

# RESILIENT MIKKELI

## The Resilient city of Mikkeli

Stretching for self-sufficiency, Resilient Mikkeli binds together the new lake front in a symbiosis of diversity with form fitting landscapes. Ranging from performing wetlands to an inter-woven civic promenade, the lakefront is alive with activity.

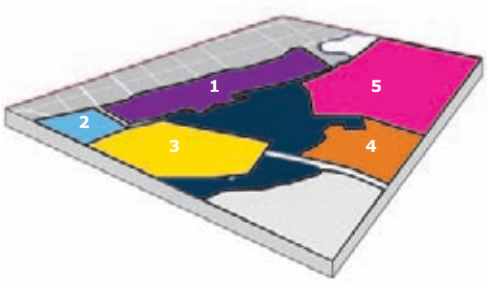
With innovative public and private spaces that engage local residents, recognize seasonal variation, and immerse residents in nature, our strategy is to create five sustainable zones around the central lake of Satamalahti. Defined by the existing landscape, each of the zones is composed of a personal block structure that integrates with the existing fabric and terrain. Utilizing the strict grid of the city center and the established birch plantings, Resilient Mikkeli brings a variety of living types, building typologies, and plot sizes.

Within every development zone, we have developed a self-supporting eco-structure. With designed ecologies fit into the landscape, our proposal stands on four pillars: a connected water cycle, balance of energy use and production, an effective waste management cycle, and a closed loop of local production and consumption cycle. The goal is to reach a carbon neutral development and make Mikkeli's lakefront a flagship project for a sustainable, hybrid and self-sufficient city.

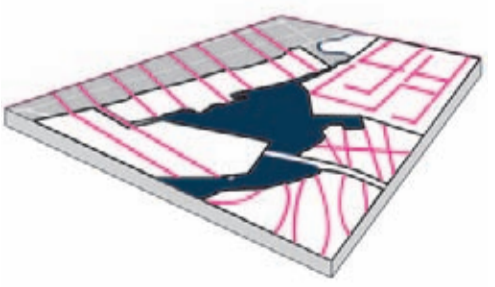


Bird's eye perspective

## Concept



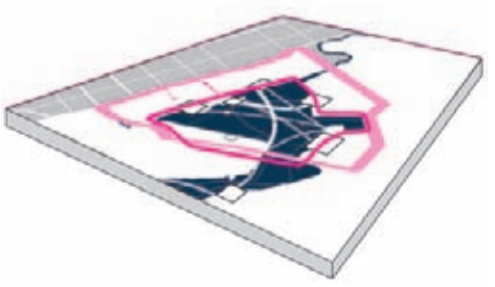
**5 Characters**  
The central lake of Satamalahti is surrounded by 5 zones with unique characteristics for development. These five zones each touch the central lake and bring changing vistas and a variety of development possibilities that range from the dense urban structure on the western bank to forest living on the eastern shore.



**City structure**  
The five zones are the City on the Lake, the Bird Sanctuary, the Water District, the Forest Campus and the Lakeside Park. Each of the zones builds on the surrounding context by making clear connections to the lake, the city's green structure, and established path system.



**The Eco-machinery**  
Within the project, the enclosed cycles of energy, water, waste and local production are implemented. Storm- and greywater, urban farming, and carbon sequestration are integrated and a smart energy grid powers the new developments. In the plan the implications of this Eco-Machinery is developed on the larger scale of the Satamalahti development as on the detailed level of the different sub-areas.



