Watering the Mediterranean landscape

A new agricultural-coastal park for the Maresme, urban surroundings of Barcelona

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Contents

“ I love it when nature surrounds me on all sides and then opens into the distance, on the horizon, and I have the feeling I am part of it”

Lev Nikolàevič Tolstòj[1]

Abstract

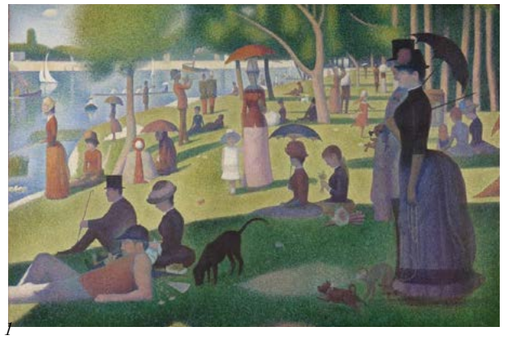
The thesis research focuses on the theme of mending the coast and its hinterland and on the protection of the Mediterranean landscape of the Maresme county, north-east of Barcelona.
The opportunity to deepen and develop a project related to this topic was given during the Erasmus + program supplemented by a thesis program in Barcelona at ETSAB (Escola Tècnica Superior d'Arquitectura de Barcelona).
Specifically, the theme of the Design Studio attended in the academic year 2019/2020 reflected on the recovery of the waterfront of Vilassar de Mar, a municipality in the Maresme region, and its agricultural land.
Interpreting the requests of the Studio and following the guidelines of the Metropolitan Territorial Plan of Barcelona (Pla Territorial Metropolità de Barcelona), this thesis proposes an agricultural-coastal park (El Parque Agrícola Litoral del Maresme) that would recover a lost historical landscape. The proposed park extends along the entire length of the Vilassar de Mar coast, connects to the rural landscape behind the city, and then reaches, through a network of ecological paths, the hinterland of the neighboring mountain municipalities (Cabrera, Cabrils and Vilassar de Dalt).
Indeed, today there are two large caesuras within the Maresme, extending the entire length of the county, namely, the highway and the railway. The highway constitutes a strong element of separation between the mountain landscape and the agricultural-coastal range. The railway, located close and parallel to the coastal front of the whole county, reduces the latter to a line without spatial quality, severely limiting its accessibility for the municipalities that overlook it. For this reason, the infrastructure of the coast has deprived the Maresme cities of their waterfront.
Along these infrastructures, the cities have expanded, resulting in a continuous urbanization that has eroded the historic agricultural and productive landscape of the region, caused by a strong waterproofing of the soil and a canalization of the waterways that once characterized the rural and natural landscape.

Gilles Clément writes "The residue is due to the abandonment of previously exploited land. Its origins are manifold: agricultural, industrial, urban, touristic, etc. Residual (délaussé) and uncultivated (friche) are synonyms ".
This thesis therefore intends to investigate the possible design strategies to be implemented to restore the ancient balance between city and nature in the Maresme region.
Through the use of the different scales of the project, the construction of strategic geographies integrated with a series of pilot projects, the intention is to strengthen the existing ecological network, now hidden or weakened, as a connecting infrastructure between the city and the sea.
Through the recovery and systemization of traces of rural roads, uncultivated and abandoned fields and residual spaces within the city, the intention is to design a green infrastructure capable of reconnecting and rebalancing the urban system with the natural one of the sea and of the mountain valleys of the hinterland.
The basic idea of the project is to lay the foundations for the construction of an agricultural-coastal park on the Maresme, made up of linear elements and of surfaces of various sizes, which are connected through each other through natural elements, forming the image of a unitary park.
This image will serve to sensitize local administrations, citizens and associations that are active in the area towards the recognition and re-appropriation of their relationship with the natural elements of their territory.

PART 1

Giving a waterfront back to Vilassar de Mar

1.1 A new attitude of the city



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The subject George Seurat[2] chose to represent in *A Sunday Afternoon on the Island of La Grande-Jatte* was similar to that of Impressionist paintings. Seurat painted the Sunday crowd of Parisians, laying on the grass of a park, on the banks of the Seine. Very fashionable women with typical clothes of the time, taking a walk sheltered with pretty umbrellas. Then, rowers who rest after the competition and, therefore, children who play composed. Some pets follow their owners. Following a couple of bourgeois gentlemen you can see a monkey on a leash. The Seine flows to the left and some small boats glide over the water. The Seine is a beautiful blue full of reflections, while the clothes of the Parisians create splashes of color scattered among the trees. The forms are highlighted by contrasts of clarity and complementary.

Seurat in his paintings represents the vitality on the Parisian banks of the Seine, but the frame of life he is showing us through his eyes becomes a symbol, and abstracting it from the context, it can simply remind us of a series of places where life and idleness take place undisturbed. And in the free flow of time, in a filter zone, encounter between two realities, land and water, and that's why so full of sensuality and scenic atmosphere.
This vision of Seurat can be considered as an idyllic vision in which man finds on the coastal front a place to stop, relax and have opportunities for socializing.

Indeed, the coastal front has always been a symbolic place, a geographical area full of cultural stratifications, relationships and resources. The great potential of this fluid space, a line between land and water, converts it into a privileged field of research for the future imagery of cities and an identity symbol in the path of urban and landscape regeneration.
To date, unfortunately, it can be seen how in reality, along the entire extension of the Maresme, this imaginary of a social and natural place has disappeared, giving way to a continuous city, further separated from its sea front due to the presence of the railway, which in turn reduces the coastal strip to a simple dividing line between the mainland and the sea, so much so that in some places the beach has completely disappeared. Many realities of the Mediterranean coastal urban landscape experience this situation (both for reasons linked to the exploitation of the benefits linked to tourism, and for an excessive urbanization of the cities, for climate changes etc.) and continuing in this direction it will be increasingly difficult to act on of them to restore a relationship of balance and coexistence between the urban and natural systems. It is precisely starting from these reflections that the proposal inserts the waterfront project within a wider system that sees the coastal front as a pivotal point of encounter not only with the city but also with the entire landscape: this is where they end. rivers, is where the mountains overlook, is where the first settlements stood. In this way it extends; from a simple borderline it branches out into the hinterland landscape like the roots of a tree.
It is necessary to think of them as generators of quality of life: how to regain the close relationship that once existed between cities and water and give back an active role to portions of land that have lost their identity (port, commercial, industrial, agricultural , natural)?

Waterfronts are dense and hybrid places where resources, opportunities, aspirations and ambitions of cities become vision, new relationships and projects. Nodes of flows of goods and people, places of exchange of cultures: analyzing and interpreting sea fronts as complex contexts therefore requires addressing them as places of identity of a social, cultural and economic community, as catalysts of urban experiences, as activators of values. Tackling the regeneration of waterfronts becomes the nerve center of the overall regeneration of the contemporary city, recognizing its role as a structural element. In contexts characterized by important historical characters, they also take on the role of cornerstones of urban identity, points of reference in continuous transformation and permanently recognizable in the historical evolution of the settlements. The urban waterfront must be able to intercept, interpret and transform the entire city and not be limited to just the coastal perimeter. The waterfront is not just that strip that overlooks the sea or a river, but it is a new attitude of the city: in fact it must be thought of as an environment available to welcome diversity and variety; it has always been a meeting point for different cultures and a place of exchange that feeds the existence of good possibilities to accelerate the processes of urban regeneration.

A waterfront:

• it is not a line, but a network of places, functions, connections and connections between the coast and the city, between port activities and urban activities;
• it is not identified only with the port area, but unfolds along the coast as a site for the densification of housing, production, relational, cultural and recreational functions;
• it is not a closed and protected area, but an osmotic interface, it is a permeable perimeter, sometimes rigid, but equally spongy, to the point of proposing itself as a "liquid" border of the city;
• it is not a local node, it does not end in its relationship with the city, but is the intersection of infrastructural beams (marine and terrestrial) that cross it and feed it; it is a node of an increasingly planetary network of relational energies, connected to other places, other cities, other waterfronts;
• it is not just a node, but above all a place formed by the intersection of uses, functions and flows: it is a creative synthesis of space and community, it is simultaneously a physical and relational place;
• it is not only history (it does not only express the need for conservation) and it is not only the future (it does not require to seize the opportunities of transformation), but it is a synthesis of identity and perspectives: it is a place where wise historical knowledge nourishes.

2

1 Georges-Pierre Seurat, **A Sunday Afternoon on the Island of La Grande Jatte**, Art Institute of Chicago, Chicago, 1884-1886.

2 Joseph Mallord William Turner, **Study of Sea and Sky** , Isle of Wight, 1827.

PART 2

Maresme, the territory: morphology, history of places and predictions

The territory is a work of art: perhaps the highest,
the most unanimous that humanity has expressed.
Unlike many artistic or technical works
which are produced by man by shaping inanimate matter,
the territory is produced through a dialogue,
a relationship between living entities, man himself and
nature, in the long time of history.
It is a choral, co-evolutionary work that grows over time.
The territory is generated by an act of love,
followed by the care of the growth of the other by
oneself.

Alberto Magnaghi, Il progetto locale.Verso la coscienza di luogo[3]

2.1 Historical and geographical framework

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Maresme = *lat.* maritĭma, same meaning as Catalan, "belonging to the sea".

This is the name of this region that the Romans identified for its close relationship with the sea and which consists of a sandy and flat strip of land, determined by the erosion of the granite stone mountains that precede it.
The proximity of the mountain range to the coast and its Mediterranean climate characterized by violent seasonal rains have determined the development of a natural torrential system for the disposal of water. This complex morphology consisting of the coastal plain, the mountain range, the rieres and the coastal strip, determines the characteristic and identity shape of the region.
The word "riera" refers to a sandy bed that carries water only occasionally as a result of heavy rain or long periods of rain. In the Maresme, the terms "riera" and "torrente" are used interchangeably, as both terms designate an intermittent and sloping river course.
Despite the singular strength and continuity of its natural elements, the Maresme region is fragmented by them. In fact, it is divided into two sub-regions at the point where, in the fringe between Caldes d'Estrac and Calella, the Serralada Litoral extends until it touches the sea. This geographical discontinuity will mark the history of the two sub-comarches, making it so that, historically, two administrative ones have also developed: the eastern one linked to the Viscount of Cabrera and the western one to the county of Barcelona.

The hydrographic network

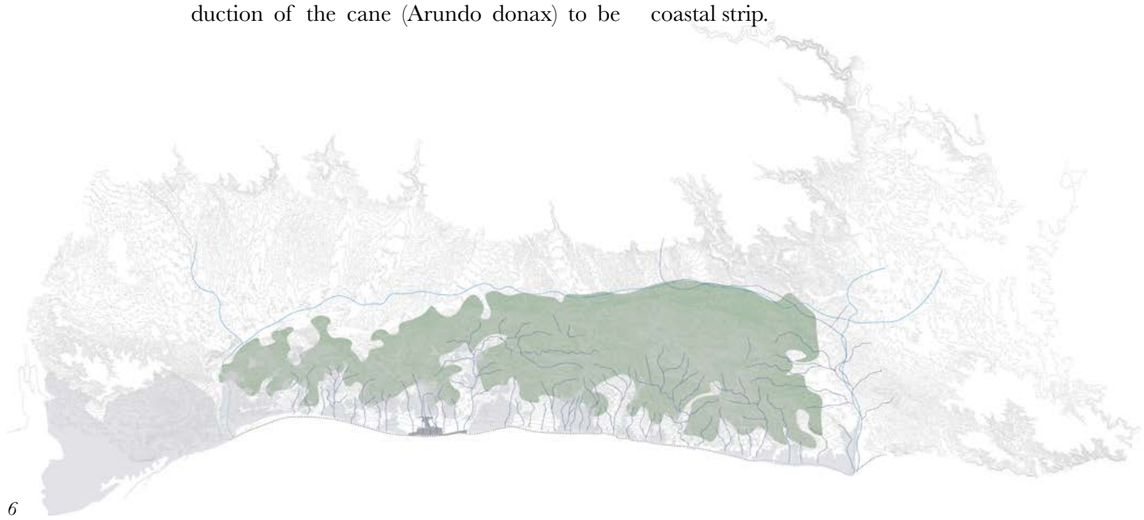
The torrents of the Maresme, perpendicular to the coastal ridge, often follow fault lines and collect small tributaries along the descent. They have always represented a very significant feature of the natural landscape and of the identity of this county, and also perform important hydrological, ecological and social functions.
They perform the important function of draining and channeling rainwater, recharging the aquifers (allowed by the materials that make up the bed of the streams), redistribute the sediments and constitute one of the most important natural ecosystems of the region (riparian forests) and represent the natural ecological corridors between the different elements of the landscape (mountain, beach, plain).
It is curious how the hydrographic network has traditionally been used (and still largely today) as a means of access to the territory: indeed, some waterways still coincide with the main urban axes and have structured the upper historical settlements ('Dalt' and 'Munt') and lower cities connecting them to each other.
These streams were the cause of the accumulation of sediments in the flat areas of the region, allowing them to resist the erosion caused by the sea by regenerating the sediments from the beaches. Furthermore, agricultural activity, which during the Middle Ages led to the increase of cultivated areas, caused an increase in the erodible surface (since the fields erode more easily than the forests) and the consequent increase in the volume of sediments constituting the beaches.
From an anthropological point of view, the streams have marked the main communication routes between the inland villages (Munt and Dalt) and the coastal ones. Indeed, they determine the location of many of these municipalities. The violence of seasonal rains determines the degradation of urban infrastructure (flooding of the plains and roads). Thus an attempt was made to control the irregular arrangement of the streams and their extent to protect and delimit the territory. One of the first interventions was the introduction of the cane (Arundo donax) to be able to fix the edges of the streams and control their path. From the mid-twentieth century, however, the option that was decided by various administrations was its underground canalization. In order to channel the streams and avoid the obstruction of these pipelines with the sediments they could bring, a series of measures have been implemented which consist in generating collection rooms at the beginning of the channel where the streams, before entering the sea, they leave the sediments. The lack of constant descent of the debris caused a decrease in sediment along the coast and amplified the erosion action of the coastline. Currently, the most suitable river-road coexistence system is the one adopted in Vilassar de Mar with the Cabrils stream in which the natural river bed is preferved and flanked by an urban promenade with a driveway. Furthermore, since during the end of the 20th century there has been a constant decline in the agricultural area of the region caused on the one hand by the deliberate urbanization between the 80s and 90s and on the other by the abandonment of this economic activity. The supply of sediments to the Maresme region was also guaranteed by the Tordera River and the submarine movement of sediments in a southwest direction by sea currents. The loss of flow of the Tordera, the decrease in the surface of the cultivated fields and the construction of several ports that act as dams for these underwater currents have increasingly amplified the erosive action by the sea and the consequent thinning of the coastal strip.

3 Catalogna in the European context

4 Catalogna and Maresme county

5 Maresme and Vilassar de Mar

6 Geographical framework



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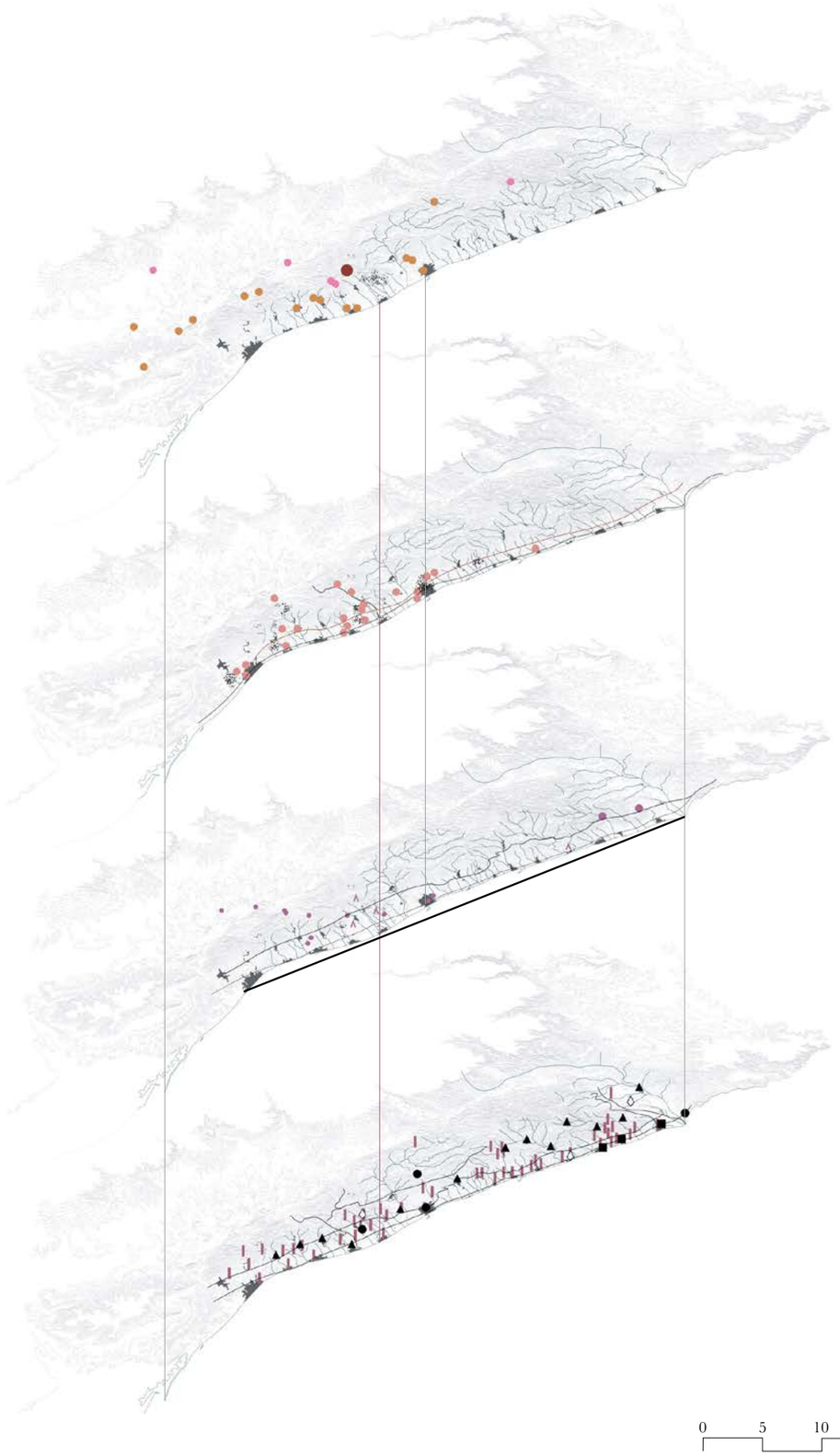


First settlements: prehistoric deposits

Roman deposits and reconstruction of the route of the Roman road

Approximation of the route of the Via Augusta which connected the populations of the Maresme

Middle Ages settlements

Reconnection of the medieval path, main urban centers and location of the main archaeological sites of the time

Types of medieval settlements and defense towers

Own drawing

0 5 10 20 Km

History of the places of Maresme

The oldest archaeological sites found in this area are the dolmens of Castellruf (which administratively is not Maresme but Vallès Oriental), Pedra Llarga (in Dosrius) and the Taula de les Bruixes (in Hortsavinyà).
The three sites are located within the mountains of Marina, Montnegre and El Corredor. It is also within the mountain ranges that we find several prehistoric and Iberian archaeological sites. According to Alexis Serrano Méndez4, the main Laietani sites in the Maresme are located in Premià de Dalt (Cadira del Bisbe), on the Montgat hill, near Tiana (Castellruf), in Montalt, in Sant Cebrià de Vallalta (Puig Castell), inside Calella (Turó de la Coma) and Pineda de Mar (Montpalau hill).
In Arenys de Mar we find the only exception near the coast (finding the Iberian village of Torre dels Encantats). The most important of all, however, was the Iberian village of Itluro (or Idluro) located on the hill of Burriac (municipality of Cabrera) which between the 4th and 2nd centuries B.C. dominated the territory of the Maresme.

Roman Age

It is in this historical period that, according to Joan Francesc Clariana i Roig[5], the first longitudinal connection of the region appears: the Via Augusta. This, drawn by the Romans following the decumanus of the cities crossed, also had a counterpart on the coast, as archaeological remains have been found in various points of the coast. It is also in this period that various infrastructures appeared, such as the Palafolls aqueduct, or when the tradition of vine cultivation was established.

Middle Ages

Under the Visigothic rule, the Roman villages fell into decay, just as the Augusta and Costa roads regained prominence in the settlements located within the mountains and in the roads that connect them. In preparation for the conquest of Barcelona by the Franks, the movement of troops to carry out the attack takes place along these internal roads of the Sierra de Marina (the smugglers' route) which will be articulated by the series of parishes and castles that the Franks build for articulate and safeguard the territory. Thus, in the post-Roman period, communications lost relevance in the flat area of the region.
Furthermore, the dangers posed by exposure to attacks and looting by sea mean that the towns are organized inland under the protection of the feudal lords or the church.

Graupera[6] present the models of urban growth that are developing in this historical period: the villages, entities of population with a market that is constituted as a unifying nucleus on which a city ends up developing; the sanctuaries, which are structured around a church for the protection it provides in its vicinity, and the new villages, created by the decision of the feudal lord who wanted to develop a territory following an orthogonal urban plan, based on Occitan scaffolding. These urban typologies mark the difference between the Lower and Upper Maresme: while in the Lower Maresme we find the presence of villages (origins Vilassar de Dalt, Mataró and Dosrius) in the Alt Maresme these urbanizations do not exist but the Viscount of Cabrera founds three new cities (Calella, Malgrat and Pineda).

Coastal surveillance

The danger of exposure to attacks and looting leads to the creation of a series of defensive and surveillance elements that characterize the coastal landscape: a series of towers and castles aligned on the first line of hills with respect to the coast.
According to Alexis Serrano, most of the towers were built between the 16th and 17th centuries. It also indicates that the Maresme area was called the 'turreted coast' due to the large number of towers, 55 of which have been preserved, but it is estimated that they were about double.

7 Historical urban settlements until 1850

8 Current situation: seamless urbanization

9 Main infrastructures

7

8

9

0 5 10 20 Km

Camì del Mig
N11 - Via Nacional
Via Nacional

The repopulation of the coast

The colonization of the territory, except in the case of the new villages of the Viscount of Cabrera (eastern sub-region of the Maresme), took place through a disintegrated system of farmhouses that cultivate free land. Historian Pere Benito i Monclús[7] explains that, although the collective imagination has cultivated the idea that coastal cities are born as a maritime quarter of inland villages, the real process has other reasons. The territorial expansion of the feudal lords' domains in the territory is produced by the annexation of lands close to the castles that defend it, that is, mountain lands and, as has already been indicated, only chapels and hermitages inherited from ancient Roman villages remained. Much of the coastal territory was therefore owned by the church. Therefore, for a series of tax and use concessions, different families establish their farms on this coastal territory and, although the coastal road can connect the different farmhouses with the hermitage to avoid being subjected to looting that smugglers or feudal lords could have exercised on land routes, communications and the transfer of goods take place by sea.

Thus, according to Benito i Monclús, the return of the settlements on the coast due to the restoration of coastal roads and of the communication systems and related services that appear (taverns, hostels to spend the night) will also grow these families, also in the activity of fishing by initiating the close relationship of these countries with the sea. The disparity in economic activities offered by these new settlements, the benefit of lower taxes and faster and safer means of communication soon led to their growth. Although still in relation to those original sanctuaries, the singularity of these nuclei will be distinguished, giving them the nickname of "de Mar" ("seaside neighborhoods").

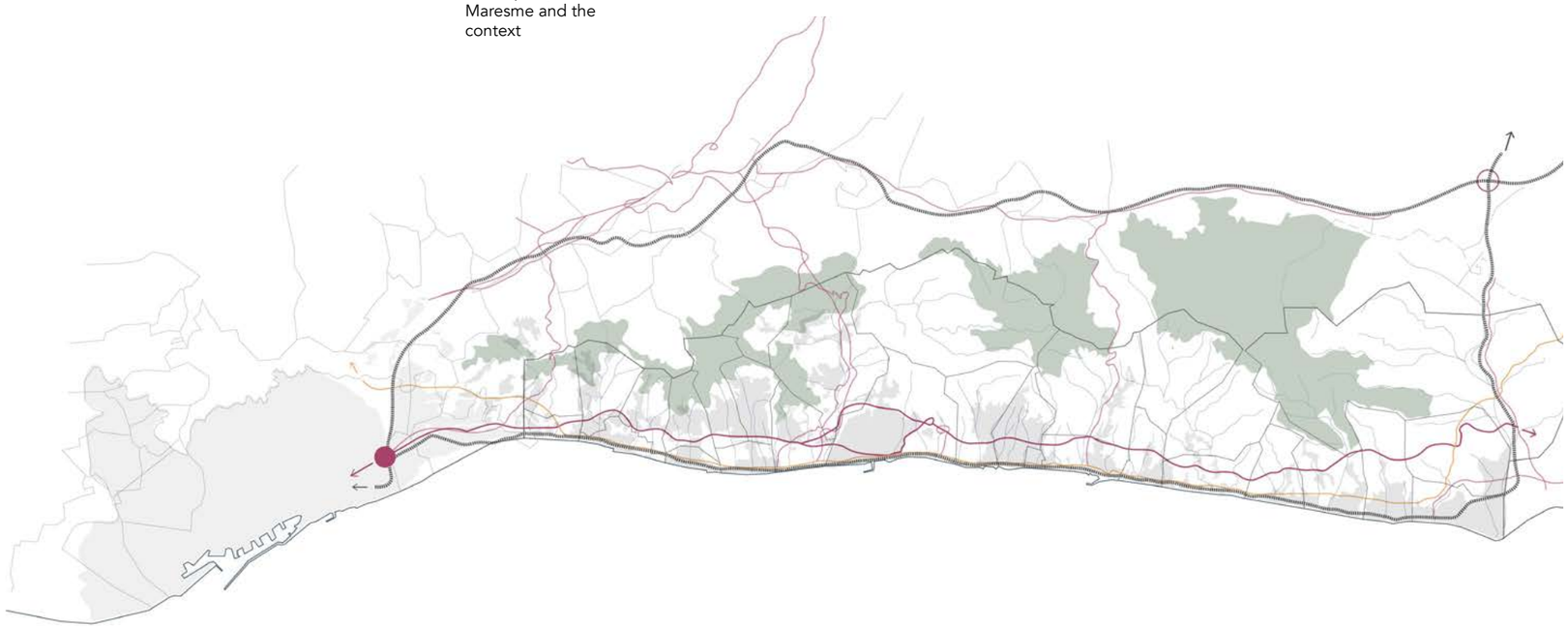
The arrival of the railway

Miquel Biada[8] of Mataró was the engine of the first railway line in the Iberian Peninsula, connecting Barcelona and his hometown.

The works began in 1845 and ended in 1848 with the maiden voyage. In 1857 the line extended to Arenys de Mar and in 1859 to Tordera. This connected operation allowed the transfer of people and goods from Barcelona and throughout the Maresme, changing its dynamics forever. The railway line does not support a large longitudinal slope, so it was necessary to position it in a point where the elevation was constant and easily solved in case of obstacles. It was chosen to position it parallel to the Camí Ral, or Camí de Baix, which connects the current maritime villages of the Maresme, running parallel to the coast right on the edge of the beach, which extends throughout the maresme at 4m from sea level, until then a diffuse and variable limit. It depended on various meteorological and natural aspects that would change its width, or even its existence. This appearance of the railway line begins as a boundary in physical space, but ends up evolving into a rift in the relationship that this city of Mar had established with it. If at the beginning the fishing activity could continue to take place with total normality, it was because in the majority of cases the cross traffic was not cut, but a series of conflicts began to arise when this direct and transversal relationship was interrupted by the other infrastructural gaps.

10 Infrastructural system of Maresme county

11 Relationship between the municipality of Maresme and the context



2.2 Pla Territorial Metropolità de Barcelona
(Metropolitan Territorial Plan of Barcelona)

The Pla Territorial Metropolità de Barcelona (PTMB - Metropolitan Territorial Plan of Barcelona) includes the territory covering the comarches of Alt Penedès, Baix Llobregat, Barcelonès, Garraf, Maresme, Vallès Occidental and Vallès Oriental, with an area of 3,236 km2 distributed between 164 municipalities, each of which has its own entity and local government. The PTMB presented was elaborated in development of the Territorial Planning Program and is the result of a work carried out over a period of almost six years between 2005 and 2010 with analysis and future forecast for 2026.
The studies reveal two main main imbalances of the Catalan territory: depressed areas, on the one hand, and congested areas, on the other. The characteristics that condition and define these areas are essentially linked to the territory, such as their link to natural resources and their strategic position.
The increase in means of mobility of all kinds and the speed of the latter today make all areas of the Catalan territory more easily connected, which further promotes territorial mobility and strengthens the character of the functional unit.
The basis of the plan is the need to seek solutions to the congestion of the city and the countryside: human activity tends to spread throughout the country (plains, mountains, sea) and due to the use and standardization of green and natural spaces of the territory, which require regulation and protection.
The Territorial Program establishes three territorial subsystems on which all proposals must be structured: the system of open spaces, the system of settlements and the system of infrastructures for mobility.

System of urban spaces

As a starting point, it is necessary to identify the natural, agricultural, cultural, social and strategic values of open spaces in order to protect and manage them appropriately, and thus ensure an adequate structure and functioning.
The morphological matrix is a rich and varied set of systems and landscapes (coastal, fluvial, flat, piedmont, mountain), also the result of man's modification of the natural

environment through agricultural activities, exploitation of resources, land occupation and transformation and urban infrastructure integration.
In recent decades there has been a substantial change in the socio-economic model, which has had a significant impact on metropolitan open spaces. These dynamics are substantially due to a progressive loss of economic interest in open spaces (linked to agricultural, livestock and forestry activities), with the consequent abandonment of traditional management. This has led to an imbalance of ecosystems and a homogenization of landscapes causing a loss of natural and landscape values.

The policies for the protection of open spaces in 1972, carried out in the metropolitan region by the Provincial Council of Barcelona, and until the mid-1980s, provided for an isolated and unique planning and management of open spaces relative to each of the spaces to be protected, isolating it from the rest of territotial planning. Only in the early 1990s were changes made in the perspective of the planning strategy of open spaces: the concept of an island of nature entered into crisis, as all the elements of the territory are related to each other. The system of open spaces is now conceived as a network that must be built from the understanding of its territorial diversity and according to conservation and improvement criteria and, therefore, must be structured taking into account the spatial, ecological and functional values of the spaces that compose it. Thus, in the mid-1990s, the Diputació de Barcelona (local government institution) echoed the new formulations and proposed a system of open spaces for the metropolitan region called "Anella Verda". The proposal designs a network of natural spaces based on the connectivity of forest masses, agricultural areas and natural spaces, and has led to the creation of a series of new parks (Parc de la Serralada Litoral (1992), Parc de la Serralada de Marina, Parc del Foix, Parc Agrari del Baix Llobregat) which host important sets of ecological elements and processes already in good condition and without significant disturbance effects of anthropogenic origin.
In this sense, the layout of the open spaces of the metropolitan region of Barcelona makes it possible to establish a good structure to develop the territorial plan and, at the same time, guarantee the ecological quality of this territory. It is an asset that has not lost sight of the fact that it is immersed in a globalized world and with trends that are difficult to change, but which establishes a basis that allows us to face more environmentally-friendly planning with greater guarantees from a perspective of sustainability. The strategic lines of the Territorial Plan establish models of settlement and mobility infrastructures that redirect the inadequate dynamics of occupation of the territory and that must be integrated and in line with a solid model of protection and management of all open spaces in order to guarantee their safety and survival in tense territory such as the metropolitan region of Barcelona. Therefore, as a starting point, it is necessary to identify the natural, agricultural, cultural, social and strategic values of open spaces in order to be able to protect and manage them appropriately, and thus ensure an adequate structure and functioning. In this sense, the Maresme encloses a very high density of agricultural areas of interest, which also structure the entire marine side. The flat and coastal areas have logically absorbed most of the growth of the region and, consequently, the open spaces cover a smaller area and often have a high fragmentation and isolation, and an unfavorable state of conservation. However, it is surprising that there are still elements of great interest in the midst of highly transformed areas, which deserve special attention as they structure the territory (settlement dividers, connectors, peri-urban agricultural activities, quality landscapes, public use) which confer to these pieces a unique strategic value that should be maintained and improved.
Through the system of open spaces, the Plan indicates the parts of the territory that must be preserved from urbanization and, in ge-

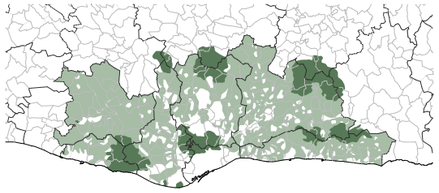
12 Protected natural areas in 1980

13 Protected natural areas in 1990

14 Protected natural areas in 2006

15 Green belt provided by the Pla Territorial Metropolità de Barcelona

16 Ecological relevance of the Pla Territorial Metropolità de Barcelona



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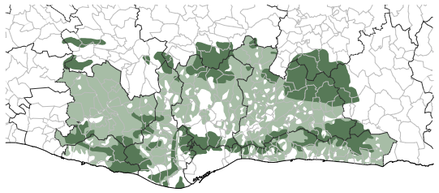

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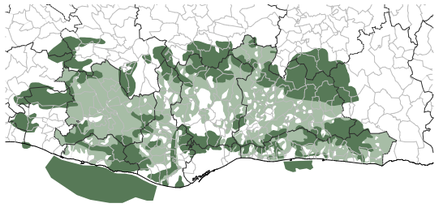

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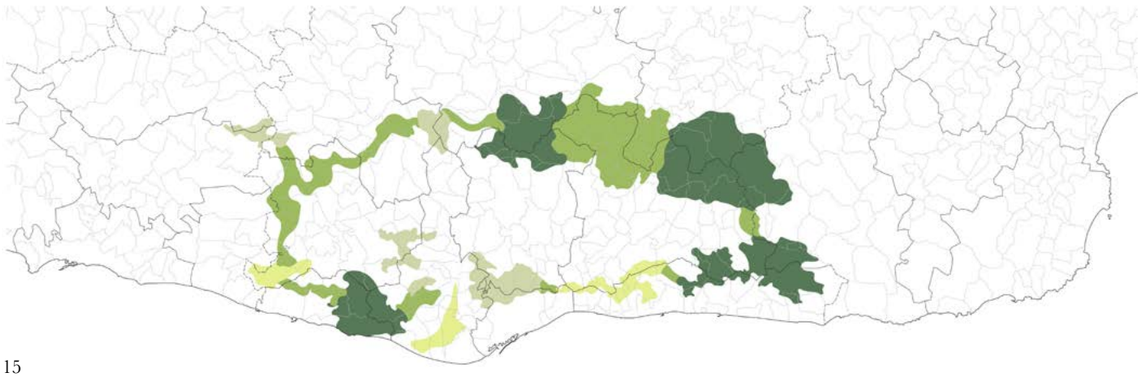

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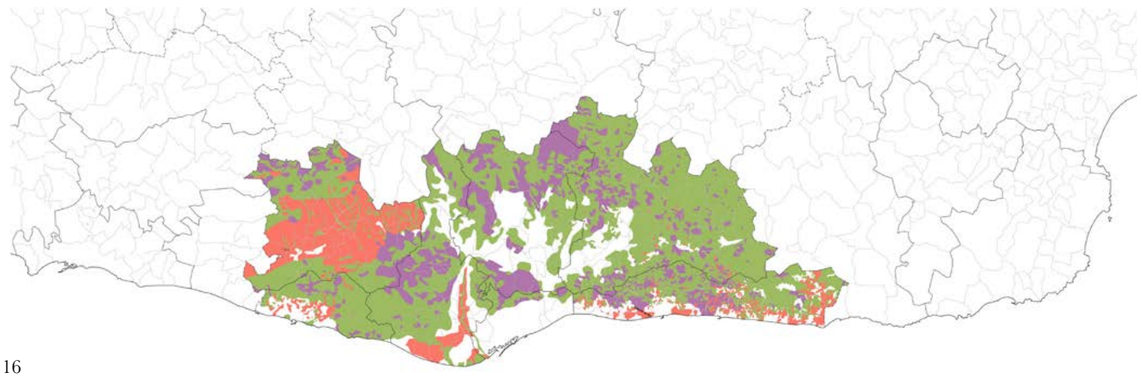
Protected natural parks
Protected agricultural park
Other green areas under PEIN protection
Ecological connectors of PEIN

PEIN - Pla d'Espais d'Interès Natural - Plan of Areas of Natural Interest



16

Naturalistic areas
Agricultural areas
Ecological connectors

0 10 20 40 Km

neral, from processes that could negatively affect its landscape, environmental, patrimonial and economic values, without prejudice to the actions that may be authorized in the circumstances and conditions established by these rules.
There are three basic types of spaces based on their characteristics and the proposed level of protection:

1. Special protection areas for their natural and agricultural interest - They are those with a highly restrictive degree of protection regarding the possibility of transformations that could affect them. Due to their quality and strategic arrangement, these spaces guarantee, on the one hand, the maintenance, development and movement of the species and, thanks to the construction of connectors, reinforce and ensure the ecological permeability and guarantee the permeability of the territorial matrix. This category includes those areas that are part of the protection areas established by the sector regulations (Plan of Areas of Natural Interest (PEIN) 9, the Natura 2000 network10) - and those that the Plan considers it necessary to preserve it.

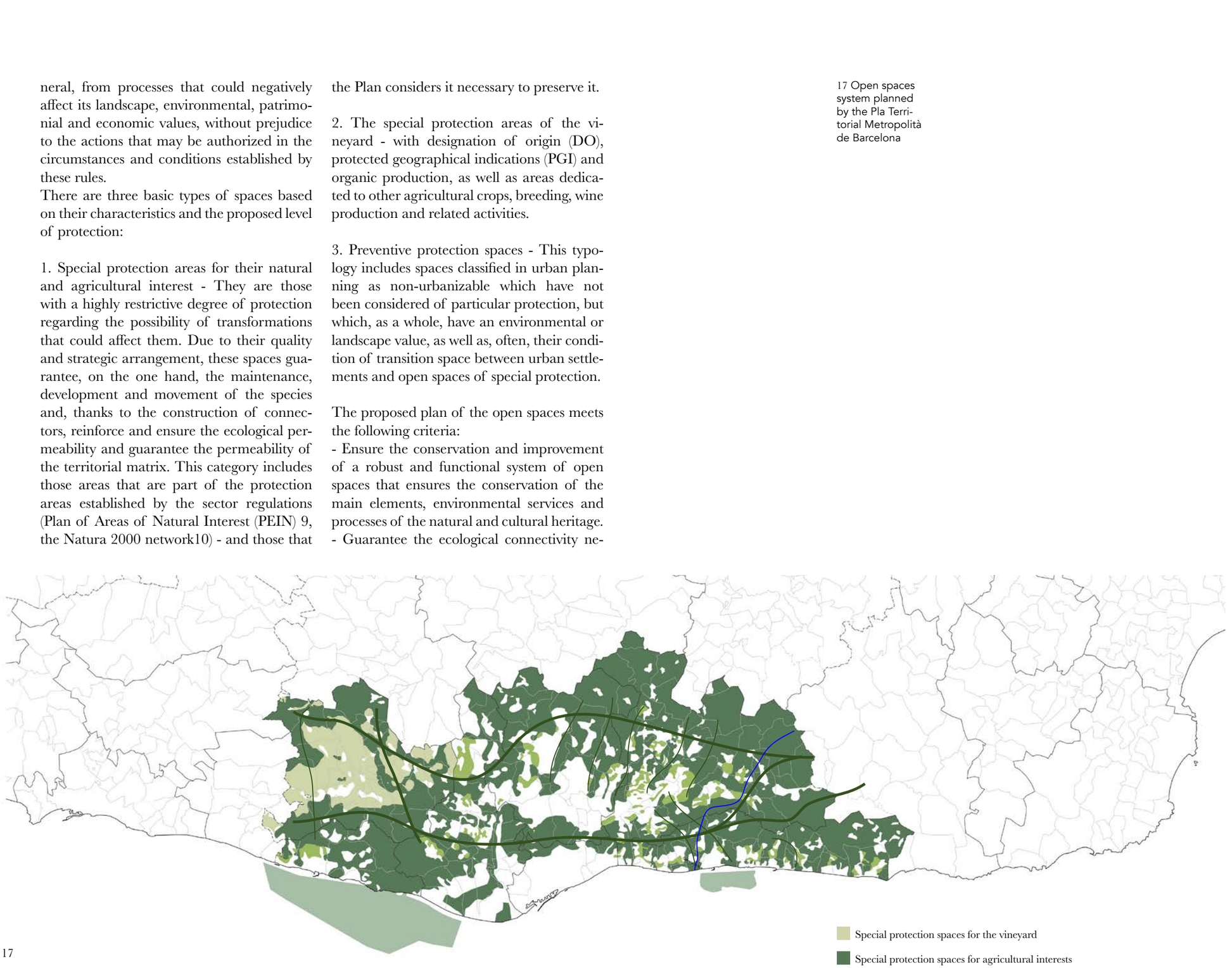
2. The special protection areas of the vineyard - with designation of origin (DO), protected geographical indications (PGI) and organic production, as well as areas dedicated to other agricultural crops, breeding, wine production and related activities.

3. Preventive protection spaces - This typology includes spaces classified in urban planning as non-urbanizable which have not been considered of particular protection, but which, as a whole, have an environmental or landscape value, as well as, often, their condition of transition space between urban settlements and open spaces of special protection.

The proposed plan of the open spaces meets the following criteria:
- Ensure the conservation and improvement of a robust and functional system of open spaces that ensures the conservation of the main elements, environmental services and processes of the natural and cultural heritage.
- Guarantee the ecological connectivity necessary for the maintenance of biodiversity and the health of ecosystems and the conservation of geological values and wetlands.
- Preserve the lands necessary for the hydrological cycle and keep wetlands in good condition.
- Promote maximum ecological continuity.
- Contribute to ensuring the continuity of agricultural activity and the rural landscape.
- Promote the management and protection of the rural landscape.
- Avoid urban implementation processes in poorly communicated areas, unsuitable for orography or subject to risks, as required by town planning legislation.

Beyond the purely quantitative data, the strength of the proposal is based on the fact that it guarantees the continuity of these spaces, so that, with the exception of very specific points, both mountain ranges are covered and crossed by an uninterrupted strip of protection special. Alongside this longitudinal continuity along the two mountain ranges, the corridor system allows, at the same time, the connection between the corridors themselves.

17 Open spaces system planned by the Pla Territorial Metropolità de Barcelona



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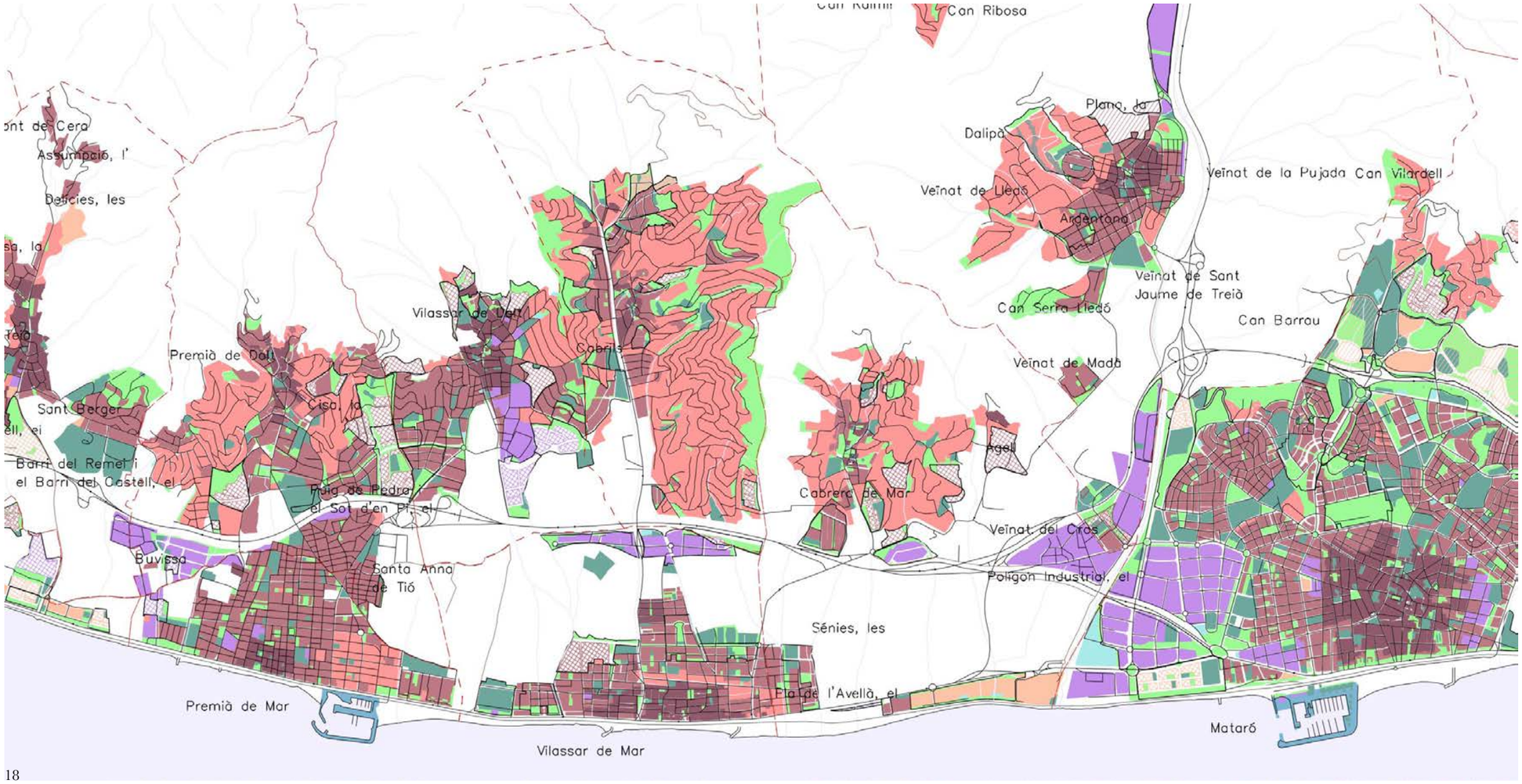
The urban system

The population and work activity scenarios show how the metropolitan region could in-

crease the population between 302,243 and 941,189 until 2026. This would mean, as we have seen, an increase in demand including new main homes and a consequent intense urban planning. It is prudent, however, to estimate that not all of this housing potential will be consumed in the time horizon of this Territorial Plan, located in 2026.
The Plan distinguishes three basic types of urban areas.
1.The inter-municipal urban continuums, which, in the case of the metropolitan region of Barcelona and their high level of urbanization, end up being the most notable. On these continuums, the Plan establishes the rules based on their characteristics: urban centers, strategic metropolitan functional areas, urban transformation areas of metropolitan interest, urban extension areas of metropolitan interest, new urban centers, specialized residential areas to be restored, areas specialized industries to consolidate and equip, metropolitan nodal reinforcement areas.
2. Urban nuclei, understood as settlements of a complex nature formed by historical nuclei and their extensions by continuity that do not fall within the category of inter-municipal urban continuums. For these nuclei and urban areas, the Plan establishes different strategies depending on the size, characteristics, accessibility and availability of land physically suitable for growth by extension
3.Specialized areas, the result of isolated places for the development of specific uses: residential, industrial, tertiary, equipment, etc. With regard to these areas, the Plan, like the other Territorial Plans, has a clearly restrictive attitude towards the creation of new implementations of this type and only assigns the change of destination / reform and reduction strategies.

