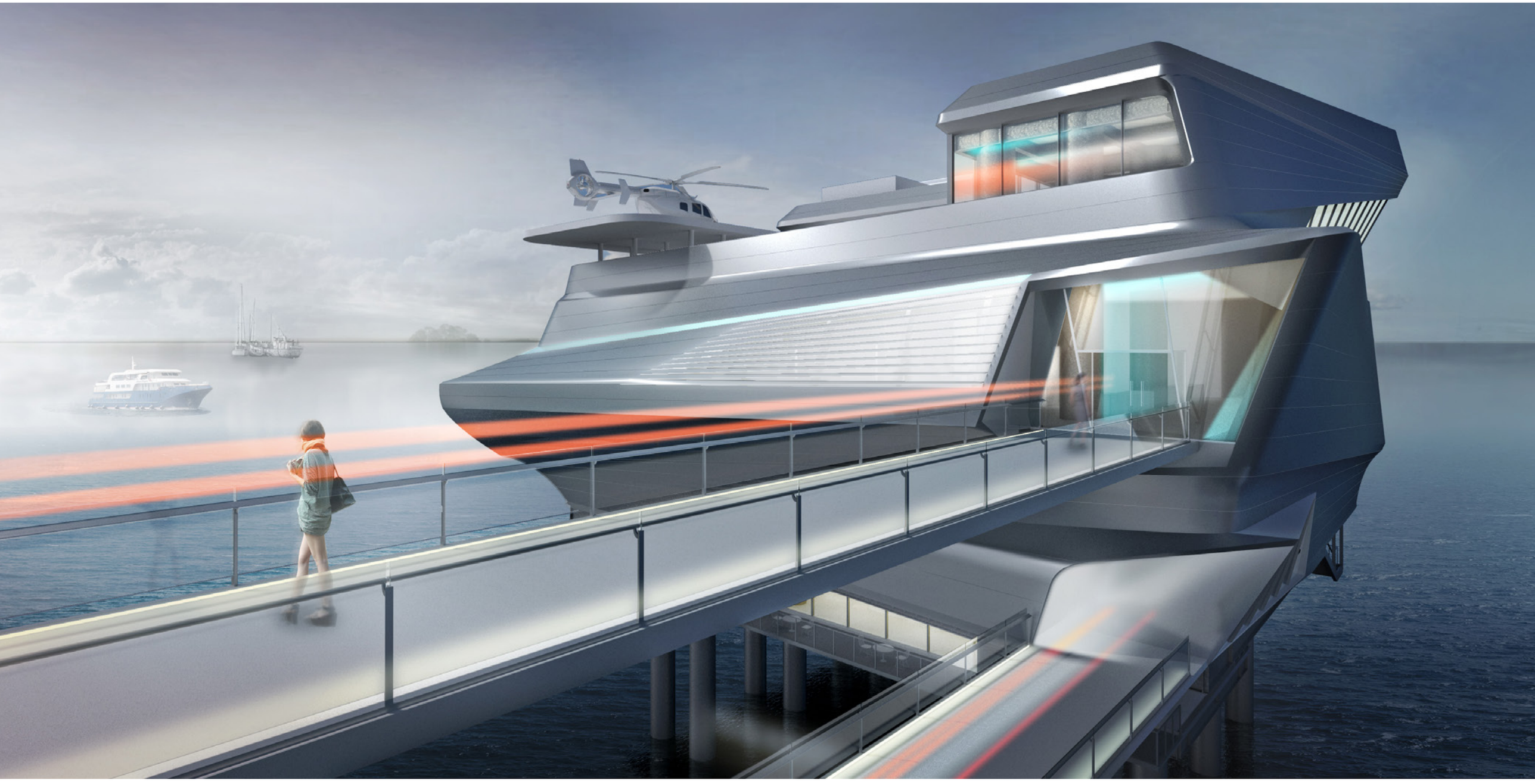


Fig.6.12/
Exterior View 02

6.4/ Interior View

Fig.6.13/

Ground Floor View

6.4/ Interior View

Fig.6.14/

First Floor View 01

6.4/ Interior View

Fig.6.15/