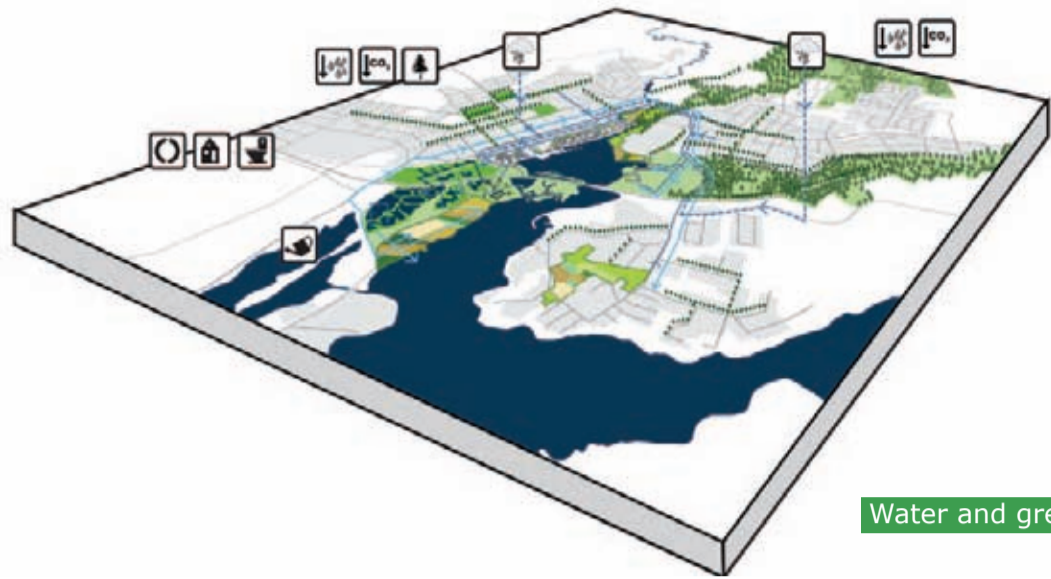
**Water and ice**  
Between the different zones strong connections by bike, foot and public transport are made, forming a connecting lake loop. On the lake, water elements are introduced, turning it into a lively water plaza in summer and a connective and social ice surface at winter time.

# Mikkeli Eco-machine

We implement an integrated self-sustainable system, the Mikkeli Eco-Machine, that will lead to such an amount of CO2 sequestration and lowering of CO2 production that the Satamalahti development can result in a neutral Carbon Footprint development. This Eco-Machine will form the sustainable base for further development of Mikkeli. The different elements of the Eco-Machine have been explored on the level of the City Centre district, but also on the level of sub areas, the blocks and the impact on everyday life.

## Water and green

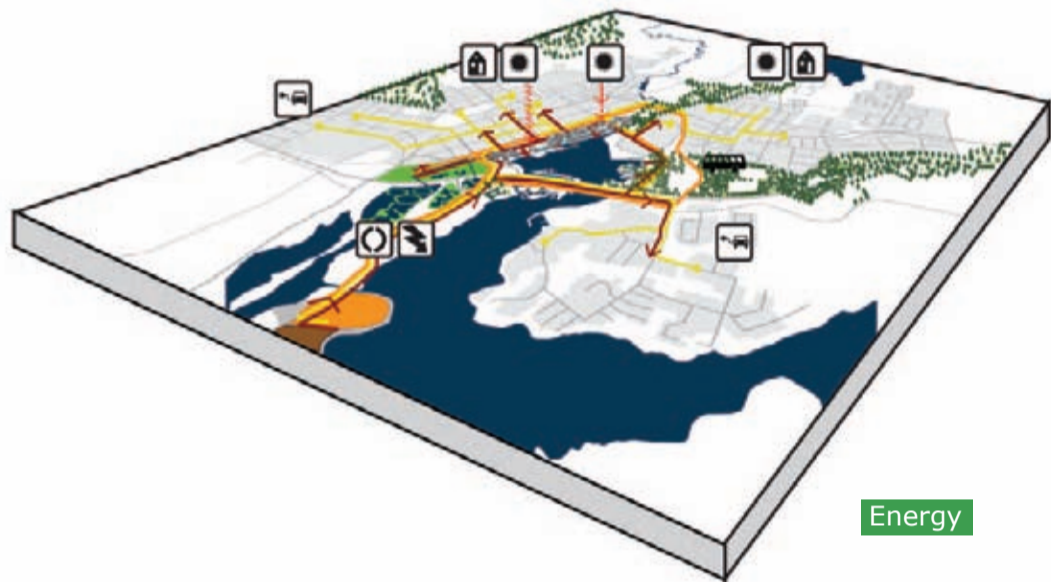
With the implementation of a sustainable water infrastructure for Mikkeli, we integrate drinking water, wastewater and stormwater management into the design and planning of Mikkeli. Water discharges will be lower by using green infrastructure within the city structure. The seepage of the stormwater is facilitated by the soil and vegetation, such as green roofs, permeable surfaces, planting of trees and water buffering areas, which work to speed up the evaporation and absorption of the water. Simultaneously the planting of trees and plants within the city borders will help the sequestration of CO2. The focus lies on the local use, treatment and disposal of the water. Next to the separated stormwater system we also suggest the decoupling of the wastewater flows. The blackwater, which is generated from toilet use, is separated from the greywater from kitchen, bathroom and washing machine wastewater. When greywater is not combined with blackwater, it can be cleaned easily with minimal energy requirements within the biological filtering system, the designed wetland for greywater purification. It can be reused for domestic use or irrigation of the proposed garden plots. This lowers the pressure on the existing waste water treatment plant. Therefore, we suggest to minimize the size of it and make it part of the biological water treatment system instead of moving it to other parts of Mikkeli. This recreational water treatment park forms the backdrop and context for the neighboring housing area. The water makes a natural border to the technical part of the water treatment plant, the other parts are open to the public, where some of the existing buildings and structures can be used as info center or park pavilions. Connected to the larger scale Eco-Machine we have investigated how these green and blue elements interact with the direct built environment, resulting in a wide range of local scale interventions.



