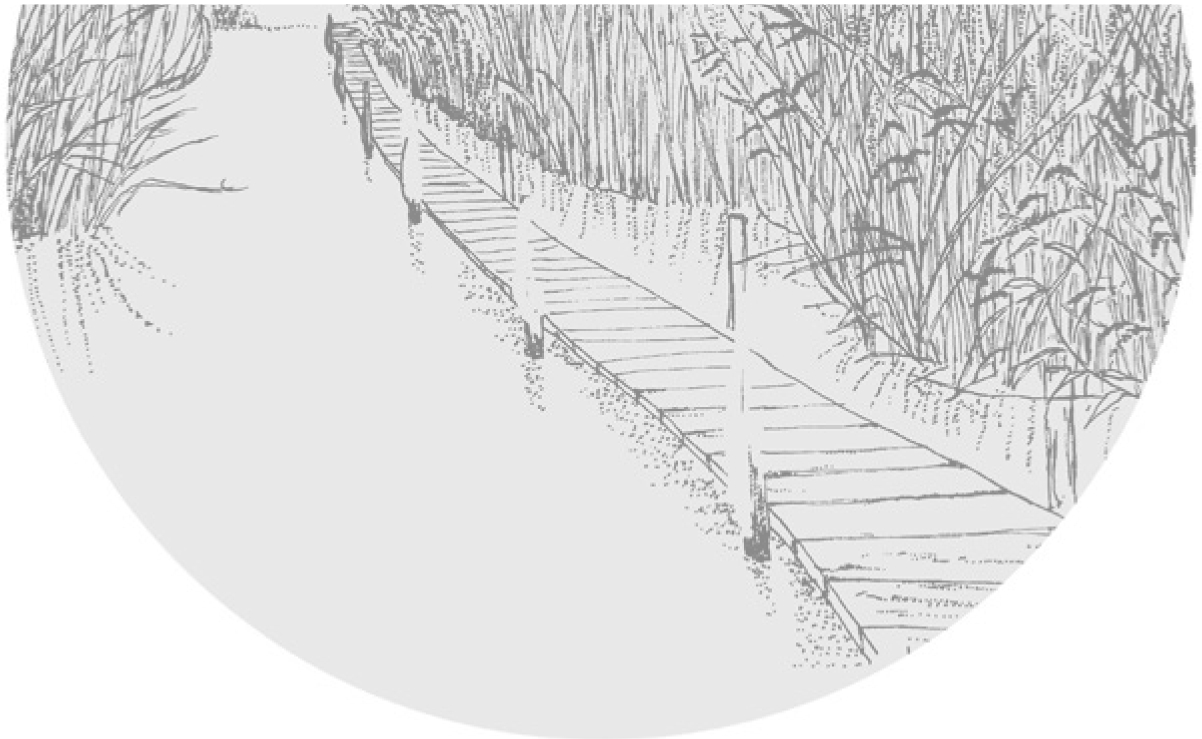
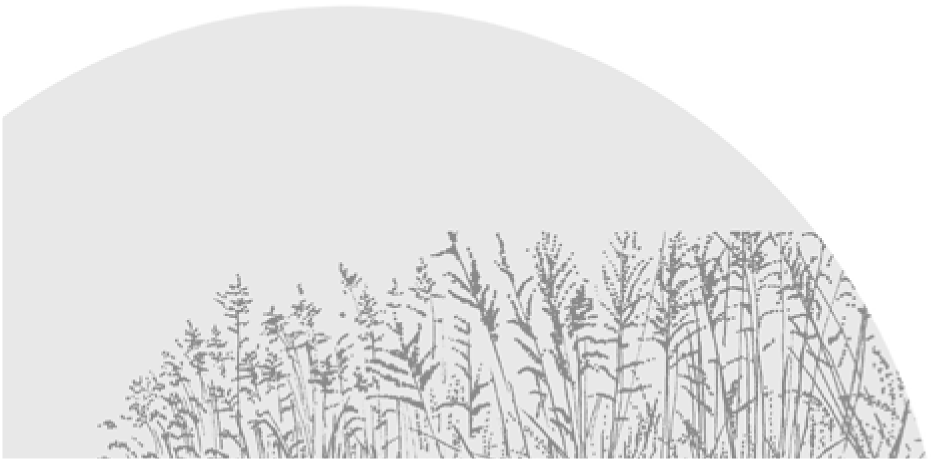
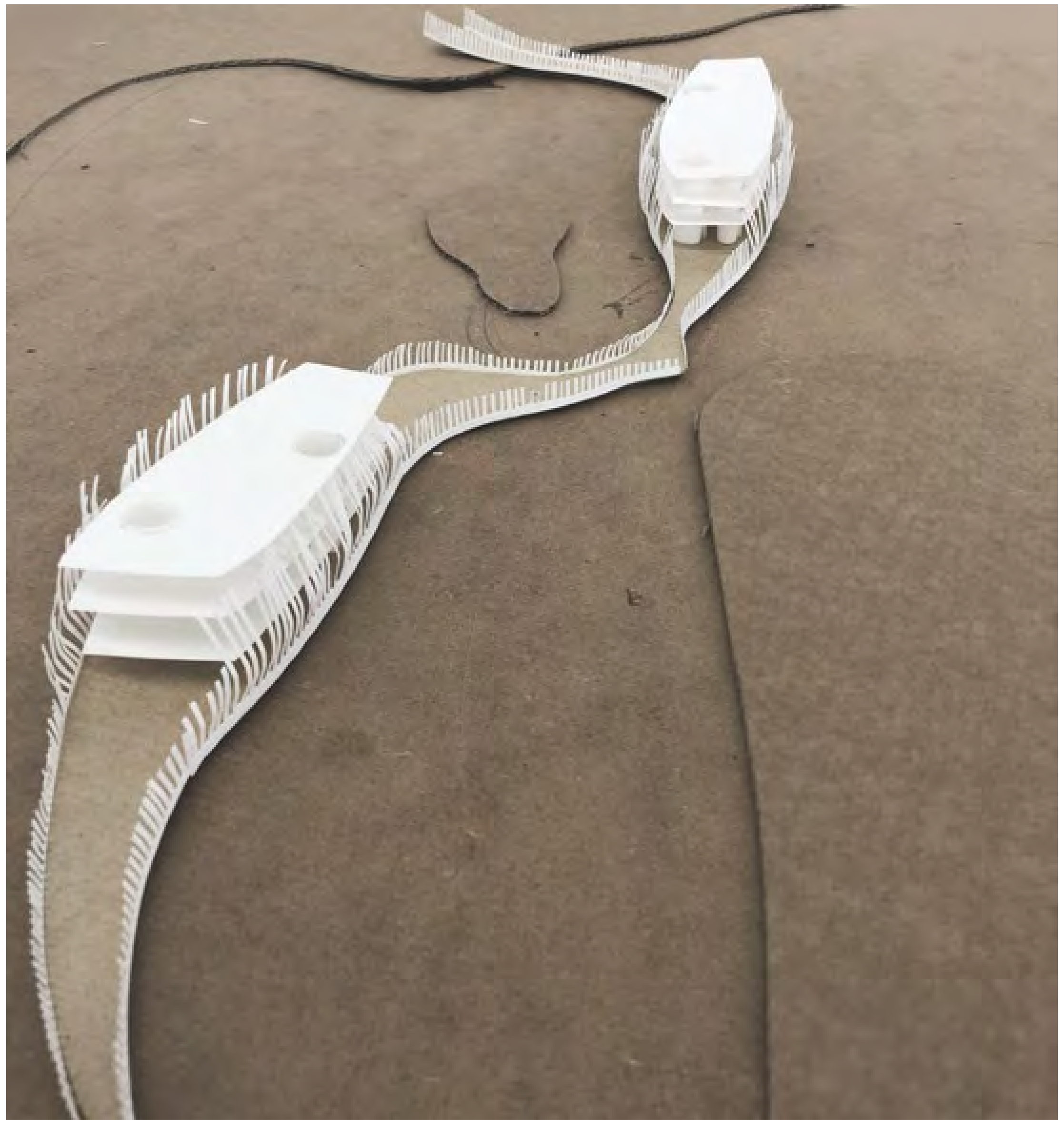


Mediterranean Coast. Drifting territory:
architecture with nature, humans and time



UNIVERSITAT POLITÈCNICA DE VALÈNCIA
ESCOLA TÈCNICA SUPERIOR D'ARQUITECTURA

TFM| Master's final project
Master's degree in Architecture|2018-2019
Universidad Politécnica de Valencia
Author |Ikemoto, Fumiko
Tutor|Garcia Martinez, Monica|Salazar Fraile, Carlos



INDEX

INTRODUCTION

In this project, the main idea is to explore and reconsider how architecture can redefine space in the relationship of human activity, nature behavior and time.

After the modernization, spaces designated for humans have started to separate from their natural environment, taking distance from nature and animal ambiences. With the introduction of the capitalist system, economic growth has gained in importance, the development of the cities means the expansion of the convenient environment for the human beings as a result.
Meanwhile, in a growing concern about the environmental destruction and the deficiency of resources that appeared during the last years, the concept of sustainable development came out, various attempt in many field to put this concept into practice are getting more and more attention.

While development of this project, we consider the term development as the growth of an entire environment towards the future. We propose a strategy for the development of natural environment where the behavior of nature, animals and human activities coexist.

PROPOSAL

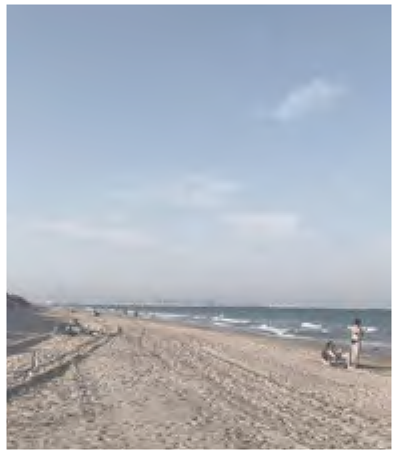
The formal proposal consists on a circular walkway in El Saler Natural Park. By walking in this circle, the visitor can experience the landscape in an integrated environment created through the collaboration of nature, animals and human beings.
In this walkway there is a platform floating on the water, which works as a core system for natural recovery. Programs of activities for human beings have been implanted; visitors can stay and spend time on this platform, come to the realization of their natural condition as one of the elements in the landscape, and also a part of the entire flow of the natural environment.

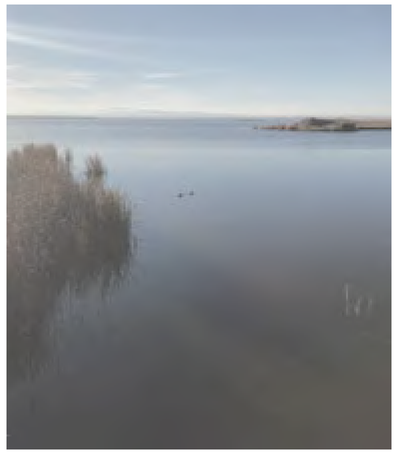
In El Saler Natural Park, there was an urban development plan and some traces of the infrastructures and buildings infrastructures can still be seen. The platform is located in the lake, which is also artificially created for this urbanization.
The purpose of this project is to think about the possibility of development to the future based on the past without neglecting or denying it, and also think about these kind of spaces that is composed with the circulation of various elements, in attempt of letting the territory of nature, human and time drift, through creating the space reusing these traces of past urban development and overlapping the environment with forms traced from nature.

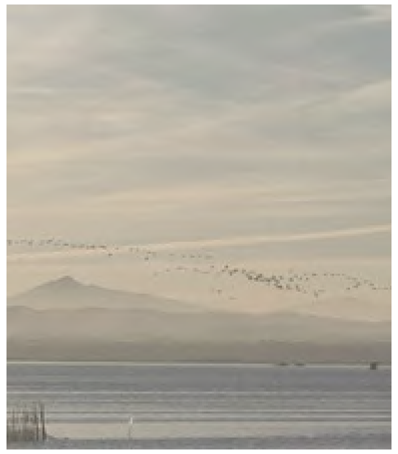
DESCRIPTIVE MEMORY

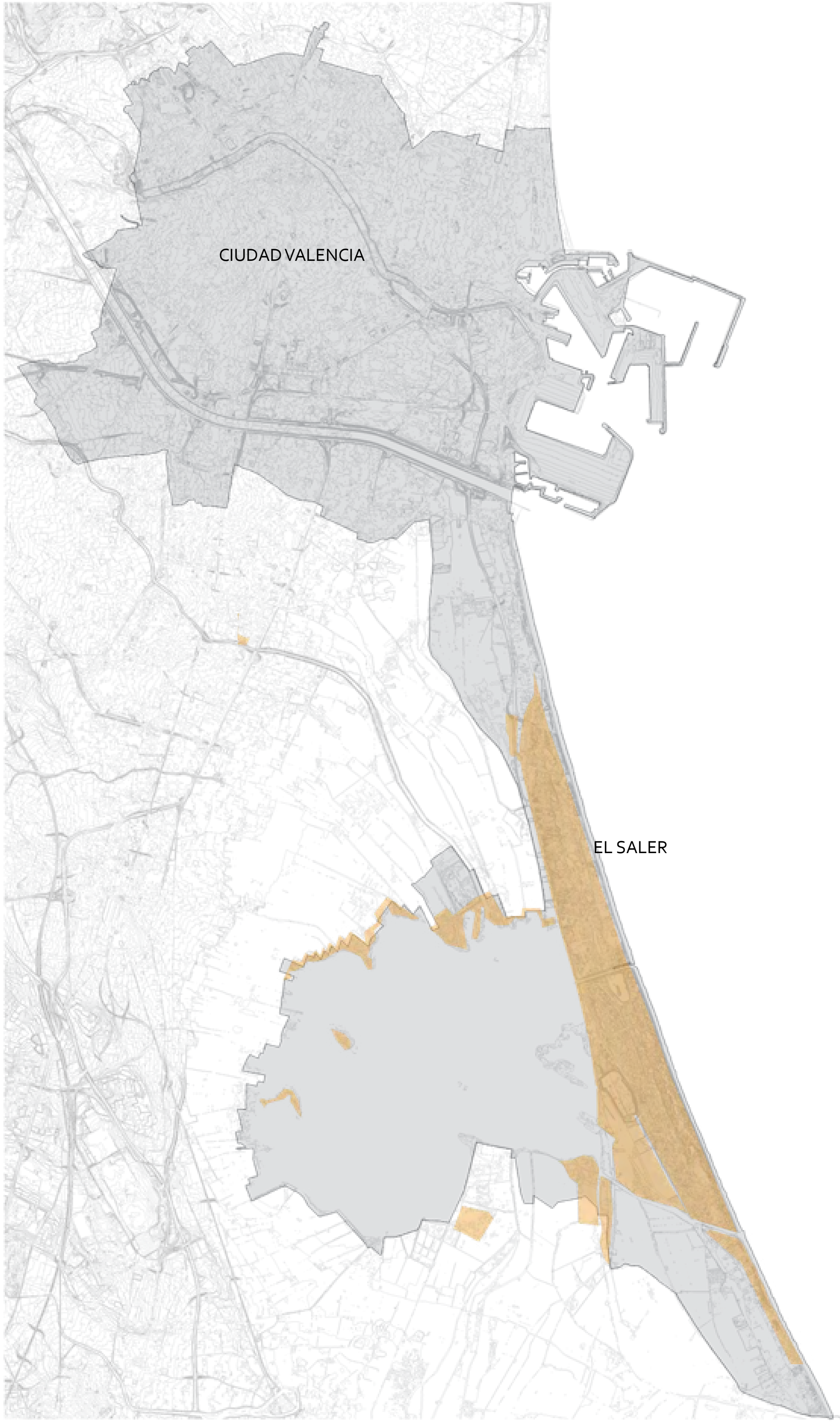
SITE







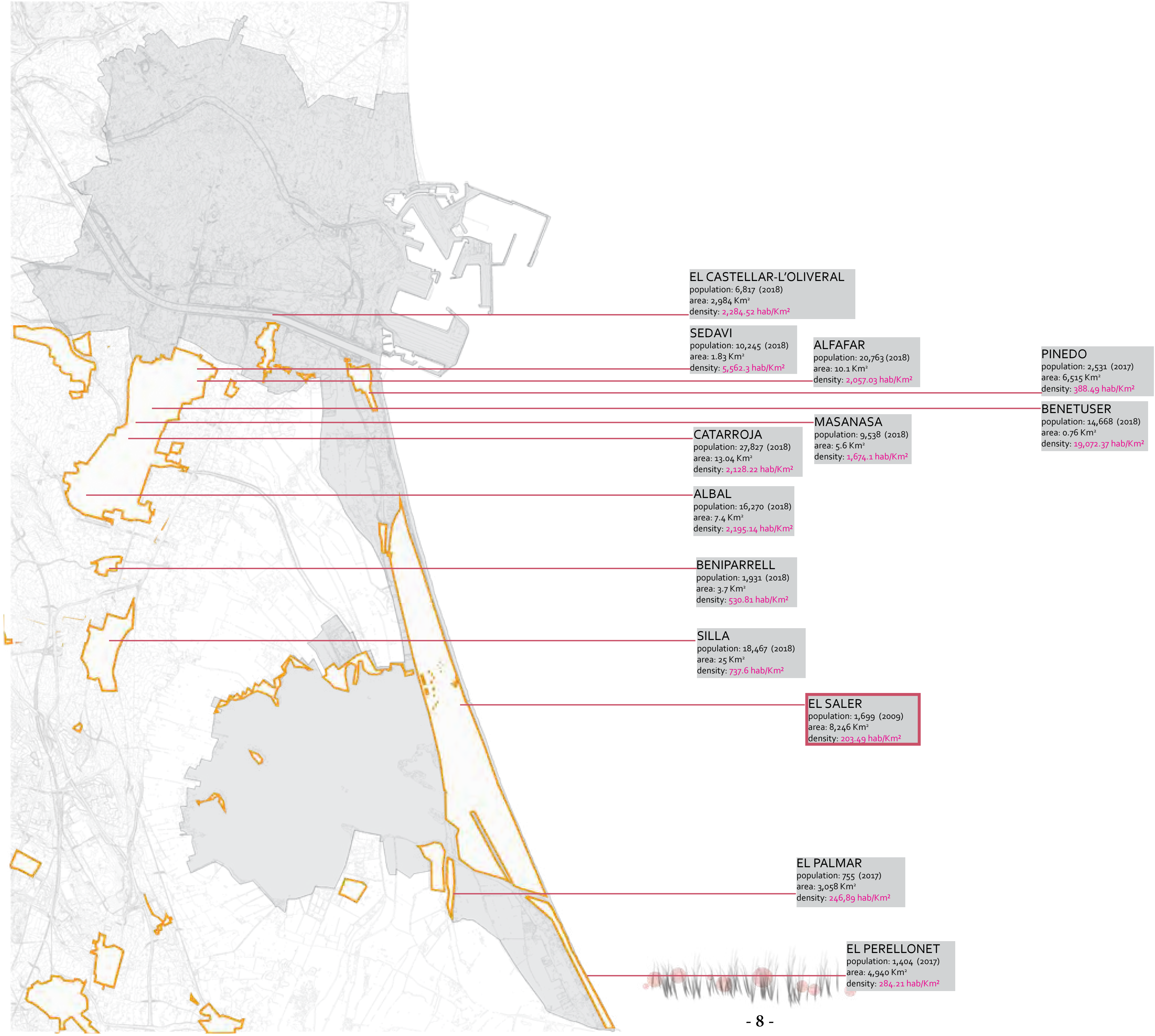




PAST AND PRESENT OF
EL SALER, LAKE ALBUFERA AND THE DEVESA

The term el Saler , which in Valencian means "the salt ", refers to the extraction of salt, which was the main economic activity of the place until 20th century.
The Saler is located on the coastal strip or sandbar of the Albufera of Valencia , between the marsh that until the seventeenth century was still an integral part of the lake and the forest of La Dehesa , with a length of more than 10 km and an average width of 1 km. The condition of real heritage prevented the exploitation in mass of the forest and faunistic wealth of the Dehesa until the 19th century, as well as any type of stable settlement in the area. 2 However, in the drawing of the Albufera that Anton van der Wyngaerde made in 1563 , a series of barracks appear at the edge of the lake in the current location of El Saler.
In 1855 El Saler had 39 neighbors (about 150 inhabitants) lived mainly on fishery, then troughout the first half of the 20th century, the population gradually grew until the 1960s , when a very strong increase took place, which has continued until recently.

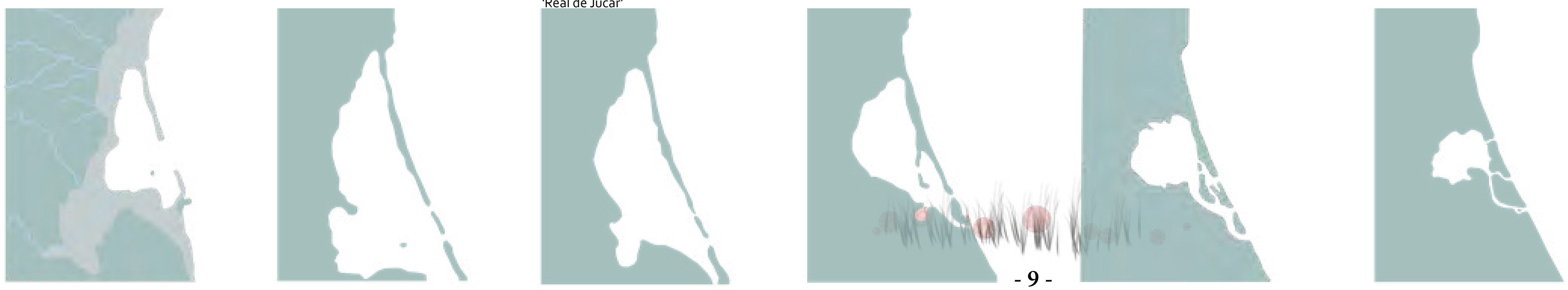
In 1927 the municipality of Valencia acquired the Albufera and the Dehesa, established that the use of this land reesponding to the tourism boom in 60's. They approved the General Plan of Ordination of the Monte de la Dehesa which allowed the construction of 15 nuclei of large plots included hotels, coastal towns, apartments, an airport, a yacht club, a racecourse, department stores, restaurants, parks and so on. The construction begun in 1968 and stopped in 1974, they built no more than a luxury hotel, a coastal town and several blocks from 9 to 11 floors surrounded by the Dehesa, and constituted the urban nucleus of the Gola of the Pujol. Since then, important actions have been carried out to eliminate the remains of this urban plan, and the recovery of a large part of the dune belt and coastal habitat has been achieved.


EL CASTELLAR-L'OLIVERAL
population: 6,817 (2018)
area: 2,984 Km^2
density: 2,284.52 hab/Km^2
SEDAVI
population: 10,245 (2018)
area: 1.83 Km^2
density: 5,562.3 hab/Km^2
ALFAFAR
population: 20,763 (2018)
area: 10.1 Km^2
density: 2,057.03 hab/Km^2
PINEDO
population: 2,531 (2017)
area: 6,515 Km^2
density: 388.49 hab/Km^2
BENETUSER
population: 14,668 (2018)
area: 0.76 Km^2
density: 19,072.37 hab/Km^2
MASANASA
population: 9,538 (2018)
area: 5.6 Km^2
density: 1,674.1 hab/Km^2
CATARROJA
population: 27,827 (2018)
area: 13.04 Km^2
density: 2,128.22 hab/Km^2
ALBAL
population: 16,270 (2018)
area: 7.4 Km^2
density: 2,195.14 hab/Km^2
BENIPARRELL
population: 1,931 (2018)
area: 3.7 Km^2
density: 530.81 hab/Km^2
SILLA
population: 18,467 (2018)
area: 25 Km^2
density: 737.6 hab/Km^2
EL SALER
population: 1,699 (2009)
area: 8,246 Km^2
density: 203.49 hab/Km^2
EL PALMAR
population: 755 (2017)
area: 3,058 Km^2
density: 246,89 hab/Km^2
EL PERELLONET
population: 1,404 (2017)
area: 4,940 Km^2
density: 284.21 hab/Km^2

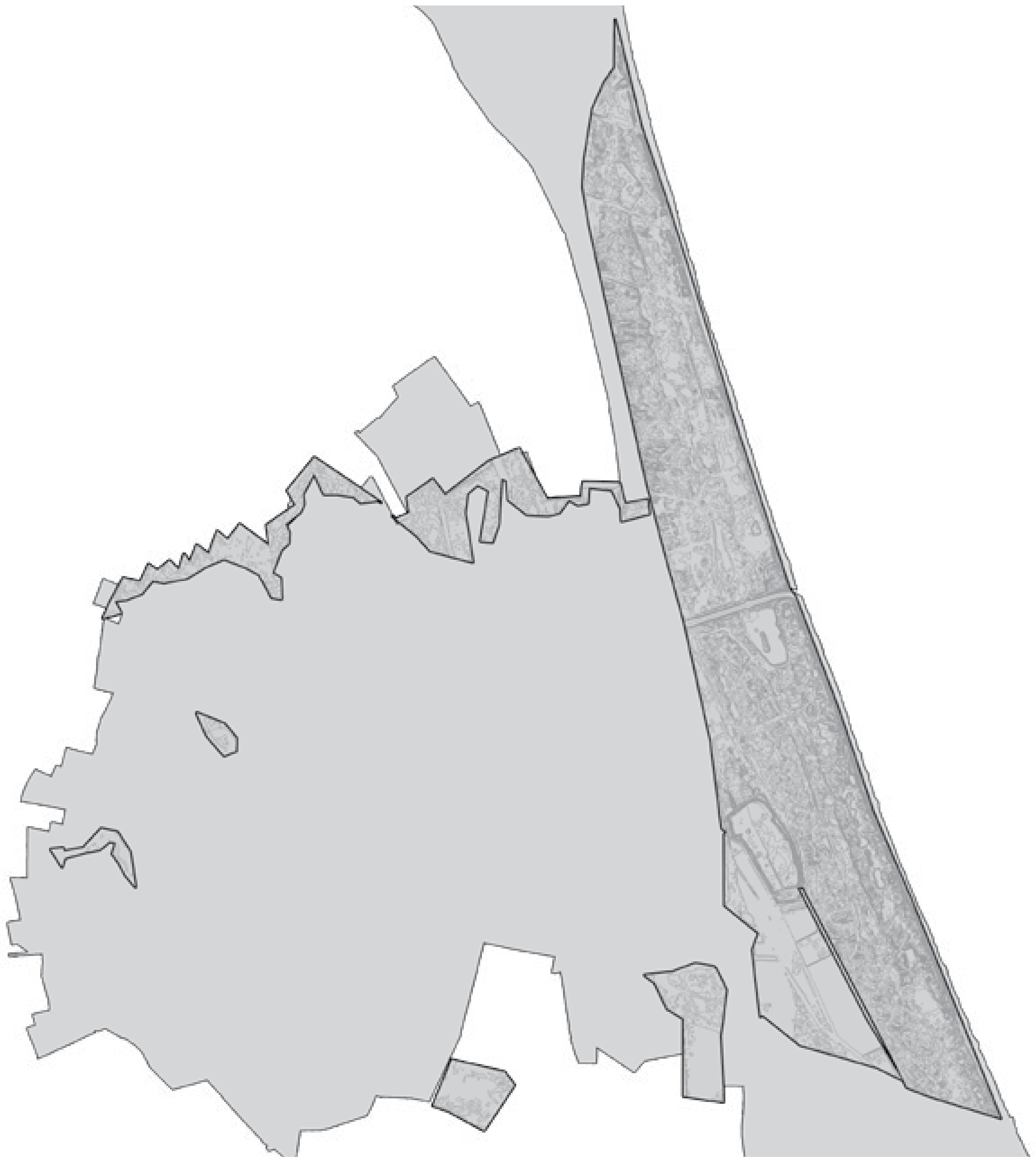
HISTORY

1250 legal recognition of fishing
around 1860 the lake began to get smaller due to the practice of burying the lake for caltivation
1865 became the property of valencia community from that of kingdom
1911 became the property of valencia city
1962 drafting of the plan of developpment of the mountains of devesa(la Montaña de la Dehesa), while the City Council of Valencia transferred to the Ministry of Information and Tourism some land for constructin of hotel and the field of golf course
1967 el Saler Ordenation Plan was approved by the municipality and with it the urbanization process was launched
1971 63ha was granted to the private company for construction of racecourse
1973 the City Council suspended the auction of plots
1974 the consistory reduced the planned building area by half.
the political forces and neighborhood associations insisted on the public use of the Albufera and the Dehesa
1979 democracy of city council, there was a turn towards a more protectionist and conservationist policy

6000~3000 years before ▶ 4th Centrury ▶ 16 Century ▶ 18 Century ▶ 19 Century ▶ Today
before the formation of shoal / Roman era / construction of the irrigation canal 'Real de Jucar' / Lagoon of fresh water / Plane expansion of rice field / One third of original surface



ANALYSIS



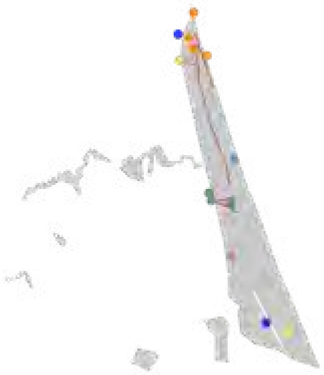
ACTIVITIES IN EL SALER

Whn we see the activities of El Saler and the devesa, mainly the places for the people are in the west side or the upper part of the devesa, though the original nature is remained mostly in the lower part.
Between Lake Albufera and the natural park El Saler, there is a wide car road connecting the south part of the community of Valencia and the city of Valencia. In adidition to this, because of the urbanization planning in 60s and 70s, some residential buildings are constructed, most of them are high tall building which are 40-50m high.
These are completely the deviation from natural landscape, separating human activity from natural behavior.

When I saw the behavior of migratory bird after some research of nature here, I decided to get the cue from their behavior, since the migratory birds are one of the main characteristics of this natural park, and they also play and important role to maintain the natural eco-cycle here.

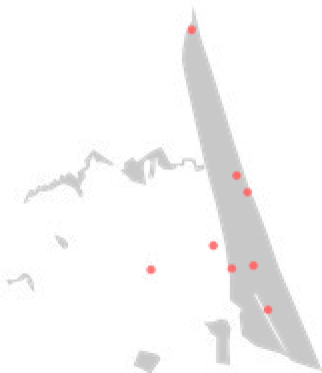
main road

residencial area

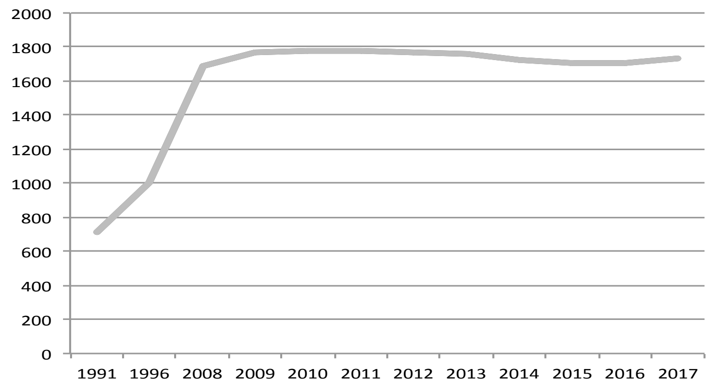


human activities

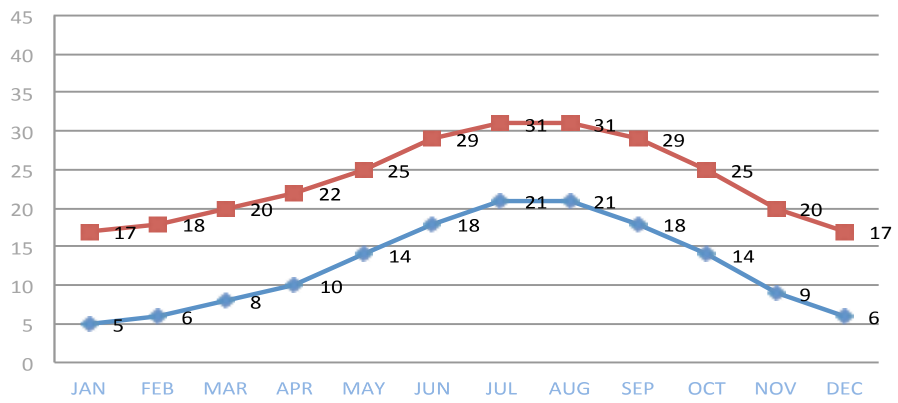
- Mirador
- Museum
- Picturesque site
- Hotel
- Picnic area
- Camping site
- visiting rout



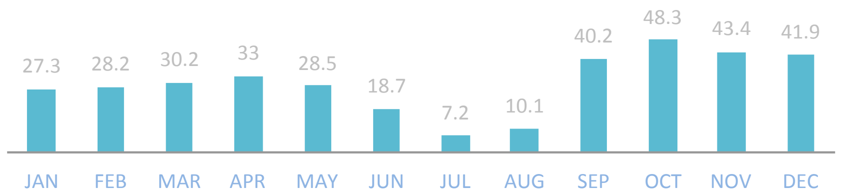
bird watching area



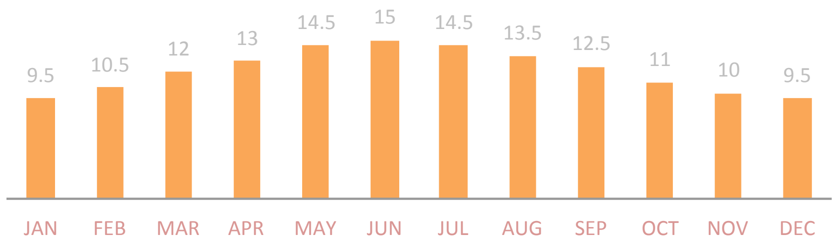
Population of El Saler



Climate of El Saler



Monthly rainfall

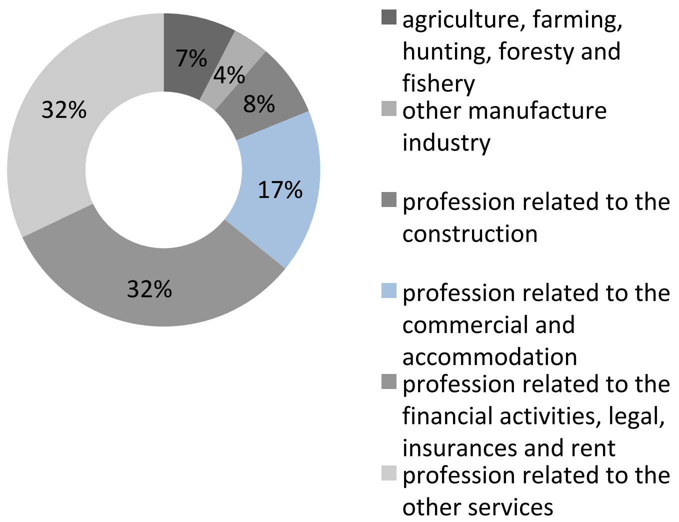


Monthly daylight

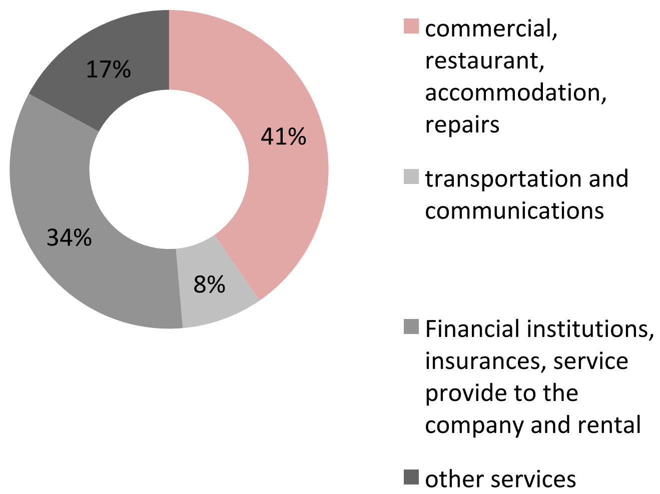
URBAN SITUATION OF THE SITE

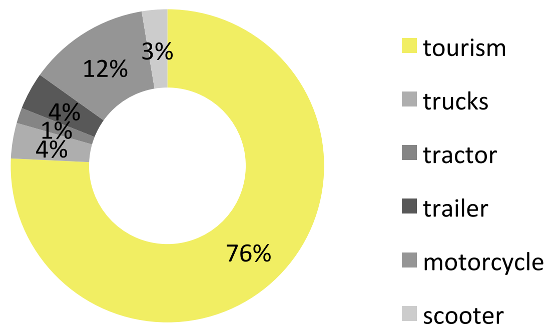
The climate of the El Saler is similar to that of Valencia. There is Hot summer and mild winter, less rainfalls and plenty of daylight.
Thanks to these characteristics, together with the natural park and the beach, every summer there is a lot of visitors on the beach, and also overnight stay guests at the camping site.

Now we can look into the citizens activities in El Saler. The ratio of the professionals are mostly financial, legal, insurance and rent, then commercial and accommodation comes next. However the ratio of the economic activities of this area is mostly commercial and services.
The itemize of the commercial and services, commercial, restaurant, accommodation, repairs part has the biggest proportion. It seems the economy of El Saler is mostly depends on the tourism.
We can see the impact of tourism from the ratio of traffic in El Saler,76% of trffic is of tourism.
In the end, it became clear that the tourism is playing an important role in the economy of El Saler.