The purpose of the Plan is to formulate a territorial model that enhances the quality of all types of cities (central and peripheral nucleus) but is also to prevent the "continuing city" from exceeding its current limits and extending by absorbing the nuclei differentiated.
The plan aims to strengthen the secondary Catalan cities to create a system of cities in the metropolitan area as sources of their urban environments, with good articulation both with the central metropolitan area and with the other cities of the Catalan urban system. The Plan establishes the guidelines for an urban evolution which has five operational principles:
1. Efficient use of land. The reuse, renovation or renovation of existing urban land is preferable to new urbanization extensions.
2.Nodality. Urban expansion, which is also necessary, should preferentially be oriented towards nodal strengthening: increasing the reach of cities and creating centrality and articulations in continuous systems.
3. Mixed and balanced uses.
4. Network. The opportunities for railway intervention must be addressed together with the management of uses and housing to maximize the population served by these means.
5. Integration with open spaces. The network of open spaces, which the Plan must create by strengthening its spatial continuity, must be an active component of the design.

18 Urbanizable land: map of the Pla Territorial Metropolità de Barcelona



The mobility system

Per quanto riguarda la sistemazione e la progettazione del sistemia viabilistico il PTMB analizza in principio una serie di problematice relative alle diverse infrastrutture viarie.

Road network

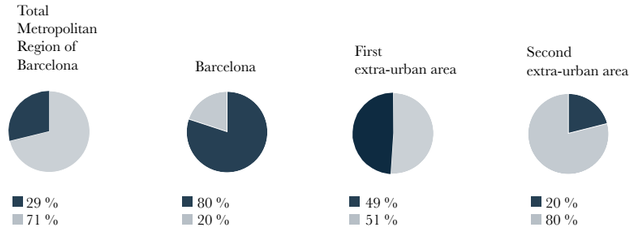
- Overload: the high-capacity metropolitan

road network supports traffic of very different characteristics, motives and destinations, both of people and goods. This mix of traffic overloads the existing network and, in addition to the increase in the harmful effects on the environment caused by the resulting congestion, limits the possibilities of developing a balanced and suitably interconnected regulation system);
- Lack of mesh: the lack of roads that allow the connection of other urban centers with each other and with the rest of the Catalan territory increases the times and distances needed to travel as the system forces you to pass through Barcelona
- Lack of capillarity: the effects of this shortage translate into problems such as the circulation of heavy vehicles on local roads or congestion at motorway exits when traffic flows directly on a local or directly urban road without sufficient absorption capacity.

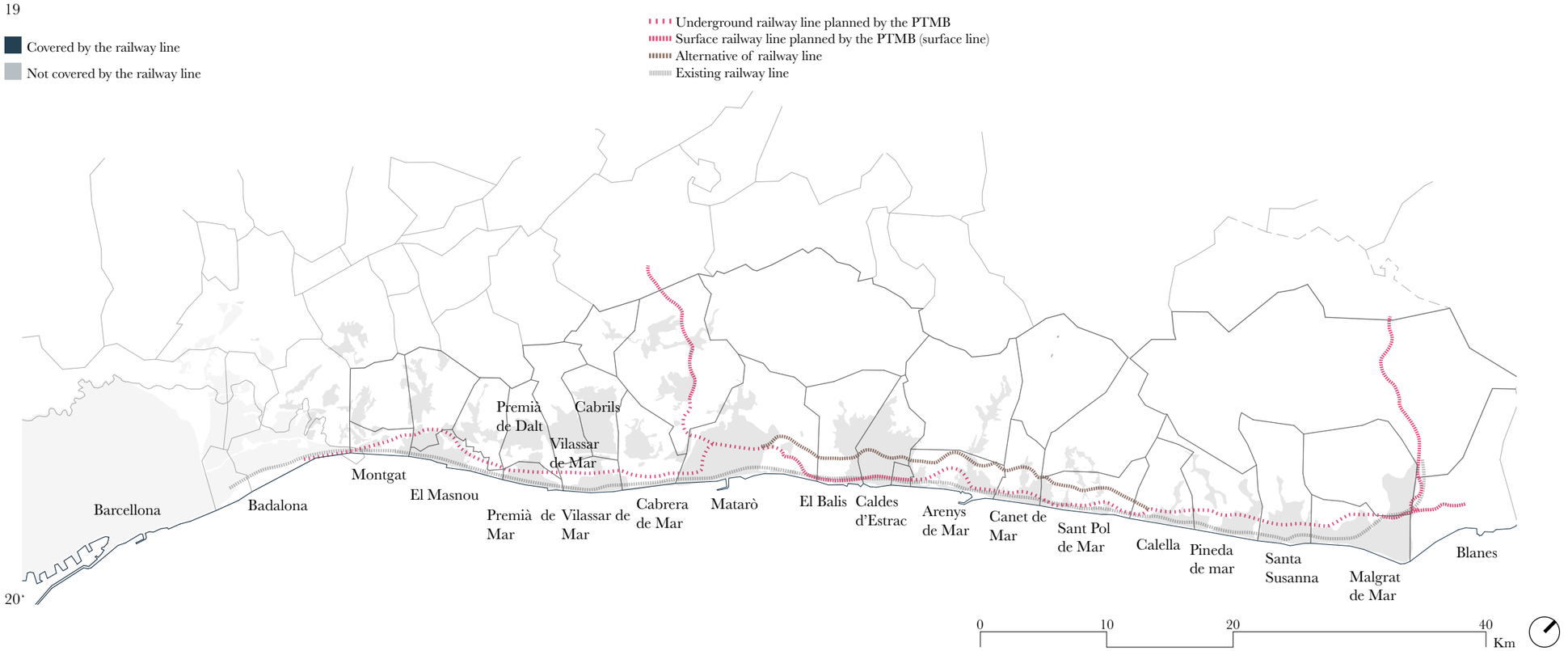
Based on these limitations, the plan formulates a series of points of need:
- Differentiate traffic;
- Complete the current radial structure of the road network with another that increases the connectivity of external nodes in the center of the region;
- Define design criteria for these roads, ranging from urban roundabouts to "park roads", with variable sections and characteristics depending on the topography and the urban and environmental needs to which they must meet;
- Design and size the road network taking into account the role that the railway network and bus services will play in the future, especially with regard to access to Barcelona, with the aim of achieving a distribution more inclined to public transport;
- Be in line with the development forecasts of the settlement system and the system of open spaces.

The railway network

- Lack of radial connections: the railway network has no direct connections between the peripheral nodes, that is, it forces you to pass through the center of the system.
- Lack of interchanges between lines and other means of transport: the global accessibility of the network is reduced by the lack of connections between the various lines that allow more direct and faster movements. In the same way, there are few possibilities of combining the railway with other means of transport of greater flexibility that allow this system to reach the capillarity in the territory that cannot be achieved efficiently by rail transport alone.
- Lack of coverage of some territories
- Most of the occupied territory (urban land) or of foreseeable occupation (urbanizable land) does not have a railway station within an easy walking distance (1,000 meters). This situation is particularly serious outside the scope of the Metropolitan Transport Authority, which comprises 41.5% of the population and has only a railway coverage of 20% of its urban and urbanizable territory.
The plan states that:
- It is necessary to complete the railway network with new lines that connect the center of the metropolitan system with some corridors that do not yet exist, at the same time other sections are developed that complete this radiality with a mesh structure that mainly covers the areas of the second metropolitan ring that tends to concentrate the most important population growth;
- It is also necessary to ensure the elements that allow the articulation between the various lines and between the railway system and the means of road transport, private or collective;
- Travel times must be reduced, especially between the nodes of the second crown, by exploiting the lines of other services to establish regional railway services and by carrying out interventions on existing lines to allow the existence of fast services with fewer stops;
- Adequate levels of connectivity must be guaranteed to the development forecasts of urban settlements, with particular attention to the areas of metropolitan nodal reinforcement.
- Promote a good adaptation of the routes to the conditions of the biophysical matrix of the territory and minimize the barrier effect of linear infrastructures, moderating land consumption by mobility infrastructures, and avoiding unnecessary duplication.



19 Current railway coverage (1000m from the stations)



20 Displacement of the railway line planned by the Pla Territorial Metropolità de Barcelona

Pla Territorial Metropolità de Barcelona - The Maresme county

The urban area of Maresme includes all the municipalities that make up the region of the same name, with the exception of the two southernmost ones (Tiana and Montgat) which, due to their proximity and level of relationship, are integrated into the AMB.
For the municipalities of the Maresme re-

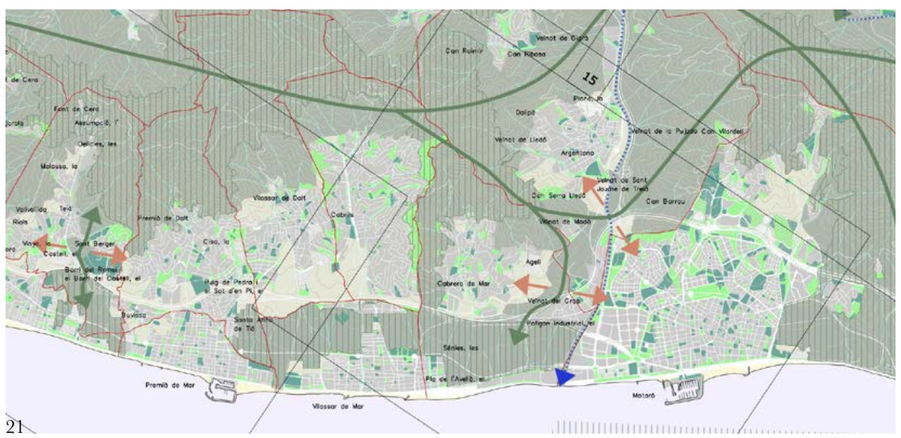
gion, sufficient urban plans and territorial areas will be used to coordinate municipal urban planning in those aspects that have clear supra-municipal implications. These urban master plans are proposed as a coordinated set of urban planning.
Due to the elongated structure of the region, four main subzones can be identified:
• The Baix Maresme. Integrated by the municipalities of Alella, Cabrils, el Masnou, Premià de Dalt, Premià de Mar, Teià, Vilassar de Dalt and Vilassar de Mar.
• The urban system of Mataró. Integrated by the municipalities of Argentona, Cabrera de Mar, Caldes d'Estrac, Dosrius, Mataró, Òrrius, Sant Andreu de Llavaneres and Sant Vicenç de Montalt.
• The urban system of Arenys. Integrated by the municipalities of Arenys de Mar, Arenys de Munt, Canet de Mar, Sant Cebrià de Vallalta, Sant Iscle de Vallalta and Sant Pol de Mar.
• The Alt Maresme. Integrated by the municipalities of Calella, Malgrat, Palafolls, Pineda de Mar, Santa Susanna and Tordera (without prejudice to the possible extension of the scope of cooperation for urban planning purposes in the municipalities of the north of La Tordera, of the waterfront of the forest region).

The system of open spaces has been organized following the various massifs that make up the Coastal Cordillera and expanding and reconnecting the areas that already enjoyed supra-municipal legal protection, from La Conreria and Sant Mateu to Montnegre. The Plan also protects those corridors that connect the aforementioned areas, substantially mountainous, with those located along the coast, so that the arrival of the protected areas to the sea is guaranteed and the occupation of the coastal plain is avoided without a solution for continuity, as established in the Urban Development Plan for the Coastal System (PDSUC).
The Plan distinguishes between two basic types of settlement strategies. In the coastal area, the occupation of the waterfront has given rise to an urban continuum, strategies are proposed to intersperse this massive urbanization. Secondly, for settlements located in the mountains, where the continuity of open spaces acquires particular importance, fundamental strategies are established, substantially of moderate growth.
As regards transport infrastructures, the proposal provides for the transfer of the Barcelona-Mataró suburban line in the hinterland, in order to increase its territorial coverage on some urban nuclei that have been extended inwards, improving the environmental quality of the facade coastal area of the affected populations.

21 System of open spaces planned by the Pla Territorial Metropolità de Barcelona - Areas of interest

22 Infrastructure system planned by the Pla Territorial Metropolità de Barcelona

In the central Maresme, between Mataró and Calella, it is a question of acting on the coast to overcome the impact it generates on the coastal facade with environmental improvement interventions and local railway variants or by shifting the current layout that allows a longer-range inter-municipal variant with changes to the location of the stations.
Finally, the splitting of the extra-urban line in the Alt Maresme, necessary to increase transit frequencies, which also raises new considerations on the construction of the current coastal route and on the approach of alternatives.
The coastal railway route listed in the PTMB responds to various studies carried out before or during the development of the Plan works, and must be specified with the preparation of the corresponding information studies on the projects to be developed, but in any case these projects must consider, in addition to the related aspects the functionality of the infrastructures, those relating to the environmental impact on the natural, agricultural and urban environment and the situation of the new stations as key locations for the location of the new centralities. In the areas of "new centrality" the ordinances, uses, intensities and equipment of general interest to be located will be specified, on the basis of the new railway "accessibility" that the new stations will generate. These newly centralized areas and the sectors to be developed in central and more accessible locations will have to provide service deficits and balance the most unbalanced systems in terms of population and jobs, in particular the Baix Maresme and the Arenys urban system.
As regards traffic, the proposed actions are essentially to improve the interior and improve the connection with Vallès: creation of a new distribution system for the county's internal traffic in parallel with the C-32 motorway between Montgat and Pineda de Mar with several alternative options for the sections, the Conreria tunnel (B-500) to connect the south of the Maresme with the Vallès plain without passing through Barcelona, and the improvement of the routes from the roads from Alella to Vilanova del Vallès and from Arenys de Mar to Sant Celoni, with variations to Arenys de Munt and Vallgorguina.



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Ecological corridors of the project

River corridor of Mataró

Railway planned by the PTMB

Replacement of the old railway with a new tram line

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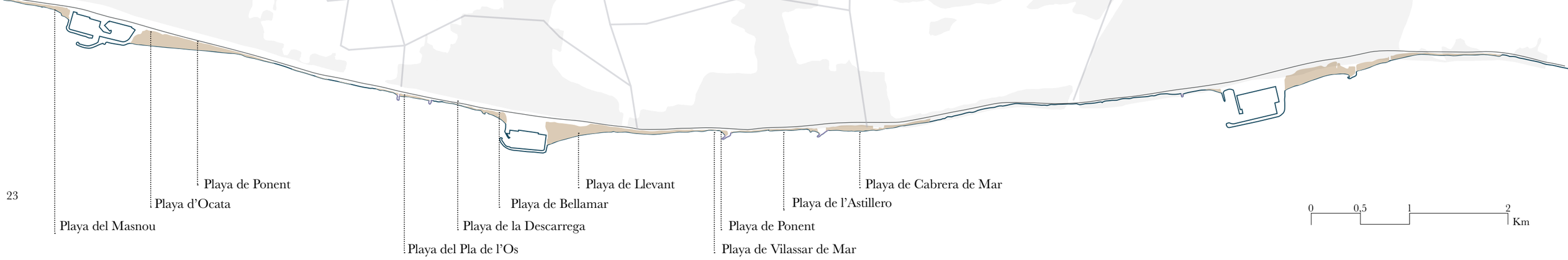

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23 Mapping of the beaches between el Masnou and Mataró and areas of sand accumulation

24 Rates of longitudinal transport of sediments due to the action of currents and waves (in thousands of m/year)

2.3 Coastal dynamics studies: strategic action in the Maresme

Technical Report of the Secretary of State for the Environment

Proposals for the defense and redevelopment of beaches with erosion problems, considering the effects of climate change

Ministry of Agriculture, Food and the Environment - General Directorate of Coastal and Sea Sustainability

Before tackling the project on the Vilassar de Mar waterfront, it was necessary to carry out a specific study on the themes of coastal defense. The focus of this chapter is the technical report of the Ministry of Agriculture, Food and the Environment, who specifically describes the problems present along the entire coast of Maresme, as well as the changes it has undergone in the over time with serious repercussions on the current situation. This technical report was drawn up with the aim of studying the entire Maresme coast, identifying problem areas and imagining a global solution that includes multiple landscape, environmental, social and economic values of the territory.

This study was carried out in two phases:

• In the first phase: identify the state and behavior of the Maresme coast;

• In the second phase: coastal defense implementation proposals

Actual conditions of the coast of Maresme

The state of the sedimentary coast of Catalonia is very "delicate", as it is subject to a progressive process of erosion, the result of which is defined by the loss of surface area of the beaches, generated as a result of conflicts in their use and exploitation, as well as by exposure to existing infrastructure and wave action.

The Green Book of the coast of Catalonia has a description of the entire set of beaches that make up its coast and, of all the coastal sections. The study deduces that the highest erosion rates correspond to the beaches located in the Maresme area.

The current structure of the Maresme coast is conditioned by the subsequent interventions that have been carried out to locate the infrastructures on the coast. First with the construction of the railway from Barcelona to Mataró, which was located on the coast, conditioning both the development of the cities and the activity and use of the beaches, which led to the need to shovel a large part of its front to protect the tracks of the train. Subsequently, ports were built on the front, preventing the course of the sedimentary flow which essentially flows from north to south. Furthermore, streams and streams have had their conditioned sedimentary activity. The Green Book of Catalonia indicates that, within all of these beaches, those with the highest erosion rates are those located south of the ports.

The Costa del Maresme is divided into three coastal systems: Río Tordera-Arenys de Mar, Arenys de Mar-Mataró and Mataró-Montgat. These are not only independent but also differ from the point of view of social and geographical use:

First sector: from the Tordera river (Malgrat) to Arenys de Mar;

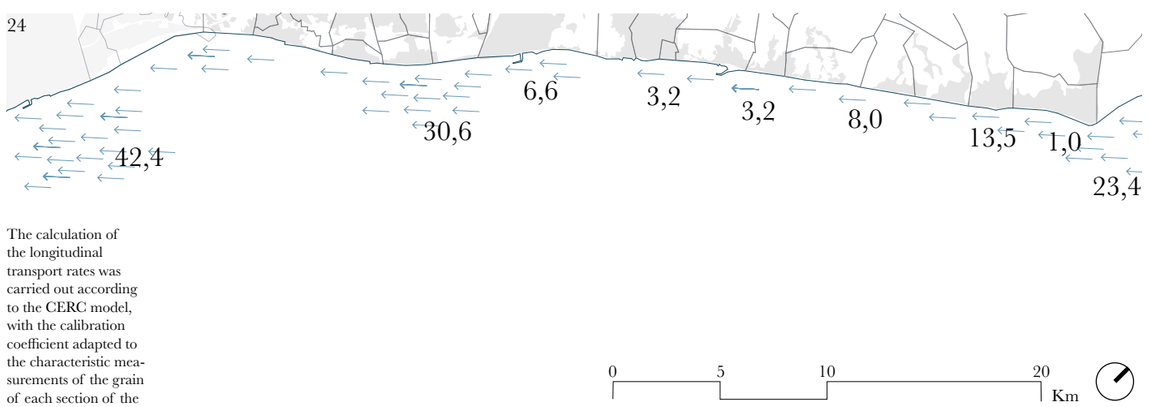
Second sector: from Arenys de Mar to Mataró:

Third sector from Mataró to Montgat

Vilassar de Mar is located in the third sector, still considered within the metropolitan area of Barcelona. The coast is very fragmented due to its marinas and the railway line, which forms a clean cut between the coast and the urban areas. The coast is very eroded with great imbalances produced by the marinas, and therefore has absolute priority within a regeneration program of the Maresme coasts.

The actions that occur must meet at least the following requirements:

• The compatibility between a natural movement of sediments along the coast and the



The calculation of the longitudinal transport rates was carried out according to the CERC model, with the calibration coefficient adapted to the characteristic measurements of the grain of each section of the coast and according to the Kamphuis model.

stability of the beach conformation, with a certain balance, over time, must be considered.

• It is possible to act differently over time in each of the systems; but taking into account the connections between them and the repercussions they can produce from one to the other, and they can be extensible for subsystems.

Effects of climate change on the Maresme coast

A first source of information to be taken into account in analyzing the effects of climate change on the coasts of the Maresme is the document, called the National Plan for Adaptation to Climate Change11, which serves as a general reference framework for the assessment of impacts, vulnerability and adaptation to climate change, carried out by a number of Spanish institutions and large groups, for the Spanish Office for Climate Change.

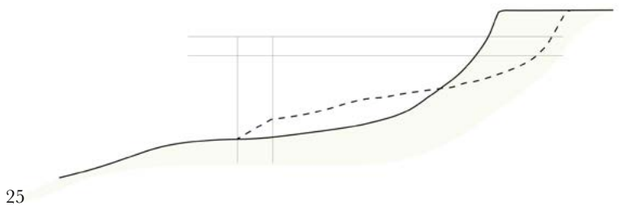
Among the sectors or systems that it contemplates and lines of action, there are the coastal zones, with a subjective estimate of the planning horizon for adaptation, between 10 and 100 years.

According to this graph, sea level rise is estimated to be between 1.0 and 0.25 m in the year 2100.

These figures are, in the year 2050, about 0.32 and 0.15 m. For the four new emission scenarios (RCP). The measurements provided by the IPCC (Intergovernmental Panel on Climate Change - 2001) 12 for the twentieth century indicated an elevation rate between 1 and 2 mm / year; although this rate may be higher, some authors set it at 2.5 mm / year (Marcos et al. 2004).

Proposal for implementation

The theoretical analysis of the possible effects of climate change on the Spanish coast must distinguish the different types of structures, considering: beaches; dunes; estuaries, wetlands and lagoons; maritime works. The final idea is to keep a beach with some stability around 60 m wide, except at the ends, near the breakwaters, where the sand will tend to accumulate and increase its width. Maintenance should be planned through sand management to try to ensure that there are no areas less than 30m wide. Therefore, material feedback should be sought within the cells and, if applicable, within the subsector. Finally, accessibility and accessibility along the beach need to be improved; hard walks are not recommended, but rather walkways or soft structures.



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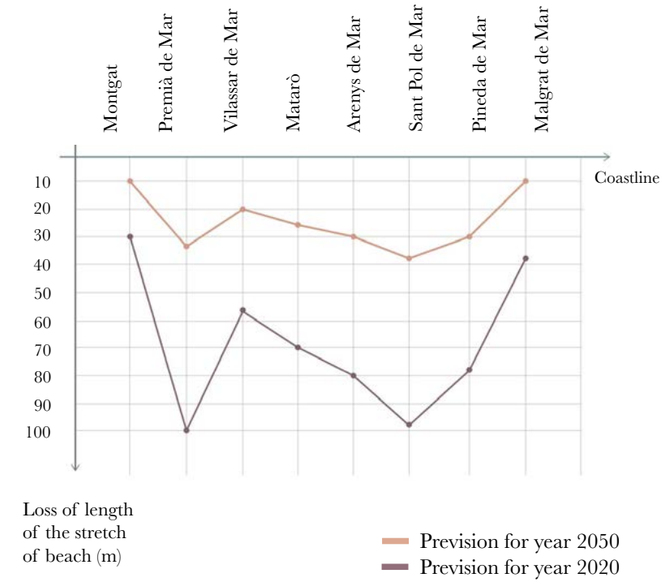
1995 - 2002 erosion of 15 m except north of the breakwaters
2002 - 2005 erosion of about 14 m except to the nod of the breakwater

25 Evolutionary summary of the coastline of sector 3 of the Maresme between 1995 and 2005



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26 Graph of the erosion trend in the Lower Maresme

(Data from the Technical Report of the Ministry of Agriculture, Food and the Environment)

Once the considerations on the variables that condition the implementation phases of a strategy such as the one proposed in this study have been exposed. The following will be considered a priority:

1. Coastal dynamics and the consequences of the action
2. The need for play and beach defense
3. Social demand
4. The degree of priority given to performance

Priority variables

The social, economic, environmental and safety variables must be incorporated into one of the functions required by the beach: playful or recreational. The environmental variables would be partly included in the functions required of the beaches, as habitat, since within this environmental aspect we have tried to make the stretches of coast as natural as possible. There are stretches of coast and places where this natural aspect is still appreciated; especially in sector 1. In these places one should try to act as little as possible, trying to ensure that the actions carried out in the sector are not in any way detrimental to this natural element of these traits.

Considerations about the PTMB

In general terms, the plan proposes actions that must be adopted in the three different geographical areas: the Baix Maresme area, the Alt Maresme area and the border area between the two.
Since this work does not focus on the study of population growth or urban development, it has proved more appropriate to reflect on mobility infrastructures and the system of open spaces.
The theoretical proposals of the Pla Territorial Metropolità de Barcelona relating to the system of open spaces are appropriate for the themes of recovery of green corridors and improvement of hydrographic basins of which, however, no specific proposals are made.

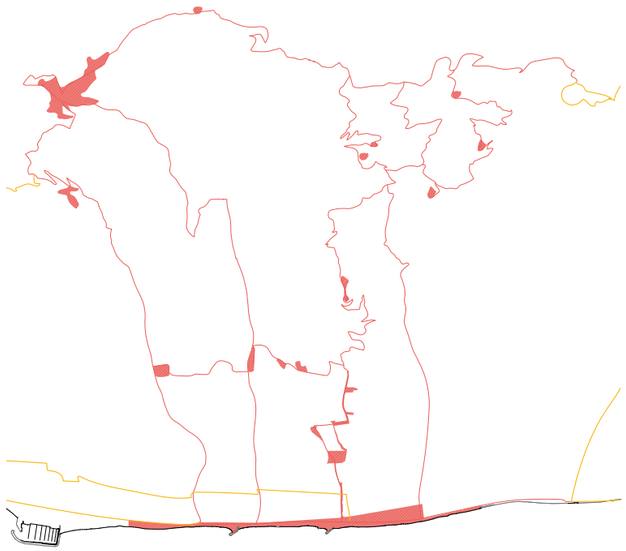
In the subsystem of mobility infrastructures, the strategy of maintaining mobility throughout the region of the flat area and of maintaining the connecting branches between the coast and the interior perpendicular to the longitudinal communication systems is strengthened, i.e. the effectiveness of the 'comb' strategy, but its shape is reconsidered to bring the road and rail axis closer in the areas of greatest economic activity, without separating from the public function of communication and passenger transfer.

In line with the PTMB, a series of principles are taken up which were then converted into guidelines for the project:
1- Mobility infrastructures that allow the territory to continue to be connected despite the change in the existing railway line.
2- Permeability of the limit. Recover the continuous relationship between coastal cities and the sea by eliminating the limit that large-volume infrastructures determine.
3- Recovery of the beaches. The impossibility of returning to the previous state due to the construction of the marinas means that the realistic proposal for the treatment of the Maresme beaches implies working with waterfront proposals capable of operating even in points where the beach has now almost completely disappeared.
4- Strengthen the sea-mountain relationship. In accordance with the proposals of the PTMB open space system, the project proposal of the coastal front will become fundamental for the connection of the green and blue corridors.
5- Adaptation to the suburban area. Recognizing that 90% of the coastal front is currently urbanized, it is necessary that the design criteria can be adapted in non-urban areas and maintain the existence of the existing natural beach.

26 Green infrastructure and recovery spaces

27 Project area

2.4 Project area, themes and aims



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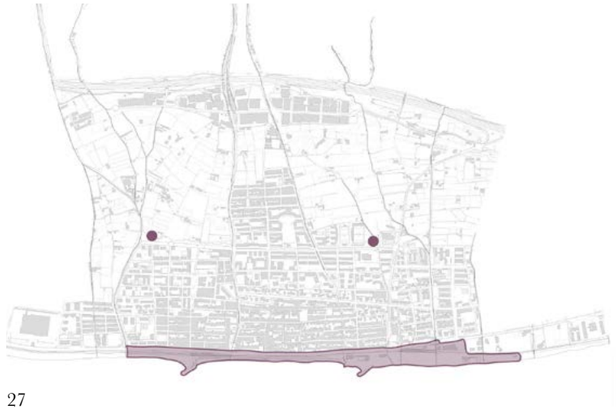

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Specifically, the project area corresponds to the entire coastal strip in front of Vilassar de Mar.
Constantly taking into consideration the theme exposed by the Pla Territorial Metropolità de Barcelona relating to ecological corridors, the waterfront becomes an important longitudinal axis as it incorporates along its path all the new transversal green and blue corridors connecting the two great natural elements: the coast and the mountains.
The PTMB has planned two new stations on the future metro line that will connect all the municipalities of the Maresme, both of which will be located along the Av. De l'Arquitecte Eduard Ferrés (corresponding to the Rambla of Vilassar de Mar). These two new stations are incorporated within the green corridors in order to build an intersection between these two large systems (infrastructural and natural). For this reason, the project also includes a rethinking of the road sections of Carretera de l'Argentona and Carrer de la Muralla which, in addition to becoming part of the green-blue corridor, aim to mend the urban fabric between Cabrera de Mar and Vilassar de Mar, through the inclusion of green oases to promote and improve social activity.
Maintaining the theme of regeneration and recovery of the existing paths that cross the different landscapes of the Maresme and the reuse of residual spaces within the city and the landscape, the design objective is design a part of this green infrastructure that crosses, connects and mends cities and urbanized areas in the unique natural context of the Maresme.
Gilles Clément[13] writes "*The residue derives from the abandonment of previously exploited land. Its origins are manifold: agricultural, industrial, urban, touristic, etc. Residual (délaussé) and uncultivated (friche) are synonymous*". So the waterfront project becomes the lifeblood for the natural rebirth of landscape.

If you stop looking at the landscape as the object of human activity, you immediately discover a number of undecided spaces, devoid of function on which it is difficult to put a name. This whole does not belong either to the territory of shadow or to the territory of light. It is located on the edge (where the woods fray, in the recesses of the crops ...).
Among these landscape fragments, there is no similarity in form.
One point in common: they all constitute a refuge territory for diversity.

Gilles Clément

PART 3

Methodology

3.1 From macro to micro: territorial strategies and pilot projects

From the historical-geographic framework it is clear that the Maresme comarca, over the centuries, has always had a close link with its territory both in terms of the positioning of the first urban areas and in terms of their livelihood. This relationship, once balanced, is now in crisis as urbanization and infrastructure have left heavy marks on the landscape: the creation of an almost totally urbanized coastal strip that has determined the birth of a continuous city, in addition to the isolation of the coastal strip from the inland due to the railway line that clearly divides the coastal cities from its characterizing element.
The Pla Territorial Metropolità de Barcelona focuses on these issues and aims at parallel work between the enhancement of the public road infrastructure and the preservation of landscape areas (rural, especially for this area of Catalonia).
Starting from the assumption of seeking a balance between the road infrastructural system and the naturalistic system, it was necessary to develop large and small-scale strategies to devise a project that could respond to the direct needs of the municipality of Vilassar de Mar and that could be inserted within of a system of connections and relations at a regional level (the coastal municipalities of Premià de Mar, Matarò and the mountain towns of Cabrera, Cabrils and Vilassar de Dalt are also incorporated in the large-scale strategies).

28

The European Commission in a 2015 study defines Nature based Solutions for the first time as: “a useful tool to pursue objectives such as increasing the sustainability of urban systems, the recovery of degraded ecosystems, the implementation of adaptive and mitigation interventions with respect to climate change and the improvement of risk management and the implementation of resilience. For the Iucn (European Union for the Conservation of Nature), Nature based Solutions are also actions to protect, manage or restructure ecosystems in a sustainable way, which provide benefits for human well-being and biodiversity “.
These became the main action guidelines of the project so that a sensitive and sustainable general project masterplan can be defined within which various types of interventions are distributed (project on the coast, rethinking of the road section etc.) which can be considered as pilot projects replicable in multiple contexts as answers to current problems of global interest.

28 IUNC definition of Nature Based Solution

3.2 Evaluation of design alternatives

In addition to working at different scales, so that the project can best meet the needs of Vilassar and its territory, it was also useful and interesting to work through the hypothesis of design alternatives as a suggestion to study the beginning of a dialogue process, now lost. , between Vilassar de Mar and its coastal front. The position of the railway plays a decisive role in this relationship and today constitutes a great physical and visual barrier.
Evaluating other scenarios can help generate long-term policies, strategies and plans, and ensure that a desirable future can emerge with a solid and concrete foundation.
Assuming that the thesis develops the scenario envisaged by the Pla Territoral Metropolità de Barcelona, also hypothesizing an intermediate scenario that started from a different assumption, namely the maintenance of the current railway line, was necessary for the purposes of a broader approach, and above all more aware and analytical.
To date, the only possible and existing connections between the city and the sea are through the underpasses, mostly narrow and degraded spaces that do not make the crossing pleasant and reduce the quality of the waterfront and of the view of the city. When you reach the station of Vilassar de Mar, the first image is that of an infinite and insuperable fence, so the strategy is to work on recovery, on a new concept of underpass and on the project of a coastal walk that encompasses them.
The underpass must become part of the waterfront route as well as an essential and harmonious element of union between the urban side of the city and the coastal one.
The aim of this research work in the field of evaluation was to think of multimetodologi-

cal strategies to study the feasibility of urban transformation projects. Precisely for this reason, we tried to use different ways of operating that correspond to several areas, a very important issue in a process of transformation of public interest. These examined and developed strategies can be used to support understanding the current dynamics of the relationship between the coastal cities of the Maresme and the coastal front.

The axonometric diagram shows how the integration of the underpasses to the waterfront promenade can be implemented. They are no longer considered as narrow, rapid and dark descents but become part of the paths and the main connectors between the urban sidewalk and the beach.

The waterfront path splits or changes altitude completely so that these tunnels become small streets.

The structure of the underpass is modified: it is enlarged, it is illuminated by cuts of light, it is re-naturalized according to the position and the type in order to convert it into a space with its own characteristics and identity.

We therefore propose the example of a possible rethinking of the underpass through the regeneration of existing walkways and the integration of the flow of people with the descent of the river towards the sea.

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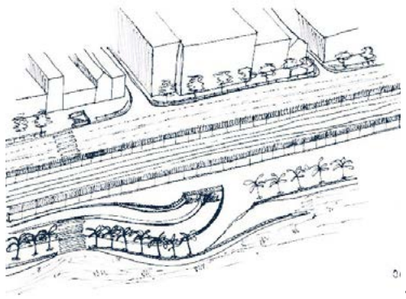

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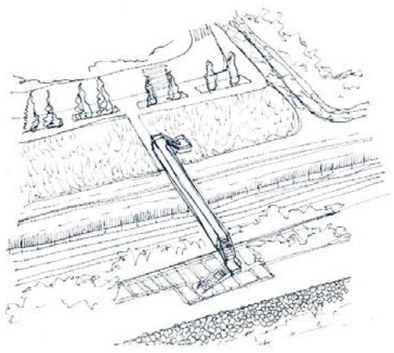

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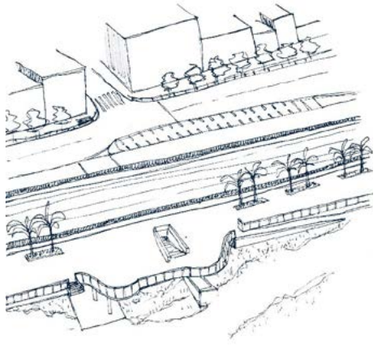


32

29 Mapping of the types underground passages from El Masnou to Matarò

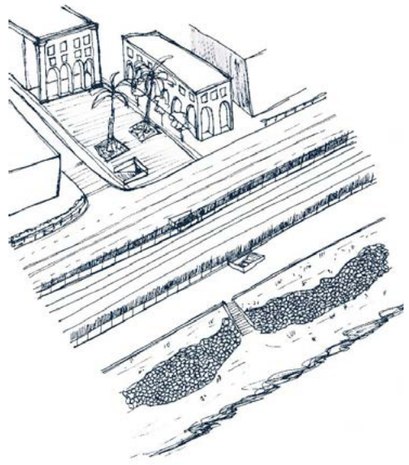
30 Underground passage of Ocata - El Masnou

31 Overpass of Premià de Mar

32 Pedestrian underground passage of Premià de Mar, overlooking the terrace of the seafront and connecting ramp to the beach

33 Pedestrian underground passage of Vilassar de Mar with a descent to the sea via a staircase

34 Underground passage coinciding with the Vilassar de Mar river track



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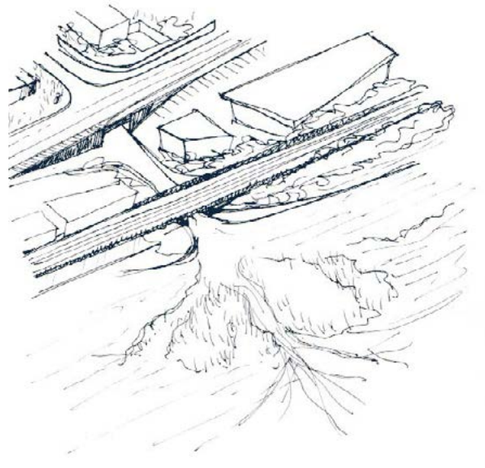

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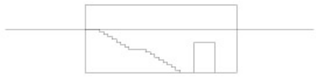
0 0,5 1 2 Km

35

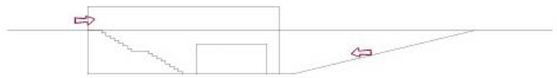
Existing underground passage



Project

Existing underground passage

Project



37

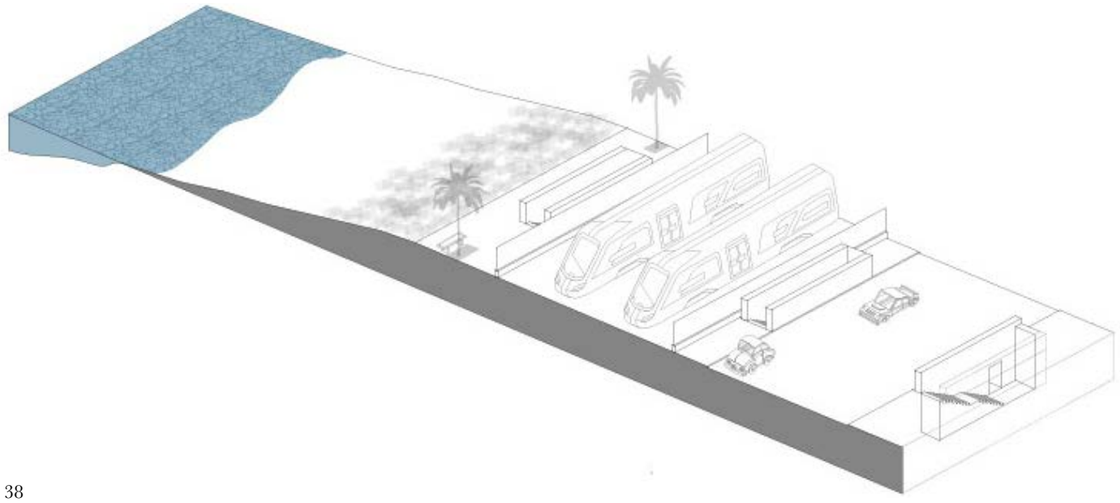
35 General concept for the project of a route that includes the underground passages

36 Change in the dimensions of the underground passages

37 A new strategy to enter the underground passage

38 Schematic axonometric representation of a type underpass of Vilassar de Mar

39 Schematic axonometric representation of a new type underpass of Vilassar de Mar



38

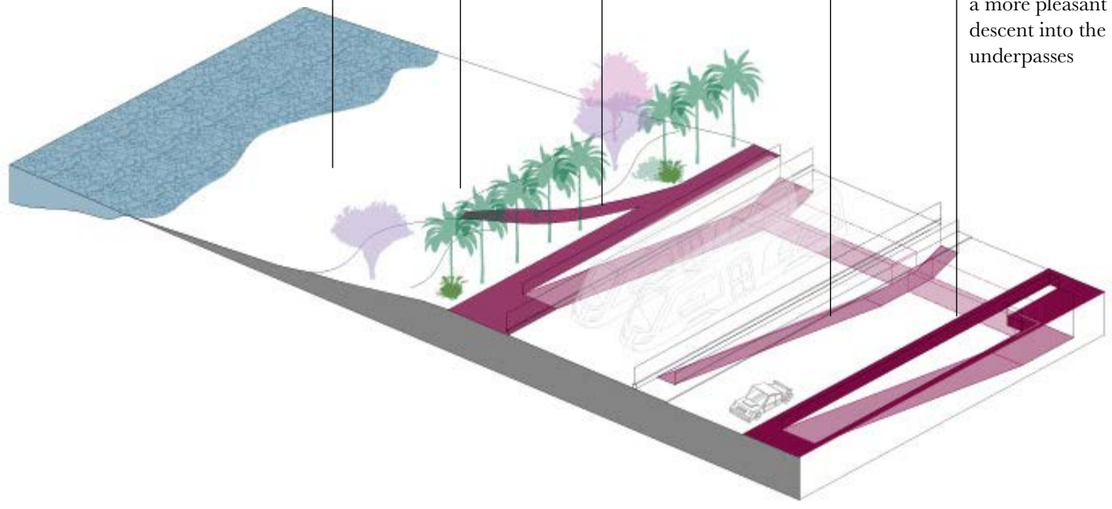
Preservation of existing sandy areas

Dune front: protection of the coastline, implementation of local flora, gradual descent from the city to the sea level

New coastal walk articulated on several levels to ensure a continuous connection between the beach, the dune park, underpasses and the city

New enlarged, illuminated and naturalized underpass

Rethinking of the road section to expand the urban pedestrian area and to allow a more pleasant descent into the underpasses



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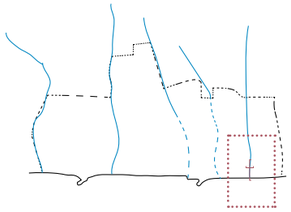
40

40 Conceptual scheme

41 Rethinking of the road section of an under-ground passage in Vilassar de Mar coinciding with the river.



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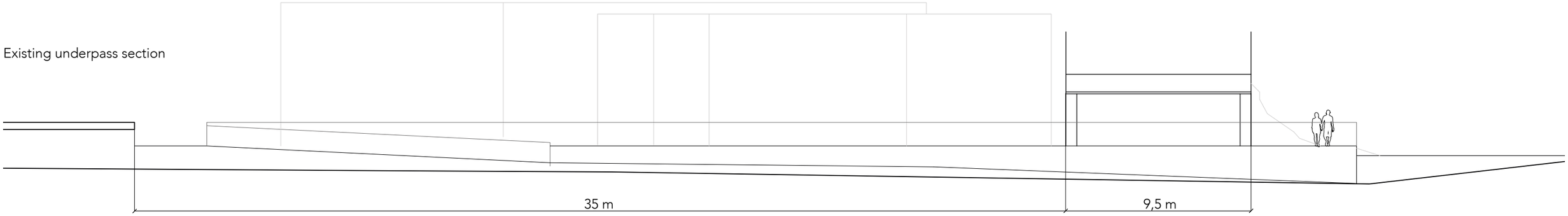
Existing underpass section



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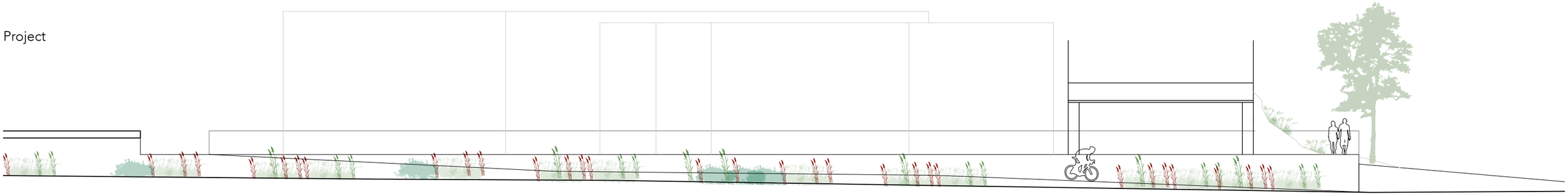
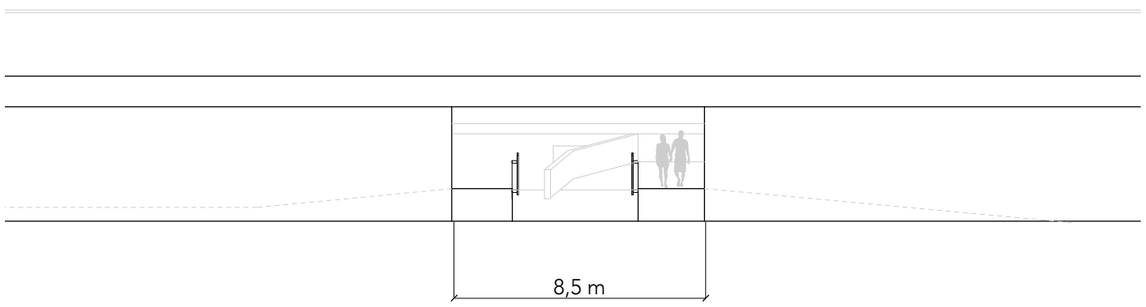


Existing underpass section



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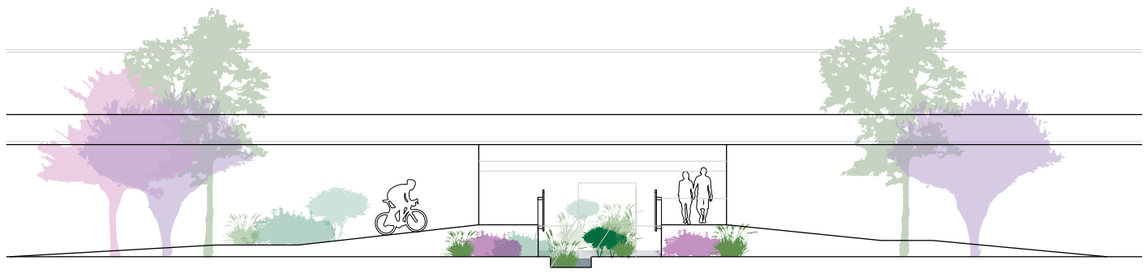
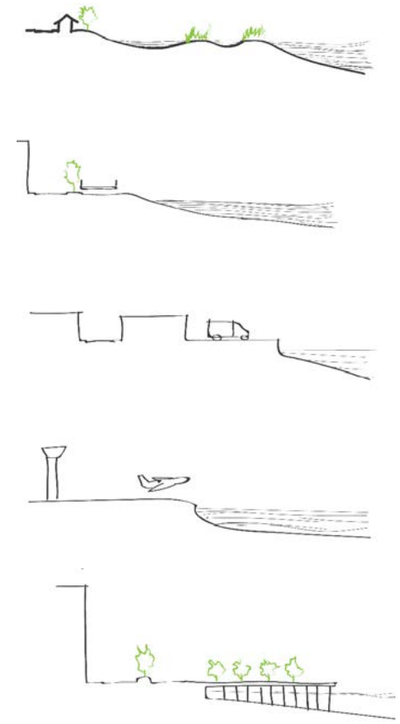


3.3 Case studies

The case studies taken as a reference address issues such as coastal regeneration, designing of sea fronts, the creation of green infrastructures within a territory, the design of parks and gardens, the relationship between city and passage and the protection of ecosystems and 'implementation of biodiversity. All themes converted into essential project actions.
In this chapter they are divided into three main macro-themes:
- waterfront projects
- urban parks and gardens
- corridors and green infrastructures

Waterfront projects

The waterfront has always been a symbolic "place", a geographical area rich in cultural stratifications, relationships and resources. The great potential of these fluid spaces, the border between land and water, make them a privileged field of research for imagining the future of the city and identifying sustainable paths for urban regeneration. This survey, through the analysis of six specific case studies, illustrates the contribution that the redevelopment of a waterfront can offer to urban regeneration, focusing attention on the theme of the path and public functions, as areas of identification and local needs. .
The types of waterfront are many and depend on many factors.
First of all, they can be more or less close to the urban fabric: the distance will influence the proximity between the coastline and the one where the built part begins. This distance is of fundamental importance because it actually determines how natural a front can be: we can therefore have more sandy waterfronts, or with harder edges, in which the spaces of the city reach the coast line with terraces, stairways that poetically fit into the 'water, or in other cases buildings that are inserted close to the coastline and accommodate the various functions related to the use of the waterfront.
Another determining factor is the slope of the land: of course there is always a difference in height, albeit minimal, between the city and the coast line, but in some cases, as in the Maresme one, it has been mentioned that the waterfront line is currently marked by the railway, located about 4 m above sea level, which marks the boundary between the city and the coast. Also in this case it is possible to adopt different solutions, such as exploiting the difference in height to create terraces and panoramic walks, hard and clear edges or gradual descents towards the beach, or inserting buildings that integrate the functions related to the uses of the beach; The difference in height, if thought out gradually, can also become an opportunity to define a filter space between the city and the sea, where you can insert functions related to the sociability and daily life of citizens. In the case of our design approach, the height difference of 4 m was conceived as an opportunity for citizens, but equally for the landscape, to regain possession of nature and the typical characteristics of the Mediterranean sandy coasts, where sand and sand coexist. plants, and where suddenly rocks, terraces full of vegetation and sand dunes can appear. Along the project we also find the functions connected to the beach therefore, even if our approach is definitely oriented towards a natural solution, the search for these case studies has also moved towards the analysis of waterfront with more built solutions, but where it remains a strong focus on integrating nature and the city while respecting both. Taking into account the importance of coastal protection as a very complex issue, mainly due to the presence of the force of the sea, case studies of waterfront in the Mediterranean context have been specifically chosen, with the aim of defining a strategy strictly connected with the territory in full respect of the landscape.