First Floor View 02

6.4/ Interior View

Fig.6.16/

Staircase From Fist Floor to Second Floor 01

6.4/ Interior View

Fig.6.17/
Second Floor View

6.4/ Interior View

Fig.6.18/

Office Space in Third Floor

6.5/ Perspective Section

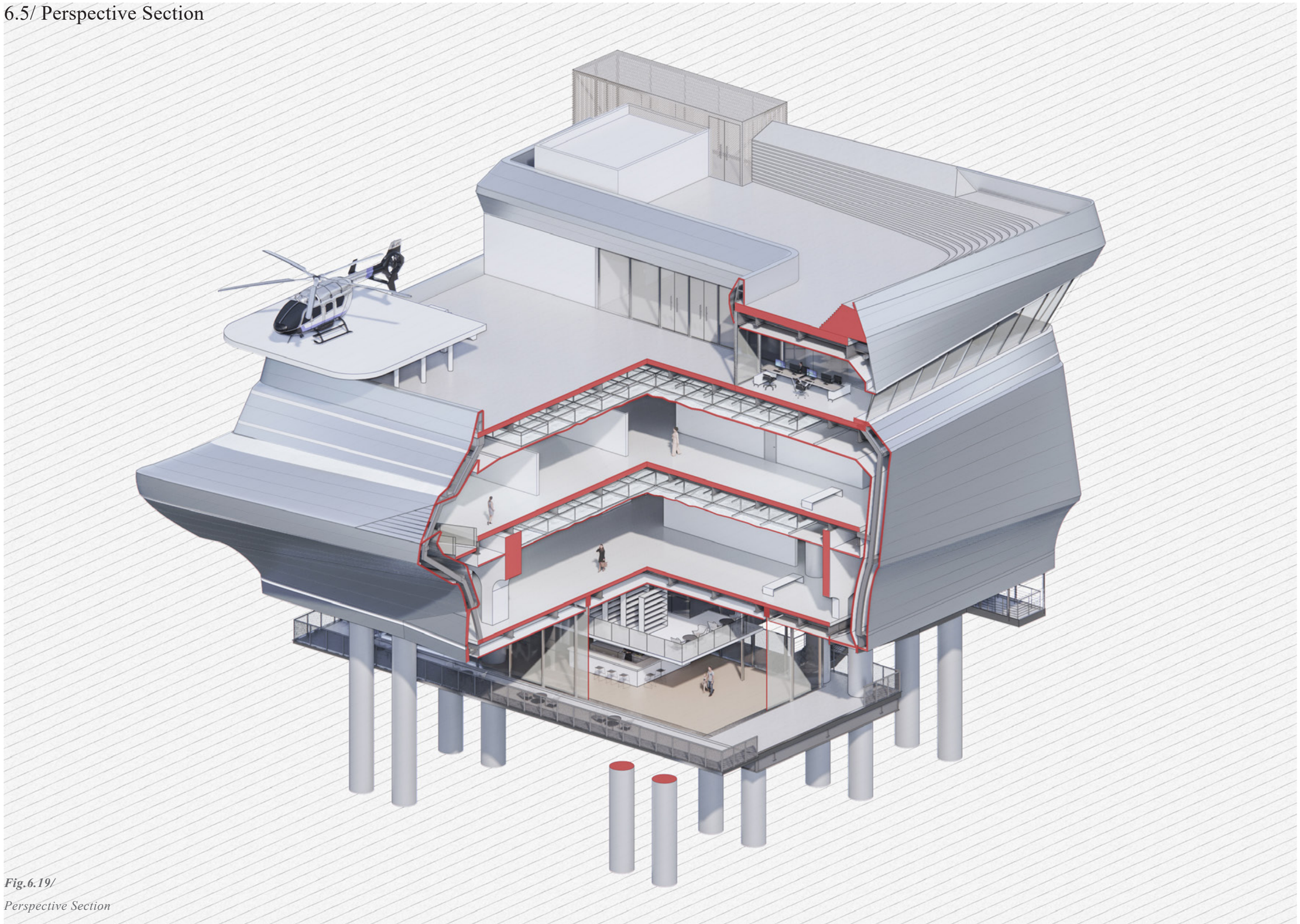


Fig.6.19/
Perspective Section

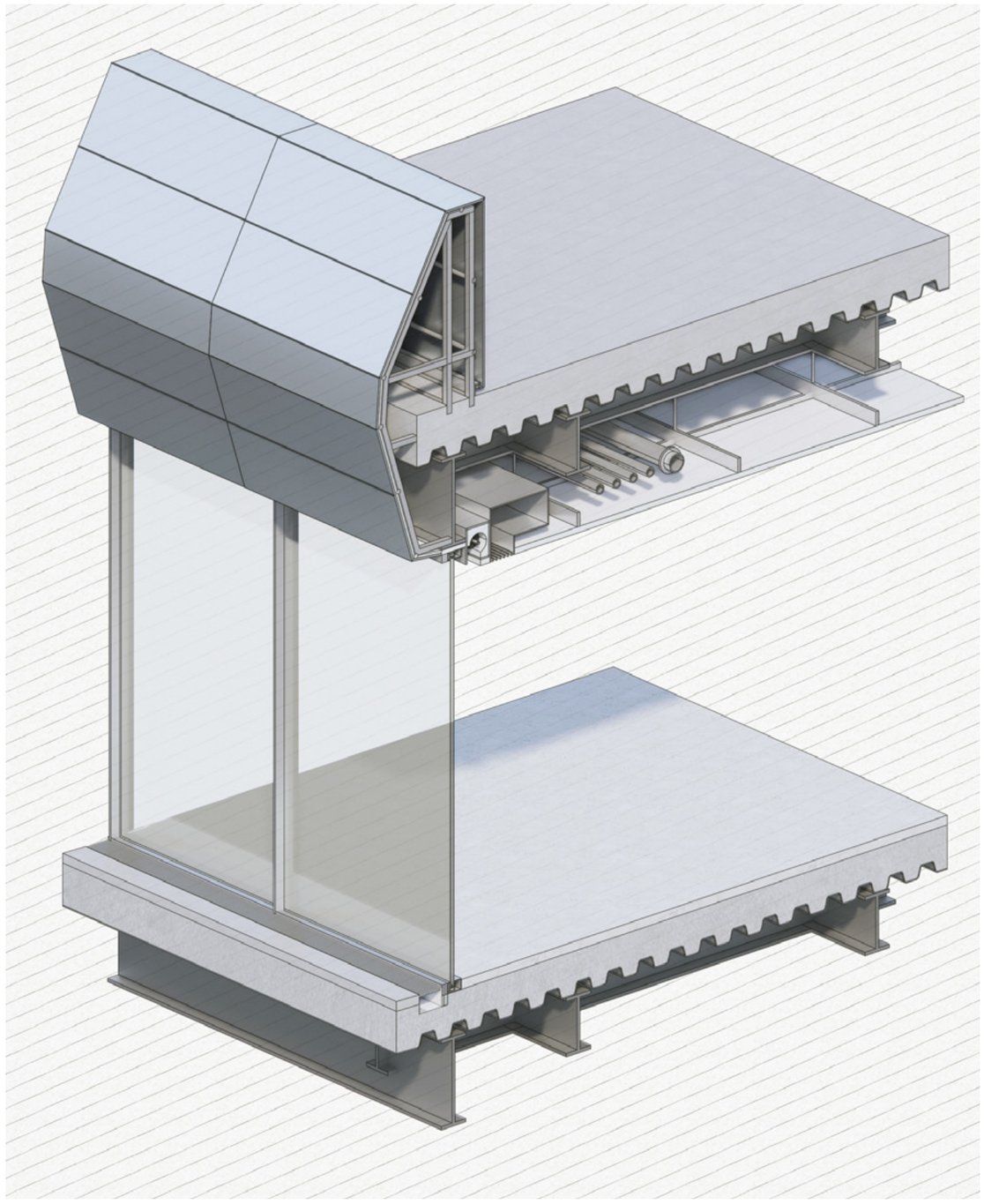


Fig.6.20/

Window Facade Structure in Third Floor