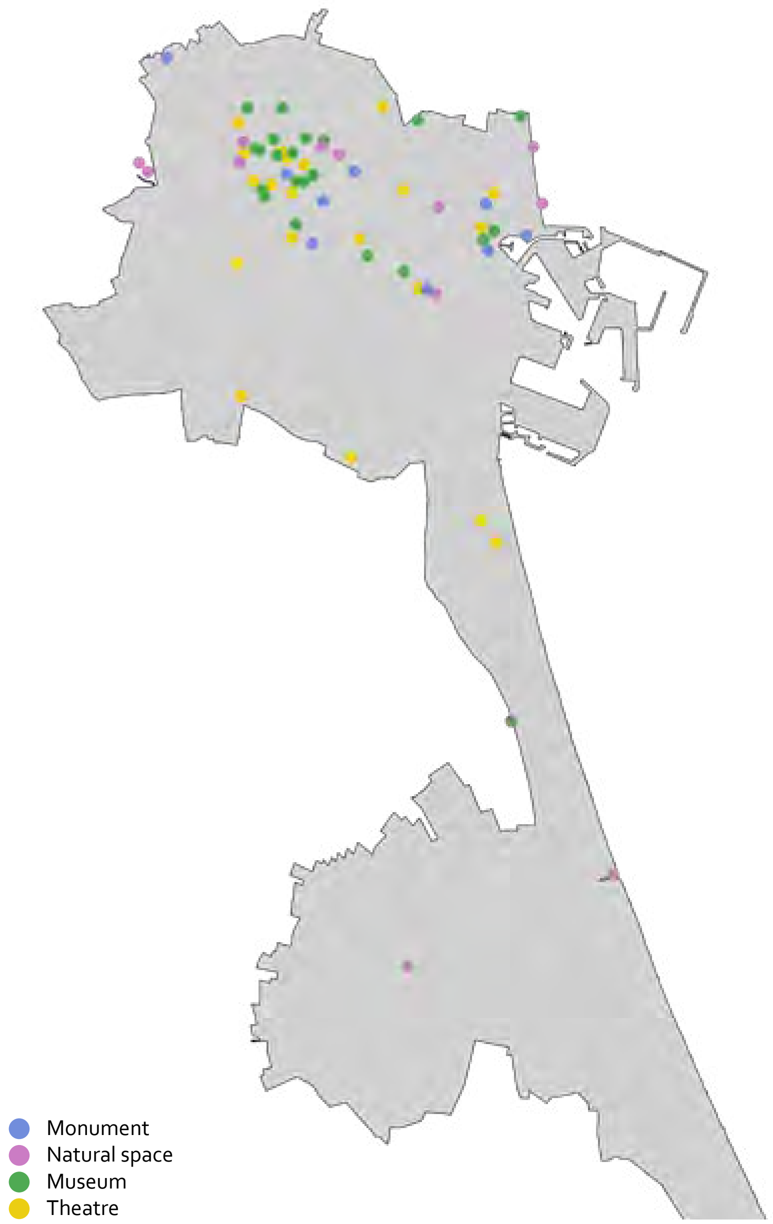


economic activities of the area(%)	
artists	1.84
profesionals	24.2
commercial and services	67.28
construction	4.15
industry	2.3





tourism according to the property	
total	806
individuals	778
companies and organizations	28



ECONOMIC IMPACT OF TOURISM
IN COMUNIDAD VALENCIANA

14.6 %
of Total GDP of Comunidad valenciana

15.1 %
of Total employment of Comunidad valenciana

13.3 %
of Total tax of Comunidad valenciana

VISION AND STRATEGY

TOURISM IN ALBUFERA AND EL SALER-TOWARDS THE SUSTAINABLE FUTURE

Sustainable tourism is the concept of visiting somewhere as a tourist and trying to make a positive impact on the environment, society, and economy, and is defined as a style of tourism that fit to the demand of visitors, industries, environment and the destination, at the same time give their full attention to the present and future impact on the economy, society and environment.
Global economists forecast continuing international tourism growth, the amount depending on the location. As one of the world's largest and fastest growing industries, this continuous growth will place great stress on remaining biologically diverse habitats and indigenous cultures in each destinations, which are often used to support mass tourism.
Therefore it is considered disireble to establish the strategy for sustainable tourims from the viewpoint of local economy, local society and culture, local environment and also their management depending on the different situations of each destinations.
Moreover those tourists who promote sustainable tourism aare supposed to be sensitive to these impacts and seek to protect tourist destinations, and to protect tourism as an industry.
There is some way of reducing the impact t of the tourism;

1. informing themselves of the culture, politics, and economy of the communities visited
2. anticipating and respecting local cultures, expectations and assumptions
3. supporting the integrity of local cultures by favoring businesses which conserve cultural heritage and traditional values
4. supporting local economies by purchasing local goods and participating with small, local businesses
5. conserving resources by seeking out businesses that are environmentally conscious, and by using the least possible amount of non-renewable resources

In Valnecia there is increasing number of visitors and overnight stays these years, the rapid growth of indutsry of tourism has great impact on local economy, society, culture and environment.
Thus, it is quite important to establish the activities and place for the visitors wherer they can learn the local eivironment, ecosystem, history in natural landscape.

NATURAL RECOVERY WITH WETLAND

Wetlands are one of the most valuable and diverse ecosystems on the planet. Yet because of development, pollution, and the effects of climate change, they are disappearing at an accelerating rate. A major study released this week on the destruction of ecosystems and the loss of biodiversity said that more than 85 percent of the world's wetlands have been lost since 1700.

In shallow wetlands, the presence of submerged and emergent aquatic vegetation is of great importance, since it can regulate the excess of phytoplankton outcrops, they are the habitat of many species of fish, invertebrates and birds and stabilize the sediments with their roots avoiding their resuspension, while contributing to purify water.

Since the 70s, the waters of Lake Albufera and wetlands have seen their quality deteriorate due to the continuous discharges of wastewater with deficient treatments, the intensification of rice cultivation and the reduction of river waters that fed this wetland. Also the urbanization around the beaches in El Saler in 70's had huge impact to the natural environment here. Nowadays there is a recovering project in Albufera, the main objective: to recover the quality of the waters present in the 50s and 60s. The study did not stay there, but proposed a series of urgent measures to be implemented. The AGUA ALBUFERA program began.

Our project is designed based on the analysis of human activities, activities of nature, and behavior of the time. So the project is also match to this official program of recovering the nature.

DESIGN

LANDSCAPE PROPOSAL

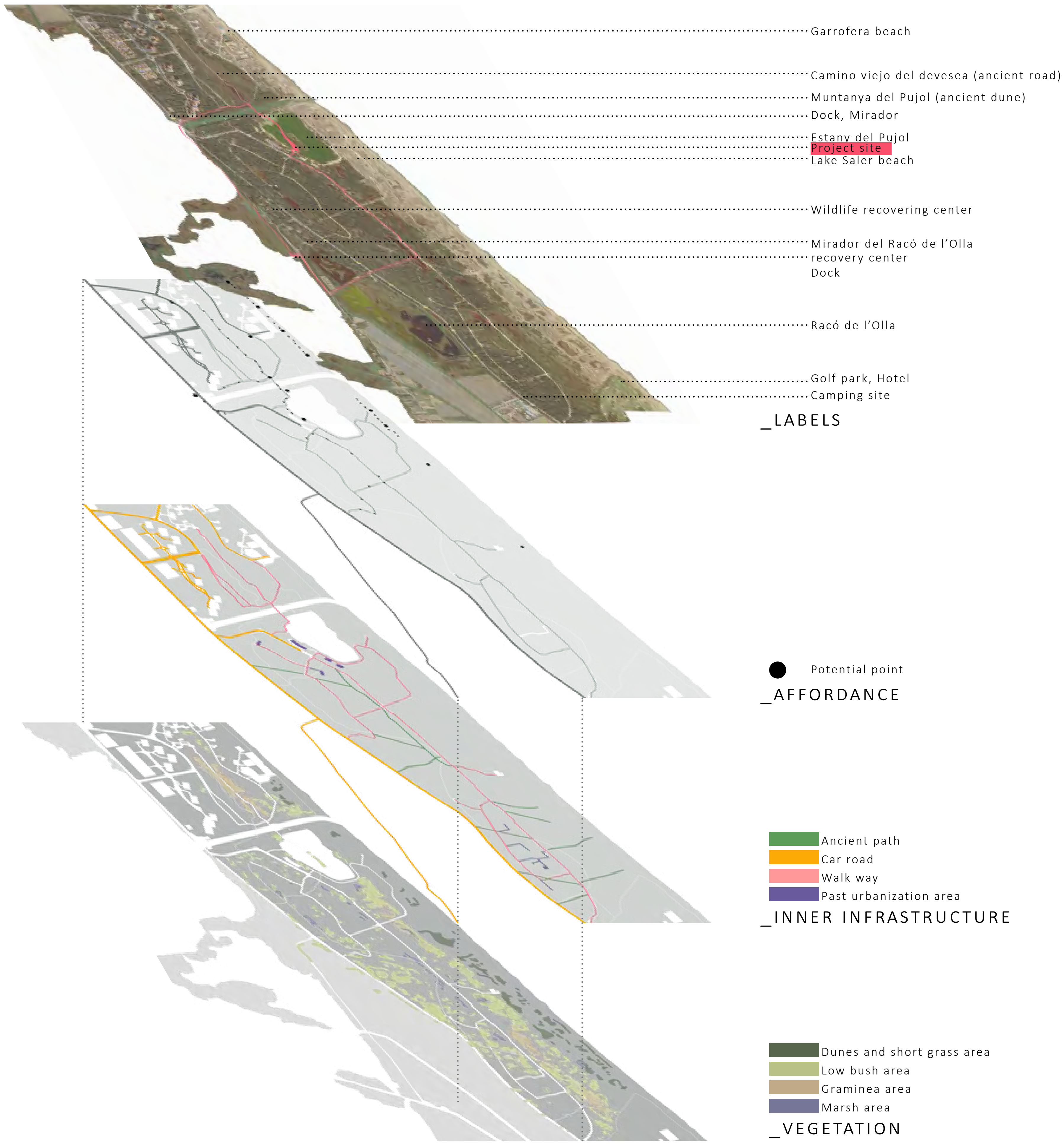
First we propose the walkwayto walk around and inside of Devesa.
This passage connects the different water scape, sky scape, texture of the vegetation, human activities and natural activities, helps for visitors to experience and understand this landscape by time.
Currently the inside of the park is nearly closed and only way to go inside is to use the rout partially prepared as the plan of natural park, but you could only see small part and beach area.
With this design of the walkway, you can walk around inside of the devesa and see the original vegetation to the trace of past urbanization, such as wide asphalt road and excavated empty plats, as a result you could understand the story of this landscape.

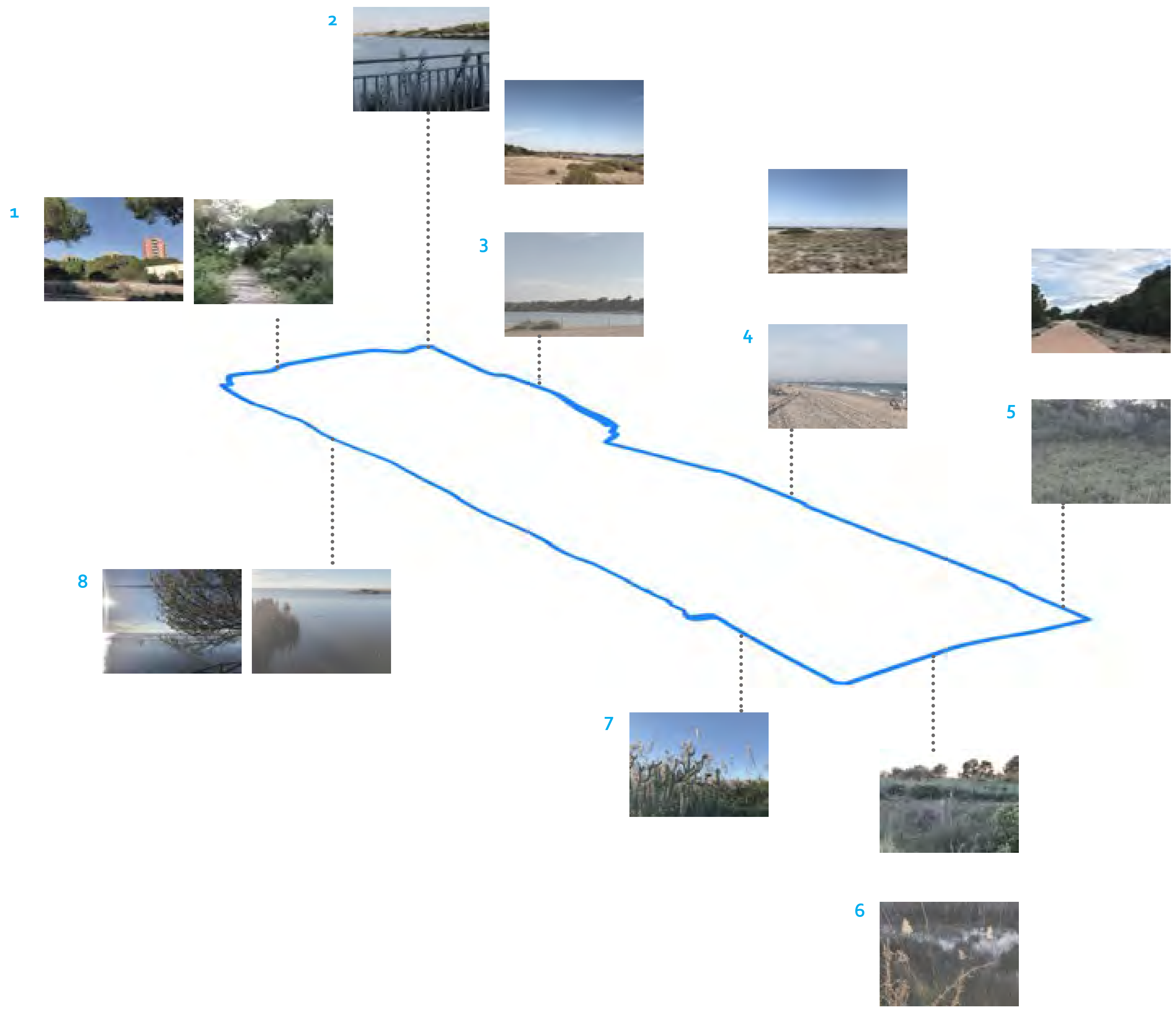
GENERAL PLAN S=1:10000

TOPOGRAPHY
- 0~1m above sea level
- 1~2m above sea level
- 2~3m above sea level
- 3~4m above sea level
- 4~5m above sea level
- 5~6m above sea level
- 6~7m above sea level

WATER
- lake albufera, sea
- salt marshes
- freshwater marshes

TEXTURE OF VEGETATION
- short grasses on the beach
- reed bed
- cluster of tall trees


Garrofera beach
Camino viejo del devesea (ancient road)
Muntanya del Pujol (ancient dune)
Dock, Mirador
Estany del Pujol
Project site
Lake Saler beach
Wildlife recovering center
Mirador del Racó de l'Olla
recovery center
Dock
Racó de l'Olla
Golf park, Hotel
Camping site
_LABELS
Potential point
_AFFORDANCE
Ancient path
Car road
Walk way
Past urbanization area
_INNER INFRASTRUCTURE
Dunes and short grass area
Low bush area
Graminea area
Marsh area
_VEGETATION



View to the sky through the path

Through the total path, you would encounter the different shapes of the sky in relation with the natural landscape of plants, water and human activities.

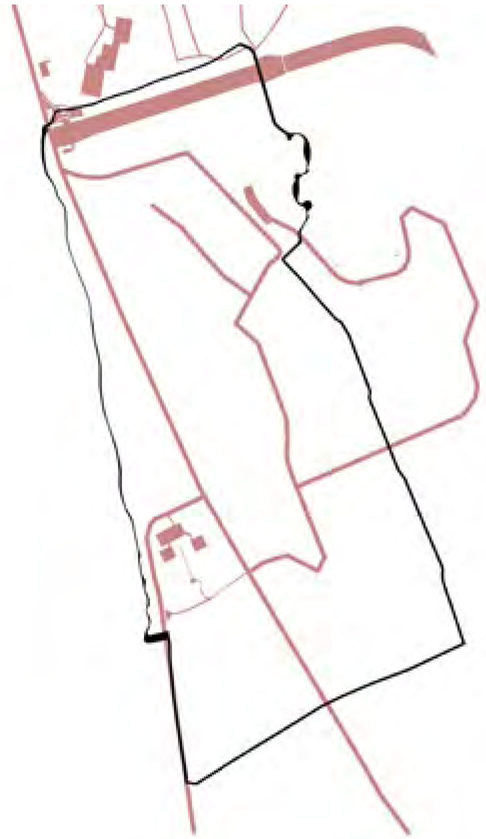
1 _Reflection of the river water
2 _sand and grasses around the Estany
3 _High tall pine woods and road
4 _ Beach and the Dunes with grasses
5 _ Bike road and plants along with the path
6 _ Path going inside of the woods
7 _ Residential area and entrance of the path
8 _ High tall pine woods
9 _ Reflection of the lake water between bushes
10 _ Wet marsh
11 _ Between cactus and reeks
12 _ Reflection of the huerta water

Water connection

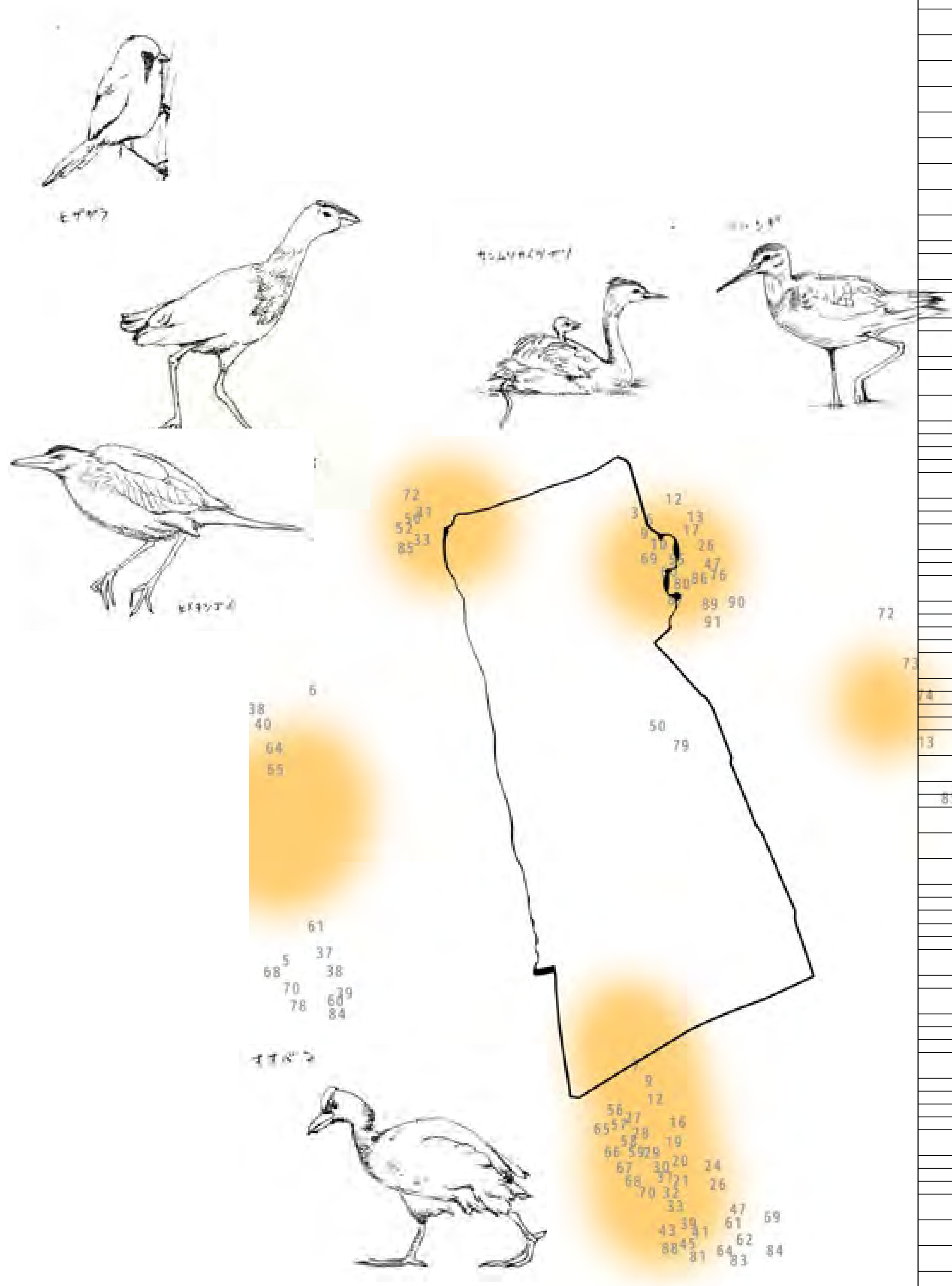
This path is connecting the different water scape in this area. Start from the lake Albufera, you would perceivcve variety of water shape through the path. These water shapes changes from season to season, hosting the variety of natural elements such as animals and plants.

1 _Entrance of the pier
2 _Crossing with bicycle route
3 _Trace of the natural pavement
4 _ between marshes
5 _ Entrance of the research center
6 _ Between bushes of reeds
7 _ along with the lake

the different water scapes



human activities

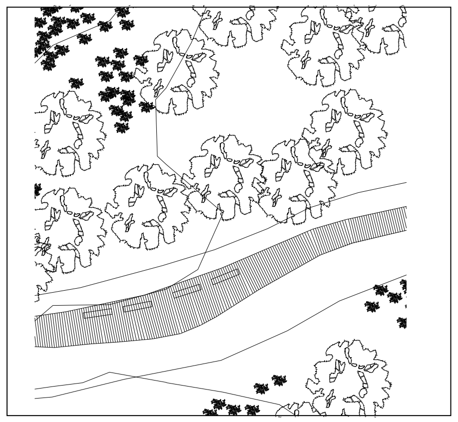


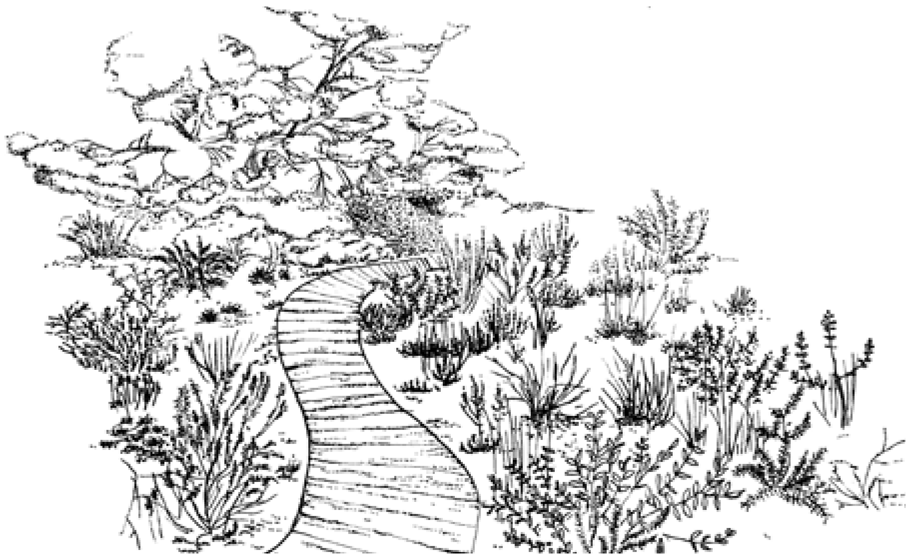
birds habitats

1	waterfowl	red-necked garbe	86
2	Great Crested Grebe	Somormujo Lavanco	125
3	Purple Heron	gazas imperiales	129
4	Red-crested Pochard	Pato Colorado	83
5	(common coots)	focha comun	135
6	Red knot	correlimos gordo	92
7	Sanderling	correlimos tridactilo	275
8	Little stint	Correlimos menudo	428
9	Temminck's stint	Correlimos de temminck	173
10	Pectoral sandpiper	Correlimos pectoral	289
11	Curlew sandpiper	Correlimos zarapitín	220
12	Dunlin	Correlimos común	13
13	Broad-billed sandpiper	Correlimos falcinelo	15
14	Buff-breasted sandpiper	Correlimos canelo	22
15	black-headed gulls	gaviota reidora	111
16	Slender-billed gull	Gaviota picofina	140
17	Mediterranean gull	Gaviota cabecinegra	9
18	Franklin's gull	Gaviota pipizcan	151
19	Audouin's gull	Gaviota de Audouin	36
20	Common gull	Gaviota cana	78
21	Lesser black-backed gull	Gaviota sombría	54
22	Herring gull	Gaviota argéntea	34
23	Yellow-legged gull	Gaviota patiamarilla	26
24	Caspian gull	Gaviota del Caspio	87
25	Little gull	Gaviota enana	91
26	Gull-billed tern	Pagaza piconegra	380
27	Caspian tern	Pagaza piquirroja	64
28	Elegant tern	Charrán elegante	33
29	Sandwich tern	Charrán patinegro	56
30	common tern	Charrán común	10
31	Arctic tern	Charrán ártico	52
32	little tern	Charrancito común	
33			50
34	Moustached warbler	Carricerín real	52
35	Savi's wader	Buscarla unicolor	67
36	Bearded reedling	bigotudo	220
37	Marbled teal	Cerceta pardilla	52
38	Purple gallinule	Calamón común	389
39	Black-tailed godwit	Aguja Colinegra	206
40	black stork	Cigüeña Negra	170
41	White stork	Cigüeña blanca	
42			201
43	Northern lapwing	Avefría Europea	105
44	European golden plover	Chorlito Dorado Europeo	166
45	Ceylon Stilt	Cigüeñuela Común	
46	tern		236
47	Balearic shearwater	Pardela balear	63
48	Scopoli's Shearwater	Pardela cenicienta	59
49	Levantine shearwater	Pardela mediterránea	
50	Mute Swan	Cisne Vulgar	9
51	Greylag Goose	Ansar común	61
52	hybrid brant	Barnacla híbrida	21
53	Barnacle Goose	Barnacla cariblanca	24
54	Ruddy Shelduck	Tarro Canelo	20
55	Common Shelduck	Tarro blanco	257
56	Eurasian wigeon	Silbón europeo	47
57	Gadwall	Ánade friso	124
58	common teal	Cerceta común	138
59	Green-winged Teal	Cerceta americana	10
60	Mallard	Ánade azulón	26
61	Eaton's Pintail	Anade Rabudo	79
62	Garganey	Cerceta carretona	269
63	Blue-winged Teal	Cerceta Aliazul	10
64	Northern Shoveler	Cuchara común	193
65	Marbled Teal	Cerceta pardilla	200
66	Common Eider	Éider común	12
67	Common scoter	Negrón común	163
68	Velvet scoter	Negrón especulado	26
69	Red-breasted Merganser	Serreta mediana	20
70	Common Merganser	Serreta grande	11
71	White-headed duck	Malvasía cabeciblanca	43
72	great bittern (Eurasian bittern)	Avetoro común	223
73	little bittern	Avetorillo común	93
74	Black-crowned Night-Heron	Martinete común	37
75	Squacco Heron	Garcilla cangrejera	121
76	Western Cattle or Eastern Cattle Egret	Garcilla bueyera	11
77	Dimorphic Egret	Garceta Dimorfa x Garceta comun	175
78	Western Great Egret	Garceta grande	376
79	Great cormorant	Cormorán grande continental	70
80	European shag	Cormorán moñudo	122
81	Spotted Redshank	Archibebe oscuro	211
82	Common Redshank	Archibebe común	246
83	Marsh Sandpiper	Archibebe fino	113
84	Common Greenshank	Archibebe claro	283
85	Lesser Yellowlegs	Archibebe Patigualdo Chico	19
86	Collared Pratincole	Canastera común	142

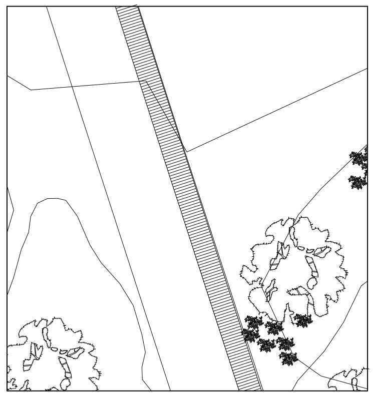
natural cycle

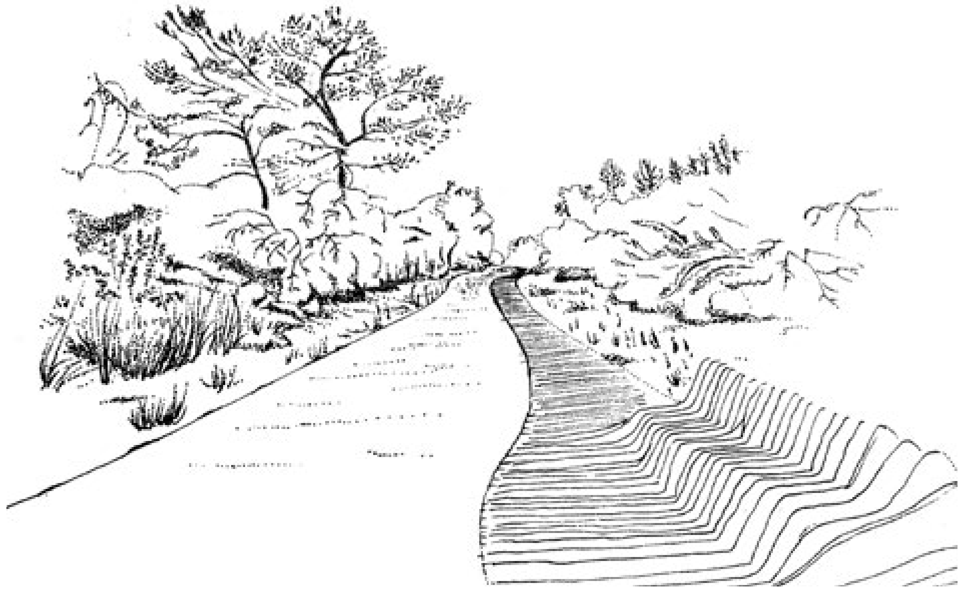
1



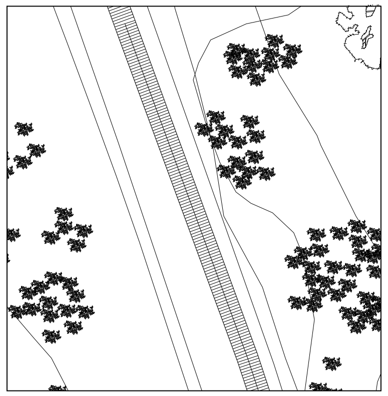


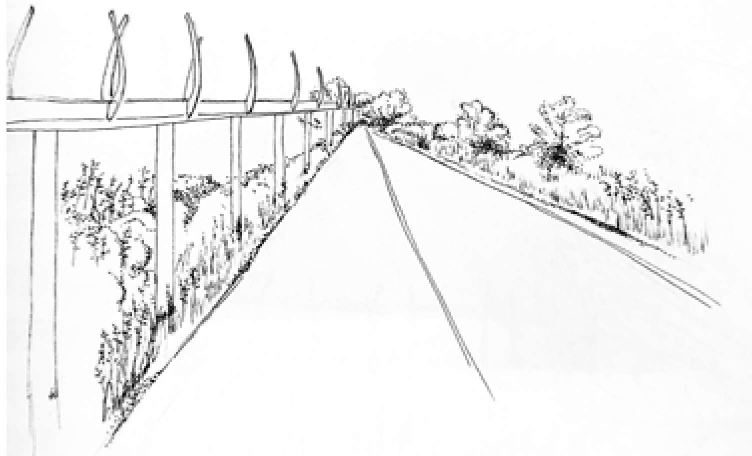
2



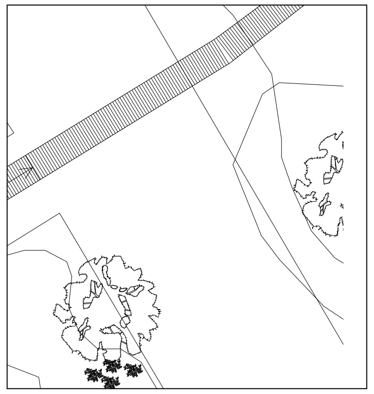


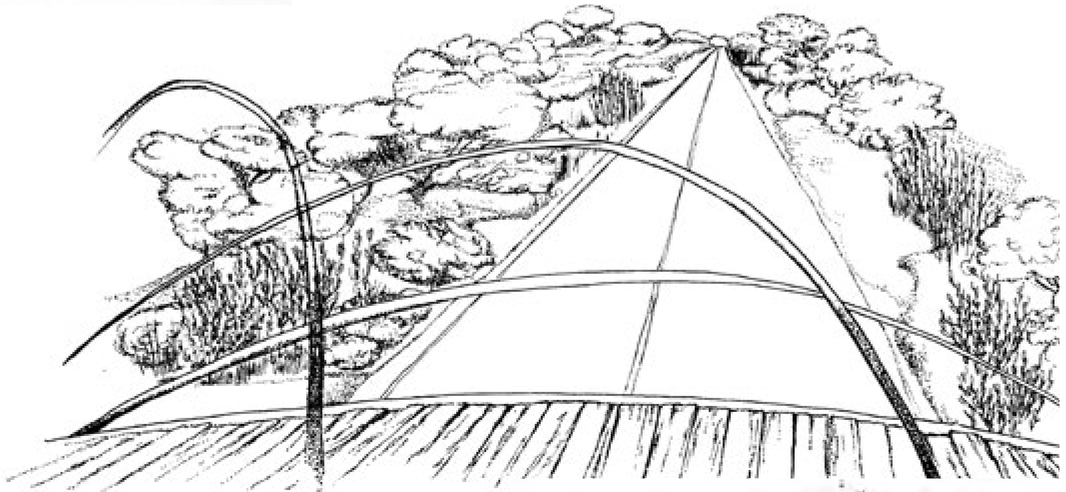
3



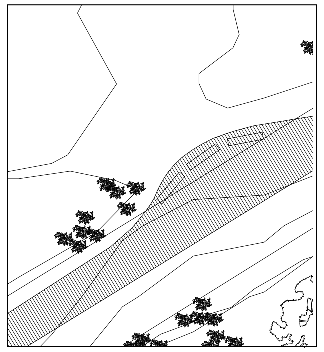


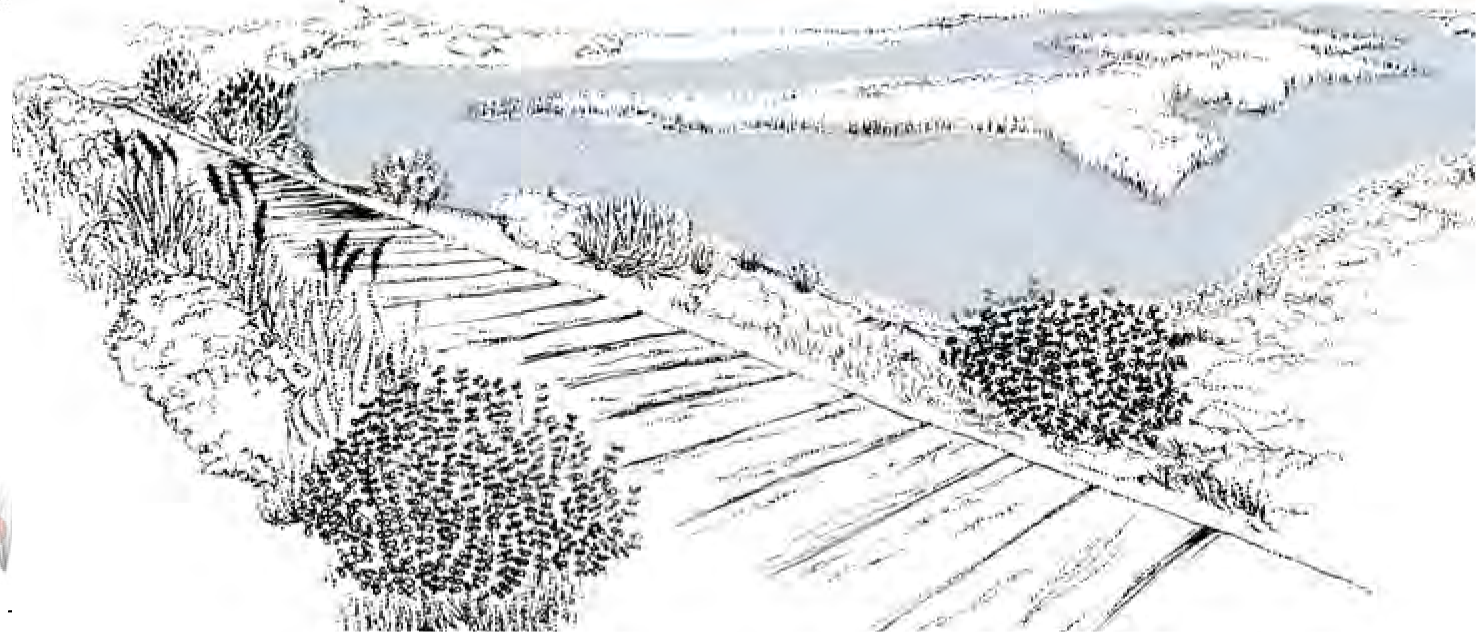
4



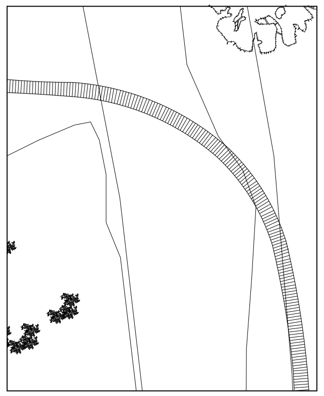


5

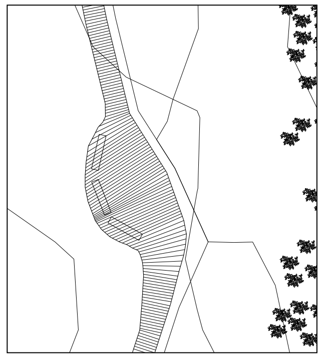




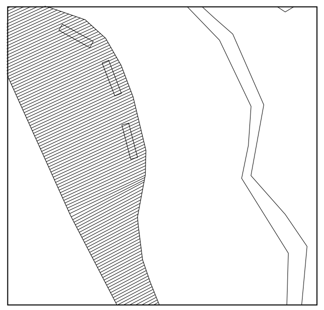
6

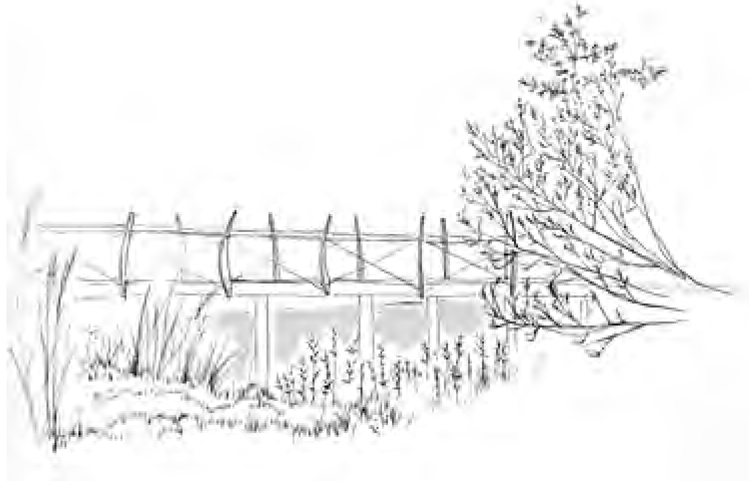


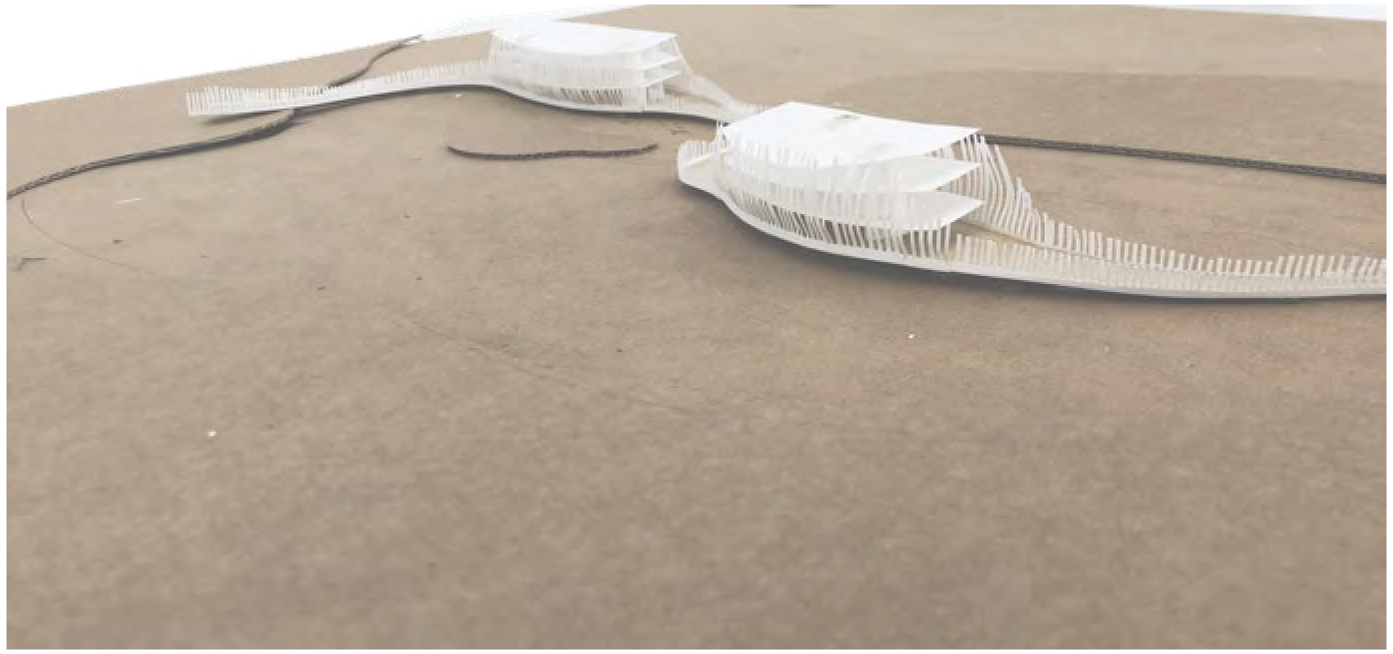
7



8

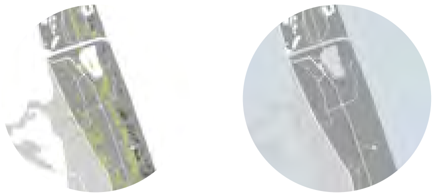






ARCHITECTURAL PROPOSAL

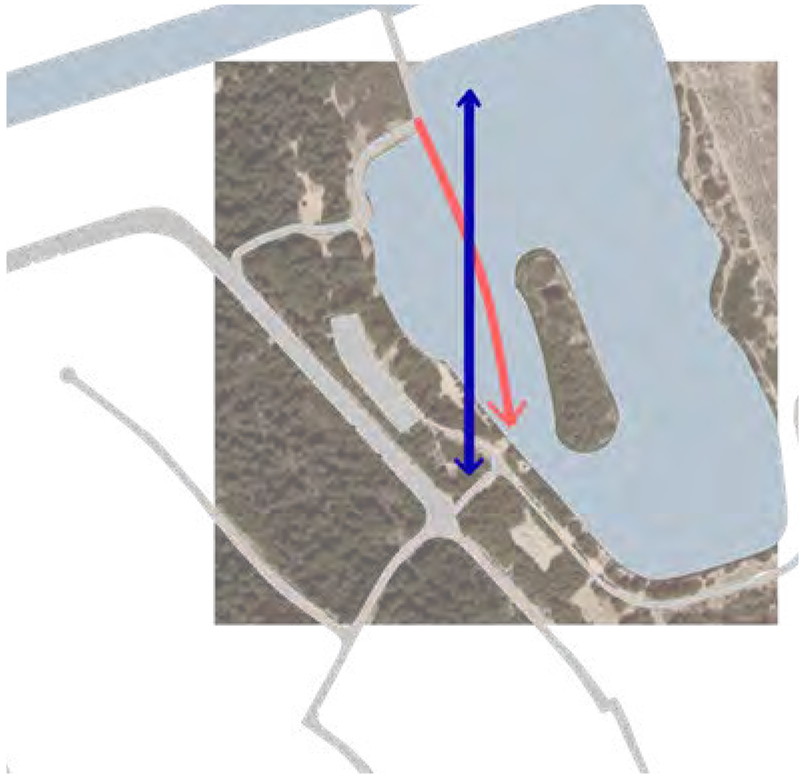
Inside of the natural park Albufera, there is an artificial lake, which was created as one of the urbanization plan between 60’s and 70’s.
The walking rout is extended to the water surface here, making the floating platform with two architectures.
This platform is floating on the water, then these architecture are lifted above the platform, surrounded by the vertical timber fins, creating the lively and comfortable atmosphere at the same time. They are visually and metaphorically similar to the habitation in the reed bed of Albufera.