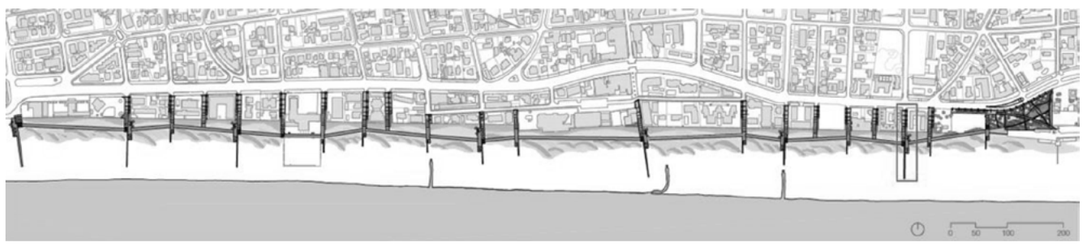
Waterfront typologies

Gavà Waterfront

Imma Jansana, de la Villa, de Paauw Arq
Gavà, Barcelona (Spain), 1993

A few kilometers south of the city of Barcelona, located in the delta of the Llobregat River, architect Imma Jansana conducted a dune recovery project in collaboration with the ecologist Josep Lascurain in a highly urbanized area on one of the beaches more subways than Barcelona.
Preserving the existing pine forest, recapturing the space for the dunes to be restored, reorganizing the access of vehicles to favor pedestrians and bicycles, and studying the wind patterns and testing the plantations, for example of Ammophilia arenaria, inside the integration of natural design materials, they not only provided a new language but also created a comfortable environment for users, up to the use of the color of concrete to reduce temperatures and the heat island effect in summer.
In this project, the existing pines are preserved and it almost seems as if the planted pine forests have always been there.

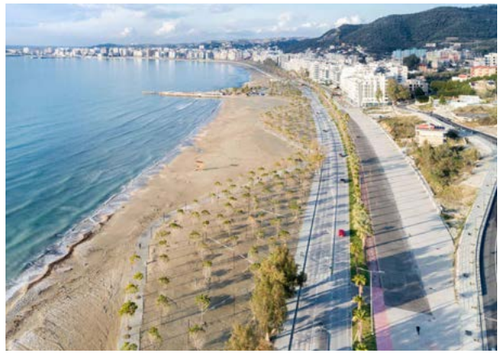
Tipology: Landscape project/ waterfront
Area: 2,5 Ha
Vegetation: Spontaneous macchia Mediterranea



Vlora Waterfront

Xaveer de Geyter Architects
Vlora (Albany), 2017-2019

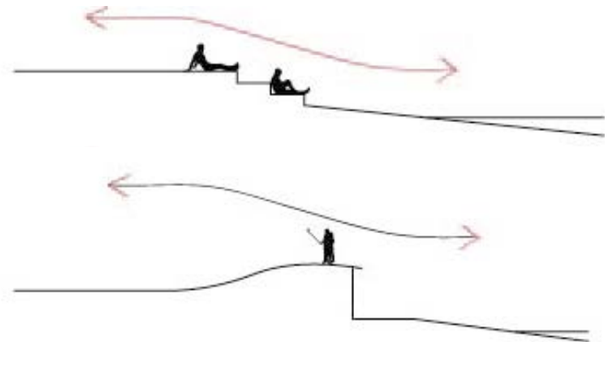
It is a waterfront project that involves the construction of a continuous walk in white concrete along all the 5 km of coastline overlooked by the city of Vlora. Throughout its journey, the planting of local species, the well-known Aleppo pine, had to contribute with minimal effort to increasing the spatial quality of the waterfront, with an operation aimed at extending the surrounding forests towards the coast to create a harmonious whole and an image of homogeneity. The promenade and the tree line are the connecting elements for the insertion of areas with different characteristics such as beaches, sports areas and other public spaces such as parks and squares. Vegetation is an element of both landscape and temporal continuity: in fact, the extension of the trees of the Bosco di Soda along the 5 km of coastline not only creates a harmonious whole, but also a unique and specific identity for the coastal city, typical of the Mediterranean landscape of Albania.



Tipology:
Landscape project and urban space - Waterfront Promenade
Area: 5 Km, 125 Ha
Vegetation:
Wooded and coastal Mediterranean of Albania

Tel Aviv Waterfront

Architects Mayslits Kassif Architects
Tel Aviv (Israel), 2018-2019



The project aimed to create a space in between, a "new urban terrain", an intermediate area that is neither city nor beach, where bathing suits and work suits mix in an urban space that does not respect any code and forms a marginal border for the city.
With the use of careful structural and detailed design to minimize the environmental impact of the project, the key points of the intervention are:
• New flow and continuity, to repair the physical break between the city and the sea by creating a continuous stretch of seats-stairs and ramps; the central promenade is connected longitudinally to the walkways of the seafront to create a continuous cycle and pedestrian path.
• Public Facilities: Refurbishment of all coastal cafes and beach service buildings to meet high standards of generous hospitality in the public space.
• Public terraces - Redesign the disused roofs of old beachfront buildings and transform them into cozy urban balconies that seamlessly connect to the main walkway, forming an integral part of the waterfront.

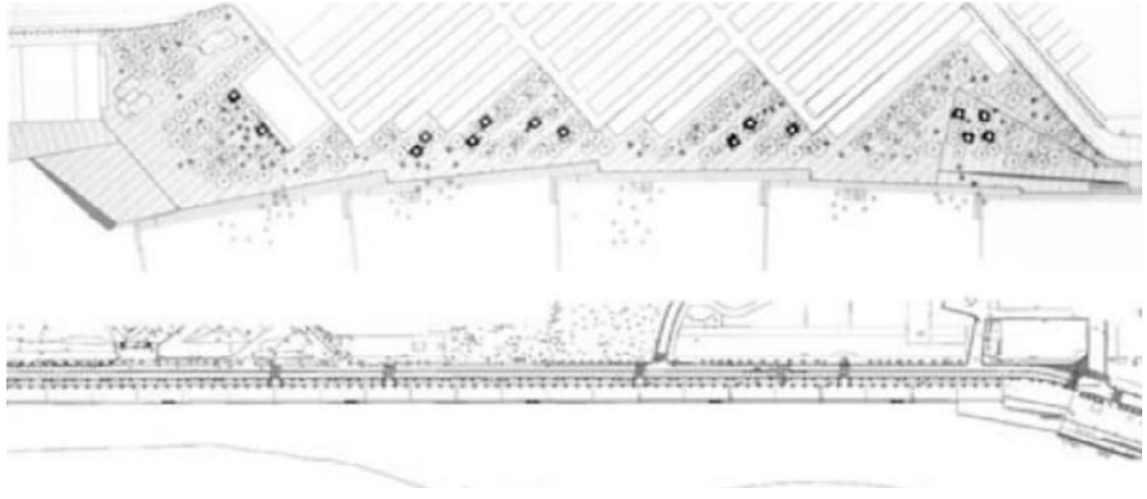
Tipology: Landscape project and urban space - Waterfront Promenade
Area: 2,3 Km
Vegetation: Row of trees (palm trees)

Passeig Marítim de Barcelona

Jordi Henric i Monras
Barcelona (Spain), 1992

The Passeig Marítim de la Barceloneta consists of a 1.25km promenade that runs from Barceloneta to Port Olímpic, and which today is mainly used by cyclists, pedestrians and runners. The main objectives of this project were to organize the bathing area for public use and to eliminate the obstacles between the residential area and the beaches, in a continuity established with different urban roads. The action for the remodeling of the waterfront, initiated in a first phase concluded in 1995, was aimed at regulating the bathing sector for city use, freeing the seafront from the obstacles that had formed a barrier between the beaches and the neighborhood and the improvement of connections between the seafront and the Barceloneta area, giving continuity to the various urban routes (improvement of connections between the first built-up areas and the sea). The adaptation of the urban layout of the Barceloneta to the linear configuration of the promenade, results in a succession of squares derived from the adaptation of the promenade to the irregular saw-tooth configuration of the urbanized surface by the sea.

Tipology: Landscape project and urban space - Waterfront Promenade
Area: 2,7 Km, 10 Ha
Vegetation: Row of trees (palm trees) and Mediterranean vegetation

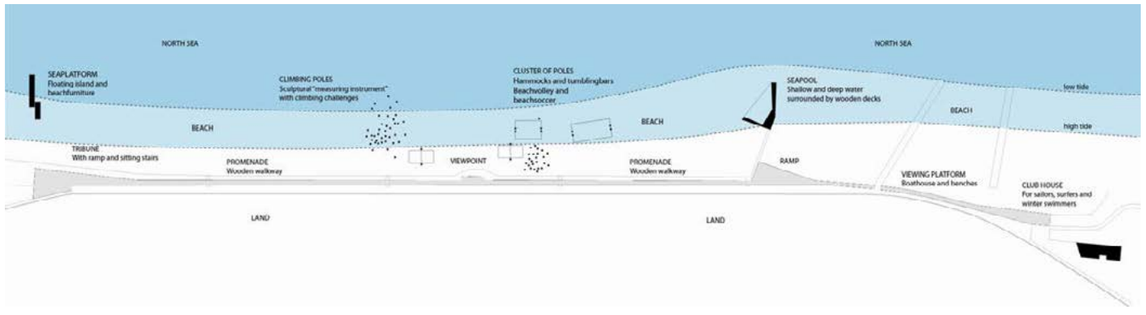


Esbjerg Waterfront

Nathan Romero Arkitekter
Hjerting, Esbjerg (Danmark), 2011

Tipology: Public space project/ waterfront
Area: 1,4 Km, 15 Ha
Vegetation: grassland and moorland (native spontaneous vegetation)

This very delicate redevelopment project includes a "promenade" along which they explore the possibilities of the encounter between the ocean and the mainland: the bay, the peninsula, the island. This is the main theme of the project, with elements such as the floating dock, the maritime swimming pool, the yacht club and the promenade itself. The new promenade returns the beach to the village of Hjerting, once separated by a wooden protective wall and a barrier of large stones, now naturally accessible. The walkway rests on the rocks making it an opportunity for social interaction, exercise and play, but also contemplative: a 700 meter long chair from which to rediscover the horizon. Along the way we find interventions of a lighter nature, apparently random groupings of poles or trees that register strength and change, the cycle of the tides; sometimes combining the purely practical with the artistic. For example, the seawater pool opens towards the horizon, at high tide it mixes with the sea, at low tide the sea recedes while the pool holds the water and becomes a mirror in the sand.

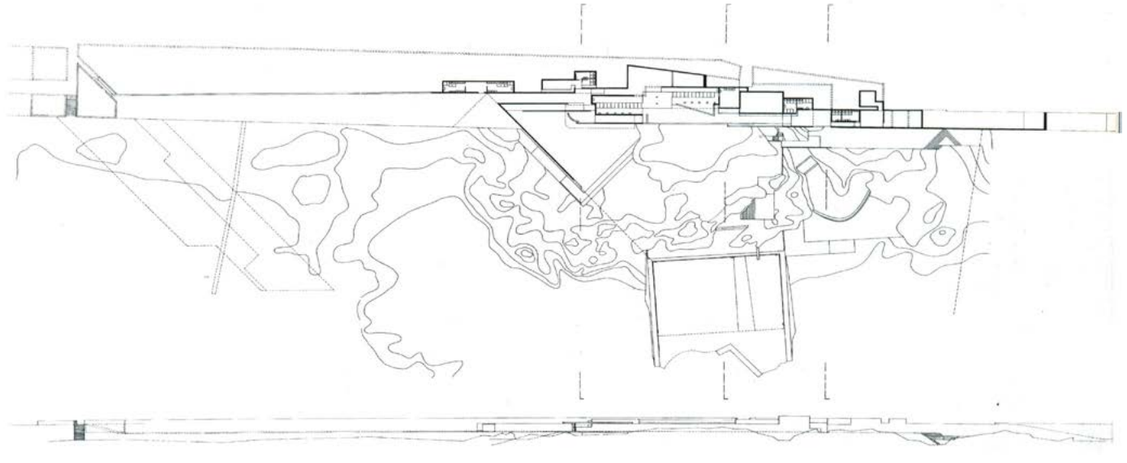


Leça Swimming Pools

Álvaro Siza
Oporto (Portugal), 1961-1966

Tipology: Landscape project and urban space - Waterfront Promenade
Area: 0,8 Ha
Vegetation: -

Simplicity, clarity, perfect harmony with the context: Siza's two pools appear among the rocks, in a place where they seem to have always been. The search for a harmonious integration between artificial and natural is the main feature of this project by Siza, built on the beach of Leça de Palmeira, in the municipality of Matosinhos, in direct contact with the rocks that emerge from the Atlantic Ocean. Despite their large size, they do not appear in the least intrusive to the eye and, if in summer they are a place full of life, once emptied, they still remain part of the cliff, to contemplate the violent breaking of the waves during a breezy winter day.
In addition to the swimming pool, the buildings that house the service areas and changing rooms for bathers were also built: these are located longitudinally with respect to the promenade, and they too seem to almost enter the ground to hide and then lead back to the paths between the rocks that lead to the pools, always trying to respect the place, and keep the view of the ocean unchanged.



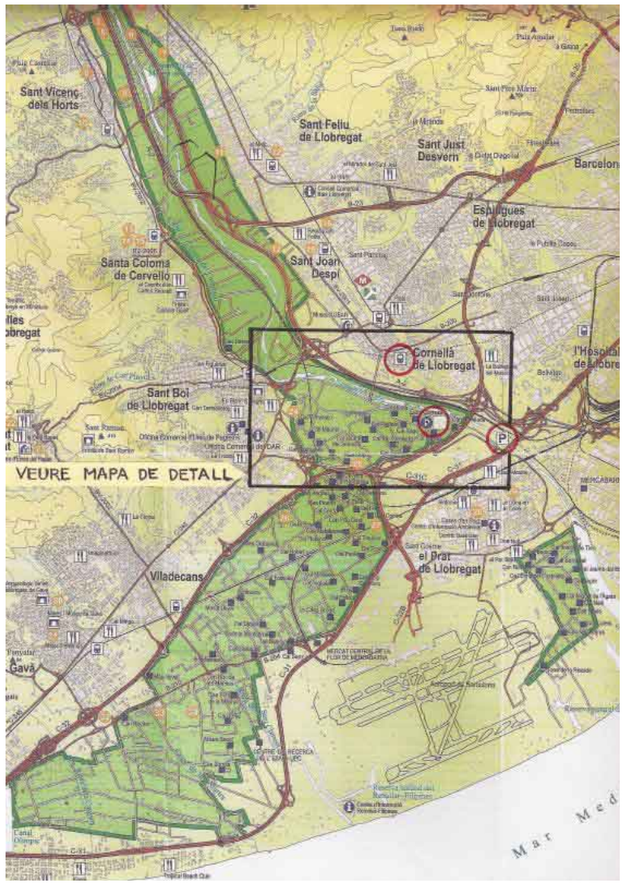
Green infrastructures and paths

The *Parque-Agrícola Litoral del Maresme* extends from the Waterfront, passes through the city of Vilassar de Mar and the agricultural area, reaching the mountains: it therefore crosses various ecosystems and thresholds of the city. The goal is to implement the biodiversity of the place and promote its landscape, by requalifying its routes. It is precisely this approach that has led to the search for case studies of green infrastructures that are not only ecological lungs of cities, but that are capable of synthesizing the various needs of an urban and landscape reality together, and of giving an answer involving economy, biodiversity , local life, traditions and history of the place. The goal, therefore, is not simply to transform existing urban spaces into green places, nor to create a system of parks in the city, but to generate a natural and infrastructural system in which biodiversity and cities can coexist without entering into conflict, but rather working in synergy to meet the needs of the local inhabitants. The analyzed case studies respond to two different needs: the Llobregat Agricultural Park and the Lugano Park had the objective of integrating a city into a green infrastructure system, while the strategy of Sanlihe Corridor and Bardolino Route was to redeem realities little promoted at a landscape and social level, or little connected with the surrounding area, and to create a network of routes to encourage tourism and liveability. While in the first case there is a polarity to be connected and integrated into a system, in the second case the aim is to create a system to connect different places, a system whose paths are opportunities to discover the territory to which they belong. An important difference but one that has in common the connection through a continuity, ensured by the landscape and by the facilities connected to it.

Agricultural park of Llobregat

Protected park of Diputació de Barcelona
Llobregat, Barcelona (Spain), 1998

When the projects for the Baix Llobregat Agricultural Park (Lower Llobregat Agricultural Park) began to take shape, the idea was, from the very beginning, to make it a tool for maintaining the agricultural space of the district, developing economic activity inherent to it and improving the environmental quality. Through a careful study of the existing settlements, fields and waterways and structuring the park, the goal was to integrate other functions to this area in order to make it livable by citizens. In this way, the agricultural space became a vehicle for balancing from an environmental, economic and territorial perspective: for this it was essential to guarantee the necessary conditions to remain competitive in the agricultural sector, but at the same time make the area an ecological lung for the metropolitan area of Barcelona and integrate functions dedicated to the daily life of citizens, inserting spaces for leisure and to educate citizens on the environmental issue.

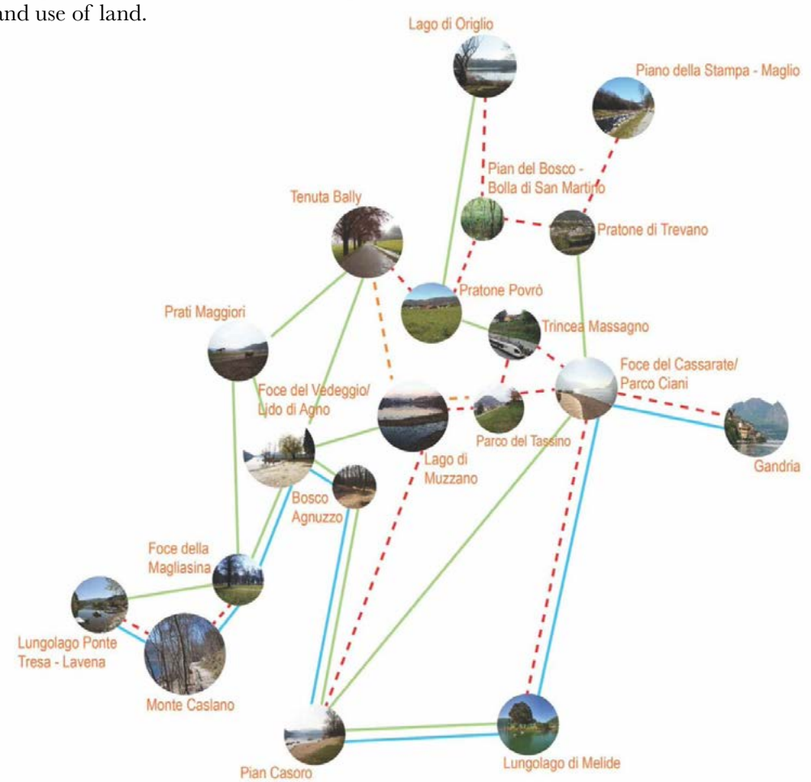


Tipology: Riverside agricultural park
Area: 30 Km
Vegetation: Riparian forests and rural vegetation

PAL 3 agglomeration program 3rd Generation

LAND
Lugano (Switzerland), 2014-2016

The construction of an interconnected system between urban centers and rural areas is a primary concern in defining the foundations of planning policies. At the same time, the uncontrolled urban sprawl must be contained as regards the social, economic and environmental impact. The PAL3 Agglomeration Program of Lugano, in its third generation, deals with the application of these principles to the Lugano region.
In recent decades, growing local and cross-border traffic and frenetic urban development have defined the open space, where the richness and beauty of natural elements face the contradictions of a densely populated urban area. The project deals with promoting urban and landscape development by integrating sectoral policies and individual measures for space interventions, allowing interested parties to have a tool to apply strategies and principles for sustainable development and use of land.



Tipology: Ecological corridor
Area: Undefined
Vegetation: Vegetazione rurale e di lago

Sanlihe Ecological Corridor

Turenscape Landscape Architecture
Qian'anzhen (China), 2013

Located in the city of Qian'an, Hebei province, the Sanlihe River project exemplifies how a neglected landscape can be recovered and made a green infrastructure as well as an everyday landscape with a restored ecosystem that provides multiple services: it is able to reduce pollution, provide opportunities for urban land development and serve different ecological functions. Covering approximately 135 hectares, this ecological corridor extends 13.4 km in length and ranges from 100 to 300 m in width. Cycle and pedestrian paths are integrated using art, revitalizing the social identity by reflecting local traditions: the Red Folding Paper is an art installation and outdoor furniture that combines seats, paths, bicycle sheds and lighting, which gave the Greenway its identity and a sense beyond "green". Along the green belt are the pedestrian and cycle paths completely accessible to the communities along the canal, which integrate with the urban slow transport network.

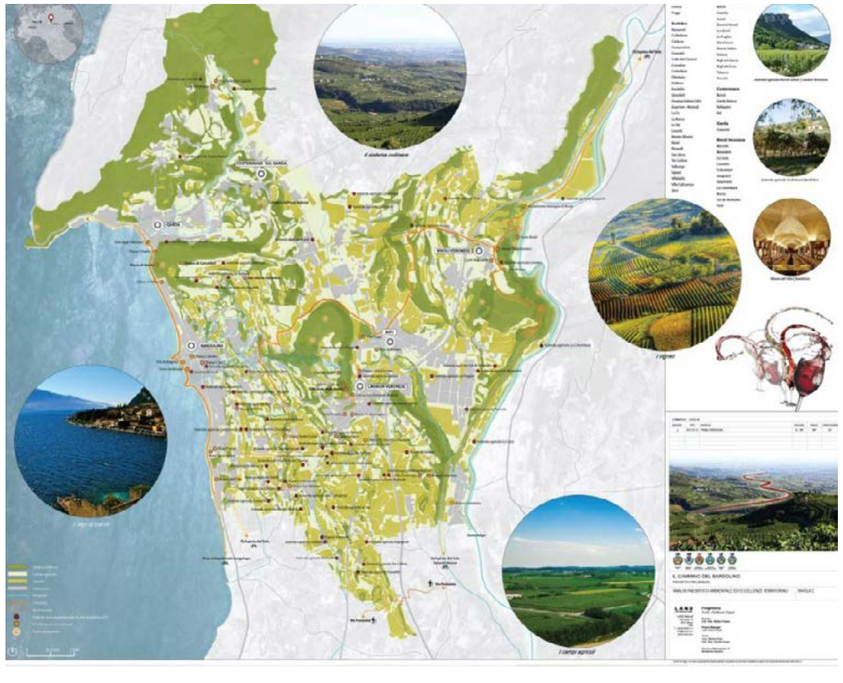
Tipology: River park, ecological river corridor,
Area: 13,4 Km, 135 Ha
Vegetation: River vegetation

Bardolino Route

LAND
Verona (Italy), 2016-2018

The project has been structured as a tool to spread knowledge of the inland places and to improve hospitality management in an area characterized by great landscape qualities and important wine production such as that of Lake Garda. The *Strada del Bardolino* has its origins in the objective of six municipalities (Affi, Bardolino, Cavaion Veronese, Costermano sul Garda, Garda, Rivoli Veronese) that want to connect and enhance their historical, cultural and economic heritage. The project consists of a dense network of existing pedestrian paths, starting from urban centers towards different destinations. Walking these paths is not only an opportunity to admire and explore the suggestive landscapes of Lake Garda, but also connects the Bardolino DOC cellars and other points where you can taste the typical products of the area. A way to promote active protection of the landscape that can contribute in a sustainable way to the socio-economic development of the territory.

Tipology: Green corridors of connection between city and landscape
Area: 143 Km, 13000 Ha
Vegetation: Lake vegetation

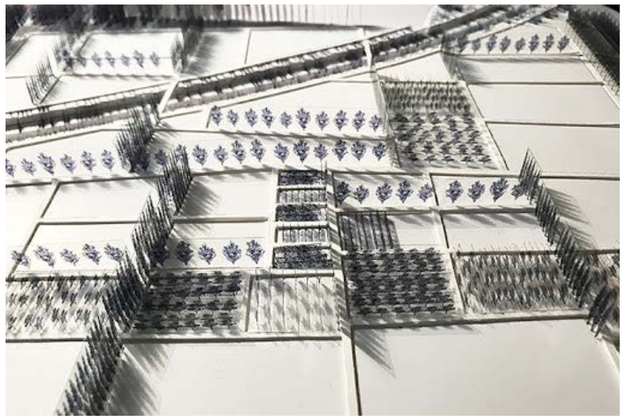


Urban parks and urban gardens

The ancient cities were perfectly integrated with the surrounding countryside while, on the contrary, the first processes of strong urbanization altered this relationship, trespassing into the city/countryside conflict.
Only from the end of the eighteenth century, in many European cities, greenery assumed greater importance in urban centers, generating the definition of "public garden" and outlining a vision in which ornamental vegetation, considered as an element capable of bringing great quality urban, both in relation to public and aesthetic-recreational health.
The research on which the design of the urban park is based has its foundations in the need to provide users with adequate urban spaces as well as a large green area to encourage the presence of biodiversity, making sure that these needs are able to coexist in the same environment. As a matter of fact, nowadaysurban green has a decisive role in the development of a city that wants to move towards a more sustainable approach, moreover it can really implement biodiversity, through structural integration initiatives of the green with the built environment or with the creation of areas reserved for the protection of some species, both concerning the flora but also concerning the fauna.
The criterion with which these case studies were chosen is to understand how this theme integrates into the built environment, trying to thoroughly analyze the characteristics that define the project, the functions and the role they have within the city system in which they are inserted; consequently, they have been measured to understand the role that public space and urban park will have in the context.
Furthermore, the question that has arisen is how biodiversity can be the key point of a project, while at the same time remaining the protagonist in designing the spaces suitable for the daily life of citizens, in times in which design is oriented towards solutions more and more technological.

Calchi Taeggi Park

Michael Dsevigne
Milan, 2019, on-going



Tipology: Public space project, park
Area: 28 Ha
Vegetation: Mix of agricultural and urban vegetation

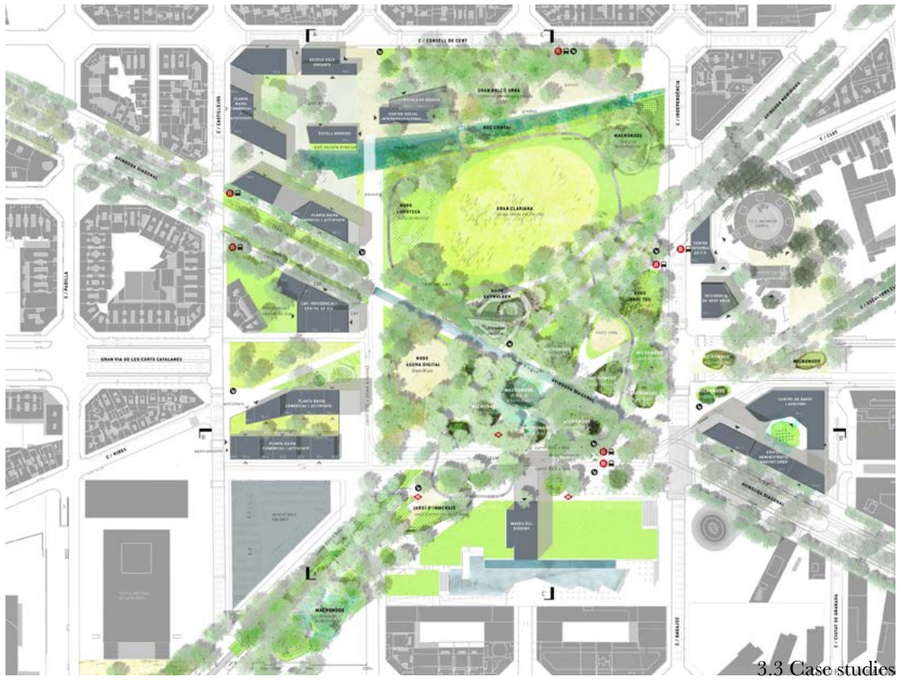
Fascinated by the Lombard agricultural landscape, with its woods, canals, embankments and rows, Desvigne has played with this same "material" and the true scale of cultivated fields, to translate into a pleasant and usable scenario what is a natural heritage of tradition, full of villages and farmhouses. The outskirts of Milan are characterized by a singular encounter between city and countryside and, in this context, the Taeggi park and the surrounding neighborhoods reflect this unique history. The park was designed as an intermediate landscape. If the new uses are urban, even the very young components are all known: its skylines, its plantations, its paths, its spaces evoke the universe of the Po Valley. The park in fact seems to be a part of the countryside in miniature, with paths that wind through the cultivated fields and vast expanses of lawn where you can lie down and forget to find yourself in a city. The new district fits into this context: the paths intertwine with the building, the orchards and poplar groves organize the transparencies and frame the views.

Canòpia Urbana, Glories

UTE Agence Ter & Ana Coello de Llobet
Barcelona (Spain), 2019

Tipology: Public space project, park
Area: 13 Ha
Vegetation: nodes of biodiversity

The intervention is a very successful example of an urban space where biodiversity and spaces for citizens work synergistically to create a space of urban quality. The urbanization of the Clariana area of Plaça de las Glòries was the first stage of the global Canòpia Urbana project, which transformed the square into a new central space with a metropolitan vocation and a neighborhood park that will act as a green lung for the city . The aim of the project was to denify a hybrid space between a park and a square capable of creating basic ecosystem services, while maintaining a high concentration of biodiversity.
Indeed, the key point of the intervention are the nodes of biodiversity, nature refuges with trees and vegetation, real miniature green lungs where a very high number of species are concentrated. The park area also includes La Gran Clariana (a large one-hectare lawn area), a green space management area, a play area for children, a dog area, a play-sports area where game tables, a bar and a sports course.



Tagus Linear Park

Topiaris Landscape Architecture
Lisbon (Portugal), 2013

Tipology: Coastal park
Area: 15 Ha
Vegetation: Coastal Mediterranean flora

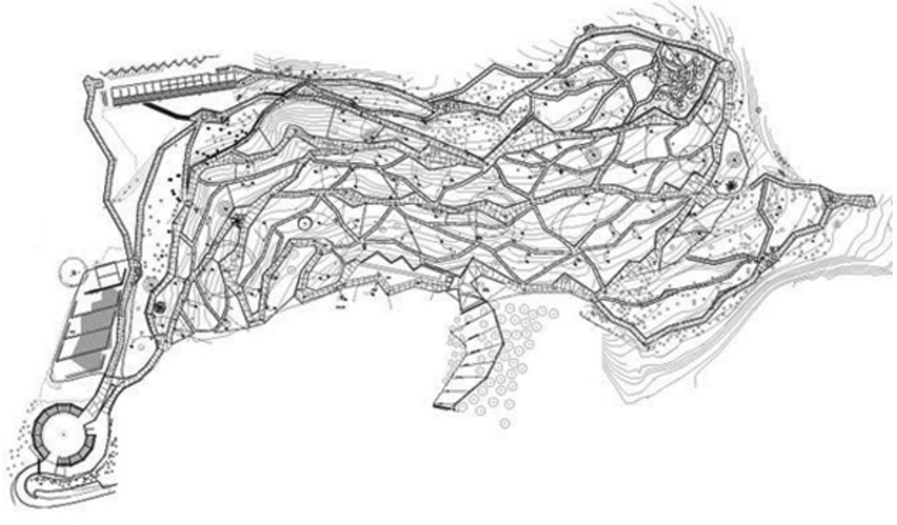
Tagus Linear Park is an area of 15,000 square meters that was conquered by the surrounding communities of the private industrial sector, born as an opportunity for citizens to regain possession of the shore, until recently blocked by large industrial lots. The goal was rethinking a urban public space located in an unexpected universe of urban, industrial, agricultural and natural landscape. People of all ages can take advantage of this unique greenway, grounded in the natural and cultural characteristics of the landscape, with a multitude of recreational and leisure options, safeguarding existing natural systems and promoting the ecological regeneration of damaged areas. The Park combines two different types of spaces: a single multifunctional area (called 'Praia Dos Pescadores') and 6 km of Pedestrian Trails. The connection between the "beach" and the natural areas takes place through a 700 m long raised wooden path through which it is possible to reach an ornithological observatory.

Montjuic botanical garden

OAB Ferrater & Partners
Barcelona (Spain), 1999-2002

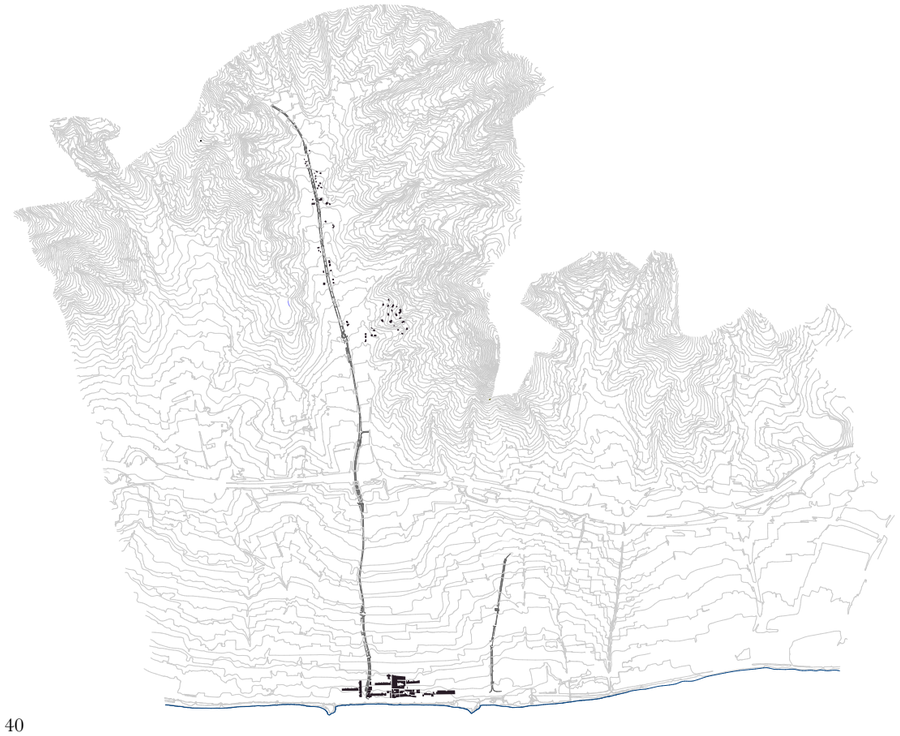
Tipology: Botanical garden
Area: 14 Ha
Vegetation: Mediterranean vegetation

The Botanical Garden of Barcelona extends on the northwest side of Montjuic covering an area of 14 hectares. The peculiarity of the area is its slope, which allows all areas to enjoy the afternoon sun and thus create the climate suitable for hosting a considerable amount of plant species affected by a Mediterranean climate. Furthermore, the slope inspires the design on which the project is based: the shape of the designed garden results from the arrangement of a triangular grid that adapts the different vegetation formations, placing them in "mosaics" (plan) and "transepts" (section), according to the different ecosystems and the different slopes. This space therefore presents itself as a large amphitheater of terracing. This arrangement has allowed the minimum movement of the ground and the creation of distributive paths with suggestive perspectives that pass next to these terraces with angular shapes but harmoniously inserted in the context, creating suggestive views and giving the possibility to delve into all the nature of the reserve.



PART 4

Context:
Vilassar de Mar



40

41

0 0,5 1 2 Km

40 Riera de Cabrils - historical connectio betwe-en Vilassar de Mar and Cabrils (until 1750)

41 Perspective of a typical *casa de cos*

4.1 The urban development of Vilassar de Mar

1750 - 1814
First construction phase

1814 - 1836
Second construction phase

1836 - 1848
Third construction phase

1848
First Urban Plan

As evidenced by previous historical studies relating to the Maresme county, from the end of the 15th century the inhabitants of the settlements which had formed in the mountainous areas, began to move to the coast to devote themselves to agriculture and fishing. Specifically, the inhabitants of Vilassar de Dalt and Cabrils (currently still existing and located above Vilassar de Mar) to protect themselves from Turkish piracy, built three defense towers and, little by little, the first roads were created, which began to form the first nucleus of the coastal district, documented since the early 1600s: Vilassar de Mar.

The neighborhood had gathered around the three fortified farms of Can nadal, Can Nufau or Can Lledó de Mar and Can Mir and on the Camí Ral line. Although documented since the sixteenth century, everything seems to indicate that this district did not experience a notable settlement until the eighteenth century. When in 1726 its inhabitants asked for permission to erect a church it was estimated a population of 200. A cadastral report presumably from 1723 located in the Vilassar Municipal Archive Museum. During the research it gives a total of 23 houses in the vicinity of the sea. Some of these properties in the Vilassar maritime district are only described, while in others −7− it is stated that there is a house and an orchard, and in one, a house and a courtyard in front.

In any case, this starting point allows us to encrypt a census of houses that is perfectly homologous to the one we have for the next 50 years, in a period that is already within the chronological limits of the research. In 1777 Vilassar de Mar consisted of a maritime quarter which counted a figure of 181 houses.

From there, the growth continued unstoppable. Only thirteen years later, we are talking about 230 families (230 houses, given the single-family character of the buildings). In the middle of the 18th century, the processes of promoting and forming new roads begin in what was the primitive core of the Vilassar waterfront, and in 1760 constructions appeared on this new road.

The costruction of a new urban fabric

The growth of the seaside district of Vilassar from the mid-thirteenth century onwards was due to subsequent construction campaigns which meant the opening of new roads that until then had been dedicated to cultivation, mainly in the vineyard.
The plots on the new roads were generally 28 feet wide - about 26, about 30 - following a modulus, about 4.50-4.80 m. This module, called "cos", and the construction of serial abutative units based on it, are commonly known as "body houses" (in Catalan "Cases de cos"). From the last years of the seventeenth century and especially to the beginning of the eighteenth century, the demographic pressure and the growing demand for new immigration have meant that the urbanization of the land represented a significant increase in productivity extracted from agricultural land, both by useful landowners and by gentlemen. direct.
Therefore, its urban formation is not the result of any planning and response to the subsequent interests of the promoters of the new urbanized areas. The way to not involve anyone in the process of urbanizing an estate was simple. The owner ensured internal access to his land and opened the road that was to be built in the center of his property. From here the estate was divided into several plots - courtyards or bodies - to be built.

First construction phase: 1815-1836

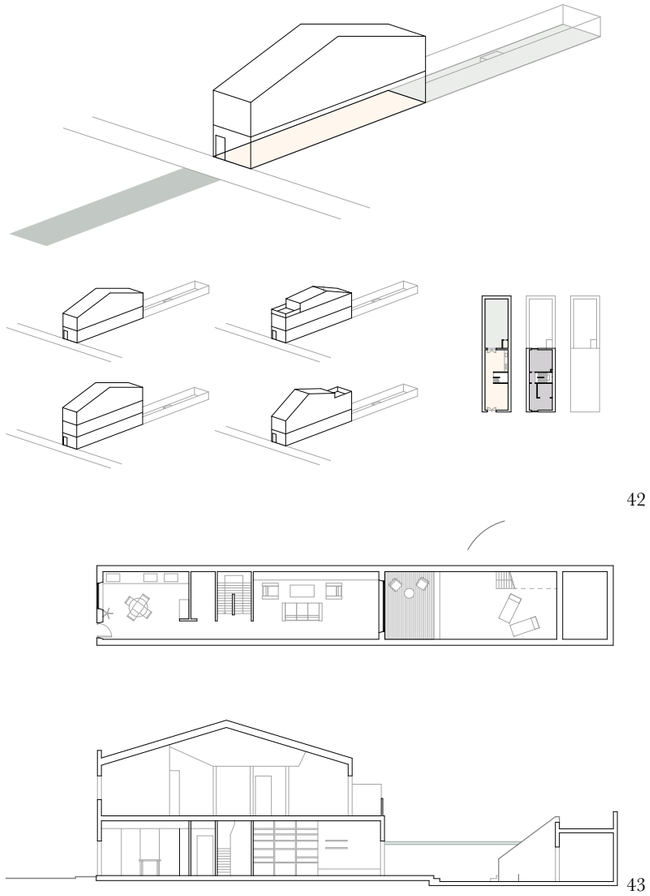
One of the peculiarities of the urbanization process of these new streets located in the middle of an estate is that they will not be designed to be occupied by houses on both sides or sidewalks of the road. In these south-facing streets, with the exception of Carrer del Carme, it was built only on the north sidewalk, so that all the houses faced the sea. The buyer had to build a house, leaving a certain number of palm trees in front of him on the street, but he also enjoyed ownership of the front courtyard, across the street left free. This is the origin of the gardens or orchards in front of the streets of Vilassar de Mar, which have made their urbanization process so unique. All the roads opened in this first phase follow the same example and all their plots had a front garden on the other side of the road.

Casas de cos

The *cases de cos* are the traditional townhouse of the towns and cities of Catalonia, built in a body, patio or lot, of approximately 4 meters in width and of variable length. It is the most common house typology that developed during the pre-industrial period and industrialization, in parallel with the development of the new suburban urban during the second half of the 19th century.

There are many streets in Vilassar de Mar where the structure of the streets is still very little transformed with traditional casas de cos.

They are two-story houses with a narrow arched doorway, a large grated window on the ground floor and double pitched roofs, with a gutter running along the street. Most are the work of the late eighteenth and first half of the nineteenth century, although some of them have been restored in a modern key.
The body of the house consists of a ground floor and a floor. From the kitchen a courtyard or a small vegetable garden began, where there could also be a chicken coop.



42 Typological schemes of the typical "Casa de Cos" (*lit. house of the body*), typical house constituting the historic core of Vilassar de Mar)

43 Example of organization of a *casa de cos* today

44 Historical map of the Vilassar de Mar in 1848 (source: Municipal archive of Vilassar de Mar)

Second construction phase: 1815-1836

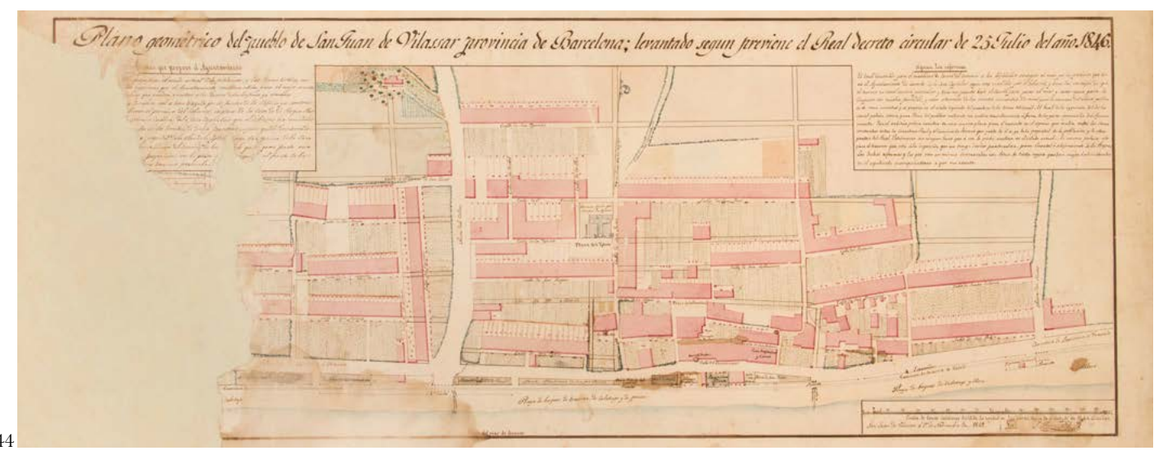
No new road openings occurred and in total, during this second phase of construction, around 86 houses were developed into newly built roads and another 32 as a continuation of previously started roads. Both the opening of new roads and the expansion of others built in the period 1815-1836 follow the basic patterns of previous urbanizations. Regardless of the legal formula for the sale of the lots, the concept of creating new roads remains unchanged: the initiative and promotion of the roads is in the hands of the landowners, who undertake the urbanization at their own risk and fortune and paying attention to their special interests. The first conflicts between private interest and public utility of the new streets of Vilassar de Mar begin to arise due to the cross roads. The problem arises at the very moment of its creation. In fact, as developments move away from the Camí Ral line, the new owners had to agree to sell private passages to convert them into public streets, useful for the urban development of Vilassar.