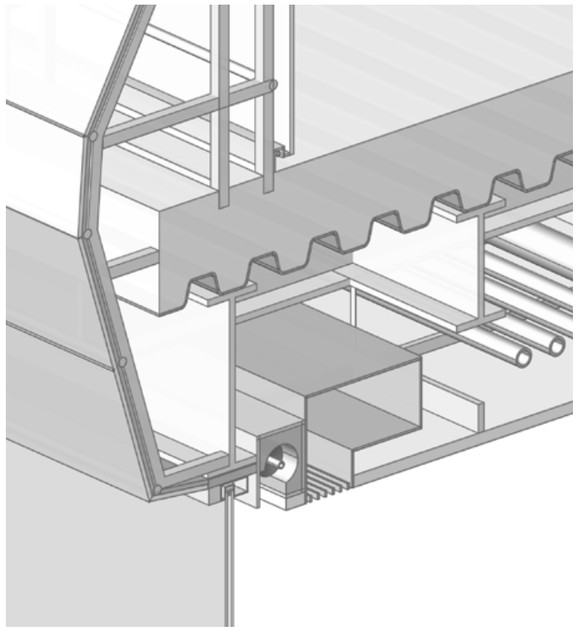


Fig.6.21/

Detail of Glass Facade 01

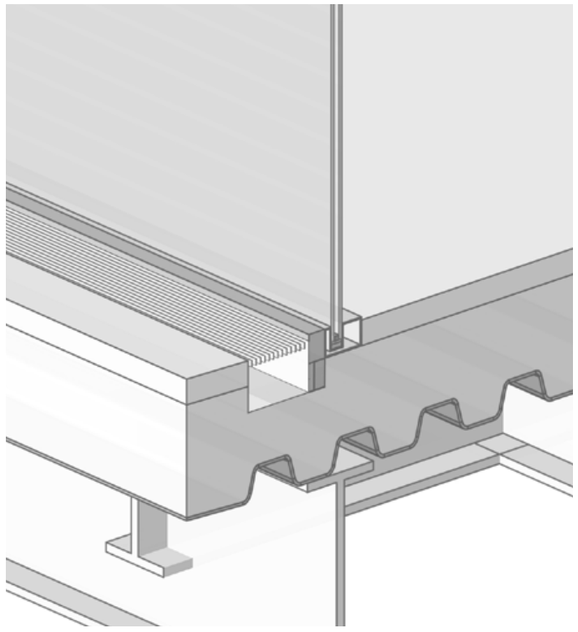


Fig.6.22/

Detail of Glass Facade 02

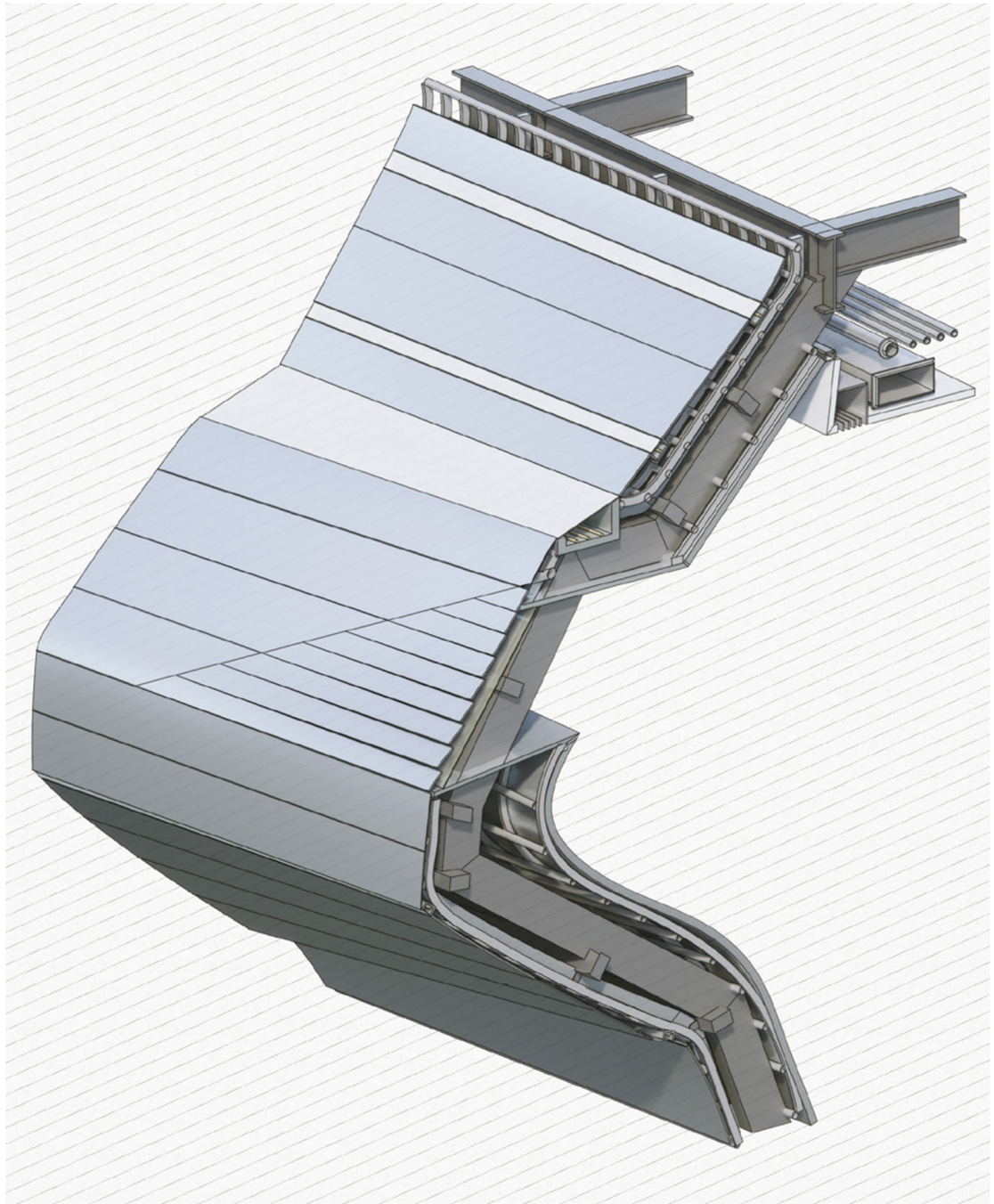


Fig.6.23/