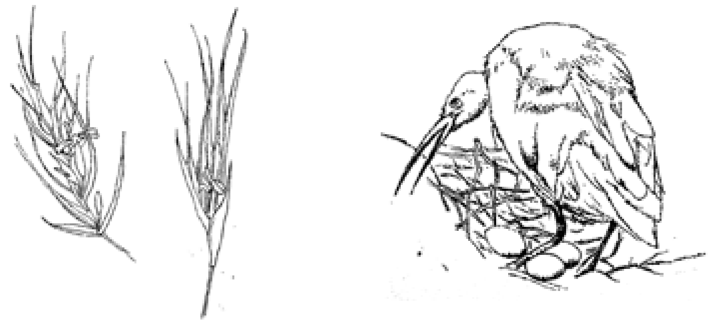


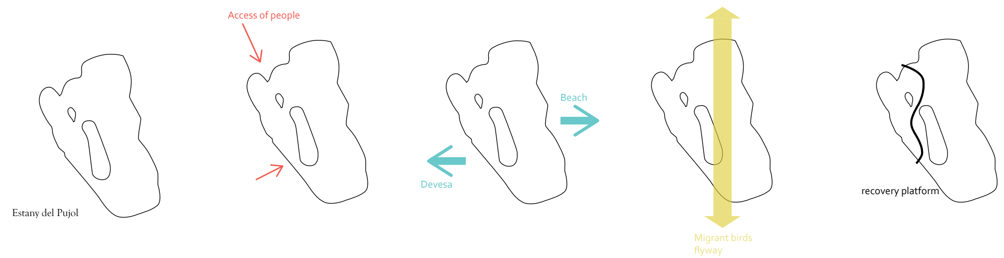
Natural elements

time laps of this area

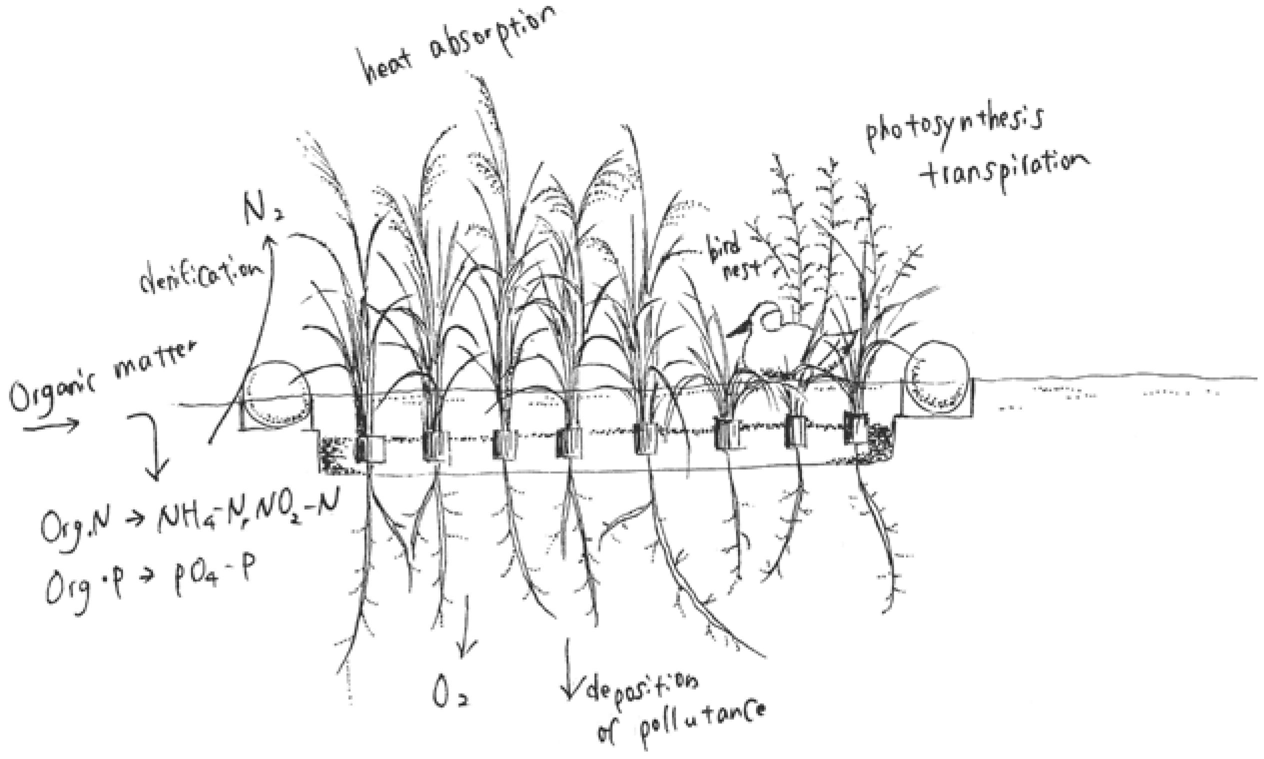
human activities







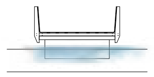
This artificial lake Estany del Pujol, is also one of the important sopping point for immigrant birds. At the beginning of the winter and in spring, you can observe a lot of spices of migrant birds comes and goes back from Siberia to Africa.
I propose to create a platform drifting on the water, making the spaces for human activities and birds activities. By mixing the two lines traced by the preexisting road and birds' flyway, the platform was placed in the curved line.
The main activity on this platform is a passage for human and birds, and also to plant and take care the reed inside of this lake, so that in near future the lake would be recovered, the clear water would be back.



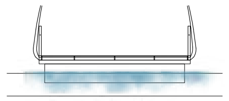
REED CULTIVATION AND PLANTATION FLOATING ISLAND

Reed is a perennial plant of Phragmites of the family Graminae, one of the aquatic plants that has the effect of natural depuration of the water.
After the seeding on the ground field and germination in the spring, the young plants will be transfered to the pine fiber pots. Then these pots will be put to the basis consists of recycled resin mat and buoyancy body, it will become the floating island of reed bed. Within 2-4 months, reed would grow over 1m.

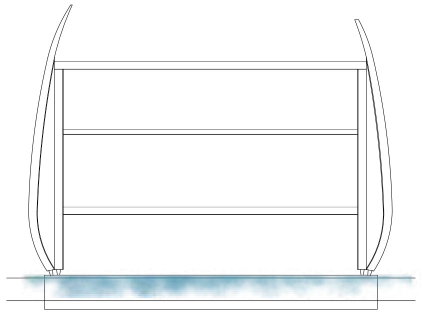
There is 5 main effect of aquatic plants as natural water depuration mechanism; removal of Organic matter, reduction of Biochemical oxygen demand, nitrogen removal, phosphrus removal and divergence of ecosystem by refrain from outbreak of phytoplancton and hosting the birds or aquatic insects.



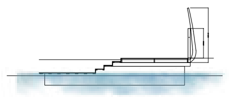
Section of drifting platform
passage S=1/1000



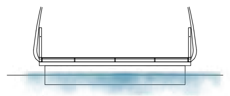
Section of drifting platform
plaza/camping site S=1/1000



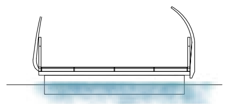
Section of drifting platform
public building S=1/1000



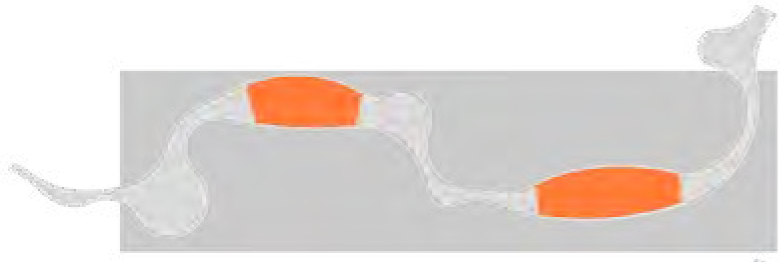
Section of drifting platform
plaza/water park S=1/1000



Section of drifting platform
plaza/camping site S=1/1000



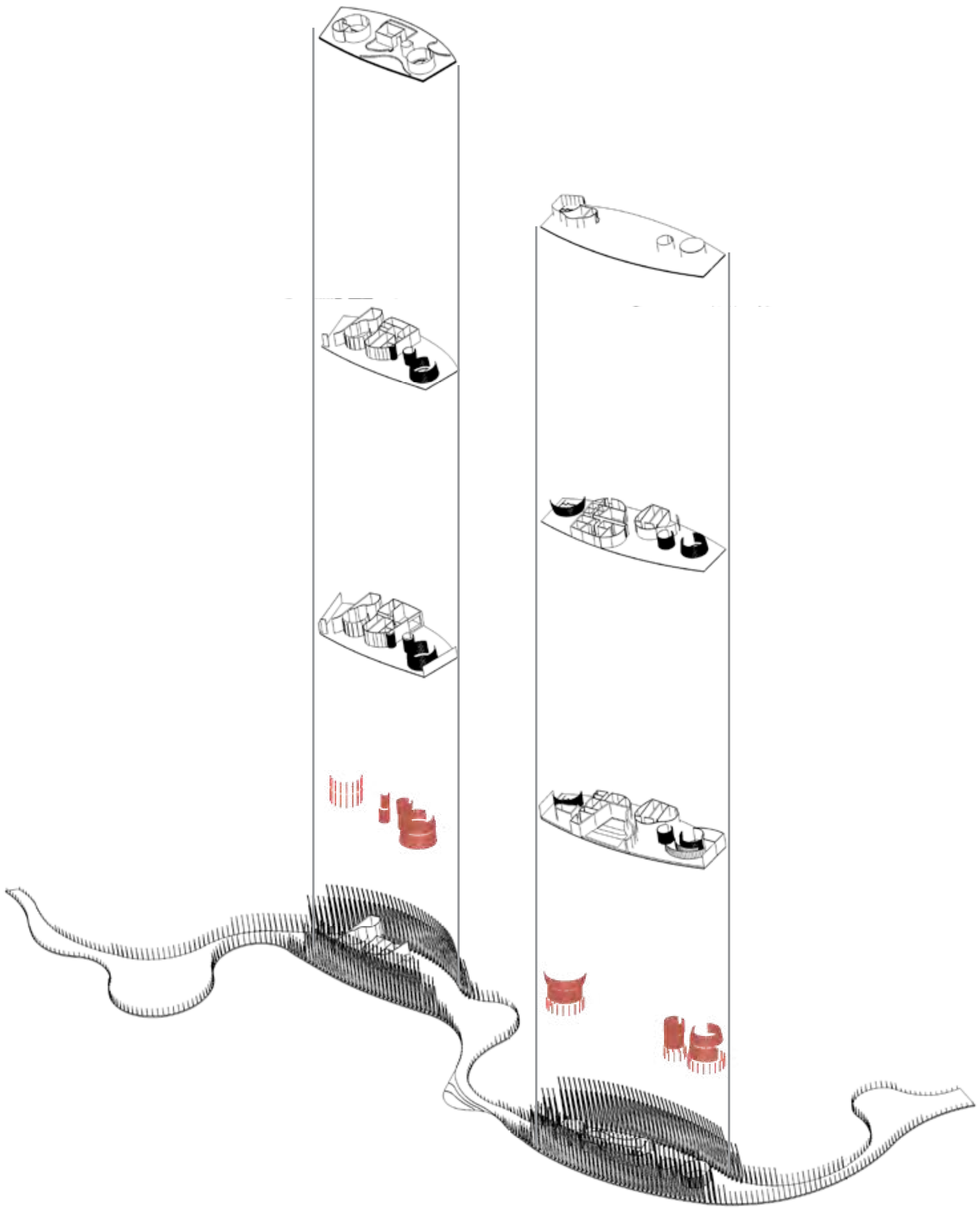
Section of drifting platform
passage S=1/1000

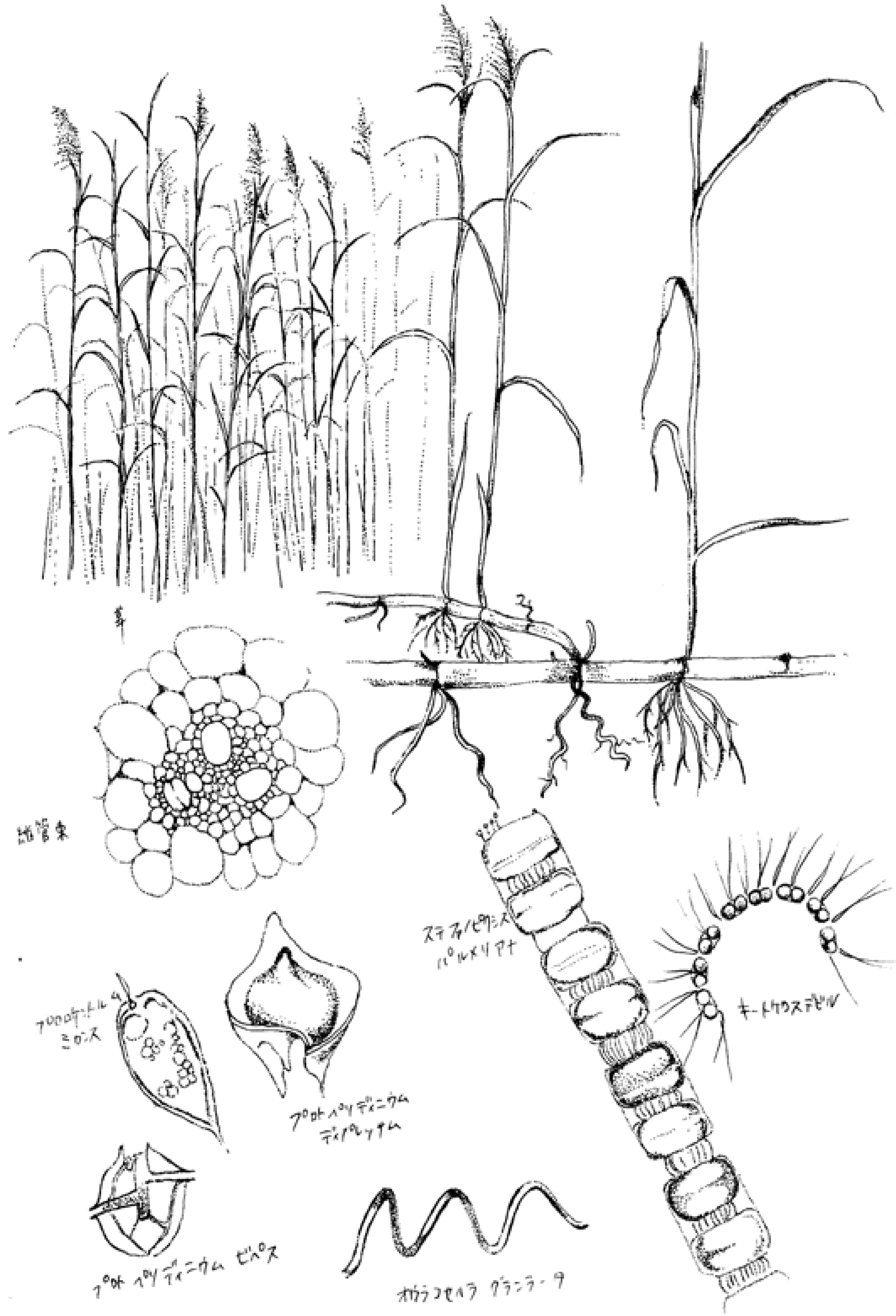


PUBLIC BUILDING
Restaurant
Offices
Library
Gallery
Theater
Garden

ACCESS AND ACTIVITY
Building access
Coffee stand
Infirmary
Sanitary

PLATFORM
Camping site
reed bed plantation
Linear park
Playground
Walkway
Observatory
Bird watching

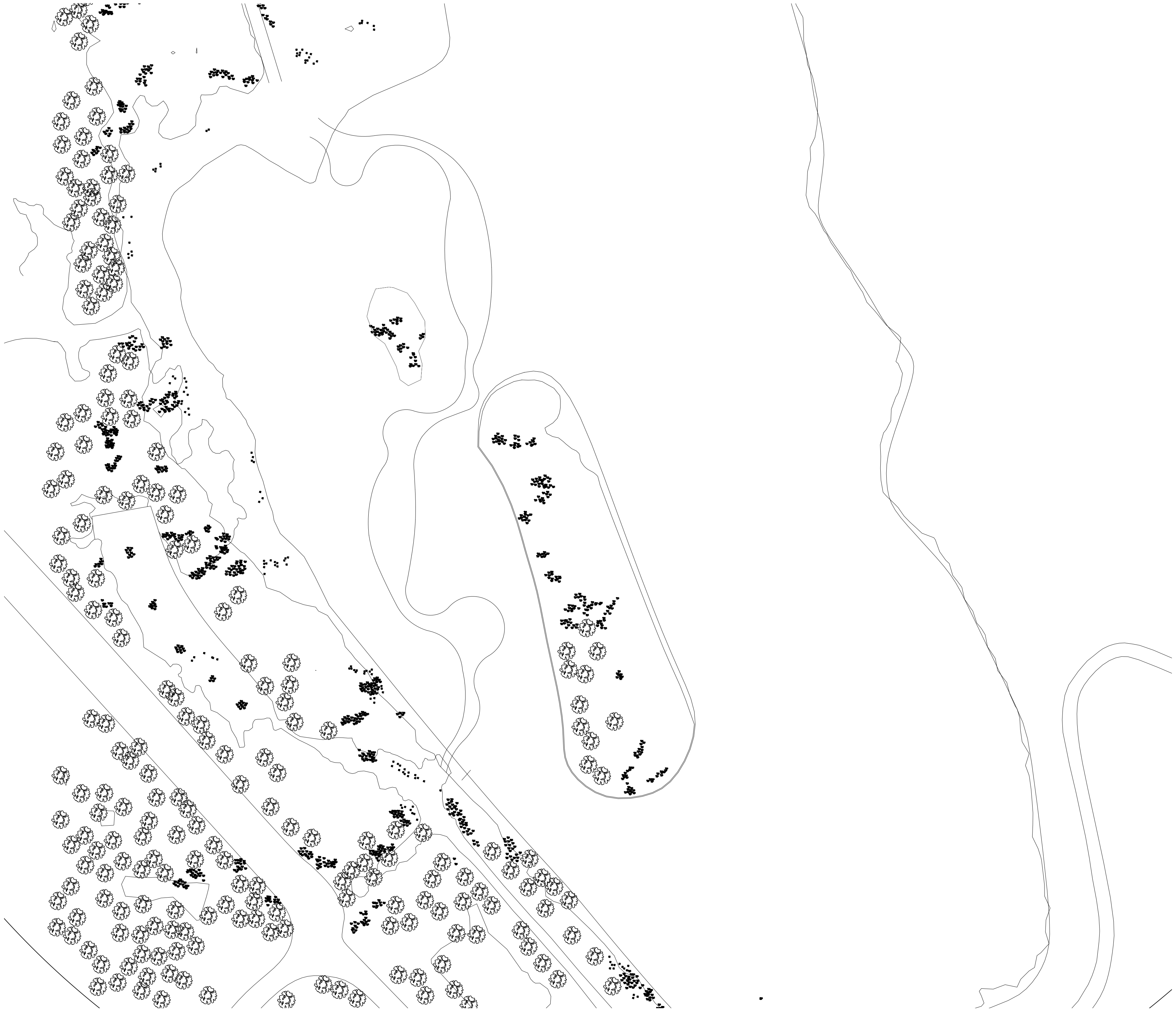



葦
維管束
ステファノピクシス
パルメリアナ
キートケロスデビル
プロロセントルム
ミカンス
プロトペリディニウム
ディバレッナム
プロトペリディニウム ピペス
オシラトリア グラニュラータ

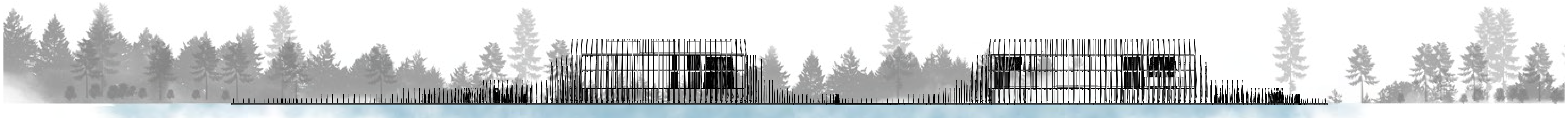
GRAPHICAL MEMORY

BIRD EYE VIEW OF WHOLE ARCHITECTURE

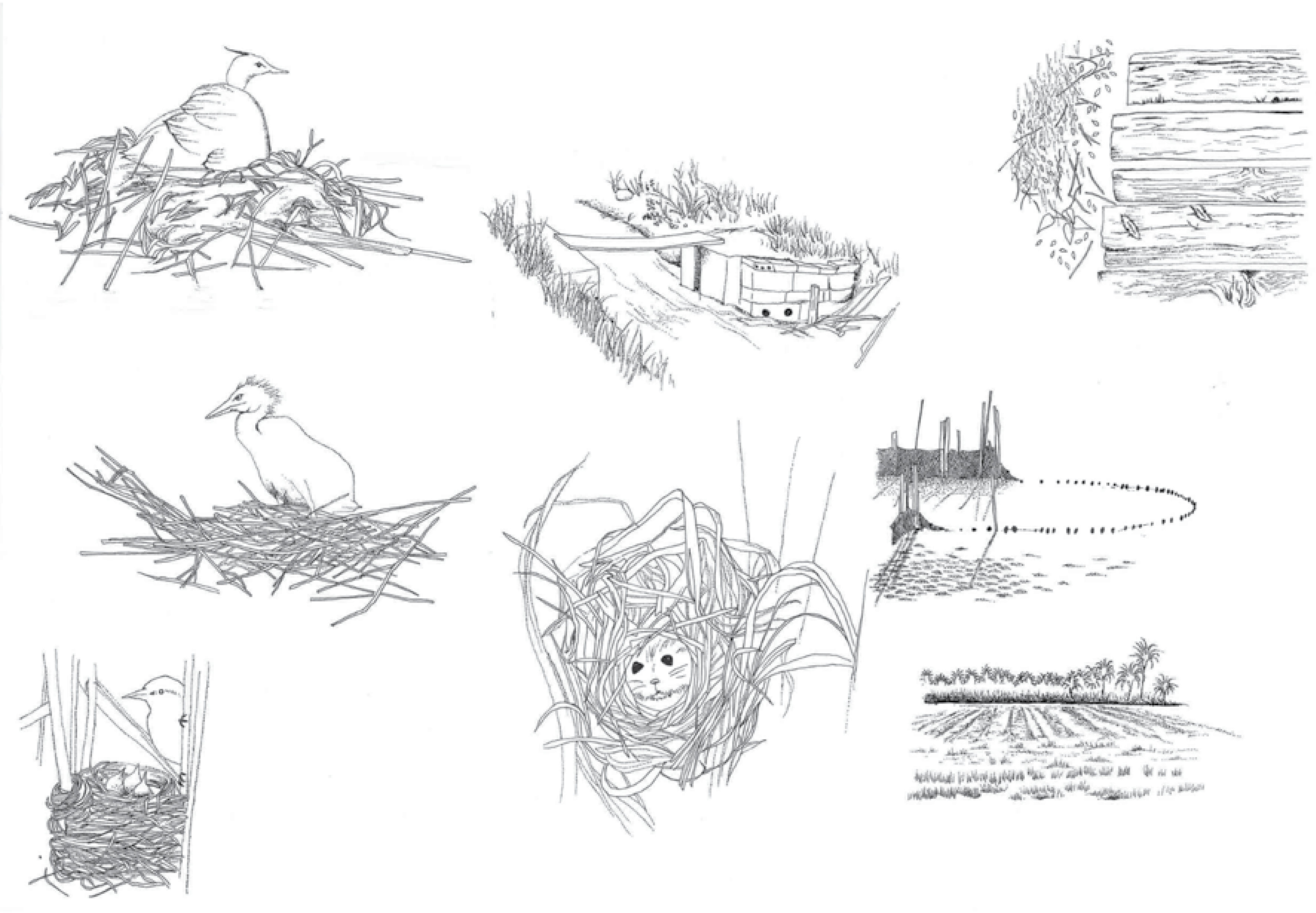
The design of building is inspired by the natural element in this natural park Albufera. Inside of the devesa there are a lot of users of this landscape, and a lot of habitats. For the beginning of this project, I have to look into them, and collected some, to understand well about this area and to create the space 'habitable' not only for human but also many of the users here.
As is described in the first part, the design of the walkway is for taking time, put yourself into the natural environment and move around to see a lot and experience a lot about this nature. The design of the building is also for putting yourself inside of the nature and nesting in it. When you arrive to the building, with all the experience and feeling you have got from the rout, you could create your own territory, which is the space you could feel comfortable and intimate, be coexistence with various elements in nature.
They could be the plants, insects, animals, humans, human activities, water, wind, sun, sand...............
One of the significant characteristics of the building is the timber fins surrounding the platform. The idea is inspired by the reed bed coloring this landscape, you can find a lot of them inside of the devesa and along side of the Lake Albufera. In side of this reed bed, many spices of mammals, insect and bird create the nest and live here. These fins helps to create the spaces more intimate and friendly to the natural landscape.