Third construction phase: 1837-1863

During these central years of the 19th century, the road network of the city of Vilassar de Mar was completed. These are the years of the last and most ambitious projects, and also those of the beginning of municipal urban control - with the problems and limitations that this entailed. For the first time in the history of the urban formation of Vilassar de Mar, in 1841 a real urban project began, conceived and conceived as such by the action of two businessmen: Joan Batllori and Magí Canela. They did not obtain the settlement of land to be urbanized, but took control of the land and developed the urbanization project themselves, deciding the roads and the subdivision.
Both owners worked together and the houses were built in a serious way - resulting in a homogeneous whole. All the openings and urban planning initiatives carried out up to now had been carried out without the minimum overall planimetric tool. It was only in 1848 that, in application of the royal decree of 1846 (which obliged the realization of geometric plans of all the municipalities of the state), the first plan of Vilassar de Mar was implemented. A careful analysis of the plan allows us to see how exclusively concentrate these reforms with the attempt to linearly widen some roads already built and their connection with other roads.

Urban conformation from 1850 onwards

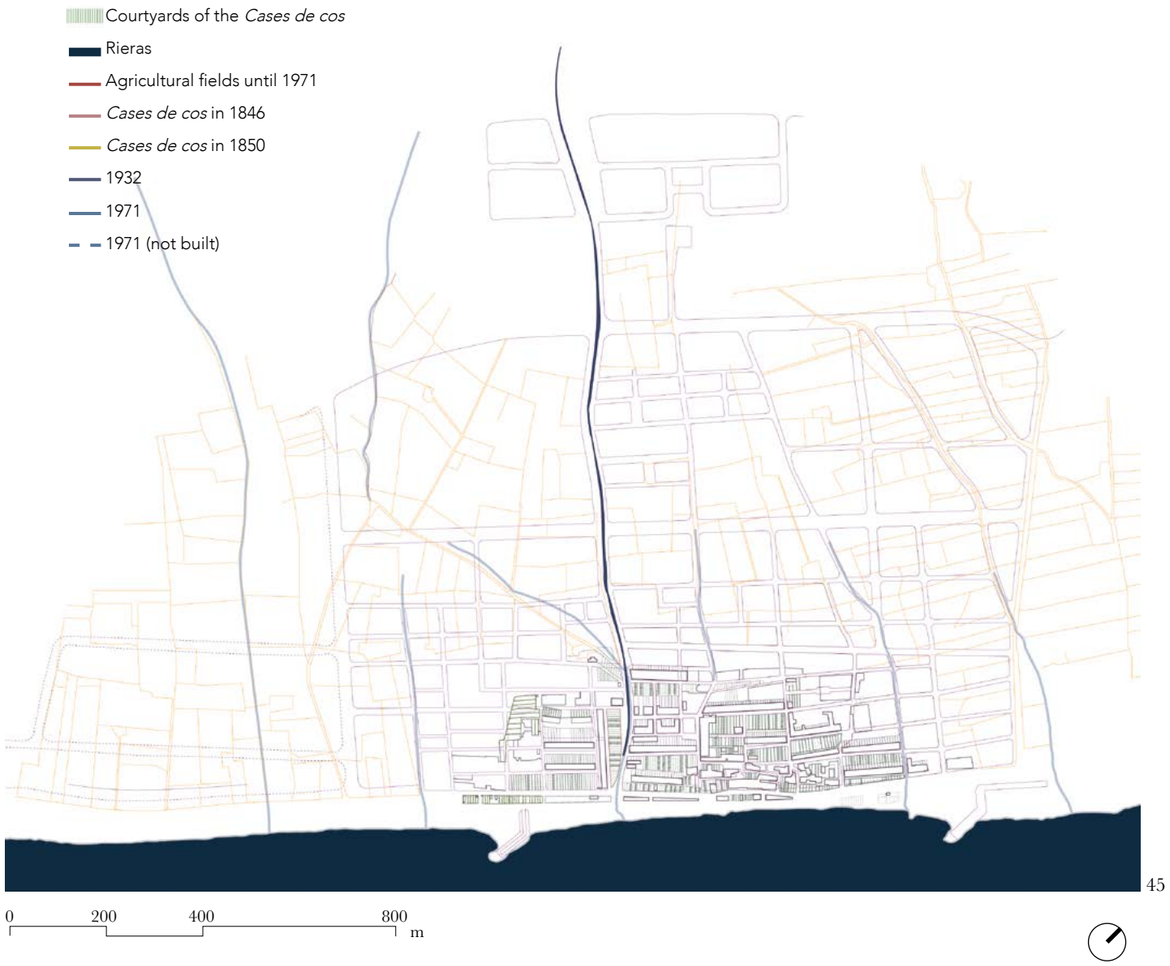
The historical overlap illustrates how, from the 1848 plans onwards, attempts were made to regularize the urban fabric outside the historic core, where only cultivated fields were present. The grid of the proposed blocks overlaps its design with that of fields and even that of rivers, it does not adapt to natural



forms but fits in with its own precise order based on subdivision, in view of the exponential urban growth that took place from the middle of the 19th century to the 20th century. By comparing the different historical maps, it can be seen how the city has developed concentrically in relation to the historical core, both due to the presence of the sea and that of the railway (which are on the same line).
The main connections with the industrial part were through two roads, both close to the streams. It is along these lines that the city of Vilassar de Mar expanded, creating a whole that extended towards Cabrils through the industrial polygon. It can be seen, however, that the 1966 plan provided for a subdivision that will not be completely built, still leaving room for the agricultural part on the sides of the city.

Hints about the industrial revolution

Industrialization in Vilassar de Mar began with the installation of the first workshops or small industries called "Quadri", which had their market in the existing commercial and maritime relations, as well as in the smuggling network of fabrics and other products, a very widespread activity until at the time, but even before the arrival of industry there was an artisan tradition in lace making. On the other hand, other historical crafts can also contribute to the incorporation of citizenship into industrial production, as in the case of the repair and weaving of fishing nets. In the 1960s, with the drafting of the sectoral planning of the Basso Maresme (1959) and the municipal planning of Vilassar de Mar (1966), the directors undertook to take the industrial and manufacturing activities out of the urban core, in agreement with the social dynamics and the economic and urban interests of the time. The construction of factories or buildings with a certain industrial activity within the residential areas was prohibited and the tendency to relocate factories outside this area began. A few years later, in 1966, a descriptive report on the progress of the San Juan de Vilassar (former name for Vilassar de Mar) plan was drawn up, which developed the guidelines established in the Maresme Master Plan. According to this project advance, the area destined for the newly established industry was foreseen within the limits of the municipality, while the existing industry within the urban core was considered to be extinguished, except in cases in which it could continue its activity but under certain conditions, such as, for istance, when it is not allowed to modify its use.



45 Historical permanences (overlay of historical maps of the municipal archive of Vilassar de Mar)

Population growth and land use

The natural landscape of the northern Maresme has undergone major transformations in the last two centuries due to changes in uses and uses. From a predominantly agricultural area, there are now mostly urban and forest -covered land, leaving agricultural activities very relegated. All the vegetation regenerated relatively quickly due to the soils resulting from the alteration of the granites and the sub-humid Mediterranean maritime climate. Forest uses are almost nil, with the exception of preventive interventions against fires. The trend is the spontaneous settlement of an oak forest, with the exception of ridges and rocky outcrops, especially in limestone and leucogranite, where summer drought becomes more evident. In these sectors the potential vegetation is a Mediterranean scrub and in extreme situations a rock community.

During this era, in conjunction with the expansion of the industry and its positioning at the urban limits, there is also a significant demographic growth. All these factors obviously reflect on urban development and on the new housing typologies introduced in the city, precisely to adapt to the socio-economic context. Vilassar de Mar, like the Maresme county, has traditionally been characterized by a very high population density, in absolute terms and compared to Catalonia. A sustained increase in the population occurred in the county and the municipality until the last third of the nineteenth century, when there is a demographic stagnation (even decreasing in the case of the Maresme). A stagnation from which it will not recover until the early twentieth century. In those years, in fact, there was a very strong increase in the population in Vilassar de Mar, and the use of the land and the evolution of the landscape changed radically, but as we said, also the appearance and organization of the new residences. Gradually the village will also become a summer resort. After the break from the War and the post-war period, the recovery took place and in the 1960s immigrants arrived from all over the peninsula, mainly to work in the flower sector, which exported its products all over Europe. From the 1970s onwards, the country experienced strong demographic growth, mainly linked to the arrival of new residents from the metropolitan area. The analysis at page 71 illustrates the types of housing contituting the current urban fabric. There is a strong difference between the types of buildings in line and multi-family houses. In addition, the bodies in line present outside the historic core are the most common houses in the city but are not comparable to the *cases de cos*, which clearly could no longer support a demographic growth of this impact. They are side-by-side villas that are practically repeated throughout the city, while the multi-storey buildings are almost all buildings up to 6 floors, with the exception of two or three buildings that even reach ten floors.

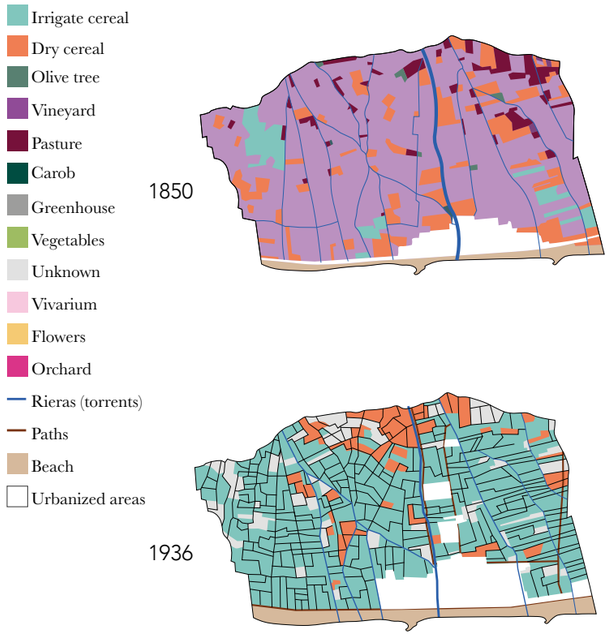
4.2 The agricultural landscape of Vilassar de Mar

The landscape of Vilassar de Mar until 1850

Until 1850, the cultivated area of Vilassar de Mar was around 84% of the total.
The high percentage of cultivated land was entirely congruent with the very high population density that the municipality already had at that time. Indeed, if the population density of the Maresme was already very high compared to the Principality (141 hab / km2 against 32 hab./km2 in 1842), that of Vilassar de Mar far exceeded those figures (492 ha./km2 in 1849).
The crop par excellence was that of cereals, which occupied a total of 240 hectares (69.6% of the total cultivated area). Of these, only 15.9 hectares were subsequently irrigated. The vineyard, both field and dense, was the second crop of the time with 25.7% of the cultivated area. At the time, wine enjoyed a great international trade, it was one of the most profitable products. The coastal municipalities had the advantage of fast long-distance transportation which enabled them to overcome communication difficulties before the transportation revolution. This explains the clear viticultural and commercial vocation of the area. Vineyards and cereals therefore continued to dominate the landscape of Vilassar de Mar until the mid-nineteenth century, accounting for 82% of the total area and 95% of the cultivated area.
In 1850, there were only 16 hectares of irrigated land in Vilassar de Mar. Therefore, the possibility of a sizable vegetable garden was nil. However, there are testimonies that affirm small orchards, thanks to the presence of a stream or stream, but they were mainly for family use without commercial purposes. The third traditional Mediterranean crop, the olive tree, has a testimonial presence, occupying only 0.3% of the cultivated area. The little profit that the olive trees made at the time, due to the uncertainty of the vintages, made them lose their importance in the Vilassar landscape.

Changings between 1850 and 1950

In the last third of the nineteenth century, the decline of cereals began in favor of the vine, first, and then of vegetable crops. This position will permanently lose due to the crisis at the end of the century with the arrival of American cereals and the subsequent decline in cereal prices. The other fundamental culture of the nineteenth century, the vine, also underwent significant changes in this period, but the most characteristic feature of the second half of the twentieth century in the Vilassar de Mar countryside was the spread of irrigated lands. The reason behind this great transformation was to be able to serve the growing demand for food from Barcelona, which doubled its population in thirty years (1900-1930) and reached one million inhabitants.
The tool that made it possible to achieve this leap and to have the ability to access more water was the application of electricity to agriculture, and making this step involved a transformation of the land. In this context, therefore, it must be placed the search for irrigated land in Vilassar de Mar during the first third of the 20th century which formed a new landscape that completely broke with what was known up to that moment: potatoes, vegetables and the flower. To the increase in population must be added the change in food patterns, with the demand for more nutritious, cheaper and fresher products. The improvement of transport and the growing commercialization of food, the origin of the imminent and incipient agri-food industry, and the railway provided economic transport that facilitated its marketing. The first plant product to benefit from the expansion of irrigation was the potato. After the Second World War, however, the period of intensive cultivation and export of the potato stopped and floriculture took over. The cultivation of products such as tomatoes, beans and onions also had its importance, but flower growing becomes so important that Vilassar de Mar became the main flower producer in the whole Maresme and in the province of Barcelona, with clavell (carnation) as the protagonist.



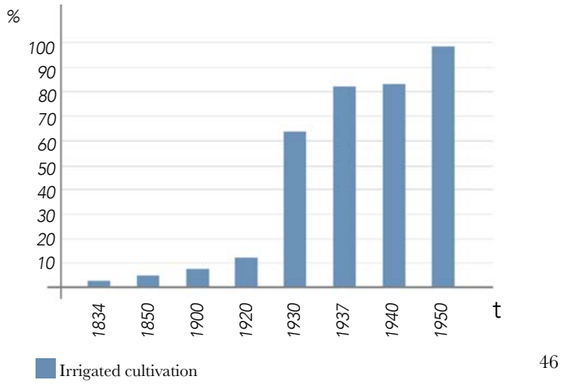
Origin and expansion of flower-growing in Vilassar de Mar

The Maresme is, without a doubt, the Catalan county best known for the expansion of flower-growing. From the early 1900s it will

become the most representative sector of the entire region and in fact Vilassar de Mar has played a leading role in this phenomenon. This change took place thanks to the possibility of increasing water abstractions, which allowed the expansion of irrigated areas. This is the only way to understand the development, first of all, of horticultural crops, and then of floriculture. Among the horticultural areas, the cultivation of cut flowers and ornamental horticulture has progressively developed. In all this process, which has significantly changed the landscape of the Maresme, Vilassar de Mar plays a leading role, in fact this is where floriculture begins. The cultivated varieties of flowers were mainly sent to pharmacies and, since they were also very fragrant, they were also used for making perfumes. Carnation cuttings bore their first fruit in 1923 and by 1970 it was already a perfectly established product in the market. But other flowers were also produced in smaller quantities, such as viola or nard. The baskets of carnations were recorded by the Vilassar de Mar railway station and from there carried throughout the province, so much so that a publication "El Litoral Agricole" (The agricultural coast) was also written. From these years onwards, the floriculture sector will enjoy great importance and exponential growth up to the present time.

The product that occupied and still occupies the extra area in the 1980s is undoubtedly the carnation. Neverthless, with the development of floriculture, the cultivation of other types of flowers begins. In the 1970s, we have already found established crops such as rose, gladiolus, asparagus or gerbera. An important production of the surface is dedicated to outdoor crops, such as gladiolus. But, despite the expansion of other flowers, the carnation will never be abandoned, maintaining a predominant role forever. At an early stage, the gladiolus experiences significant growth; subsequently, the second place after the carnation will be occupied by the rose and Vilassar de Mar will become one of the municipalities of the Maresme leader in the production of roses. In the 1980s the cut flower will remain, while the ornamental plant sector will have a much more unfavorable situation.

A significant change in the landscape is represented by the introduction and spread



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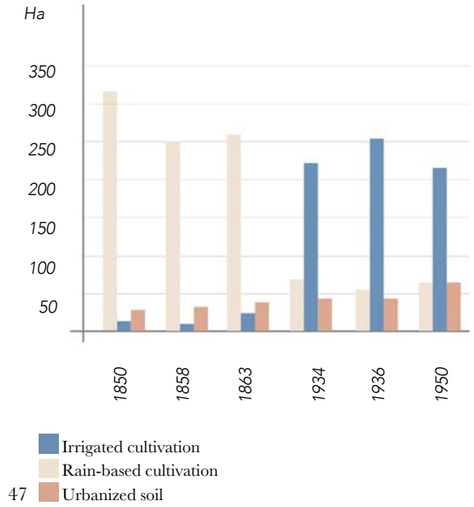
46 Changes in irrigated lands between 1834-1950

47 Changes in the use of soil between 1850-1950

48 Relation of agricultural landscape and historical persistence of the vegetable gardens of the *Case de cos*



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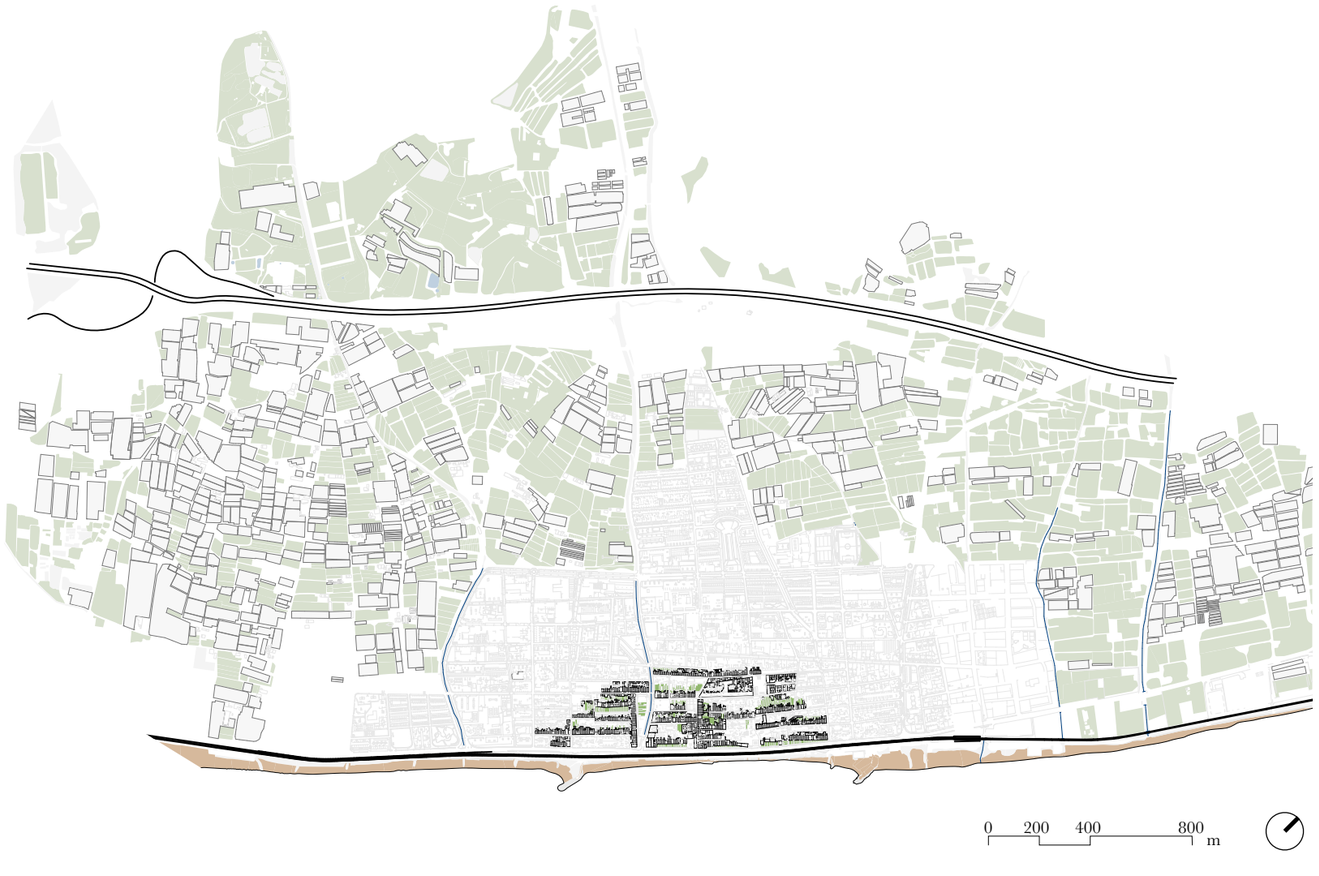

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of greenhouses: the diversity of species and varieties is enormous in the world of floriculture and the art of flowers requires a lot of attention from the farmer. The intensification of these crops, indeed, generated an impoverishment of the soils, which by nature are very good, and which would not be profitable were it not for the treatment given to them by the farmers. The development of this type of intensive farming generated considerable human and technological potential and at the end of the 1950s a series of changes were perceived that will characterize the sector in the decades following today; in this regard, new elements are mentioned such as the increase in the couple of agricultural machines and the introduction of the necessary structures for indoor crops, the protagonist of the greenhouse.

At the end of the 1950s, Vilassar de Mar was practically transformed into a "monumental garden" and, in the 1960s, cultivation in greenhouses began and, in the 1980s, much of the cut flower sector grew inside a phenomenon called "hut", because actually the spread of these buildings, which took the place of fields in the open air, greatly affected the general appearance of the landscape and the greenery.

The Flower Market of Vilassar de Mar

To conclude, we cannot fail to mention the Market of Flowers and Ornamental Plants of Catalonia. A structure that is still very active today between Premià de Mar and Vilassar de Mar, and which reflects the importance that the floriculture sector has had since the 1920s and which still continues to have today. Flower growers aspired to have a market that would remain close to the growing areas, so in 1971 an assembly was held at the Vilassar de Mar Town Hall with local farmers and it was decided to design this structure (since it was already thinking of locating it in Mataró). Thus, since the 1980s, the Maresme has had two markets selling flowers and ornamental plants wholesale: a traditional destination in Mercabarna, and another of origin, the market of flowers and ornamental plants of Catalonia, in Vilassar de Mar.

Use of the soil (nowadays)

- Irrigate cereal
- Dry cereal
- Olive tree
- Vineyard
- Pasture
- Carob
- Greenhouse
- Vegetables
- Unknown
- Vivarium
- Flowers
- Orchard
- Rieras (torrents)
- Paths
- Beach
- Urbanized areas

f2hd51

0 200 400 800 m

4.3 The landscape of Vilassar de Mar

Overall, the Maresme territory offers a varied typology of open spaces and related landscapes, the result of the diversity of the physical framework, natural systems and their interaction with human activities. These open spaces are associated with important natural, social, economic and landscape values, although in various areas the dispersed occupation and the peri-urban phenomenon have resulted in an unfavorable state of conservation and a loss of landscape quality. The image is that of a territory where some main elements associated with the main types of open spaces can be distinguished: forest formations (wooded or not), agroforestry mosaics, wine landscape and coastal strip.

1. Mountain range
The current distribution of forest formations completely coincides with the mountain morphologies of the entire region, where, given the presence of the reliefs, forestry activities and, to a lesser extent, agriculture and livestock have traditionally been carried out. Due to the differences in elevation and weather, the forest formations present a considerable variety, from broad-leaved forests to the white pine forests of the coastal mountain ranges, passing through the pinassa pine forests, holm oak forests, oak forests and riparian formations of river areas.

2. Hilly area - agricultural
The potential vegetation of most of the hillsides is an oak grove. In the ridges and rocky outcrops, holm oaks advance with difficulty, which may indicate that the potential vegetation would consist of a patch of Quercus ilex, Phillyrea latifolia, Rhamnus alaternus Juniperus oxycedrus and Pistacia lentiscus.
Heading towards the agricultural plain, the forests give way to non-wooded forest formations, agricultural fields and residual river flora.

3. The urban belt
Today, in the intermediate belt, between the hills and the coast, much of the agricultural land has been urbanized and the streams have been channeled with the almost total disappearance of spontaneous vegetation. This, until the twentieth century, was mainly ruderal and arvense with the exception of the edges of the streams with residual patches of vegetation from dry beds, with the prominent presence of planted trees (holm oak, banana and various fruit trees) and groups of reeds and willows.

3. The coastal strip
The coast has an alternation of agricultural areas, where the city has not expanded, and areas of littoral flora of pasmophilous plants (plants that grow wild in the sand).
Examples are *Elymus farctus, Euphorbia paralias, Glaucium flavum, Medicago marina, Polygonum maritimum, Silene niceensis and Sporobolus pungens.* Only the abundance of Cakile maritima and Salsola kali stands out, with nitroalophilic characteristics. Currently, ruderal and banal plants dominate, many of which are alien. At the mouth of the streams there were small residual patches of wetlands, now completely disappeared. Now only nitrophilous plant populations and exotic ruderal populations are found.
The coastal strip of the region is occupied by an agricultural matrix (irrigated in the Maresme and Baix Lobregat, and vineyards in Garraf), with a notable presence of urban fabric. These are discontinuous agricultural belts of coastal areas, with the peculiarities of delta formations (wetlands of great biological importance), and with the presence of some wooded areas
Pine forests, arid meadows, holm oaks and algarboros dominate the landscape, also occupying the interstitial spaces between urban areas and old abandoned fields. These moderately or steeply sloping soils are at considerable risk of erosion due to poor soil cover and lack of maintenance of stone walls and traditional farmland, causing significant loss of soil and fertility.
Coastal vegetation is now almost non-existent, partly due to the ground conditions and also because it was damaged by urbanization.
The old rotation of crops among the vineyards and the cultivation of Scots pine, which was used to rest the soil and was an element of diversification of the landscape, has disappeared, although in some very specific places “vineyards have been planted in recent areas. The agricultural area is in decline due to the strong pressure of urbanization and the reduced economic attractiveness of agriculture, with the exception of greenhouse crops, especially flowers and ornamental plants, located right in the lowland areas most sought after by the city.
The abandonment of vineyards and other medium-slope crops and the increase in land cover by natural vegetation is one of the causes of the decrease in the descent of the Sauló by the streams and the consequent regression of the beaches of the Maresme has become more pronounced in recent decades. However, the main serious impact on the beaches is currently due to the breakwaters of the new tourist ports.

Natural landscape (nowadays)

- Woods
- Greenhouses
- Urban green
- River vegetation
- Green buffer zone
- Coastal vegetation
- Agricultural fields
- Beach
- *Rieras* (torrents)

0 200 400 800 m

49

50

0 200 400 800

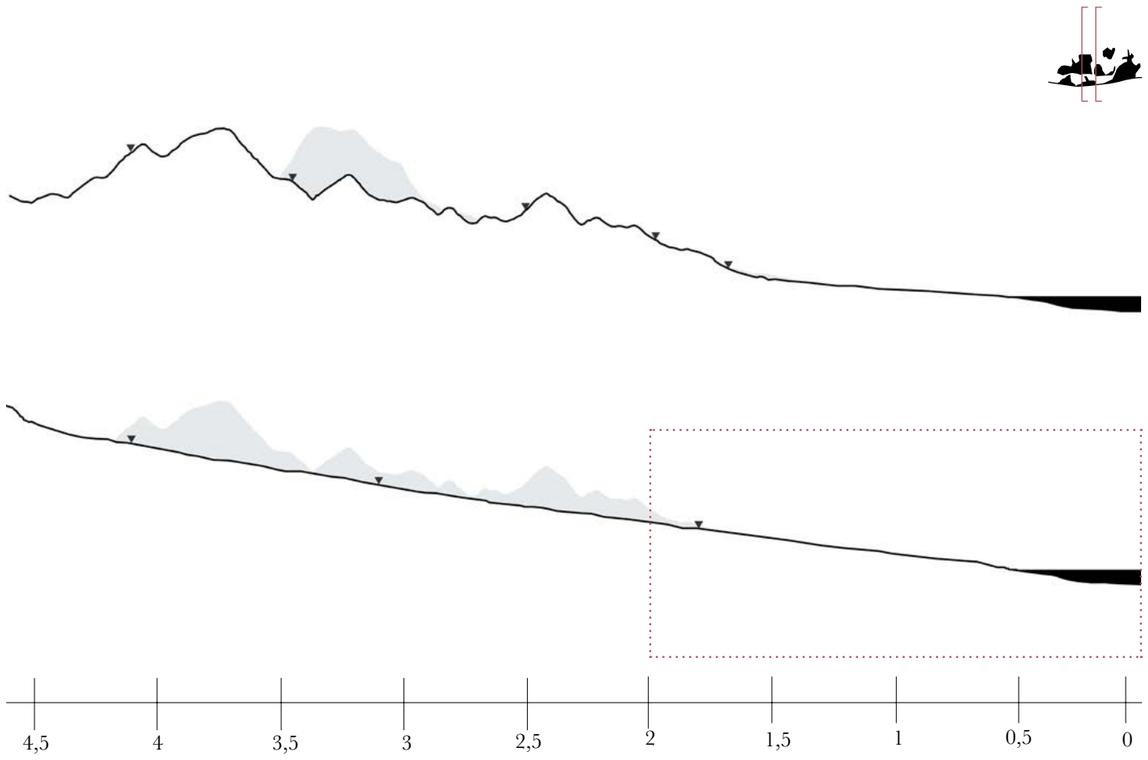
49 Relationship between the agricultural and the urbanized landscape of Vilassar de Mar

50 Density of urban fabrics in comparison

4.4 In-depth analysis about Vilassar de Mar

The thresholds of Vilassar de Mar and its context

The previous historical-geographical study highlights an important feature of the morphology of Vilassar de Mar.
The route between the peak of the mountain of Cabrils, where the Serralada Litoral Park is located, and the coastline of Vilassar de Mar, presents a remarkable diversity of landscapes within a relative small distance, just 5 km.
Descending from the Serralada Litoral Park, the path passes through the pristine wooded areas of the mountains, where the only settlements are the remains of the defensive towers. This leads to the town center of Cabrils, "clinging" to the sides of the mountain: an urban settlement characterized by small single-family houses along roads scattered in the greenery. We proceed along the industrial area close to the highway, and then cross the agricultural area, with the fields, the greenhouses, narrow passages. It then enters the commercial-residential area of the city of Vilassar de Mar and eventually reaches its consolidated urban center with its typical houses, the *cases de cos*, up to the end of the coast.
Unfortunately, however, all this succession of spaces is not continuous because, as Lynch analysis shows, it is interrupted by two major infrastructural barriers: the motorway (Camì del Mig) and the railway.
The neighboring mountain municipalities (Premià de Dalt, Vilassar de Dalt, Cabrils ...) are therefore separated from the coastal area and the latter is forced into a thin strip because it is limited by the railroad barrier and the limit of the sea.
Despite this strong point of criticality, it is possible to identify paths that cross these barriers transversely, and that in some way attempt to mend this fragmented landscape and physically connect the various thresholds: these are the paths marked by the "rieras".



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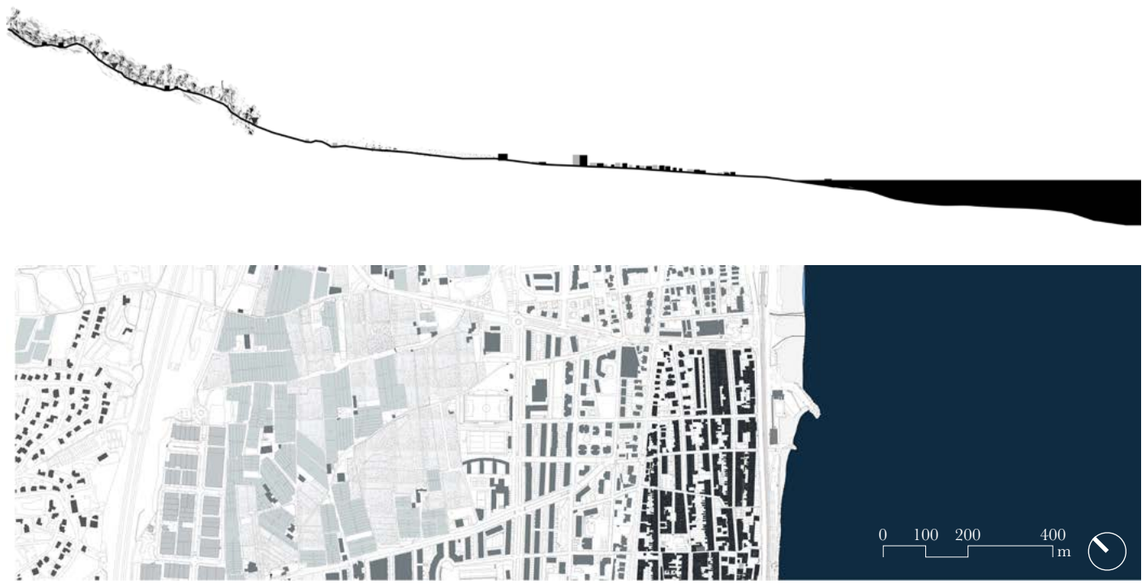

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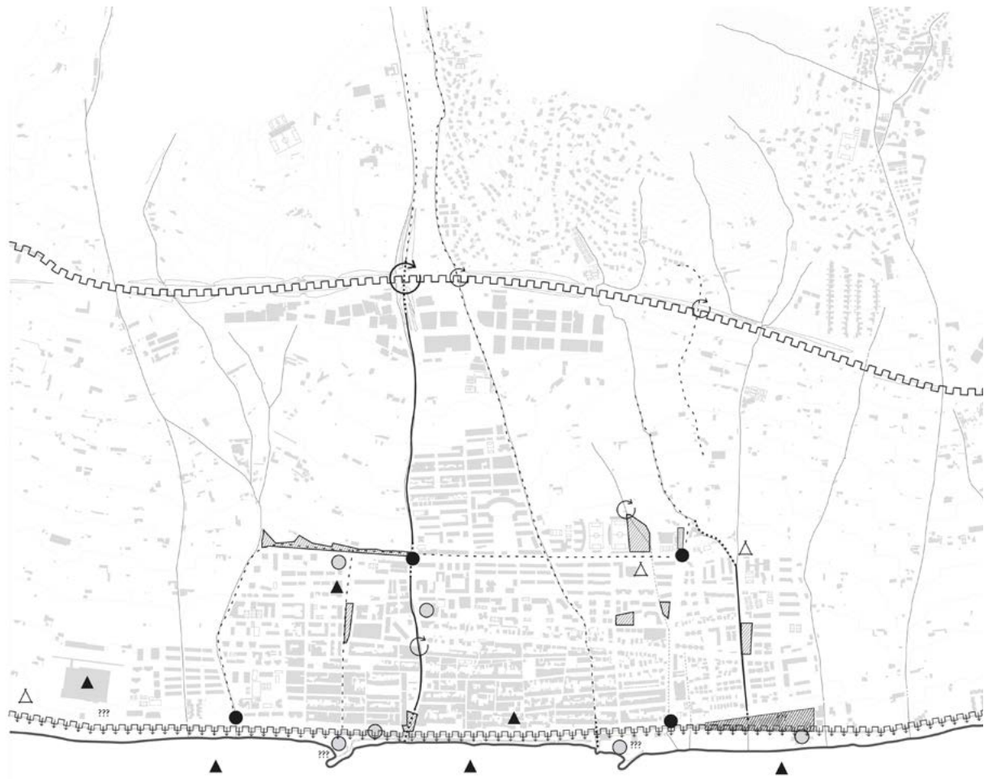
51 Territorial sections of the site

52 Territorial thresholds of Vilassar de Mar

53 Lynch analysis



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Lynch Analysis legend

- Landmarks
- Nodes
- Nodes of people
- Points of cofusion
- Chaotic and/or characterless areas
- Discontinuity
- ??? Lack of relation
- .... Characterless path
- Incomplete/broken path
- Disconnected, hidden waterfront
- Barrier
- Paths

0 100 200 400 m

The road as a space for sociality

The street is the public space that guarantees the right to move. It determines accessibility to people, places, activities and information (one of the five performance dimensions for urban quality according to Lynch). It has the power to physically establish hierarchies in the use of urban space. The urban fabric of Vilassar de Mar is deeply related to the morphology of the Maresme territory and to its historical development.
The streets of its historic center tell the story, which differ from each other on the basis of various factors: section (size, sidewalk-carriageway ratio); relationship with the accesses to buildings; flooring; presence of vegetation.
All these characteristics determine the functioning, the connections, the conformation, the organization and their hierarchy.
Focusing attention on the type and use of the road means intercepting fragments of everyday life and understanding their dynamics, a fundamental step if you are approaching a structuring public space project.
The streets are in fact places of meeting between citizens, but at the same time places where the movement of pedestrians is related to the vehicular one. The analysis therefore focuses on the organization of the road in relation to its use, to understand which roads will become a project area, to no longer be just a simple connection, but also a quality space.

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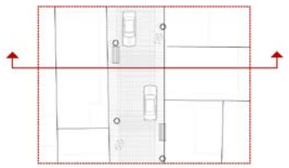

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main sreets

pedestrian streets

56

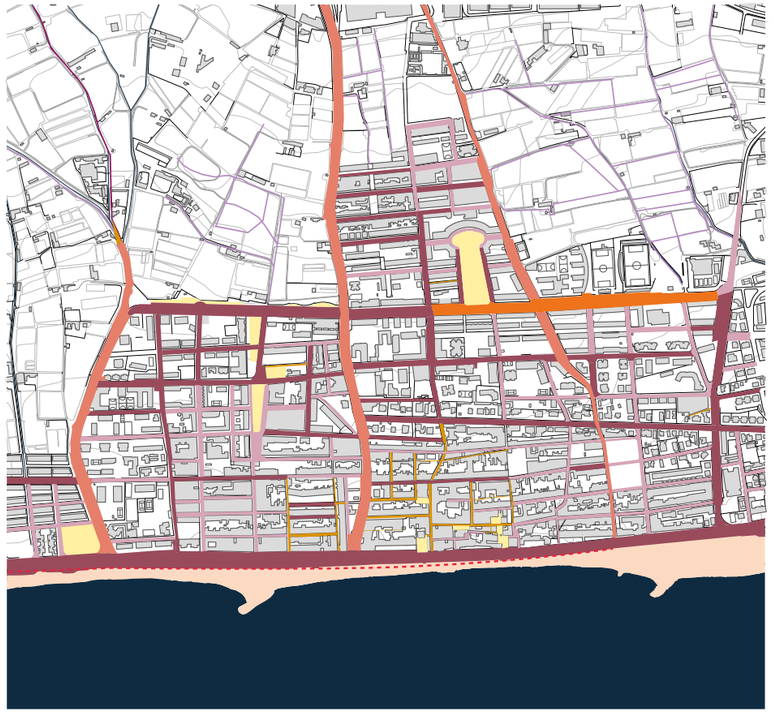
54 Typical street without sidewalk

55 Typical street with a sidewalk

56 Relationship between pedestrian paths and traffic

57 Street typology

58 Use of the streets



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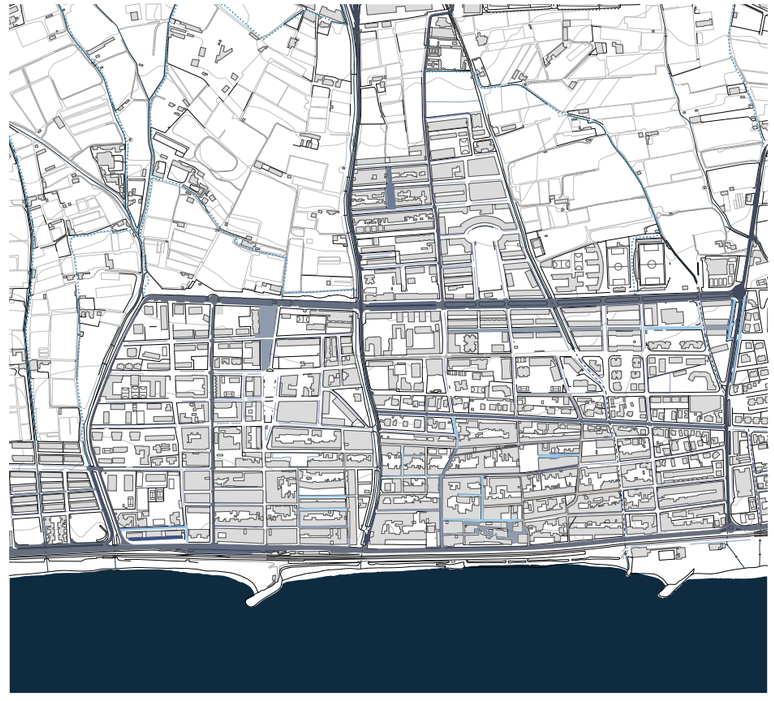

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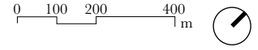


Mobility and facilities

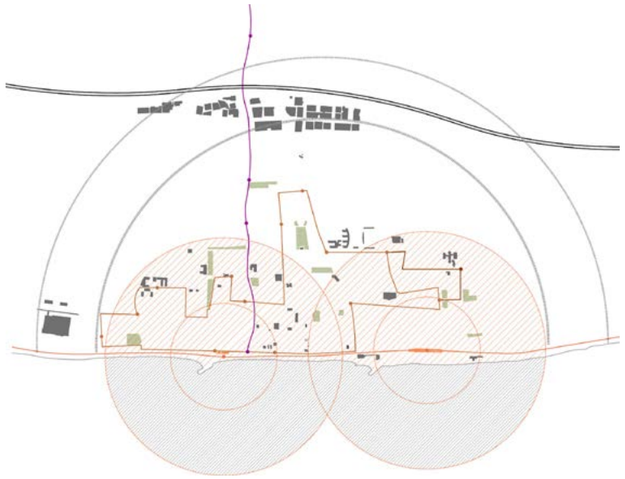
In the context of Vilassar de Mar, to overcome the longitudinal infrastructural barriers, it is essential to work on the entire road organization, to ensure continuity and ease of connections based on the transversality of the connections, the redistribution of traffic within the entire network, to relieve the most congested points. To give the city the opportunity to connect with the coast and its natural surroundings, it was essential to analyze the road organization to understand its principles and reinsert them in an integrated mobility proposal with a strategic vision aimed at giving Vilassar de Mar a new attitude of opening, both towards its coastal front and towards the mountain area.

Facilities in Vilassar de Mar are distributed quite unevenly. Its historic core is a purely residential area, but it does not have basic services; instead there are concentrated points of historical and cultural interest, such as the Can Nadal Tower, the Navy museum, the Enric Monjo Museum, the Carme Rovira House Museum and the Can Bisa.

Although it does not have large green spaces or parks, it still manages to offer small quality and meeting spaces by working with a system of small squares (Plau Vila, Plaça de l'Ajutament), some with trees, others that are small playgrounds for children (Plaça de Geroni Jelpi i Novell, Plaça de la Marc Sicà, Parc de Papots), or some that are presented only as rest areas with some seating.

The main concentration of commercial services is located in Avinguda de Montevideo, the central street of Vilassar de Mar which crosses the city transversely connecting the station to the industrial area. Along this axis is the main market of Sant Joan and the parish of Sant Joan, the main church, to get to the Town Hall, located exactly in the middle of the coast.

Vilassar de Mar offers many services related to both education.
It has 5 primary schools, a middle school, 2 high schools, and 3 nautical institutes. The Municipal Library Ernest Lluch therefore occupies a central role in the education of Vilassar de Mar and is part of the library system of the province of Barcelona: it was recently designed by the architect Màrius Quintana not only as a library, but also as an accommodation and as a cultural center for the Lower Maresme, equipped with a municipal historical archive, interactive rooms, and training rooms.
Vilassar de Mar is also very well equipped with sports facilities, distributed evenly throughout the city. In addition, the part of the coast has two nautical clubs, that of Vilassar de Mar and a few meters that of Cabrera de Mar.



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59 Vilassar de Mar rail transport coverage

60 Mobility and facilities

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Vehicular circulation and street network

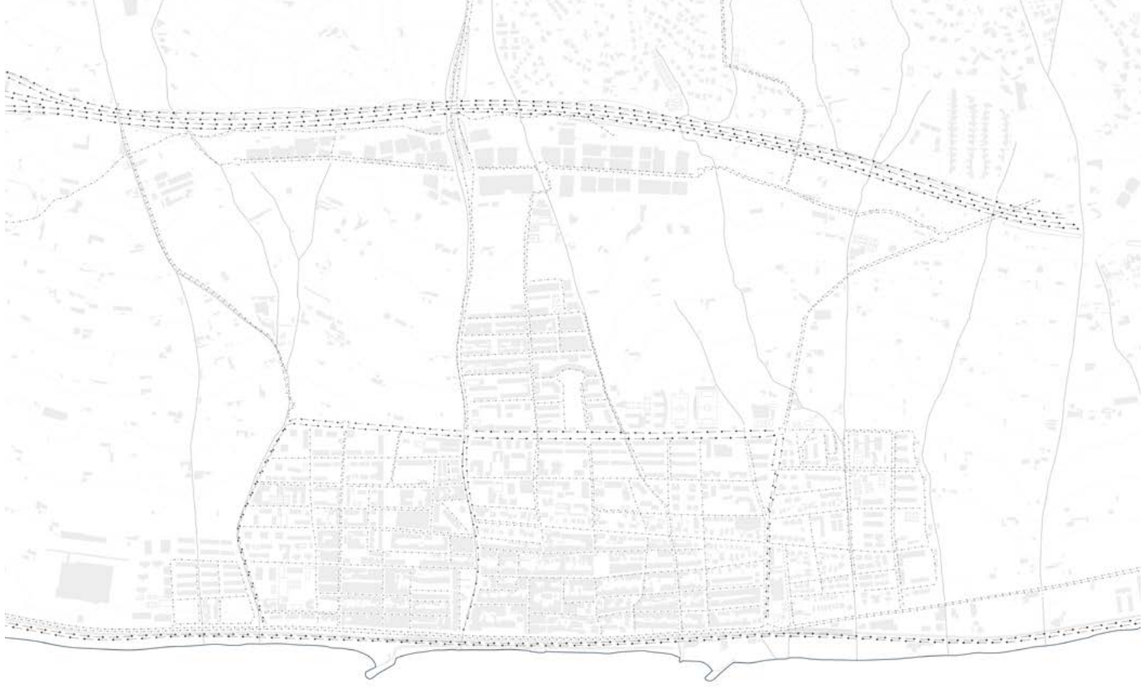
Traffic distribution of Vilassar de Mar works on a ring main circulation system. One of these roads, Via Nacional, is also a fundamental axis for regional mobility as it constitutes the only historical road axis that connects all the municipalities of the Maresme to Barcelona. Despite the Autostrada del Maresme (C-32), the Via Nacional still constitutes a strong barrier (in addition to the railway line) between the city and the sea front.