Aluminum Composite Panel Facade Structure

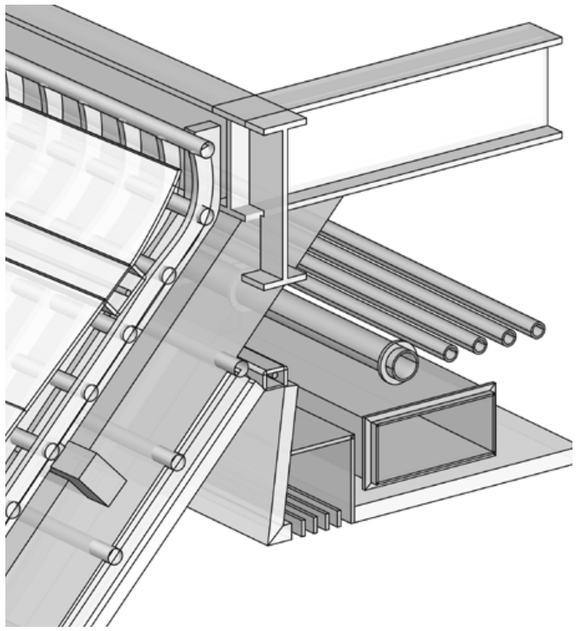


Fig.6.24/

Detail of Aluminum Composite Panel Facade Structure 01

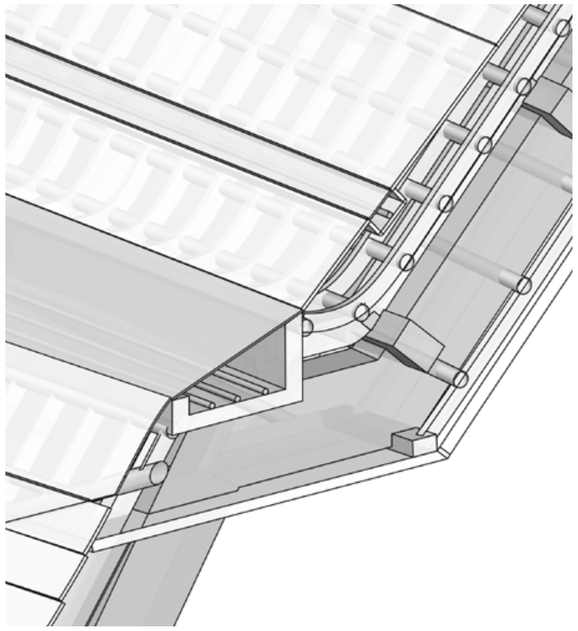


Fig.6.25/