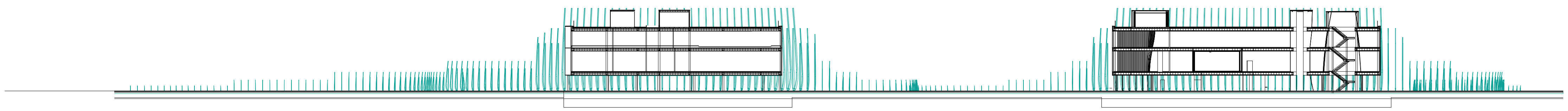


SITE PLAN S=1:2000

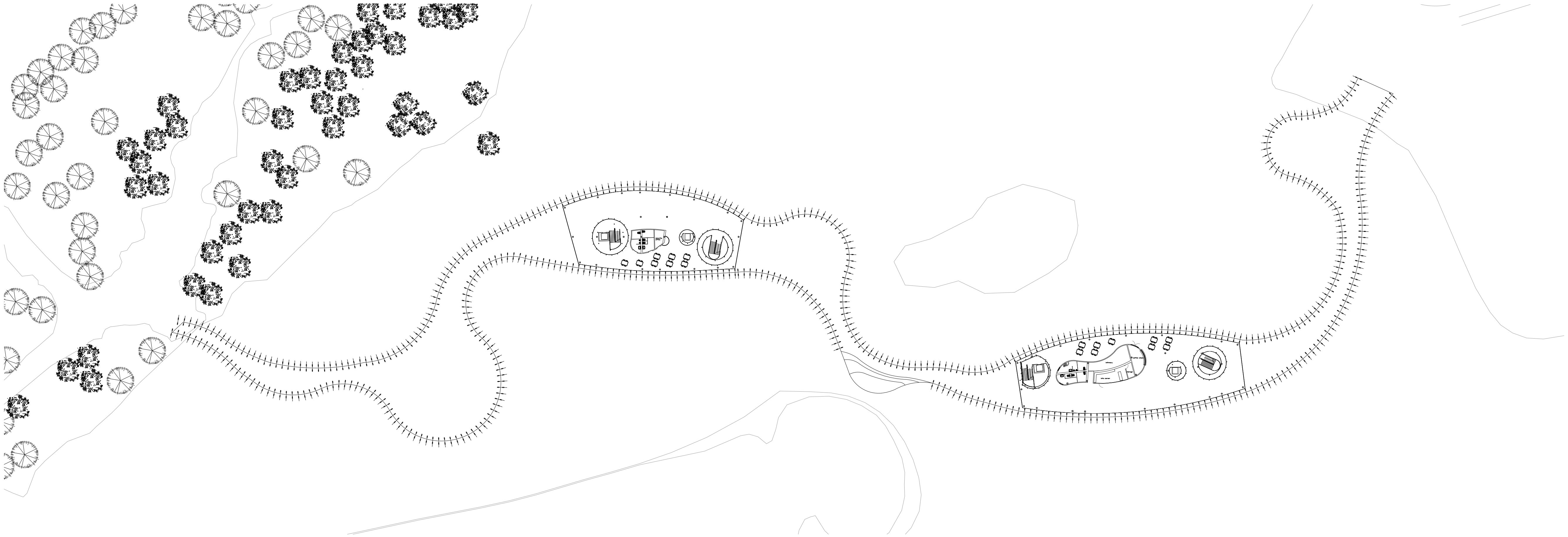


ELEVATION S=1/1000

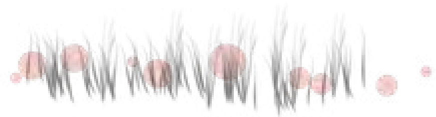


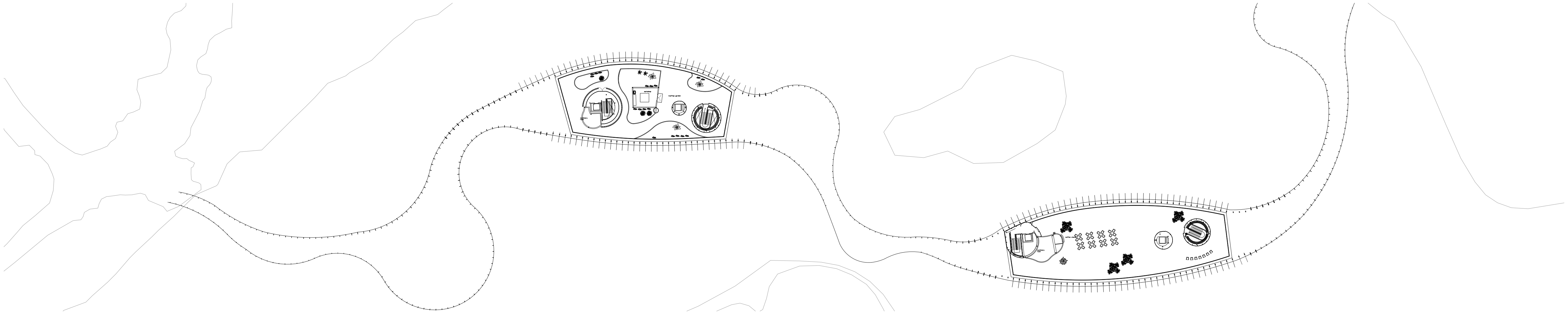


SECTION S=1/1000

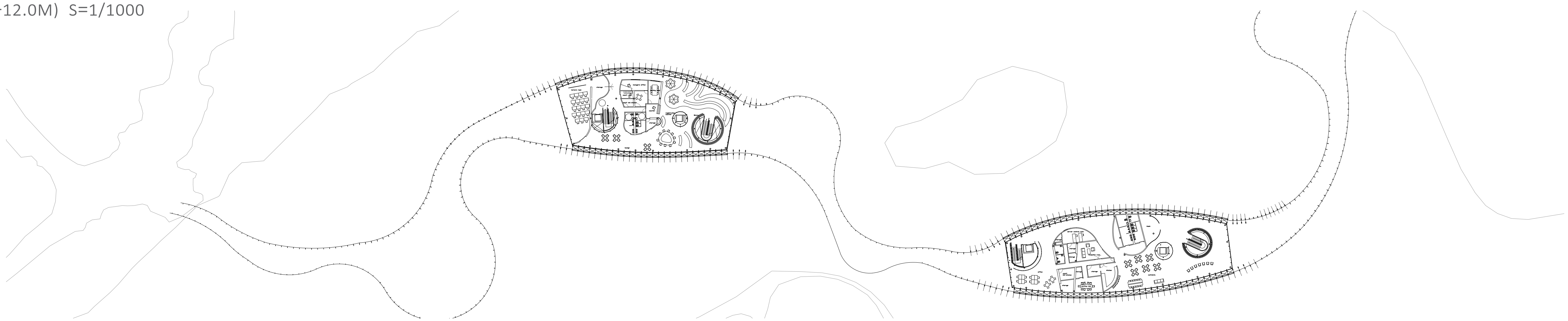


PLAN (GL+1.5M) S=1/1000

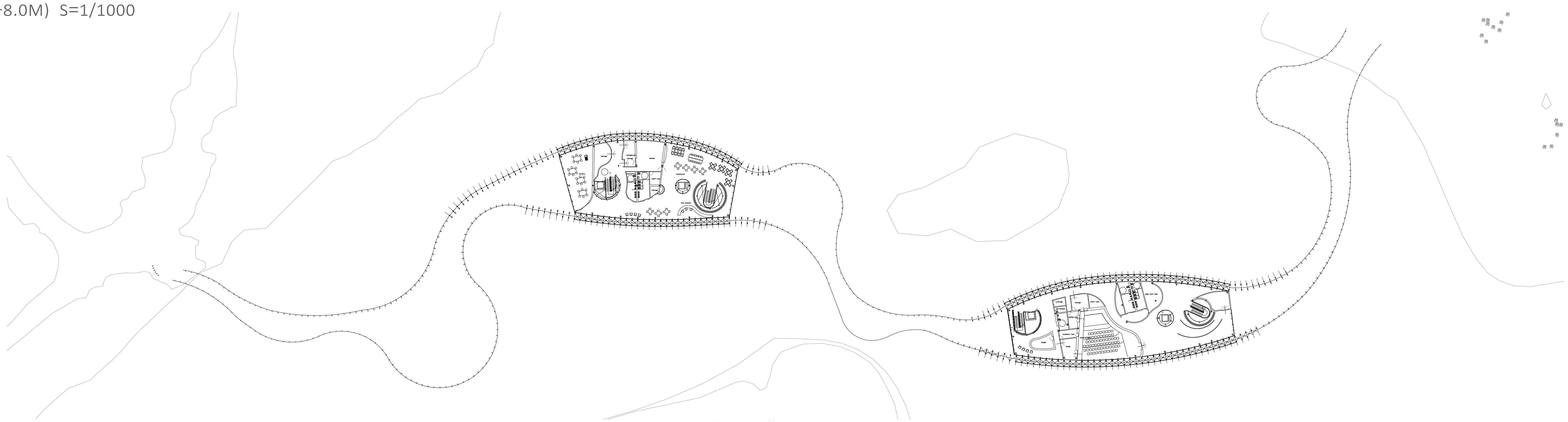




PLAN (GL+12.0M) S=1/1000



PLAN (GL+8.0M) S=1/1000



PLAN (GL+4.0M) S=1/1000

BUILDING 1

Infirmary

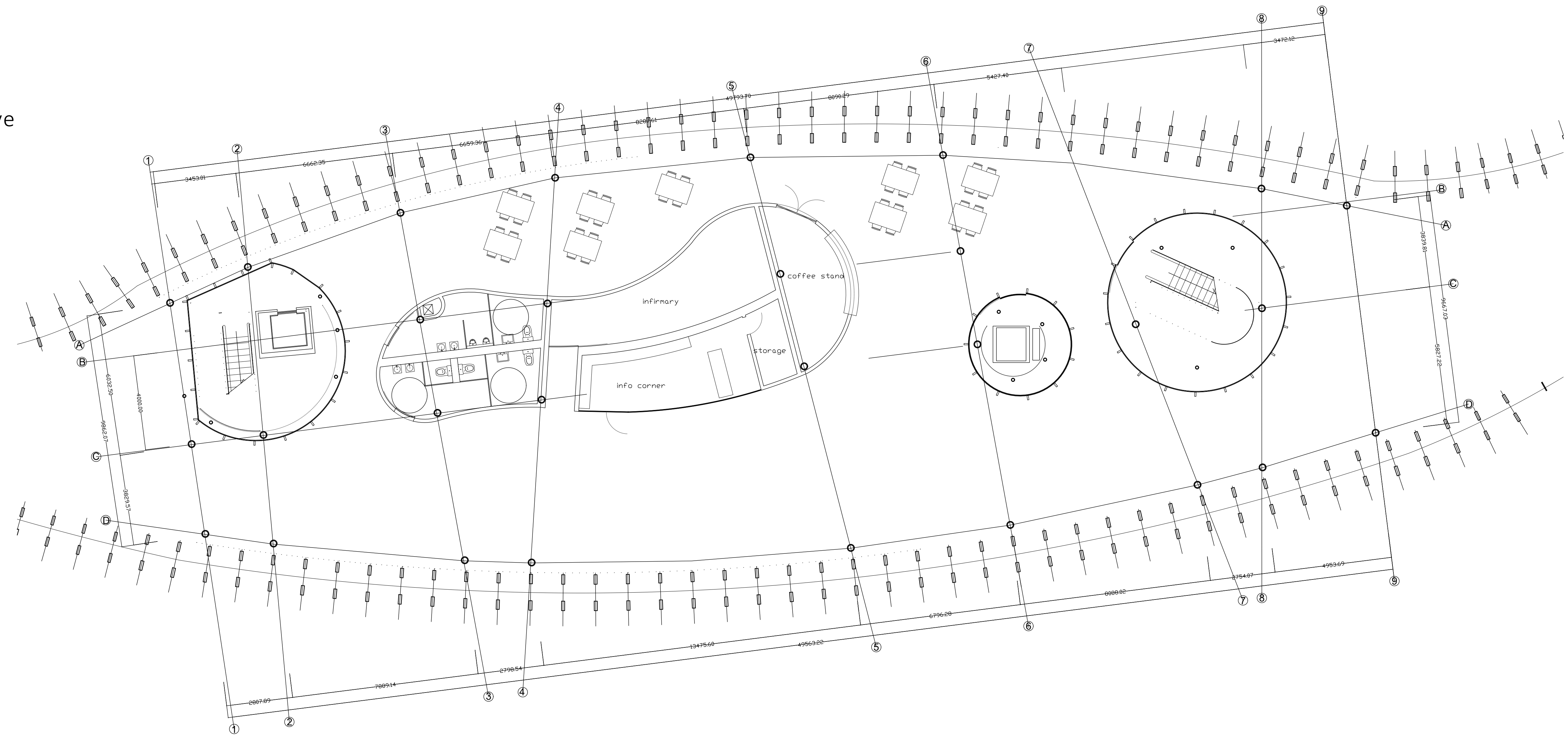
Mini theater

Studio

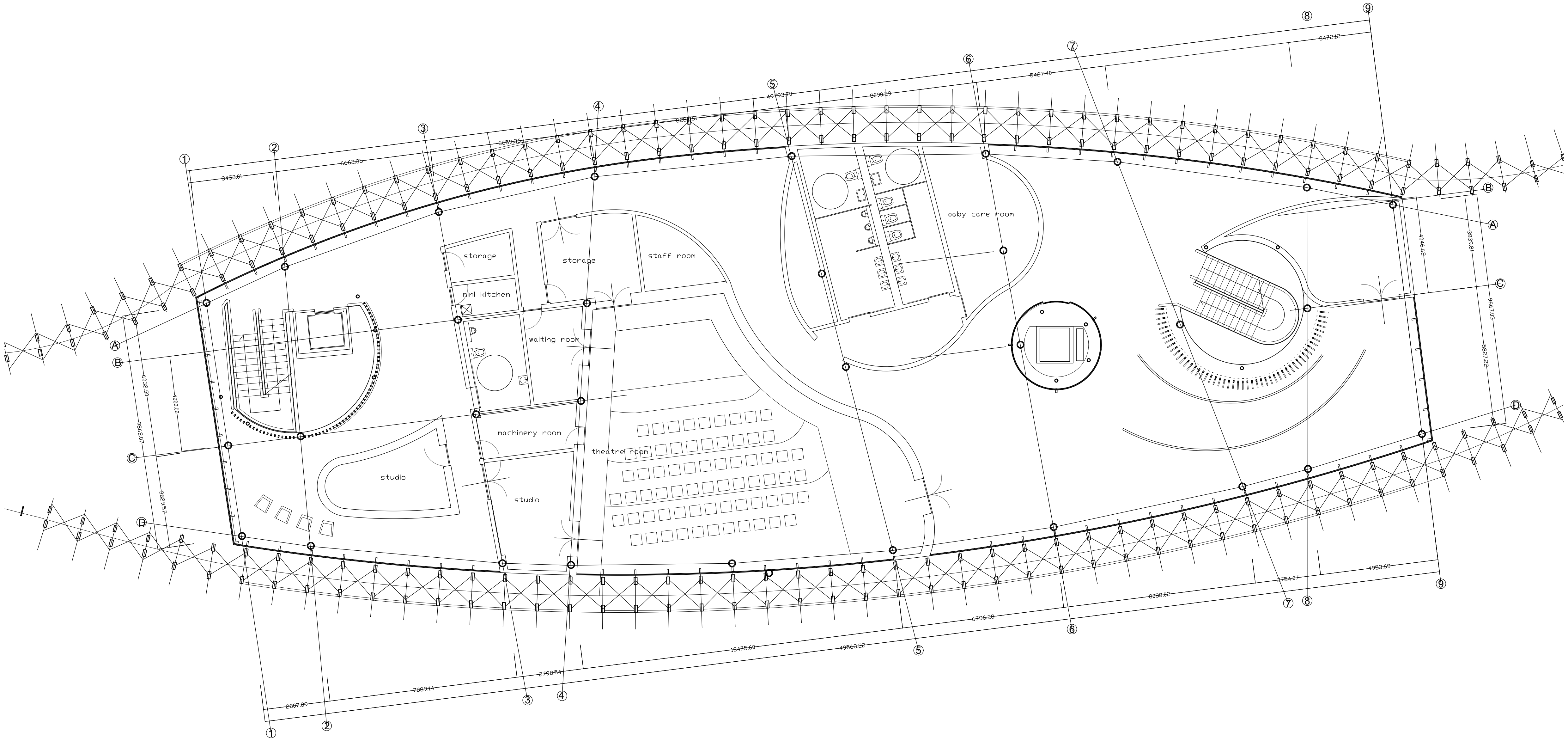
Gallery

cafeteria

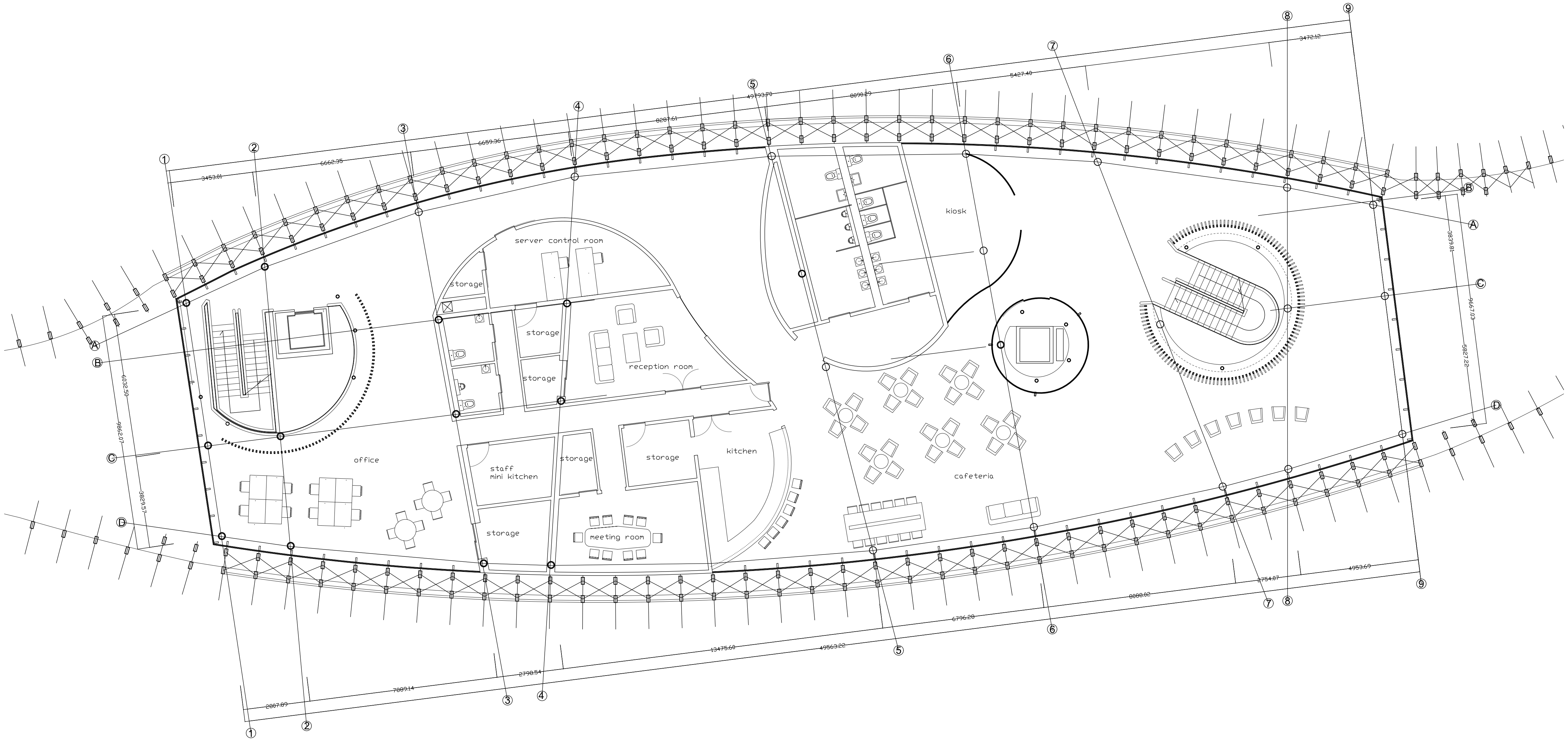
Administrative



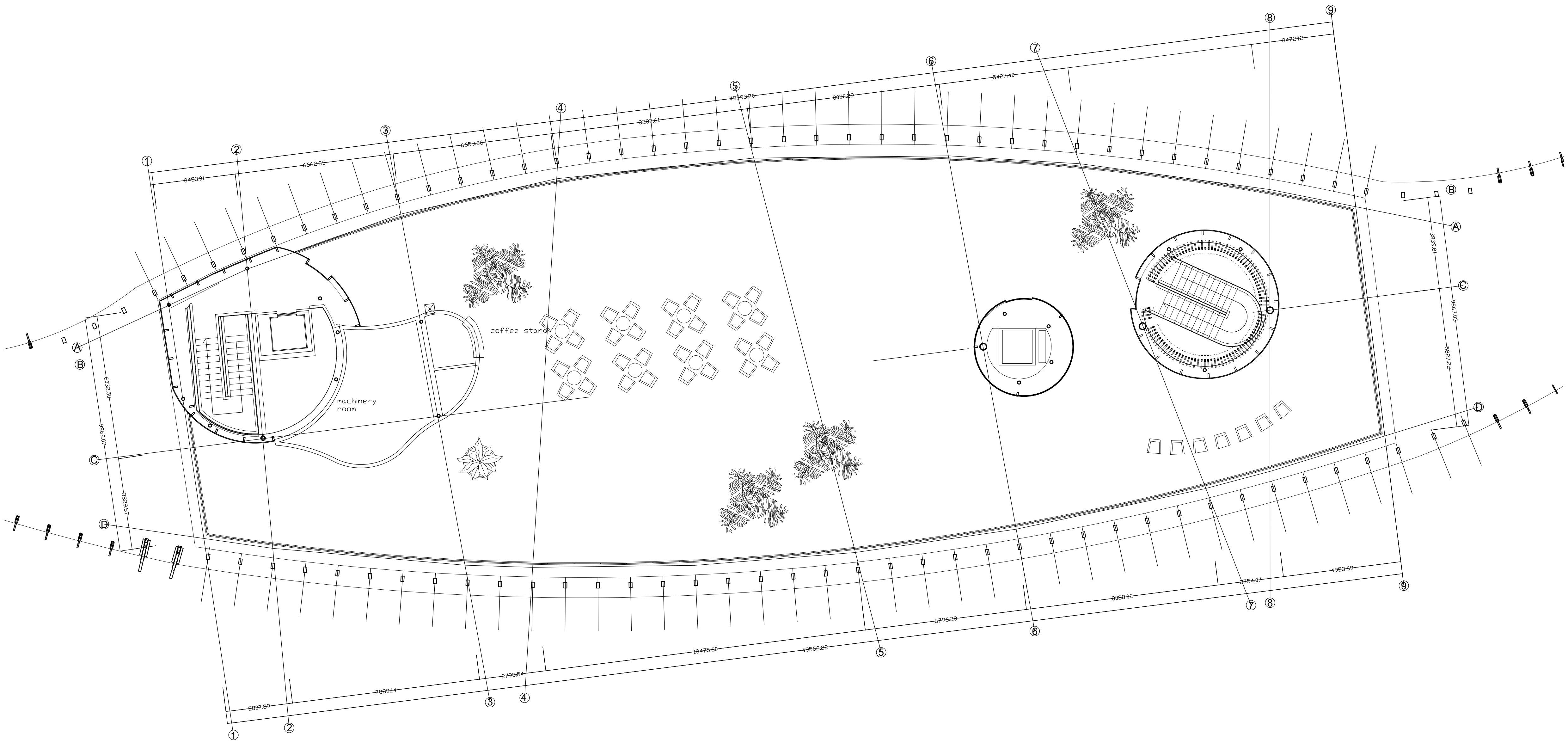
PLAN (GL+1.5M) S=1/200



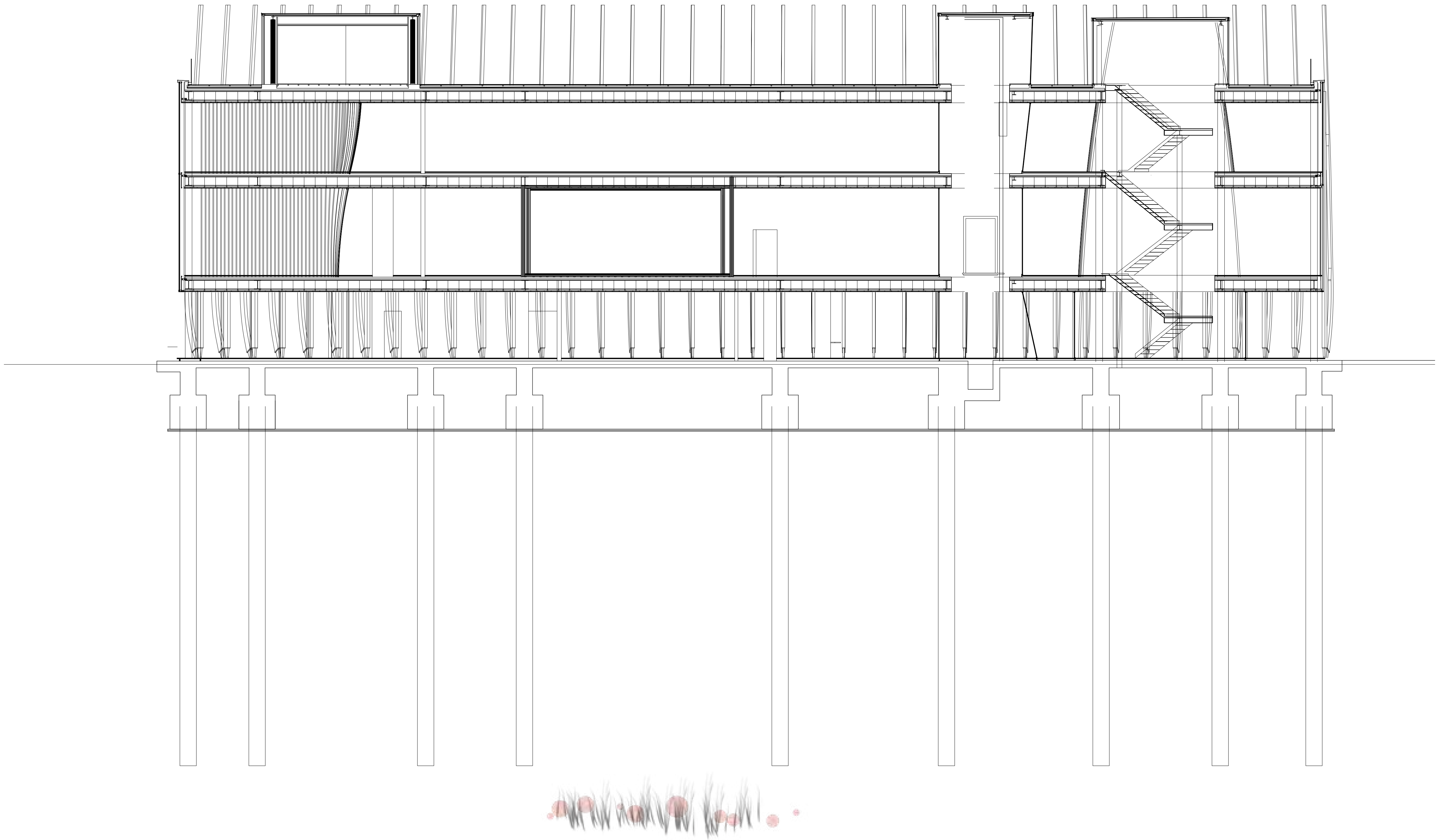
PLAN (GL+4.0M) S=1/200



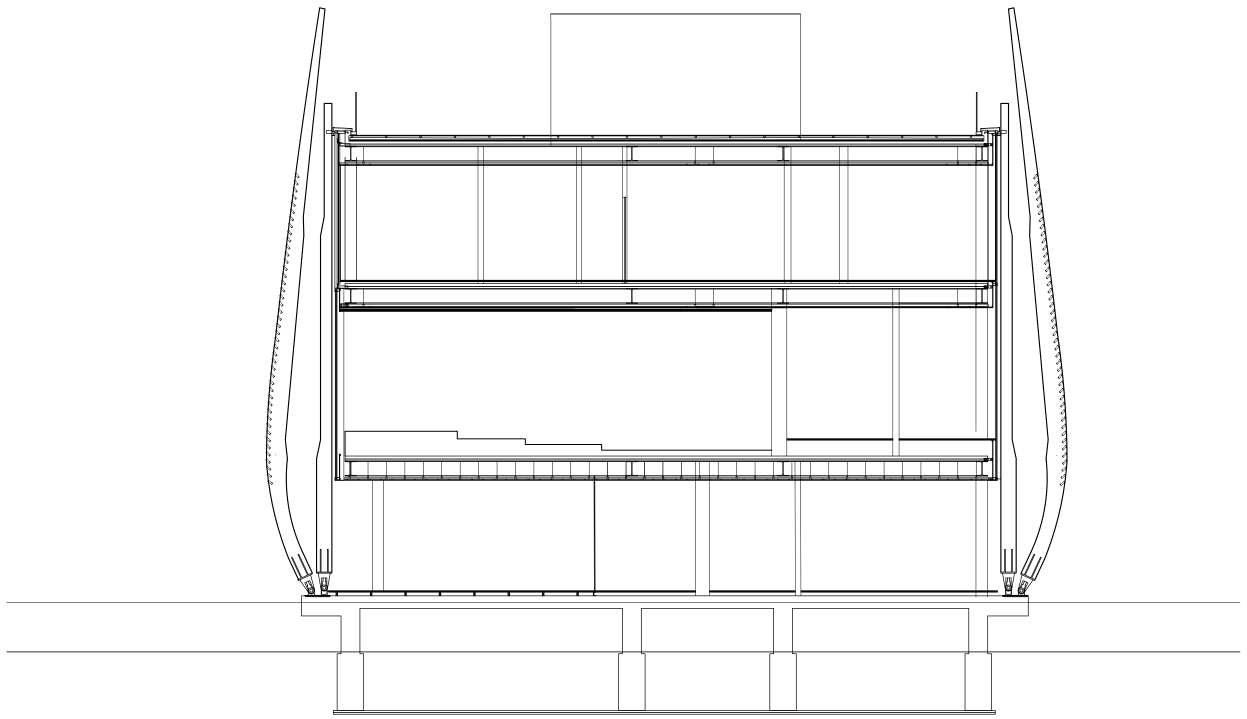
PLAN (GL+8.0M) S=1/200



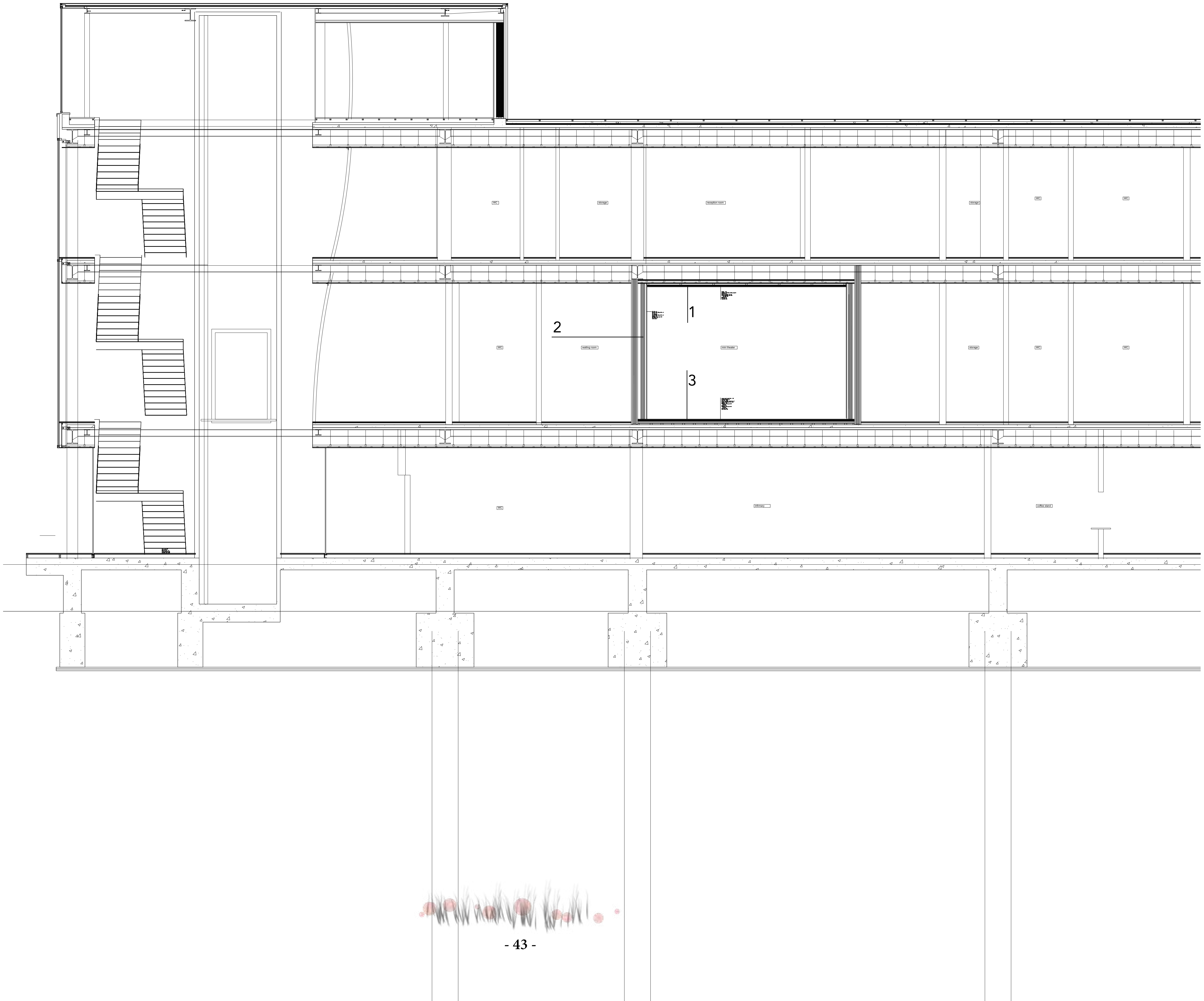
PLAN (GL+12.0M) S=1/200

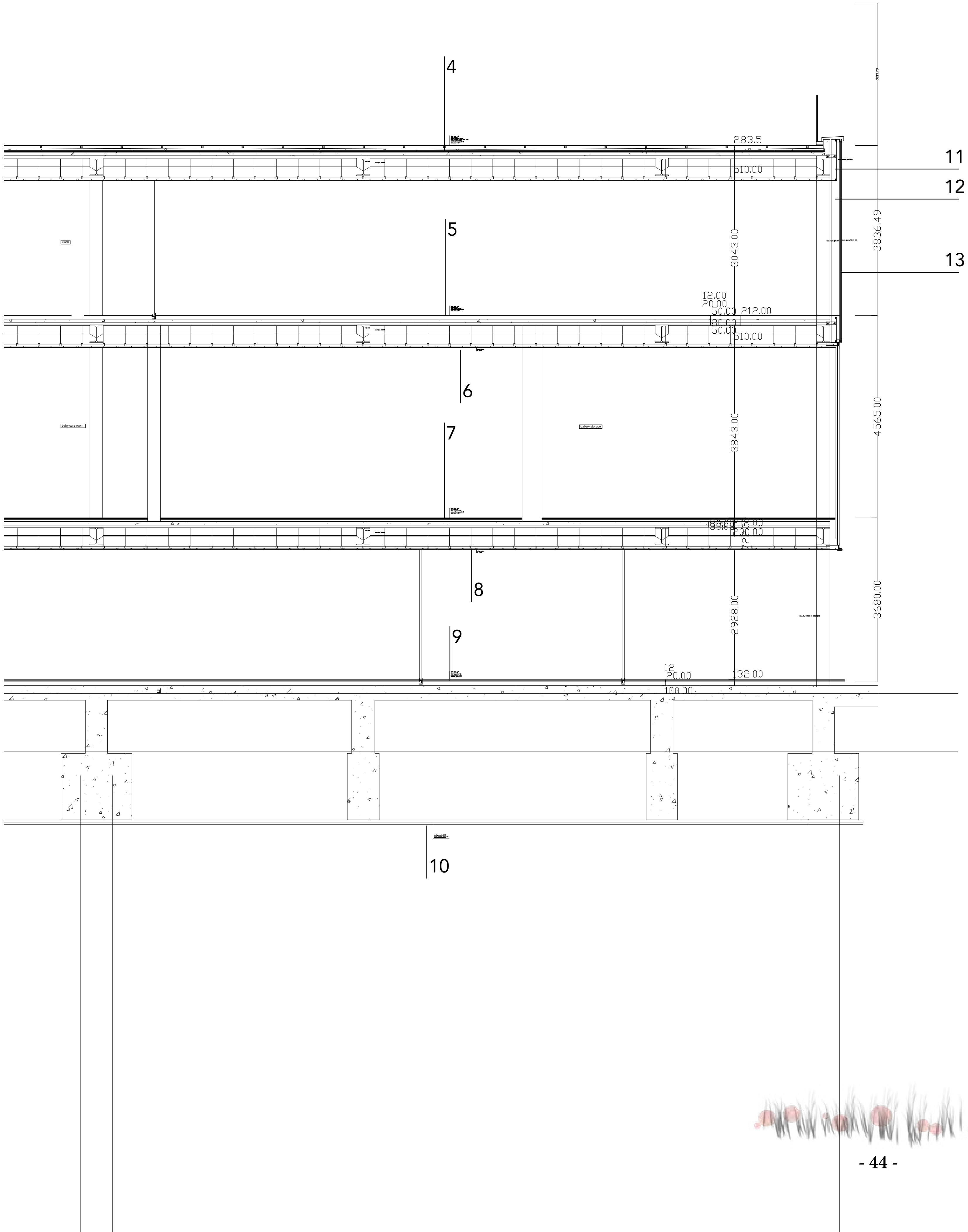


SECTION N/S S=1/200



SECTION E/W S=1/200

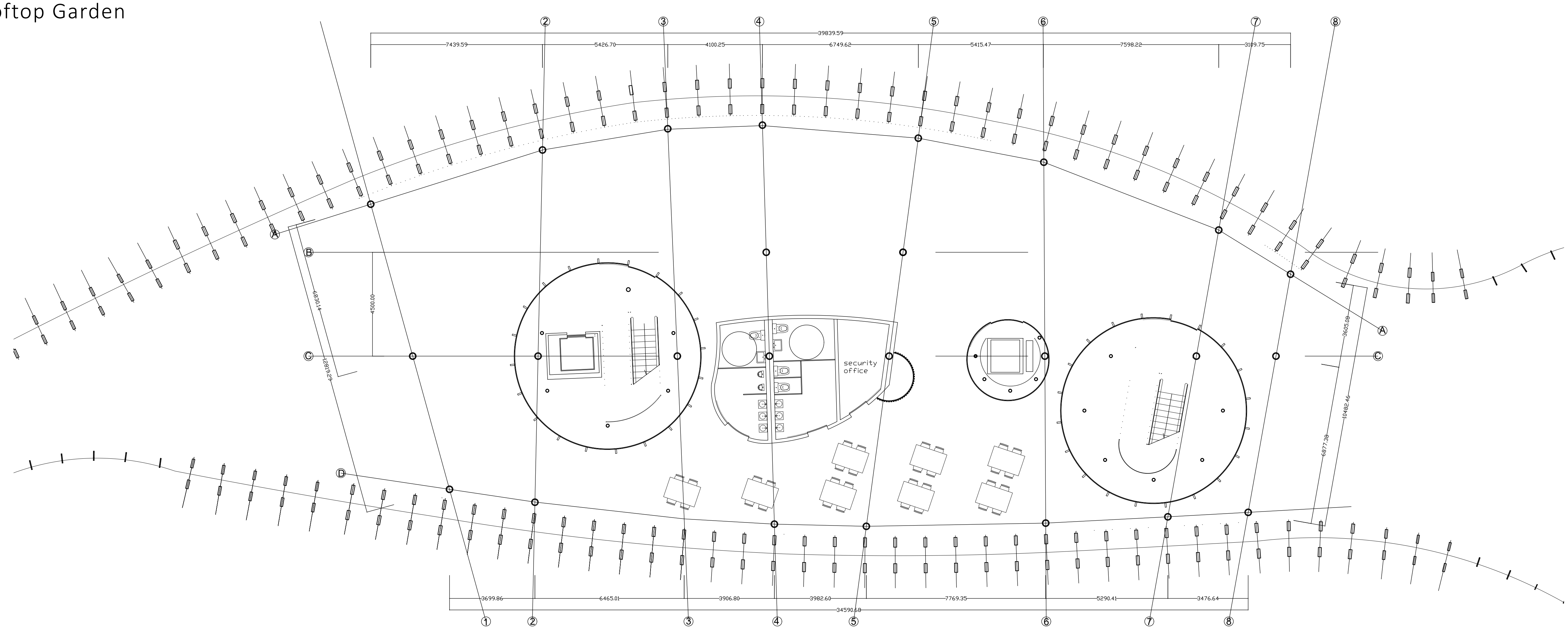

WC
storage
reception room
storage
WC
WC
1
2
WC
waiting room
mini theater
storage
WC
WC
3
WC
infirmary
coffee stand



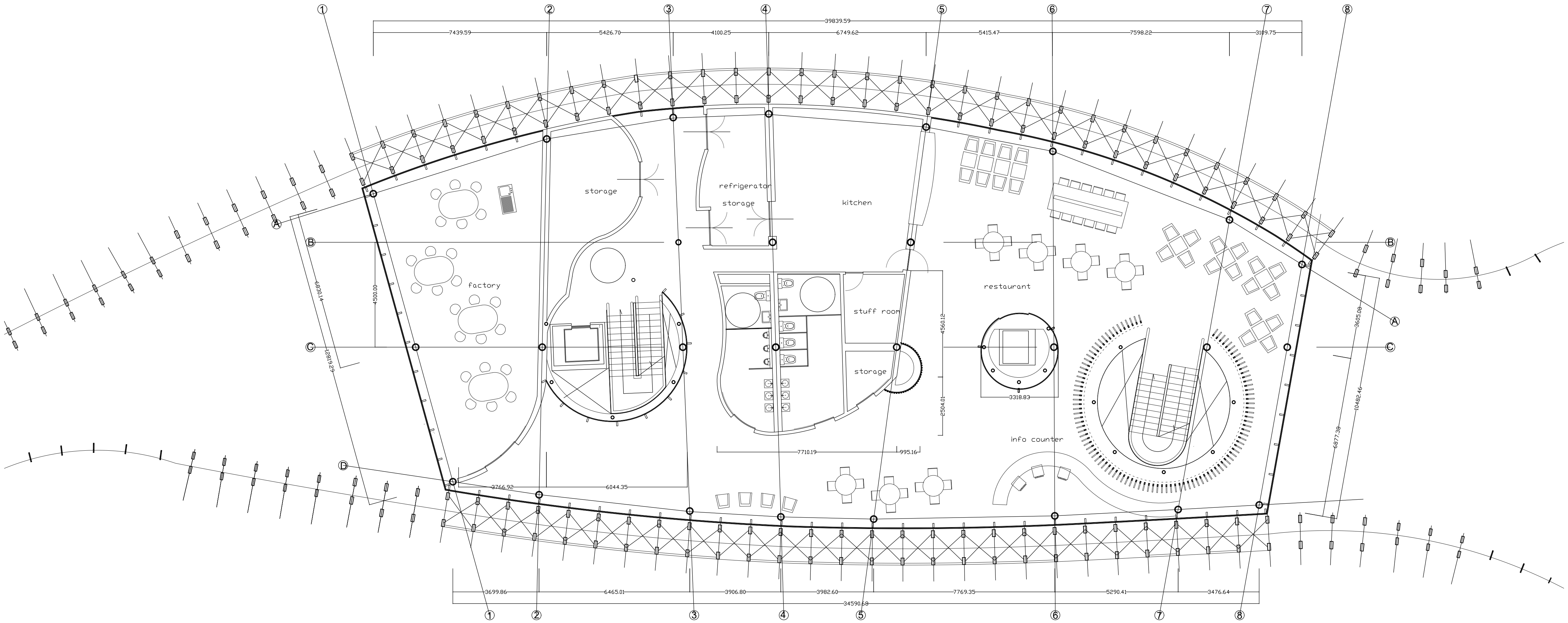
1_Glasswool 32k (t=30)
Vibration absorbing ceiling support
Plywood (t=12)
Sound insulation mat (t=5)
Sound insulation pad (t=40)
Rockwool 80k (t=40)
Plywood (t=12)
PB (t=12.5 x2)
cleartone (t=15)
2_ PB (t=21 x 2)
LGS GW 32k filling (t=50 x 2)
PB (t=21 x 2)
Air chamber
LGS GW 32k filling (t=50 x 2)
Plywood (t=12)
Vibration proof pad (t=40)
PB (t=12.5 x 2)
Cloth panel
3_ Sound proof wood floor (t=13)
Leveling plywood (t=5)
hard PB (t=12.5)
Sound insulation sheet (t=4 x 2)
Impact absorbing mat (t=12.5)
Plywood (t=12)
Vibration proof pad (t=40)
RW k80
Plywood (t=12)
Vibration proof pad (t=40)
RW k80
Concrete (t=80)
Deck plate (t=50)
4_Floor wood (t=20)
Floor support
Leveling concrete (h=100)
Glass wool (t=30)
Asphalt waterproofing
Reinforced concrete (t=80)
Deck panel (t=50)
5_Floor wood (t=12)
Plywood (t=20)
Floor support (h=100)
Reinforced concrete (t=80)
Deck panel (t=50)
6_Ceiling support
PB (t=12.5)
7_Floor wood (t=12)
Plywood (t=20)
Floor support (h=100)
Reinforced concrete (t=80)
Deck panel (t=50)
8_Ceiling support
PB (t=12.5)
9_Flfloor wood (t=12)
Plywood (t=20)
Floor support (h=100)
Leveling mortar (t=30)
Concrete slab (t=270)
10_Leveling concrete (t=50)
Humid insulation film (t=0.2)
Leveling concrete (t=50)
11_Wooden modesty panel (t=12)
12_timber mullion []60x180
13_Double glazing
(FL12+A8+FL12)