61

Railway

Traffic intensity

Street network



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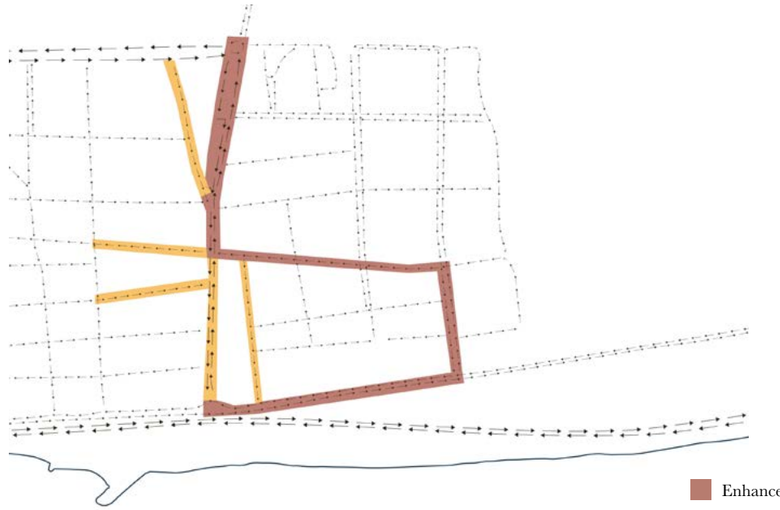
61 Circulation overload

62 Current driveway viability

63 Traffic flow redistribution

64 Driveway viability of the project



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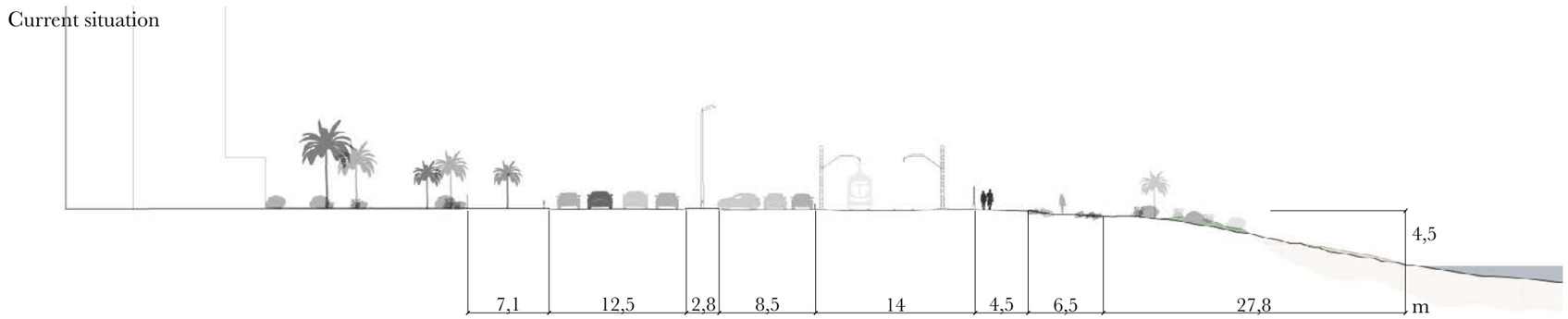
Enhanced traffic flow

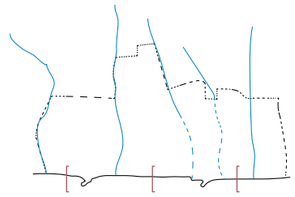
Change of direction of travel

64

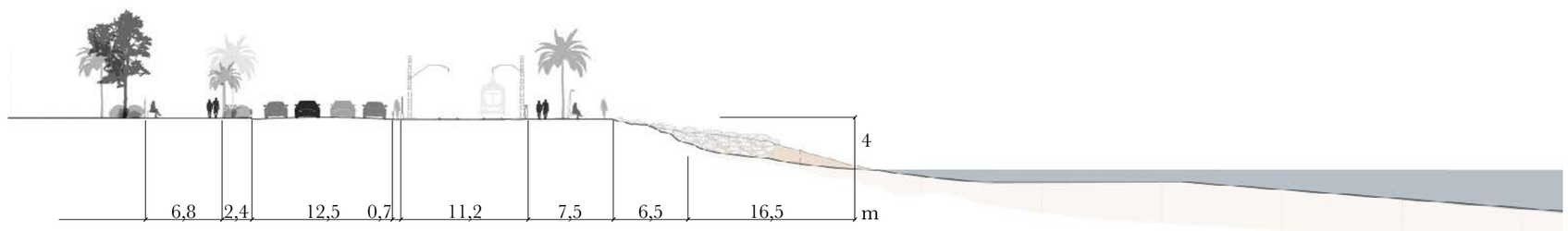
0 100 200 400 m

Current situation

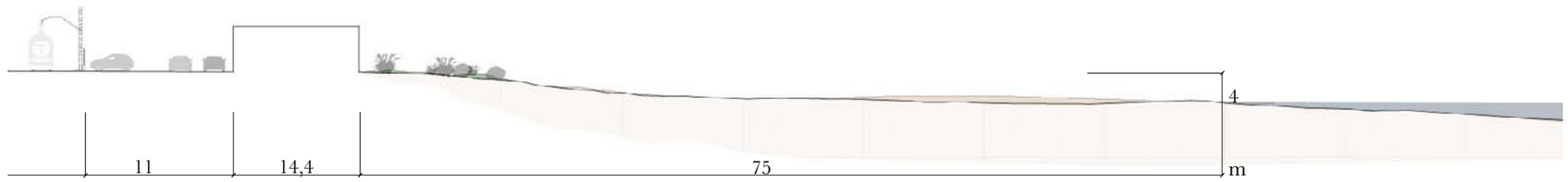


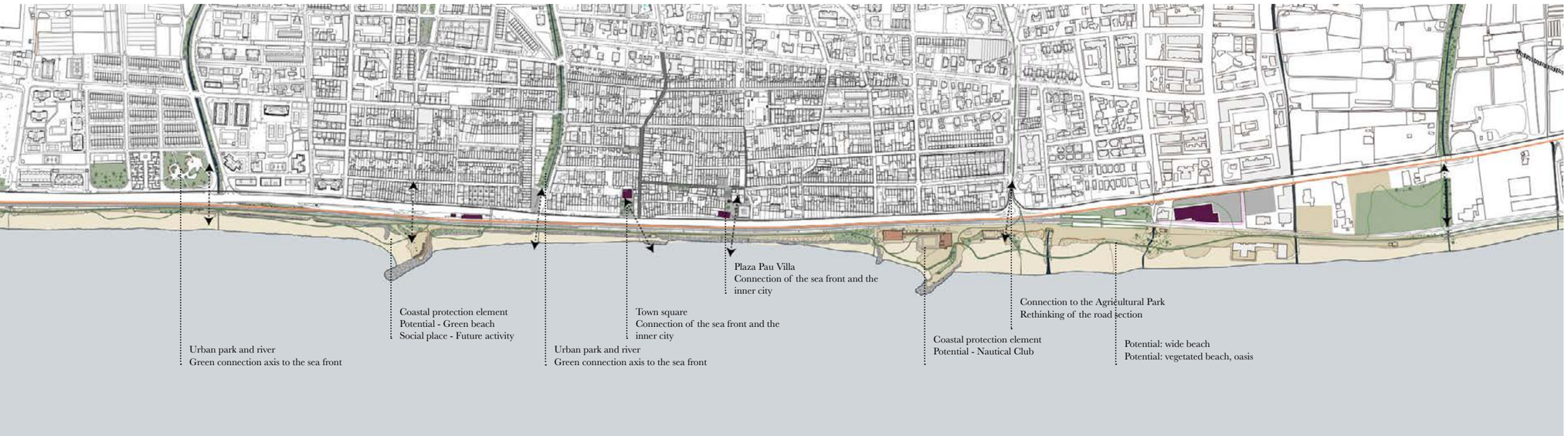


Current situation



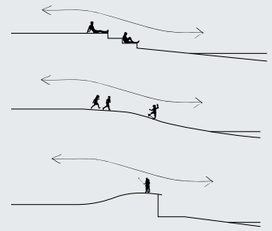
Current situation

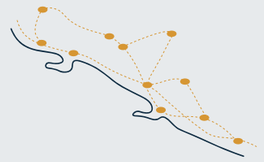




Winning back the waterfront

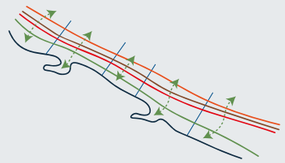
A strategy to overcome the infrastructural barrier of the railway and mend the city and the sea.





1. Connecting and opening

- Coastline
- Cycle and pedestrian routes - existing and new roads / routes forming the new maritime front of Vilassar de Mar
- Points of interest - Squares, parks, sports complexes, markets, rivers, beaches



2. Organizing and crossing

- Coastline
- Via Nacional
- Urban front
- Rieras (torrents)
- Waterfront
- Tram line
- Crossings

3. Renaturalizing and equiping

- Coast line
- Paths
- Rieras (torrents)
- Waterfront

PART 5

Towards the *Parque Agrícola Litoral del Maresme*

(Agricultural-Coastal park of the Maresme)

How to give importance to nature but at the same time to the quality of an urban space?

5.1 Designing a new green infrastructure

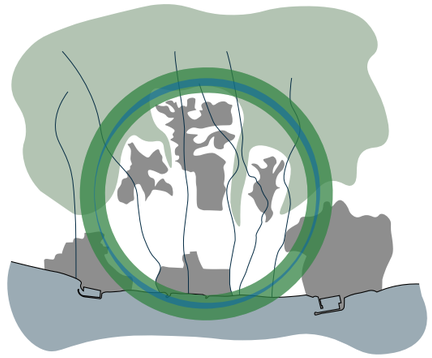
The waterfront project constitutes the main turning point of this work since, as it can be seen from the previous studies, the displacement of the railway line gives Vilassar de Mar (and all the municipalities along the Maresme coast) the opportunity to restore its ancient relationship with the sea, reclaiming the coast as a social and natural identity space.
The waterfront is a fundamental part of a coastal city both at urban and landscape level, which is why, in order to guarantee an effective response, thinking of designing it as an independent segment is not sufficient, but it needs to be considered within a much larger system consisting of physical, visual, social and natural connections.
Since over centuries human intervention has increasingly invaded the landscape (the infrastructures have canceled the waterways, the agricultural area has been invaded by industries, the coastal strip is increasingly urbanized, etc.), we must aim for to the conservation of the surviving natural landscape and push in this direction, identifying points where nature can expand and penetrate the urban fabric and integrate it.

Preserving and regenerating landscape values

The acceptance and specific socio-ecological declination of the concept of resilience in the context of the landscape project will certainly entail, in the short and medium term, a reorientation, if not a real rewriting, of the relationships between public space and construction technologies, starting from the methodological choices and the theoretical-applicative systemic foundations of this design approach in line with the current needs related to environmental sustainability.
Gilles Clement speaks of "*living world to indicate the sum of beings endowed with the capacity for transformation, from bacteria to man, intertwined together in a knot of more or less close relationships, which bind each part to the whole in a continuously renewed dynamic*".
A landscape project, with its various territorial areas and technical components, in the light of the resilience paradigm, must therefore be increasingly reinterpreted as a process of

65 Green connection between the coastal front and the inland

66 Ecosystem services classification



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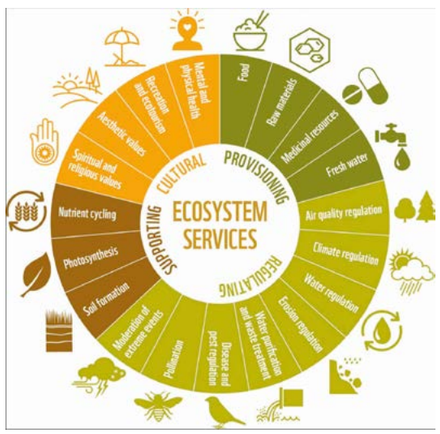

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technological-environmental transformation of the settlement space in its entirety and in its consistency as a complex system in which man, nature, artefacts and society interact.
In order to give importance to nature and at the same time to the quality of an urban space, it is essential that these two elements work in synergy, in order to create a natural system that also becomes a public space for the city and its surroundings.

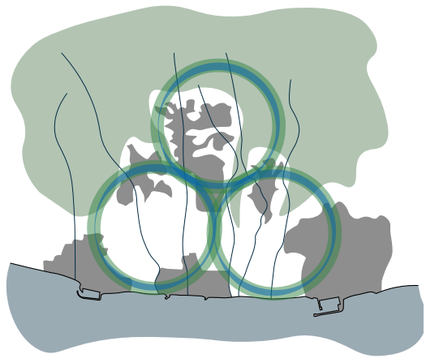
What does designing a green (and blue) infrastructure entail?

A green (and blue) infrastructure is a complex project, which takes into consideration many aspects, not only of a landscape nature, but also of a social, economic and urban nature.
The green infrastructure project finds its goal in the creation of a network of strategically planned natural[1] and semi-natural areas with other environmental elements, designed and managed in such a way as to provide a wide spectrum of ecosystem services.
With the definition "ecosystem services" we mean the ability of natural processes and components to provide goods and services that meet, directly or indirectly, human needs and guarantee the life of all species; their function depends on biodiversity, which is essential for them to give their benefits.
These benefits can be grouped into 4 main categories:
- Life support: these functions collect all those services necessary for the production of all other ecosystem services and contribute to the conservation (in situ) of biological and genetic diversity and evolutionary processes;
- Regulation: in addition to maintaining the health and functioning of ecosystems, the regulatory functions collect many other services that have direct and indirect benefits (such as climate stabilization, waste recycling, prevention of hydrological instability, regulation of pollination and the creation of habitats for diversity), usually not recognized until they are lost or degraded;
- Supply: these functions collect all those resource supply services that natural and semi-natural ecosystems produce (food, raw materials, fresh water and biological variability);

- Cultural: natural ecosystems provide an essential "consultation function" and contribute to the maintenance of human health by providing opportunities for reflection, spiritual enrichment, cognitive development, recreational and aesthetic experiences.
This is precisely what the project wants to promote: the diversity of points of view.
Having identified a relative height and a different type of landscape in each "threshold", the project aims to unite them and build a single system by devising a path that crosses every area and transmits, while crossed, the beauty and richness of the landscape of the Maresme.

Why designing a "ring" ecological system?

And here is the challenge: the apparent lack of communication between the different altitudes (mountains, plains, sea) is reconsidered through the design of a road system that connects and reconnects the city and its strong natural surroundings in a non-invasive way.
The rings intersect the different systems, the natural one and the urban one, and the result is the identification of areas that represent the melting point between nature and the city; they constitute the link between the mountain and the sea through a track that runs through every corner, known or to be discovered, of this landscape.
A great action capable of connecting, but also of giving an impulse that leads to a chain reaction to redevelop and enhance the landscape heritage; a project that, in the future, would be able to spread throughout the region through a series of interventions, even on a timely basis.
Going more specifically, the project provides for the identification of existing road routes to connect the identified areas of interest and, where necessary, to expand the stretch in order to give the itinerary continuity and circularity.
The new ecological ring will connect to other existing ecological rings and corridors in order to generate a continuous system of green corridors that are not only intended to protect and preserve all the natural landscape of the county, but also to connect with other parks and protected areas belonging to the Anella Verde project of the PTMB.



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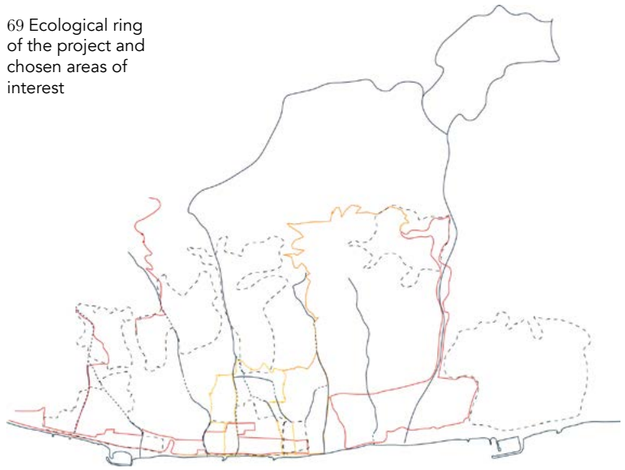
67 Division into sub-rings to structure an ecological network

68 Existing rings and first hypothesis of a green ring and ecological corridors

69 Ecological ring of the project and chosen areas of interest



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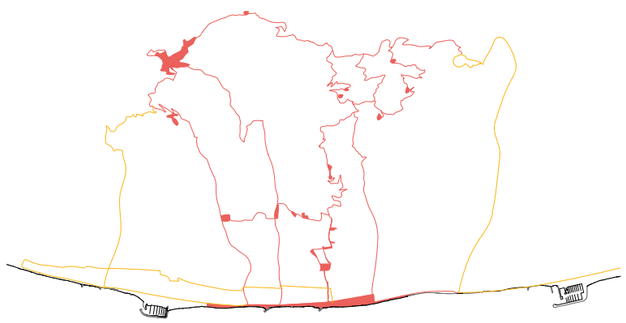

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Existing rings systems (trekking paths)

1. Existing tourist route (Premià, Vilassar de Dalt, Sea front)
Distance: 14.6 km
Altitude difference: 600 m (uphill) and 495 m (downhill)
2. Existing tourist route (Baixador Renfe Cabrera, Passeig Maritim, el Cros, Argentona, Carretera de Vilassar, Camí del Mig)
Distance: 21 km
Travel time: 1h 48 '
Difference in altitude: 195 m
3. Existing tourist route (Premià, el Masnou, Vilassar de Mar)
Distance: 24.3 km
Travel time: 1h 55 '
Difference in altitude: 110 m
4. Existing route to be upgraded (connection between the touristic ring of the project to the existing route n. 2)
5. Project tourist route (Vilassar de Mar, Cabrils, Cabrera de Mar)
Distance: about 6 km
Journey time: 45 min
Difference in altitude: 80 m

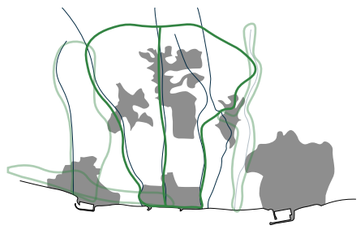
The ecological ring of Vilassar de Mar

These maps offer a detailed description of the strategy underlying the project: defining a green corridor in the context of interest, which crosses the different landscape thresholds of the Lower Maresme, connecting the city centers. It is a ring system that traces the existing agricultural and mountain paths, to which the waterfront path is connected, and which incorporates another network of secondary natural paths. These then branch off into the agricultural-mountain landscape and intersect cities and places of great landscape value (such as the Serralada Litoral Marina Park, the archaeological area of Can Boquet and Castel de Burriac) and residual agricultural spaces with a great potential for the future leisure, cultural, productive areas and nodes of biodiversity. Once the main route has been defined, a system of sub-routes is also presented (into which it is divided) so that the eco-

logical network can interact at different scales and serve all the cities of this area of the Maresme: Vilassar de Mar , Cabrera, Cabrils, Vilassar de Dalt, Premia de Mar and Matarò. Furthermore, this new green infrastructure will connect to the existing ecological corridors of Premia de Mar and the Riera d'Argentona (Matarò), acting as a future connecting element between already consolidated ecological systems, to unite them in a system in continuous relationship and interdependence.

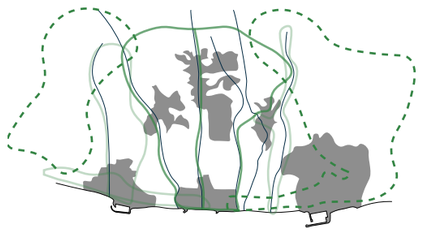
Time 0

Current situation of the ecological rings:
-Premià de Mar-Premià de Dalt
-River of Matarò
- Premià de Mar coast



Time 1

Implementation of the consolidated ecological ring-system with the addition of a green connecting ring



Time 2

Future prediction for a large-scale development of ecological rings that work on several areas of the Maresme area.

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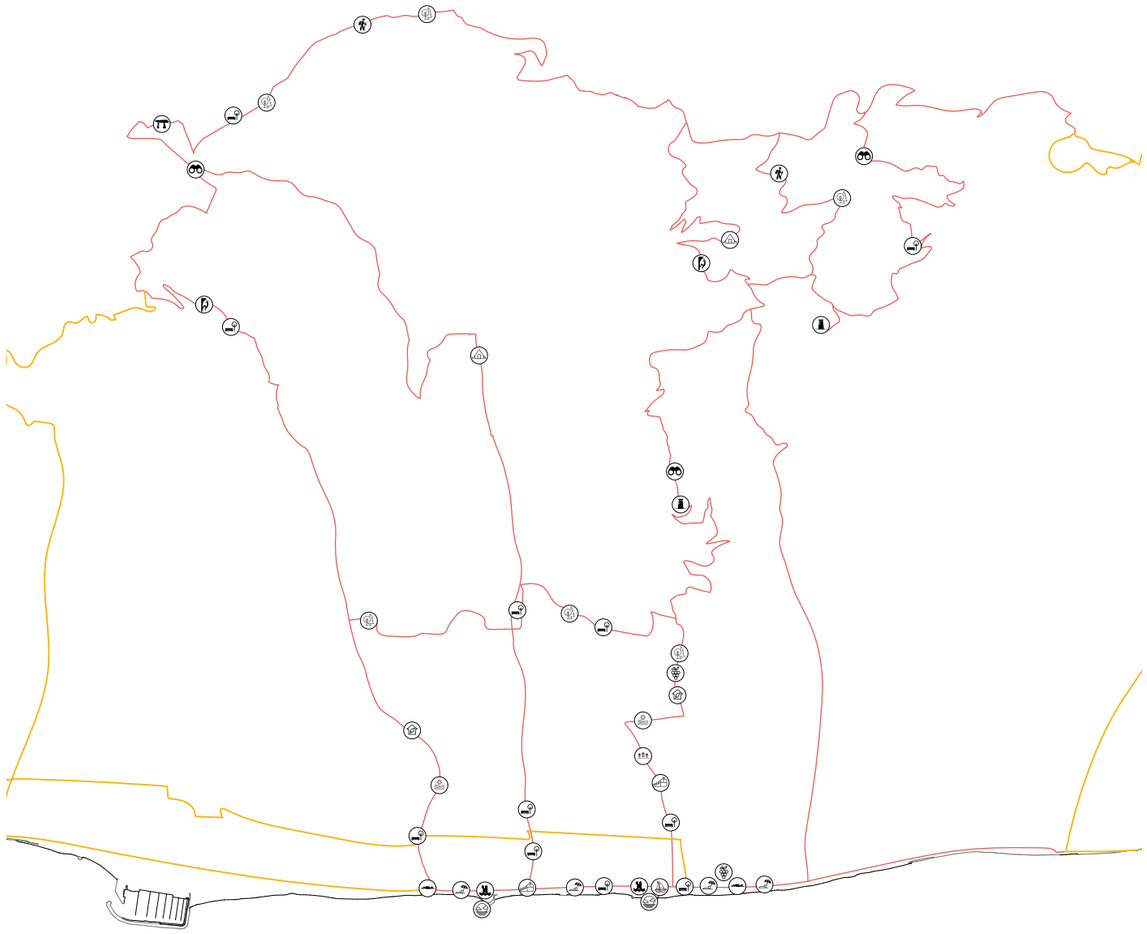
70 Development of the green rings over time

71 The activities and places of the planned green infrastructure



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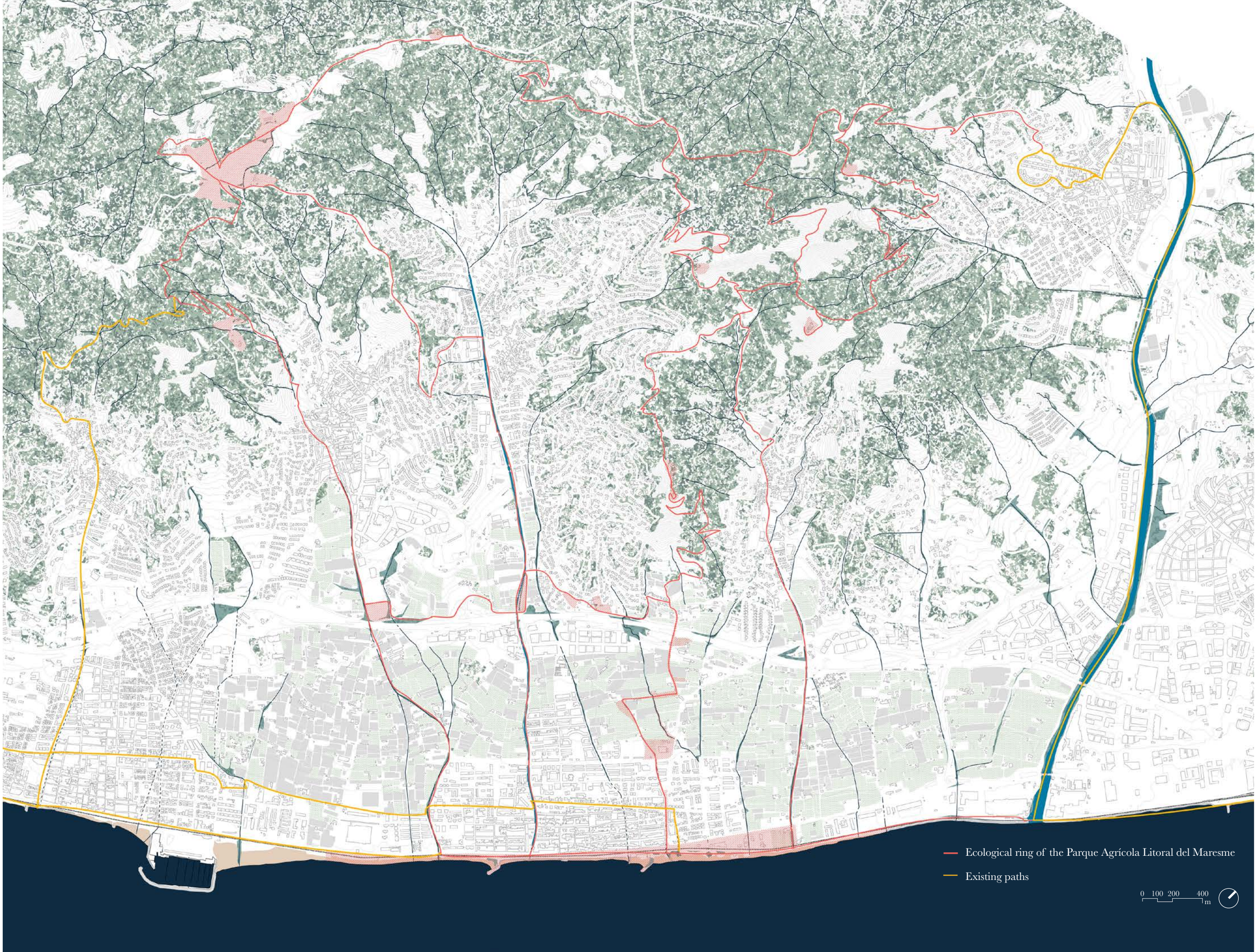
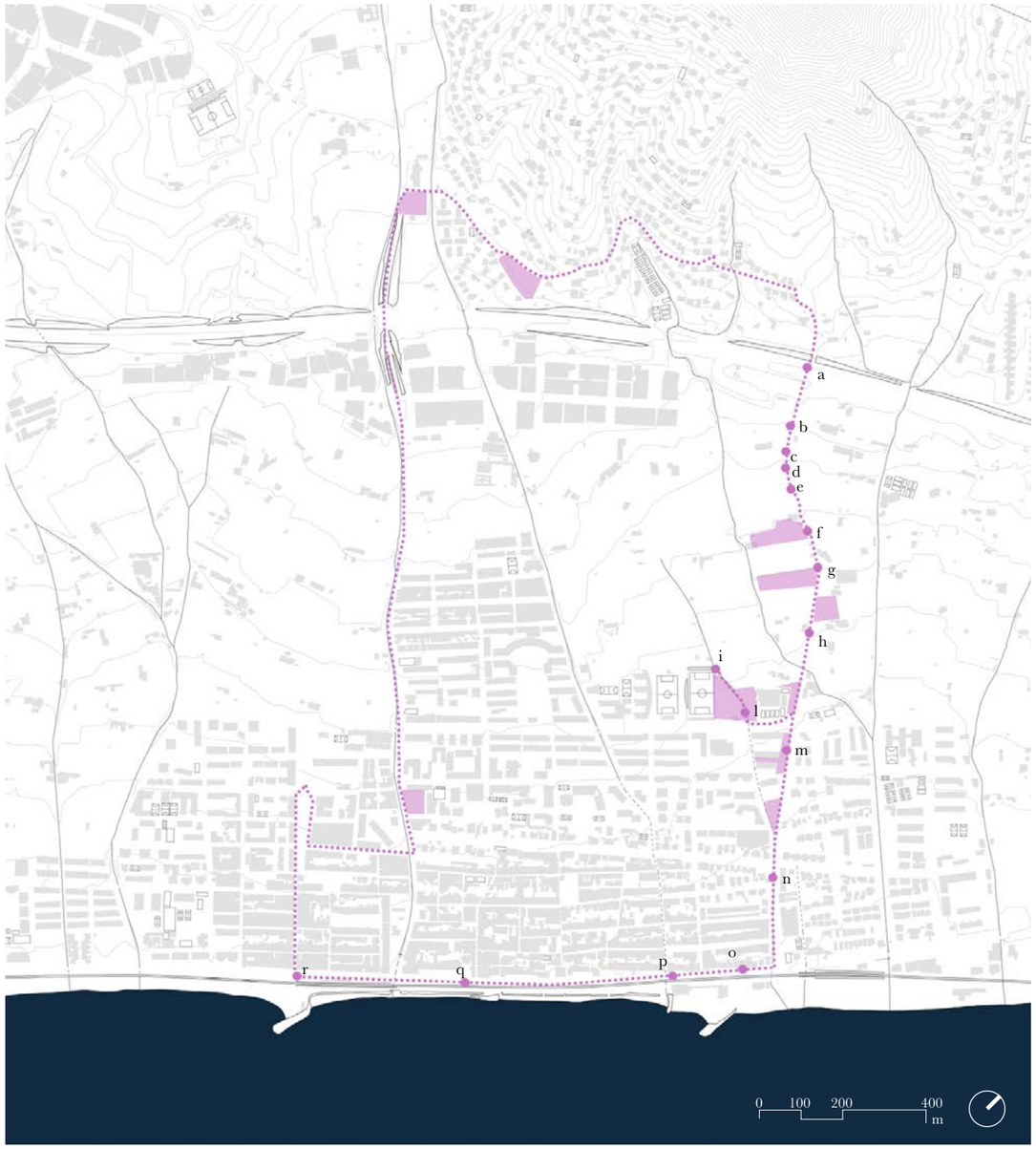
Ecological ring of the Parque Agrícola Litoral del Maresme

Existing paths


Ecological ring of the Parque Agrícola Litoral del Maresme
Existing paths
0 100 200 400 m



72 A photographic itinerary (made during the project survey in Vilassar de Mar)


a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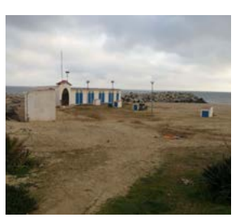
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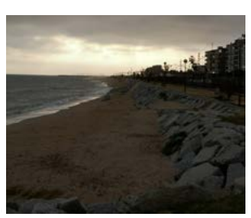
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72

Residual space in Cabrils

Problem: Abandoned and decaying urban space

Potentiality: Viewpoint and green area

Path between the greenhouses and fields of Vilassar de Mar

Problem: Path in decay; instable path; lack of safety

Potentiality: Connecting element of the landscape

Path between the greenhouses and fields of Vilassar de Mar

Problem: Path in decay; instable path; lack of safety; abandoned fields and greenhouses

Potentiality: Connecting element of the landscape; reuse of agricultural spaces in the park

Current situation of the Plaza de la Estación

Problem: Unexploited area

Potentiality: Strategic position

Current situation of the Placita del Mar

Problem: Urban residual space / Characterless area

Potentiality: Connecting element between agricultural area and coastal area

Carrettera d’Argentona

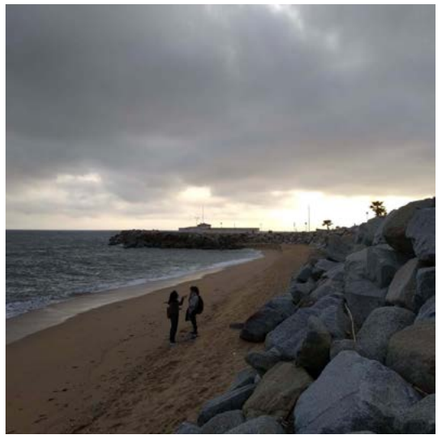
Problem: Dysfunctional road section

Potentiality: Green corridor

Trace of a riera integrated into the underpass

Problem: Interrupted path; flows overload (stormwater, people and cars)

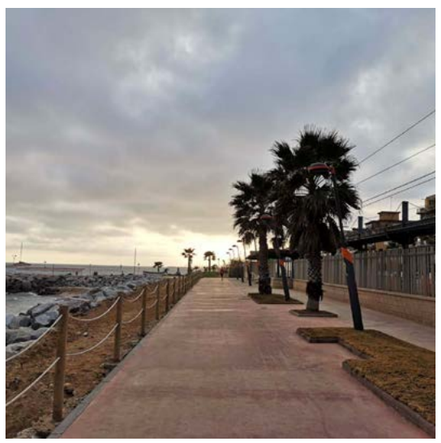
Potentiality: Direct access to the beach and the oasis



Current situation of the beach in the section between the two breakwaters

Problem: Almost total erosion of the beach; discontinuity between city and sea

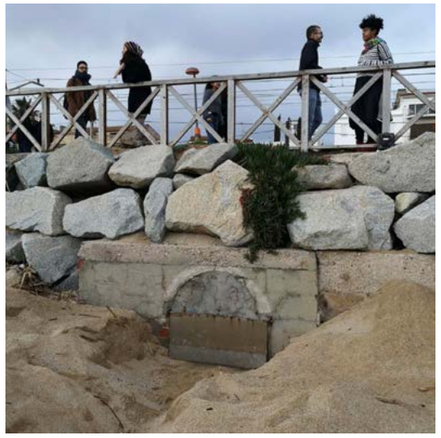
Potentiality: Using the difference in height for a gradual descent



Current situation of the waterfront

Problem: Path limited by the railroad fence and with no access to the beach

Potentiality: Restoration of the path section and direct access to the beach



Current situation of the view on the beach and drainage system for stormwaters

Problem: Discontinuity; non-integrated drainage solution; lack of safety

Potentiality: Integration of the drainage system into the coastal regeneration

Current situation of the beach in the section between the two breakwaters

Problem: Almost total erosion of the beach; discontinuity between city and sea

Potentiality: Using the difference in height for a gradual descent

Stato di fatto del frangiflutti di Ponente

Problem: Urban residual space /Characterless area

Potentiality: Wide space; strategic position; presence of interesting natural elements (dunes, cliffs)

5.2 Nature Based Solution as a design tool: regenerating urban space and the coastal ecosystem through resilient public spaces

Nature Based Solutions

Nature Based Solutions basically consist in the increase, improvement and enhancement of natural areas, in order to generate a series of ecosystem benefits and services such as, for istance, the improvement of air quality (intercepting dust and other atmospheric pollutants), regulation urban microclimate, containment of the heat island in the city, regulation of meteoric water flows, provision of leisure/recreation opportunities, improvement of the quality of life, conservation of biodiversity, absorption of greenhouse gases and much more

Based on the four objectives indicated above, the European Commission recommends seven Nbs to be developed by the Member States:

- urban regeneration through Nature based Solutions;
- NbS to improve well-being in urban areas;
- define NbS for increasing coastal resilience;
- management of watershed areas through the restoration of ecosystems;
- Nature Based Solutions to increase the sustainability of the use of matter and energy;
- NbS to improve the value of ecosystems;
- NbS to increase carbon sequestration.

Coastal resilience

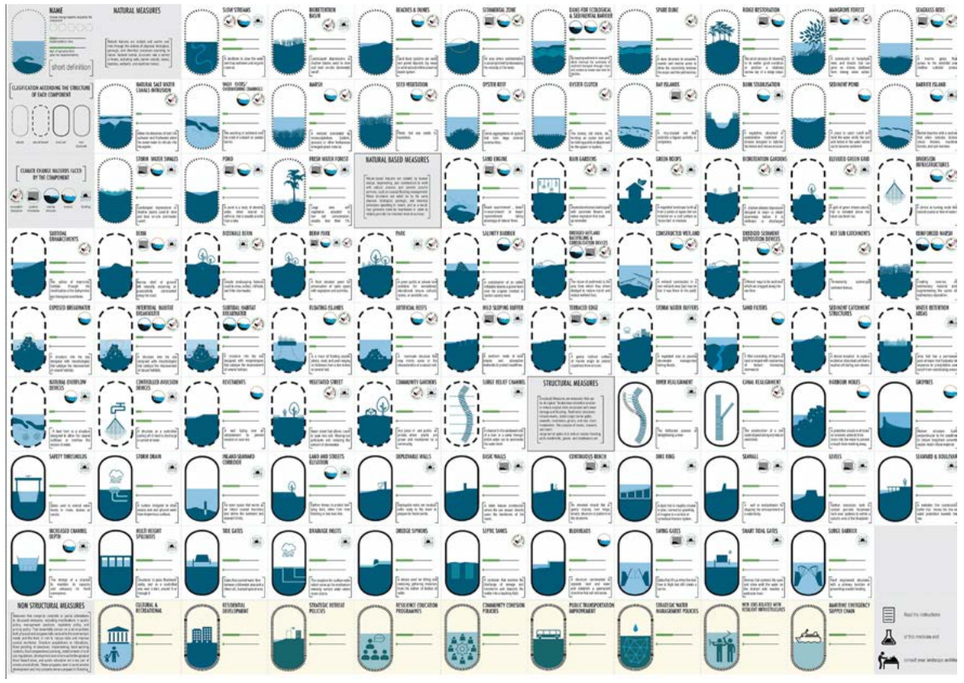
The increase in erosion, result of the combination of rainfall and sea level rise, is an opportunity for the gradual transformation of this homogeneous coastline into different types of spaces along the front (coves, terraces, sea pools, etc.). Less vulnerable and more consolidated landscapes are more capable of promoting distinct activities related to idleness, sport, the sea and sociability.

Starting from consolidation operations, the structuring physical bases are created that allow the establishment of functions capable of lasting over time because in favorable conditions. This actions, from purely functional of counseling and protection, becomes project inputs where the safeguard intervention itself also acquires the function of public space.

The main actions to be undertaken can be summarized in the tables of the doctoral thesis of Miriam García (scholar and researcher

73 Miriam García, **Lexicon for a Synthetic Metamorphosis of the Coast**, Phd Thesis, *2100 Climate Scenarios for the Metropolitan Coast of Barcelona,* Barcelona, 2019.

of issues relating to coastal protection in its entirety): *Towards the Synthetic Metamorphosis of the Coast. Resilient landscape design.* The result of his research is a new visual alphabet that displays a set of tools for coastal landscape design. In the planning strategy drawings for coastal protection, some of the principles present in the table on the following page have been selected so that the project can present itself with a truthful and feasible proposal.



73

Lexicon for a Synthetic Metamorphosis of the Coast

NbS cathegories used in the coastal strategy for the Waterfront of Vilassar de Mar

NATURAL MEASURES

Natural features are created and evolve over time through the actions of physical, biological, geological, and chemical processes operating in nature. Natural coastal structures take a vareity of forms, including reets, barrier islands, dunes, beaches, wetlands, and maritime forests.

Beaches and dunes

Sand dune system are sand and gravel deposits (by wave or wind action) within a marine beach system.

Spare dune

A dune strcture in estuarine, coastal and marine areas to allow the connectivity between the sea and the saltmarshes.

Sedimental zone

An area where sedimentation is accomplishes by decreasing the speed of the water.

Seagrass beds

A marine grass that grows in the intertidal and shallow subtidal zones.

Ridge restoration

Recovery of the slope and crowning of banks and coastal fronts with sediments and plantations to restore their defensive and environmental functions

Embryo dune catalyst

Morphological reconstruction with plant species that achieves accumulation and stabilization.

Active catering dune system

The process of restoring the characteristics of dune systems of dune systems by catalyzing the natural precessors that are theirs.

Dune system consolidation

The dune management process to increase its magnitude thanks to the control of the vegetation cover and the state of sand collectors

Bioretention gardens

A shallow planted depression to retain or detain stormwater before it is infiltrated or discharged downstreams.

NATURE BASED MEASURES

Nature-based measures are created by human design, engineering, and construction to work with natural process and provide specific services, such as coastal flooding management. These structures are acted on by the same physical, biological, geological, and chemical processes operating in nature, and as a result, they generally must be manteined in order to reliably provide the intended level of service.

Mild sloping buffer

A landform made of mild slopes and absorptive materials to protect coastlines.

Terraced edge

A gently inclined surface of marine origin to protect coatline from erosion.

Park

A green public or private land available for recreational, educational, leisure, cultural, scenic or aesthetic use.

Vegetated street

Green street that allows runoff to soak into soil, filtering out pollutants and reducing the amount of stormwater.

Sand filters

A filter consisting of layers of sand arranged with coarseness of texture increasing downwards.

Tide pool

Provide shoreline stabilization of the beach portion of the new shoreline, as well as increase ecological performance through changing tidal levels

Sea forest

Biological production structure that is linked to a perception of increasing oxygen levels and long-term improvement of water quality

Algae purifier

Floating structure made of algae that acts as a water purifier through photosynthesis

STRUCTURAL MEASURES

Structural Measures are measures that can be designed in order to decrease shoreline erosion or reduce coastal risks associated with wave damage and flooding. Traditional strcture include levees, storm surge barrier gates, seawalls, revetments, groins, and near shore breakwaters. The purpose of leeves, seawalls, and storm surge barier gates is to reduce coastal flooding, while revetments, groins, and breakwaters are typically intended to reduce coastal erosion.

Storm drain

A surface designed to drain excess rain and ground water from impervious surfaces.

Seaward and boulevard

A walkable thin constructed buffer zone that moves the line of water protection towards the sea.

NON-STRUCTURAL MEASURES

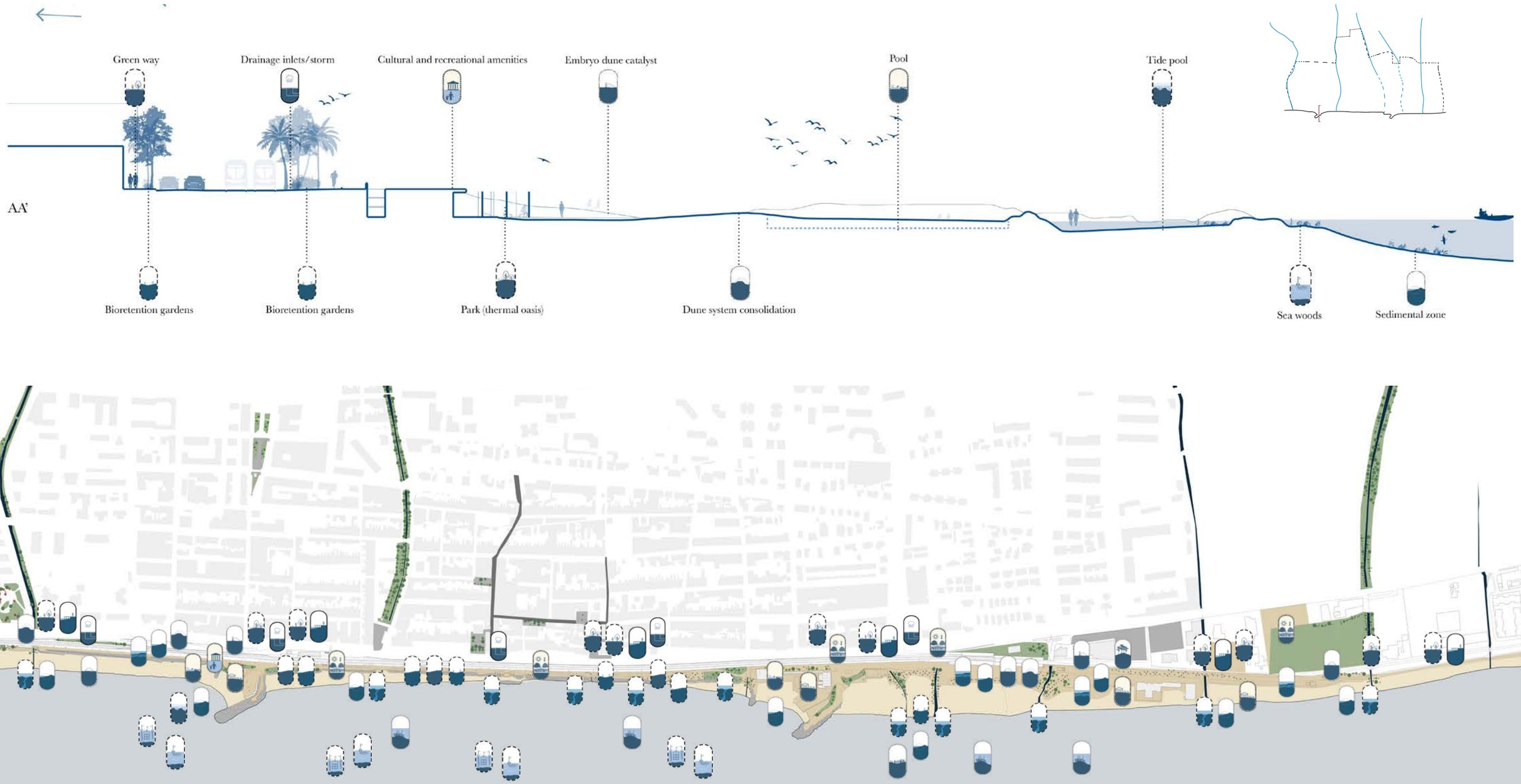
Measures that comprise complete or partial alternatives to structural measures, including modifications in public policy, management practices, regulatory policy, and pricing policy. They essencially consist on a set of policies both physical and programmatic tailored to the community's needs and the level of risks and improve coastal, implementing flood warning systems, flood preparedness planning, establishment of land use regulations, development restrictions within the greatest flood hazard areas, and public education are a key part of nonstructural efforts. These programs seeks to avoid unwise development and help property owners prepare for flooding.