Detail of Aluminum Composite Panel Facade Structure 02

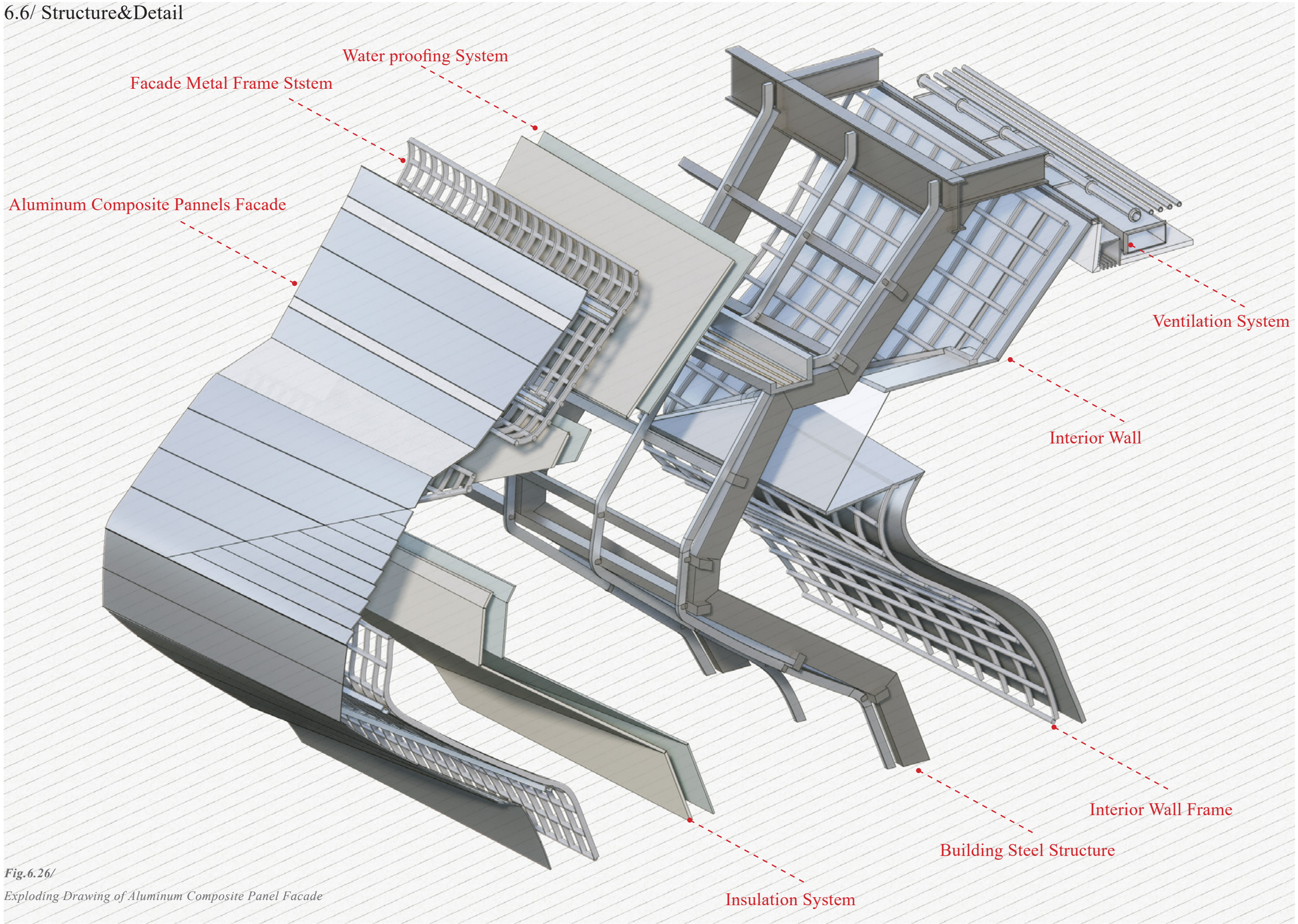


Fig.6.26/
Exploding Drawing of Aluminum Composite Panel Facade

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