BUILDING 2

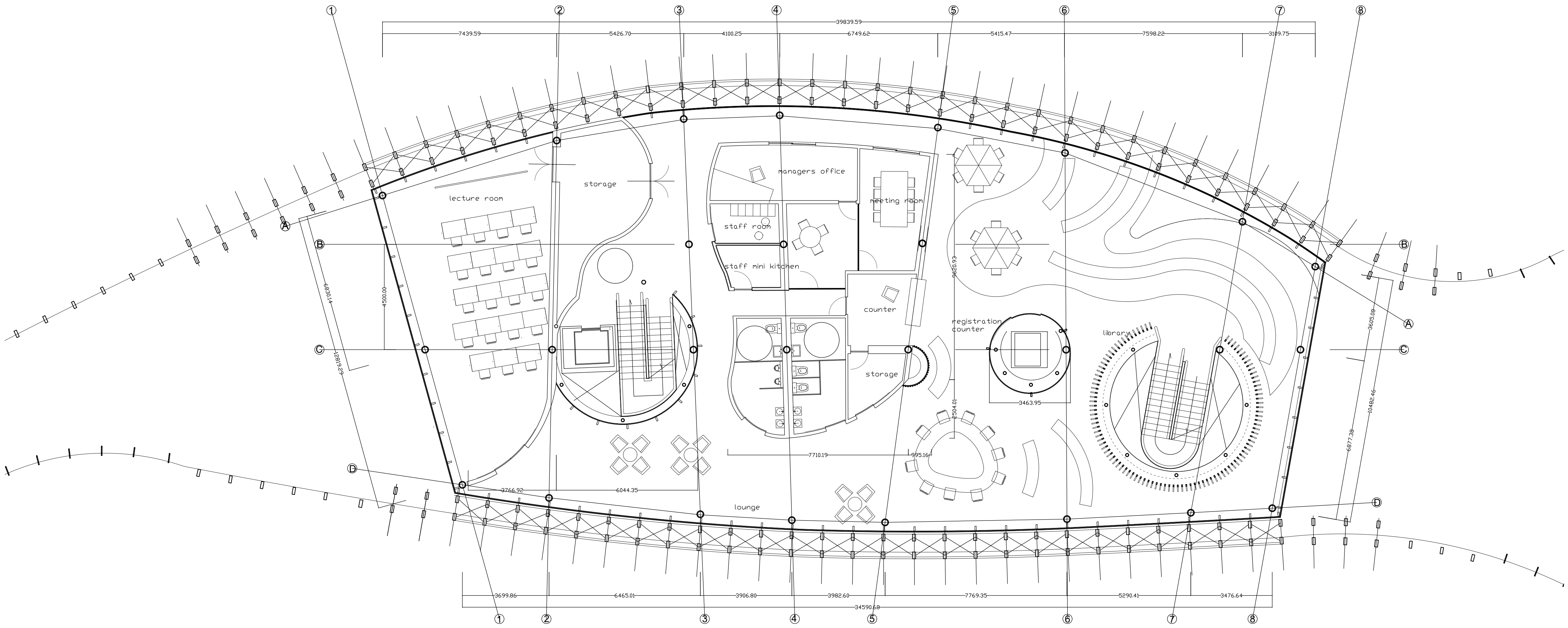
Restaurant
Factory
Library
Lecture room
Secretary rooms
Rooftop Garden



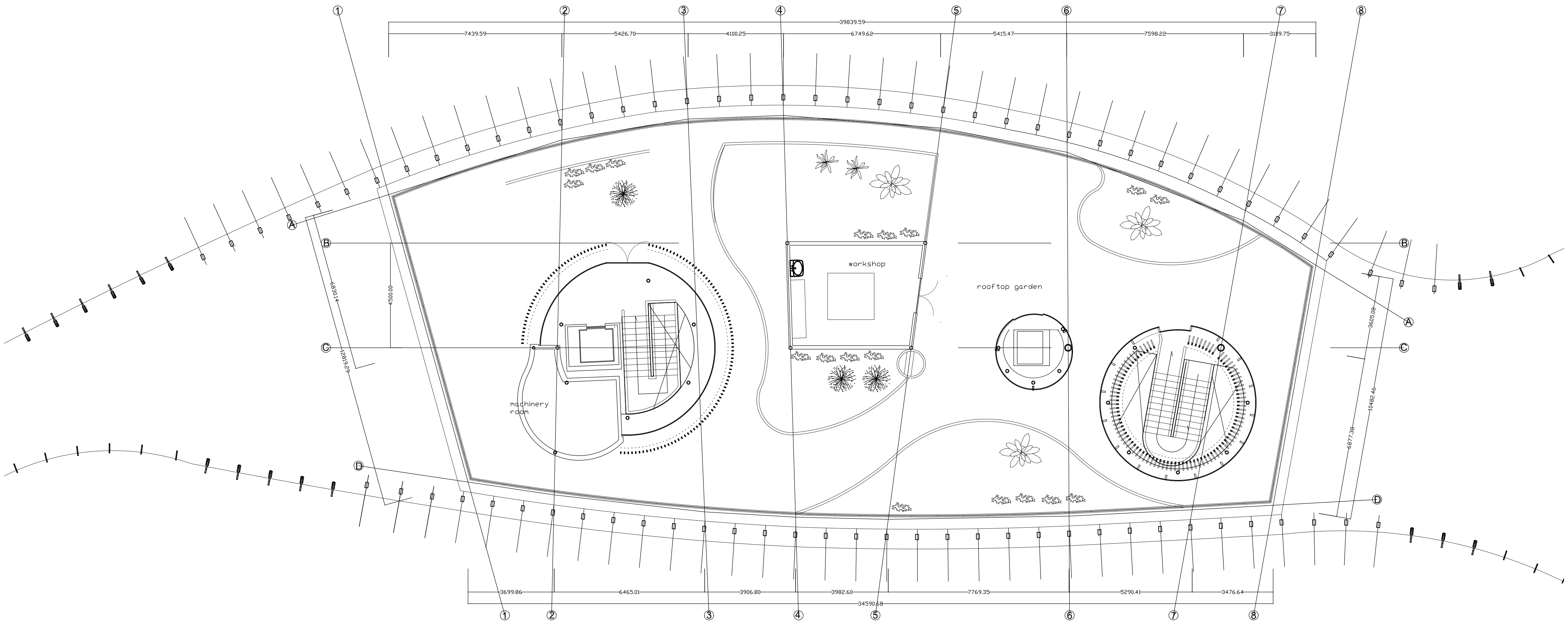
PLAN (GL+1.5M) S=1/200



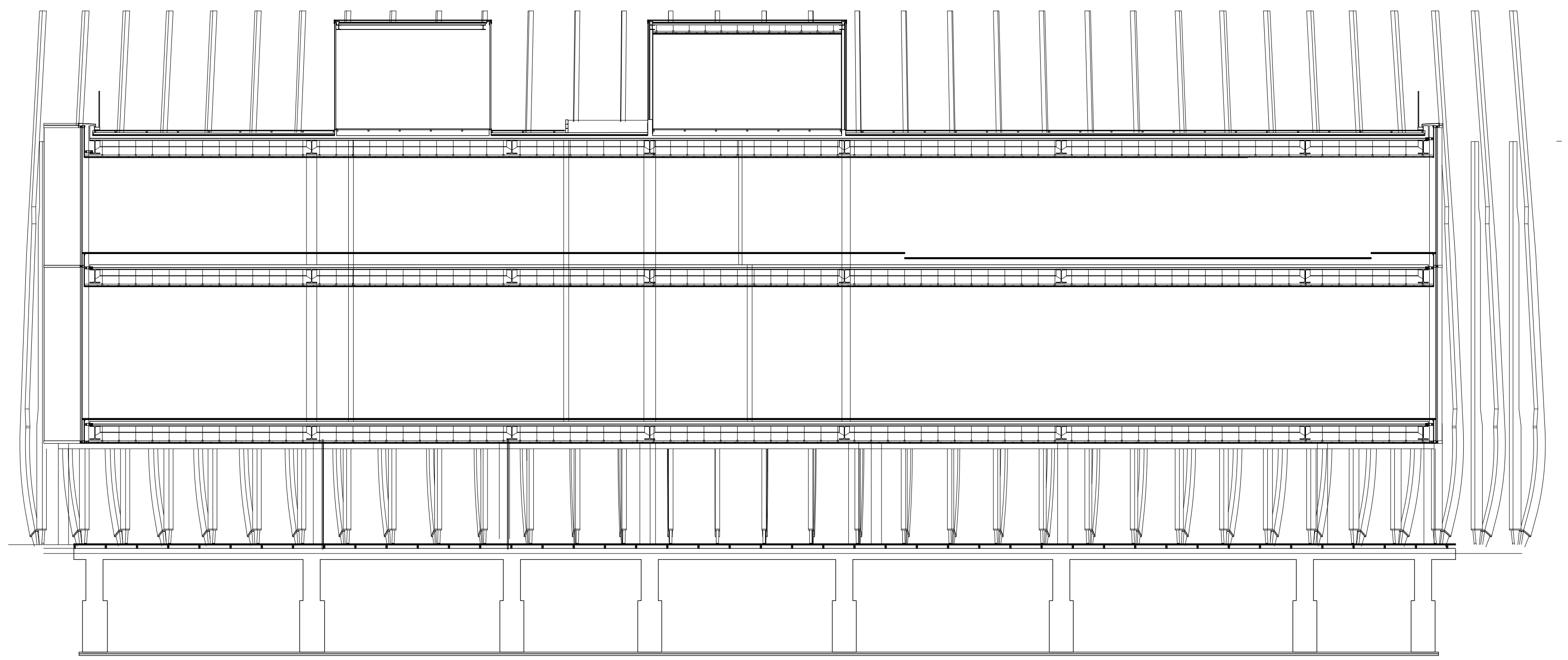
PLAN (GL+4.0M) S=1/200



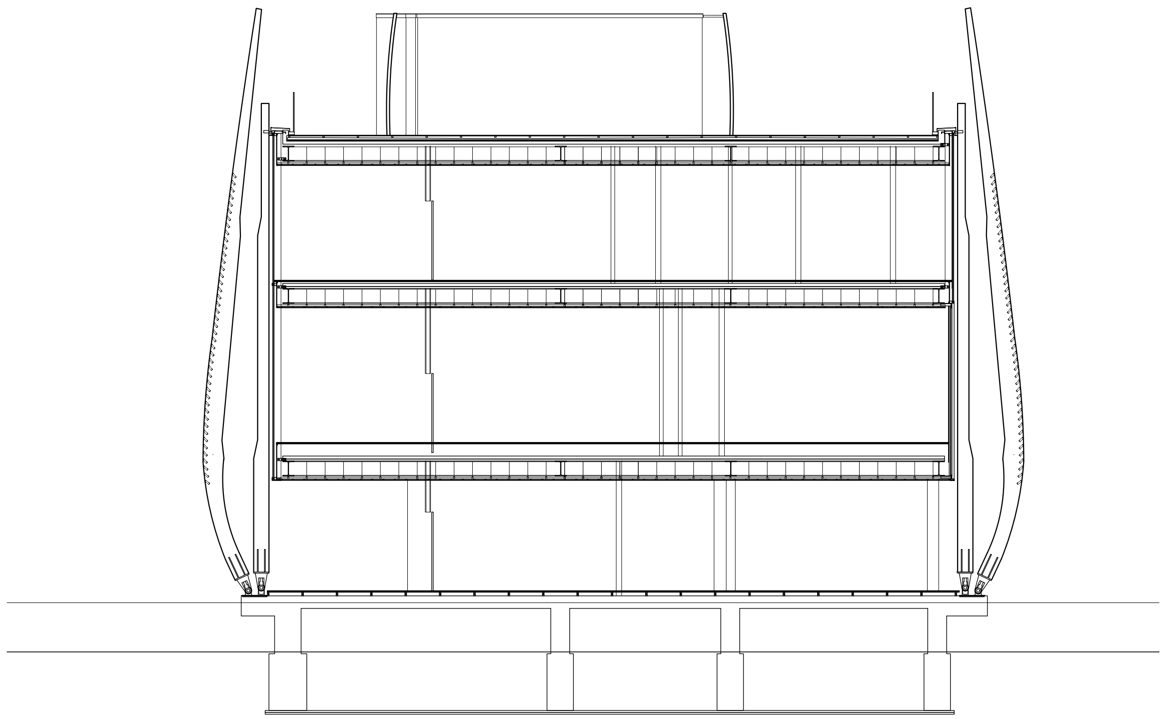
PLAN (GL+8.0M) S=1/200



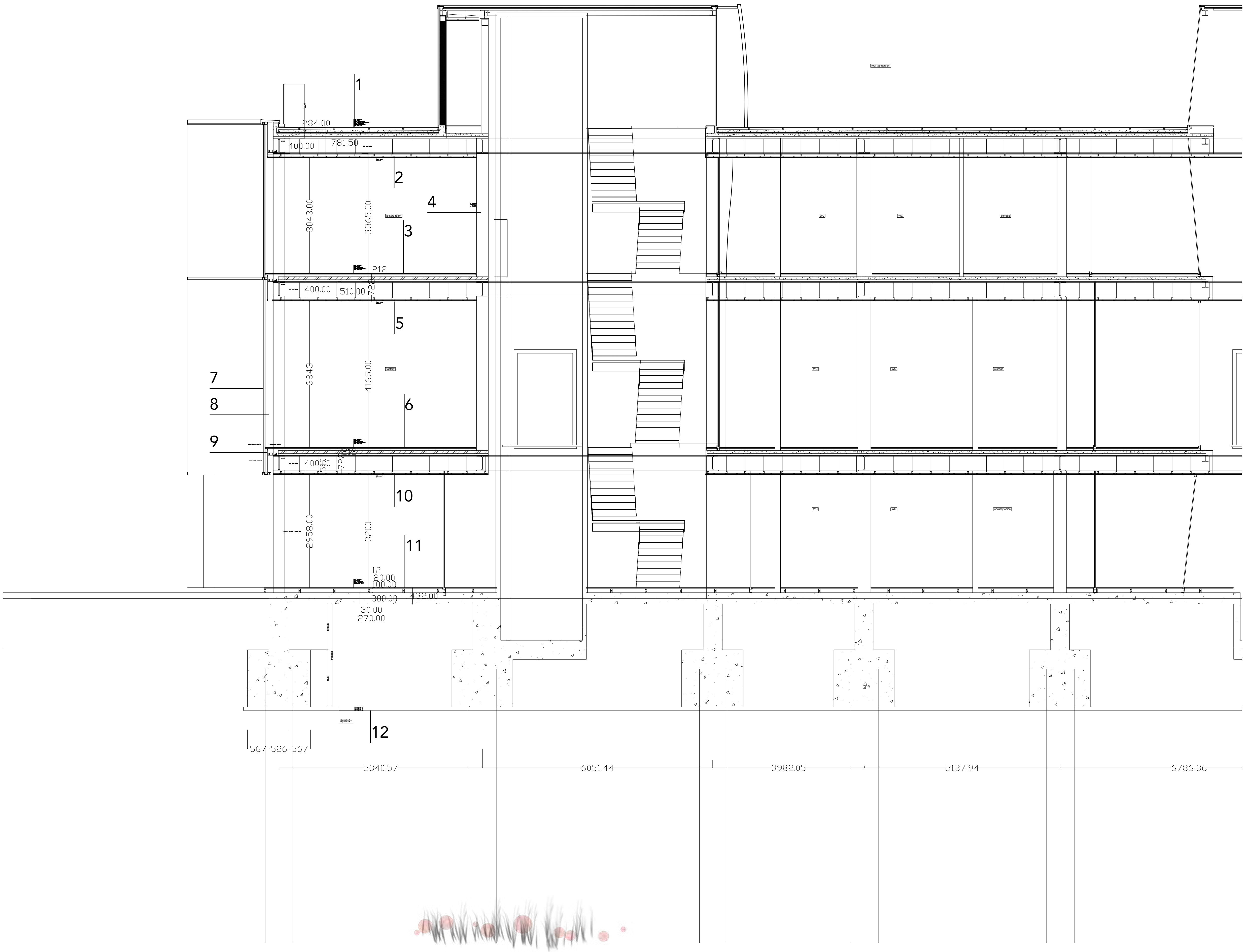
PLAN (GL+12.0M) S=1/200



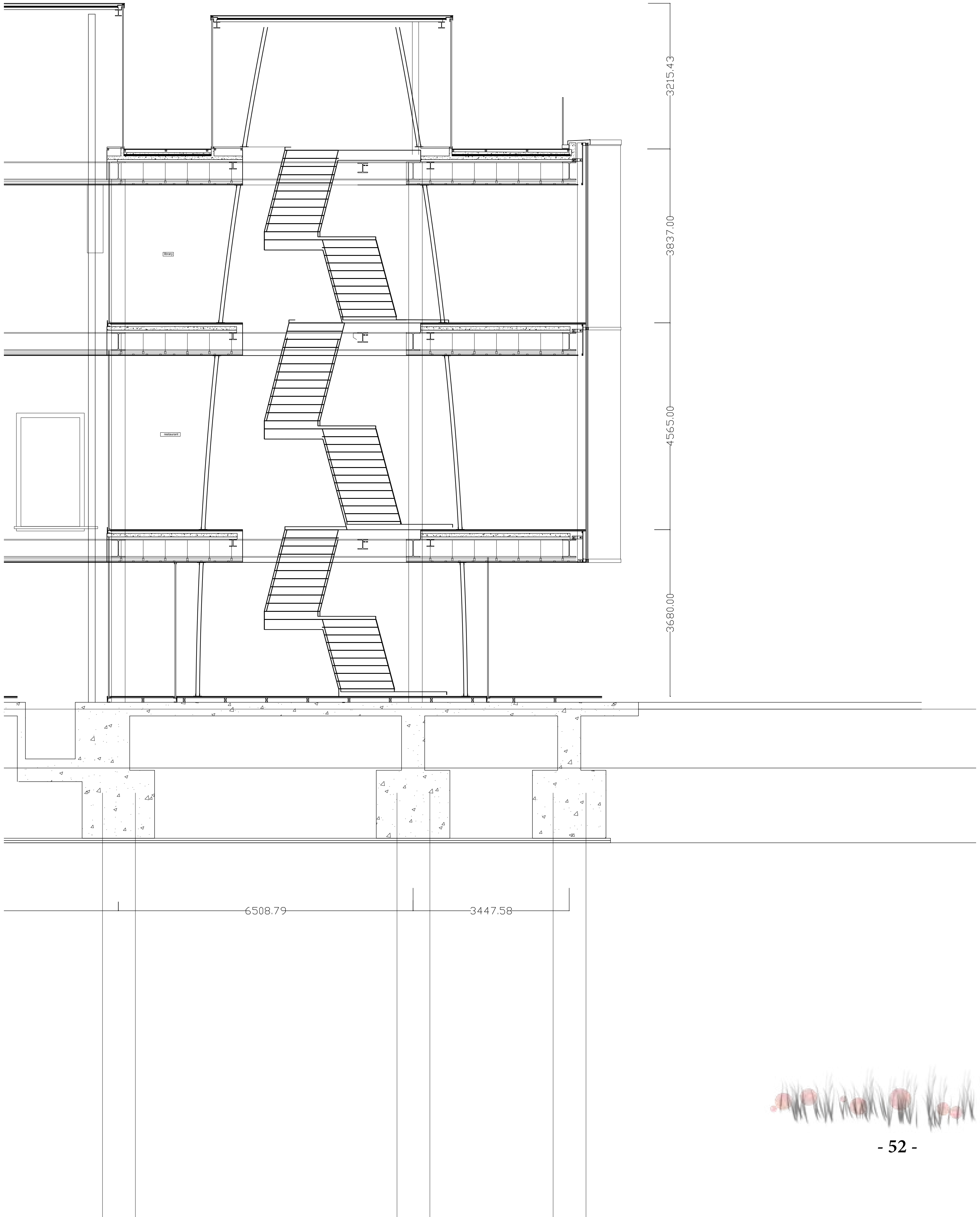
SECTION N/S S=1/200



SECTION E/W S=1/200



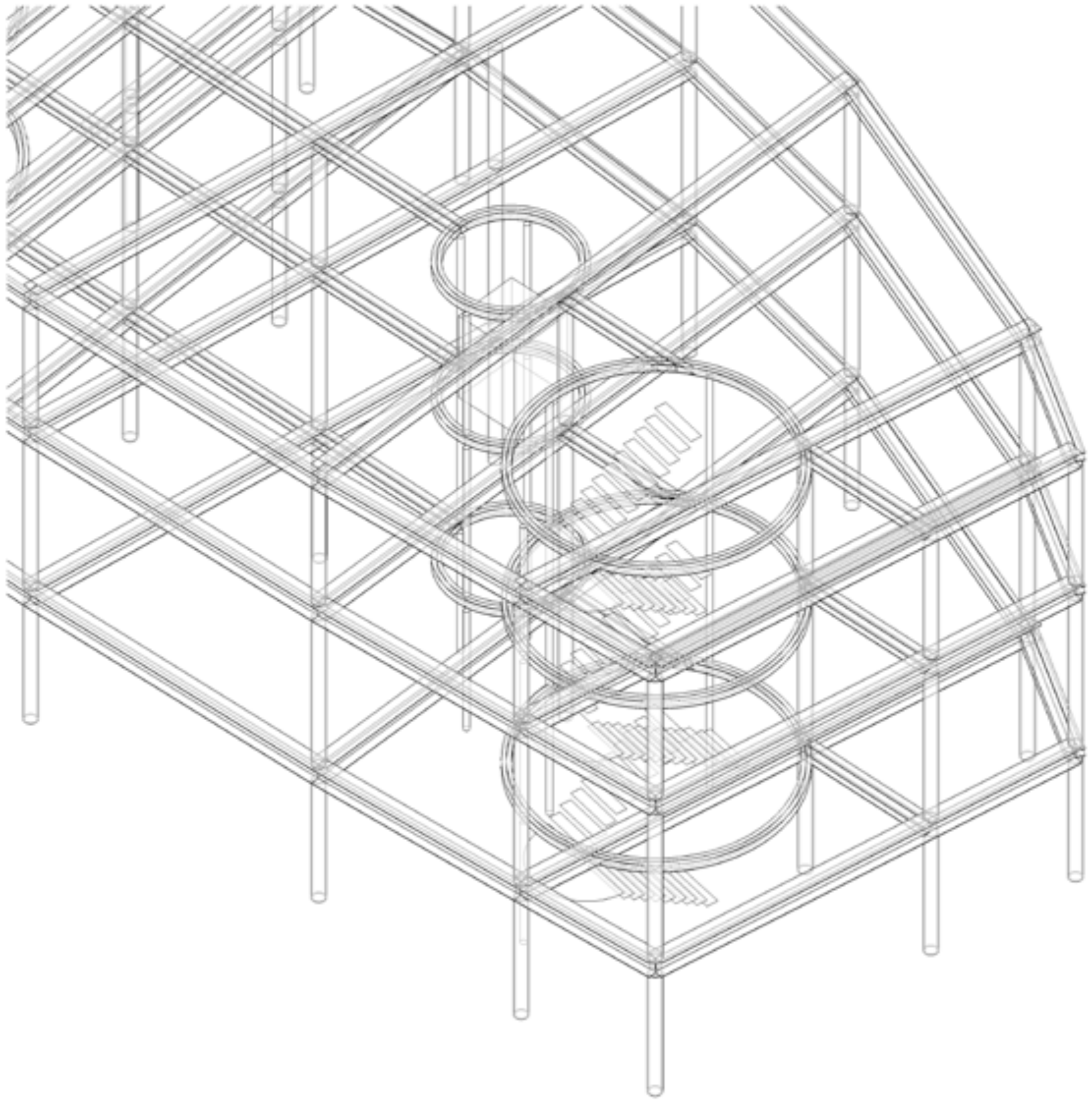
SECTION3 S=1/100



1_Floor wood (t=20)
Floor support
Leveling concrete (h=100)
Glass wool (t=30)
Asphalt waterproofing
Reinforced concrete (t=80)
Deck panel (t=50)
2_ Ceiling support
PB (t=12.5)
3_ Floor wood (t=12)
Plywood (t=20)
Floor support (h=100)
Reinforced concrete (t=80)
Deck panel (t=50)
4_ PB t=12.5 +9
LGS (t=70+70)
Rockwool filling
PB (t=12.5+9)
5_Ceiling support
PB (t=12.5)

6_Floor wood (t=12)
Plywood (t=20)
Floor support (h=100)
Reinforced concrete (t=80)
Deck panel (t=50)
7_Double glazing
(FL12+A8+FL12)
8_Timber mullion ([]60x180)
9_Wooden modesty panel (t=12)
10_ Ceiling support
PB (t=12.5)
11_Flfloor wood (t=12)
Plywood (t=20)
Floor support (h=100)
Leveling mortar (t=30)
Concrete slab (t=270)
12_Leveling concrete (t=50)
Humid insulation film (t=0.2)
Leveling concrete (t=50)

STRUCTURE PLANNING



STRUCTURE CONCEPT

The principle idea of the architecture of this project is, as is explained before, to wrap up different element and activities together, and also to visualize the image of architecture like the bushes of reeds in the Lake Albufera, enveloping the habitats of different animals and create the beautiful scenery.
To realize this idea, I created the image of the space supported by vertical elements, which are arranged not in the equal intervals on plane.
As the structure plan, first I drew a zigzag line to the direction of the floating platform, and then arranged the beams along with this line, also pillars at even intervals on the beams. The vertical movements in this building, not only that of the activities of people but also building equipment, are placed at the side or to be surrounded by the pillars, like staircases, elevators and water pipes and so on. In this way, the space similar to the natural environment that is maintained in one balance supported by various elements, so-called dynamic equilibrium, integrated with the structural stability is created. It could remind us of the reed as a whole, horizontal root and some stalks lithely grow from it, embracing the nests of birds or small animals.

JUSTIFICATION OF THE ADOPTED SOLUTION

Structure

The project has been designed with a steel structure with pile foundation. According to the building design, area and the height of the building the steel structure was a proper solution, in order to make profit of all the advantages that this kind of structure has.

There are three different types of bars in the structure: Beams, Joists and Pillars. Their final measurements are the followings:
- Beams: Steel Bar S275. Section HEB 400, maximum length of 11.7 m.
-Joists: Steel Bar S275. Section HEB 220, maximum length of 8.6 m.
-PIllars: Steel Bar S275. Round tube 273mm/ 25 mm thickness, maximum length of 4.1 m.

Considered regulation

The following are the basic documents of the Technical Building Code that are applicable to this project. Consequently, the structure has been calculated according to what is established in the following Basic Documents:
DB-SE: Bases of calculation
DB-SE-AE: Actions in the building
In addition to them, the DB-SI has been taken into account: Security in case of fire, in its SI-6 section: Resistance to fire of the structure and the regulations referring to the structural steel, EHE-08 standards.

Calculation method

To obtain the solicitations, the principles considered are: Rational Mechanics and the classical theories of Resistance of Materials and Elasticity.
The method of calculation applied is the one of the Limit States, in which it is tried to limit the effect of the external actions weighted by coefficients, will be inferior to the response of the structure, reducing the resistances of the
materials.

In the last limit states, the ones corresponding to: balance, exhaustion or rupture, adhesion, anchoring and fatigue (if applicable) are checked.
In the limit states of use, are checked: the formations (arrows), and vibrations (if applicable).

Once the load states have been defined according to their origin, the possible combinations with corresponding increase and decrease coefficients are calculated according to the safety coefficients defined in art. 12 of the EHE-08 standard and the combinations of basic hypotheses defined in article 13 of EHE-08 standard.

To obtain the efforts in the different simple assumptions of the structural framework, will be made according to a first order of linear calculation, admitting proportionality between stresses and deformations, the principle of overlapping actions, and a linear and geometric behavior of the Materials and structure.

In order to obtain the decisive stresses in the dimensioning of the elements of the slabs (beams, joists, slabs, ribs) the enveloping diagrams will be obtained for each effort.
For the dimensioning of the supports, they are checked for all defined combinations.

Computer calculations

In order to obtain the solicitations and dimensioning of the structural elements, a computer program
has been provided. The whole structure has been calculated by ARCHITRAVE.
Architrave® 2019, Professional standard for 3 month, Created by PEREZ-GARCIA, Agustin, ALONSO DURÁ, Adolfo, GÓMEZ-MARTÍNEZ, Fernando, ALONSO ABALOS, José Miguel y LOZANO LLORET, Pau. Architrave® check the ELU and ELS of the building construction.

CHARACTERISTICS OF THE MATERIALS TO BE USED

Steel profiles

		whole work	foundation	compressed	flexed	others
steel in profiles	class and designation	s275				
	elastic limit (N/ mm2)	275				
steel in sheetsClass and designations		s275				
	elastic limit (N/mm2)	275				

Tests to be carried out

Structural steels: the relevant tests will be carried out according to what is indicated in Chapter 12 of the CTE SE-A

Permissible deformations

To the CTE standard SE-C, Article 2.4.3, and depending on the type of structure, a maximum permissible seat is considered acceptable:

$$\delta s_{AB} = s_B - s_A \qquad \beta_{AB} = \frac{\delta s_{AB}}{L_{AB}} = \frac{s_B - s_A}{L_{AB}}$$

Limits of deformation of the structure. According to what is stated in article 4.3.3 of the CTE SE standard, the arrows of the different elements have been verified in the structure. Both the local and total collapse has been verified in accordance with what is stated in 4.3.3.2 of the aforementioned standard.

For the calculations of the arrows in the flexed elements, beams and slabs, both instantaneous and deferred deformations shall be taken into account, calculating the equivalent inertias according to what is indicated in the standard.

For the calculations of the arrows, the constructive process, as well as the environmental conditions, age of loading, have been taken into account, according to the usual conditions of the constructive practice in conventional construction. Therefore, from these assumptions, the relevant creep coefficients are estimated for the determination of the active arrow, sum of the instantaneous arrows plus the deferred arrows produced after the construction of the partition walls.

Considering that in this particular case deformations will predominantly affect the steel beams that from and tie the frames, and considering that the interior will be finished with ordinary partitions or rigid pavements with joints, the maximum deformations of the elements is considered to be L/400, with L being the maximum bearing distance, equivalent in the constant basis to 18m.
This means that the global deformation of any element must not surpass 4.5 cm.

INFORMATION OF THE SITE

Location is in El Saler in the municipality of Valencia with coordinate 39°20'52.2"N, 0°18'56.4"W, the determination of the location is following;

Floor bearing capacity

According to the geotechnical report obtained from the data of the Valencia Institute of Building included below, the carrying capacity of the selected soil is 100kN/m², and the soil type is T-3. The bulk density is set in 18kN/m³.

Wind load

According to the CTE DEB SE AE, this site is located in the part that has 26m/s of the basic value of velocity of the wind.

The typology of the roughness of the land is deifend as I, the border from the sea or the lake, where the water surface in the direction of the wind is less than 5km of distance. So the wind dynamic pressure is 0.423 kN/m².

Snow load

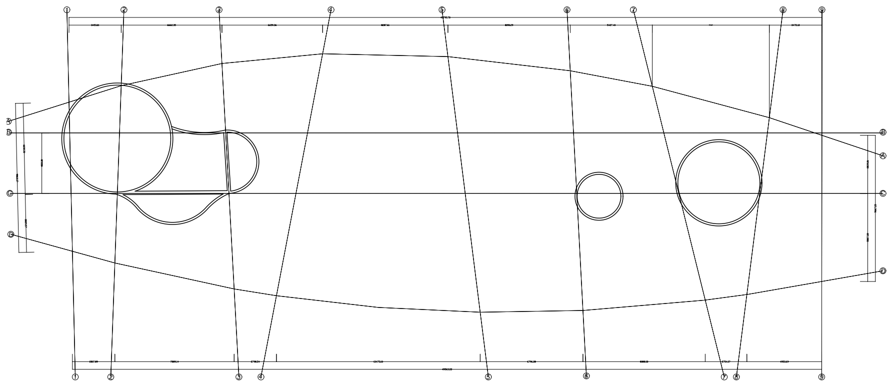
Snow load in Valencia is defined as 0.2kN/m2.

Actions due to the earthquake

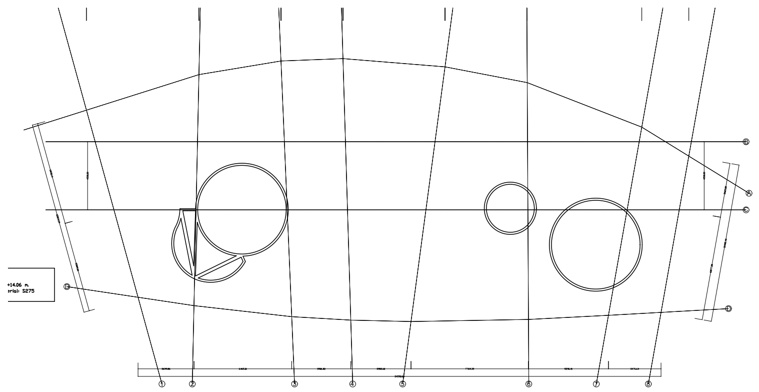
Being a building of normal importance in the province of Valencia, the seismic acceleration value is ae=0.06g (according to the list of populations of NCSE 2002), the contribution coefficient K=1.0, risk factor will be ρ=1.0. And the ground factor C=1.6, since the ground type is T-3.