Sea sports

Cultural and recreational amenities

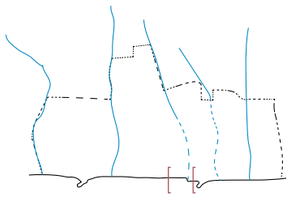
Swimming pool

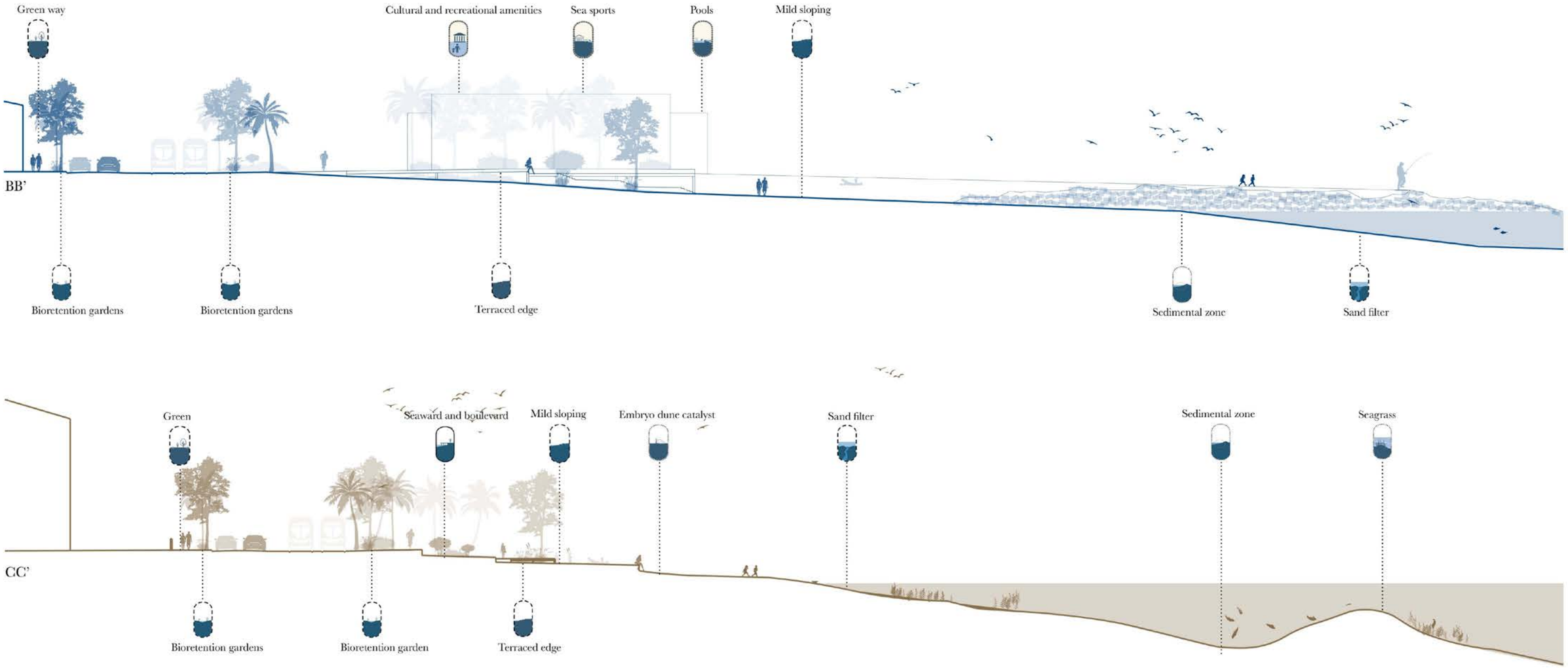
Climate shelter

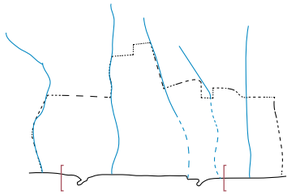


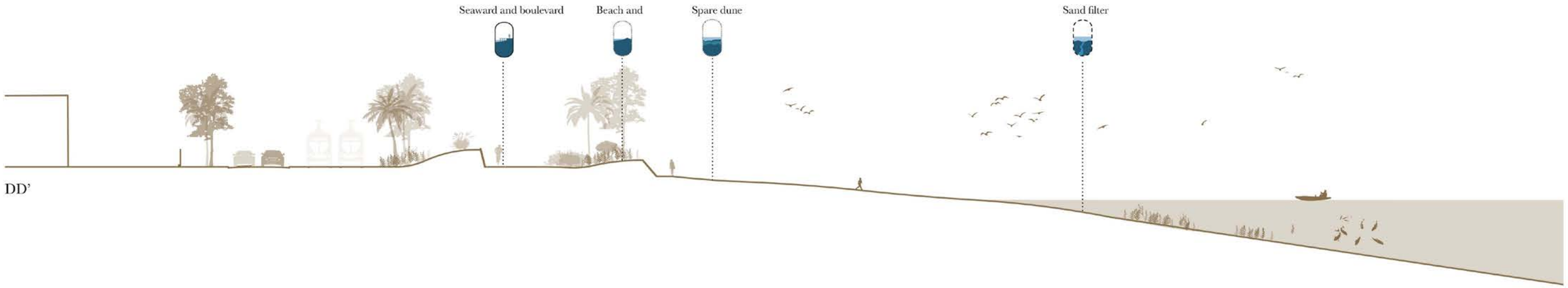
New visual alphabet of coastal landscape design tools

- Bioretention gardens
- Sand filter
- Terraced edge
- Tide pool
- Vegetated street
- Mild sloping buffer
- Sea forest
- Algae purifier
- Park
- Spare dune
- Sedimental zone
- Embryo dune catalyst
- Active catering dune system
- Dune system consolidation
- Ridge restoration
- Seagrass bed
- Beaches and dunes
- Seaward and boulevard
- Drainage inlets/storm drain
- Sea sports
- Cultural and recreational amenities
- Swimming pool
- Climate shelter




Green way
Cultural and recreational amenities
Sea sports
Pools
Mild sloping
BB'
Bioretention gardens
Bioretention gardens
Terraced edge
Sedimental zone
Sand filter
Green
Seaward and boulevard
Mild sloping
Embryo dune catalyst
Sand filter
Sedimental zone
Seagrass
CC'
Bioretention gardens
Bioretention garden
Terraced edge




Seaward and boulevard
Beach and
Spare dune
Sand filter
DD'


Seaward and boulevard
Weather shelter
Bioretention gardens
Active catering dune
Seagrass beds
EE'
Sand filter
Ridge restoration
Sand filter
Sedimental zone
Sedimental zone

5.3 Sensitivity and sustainability: designing with nature

"*Let us green the earth, restore the earth, heal the earth.*"

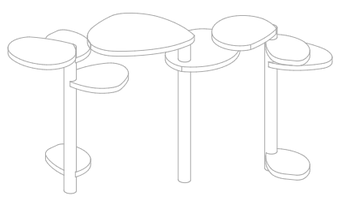
Using the thought of Ian McHarg[14], the goal is to place the emphasis not on design or on-nature, but on human cooperation and biological participation. He tries not to arbitrarily impose design, but to fully exploit the potential that nature offers us.
Flowers or a set of trees have always been inspiring for men and have been the subject of profound feelings that have touched the artistic sensitivity of many painters. Plants have always aroused the interest of man who throughout history has transported them from one continent to another, has selected them to make them more productive and has admired them for their beauty. The tree-essences world is a heritage of incalculable value also for the multiplicity of services it guarantees to the environment.
If we think that a single tree can bring significant benefits to a city and its inhabitants, an urban natural system can be an extraordinary help to improve the quality of health and life in a city.
As far as possible all the places of our daily life need plants and trees in order not to be hostile, unlivable and essentially inhuman. This is as true for private spaces as it is for public spaces. Trees populate cities, making us live better, because they are beautiful, because their green relaxes us and because they are a familiar and reassuring presence for people.[15] However, aesthetics and well-being are not the only noteworthy advantages because the presence of trees in the city can be useful in many other fields:
- with their roots they fight hydrogeological instability and consolidate the land (especially if sloping)
- with photosynthetic activity, plants not only continue to transfer energy from the sun to the earth which they transform into precious organic molecules, but also clean the air;
- with the leaves and roots of a mature tree they absorb carbon dioxide that pollutes our atmosphere, but also other pollutants such as heavy metal particles, lead, fine dust deriving from industrial activity that cause the melting of glaciers, the loss of biodiversity and rising ocean levels.
- with their foliage they create shade that cools the summer climate of the cities and becomes a determining public health factor
- with transpiration, which involves a loss of calories, a tree increases the humidity of the air and decreases its temperature. The tree is an excellent natural air conditioner and during its life it is capable of humidifying the atmosphere with a volume of water corresponding to one hundred times its weight;
- with their existence and their variety they guarantee and promote biodiversity

Designing with tree essences is applicable to all scales, be it a single building, a public space or an urban project.
The project strategy consists of:
- design and preserve the city by responding to the rhythms and dynamics of the ecosystems to which it belongs;
- consists in applying actions for potential to biodiversity, ecological processes and, as a consequence, improving people's quality of life;
- seek a balance between human activities and natural processes by establishing a win-win relationship.

A careful approach

Relationship with time is a fundamental issue when it comes to landscape design. When you plant a tree, you have to give it time to grow: after all it is a living being, so it becomes crucial thinking about how to create quality spaces for urban life while respecting the times and needs of nature.

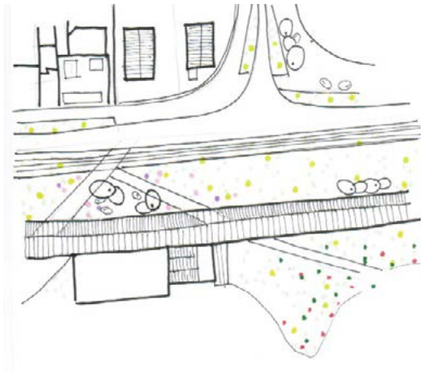
The project has a simplified evolutionary vision in:
Time zero: corresponds to the moment in which the built parts of the project are built, coinciding with the moment of planting. To ensure shading in the points along the seafront where the squares and terraces are located, a shelter is proposed which, like the branches of a tree on a sunny day, shelters from the hot rays of the sun. These are the same ones used permanently as bus and tram stops, but along the paths of the park they are proposed as temporary structures to adapt to the unschedulable growth of nature.
Time one: it is the intermediate stage in which nature takes its place and merges with the promenade.
When we talk about a sensitive and sustainable approach, we also refer to the design choices and construction methodologies. In general, the project is a pavement, a walkway, a flowerbed and only in one point is a building, a pivotal element along the sea front as a new reference for Vilassar de Mar. Dry construction systems were opted for mainly in wood (other non-wooden elements thought of prefabricated nature) in order to have a non-invasive project with a predominantly reversible character.

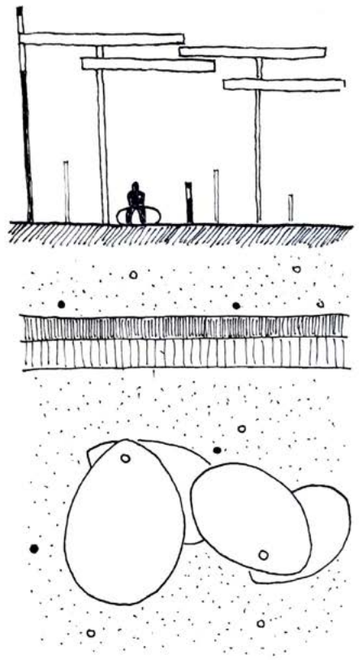


Shelter axonometry

Time 1 of the project (low vegetation and shelters)

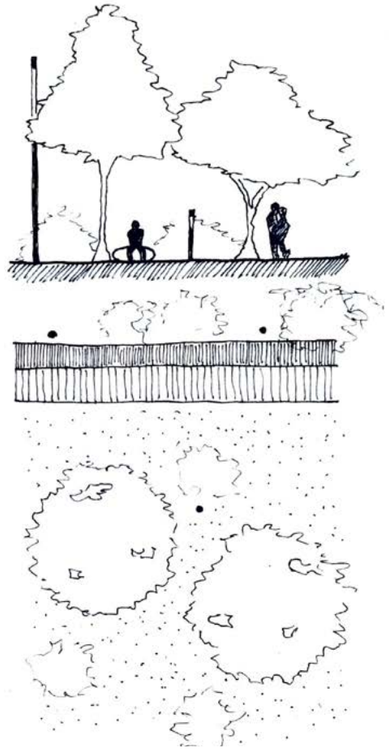
During the growth phase of the plants, shading in the sunniest spots is guaranteed by temporary shelters designed with a light-weight structure to adapt to the unplanned growth of nature.





Project time 2 (complete vegetation growth)

Once the vegetation has grown sufficiently to shade the spaces in the park, it will be possible to reuse the shelters as urban furniture along the path or inside the park.



5.4 *El Parque Agrícola Litoral del Maresme*: Masterplan and pilot projects

With Nature based solution we refer to actions to protect, manage or restructure ecosystems in a sustainable way, providing benefits both for human well-being and for biodiversity.
These have become the main guidelines for action so that a general project master plan can be defined, based on oases and paths, attentive to the sea-
rch for spatial quality, but at the same time sensitive and sustainable.
Within the system, various types of interventions are distributed (such as green oases, dry construction systems, drainage systems, choice of tree species) which can be considered as pilot projects that can be replicated in multiple contexts as they are answers to current problems of global interest.
The Masterplan concretizes this strategic general vision in a design of a system of urban spaces that works on the transversal streets that make up the urban fabric of Vilassar de Mar and Cabrera de Mar. The Masterplan project covers a very large part of the city: crossing all the thresholds, it extends from Cabrils (in the part of the mountains), continues through the rural part in the middle of the fields, crosses the city cutting the Rambla (Avenida de l'Arquitecte Eduard Ferrés) and continues along the new pedestrian street (Carrer de la Muralla and Carretera de Argentona), with the intention of joining the promenade.

The founding idea of the project is, therefore, a path that connects all these thresholds, which transforms (in terms of size and materials) adapting to its character but which always fulfills the same function: to connect the two parts of the territory of the Vilassar de Mar system. -Cabrils-Cabrera de Mar.
From the north, a pedestrian bridge connects the town of Cabrils, with direct access to the Parque Agrícola del Maresme. The route crosses the Park and, along the river, whose bed is structured with rhombuses of earth to control its flow, meets points of biodiversity, passing through cultivated fields and greenhouses, some of which will be given new

The palces along the agricultural park

m/asl

Pedestrian bridge connecting Cabrils 40-45

Access to the park 40

The greenhouses and the fields 30-40

Junto al Rio 25-30
"By the riverside"

Through the flower fields 21-25

Plaza de la Estación 16,5-20
The new square of the station

Los Jardines Urbanos de Vilassar de Mar 11-16,5
The urban gardens of Vilassar de Mar

Placita del mar 11
Little square towards the sea

Carrettera Argentona 5-11

The Waterfront of Vilassar de Mar 0-5

m/slm

0 100 200 400
m

74 View of the Agricultural park

functions. The path would arrive at the Plaza de la Estación and almost with a spontaneous gesture, gently enter the station or continue towards the sea passing through the urban gardens of Vilassar de Mar. Once the descent along Carrettera de Argentona is completed, the new waterfront opens up, the central theme of the project in as a connection of the paths identified as future green corridors connecting the city of Vilassar de Mar and its mountain inland.
Nature and city meet and mix, giving life to an environment that wants to welcome the local population and give a new identity to a succession of urban and natural spaces that have been abandoned until now but full of potential.

74

Junto al Rio
By the riverside

The key to the project is movement, be it of water, nature, people and time. Through the analysis of the flows and the speed of the water, the sinuous shape of the canal is generated, around which the roads, refreshment points and biodiversity will develop. Water and nature become the central axis of the project as realities that change over time, which will shape and change the appearance of the park

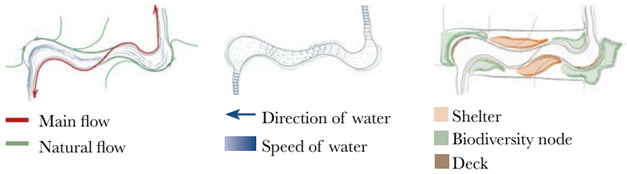
With the idea of including as few elements as possible, we opt for a simple and mimetic street furniture. The main seats are mobile (they can change position depending on the needs and choices of those who go to experience the space), the green color makes it more camouflaged within biodiversity. Even the fixed elements (benches on the pier) have a minimal design and a neutral color of the stone so as not to alter the perception and vision of the river.

The lighting (mostly low) takes the shape of a plant and is hidden among the natural elements, maintaining the naturalness of the place both day and night.

The choice of tree species was made after a careful study of the original flora of the place and of the Mediterranean reality in order not to alter the ecosystem and the natural habitat of pre-existing plants. The location and choice of some tree species was determined by the presence of the water element, as plants, in addition to being beauty and furnishings, play a necessary role in the maintenance of the banks and in containing water.

All walkways and piers were conceived as light wooden structures supported by wooden trusses embedded in the ground (taking the ancient foundations of the city of Venice as a reference).

With the presence of gravel and quarry stone for the reinforcement of the channel bed, the structure is not in direct contact with the ground (with the exception of the foundation pillars), thus protecting it from deterioration caused by water erosion and humidity.



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0 2 4 8m

0 0,5 1 2 m

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75 Diagram of the routes, waters and spaces

76 Zoom curves of the canal with the Junto al Rio pier

77 Section with detail of the canal bed and the construction method of the pier

78 Night view of the biodiversity oasis of the agricultural park

79 View of the canal from the deck

78

79

Plaza de la Nueva Estación
(The square of the new station)

Crossed by the main road of the project, the station square must be considered the meeting point between the city of Vilassar and its rural part.
For this reason it was decided to articulate it with a paved part, more urban, and a gravel part, connected to the park. Here we find the most evident and characteristic element of the square, which is the large ramp that gently descends towards the station. The station car parks are integrated into the space of the square behind the sports facility, designed simply with an arrangement of bushes in line with the main lines that organize the space.
The idea of the tree-lined entrance in front of the pre-existing building has been maintained and rethought in a less impactful way, keeping it as a passage element for the flow of people who will use the building, the parking lots and the small kiosk.

80

81

80 Plan of the Plaza de la nueva Estación

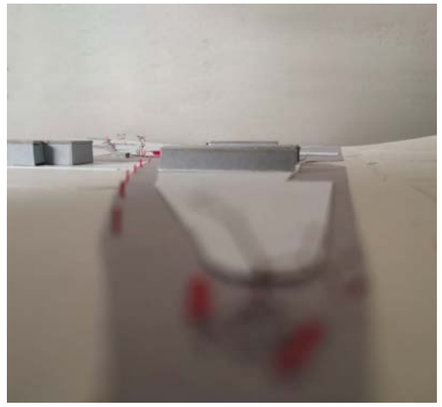
81 Section along the green ramp of the metro access square

82 View towards the steps of the square

83 Study maquette - View from the Placita del Mar

84 Study maquette - View from the Placita del Mar

82



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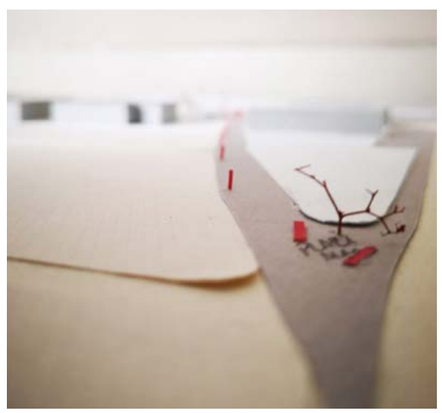

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Los jardines urbanos de Vilassar de Mar

(The urban gardens of Vilassar de Mar)

Calle de la Muralla is part of the system of streets that form the new pedestrian network of Vilassar de Mar. It connects Plaza de la Estación and the Rambla with the Placita del Mar. This will connect with the Carretera de Argentona, which leads from mountain to the waterfront. The project of this street wants to adapt to the new flows of the mountain-station-sea system and must ensure pedestrian and vehicular access to the residences.

The continuity of the path towards the waterfront is given by the paving and by the greenery. The paving remains the same from the paved square to the continuation towards the sea, dematerializing only in the part of the gardens to highlight the passage and the contact between the two aspects of the project, the natural one and the urban one, and thus give life to a linear garden. Playing with the joints, green stripes were inserted that create islands of shrubs and low plants. The vegetation never completely covers the ground on purpose so as not to perceive too much the gap between the green part and the paved part, but above all the dematerialization and the intertwining. The street remains mainly a pedestrian and cycle path with limited access to residences and emergency vehicles.

To make the transit of cars and the cycle and pedestrian flow coexist and integrate, the starting point was to identify which were the entrances to the residences.

The vegetation divides the street into shorter sections so that the cars do not gain speed and that direct routes are defined to the service entrances. The green mainly arises as a border between cars and pedestrians but also to avoid the relationship with the more private parts of the residences. There are secondary passages that can only be crossed by pedestrians, to reach the green oases, more welcoming and intimate spaces, where there are seats (with integrated lighting) given by a slight rise from the ground.

The plants remain low along the path, of medium height in the oases and only gain height when they reach the Placita del Mar (recovery of an urban residue), the culmination or starting point of the gardens and, therefore, an emblematic part.

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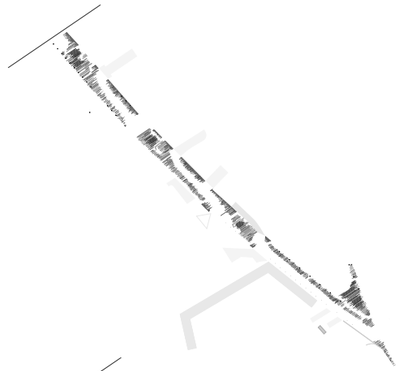

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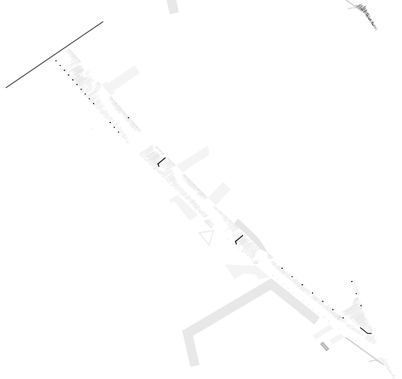

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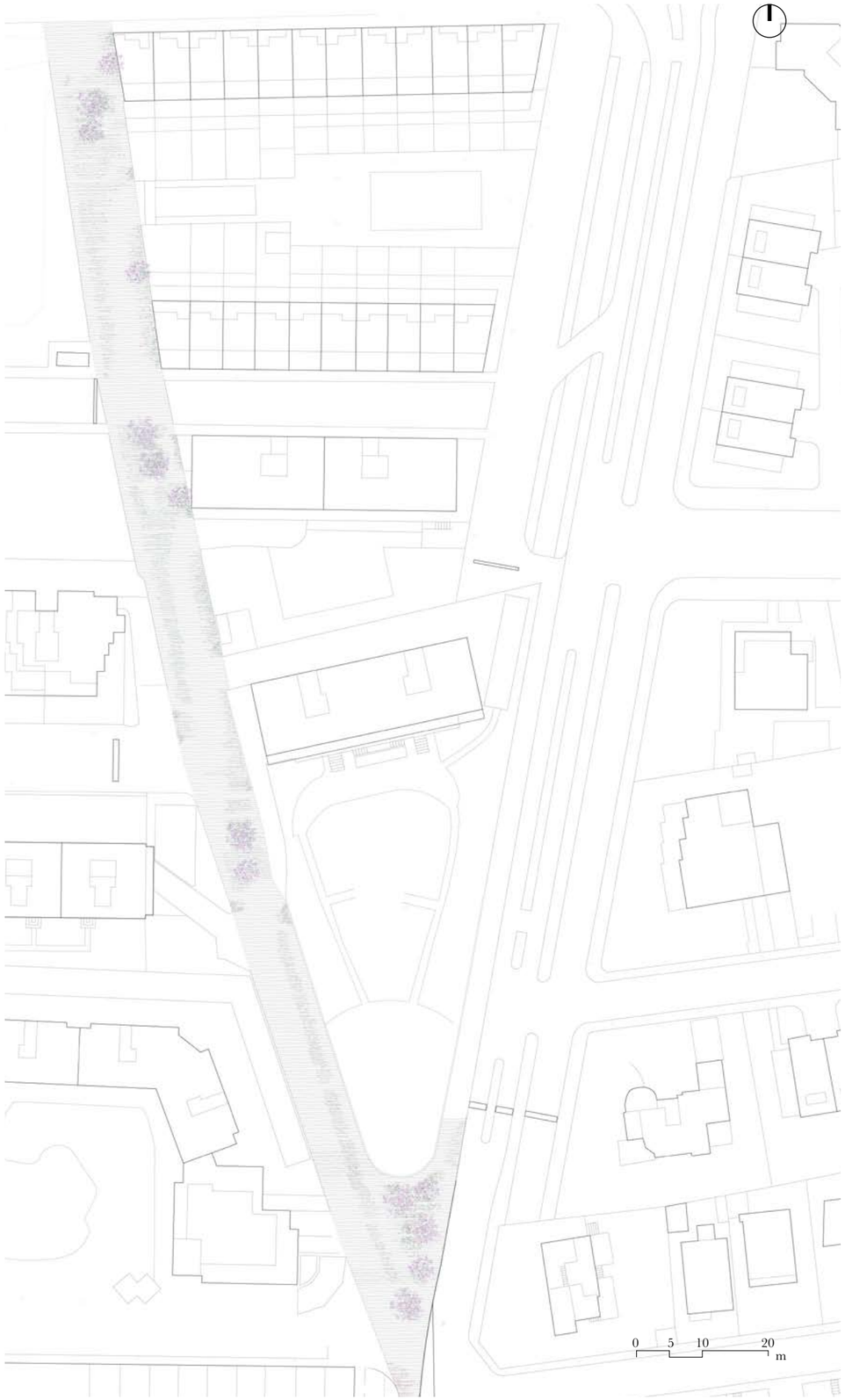
85 Drainage system

86 System of cycle/pedestrian/ vehicular paths

87 Vegetation system

88 Lightening system

89 Plan of the Giardini Urbani



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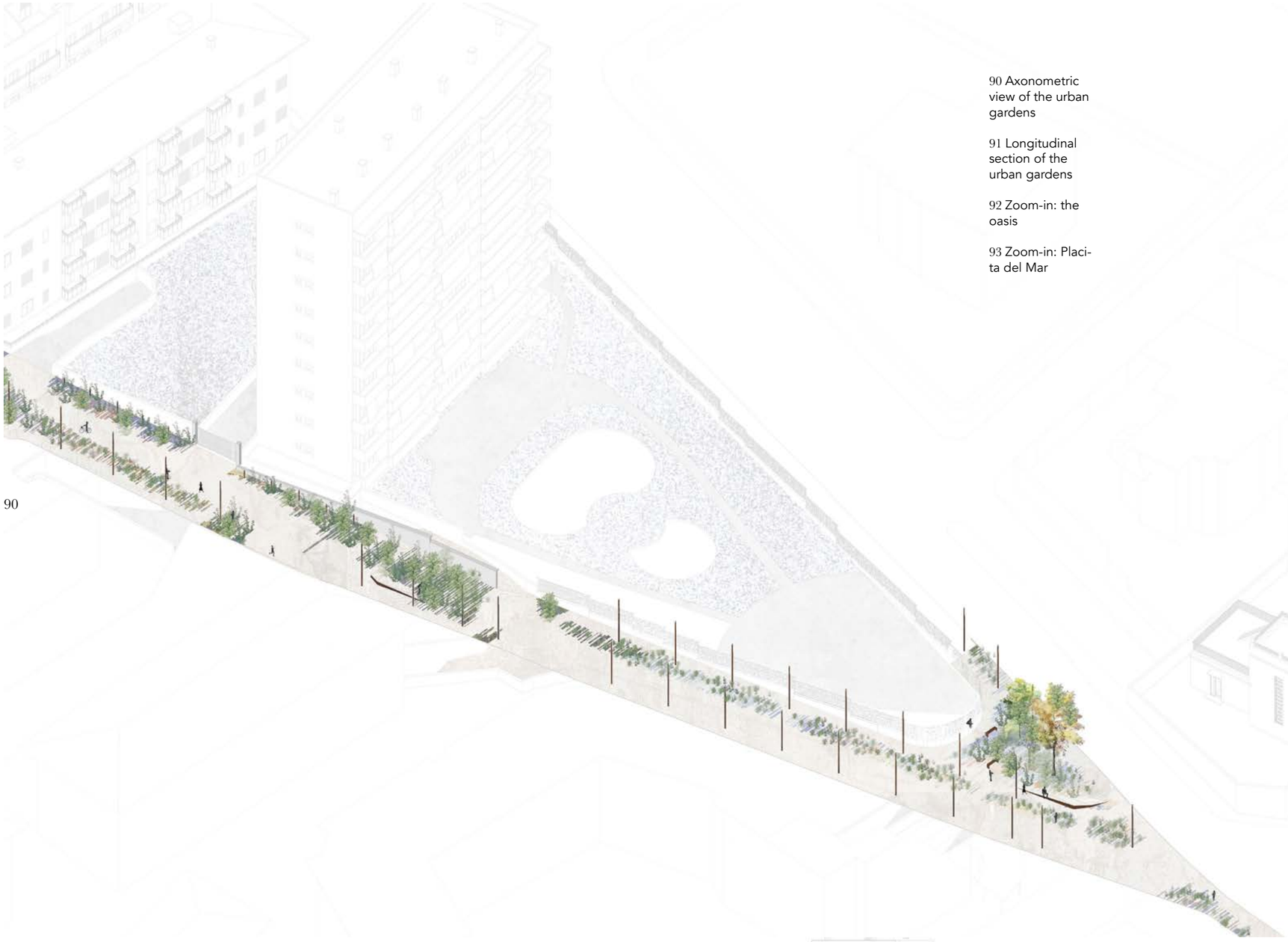
90 Axonometric view of the urban gardens

91 Longitudinal section of the urban gardens

92 Zoom-in: the oasis

93 Zoom-in: Placita del Mar



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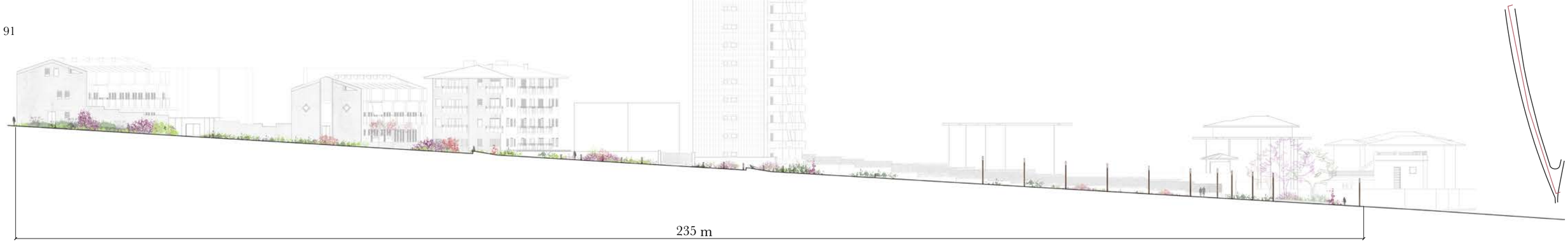

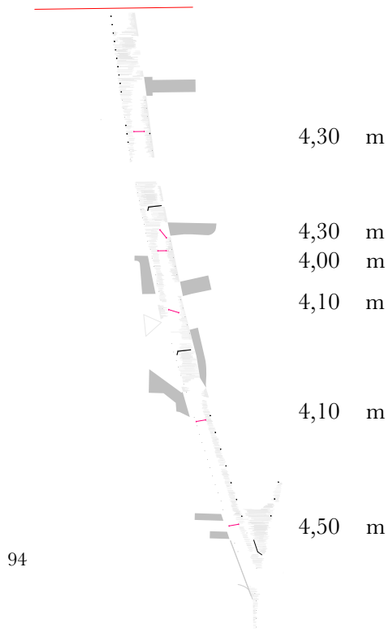

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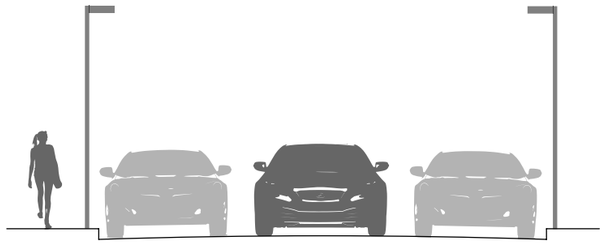
Existing street section



Project

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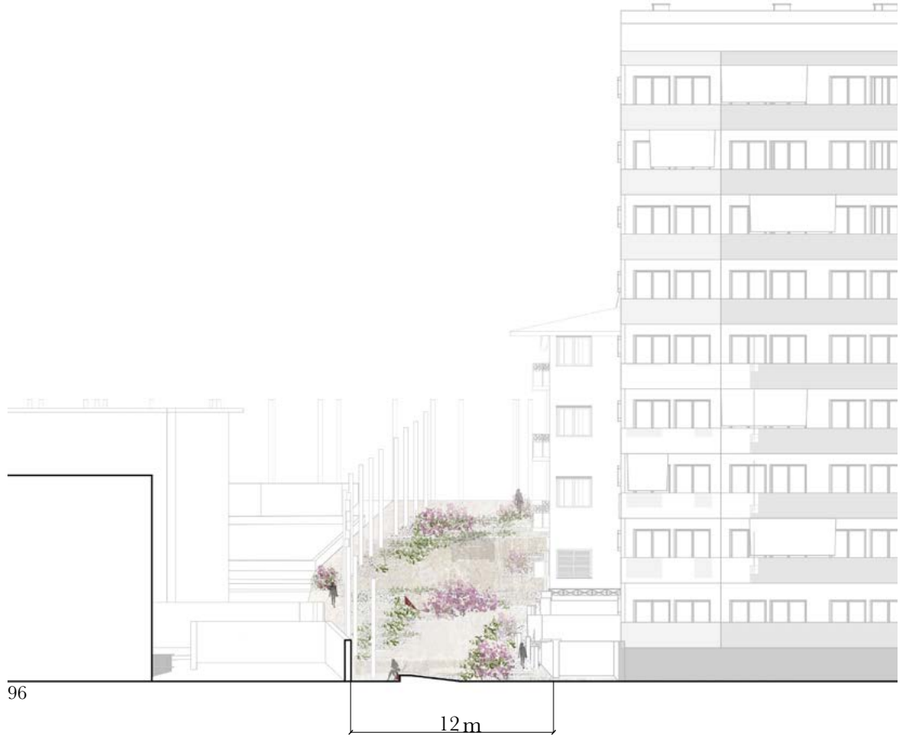

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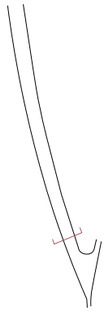


94 Access to the residences and size of the driveway

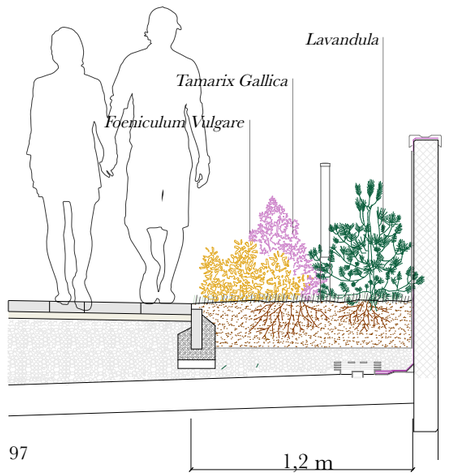
95 Comparison between the current state section and the project section

96 Transversal section

97 Detail of the vegetation

98 Detail of urban furniture

99 Zoom-in: the paving system



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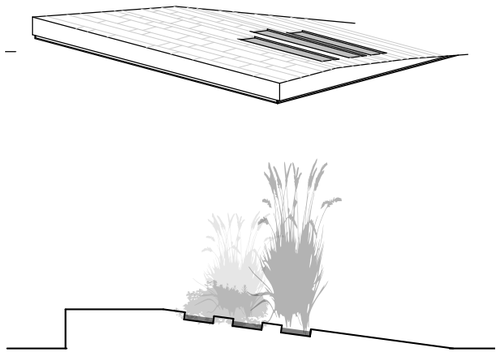

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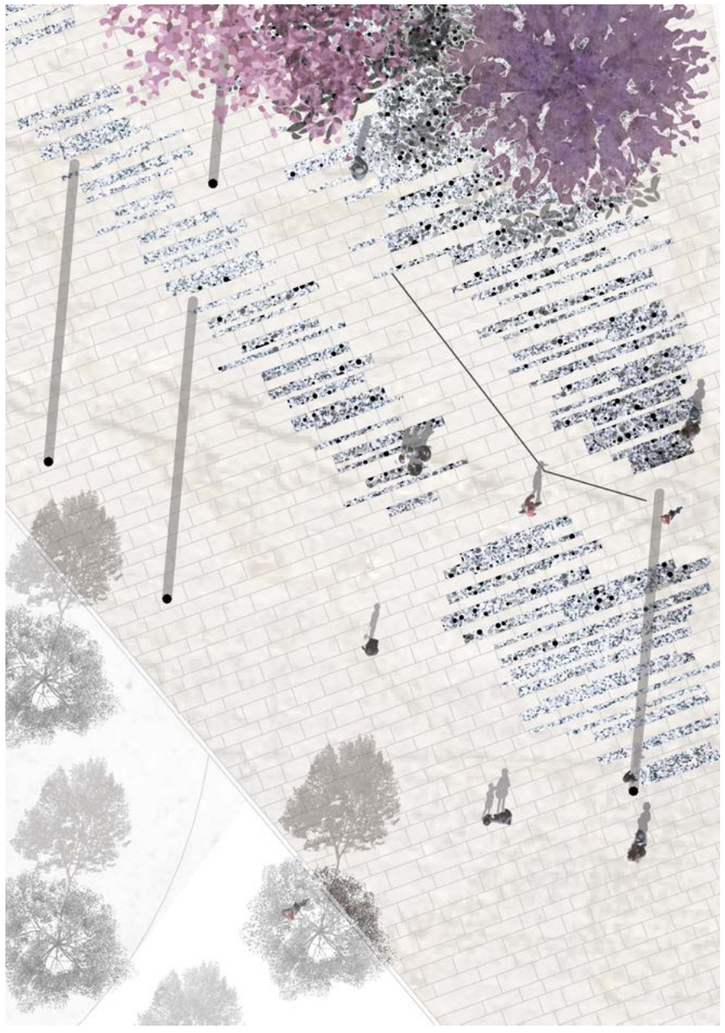


99

100 View of the Urban Gardens

101 Plan of Carrettera de Argentona

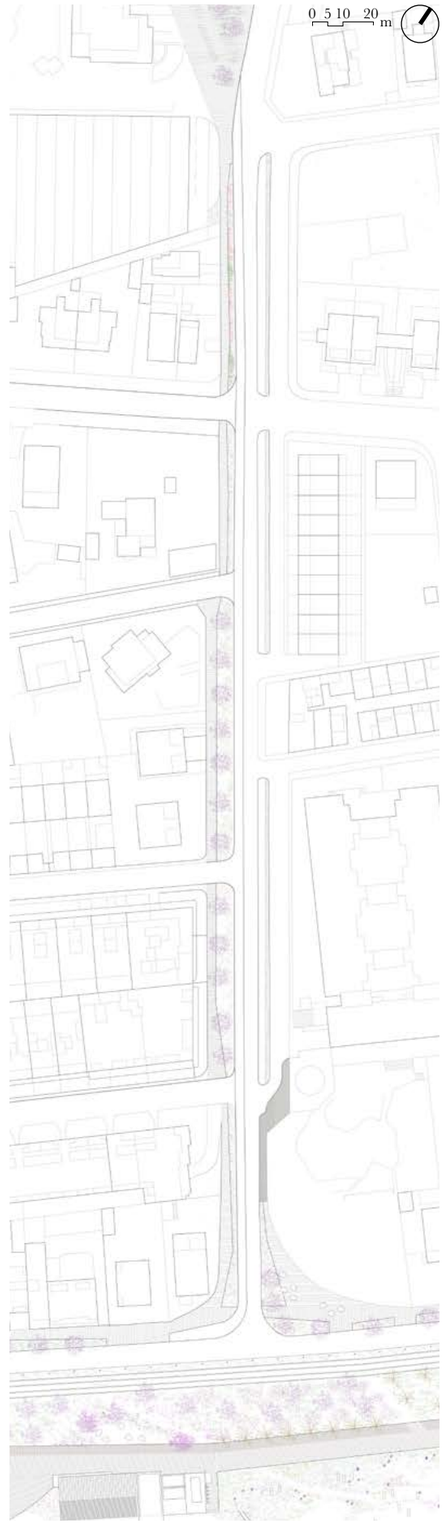
Carrettera de Argentona
(Argentona greenway)

The Carretera Argentona is the road that marks the border between Vilassar de Mar and Cabrera de Mar, and which directly connects the Nacional with the Maresme motorway. The first section, which connects the urban gardens of Vilassar with its waterfront, has been rethought according to the role within a strategic vision linked to the ecological corridors, of which it is now part of the system. Indeed, it was a key connection element, and its road section needed a modification to be more integrated within the cycle-pedestrian connection system. First, the traffic has been redistributed along the parallel streets, in order to significantly reduce the carriageway (making it one-way only in the stretch from the Nacional to the Placita del Mar) and to give more space to the sidewalk, the cycle path, the vegetation and to the parking lots.

The traffic system was integrated into the existing one, which works in circuits, in order to move the lift towards Cabrera from Carretera Argentona to Avenida Burriac. In this way it is possible to satisfy the needs related to both cycle and pedestrian traffic, restoring quality to an urban road, but at the same time guaranteeing a direct connection to the mountains also for cars, also going to lighten traffic.

However, it is through the design of the vegetation that the characters of the urban side of the Vilassar waterfront begin to take shape in this street: the pavement remains the same as the station square and the urban gardens, but the relationship between sidewalk and flowerbed changes. You no longer walk along a sidewalk in which flowerbeds are inserted, suffocating for the vegetation, but a path almost inserted within a "strip" of continuous and wide vegetation, which extends throughout the waterfront, and which changes in relation to the spaces it encounters and to the connection with the beach: it narrows to define paths or crossings, leaving room for the flooring, or widens to create intermediate resting points, where the seats are located.

100



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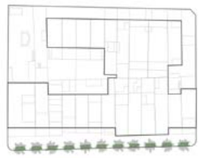
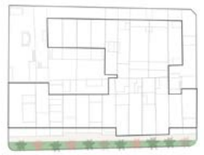
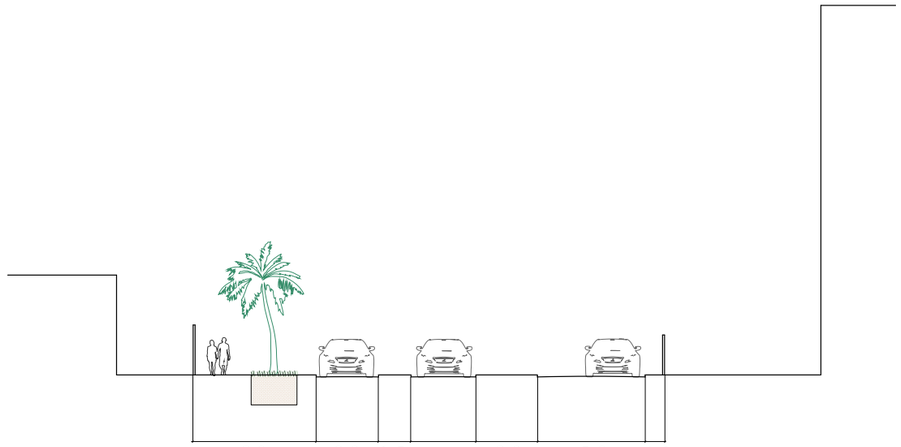
(a) (b)

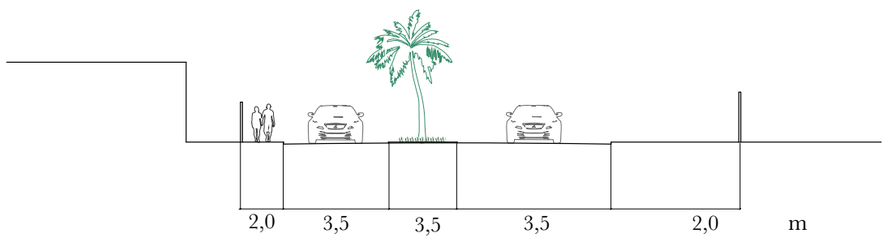




A new relationship between sidewalk and vegetation:
a. flower beds in the pavement, suffocating for tree roots
b. continuous vegetation along the pavement
c. opposite relation: pavement path in the vegetation

102





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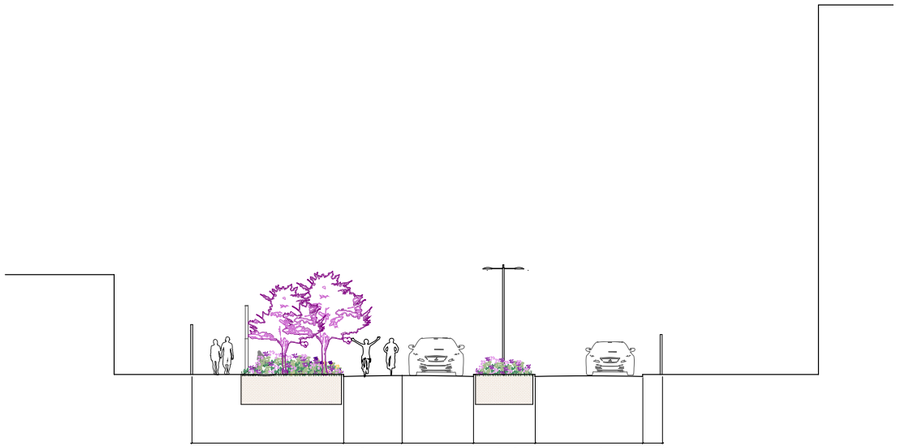
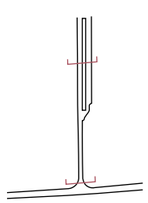
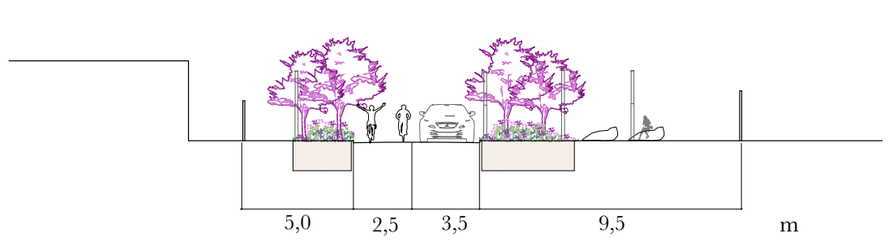
102 A new relationship between sidewalk and vegetation

103 Sections of the street section (current status and project)

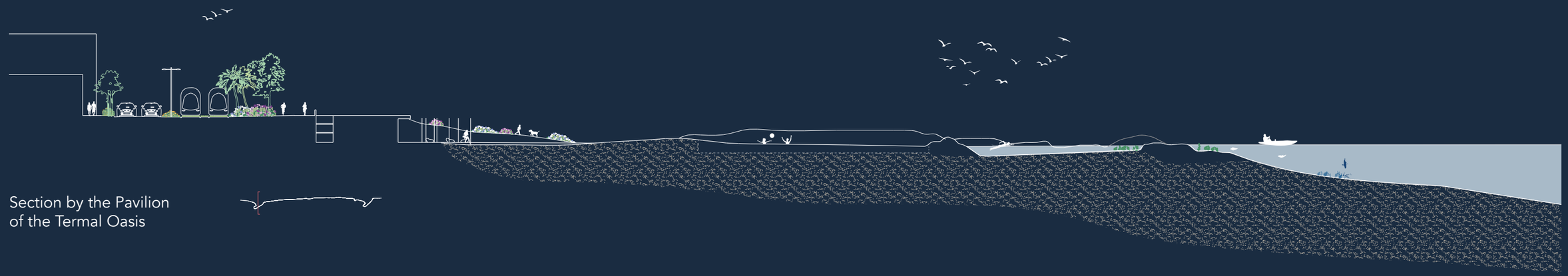
(c)



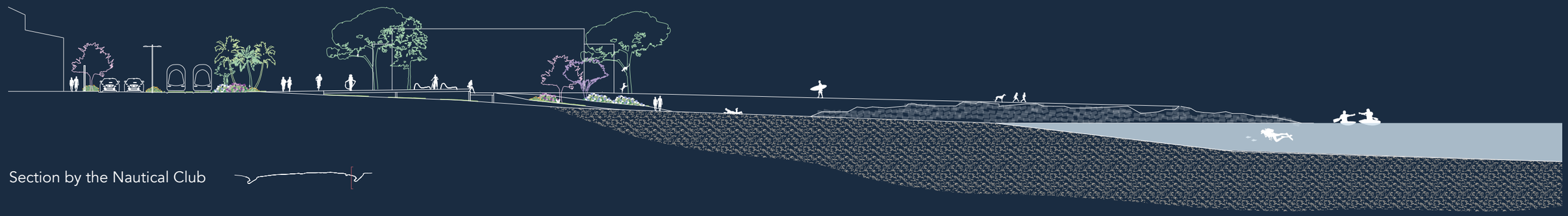




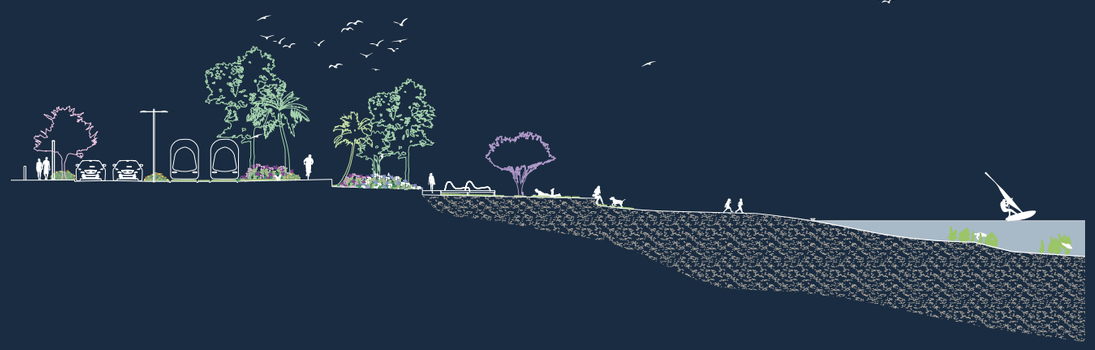
Masterplan of the waterfront of Vilassar de Mar



Section by the Pavilion
of the Termal Oasis



Section by the Nautical Club



Section by the terraced edge by the sea

Section by the sand dunes

0 2 4 8 m

Axonometric view of the Thermal Oasis

Axonometric view of the Terraced edge and the Municipality hall new square

The uses of the Waterfront

The project consists in rethinking the coastal front of the municipality of Vilassar de Mar, starting from this reflection that brings all the principles discussed up to now: how to give importance to nature but at the same time be able to create a quality urban space? The *Parque Agrícola Litoral del Maresme* would combine these two fetures, designing a new urban space through nature, to define a physical and social connection between the sea and the mountains, which includes different spaces suitable for the daily life of the citizens of Vilassar de Mar and the Maresme. The key point of the project was the intention not to place a hierarchy between the two aspects, but to seek a synergistic relationship.

The maritime coast of Vilassar de Mar has a particular feature: the two breakwaters, which mark its length symmetrically. In addition to giving it this aspect, they define above all three different areas, which behave differently. In fact, their presence is crucial above all at an environmental level: the flow of currents carries the sand following the course of the breakwater cliffs, causing it to deposit between the cliff and the beach, and protects the part of the beach that falls back. In this way the sand is distributed in an unbalanced way and, as can be seen in the contour diagram (1), the two parts of the coast on the sides of the breakwaters have a much larger portion of sand, allowing to overcome the difference in height between the city, at an altitude of 4m asl, gradually. On the contrary, the central part is still almost completely eroded and therefore with less sand. The project strategy envisaged from the beginning to approach the waterfront with operations based on nature, leaving it space to preserve it and allow it to expand along the entire waterfront.

The waterfront of Vilassar de Mar is therefore conceived as a succession of spaces, which fit and adapt to this irregular course of the beach, giving rise to a single linear park that also incorporates the other side of the city (2), trying to define a the only green system in which the new tram network passes without acting as a break between the urban front and the maritime front. In this system, the two breakwaters welcome the main areas of aggregation: if in the cliff upon arrival from the Carretera Argentona we find the terrace and the pier, an element of conjunction between the Nautical Club of Vilassar and the adjacent restaurant, in the cliff of the south find the thermal park of the dunes, with the pools in the cliff. The central part, always following the strategy of operations based on nature, was conceived as a system of terracing-gardens, which gradually and with a succession of slightly sloping paths lead to the beach.

In this way it is possible to guarantee a continuity of the path not only on the seafront at altitude 4, but also at the level of the beach (diagram 4), as well as a continuity of the vegetation (diagram 5), a connecting element between the urban side and the coast.

The new 'intermediate' space, designed to mediate between the city and its beach, thus becomes a common social platform. Its hospitality, the opportunity it offers to take advantage of spaces of an ever-changing nature and suitable for everyone, defines a highly multicultural heterogeneous space, which wants to expand and fit into the context of the city.

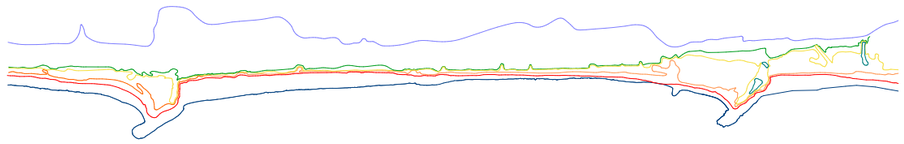
104 Morfology of the coast (Curves of level every 1 m)

105 Pedestrian crossings system

106 Sequence of the spaces of the coastal park

107 Continuity of the path on the sand and continuity of the path on the seafront

108 Distribution of the project vegetation



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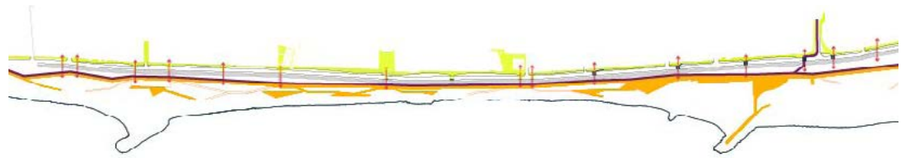

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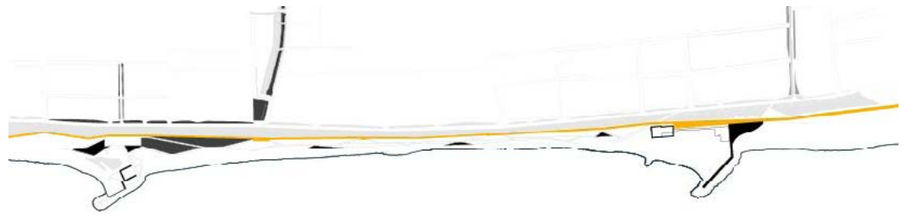

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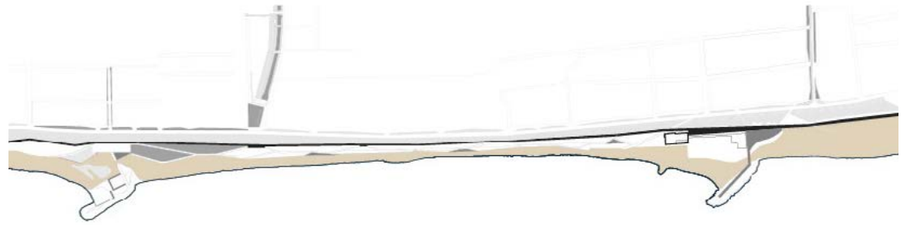

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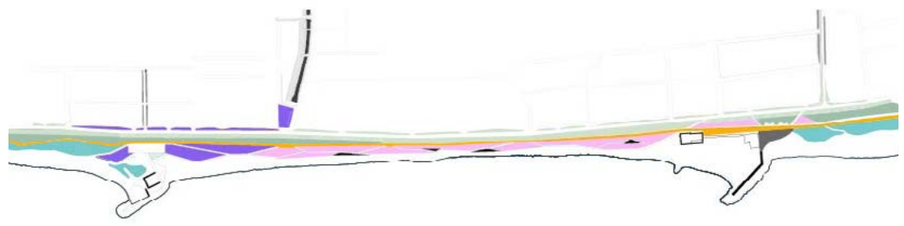

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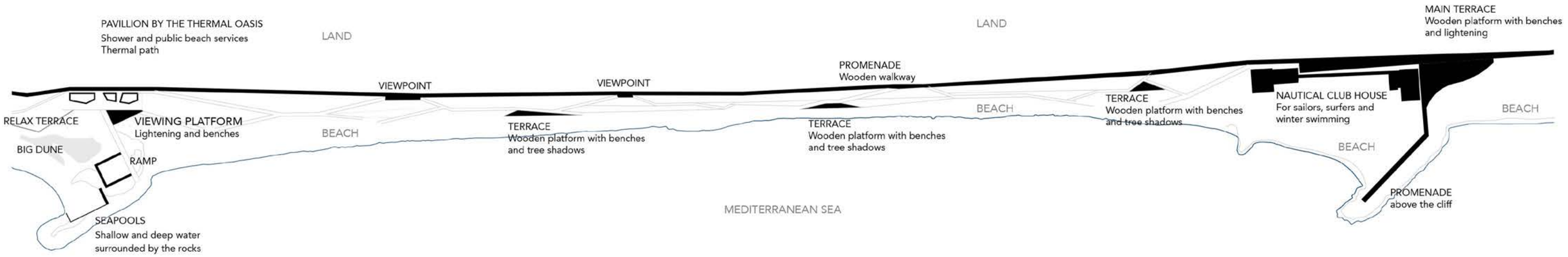
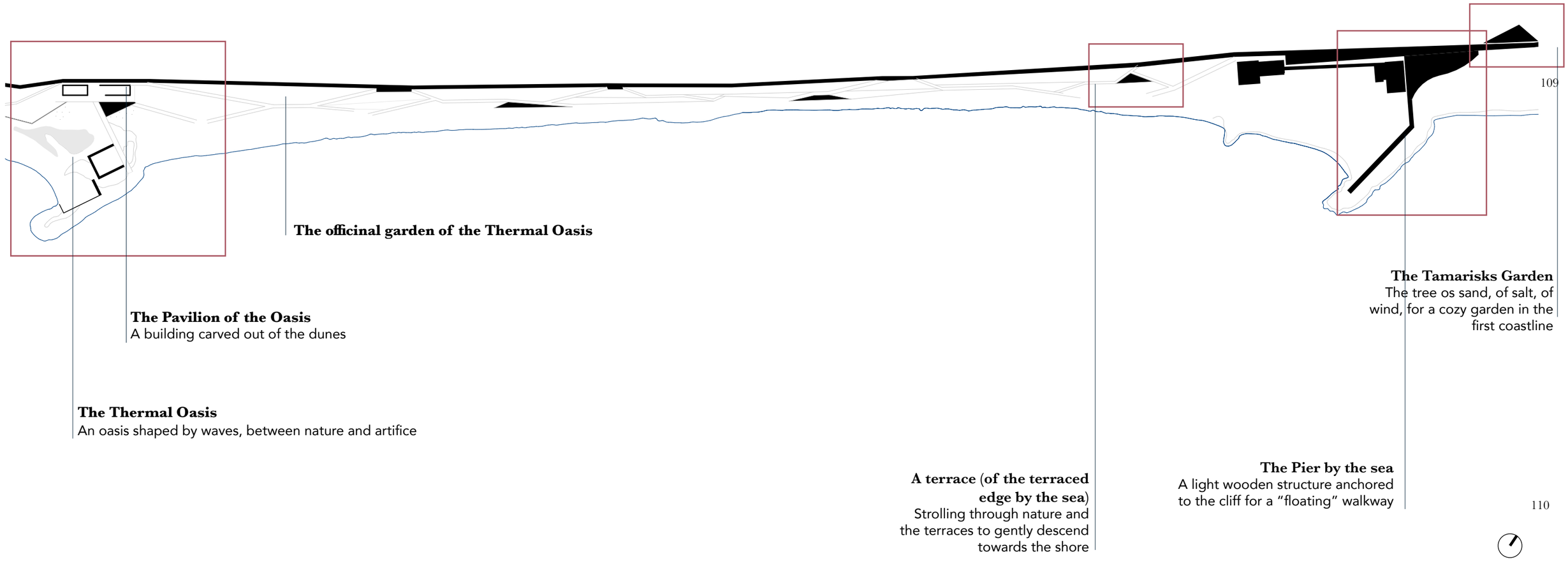
The elements along the waterfront path

109 The elements of the path

110 Keyplan of the pilot projects





The officinal garden of the Thermal Oasis

The Pavilion of the Oasis
A building carved out of the dunes

The Thermal Oasis
An oasis shaped by waves, between nature and artifice

A terrace (of the terraced edge by the sea)
Strolling through nature and the terraces to gently descend towards the shore

The Pier by the sea
A light wooden structure anchored to the cliff for a "floating" walkway

The Tamarisks Garden
The tree os sand, of salt, of wind, for a cozy garden in the first coastline

The Pier and the Tamarisks garden

Finally, after crossing the Carretera Argentona, we find ourselves in the clearing that faces the waterfront, where you can see the sea and the richness of biodiversity of the Coastal Park. Immediately you can choose whether to go into the oases of the dune system, the wildest and most natural part of the Park (which leads to Cabrera de Mar) or continue along the path that leads to the terraces, where we immediately find a node of biodiversity, the Garden of the Tamerici , and the Pier on the sea.

The Tamarisks Garden is precisely the first space you come across following the natural flow of the walkway. The flower beds and paving guide the traveler along the path that then reaches the terraces overlooking the sea and the pavilion of the dunes and the pools. This is achieved by crossing basic paths, with the intention of defining, through this simple and immediate intersection, a more intimate and intimate place, immersed in the tamarisks, the pilot plant of the project. A little further on you come to a real meeting space, a wooden terrace creates a space of union between the nautical club and the restaurant and at the same time makes the whole area of the rock habitable (extending into a walkway "pies dans l'eau ") and overcomes the differences in height between the beach and the height of the building.

These spaces are identified not only by their arboreal essences, but also by the choices made regarding urban seating. Along the path, the classic and simple rectangular seats, while in the Tamarisk Garden and on the terrace they change in shape. They are large stones, not directed parallel or perpendicular to the path, but positioned so as not to define a precise point of view but to create a relationship between people when they sit down.

111 Plan of the Pier

112 Plan of the Tamarisks garden

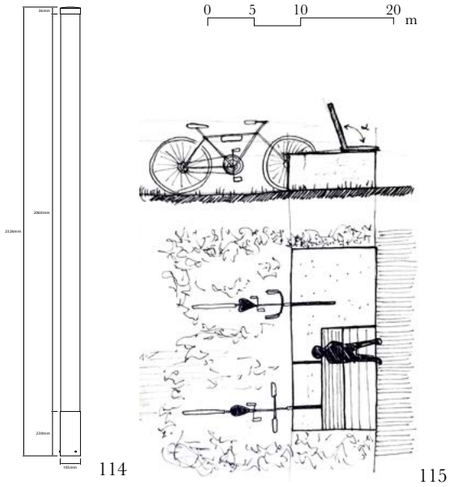
113 View of the Tamarisks garden

114 Urban furniture: Lonsdale RGB led pole - Coolon - 2060/1030x105 mm

115 Urban furniture: Stone Bench-bike - seduta di progetto - ????x1200x550 mm

116 Urban furniture: Stone Bench - artform - 2000x1550x550 mm

112



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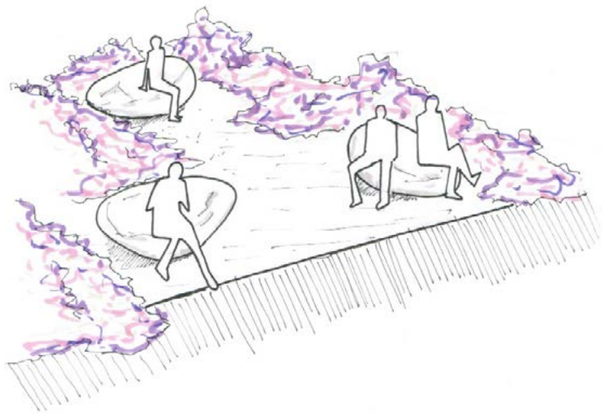

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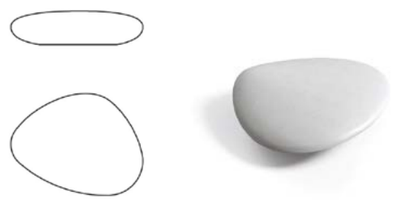


116

The Terraced edge by the sea

The part of the coast between the two cliffs is the most urban, since it is in direct contact with the center of Vilassar de Mar; it is also the part where the beach hes been most eroded, and therefore delicate, especially in certain periods of the year, with the rising tides. Today accessibility at the beach level is almost non-existent. Thinking of a terraced system guarantees continuity along the entire coast and divides the difference in height, making the difference in altitude more gradual. The wooden walkways follow a diagonal course, adapting to the slopes of the ground, and creating paths through the terraces, which merge with the sand, distributed on several levels and in some cases also added, as in the sand basins. Thus, from the height of the promenade to the shore, a continuity of the beach is always guaranteed.
So while some terraces are real sand basins, some are designed as pools of water, with an integrated drainage system, others are paved and designed as small balconies overlooking the sea on which to sunbathe; instead, among the garden terraces, we find some that are flower fields or small parks with trees, shrubs and lawns.
The seats selected for these spaces have the shape of a deckchair with the intention of recreating a more domestic space.
It is not just a question of measures, but of a shrewd design of the public space which, thanks to some hidden devices, wants to be welcoming and empathetic, to give citizens a place to feel comfortable, relaxed, and indeed at home.

The steps overlooking the sea have the size that comfortable armchairs could have. These are furnished with some sinuous seats that have the size of a bed. Everything is essential in proportions and relates the elements to each other (even those along the way), paying attention to people and natural elements.

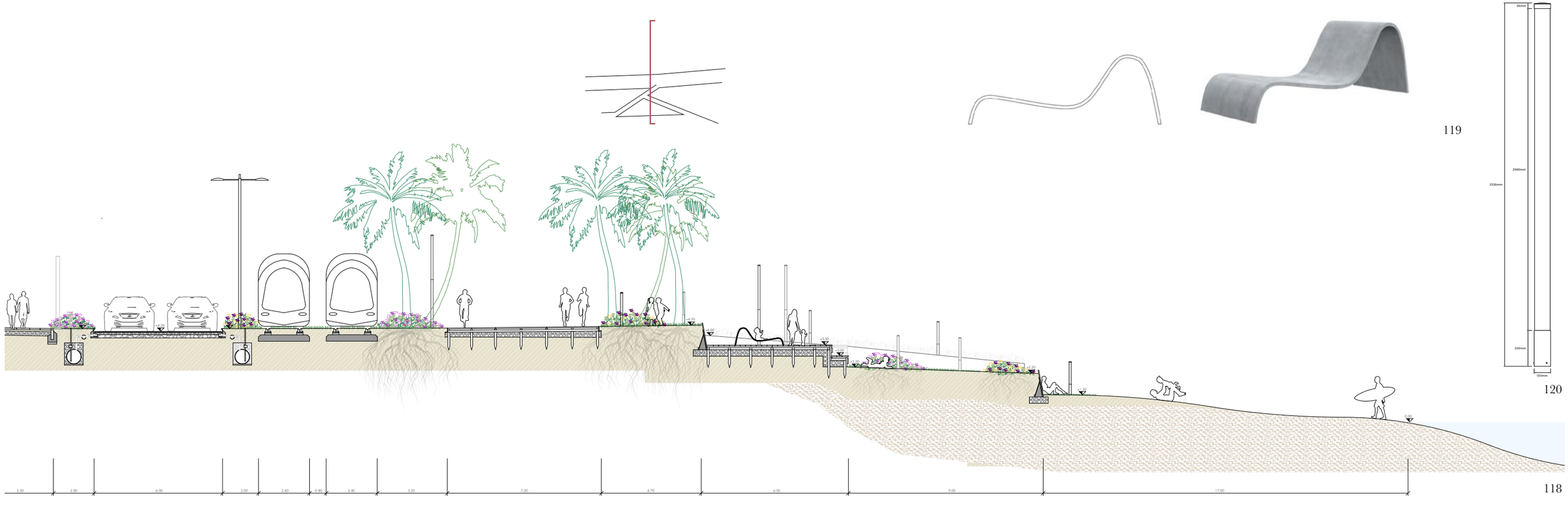
117 Plan of the terraced edge

118 Technical section of the light structure that makes up the waterfront

119 Urban furniture: Zephyr - Gravelli chair- 1920x660x690 mm

120 Urban furniture: Lonsdale RGB led pole - Coolon - 2060/1030x105 mm

117



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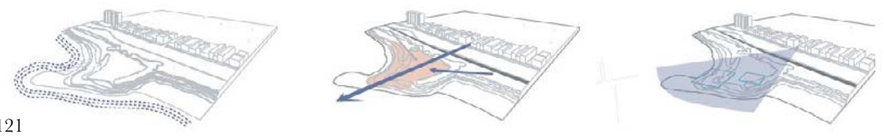
118

Between nature and artifice: the Thermal Oasis

The ground has been modeled in a non-invasive way, as if it were the movement of the waves themselves to shape it, penetrating the inlets of the cliff and creating space for the natural pools, for the dunes and for the pavilion that is hidden in them.
Provide shoreline stabilization of the beach portion of the new shoreline, as well as increase ecological performance through changing tidal levels.
The shape of the tide pool allows it to be used both at high tide, as a real natural pool, and when it empties. In that while, the water will remain in a small portion, and a strip of sand will be created between it and the sea.



121

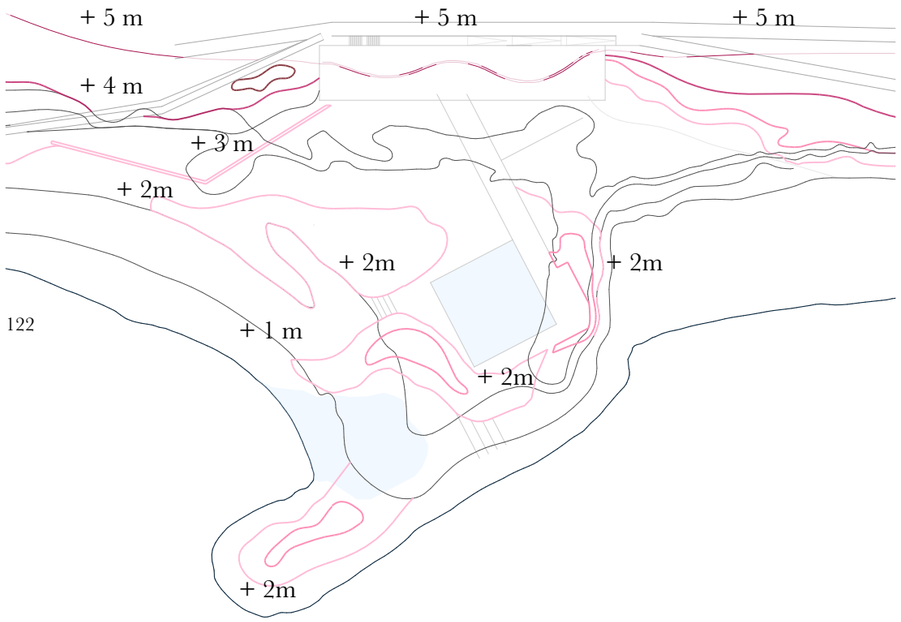
121 Compositional schemes: water movement, directionality and visual cone

122 Modelation of the soil and change of the level curves

123 Diagram of the modeled level curves

124 Times of uses of the tide pool according to the average trend of high and low tide over the year

125 Aproximated pool filling accordin to the trend of high and low tide over the year



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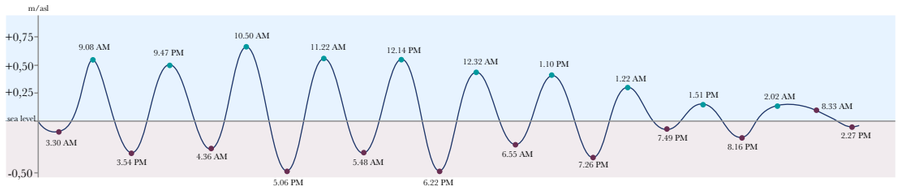
Uses of the tide pool according to the average tide trend

Average high tide
+0,73 m asl

Average low tide
-0,52 m asl



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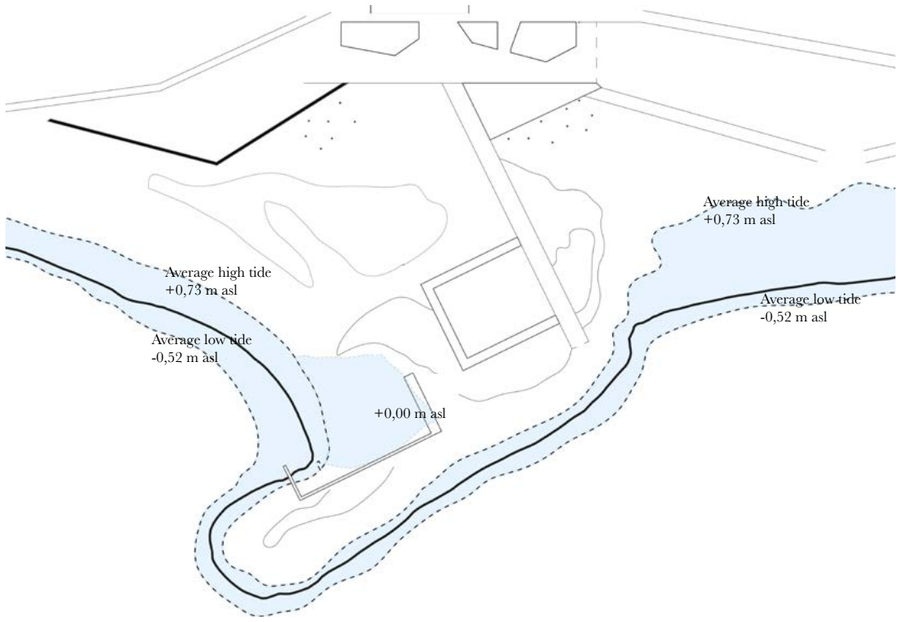

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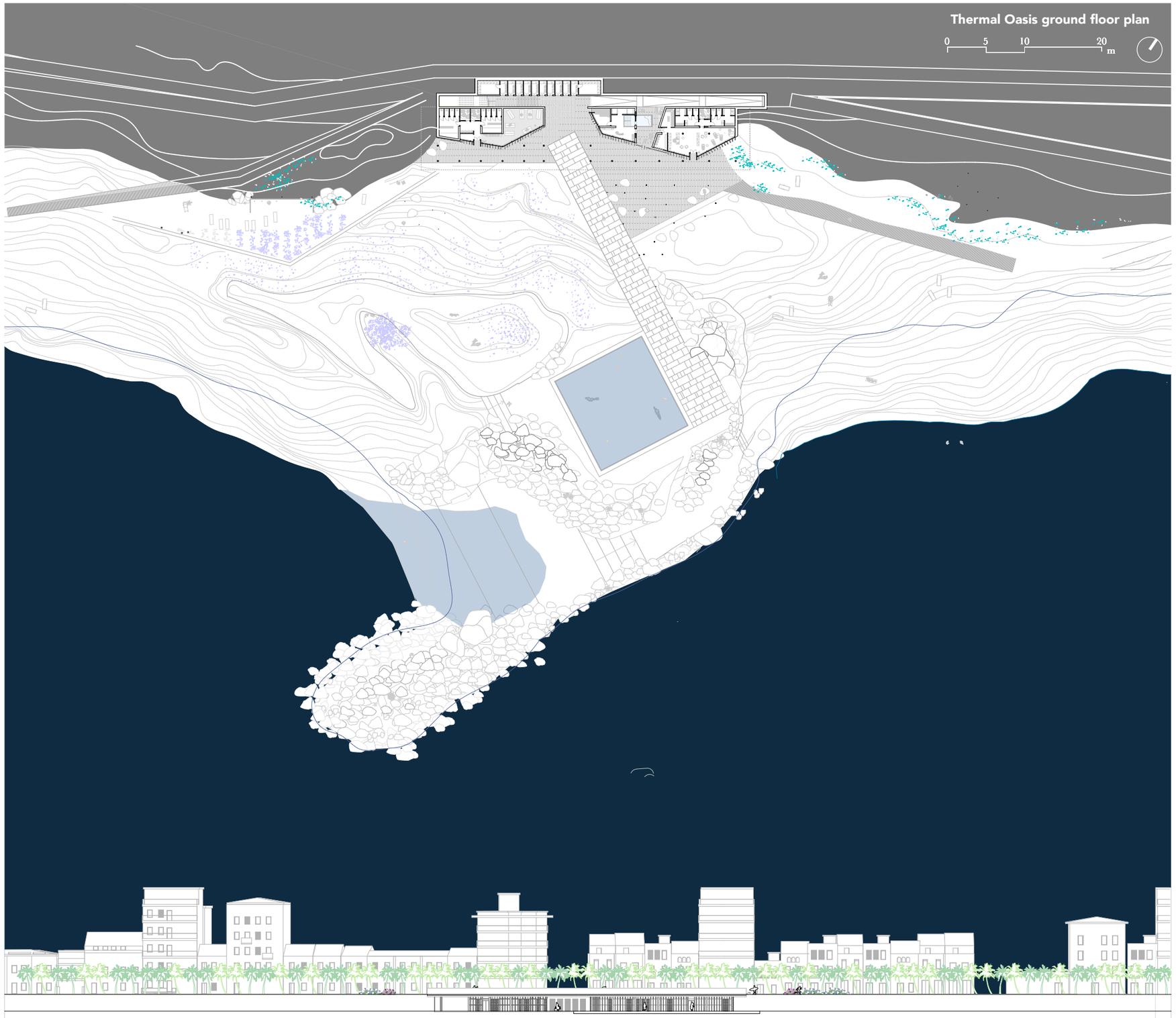
The Thermal Oasis and the Pavilion

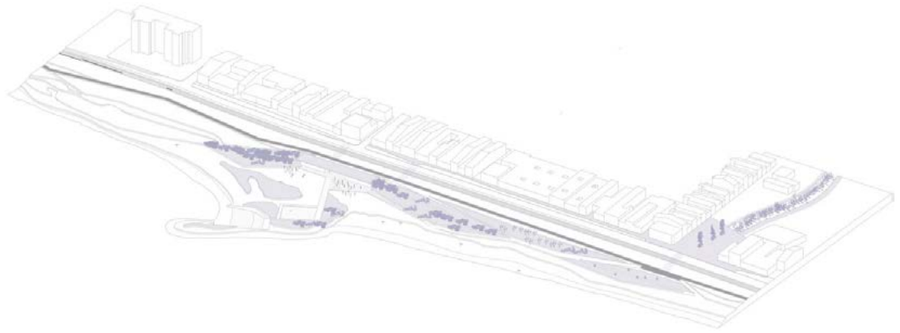
"Two ways can be identified to design the relationship between 'built' and the sea, or, as it is more often and generically said, between city and sea. The first, entirely centered on the 'built', is the one for which the city 'projects itself' onto the coast. In this case the relationship essentially consists of the meeting - or it would be better to use the term 'clash' - between the urban fabric, whatever it is, and an element, in a certain sense exceptional, such as the coast. According to this approach, the 'unprecedented' encounter between rule and exception, between artificial and natural, between permanent and ephemeral, between fixed and mobile, would take place on the coast. "16 The breakwater of Playa de Ponent is nowadays a space not used, where there is only a small building used as a deposit and a dirt clearing where spontaneous vegetation has arisen. The great potential of this place, as well as the starting points of the Dune Thermal Oasis project, are the presence of a cliff and its proximity to the dune area of the Vilassar de Mar Waterfront. The waves break on the cliff, the tide rises, and the waves enter in the opposite direction to the current, but calmer, re-entering to form a cove. For this reason, the strategic approach envisaged a natural swimming pool that followed the movements and trends of the high tide, to preserve the stretch of coast in this part of the beach. Thus this strategy becomes an opportunity to define a resting place, in a certain sense almost a landing place, but also the starting point, where the waves enter and take their space in a swimming pool among the rocks, which meets a another swimming pool on the sand, an oasis between dunes and cliffs, and the terraced gardens.

While this space is being shaped by the tide, the path of the promenade wants to be part of it, descends into the dunes and carves out its space in a building almost hidden by the staircase of a pavilion. It then opens towards the cliff without breaking in, following the shape of the broken terraces and projecting itself explicitly and directly towards the pools. Almost a transposition of an urban element which, in addition to a direction, also assumes a specific direction: not only the sea entering the city, but also 'from the city to the sea'.



Façade of the Pavilion

Process of modellation of the soil using a study maquette (1:500)



In the succession of spaces that make up the Vilassar de Mar seafront, the key point has always been the synergy between the vegetation and the search for a spatial quality, especially through the vegetation itself. We have said that this place is the starting point, but equally the point of arrival: we are now on the seafront, after having covered the journey in the mountains and all the waterfront, or having arrived following the flow of the Riera di Vilassar.
The vegetation also wants to mark and emphasize this resting place and, wanting to establish a strong relationship with the element of salt water, it becomes a place of well-being. Salt, water, and therapeutic plants: scents, colors and sounds give rise to an atmosphere of total relaxation. The dune vegetation remains constant throughout the project, but it is only in this part of the coast that officinal vegetation is used, to guarantee a feeling of natural well-being, peace, calm and deep contemplation of the relationship with the sea. More precisely, the selected essences are aloe, calendula, chamomile, rosemary, sage and verbena. These plants are characterized by a particular scent, not only given by the flowers but also by the foliage. Precisely for this reason they have not been mixed, but are located in separate sectors within the spa park. Furthermore, if along the entire course of the project a selection criterion has been chosen through the use of complementary colors, the visual sensations in this part of the park also change radically: the selection took place through the use of harmonic colors, which they do not create contrasts, spreading feelings of well-being to the eyes.

The Thermal Pavilion, a building carved out of the dunes

The space of the Pavilion houses the services related to the use of the beach, swimming pools and the thermal oasis. At the point of arrival (or lifts) the cabins and two depots have

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126 Compositional diagrams

127 Section of the Pavilion

128 Diagrams of the uses

129 Diagrams of the view from he Pavilion

130 Axonometric exploded of the Pavilion

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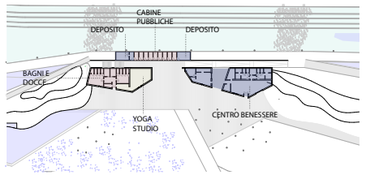

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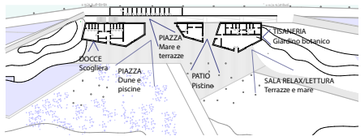

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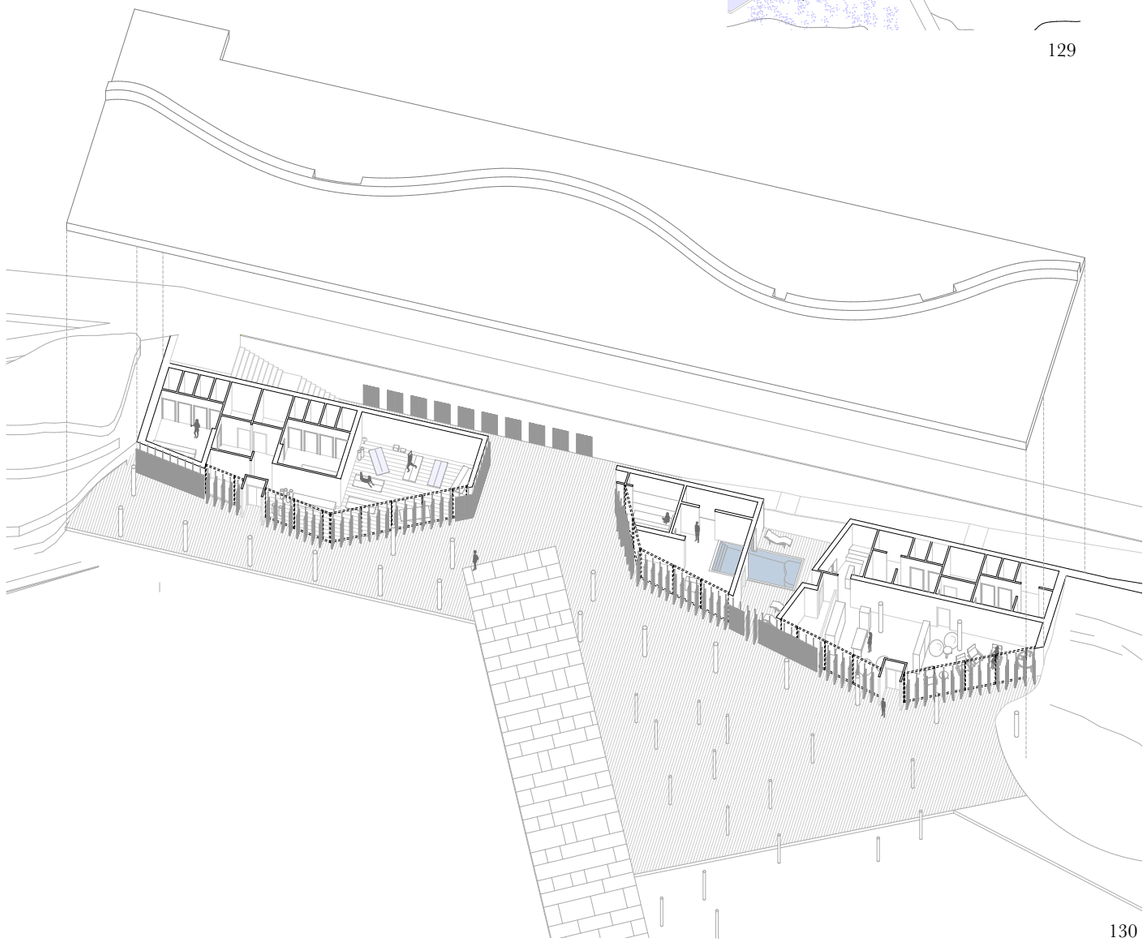

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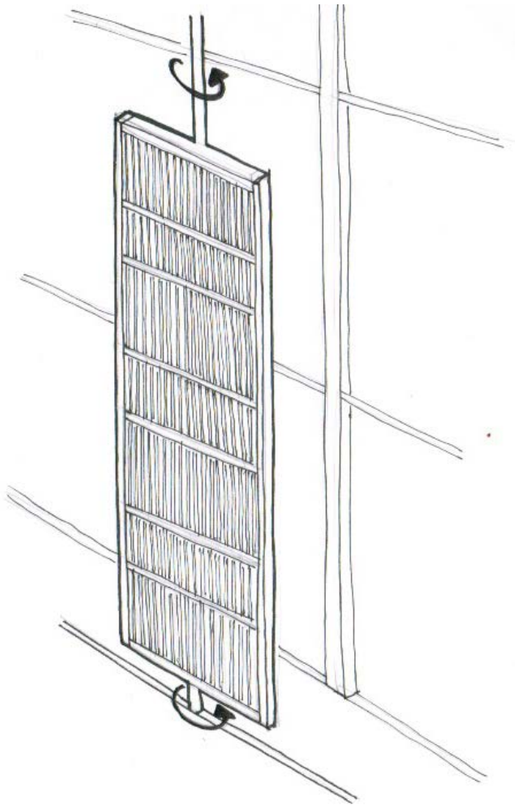
been positioned; in the south block are located the changing rooms and public showers, with connection to a multipurpose room, mainly designed for sports use.
The north block, on the other hand, broken by a patio that creates a visual glimpse coming from the ramp, houses the thermal functions, becoming a wellness center, connected with the external thermal functions belonging to the park.
At the entrance we find the reception, which deliberately divides the relaxation room from the rest of the spaces, to make it more secluded and allow a view of all the garden terraces of the waterfront; from here direct access to the changing rooms and the bio sauna, and then go out onto the patio, and find yourself in the other block which includes an ice and salt room, benefits for the skin, a sauna and a Turkish bath, with a tub of hot salted water and a whirlpool, which leads to the outside. The temperature difference between the water and the outside is also of great benefit to the body. This space remains an open patio but with a view of the sea, which cannot be accessed from the outside.
The building has a light skin, a dynamic facade defined by a succession of pivoting panels to allow users to always have different views and a greater or lesser degree of privacy.
In front of the opaque closures, the panels build a ventilated wall, while in front of the transparent closures, they mark the facade, defining it according to the uses, and allow the light to penetrate in a delicate way.
The technology of these panels, composed of thin strips of pine wood, is similar to that of the sunscreen panels.
When we talk about sunscreen walls we are referring to walls or windows of buildings covered with different modules or positioned to create a ventilated wall. The benefits associated with the installation of these panels are many: solar control and shading, thermal comfort and great resistance to atmospheric agents. This solution is functional both in summer and in winter: in the first case they limit the action of ultraviolet rays, while in the colder periods they allow to limit the cooling effect of the wind.
Since the pavilion is located under a sufficiently projecting terrace to adequately shade both the pavilion bodies, the main problems concern the wind and privacy inside a building designed to have views of the landscape along the entire length of the facade. in order to enter into a strong connection with the beach and the sea.
As for the construction of the building, the prerogative was to have a completely dry construction, consistent with all the construction systems used in the various pilot projects. We therefore used the construction technology of traditional Japanese houses, sensitive and respectful of the natural context in which they are inserted, with foundations on plinths without lean concrete and with an aired attic in contact with the ground without, however, the use of the crawl space and the concrete cauldron thrown. The ventilated floor is made up of plinths that support wooden planks that support the upper layers of the floor.

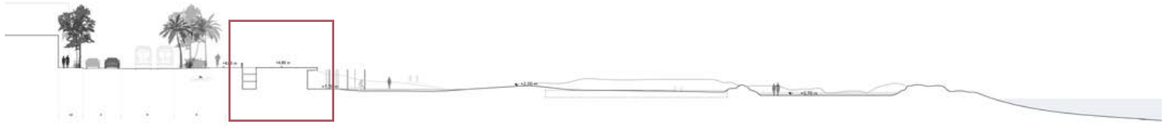
131 Constructive detail of the Pavilion

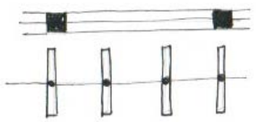
132 Axonometry of the sunscreen panel

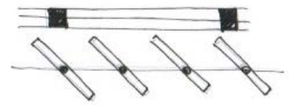
133 Visibility diagrams connected to pivoting panels: maximum, minimum, partial

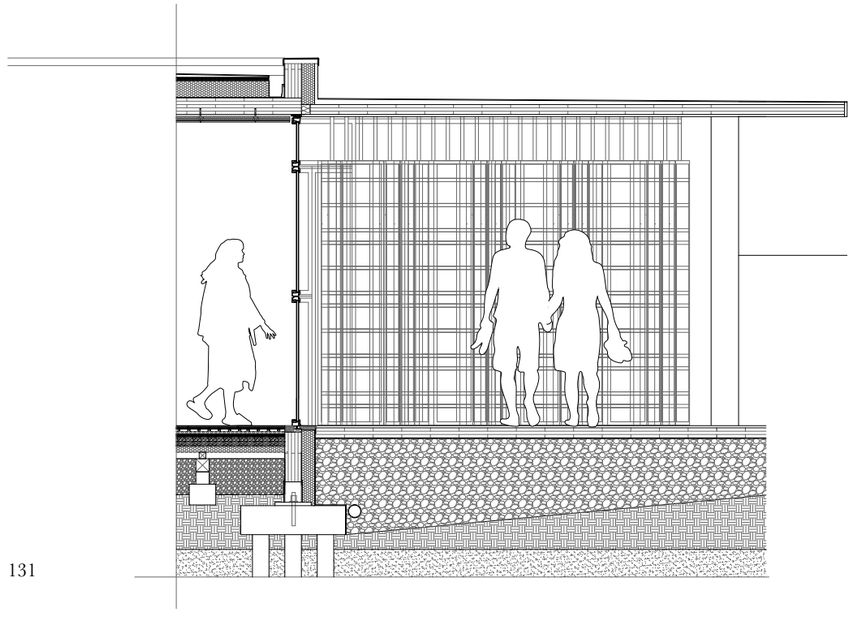
134 Zoom of the façade

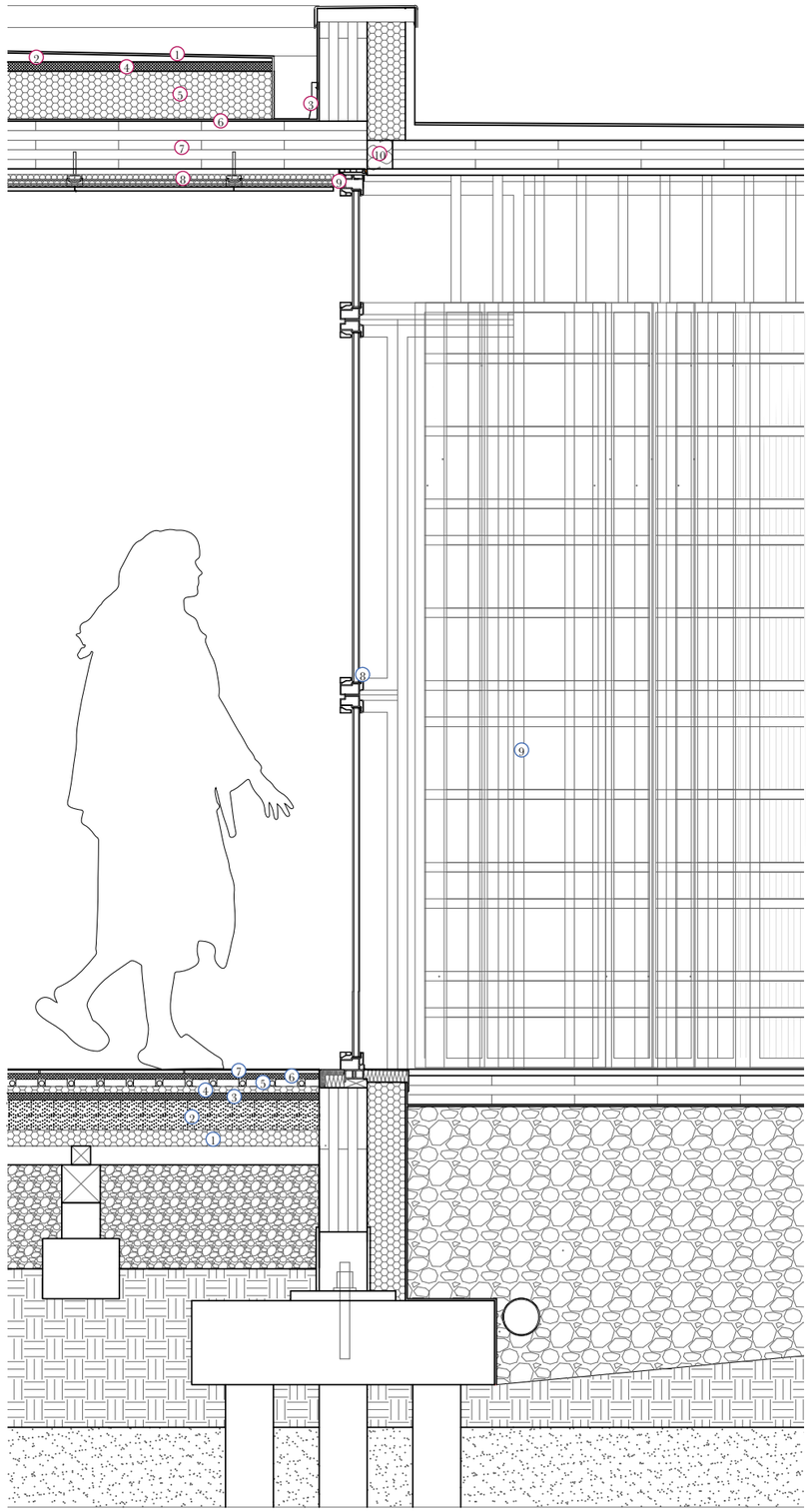










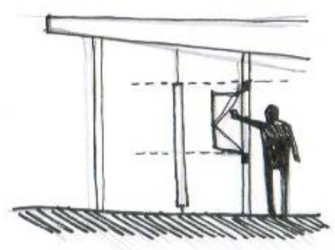


TERRACE ROOF

1. Polyurea waterproofing
2. Slope dry granular screed
3. Sheet metal channel
4. Mineralized wood panel
5. Cover insulation
6. Vapor barrier
7. Xlam slab
8. False ceiling
9. Sliding aluminum opening

SLAB IN CONTACT WITH THE GROUND

1. Thermal insulation, 500 mm: panel in synthesized expanded polystyrene
2. Implant holder screed, 100 mm: dry granular
3. Stiffening of screed, 23 mm: gypsum fiber sheets
4. Housing underfloor heating pipes 42.2 mm: pre-perforated EPS panel
5. Heat transfer fluid transport, 17 mm: radiant panel pipes
6. Thermal conduction, impact sound insulation, 18 mm: gypsum fiber plate
7. Interior flooring, 20 mm: sandstone slabs
8. Lighting, ventilation, 210 mm: lift and slide
9. Blackout, 140 mm: sheet of wooden pivoting panels
10. Thermal insulation, 40 mm: Thermal insulation 40 mm
11. Thermal and acoustic insulation or perimeter desolidarisation, 8 mm: perimeter band in closed cell expanded polyethylene
12. Drainage, 55 mm: galvanized steel channel



0 0,1 0,2 0,4 m

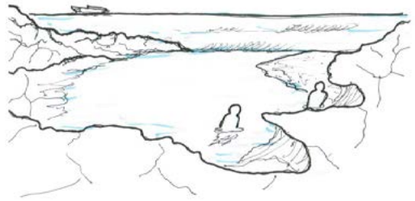
For the construction of the swimming pool on the beach, it has been chosen a technology of bio-pools in EPDM. To waterproof a bio-pool or natural pool, a resistant, long-lasting and above all eco-friendly material is needed. Inside a garden or in any case in an open space, a bio-pool can add a lot both from an aesthetic and a functional point of view. A bio-pool is lived in total naturalness, thanks to its healthy purification system that does not include any type of chemical substance, only plants and other pumping systems allow for perfect water clarity and excellent bathing. A return to Nature that must obviously also take into account the construction system which often does not involve the use of concrete and which uses only natural materials. The only exception to this must be made for the waterproof covering, which however must meet certain environmental requirements. IMPERMEA EPDM elastoseal is an excellent product, used by WWF Italy for the restoration of wetlands within their Oasis, it is also indicated by Greenpeace as an alternative to PVC plastic. Furthermore, NIBE (Nederlands Istitut voor Bouwbiologie en Ecologie), certifies it compatible for green building. Thanks to these peculiarities it fits perfectly into the natural biological context, not releasing harmful substances and allowing the natural life of plants.
The IMPERMEA EPDM elastoseal sheet can be laid directly on the ground, if the substrate consists of a bed of sand, but in this case it was considered appropriate to insert a further layer of gravel, to create continuity and an additional barrier, since the swimming pool near a public space and the Pavilion.