STRUCTURE SYSTEM

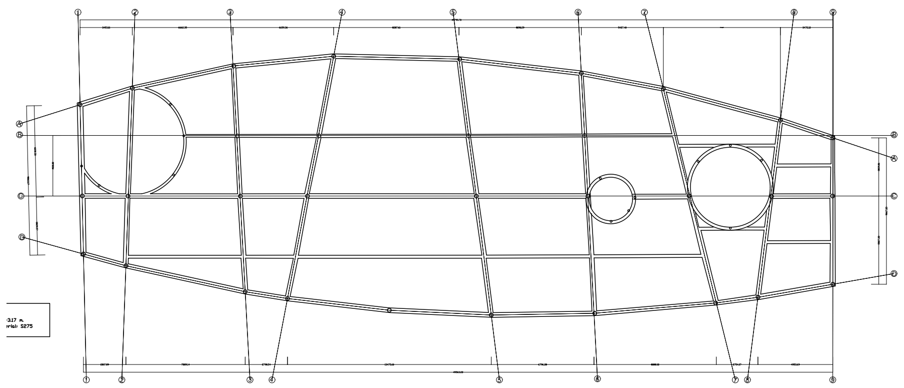
structure framing plan (s=1/500)



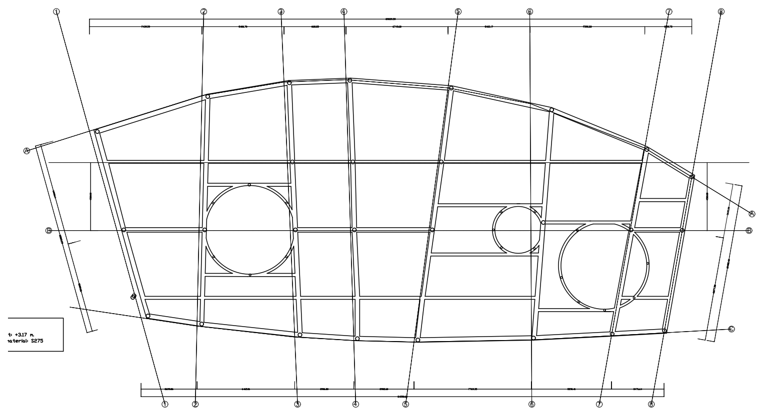
Building 1(+15m)



Building 2(+15m)

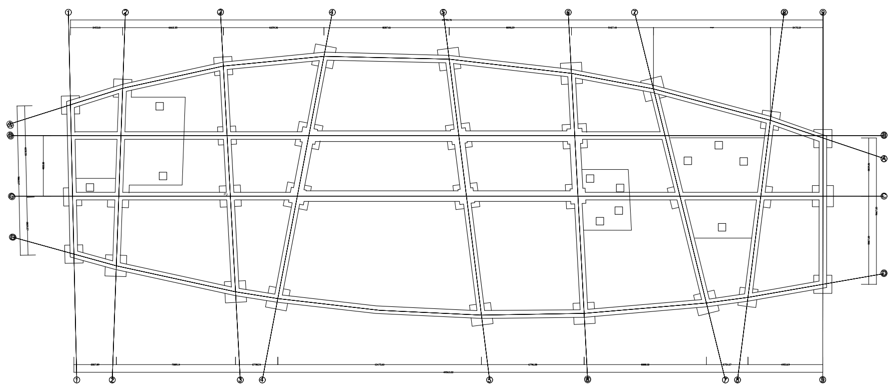


Building 1(+4.5m)

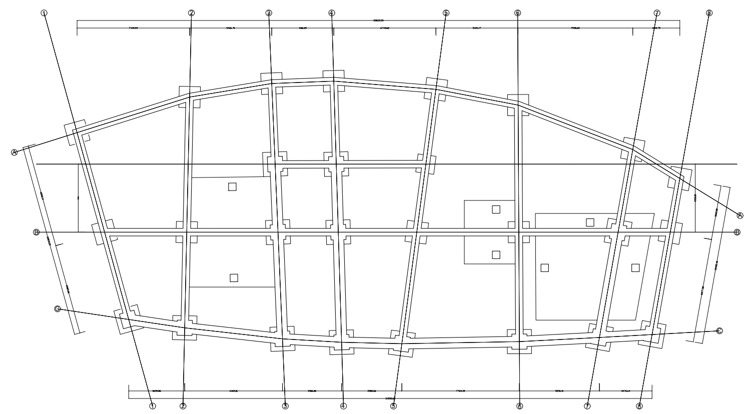


Building 2(+4.5m)

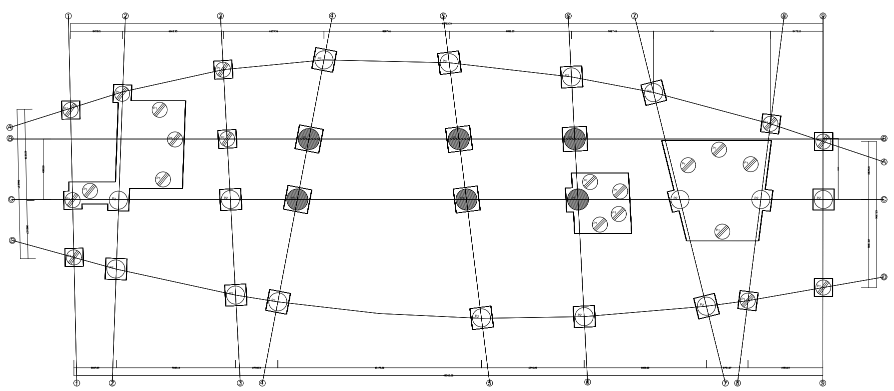
Foundation plan (s=1:500)



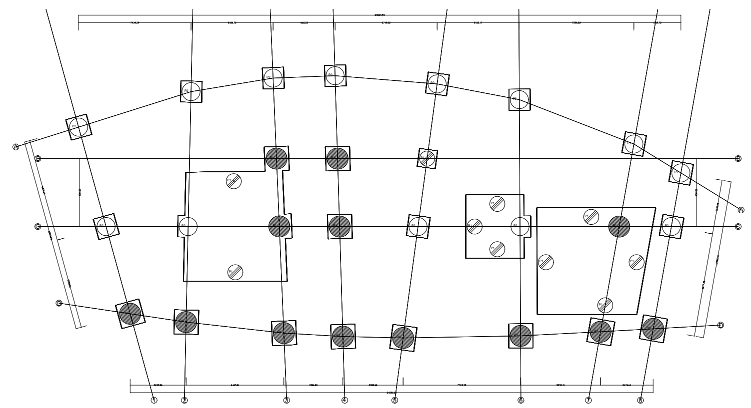
Building 1(-1.5m)



Building 2(-1.5m)

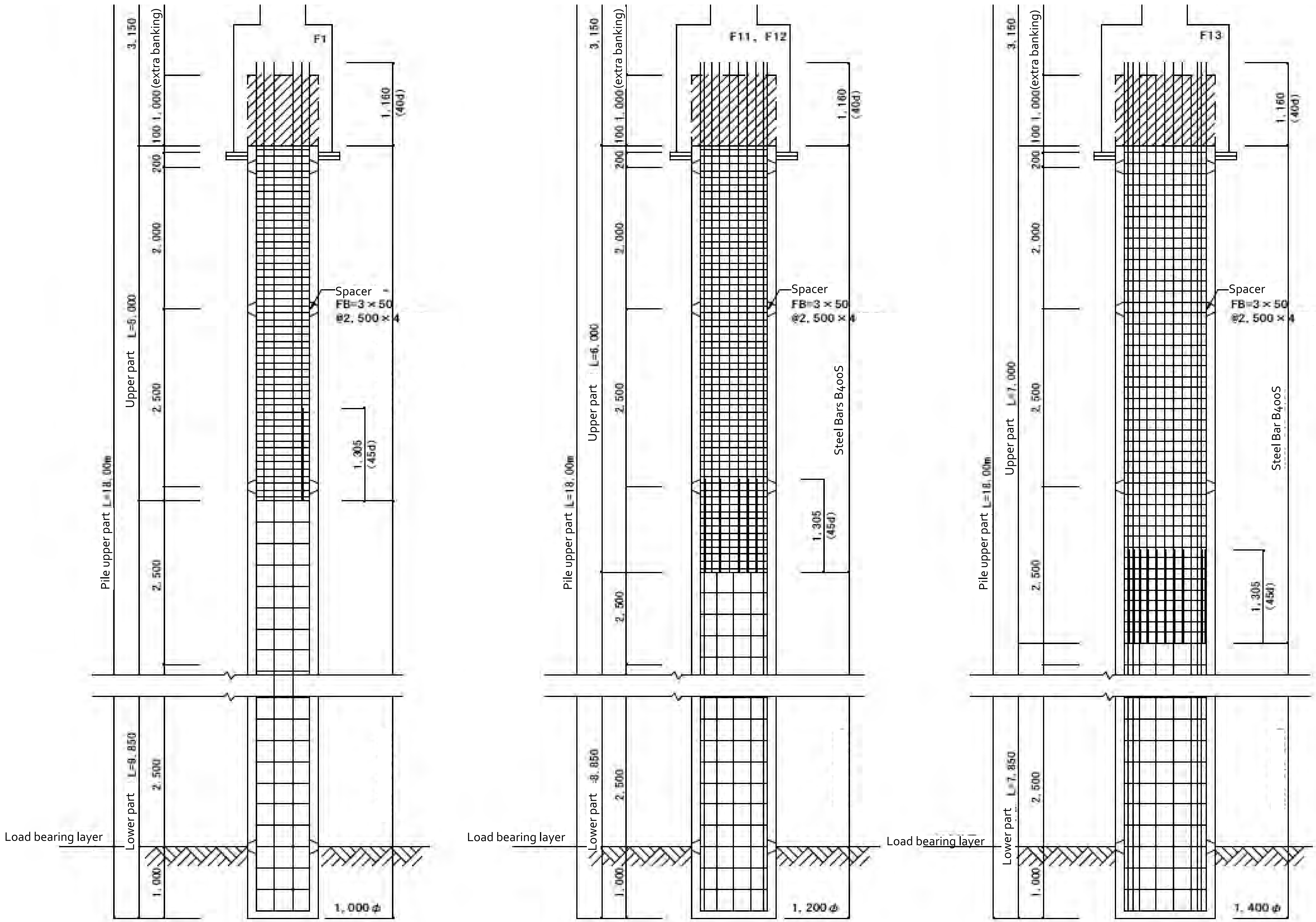


Building 1(-3m)



Building 2(-3m)

Specification of the pile foundation		
type of pile foundation	Cast-in -place reinforced concrete pile	
concrete	type	HA25
	Maximum/Minimum quality (kp/m3)	400/150
	maximum size of aggregate(mm)	50
	type of the embironment(aggressive ness)	I
	Consistency of Concrete	Plastic
	Expected Control level	Statistical
	Coefficient of minoration	1.5
	Concrete calculation strength: fcd (N/mm2)	
reinforcement steel bars	designation	B400S
	Elastic limit	400
	Expected Control level	Normal
	Coefficient of minoration	1.15
	Steel resistance calculation (bars): fyd (N/mm2)	347.82


F1
F11, F12
F13
3,150
100 1,000 (extra banking)
200
2,000
2,500
1,160 (40d)
1,305 (45d)
Spacer
FB=3 × 50
@2,500 × 4
Upper part L=5,000
Upper part L=6,000
Upper part L=7,000
Pile upper part L=18,00m
Lower part L=9,850
Lower part L=8,850
Lower part L=7,850
Steel Bars B400S
Steel Bar B400S
Load bearing layer
1,000
1,000φ
1,200φ
1,400φ

ACTIONS ADOPTED IN THE CALCULATION

Graviation actions

a)self load

SLAB

The composition slab system will be applied.

slab	thickness(mm)	depth(mm)	selfweight(N/m2)
galvanized deck panel	1.2	50	0.13
concrete	-	80	2.4

FINISHING AND PAVEMENT

(Table on the right)

buioding1			kN/m2	unit	length	area	load		kn/m2
rooftop	furniture	furniture							
		garden	1.7			386.45	656.965		
	wall	plaster	0.16		39	101	16.16		
		wood	0.1		39	124.8	12.48		
	floor	wood deck	0.17			449.81	76.4677		
		waterproofir	0.18			559.821	100.76778		
		RC (t110)	2.64			497.6	1313.664		
							2176.50448	SUM	4.3736526
2nd Floor	ceiling	plywood + su	0.15			497.6	74.64		
	furniture	desk and chair		25 x 46			1150		
		office desks		35			35		
		bookshelves		40 x 20			800		
		toilet		40 x 4, 40x2			240		
		sink		3x2			6		
	wall	plaster	0.16		85	272	43.52		
		ECP	0.7		52	166.4	116.48		
	glass	t12mm	0.03		147.314	471.4048	14.142144		
	marion	(m3)	0.5	60*180*79		4.0532	2.0266		
	floor	wooden	0.15			497.6	74.64		
		plywood	0.07			497.6	34.832		
		RC(t 80)	1.92			497.6	955.392		
		deckpanel	0.51			497.6	253.776		
							3800.44874	SUM	7.63694386
1st Floor	ceiling	plywood + su	0.15			497.6	74.64		
	furniture	desk and chair		40 x 66			2640		
		toilet		40 x 8			320		
		sink		4			12		
	wall	plaster	0.16		85	340	54.4		
		ECP	0.7		52	208	145.6		
	glass	t12mm	0.03		137.864	551.456	16.54368		
	marion	(m3)	0.5	60*180*(79-11)		2.9376	1.4688		
	floor	wooden	0.15			497.6	74.64		
		plywood	0.07			497.6	34.832		
		RC(t 80)	1.92			497.6	955.392		
		deckpanel	0.51			497.6	253.776		
							4583.29248	SUM	9.21003792
ground Floor	ceiling	plywood + su	0.15			497.6	74.64		
	furniture	desk and chair		40 x 32			1280		
		toilet		40 x 6			240		
		sink		3 x 2			6		
	wall	plaster	0.16		23	73.6	11.776		
		ECP	0.7		13	41.6	29.12		
	glass	t12mm	0.03		63.428	202.9696	6.089088		
	floor	wooden	0.15			559.821	83.97315		
							1731.59824	SUM	3.09312841
							12291.8439	TOTAL	21.9567396

builfing2			kN/m2	unit	length	area	load		kn/m2
	furniture	furniture		70*8			560		
		garden(屋上	1.7						
	wall	plaster	0.16		28.6	74.36	11.8976		
rooftop		wood	0.1		22.6	67.8	6.78		
		wood deck	0.17			594.262	101.02454		
	floor	waterproofir	0.18			697.238	125.50284		
		RC (t110)	2.64			629.728	1662.48192		
							2467.6869	SUM	3.9186552
	ceiling	plywood + su	0.15			629.728	94.4592		
		desk and chair		25*24,70*6, 240,20*6			1380		
		office desks		40*4			160		
	furniture	bookshelves							
		toilet		40*11			440		
		sink		3*6			18		
	wall	plaster	0.16	63.8+27.2+3	128	409.6	65.536		
2nd Floor		ECP	0.7		91	291.2	203.84		
	glass	t12mm	0.03	17+38+37	157.078	502.6496	15.079488		
	marion	(m3)	0.5			2.86848	1.43424		
		wooden	0.15			629.728	94.4592		
	floor	plywood	0.07			629.728	44.08096		
		RC(t 80)	1.92			629.728	1209.07776		
		deckpanel	0.51			629.728	321.16128		
							4047.12813	SUM	6.42678764
	ceiling	plywood + su	0.15			629.728	94.4592		
		desk and chair		68*15+10*10			1120		
	furniture	toilet		40*10			400		
		sink		3*5			15		
		plaster	0.16	63.8+27.2+4	167	668	106.88		
	wall	ECP	0.7	63.8+27.2+4	131	524	366.8		
		sound proofi	0.26		32.8	131.2	34.112		
1st Floor	glass	t12mm	0.03		150.328	601.312	18.03936		
	marion	(m3)	0.5			2.69568	1.34784		
		wooden	0.15			629.728	94.4592		
		plywood	0.07			629.728	44.08096		
	floor	RC(t 80)	1.92			629.728	1209.07776		
		deckpanel	0.51			629.728	321.16128		
		sound proofi	0.26			132.194	34.37044		
							3859.78804	SUM	6.12929398
	ceiling	plywood + su	0.15			629.728	94.4592		
		desk and chair		25*36			900		
	furniture	toilet		40*6			240		
		sink		3*2			6		
ground Floor	wall	plaster	0.16	49.2+7.3	56.5	180.8	28.928		
		ECP	0.7		49.2	157.44	110.208		
	glass	t12mm	0.03	10+11*1.2+4	60.566	193.8112	5.814336		
	floor	wooden	0.15			697.238	104.5857		
							1489.99524	SUM	2.1369966
							11864.5983	TOTAL	17.0165687

b)use load

floor	zone	Load (kN/m2)
0,1,2,3	office areas	3
0,1,2,3	public access	5
1,2	areas with tables	3
1,2,3	administrations	2
4	Roofs not accessible	0.4

c)snow load

floor	zone	load(kN/m2)
4	roof	0.2

Wind Load

Coeficientes de presión y succión					
Coeficientes de presión y succión	Presión c_p	0.70		0.80	
	Succión c_s	0.40		0.50	

Altura del punto	F	c_e	Presión estática del viento [kN/m2]			
			Presión barlovento A	Succión sotavento A	Presión barlovento B	Succión sotavento B
6.0	1.1857	2.7008	0.799	0.456	0.913	0.571
4.5	1.1409	2.5474	0.753	0.431	0.861	0.538
7.3	1.2161	2.8070	0.830	0.474	0.949	0.593
10.1	1.2667	2.9877	0.884	0.505	1.010	0.631
12.9	1.3048	3.1274	0.925	0.529	1.057	0.661
15.7	1.3354	3.2416	0.959	0.548	1.096	0.685

Coeficientes de presión y succión					
Coeficientes de presión y succión	Presión c_p	0.70		0.80	
	Succión c_s	0.30		0.50	

Altura del punto	F	c_e	Presión estática del viento [kN/m2]			
			Presión barlovento A	Succión sotavento A	Presión barlovento B	Succión sotavento B
6.0	1.1857	2.7008	0.799	0.342	0.913	0.571
4.5	1.1409	2.5474	0.753	0.323	0.861	0.538
7.3	1.2161	2.8070	0.830	0.356	0.949	0.593
10.1	1.2667	2.9877	0.884	0.379	1.010	0.631
12.9	1.3048	3.1274	0.925	0.396	1.057	0.661
15.7	1.3354	3.2416	0.959	0.411	1.096	0.685

Seismic actions

The a_0 in Valencia is 0,06 and the contribution coefficient K=1,0.
For constructions of medium importance the risk factor will be ρ=1,0.
Finally, the ground factor, since the ground is type 3, will be C=1.6

$a_0 = S * \rho * ab$ --> 1.0 * 0.06 * g
0.06g ≤ 0.1g --> S = C/1.25 = 1.6/1.25=1.28

a_c = 1.28 * 1.0 * 0.06 * 9.81 = 0.753

The fundamental period of oscillator will be T=0.09 * n, n is the number of slabs, then T= 0.27.

Characteristic periods of response spectrum:

Ta= K * (C/10) = 1.0 * (1.6/10) = 0.16
Tb= K * (C/2.5) = 1,0 * (1.6/2.5) = 0.64
According to the rule T >Tb --> a(T) =K *(C/T)= 1.0 * (1.6/0.27) = 5.9259..... ≈5.93

The response coefficient will be the following: β= v / μ ;
v= (0,5/Ω)0,4
v= (0,5/5)0,4 =0,4 and μ = 3

To sum up, the response coefficient will be β= 0,13

Hypothesis, security coefficient and combinations

According to the actions determined by their origin, and taking into account wheather the effect of the same is favorable or unfavorable, as well as the weighting coefficients, the calculation of the possible combinations will be carried out as follows;

Break Limit Ultimate States. Steel:CTE DB-SE A
-non seismic situations

$$\sum_{j\geq 1}\gamma_{Gj}G_{kj}+\gamma_{Q1}\Psi_{p1}Q_{k1}+\sum_{i>1}\gamma_{Qi}\Psi_{ai}Q_{ki}$$

Stuation 1: Persistent or Transient				
	Partial safety coeficients(γ)		Combination coefficients (Ψ)	
	Favorable	Unfavorable	Principle(Ψp)	Accompaniment (Ψa)
Permanent load(G)	0.80	1.35	1.00	1.00
service load (Q)	0.00	1.50	1.00	0.70

Break Limit Ultimate States.Concrete in foundations: EHE-08/CTE
-non seismic situations

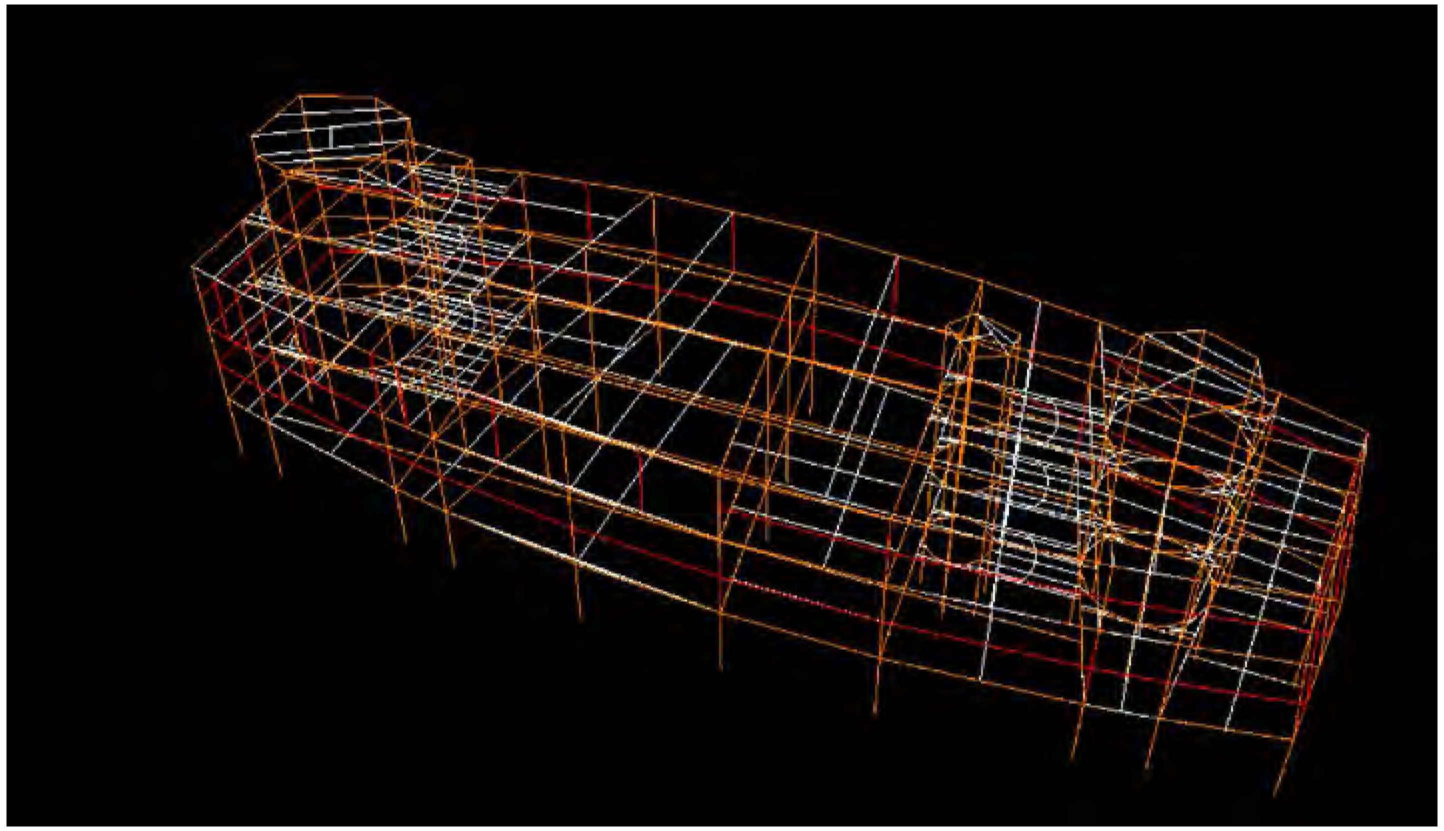
$$\sum_{j\geq 1}\gamma_{Gj}G_{kj}+\gamma_{Q1}\Psi_{p1}Q_{k1}+\sum_{i>1}\gamma_{Qi}\Psi_{ai}Q_{ki}$$

Stuation 1: Persistent or Transient				
	Partial safety coeficients(γ)		Combination coefficients (Ψ)	
	Favorable	Unfavorable	Principle(Ψp)	Accompaniment (Ψa)
Permanent load(G)	1.00	1.60	1.00	1.00
service load (Q)	0.00	1.60	1.00	0.70

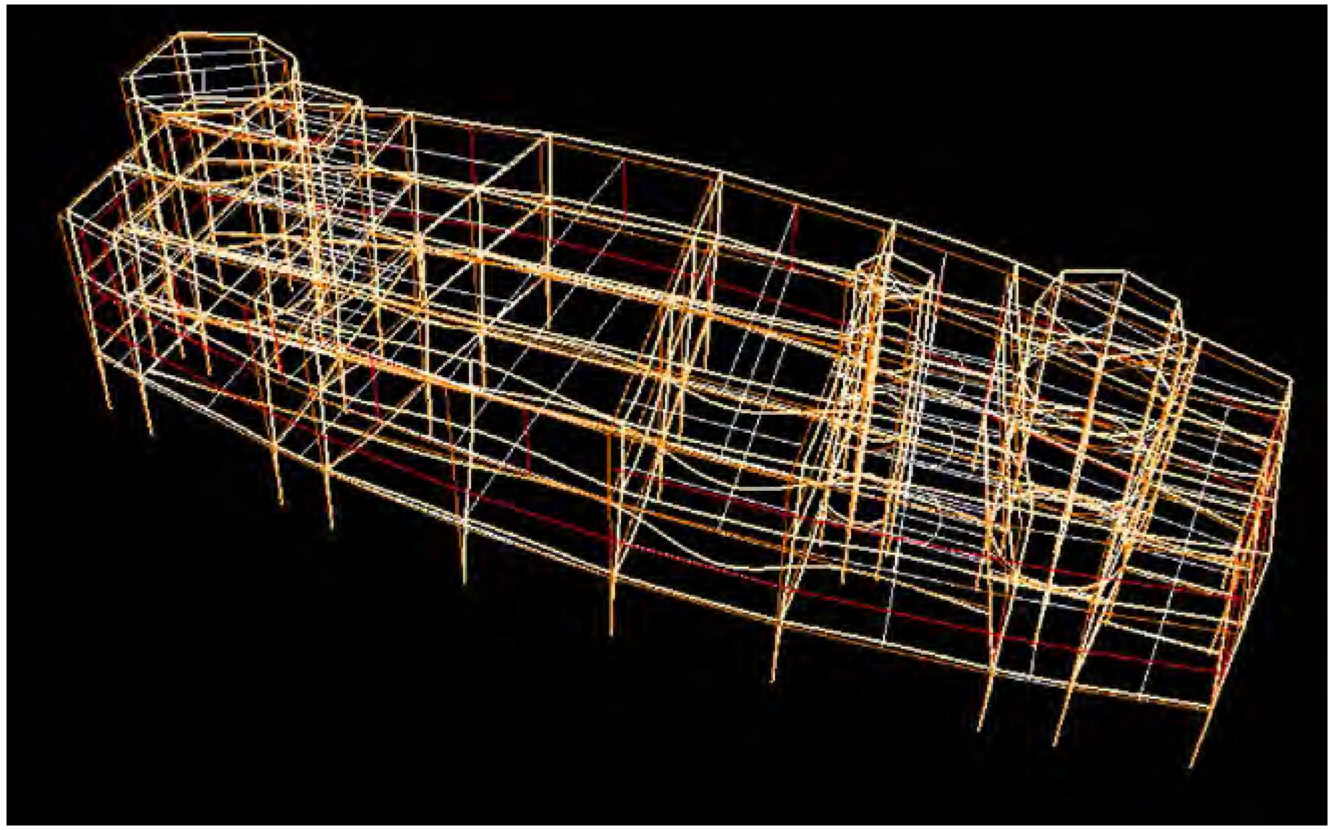
STRUCTURE MODEL

Building 1

Structure model with finite elements and Load of estimated actions



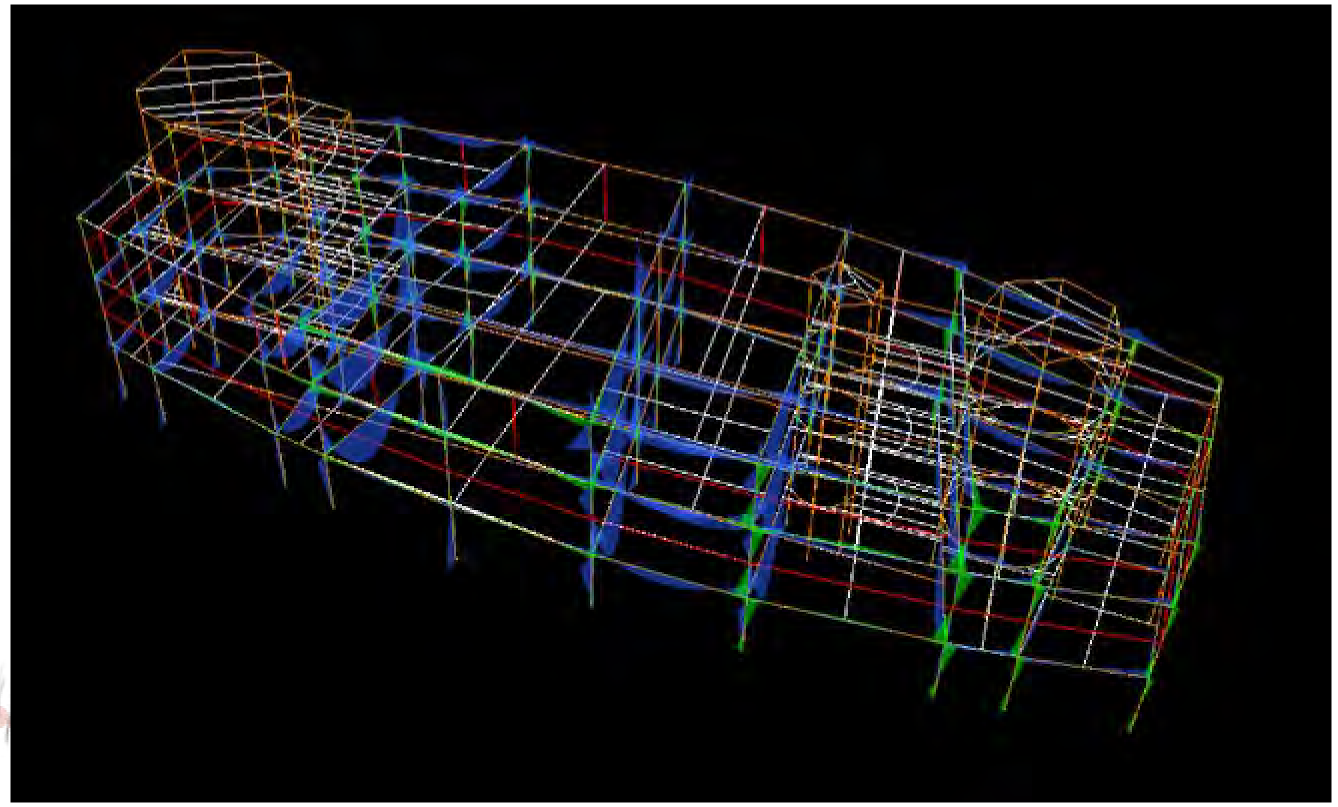
Result from the simulation of deformation (maximum -0.78 mm)



-slabs: composite slab of steel decking(t=50) and reinforced concrete(t=80)
-pillars: main frame Round tube 273mm/ t25 mm
secondary frame Round tube 139mm/t12.5mm
-beams: HEB 400
-secondary: beams HEB 160
-joist: HEB 200
-foundation: cast-in place concrete pile foundation (applied as single footing to obtain the relative dimensioning of the piles)

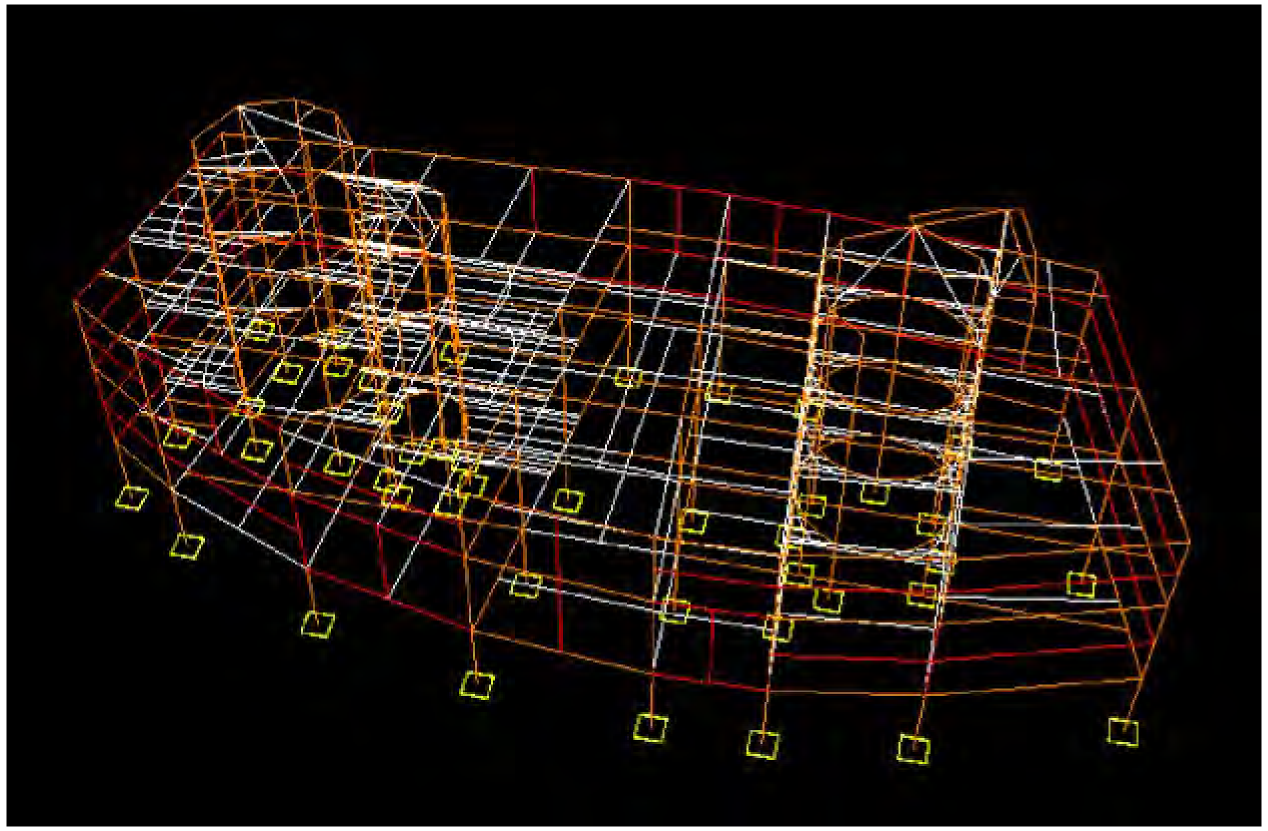
*Due to the calculation method of the program, all the curved beams are modified to strait lines between two pillars

Result from the simulation of bending moments

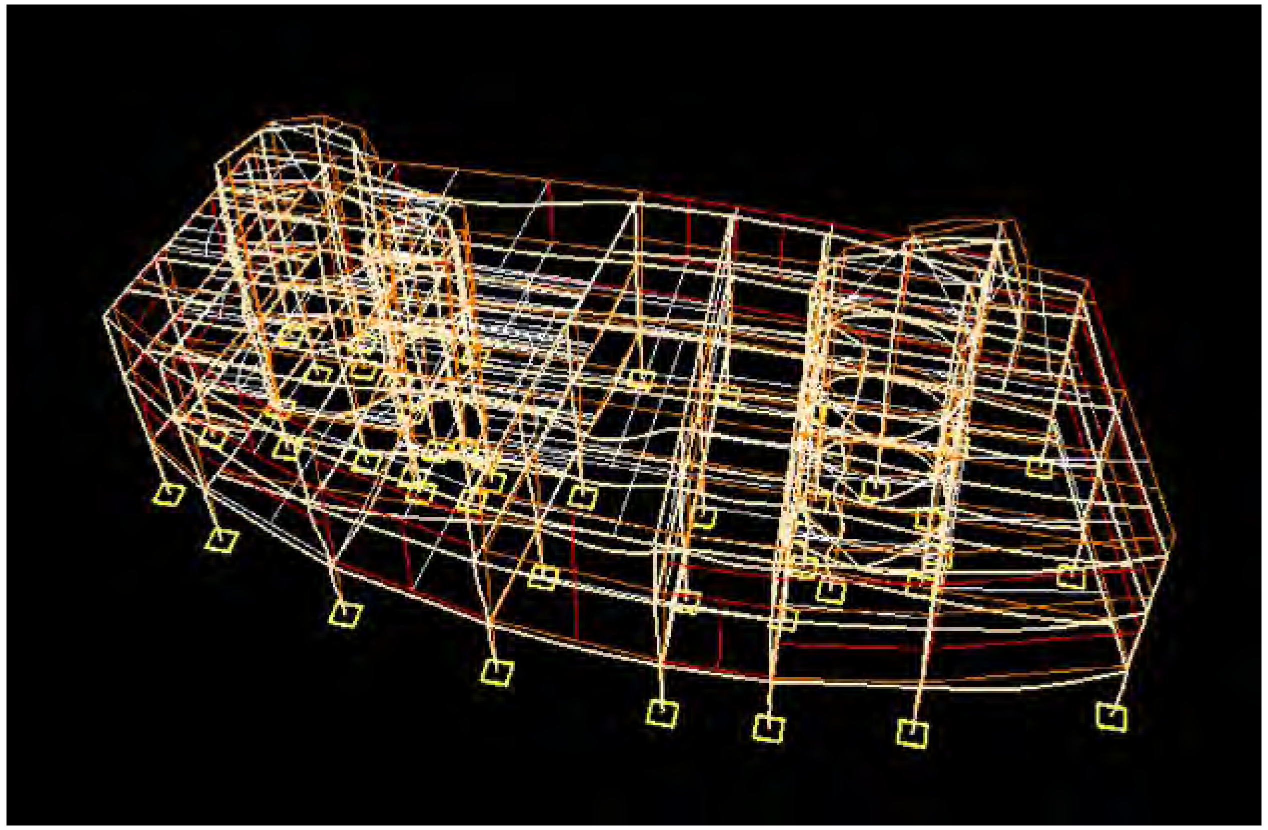


Building 2

Structure model with finite elements and Load of estimated actions



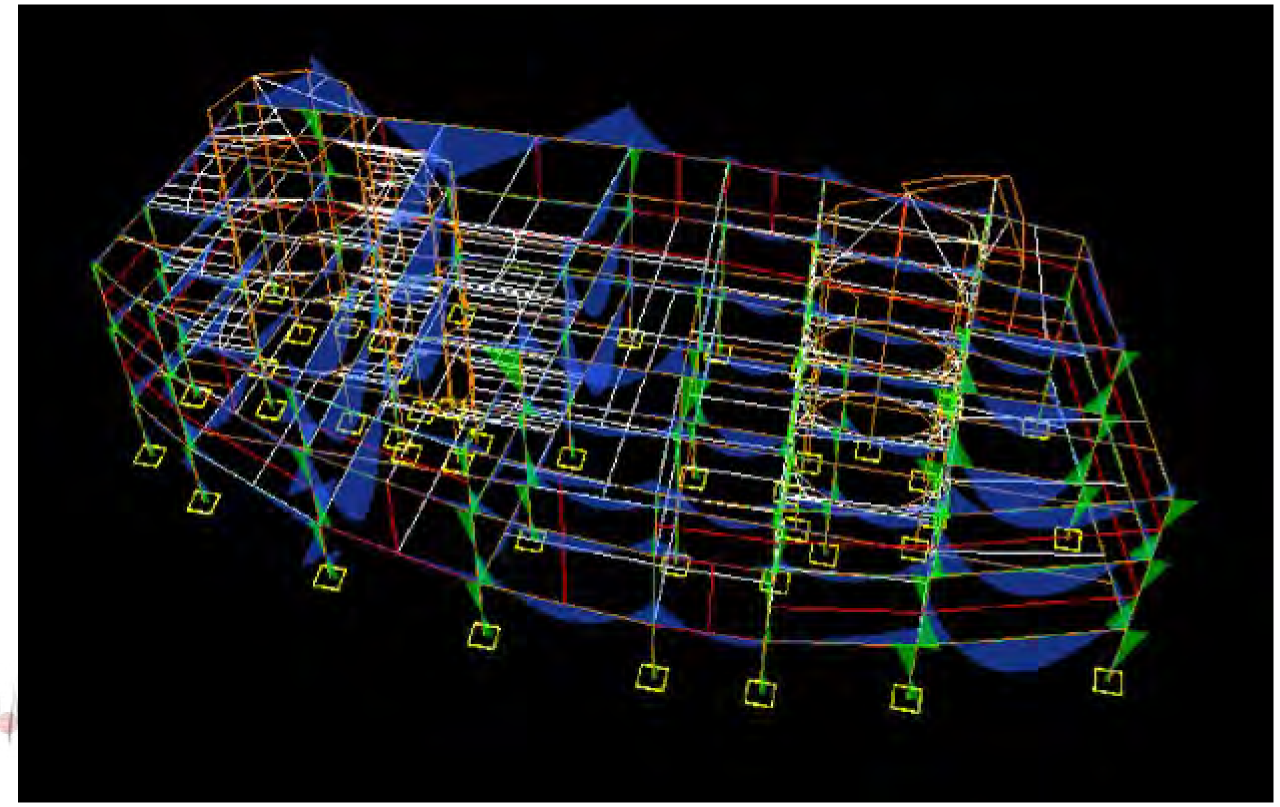
Result from the simulation of deformation (maximum -0.78 mm)



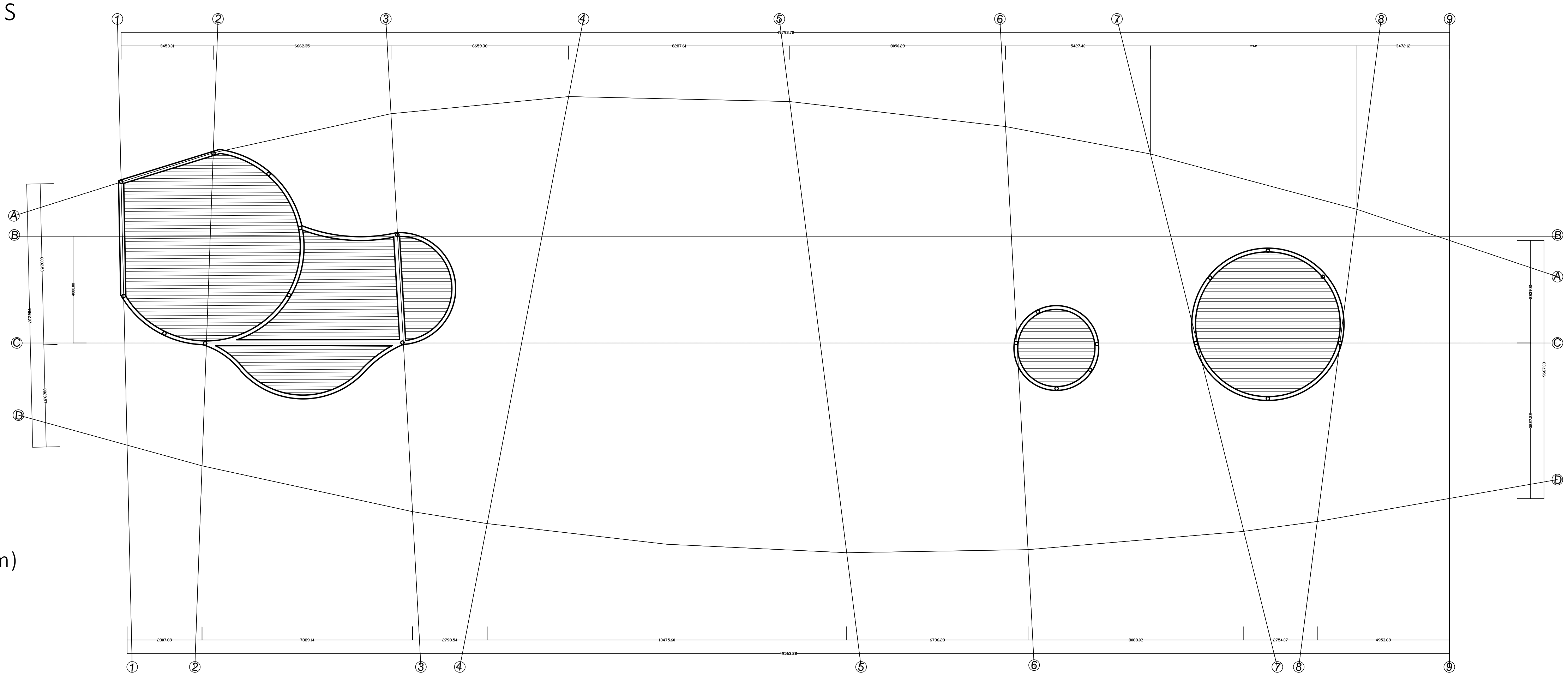
-slabs: composite slab of steel decking(t=50) and reinforced concrete(t=80)
-pillars: main frame Round tube 273mm/ t25 mm
secondary frame Round tube 139mm/t12.5mm
-beams: HEB 400
-secondary: beams HEB 160
-joist: HEB 200
-foundation: cast-in place concrete pile foundation (applied as single footing to obtain the relative dimensioning of the piles)