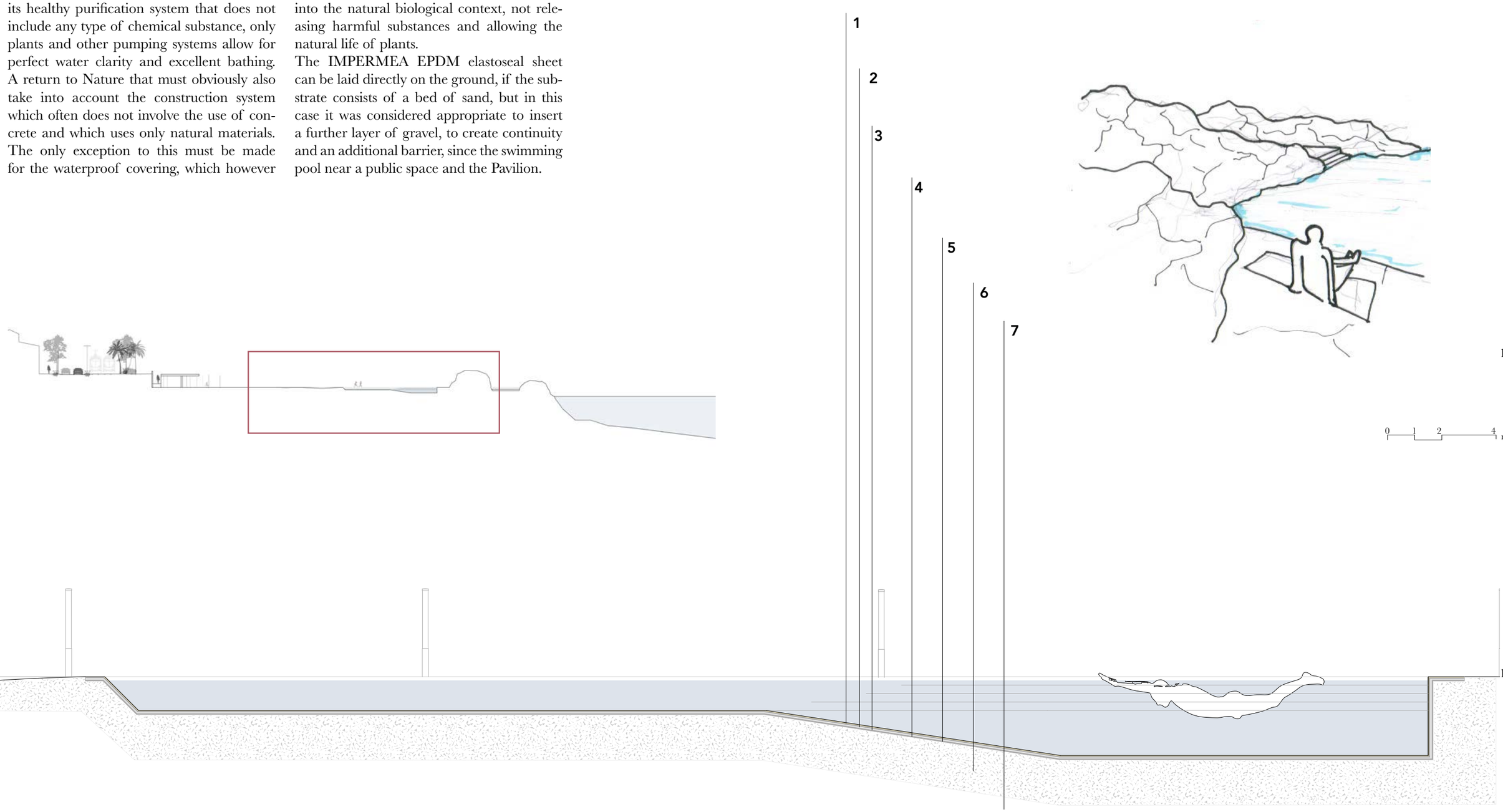
135 Constructive detail of the biopool

136 Sketches of the pools

EPDM BIO-POOL SYSTEM

1. Finishing layer in sand and bioresin
2. Laying layer in small-grained stones
3. Structure metal mesh for laying
4. Waterproof fabric
5. EPDM protective geotextile fabric
6. Gravel layer
7. Excavation





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GARDEN SIDEWALK- DRAINAGE TILES

1. Undergrounded edge stone
2. Reinforcement pre-cast concrete block
3. Frost protection layer
4. Soil
5. Stone tiles, 7 cm
6. Sand, 10 cm
7. Gravel, 20 cm

DRIVING ROAD (1% slope on both sides, with integrated water collection system)

1. Rubber finishing layer, 2 cm
2. Permeable bituminous layer, 4 cm
3. Mineral mixture 0/32, 15 cm
4. Firm - subbase or esplanade

DRAINAGE SYSTEM

1. Water collection canal (Material: polymer, vibro-pressed concrete)
2. Containment steel profile
3. Frost protection layer 0/32
4. Siphon and filter
5. Drainage pipe
6. Storage tube
7. Well
8. Gravel
9. Sand
10. Control system
11. Tube to connect the water to the ground, 7 cm
12. Irrigation system

TRAM (tram with rubber wheels)

1. "phoenix glue" shaped lanes
2. Fixing profiles, h. 15 cm
3. Rubber profiles
4. 30 cm of concrete base slab

WATERFRONT SIDEWALK AND WOOD TERRACES
(Pine wood: very resinous >> very resistant)

1. Main beams in laminated wood h. 10 cm, each meter
2. Secondary beams in laminated wood h. 7 cm
3. Wooden plank, 25 cm x 240 cm, h. 5 cm
4. 30 cm of resistant material, gravel, slope of the 1%
5. Base pillars in laminated wood, tip diameter between 10 e 20 cm
6. Wood cladding panel

TERRACE CONTAINMENT STRUCTURE
1. Gravel base, 20 cm
2. Precast element in reinforced concrete of containment
3. Laminated pine wood cladding panel attached to the structure

137 Schematic detail of the movement of water in the drainage and water collection system

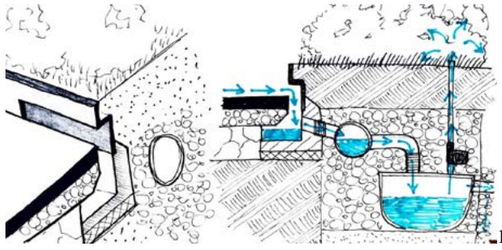
138 Diagram of the movement of water in the road section

139 Road section type and detail of the terraced edge

140 Zoom-in: section of the street along the waterfront

The urban drainage system

Water drainage takes place mainly through nature itself as the entire coastal front is transformed into a long linear park. Neverthless, in the part which is occupied by the tram line and the driveway, it is proposed a drainage system able to collects and purify stormwater; then, through a filtering system, it is possible to irrigates the entire natural belt of the coast.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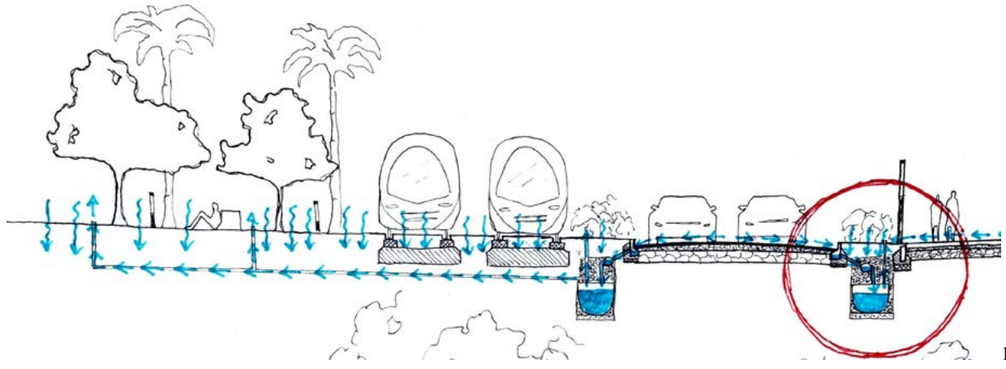
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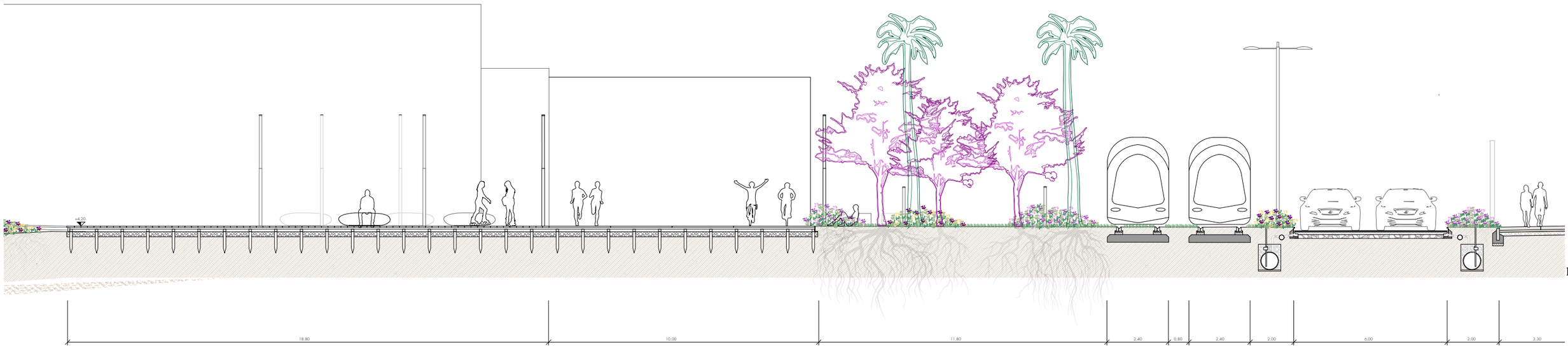

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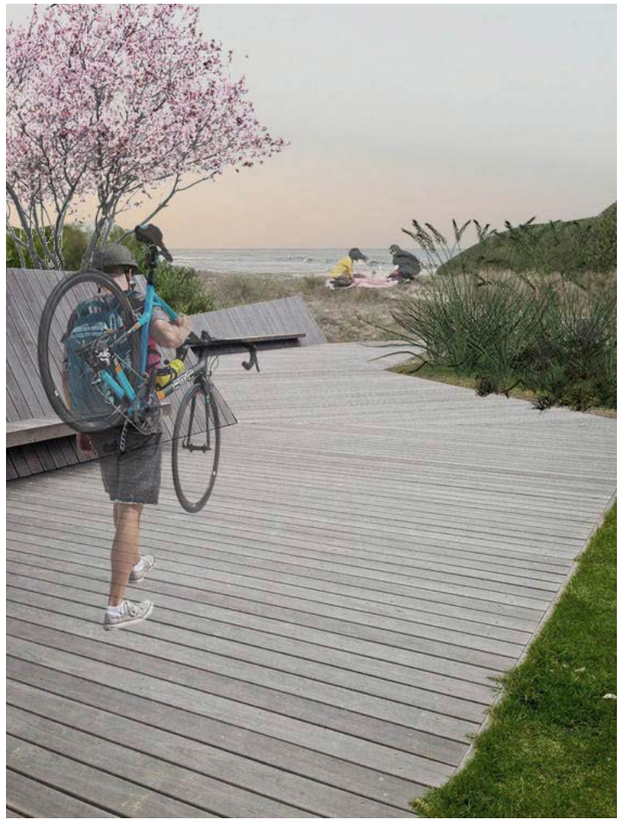
A stroll towards the oasis



A walk in the dunes

The flora of the *macchia mediterranea*

The ideal section relating to the main essences of the project shows the seasonal color scheme and the mix of species suitable for coexistence.
In the "PART 7" of this work, all the criteria necessary for the correct and sensitive design of tree and flower essences within a landscape and urban public space project will be analyzed in detail.

Tamarix Gallica

Pinus Pinea

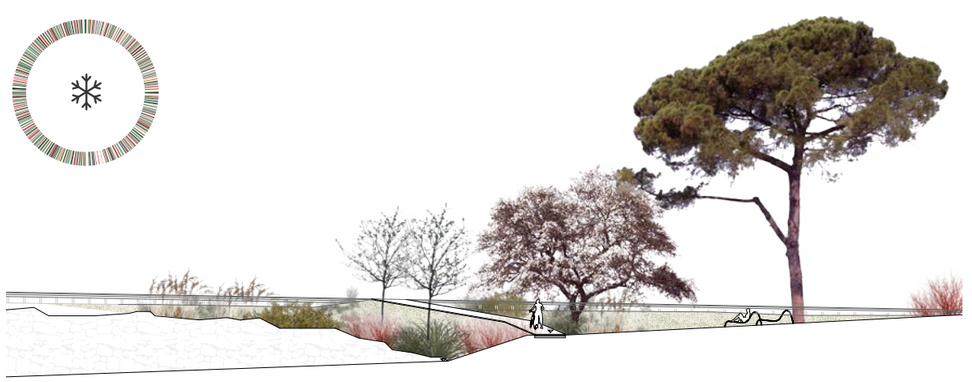
Foeniculum vulgare

Lavandula

Cornus sanguinea

141 Section of the essences of the project

142 A four-season view: autumn, winter, spring and summer (continues at page 171)



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PART 6

The dictionary of the landscape

6.1 Criteria for the selection of essences: landscape coherence and chromatic continuity

Specific criteria categories

1. Environmental conditions
- sun exposition
- climate and microclimate
- winds and perturbations
- temperature and humidity

2. Context
- morphology of the territory
- type of soil (sandy, loamy or oily clay)
- the pH of the soil
- type of green area
- availability of space
- function of the plant (structuring, ground cover, focal, spatial)

3. Type of plant
- seasonal interest
- define groups of plants to ensure diversity and coexistence
- satisfy the different ecosystem services
- combine colors

4. Interaction with people
- create moods
- create focal points
- create shelter

Versatility and landscape continuity

In order to maintain continuity throughout the project also through the use of vegetation, the choice was based on those plants that mainly had to satisfy the requirements of environmental conditions and context, as guidelines, while for the different areas (pilot projects) all four categories of plant selection are taken into account equally.
Before starting to select the project plants, an accurate research (previously reported) was carried out on the existing biodiversity; in addition, an in-depth investigation was also carried out on the native plants (trees, shrubs, flowers) of Catalonia, and more specifically of the Maresme, to enhance this biodiversity already present and create a new one that would interact perfectly with it.
Since plants are an essential part of the design of the *Parque Agrícola Litoral del Maresme*, a good solution to re-naturalize an extended space in a relatively short time is to use plants with ground cover qualities. Such problems are solved with plants that have good ground cover qualities with fast, dense, low growth, and with leaves and twigs that help avoid weeds. Some of these plants are lavender, heather and sage. Along the path from the sea to the mountain, versatile plants have been selected, capable of adapting by their nature to different climates and ecosystems, from the mountain to the coastal one, with particular attention to the tamarisk, a clear example of this characteristic.

Plants for sandy soils and coastal areas

In the various inspections carried out on the coast of Vilassar de Mar, two very characteristic plants of the area were identified: the dwarf palm and the agave. It was decided to keep them and to take advantage of their characteristics as a basis to support plants that do not disturb them but rather help them, creating a more favorable ecosystem.
As a criterion, however, it was necessary to select, along the entire coast, plants that adapted to sandy soils. These lands are called “light” or “poor”. They are typically well drained, but dry out in the summer and fertilizers don’t last long. Many plants have adapted by developing roots that penetrate deeply. The leaves change to reduce moisture loss: small and curved, evergreen and shiny, or covered with a fuzz. Once established, they grow up without needing much attention. For example, Allium and lavender grow well in sandy soils, and are suitable for gravel gardens in areas with little rain. It is also essential that they are suitable for coastal areas: here the salt from the sea spray is carried by the wind into the hinterland, causing problems for many plants. Others, on the other hand, tolerate high salinity well: they often have leaves with a resistant and shiny surface, which absorb little, or are covered by a hair that protects them from salt. Coastal gardens are often exposed and plants must be protected with hedges or reeds.

Colors as a design tool

The choice of colors can often be personal,

but there are some useful theories on how to combine and mix colors to achieve pleasing combinations. Even light and shadow can change them and some catch the eye, while others are more discreet. Furthermore, colors influence mood and positivity, so they have been carefully chosen based on the atmosphere designed for the spaces of the project.

Colors combinations

The Tamarisks Garden is the only space along the waterfront, more intimate and intimate, which includes only one species of plants, precisely the tamarisk, the protagonist of the project due to its versatility; here we therefore find few and similar chromatic shades (monochromatic system).

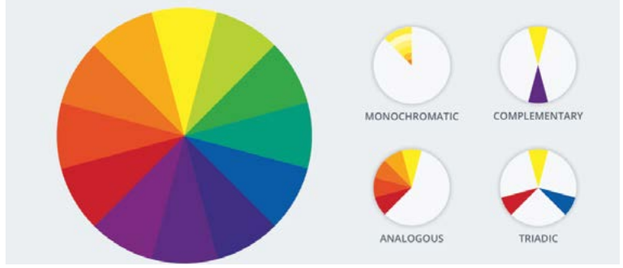
The basic criterion for the whole park was the use of the color wheel, which is divided into primary, secondary and tertiary colors. This wheel is useful for creating harmonic and contrasting patterns. For example, exactly opposite colors in the wheel are considered "complementary", and when they are next to each other, their contrast gives a sense of exuberance, without however tiring the eye. For this reason, this scheme was mainly used throughout the Parque Agrícola Litoral, so that the urban space could be revitalized, transmitting a sense of positivity, of prosperity.
The only exception is in the Thermal Oasis, where a combination of harmonious or similar colors was chosen, such as blue, purple, pink and green with little peaks of yellow and orange. Harmonic colors are able to generate different moods, depending on whether you choose contrasting or similar colors.
However, if colors are to muted they can give a dull effect, so to enhance the patterns of the vegetation, some points of stronger colors have been inserted to create points of shadow.

Creating moods and focal points

Color can convey a mood or a message and has a powerful effect on the atmosphere of a garden or park. For instance, warm, vibrant colors such as crimson, scarlet, magenta, golden yellow and orange give a sense of excitement, while cool colors such as sky blue, pale pink, mauve, soft grays and blue-green produce serenity.
Color can also be used to draw attention to a particular element or area of the garden, (as for distinguish the Thermal Oasis) by creating a contrast between the plants in order to increase their visibility.

Creating a sequence of colors all year round

Another important criterion was choosing the plants based on their flowering, selecting essences that bloomed at different times of the year, to keep the chromatic interest high in all seasons.



143 The color wheel

143

6.2 Catalog of the essences

La pioggia nel pineto

Ascolta. Piove
dalle nuvole sparse.
Piove su le tamerici
salmastre ed arse...

Gabriele d'Annunzio

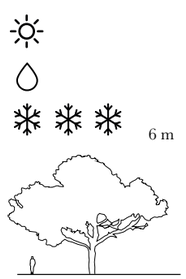
The tamarisk: landscape coherence and chromatic continuity

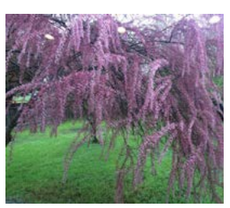
The most common species of tamarisk are: tamarix penandra (or hispid aestivalis), tamarix tetranda (or parviflora), tamarix gallica and tamarix africana. These latter two types are often cultivated also to protect vegetable gardens or in vineyards near the sea, again for their precious role as windbreak.
Among the Tamaricaceae family, the species chosen as the main plant of the project is Tamarix Gallica, a very versatile plant. Thanks to its versatility and the beauty of its starry pink flowers, it is very suitable to urban space design, which is why it was chosen as the protagonist plant to mark the continuity in the path between sea and mountains, accompanied by the plants that will be explained later.

The tamarisks grow very easily along the coasts, but thanks to their rusticity, they can also grow in flat and hilly areas. They are however suitable for areas with a mild climate, marine but also desert, by virtue of their ability to retain sand. Among these, the Gallic type is the most suitable for the construction of windbreak barriers or for the consolidation of the dunes that are carried out along sandy coasts.

Features

The tamarisk, or tamerix in its classification, is a small tree with a shrub-like habit, native to the arid areas surrounding the Mediterranean: for this reason it is also often mentioned as a "*desert shrub*". It looks like a deciduous shrub with a squat trunk and a decomposed crown, which reaches heights that rarely exceed 6 meters. It is used as a shrub with an ornamental value and particularly appreciated among its characteristics is the light flowering. The leaves of the tamarisk are small and clear, in the shape of a scale. They have the characteristic of being very thin needles, pressed hard against the branches. Thanks to this features, tamarisks are also able to greatly reduce the loss of water from the whole plant. The flowers are gathered in long and thin spikes. They are very small and they are characterized by their lively light pink color, which is the most characteristic feature of the plant, thanks to which the tamarisk boasts a remarkable ornamental impact. Over time, small brown berries ripen that bear dry seeds. It has a pink color, with a particular elegance that contrasts well with the dark bark. Its branches remain green even during the winter season.





Habitat

In mild climate areas they resist wind and thrive along the coasts, forming magnificent hedges.
The tamarisks in general have an excellent tolerance to salt, when they receive the splashes coming from the sea waves. Nonetheless, they equally well tolerate a widespread presence of salt in the soil, a common element of marine areas. Therefore, their use within a garden near the sea is optimal, with the aim of forming a line of defense from winds, salt and spray.

Sun exposition

It prefers a sunny position. As mentioned, the tamarisk boasts a very high tolerance towards salty soils, and also its resistance to areas subject to atmospheric pollution is high, so that its cultivation in inhabited centers does not give particular problems.

Soil

Tamarisks are rustic or almost rustic, so they require sun and fertile, well-drained soil.
They like sunny exposures, light loose soil, preferably sandy, tolerating even brackish ones. Tamarisk trees resist drought and also resist cold. They can also live in saline soils, so they are halophytic plants. They do not fear the heat and do not suffer from most parasites.
Its root system is superficial, but it also has the ability to go deeper for its sustenance.

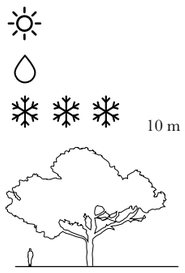
From the mountains to the sea: the main vegetation of the project

In addition to tamarisks, along the entire ecological ring that connects the Vilassar de Mar-Cabrera-Cabrils system, also including the Vilassar waterfront, there are some species of plants and shrubs whose characteristics make them suitable for different types of ecosystems, from the hilly one to the coastal one. Also, one aspect that was taken into account was to include especially particular trees and shrubs, which have more than one season of interest.

Pinus Pinea
Stone pine

Umbrella-shaped conifer, with short trunk and rounded crown. Dark green leaves, but persistent juvenile foliage is blue-green. Shiny ovoid pine cones with edible seeds.

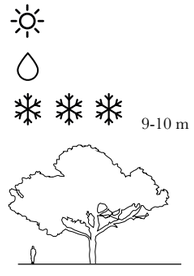
Elevation: 0 - 300 m asl



Ceratonia siliqua
Carob

Due to its characteristics, it is possible to have flowers, fruits and leaves on the same carob tree at the same time, being evergreen and the ripening of the fruits is very long. The carob is a slightly twisted, evergreen, robust tree with an expanded crown, branched at the top. It can reach a height of 9-10 m. Flowering takes place in August-September and ripening is completed between August and October of the year following the flowering that gave them origin.

Elevation: 0 - 600 m asl



Cornus sanguinea
Common dogwood or bloody dogwood

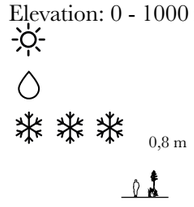
Upright deciduous shrub that can reach 3m in height. The reddish green, sometimes green, winter shoots have an intense red color when young. It has ovate medium green leaves that turn reddish purple in autumn. Flattened inflorescences of starry white flowers, at the end of spring, are followed by ovoid blue-black fruits.
It grows well in very humid areas.

Elevation: 0 - 1300 m asl

Foeniculum Giganteum
Fennel

Genus of biennials and summer flowering perennials, some of which are cultivated for the yellow flowers and the other species for the leaves, suitable for embellishing the borders and used in cooking. From rustic to almost rustic, they are grown in an open and sunny position, in fertile, well-drained soil. Remove the inflorescences before they wither. Plant in the fall.

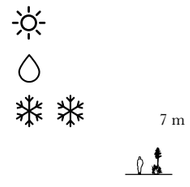
Elevation: 0 - 1000 m asl



Lavandula angustifolia
Lavender

Genus of evergreen shrubs, mostly summer flowering, with whole or compound leaves, often gray-green. They form low, impressive hedges. They require full sun and fertile, well-drained soil. Lavender augustifolia is a bushy, evergreen shrub with heights between 40 and 60 cm. It has linear to strictly ovate, aromatic, gray felted leaves. In mid-summer it produces small compact and fragrant spikes of blue-violet flowers, sometimes pink or white, on 10-30 cm tall stems.

Elevation: 0 - 1800 m asl



Phoenix canariensis
Palm

Evergreen erect palm, with robust trunk, up to 18 m high. It has arched, feathery leaves up to 5m long, composed of tightly lanceolate, leathery, bright green leaflets. It produces large pendulous clusters of yellow-brown flowers, followed in autumn-winter, on ripe specimens, by yellow or red, oblong fruits.

Elevation: 0 - 50 m asl

Oxalis triangularis
False shamrock

Genus of tuberous, rhizomatous or fibrous-rooted perennials, cultivated both for the colorful flowers and for the ornamental leaves. Some species are pests. Rustic to almost delicate they require temperatures above 5°C, full sun or partial shade and well-drained soil. They multiply by division in autumn or early spring.

Elevation: 0 - 1800 m asl

Erica (Multiflora e arborea)
Erica

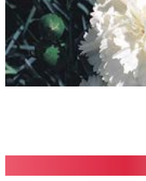
È un arbusto sempreverde, a fusto legnoso, molto ramificato e con foglie aghiformi, lunghe 5–10 mm.
I fiori, roseo-violacei, lunghi fino a 7 mm, sono riuniti a formare fitte infiorescenze all'apice degli steli.
Cresce prevalentemente su terreni calcarei in ambienti di macchia e gariga.

Elevation: 0 - 800 m asl

Dianthus
"Alice" and "Haytor White'"

Carnation requires sunny exposure, soil rich in organic and mineral substances, compact, calcareous and dry.
They multiply with sowing, by means of cutting and by division of the tufts.
The annual species are sown in spring or in box in February, with flowering after 6 months.

Elevation: 0 - 1500 m asl



Scilla autunnalis
Autumn squill

It grows in arid meadows on calcareous soils that are often decalcified and therefore subneutral, not very deep, rich in skeleton and dry in summer. The plant, especially in the bulbs, contains toxic substances. Biological form: bulbous geophyte. Flowering period: August-September.

Elevation: 0 1300 m asl

Allium
Garlic

Genus of perennials, some edible, with bulbs, rhizomes or fibrous tubers. Almost all have basal leaves, which give off a sharp odor; most of them produce small flowers gathered in a dense spherical or ovoid umbrella. Rustic and frost-resistant, they require open and sunny exposure and well-drained soil. It is multiplied by seed in autumn or by division of the tufts.

Elevation: 0 1800 m asl

Aloe vera
Aloe vera

Genus of evergreen plants, shrubs, perennials in some cases climbing, with rosettes, succulent foliage and tubular or bell-shaped flowers. Almost delicate, they require a minimum temperature of 7-10ºC.
Plants over 30 cm in extension, prefer full sun; the smaller species generally love partial shade. They need very well drained soil. They multiply from seed, by cuttings or by planting new shoots in spring and summer.

Elevation: 0 - 200 m asl

Calendula officinali
Pot marigold

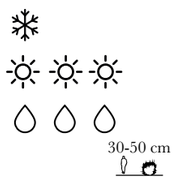
Genus represented by annuals and evergreen shrubs. They are grown in the sun, in well-drained soil of any type. Caldendula Officinalis has alveolate, very aromatic pale green leaves.
They have tall cultivars, grow up to 60 cm in height, while dwarf forms up to 30 cm.

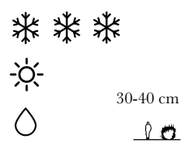
Elevation: 0 - 200 m asl

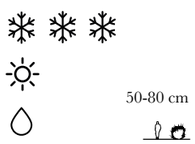
Matricaria recutita
Chamomile

The plant has taproot roots and stems that start from the base, more or less branched in the upper portion. The height generally does not exceed 50 cm in spontaneous forms, while in cultivated varieties it can reach 80 cm. The plant is distinctly aromatic. The leaves are alternate and sessile, oblong. The flowers are gathered in small flower heads with conical and hollow receptacle. The external flowers have a white ligule, the internal ones are tubular with a yellow corolla. These flowers have a pleasant aromatic smell and contain a characteristic essence consisting of the active ingredient azulene, and a mixture of other substances.

Elevation: 0 - 1400 m asl







Rosmarinus oficinalis
Rosemary

Rosemary is a perennial shrub plant, has the classic bushy habit and its height can even reach three meters. It has small dark green leaves and the flowers, present for most of the year, are blue-violet in color, while the fruit is brown and small in size. The strong aromatic smell emanating from the plant is due to the essential oil present mainly in the young twigs and flowers.
It requires a sunny position sheltered from the icy winds; well-drained light sandy-peaty soil; not very resistant to harsh and prolonged climates.

Elevation: 0 - 300 m asl

Salvia officinalis
Sage or garden sage

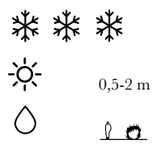
It is a plant native to the Mediterranean countries, where it often grows spontaneously, even in the poorest and most difficult soils. an evergreen plant, with characteristic oval leaves. Their surface is wrinkled, silvery green in color, and they give off an unmistakable and pleasant aroma. The flowers of salvia officinalis appear in early summer, are large and showy, purplish blue and gathered in beautiful spikes.

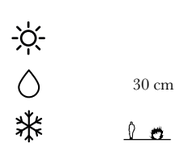
Elevation: 0 - 300 m asl

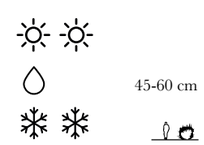
Verbena officinalis
Common vervain

Verbena is a rustic plant, very resistant to low temperatures, able to survive the rigors of winter buried under the snow, and late frosts when the soil is free and often wet. In cold climates the area part disappears and the plant starts to vegetate again early, but with an initially slow development and forming only leaves adhering to the ground.

Elevation: 0 - 1000 m asl







Conclusion

Conclusion

According to Gilles Clemènt's thought, "*the reality of the Third Landscape is of a mental order. It has the same degree of mobility as the theme that forms its center: that of life on the planet.*
Due to its content, to the questions posed by diversity, to the need to preserve it - or to favor its dynamics - the Third Landscape acquires a political dimension. The statute of the Third Landscape is of a planetary order. The maintenance of its existence does not depend on experts but on a collective conscience ".

Taking up the thought of Gilles Clemènt, for this work to find its concreteness, it would need to superimpose other levels on the project level addressed: the social, economic and cultural.
Although this work already refers to specific objectives set out in the local and regional planning documents (Plan Territoral Metropolitàno de Barcelona), imagining its real usefulness would mean going through the involvement of the various territorial actors involved.
The role of this project finds meaning above all in the cultural level, as a tool for collective debate, a vehicle for hypotheses of possible transformations of the territory and dialogue between the various local institutions.
In this case the project would play a mediating role between local institutions., supralocale and other interested bodies, and again between local institutions and citizens or citizens' associations.
Designing a scenario, says Bernardo Secchi, means wondering "*what would happen if ...*". Here, the role of this project is to ask the question and configure possible scenarios to share.

The scenario proposed here interprets in particular the lines of the Plan to form a planning scenario that hooks up to a concrete existing one, which is crucial to guarantee the feasibility of a project. For this reason, we have relied on the guidance of the Barcelona Metropolitan Territorial Plan (PMTB) and on the proposals for the defense and clean-up of beaches with erosion problems described in the technical information of the Ministry of Agriculture, and of the supply of the environment of the Maresme.
Even though the proposal of the Parque Agrícola Litoral del Maresme reaches a scale of detail, it does not want to be a closed and definitive image, but rather one to be pursued through the long times of nature and the government of the territory, as an image of process.
The landscape itself by its very nature is active, changeable, unpredictable and does not obey a set program and calendar, but rather the needs of the environment to adapt.
Finally, it is believed that the topic investigated is of extreme relevance in the contemporary world and in relation to all the challenges that the territory will have to face in response to the ongoing climate changes.
Working with nature and landscape, with water and greenery, as privileged materials for a more resilient soil project, is urgent today.
It is even more urgent to investigate these aspects on the border line: "the coast".

Sources

Notes

[1.] War and Peace is a historical novel by Lev Nikolàevič Tolstòj written between 1863 and 1869. Lev Nikolàevič Tolstòj (Jàsnaja Polyana, 9 September 1828 - Astàpovo, 20 November 1910) was a Russian writer, philosopher, educator and social activist.

[2.] Georges Seurat (Paris, 2 December 1859 - Gravelines, 29 March 1891) was a French painter, pioneer of the pointillism movement.

[3.] From 2010, a book by Albero Magnaghi (Turin, 8 June 1941) is an Italian architect and urban planner, founder of the territorialist school.

[4.] Director of the historical archive of the Maresme.

[5.] Researcher of the Archaeological Section of the Museum of Mataró

[6.] From L'organització de l'Espai i models de poblament del Baix Maresme durant l'Edat Mitjana Organització de esprit i models de poblament.Mataró, 2003p 23-40 by Joaquim Graupera i Graupera is an art historian of the University of Barcelona.

[7.] Professor at l'Universitat de Lleida, Departament d'Història Department, Medieval History.

[8.] Miquel Biada Bunyol (Mataró, November 24, 1789 - Mataró, April 2, 1848) was a Spanish merchant seaman who was the main promoter of the Barcelona-Mataró railway (1848), the first railway of Catalonia and Spain, although since 1949 some the consider the first railway of the Iberian Peninsula.

[9.] Approved in 1992, it is the highest level planning tool that structures the system of protected areas in Catalonia and integrates this system throughout the territory.

[10.] Natura 2000 is the main tool of the European Union policy for the conservation of biodiversity. This is an ecological network spread throughout the Union, established pursuant to Directive 92/43 / EEC "Habitat" to ensure the long-term maintenance of natural habitats and species of flora and fauna that are threatened or rare at community.

[11.] 2021-2030 è lo strumento di pianificazione di base per promuovere un'azione coordinata per affrontare gli effetti del cambiamento climatico in Spagna.

[12.] is the scientific group formed in 1988 by two United Nations bodies, the World Meteorological Organization and the United Nations Environment Program for the purpose of studying global warming.

[13.] From "Manifesto of the Third Landscape" of 2004 by Gilles Clément (Argenton-sur-Creuse, 6 October 1943), a French agronomist, biologist, writer, entomologist and landscape architect, teacher at the École nationale du paysage in Versailles.

[14.] Ian L. McHarg (20 November 1920 - 5 March 2001) was a Scottish landscape architect and writer who dealt with land use planning using natural systems. McHarg was one of the most influential people in the environmental movement who brought environmental concerns into the public consciousness and ecological planning methods into the mainstream of landscape architecture, urban planning and public policy. He was the founder of the landscape architecture department of the University of Pennsylvania in the United States. His 1969 book, Desi
gn with Nature, pioneered the concept of ecological planning.

[15.] From "It Takes a Tree to Save the City: A Manifesto for Politicians and Public Administrators" by Francis Hallé of 2018.

[16.] From the essay "Linearità e waterfront" by Michele Sbacchi of 2018.

Bibliography

Books

Gilles Clément, 2008, *Il giardiniere planetario,* Milano, 22 Publishing, 2008

Gilles Clément, 2005, *Manifesto del Terzo paesaggio,* Quodlibet, Macerata, 2005

Waldheim C., 2016, *Landscape as urbanism: a general theory,* Princeton University Press, 2016

Gausa Manuel, 2003, *Hiper-Catalunya, Catalunya Land Grid - Schema di sviluppo sostenibile per una Catalunya Geo-urbana,* 2003

De Precy J., 2012 , *E il giardino creo' l'uomo: Un manifesto ribelle e sentimentale per filosofi giardinieri, Ponte alle Grazie,* Firenze, 2012

McHarg Ian L., (1995), *Design with Nature,* John Wiley & Sons Inc, 1995

C. Nifosì, M. Secchi, 2020, *"Territori in divenire. Scenari e progetti per la laguna di Karavasta",* Lettera 22, Siracusa, 2020.

C. Nifosì, M. Secchi, C. Nifosì, M. Secchi (2018), *Territorio costiero, paesaggio di intermediazione, in T.R.I.A (Territorio della Ricerca su Insediamenti e Ambiente)* n. 19 - *Inclusive coastal landscapes: green and blue infrastructure design for the urban-land interface,* Vol.10 n.2, Agosto 2018

Longo O., Orsini F., 2012, *«Il rapporto città-mare come infrastruttura inclusiva multiscala». In: Orioli V. (a cura di), Milano Marittima 100 – paesaggi e architetture per il turismo balneare. Collana saggi di architettura Alma Mater Studiorum.* Milano: Bruno Mondadori, 2012

Giansanti A., 2014, *Turismo, ambiente e territorio. Sinergie per uno sviluppo economico sostenibile.* Vignate: TiPubblica, 2014

De Meulder B., Wambecq W., (2018)*Between Land and Sea: Reshaping the Belgian Coastline. A Case Study between Ostend and Blankenberge,* The Plan Journal, 2018

Di Campli A.,(2006) *Interfacce costiere,* Kappa Edizioni, Roma

Smithsonian institution, Fontebuoni A. (Traduttore), 2009, *Flora. Le piante viste da vicino,* Gribaudo, Milano, 2009

C. Brickell (a cura di), 2018, *L'enciclopedia di piante e fiori, The royal Horticultural society,* Gribaudo, Milano, 2018

Gavazzi G., Castelli de Sannazzaro S., 2019, *Sostenibilità. La lezione delle piante,* Hoepli, Milano, 2019

Steinkopf L.E., 2020, *Piante che crescono al buio,* Milano, Gribaudo , 2020

Leonardi C., Stago. F, (2004), *L'architettura degli alberi,* Mazzotta

Mancuso S. (2019), *La nazione delle piante,* Laterza

García M.G., 2019, *The Reinvention of the Coast. 2100: Climate change scenarios of the metropolitan coast of Barcelona,* Barcelona Regional

García M.G., 2012, *Guidelines for sustainability and landscape integration of coastal aquaculture facilities, Xunta de Galicia*

Lleonart M. A., 2018, *L'Agrícola de Vilassar de Mar SCCL, 1918-2018: 100 anys d'història,* Índex, 2018

Percerissas L., 2010, *Evoluciò y paisatge a Vilassar de Mar,* Pagès, 2010

Caballé i Esteve F., 2007, *La Formació urbana de Vilassar de Mar, L'Ajuntament de Vilassar de Mar,* 2007

Méndez A. S., 2009, *Vilassar de Mar 1784, un abans i un després: context històric i desenvolupament dels principals entorns a la segregació de Vilassar de Mar, Ajuntament de Vilassar de Mar,* 2009

Roca i Pagès J., 2000, *Petites històries de Vilassar de Mar i del Maresme, mig de veres, mig de broma, vistes per un pagès,* Oikos-tau, 2000

López Martín R.,2013, *Maresme, 17 excursions a peu, Cossetània,* 2013

Vallbona R.,2015, *Relaxed cycle tourism in Calella and El Maresme,* Cossetània, 2015

Blasco Trallero D., 2011, *Evolución costera del Maresme Norte (Blanes-Arenys),* UPC, Barcelona, 2011

Benedetti C., 2014, *Costuire in legno, edifici a basso consumo energetico,*Bolzano, Bozen-Bolzano University Press, 2014

Edoardo Zanchini, Maria Assunta Vitelli, Gabriele Nanni, 2016, *1000 Materiali per una nuova edilizia,* Legambiente, Rapporto dell'osservatorio Recycle di Legambiete,Novembre 2016

Articles and magazines

Benito i Montclús, Pere, Marzo 1992, *L'obertura al mar d'una societat feudal, in "Singladures",* n12, Vilassar de Mar

Serena Savelli, 2015, *Le soste del viandante, leggere i paesaggi degli Itinerari Culturali,* in "Architettura del paesaggio" n30, 2015, pp. 23-24

Goula M., Pérez., Spanou, (2012), *"Tour-scapes or how to convert mature tourism destinations to complex sustainable landscapes; the strategy of the second coast",* in Ara Journal of Tourism Research, No 2 Vol. 3

Documents of local planning

Plà Territorial Metropolità de Barcelona, approvato definitivamente il 20 aprile 2010, (DOCG nu. 5627, 12-05-2010)

Dirección General de Sostenibilidad de la Costa y del Mar, 2014, Estudios de dinámica litoral, defensa y propuestas de mejora en las playas con problemas erosivos, considerando los efectos del cam bio climático: estrategia de actuación en el maresme ministerio de agricultura, alimentación y medio ambiente secretaría de estado de medio ambiente, Dirección General de Sostenibilidad de la Costa y del Mar, Madrid 2014

Sitography

http://www.icgc.cat (Istituto cartografico e geologico della Catalogna)

http://www.vilassardemar.cat/

https://www.opengis.uab.cat/

https://territori.gencat.cat/

https://www.miteco.gob.es/

https://www.arquitectes.cat/

https://bibliotecavirtual.diba.cat/

https://geoportalcartografia.amb.cat/

https://landlab.es/en/

https://it.tideschart.com/

https://www.actaplantarum.org/

https://www.qgis.org/it/site/

https://www.ladybug.tools/

https://www.minambiente.it/

http://www.arbolapp.es/

http://biodiver.bio.ub.es/biocat/

https://www.atlasofplaces.com/

https://www.archdaily.com/

https://divisare.com/

https://ferrater.com/es/

http://micheldesvignepaysagiste.com/

http://www.alvaroleitesiza.com/

https://www.turenscape.com/en

https://www.landsrl.com/

http://www.editorialelotus.it/

https://issuu.com/

https://www.treccani.it

https://www. piscinenatura.it

https://www.micheldesvignepaysagiste.com/

https://www. www.breinco.com/es/

https://www.escofet.com/

https://ec.europa.eu/info/sites/info/files/naturebasedsolutions-w920px.png

https://ec.europa.eu/

https://www.iucn.org/

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