*Due to the calculation method of the program, all the curved beams are modified to strait lines between two pillars

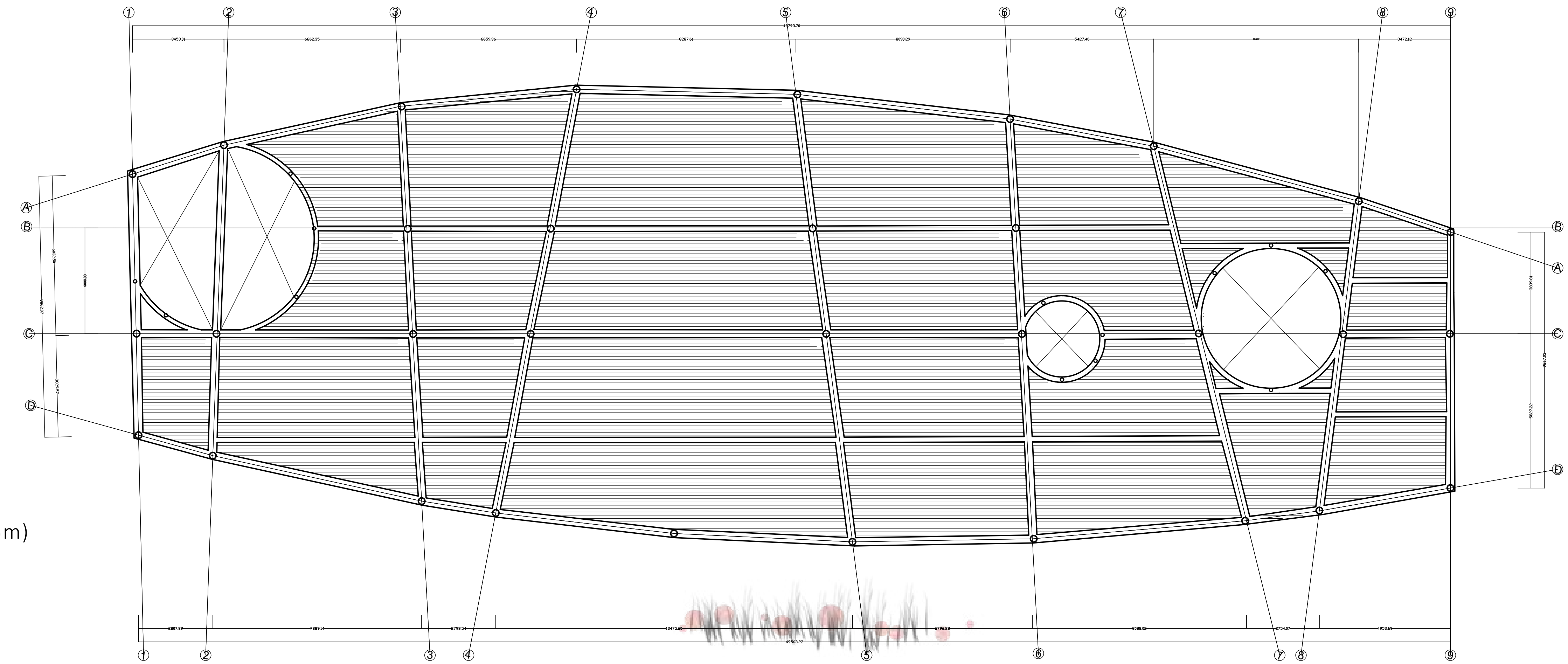
Result from the simulation of bending moments



STRUCTURE PLANS
s=1:200

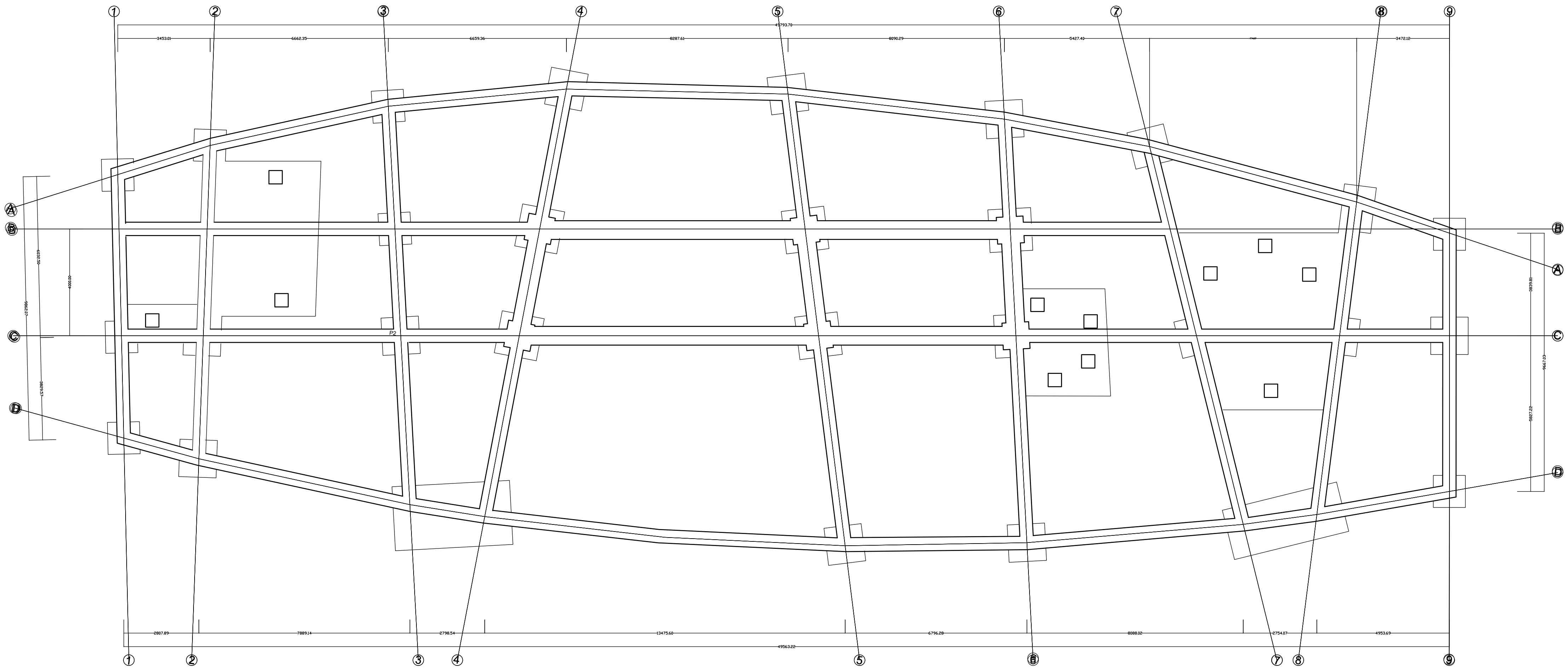


Building 1 (+15m)

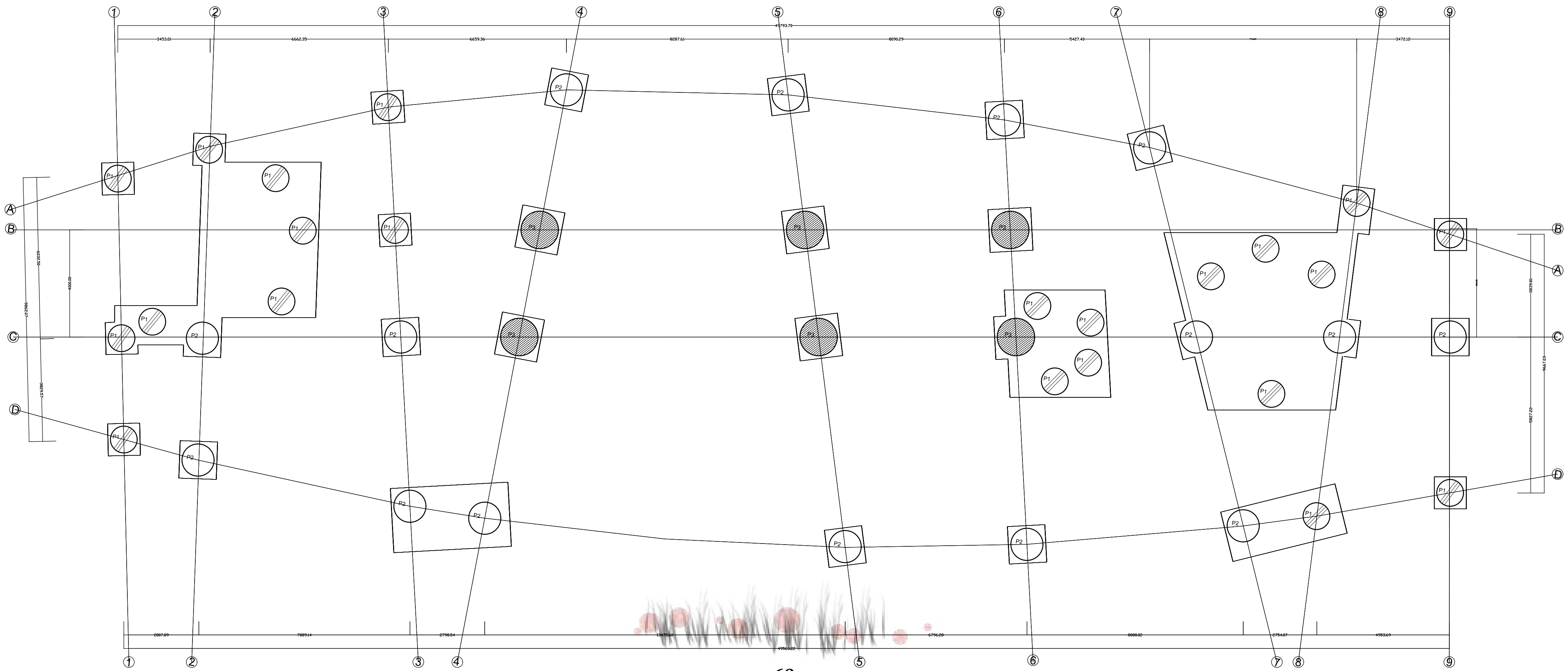


Building 1 (+4.5m)

FOUNDATION PLANS
s=1:200

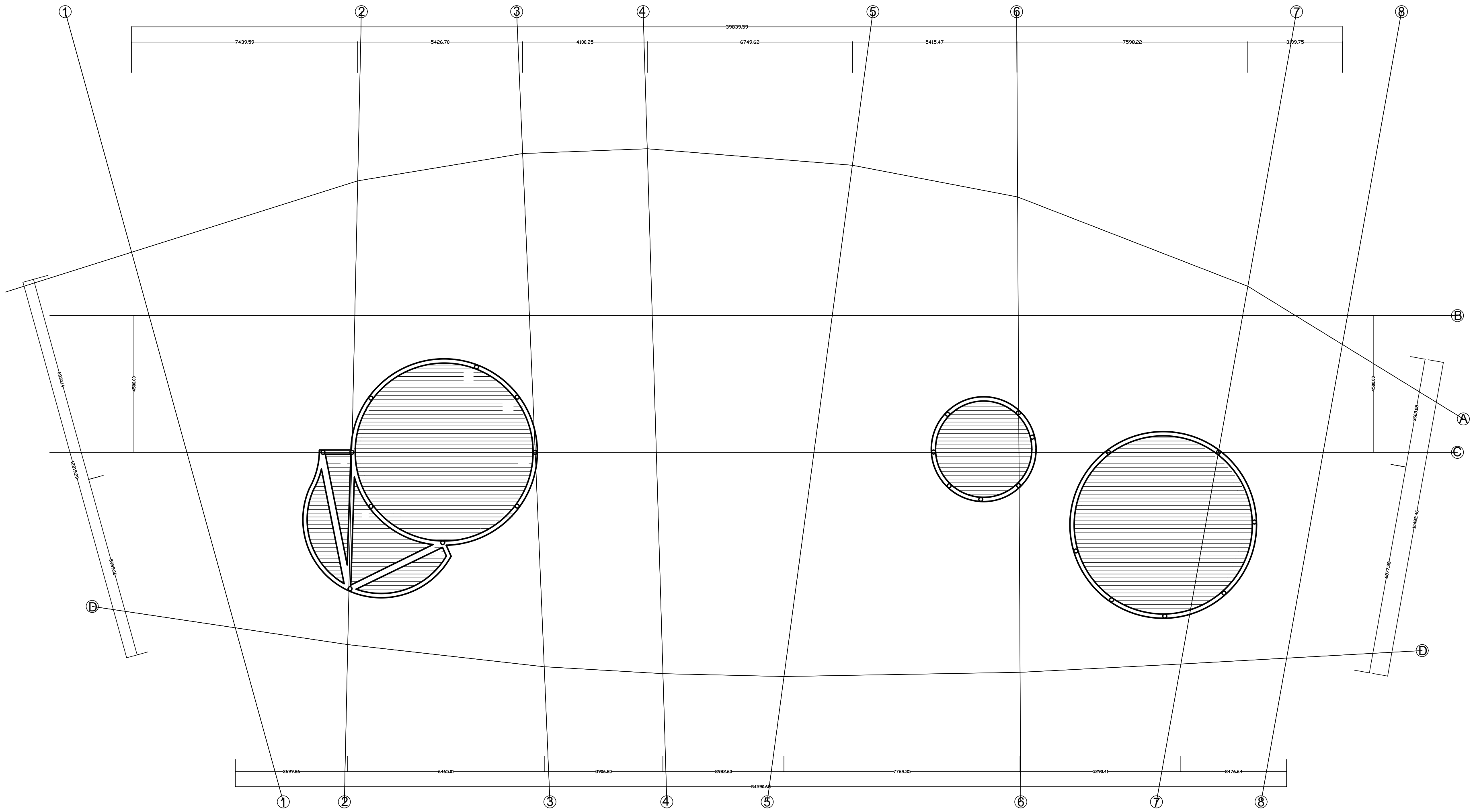


Building 1 (-1.5m)

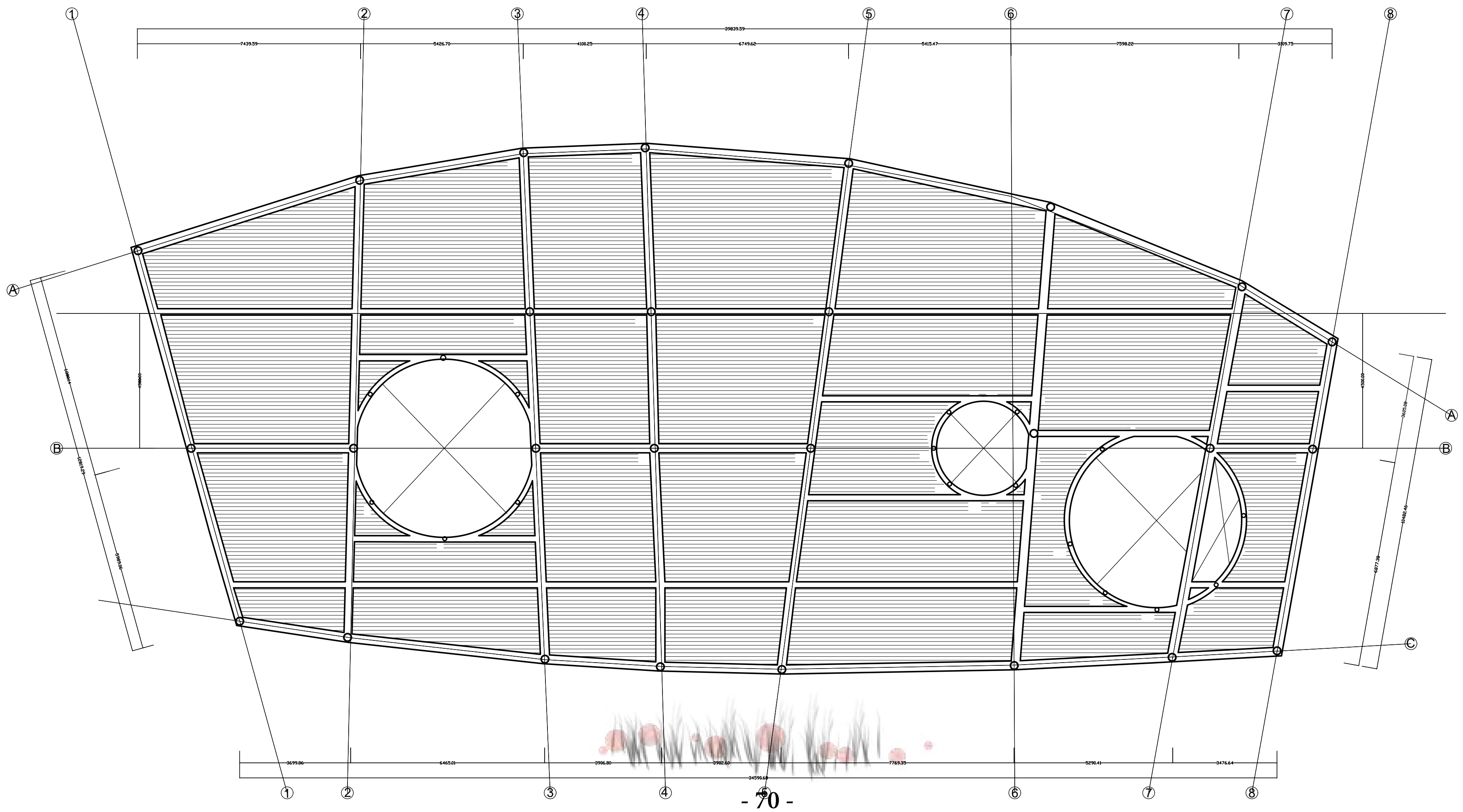


Building 1 (-3m)

STRUCTURE PLANS
s=1:200

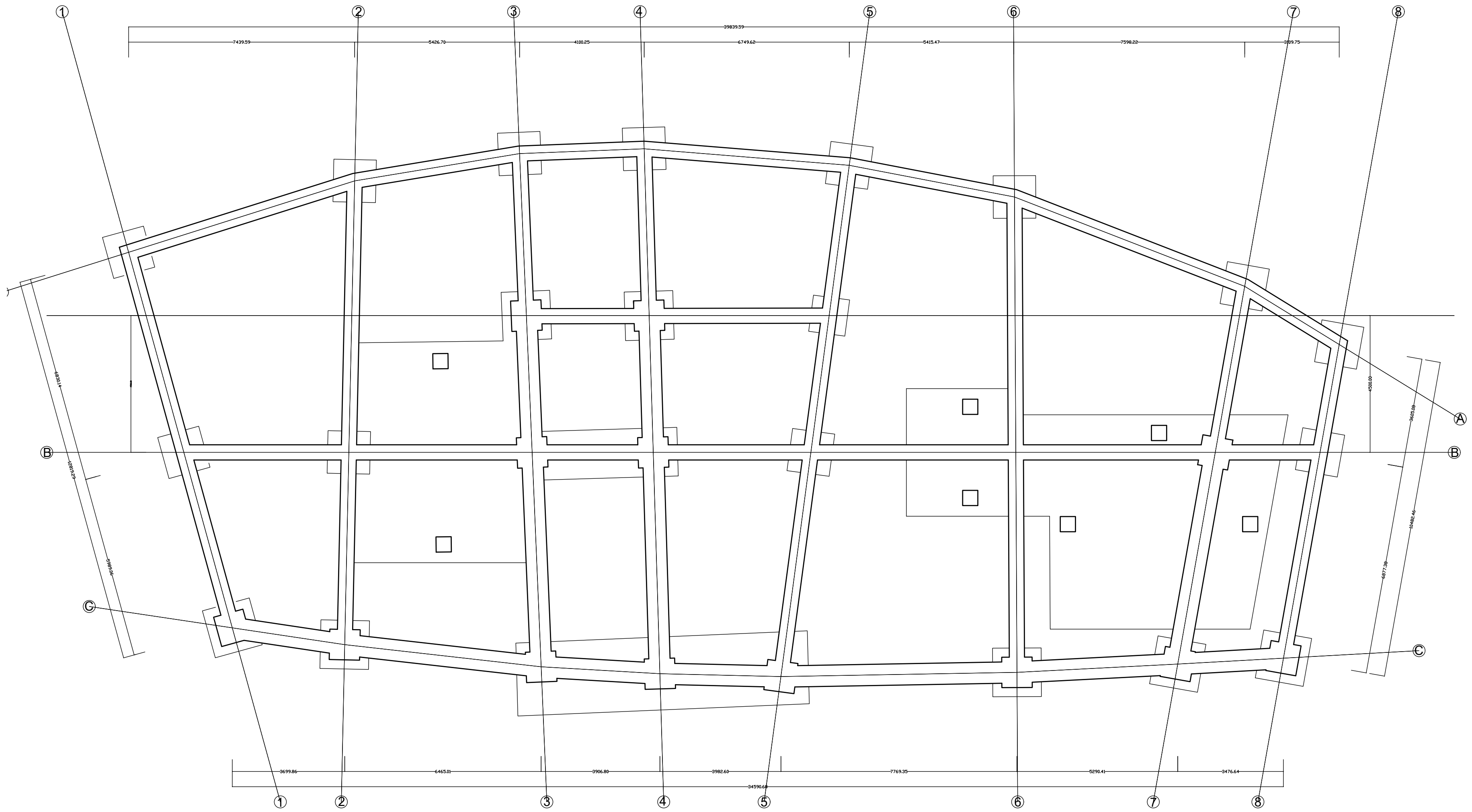


Building 2(+15m)

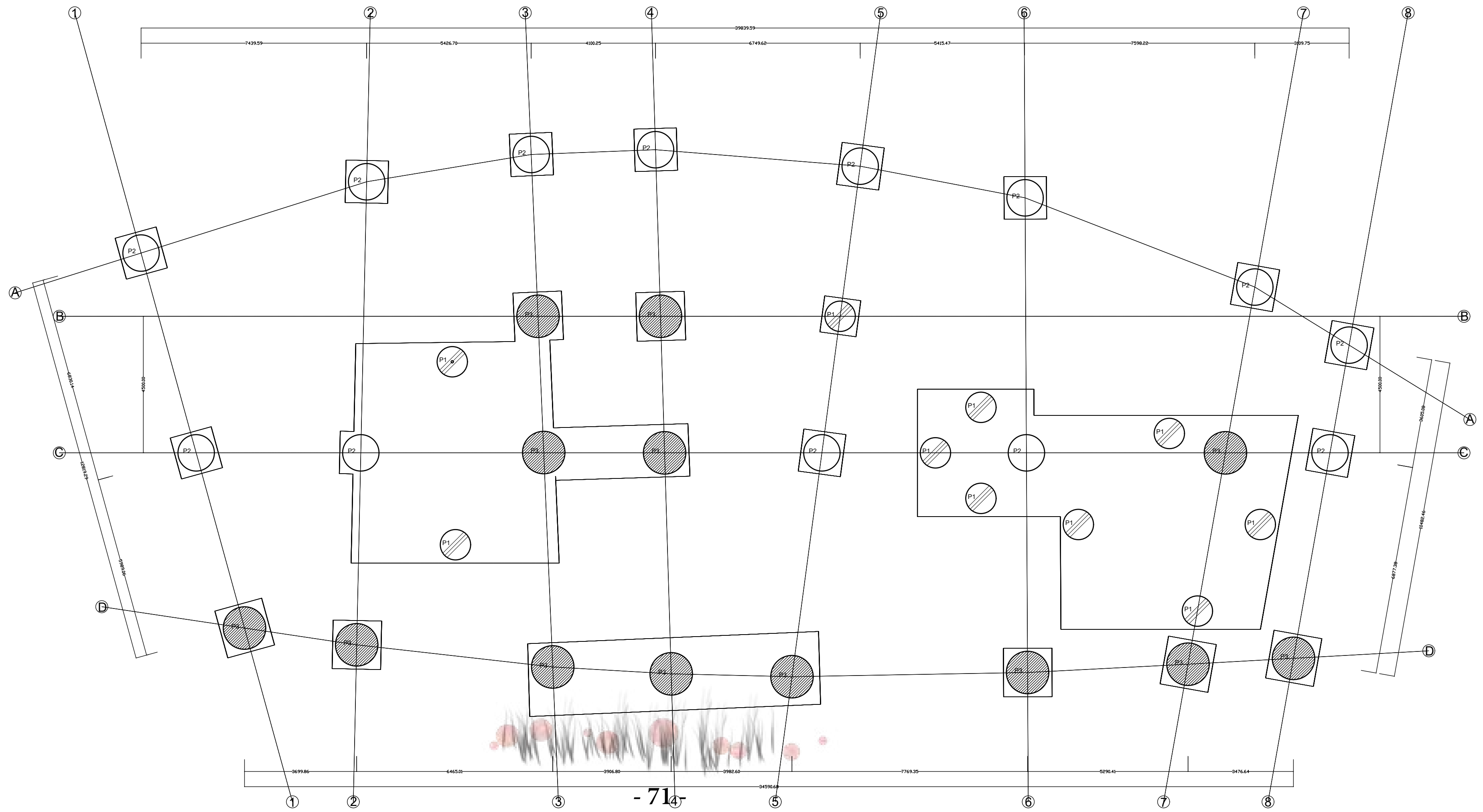


Building 2 (+4.5m)

FOUNDATION PLANS
s=1:200



Building 2 (-1.5m)



Building 2 (-3m)

CONSTRUCTIVE PLANNING

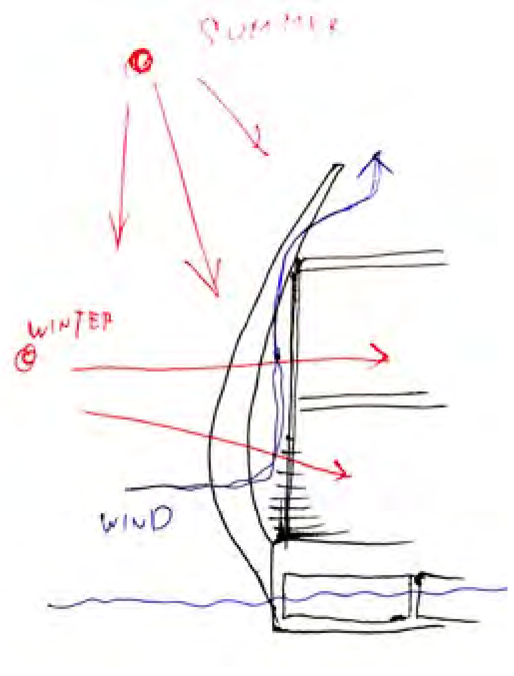
CONSTRUCTION CONCEPT

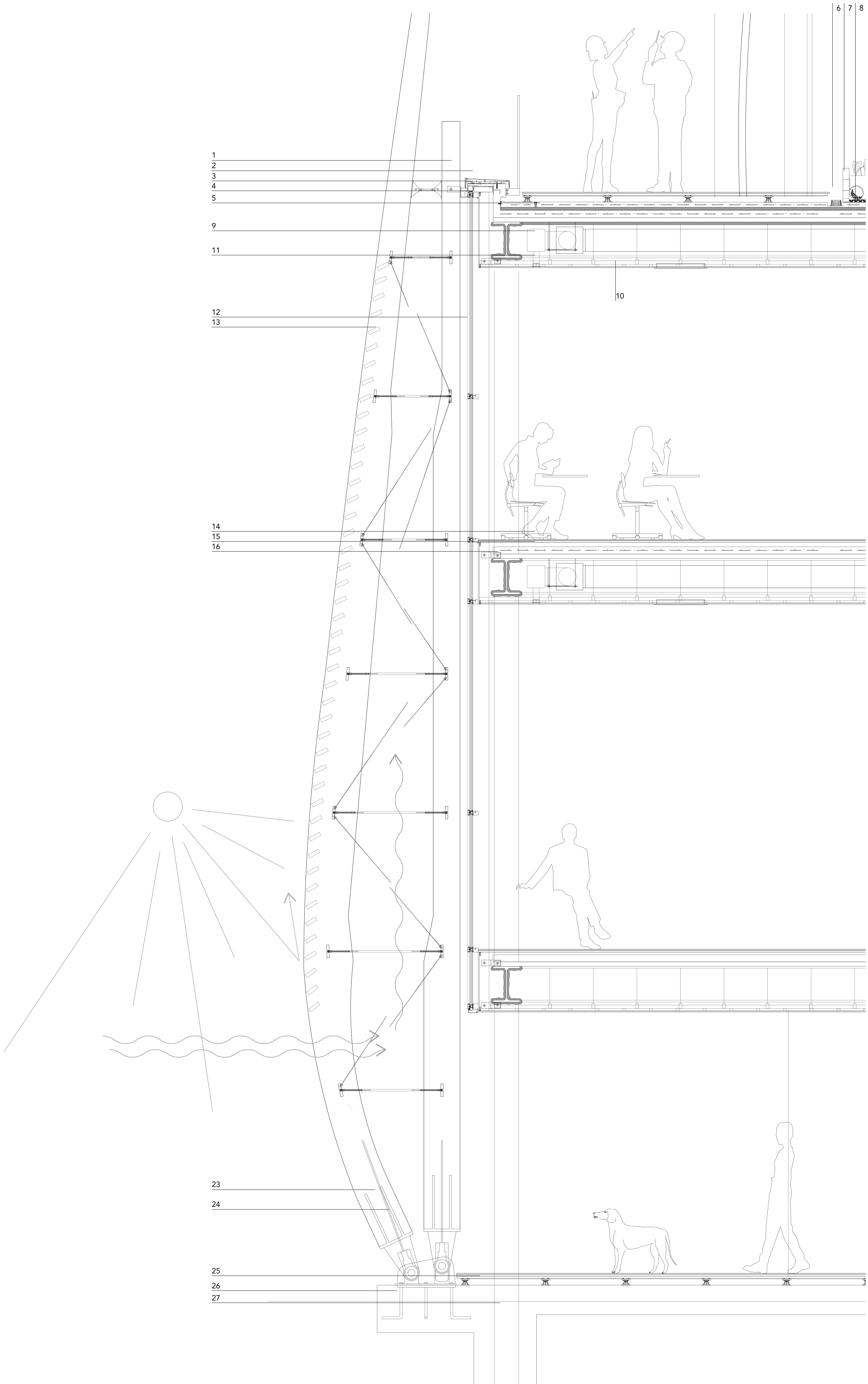
The objective of this project is to create the space to understand the natural eco-system unique to this wet land, and to create a hub for recovering the nature and landscape at the same time. Both objective would help the development with cooperative relationship of nature and human, the buildings themselves are also contributing this sustainable development.

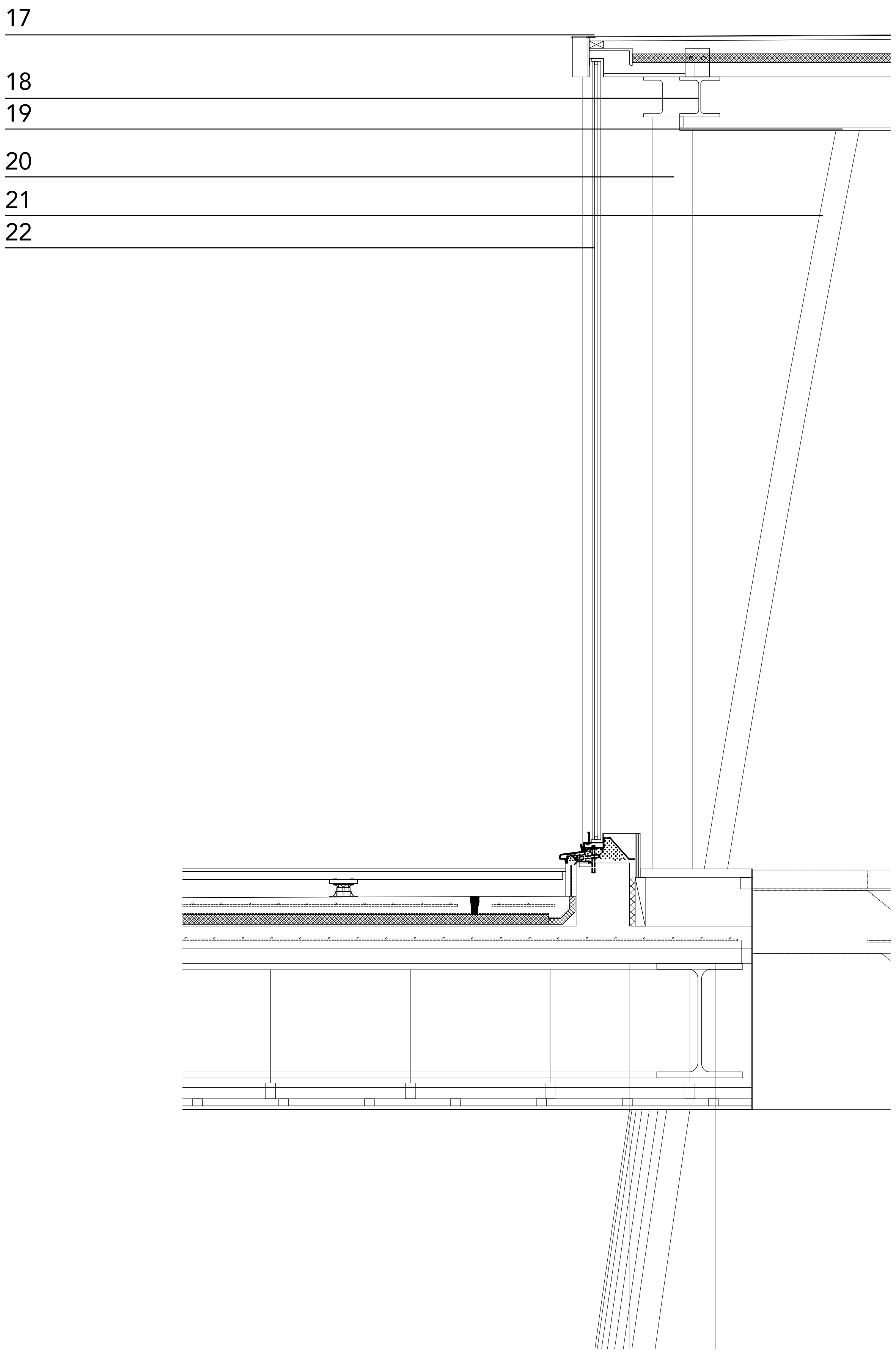
As the constructive material, we use a lot of timber so that the project could be match to the surrounding nature and environmental friendly, since the natural effect of timber such as thermal insulation, humidification and so on could help saving energy to keep the interior environment comfortable. In addition to the technical merit, wooden material also has the effect of giving the space warm and intimate atmosphere.

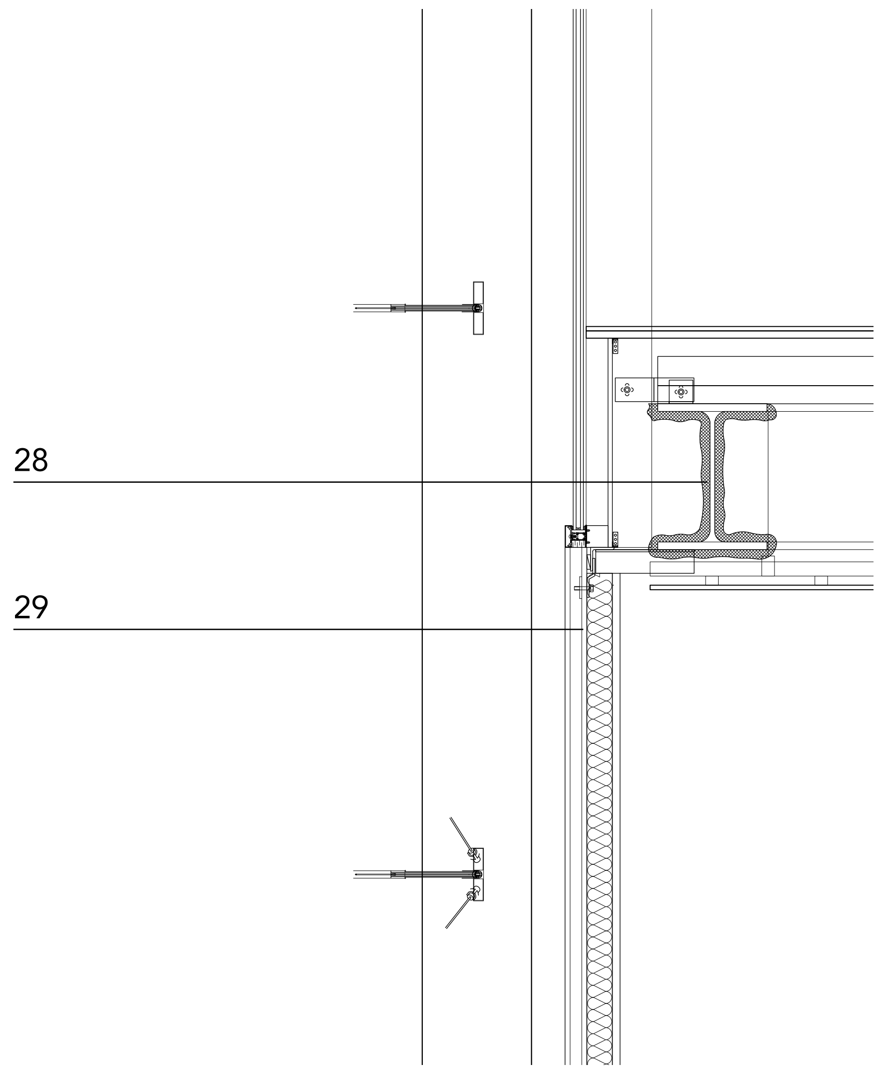
Also using timber revitalize the cycle of foresting, such as planting, cutting, and using, consequently it could save the long-term global environment.

The most significant element of this project are the fins covering the platform and building. We could use the effect that the timber has, and at the same time, these fins creating the double skin facade with interior glazing and exterior louver, we could make profit of the strong wind comes from the sea, make natural ventilation inside of the building.




1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
23
24
25
26
27



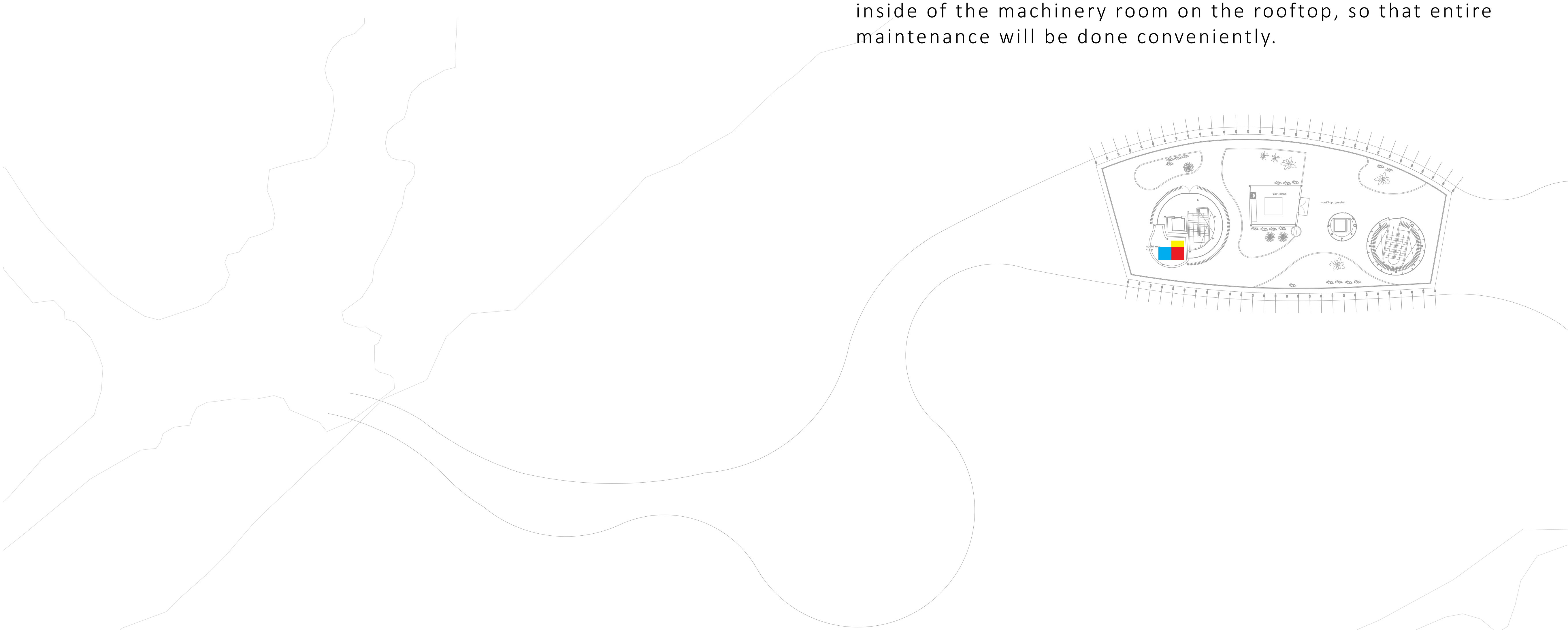


1_timber fin
steel angle piece with vibrationproof rubber
2_aluminum coping
3_Lshape angle piece 65x65x6 @600
4_timber glass mullion
5_reinforced concrete t=80
deck plate t=50
6_stainless steel syphone floor drain
7_vegetations
artificial lightweight soil
ponding tray
protecting sheet
root resistant sheet
leveling concrete
metal rath
8_heat insulation (rigid urethane form t=30)
asphalt waterproofing
9_air chamber box
air duct
10_air blowoff port
11_ceiling support
ceiling joist
plaster board t=12.5
12_double glazing FL8+A12+FL8
13_horizontal louver
14_wooden floor t=12
structural plywood t=20
system floor t=50
15_concrete t=80
16_deck plate t=50
17_water insulation sheet t=2
water resistant plywood t=12
polystyrene form t=30
deck plate t=50
18_steel beam HEB 160
19_ceiling joist
plaster board t=12
20_steel Oprofile pillar ø139.5
21_rimber fin
22_double glazing FL8+A12+FL8
23_timber fin
24_metal profile
25_wooden floor t=15
structural plywood t=20
ssytem floor t=50
26_leveling mortar t=30
reinforced concrete
27_pillar ø273.5
steel stiffeners
bearing base plate
pile foundation
28_ HEB 400
Refractory covering
29_expansion pressure concrete plate t=60
heat insulation t=70
plaster board t=12+9

INSTALLATION PLANNING

GENERAL PROPOSAL

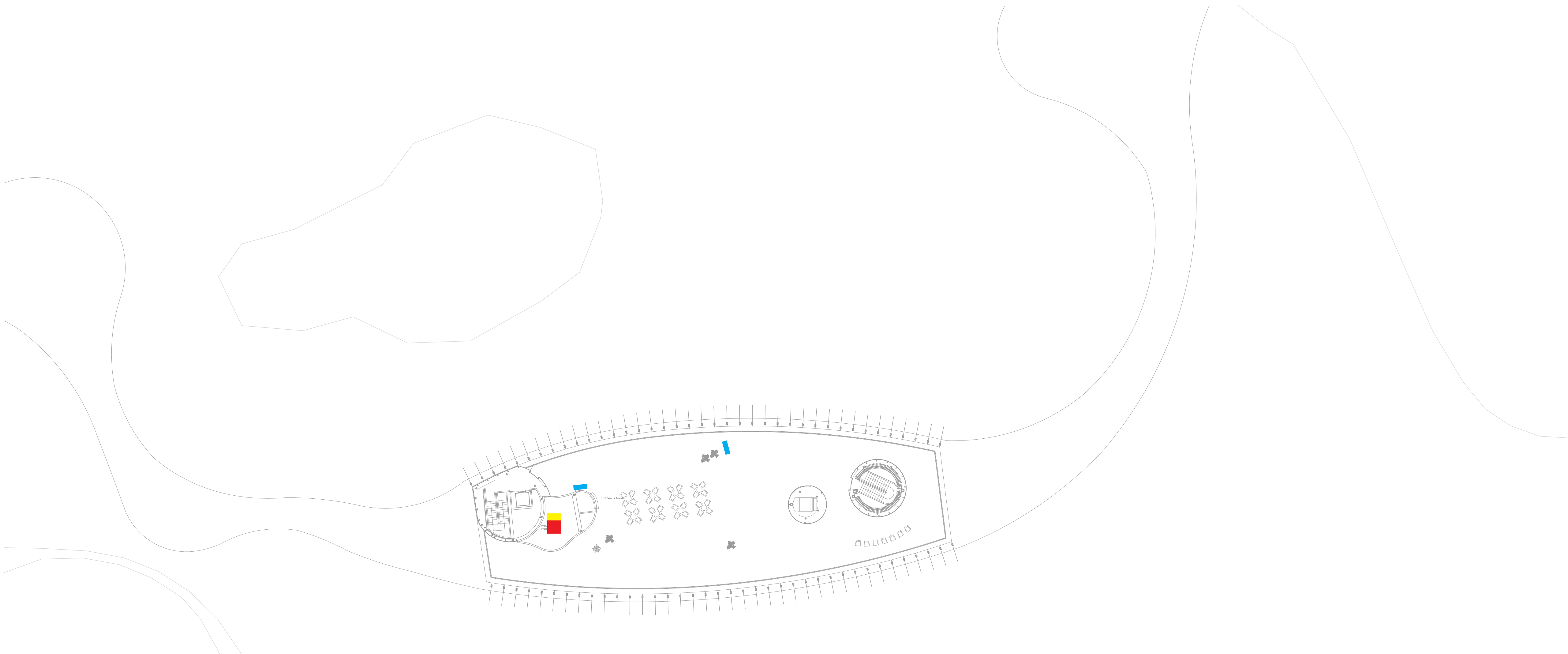
Facilities are placed on the rooftop, the machineries to supply electricity and control the air conditioning are placed inside of the machinery room on the rooftop, so that entire maintenance will be done conveniently.



Air conditioner

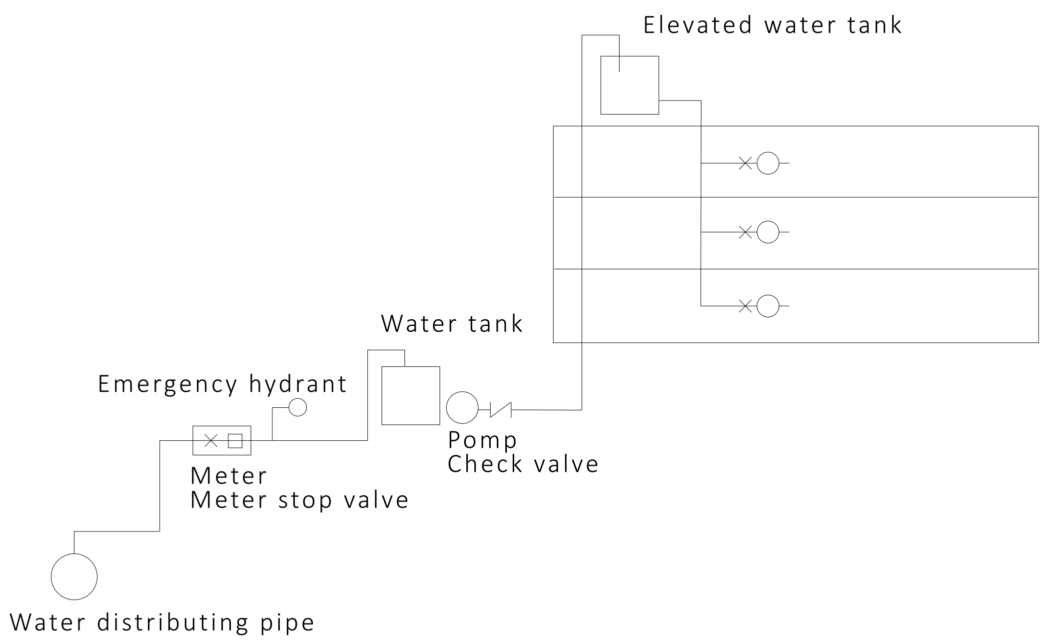
Electricity

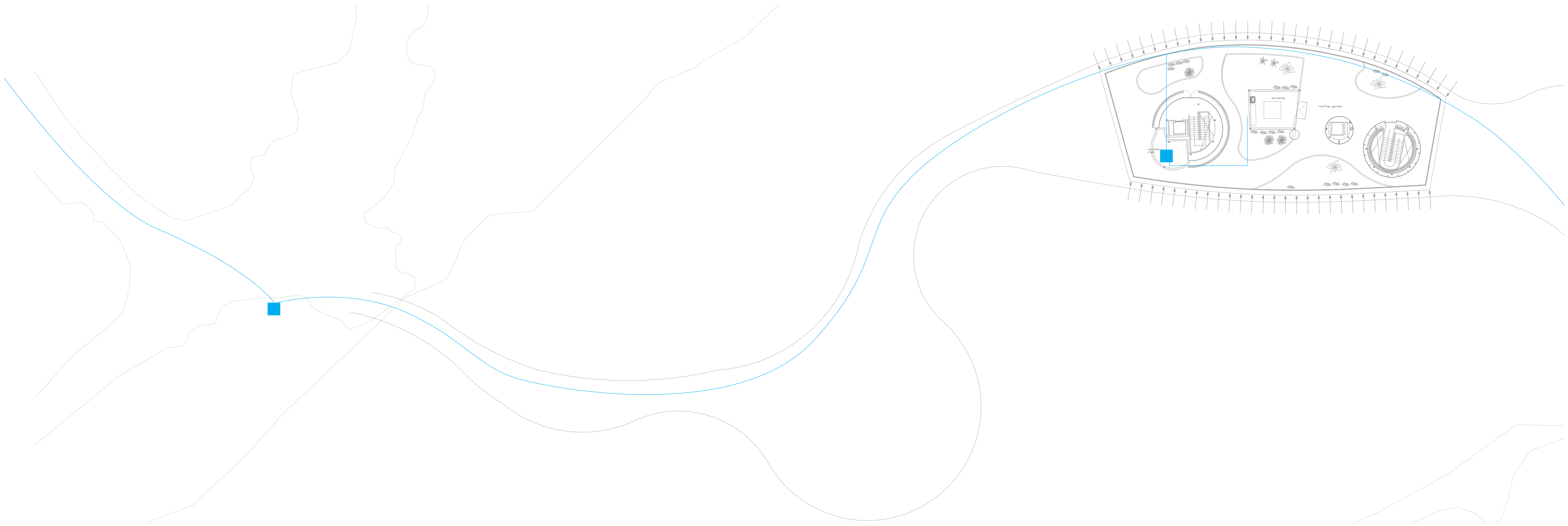
Hydraulic


coffee stand

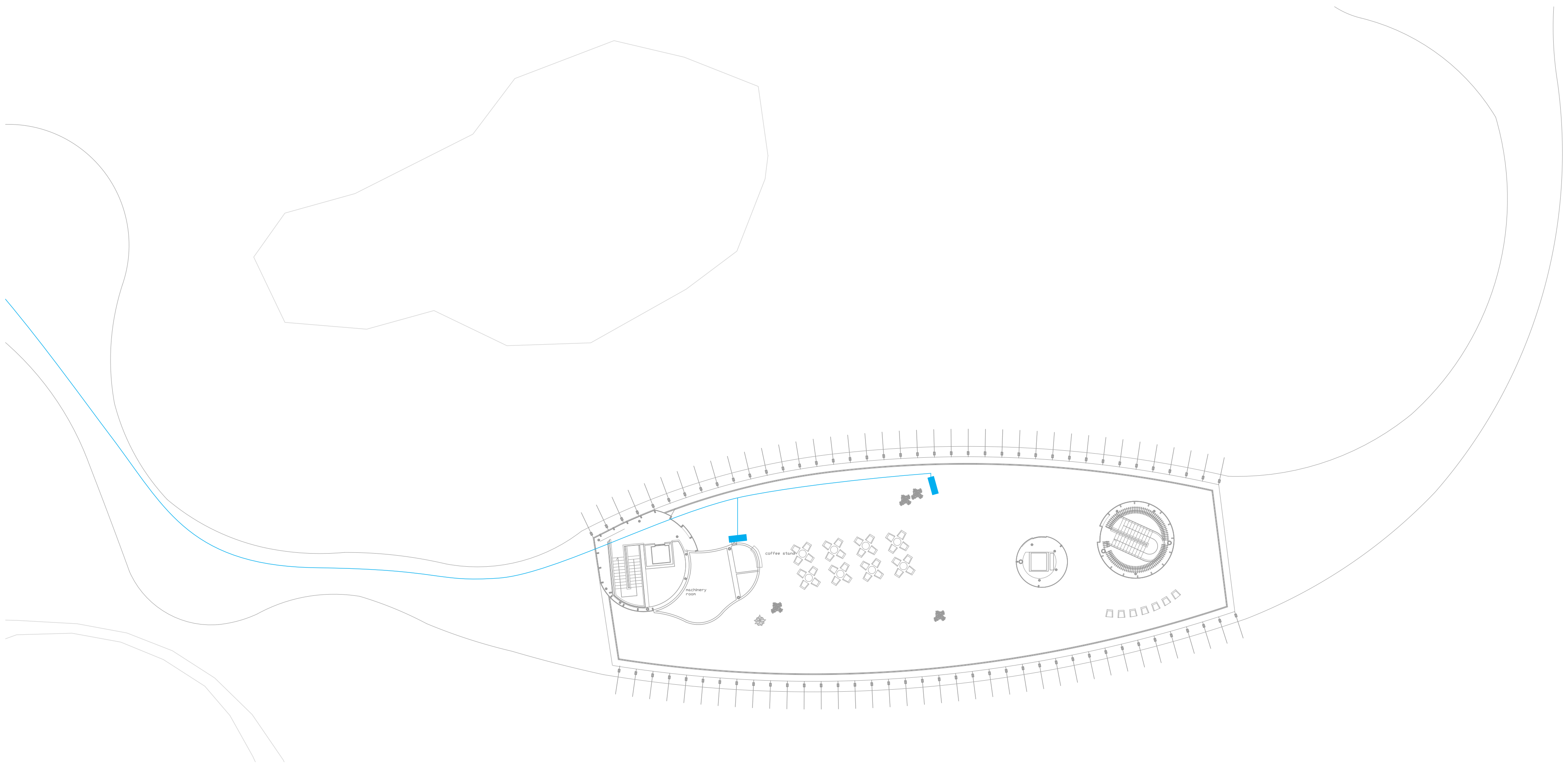
HYDRAULIC SYSTEM

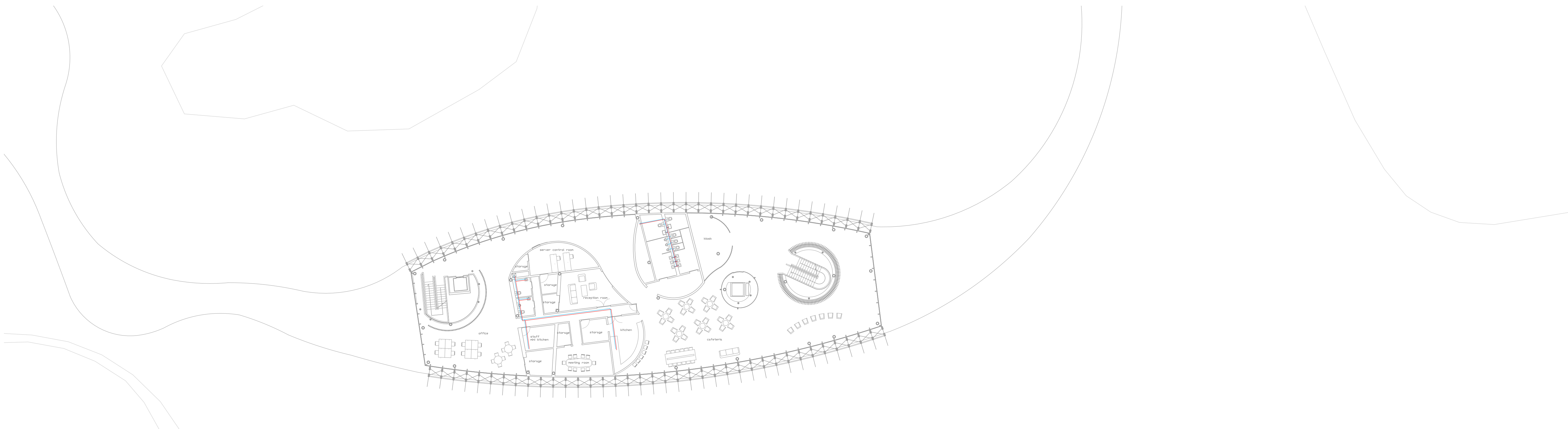
To solve this installation it was decided to use a high place water tank system, since the water will be fed from the entrance of the platform to the entire project.
The water receiving tank is placed the out side of the platform, then the water will be sent by the storage pump, through under the platform to the rooftop of the buildings, then be collected in the water storage tank on the rooftop, then supplied to the each destinations.




workshop
rooftop garden
machinery room

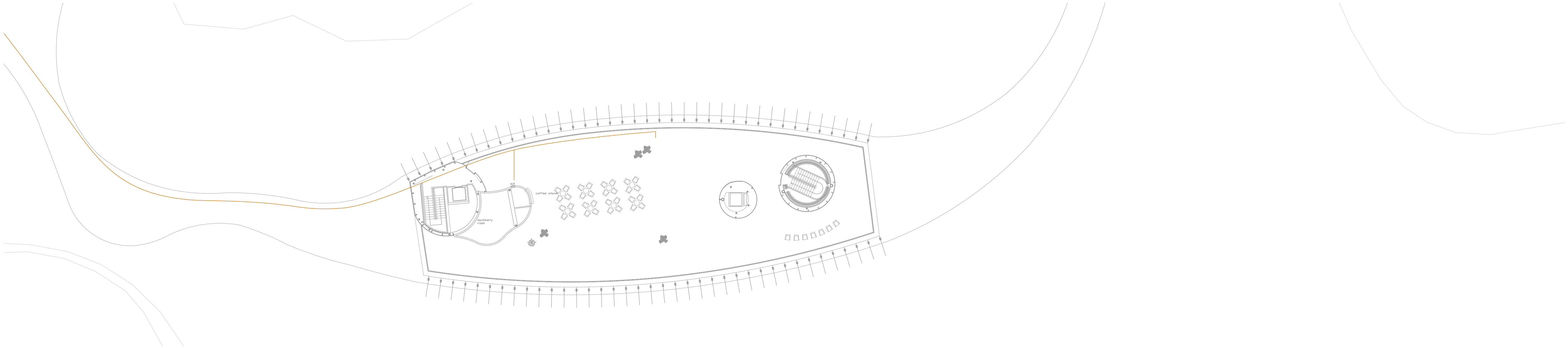

storage
managers office
lecture room
meeting room
staff room
staff mini kitchen
counter
registration counter
library
storage
lounge

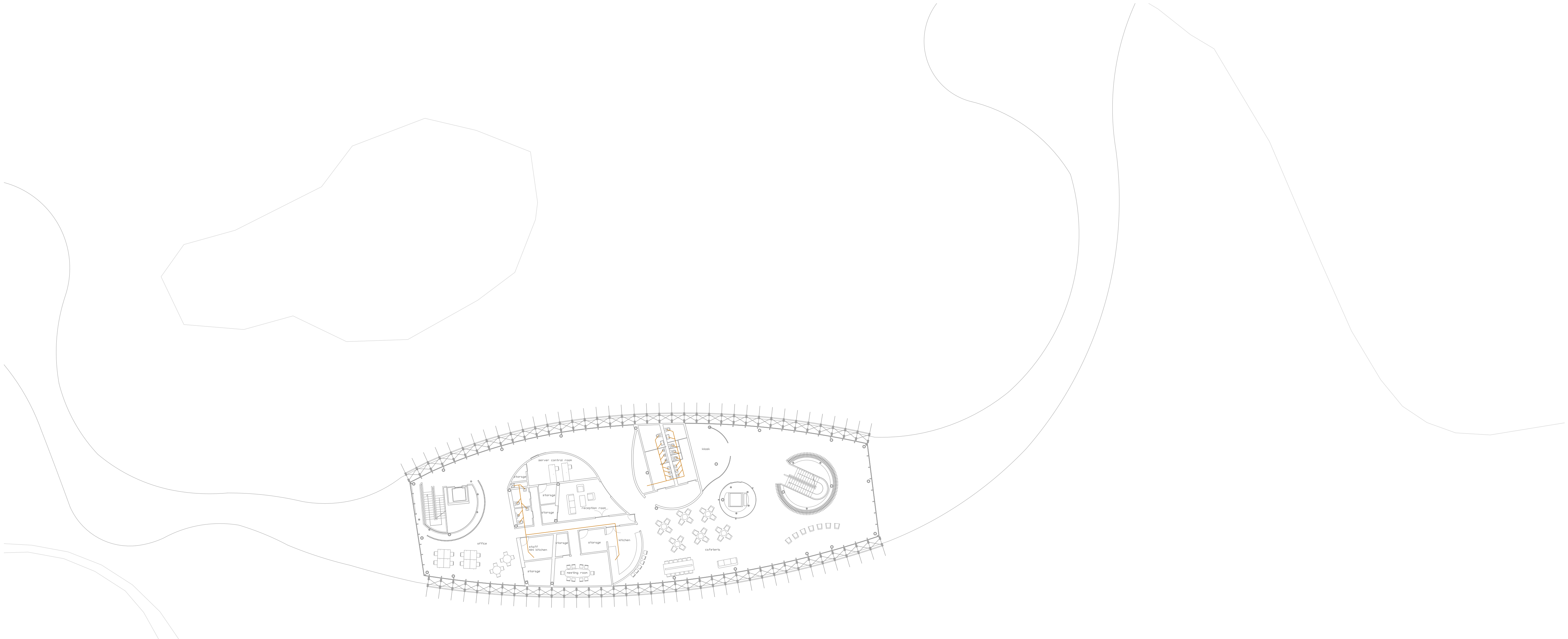

machinery room
coffee stand


server control room
storage
storage
storage
reception room
kiosk
office
staff mini kitchen
storage
storage
kitchen
cafeteria
storage
meeting room

workshop
rooftop garden
machinery room

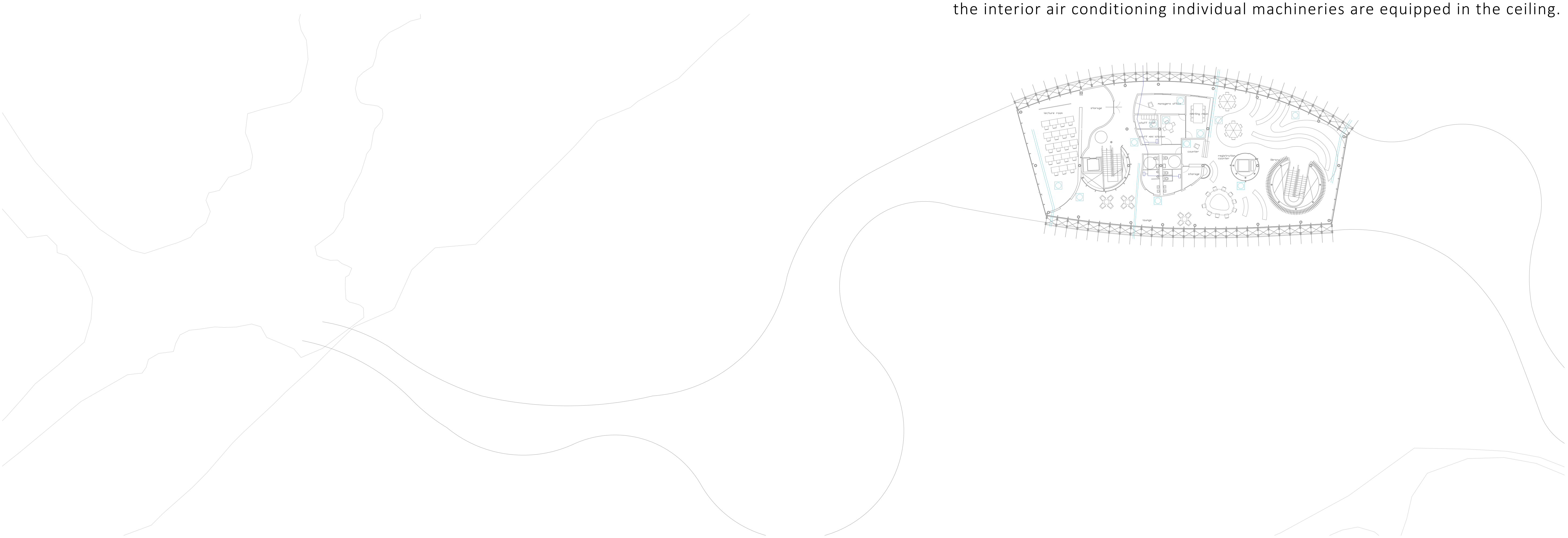
storage
lecture room
managers office
meeting room
staff room
staff mini kitchen
counter
registration counter
library
storage
lounge

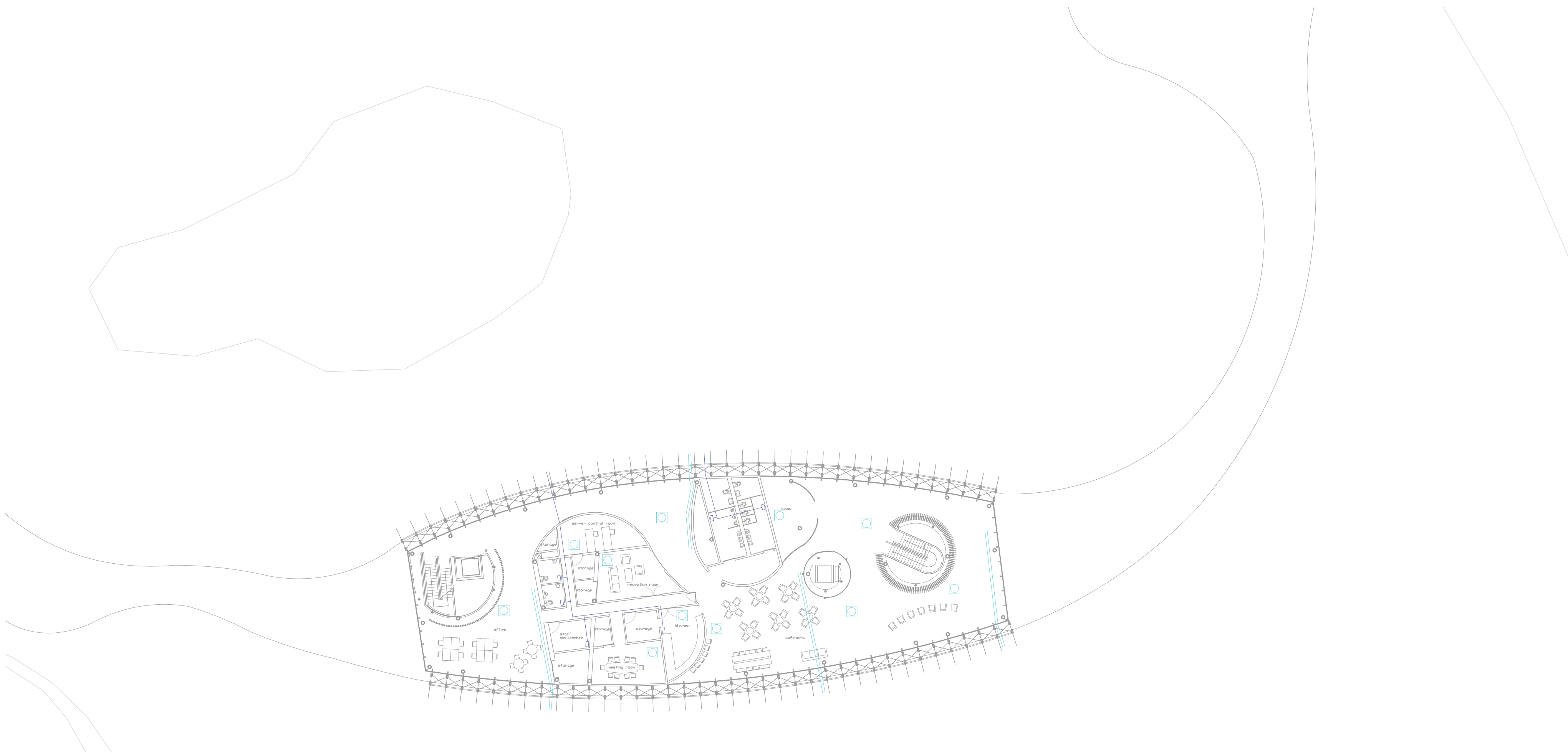

machinery room
coffee stand


server control room
storage
storage
storage
reception room
kiosk
office
staff mini kitchen
storage
storage
kitchen
cafeteria
storage
meeting room

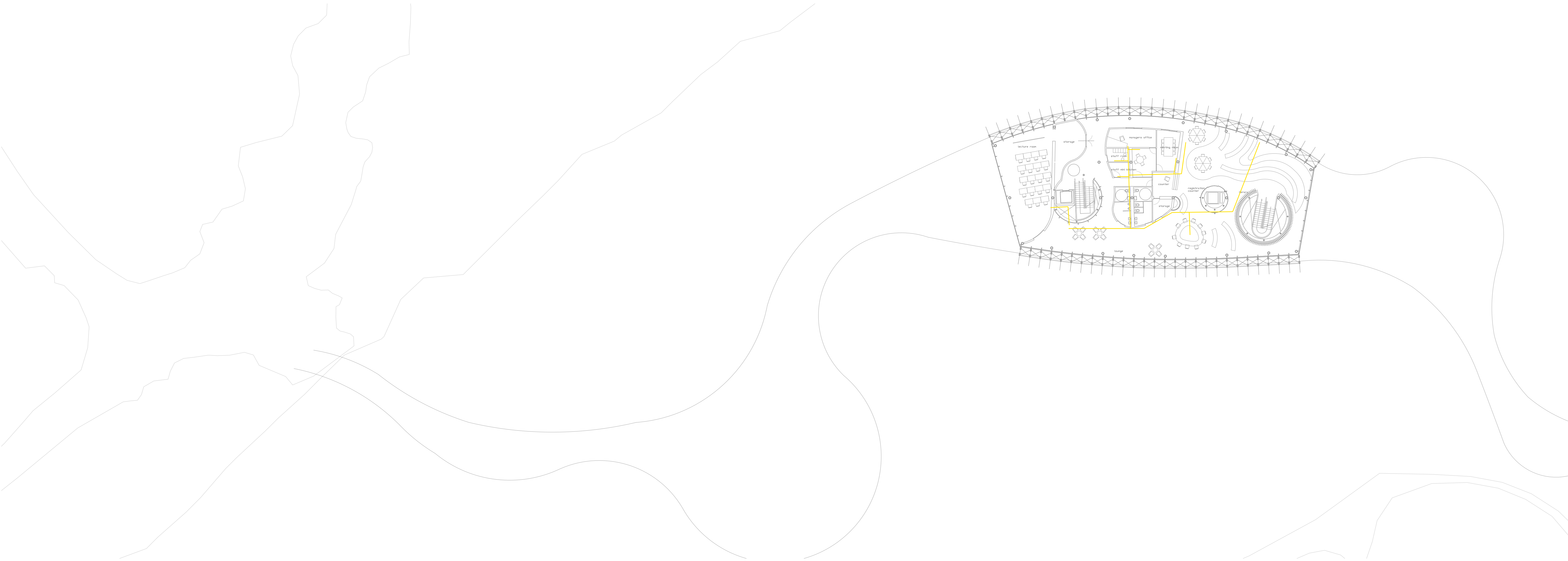
AIR CONDITIONER

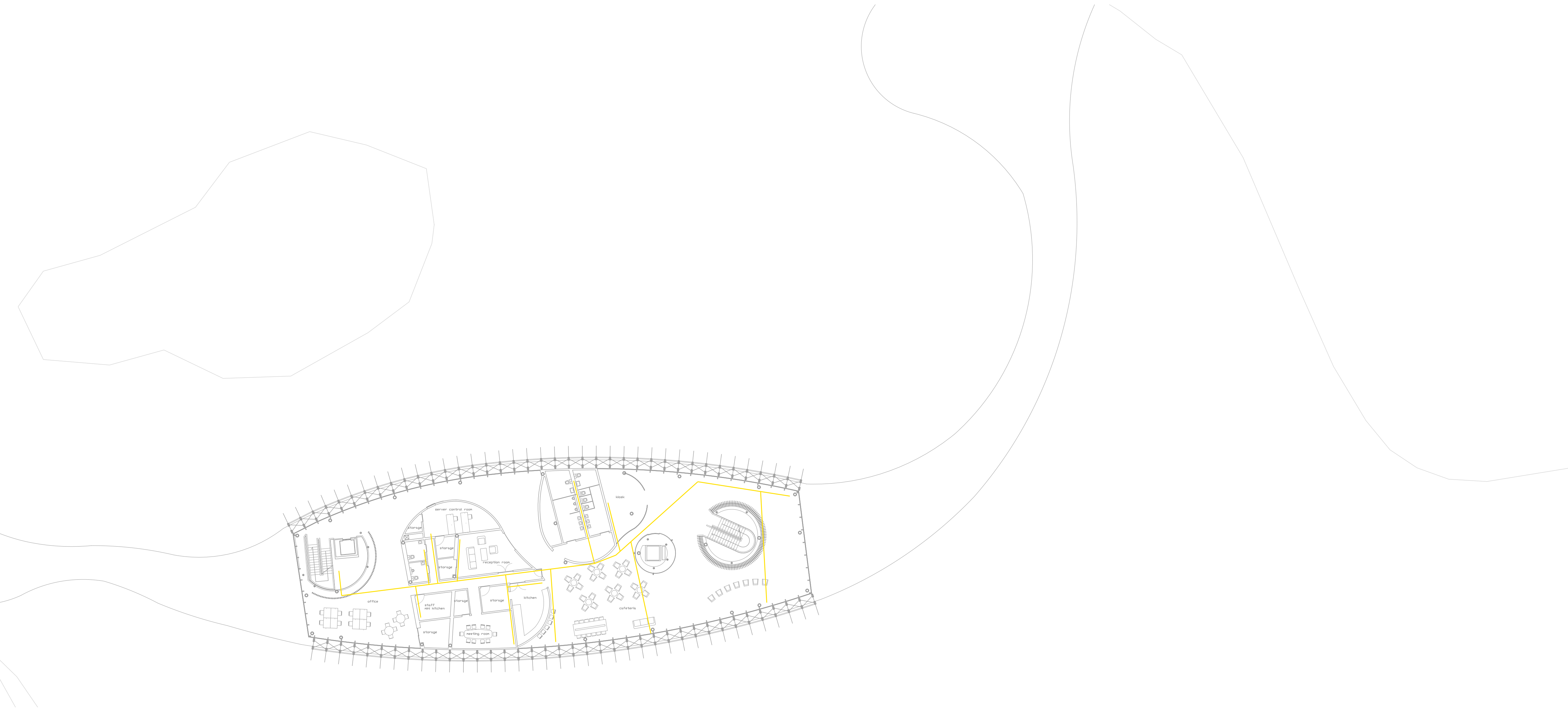
Multi-package system will be applied, the exterior machineries are on the roof top, then the air duct and air chamber are equipped to take outside air then the interior air conditioning individual machineries are equipped in the ceiling.




server control room
storage
storage
storage
reception room
kiosk
office
staff
mini kitchen
storage
storage
kitchen
cafeteria
storage
meeting room

ELECTRICITY




server control room
storage
storage
storage
reception room
kiosk
office
staff
mini kitchen
storage
storage
kitchen
cafeteria
storage
meeting room