Water and green

## Energy

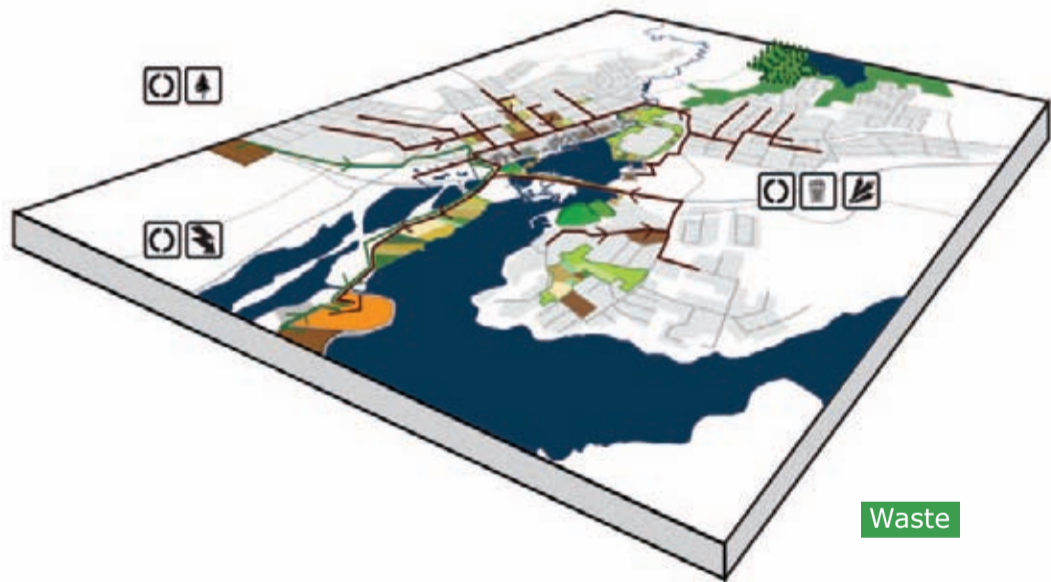
The high concentration of organic substances in blackwater makes it ideal for the production of biogas through fermentation. Through the addition of other sources of biomass to the blackwater, energy can be generated in the form of heat and electricity. The algae farming fields are producing part of this biomass. The algae culture is also producing biofuel. Algae can be produced using wastewater, and are biodegradable and claimed to produce between 10 and 100 times more fuel per unit area than other second-generation biofuel crops. We implement a smart grid energy system in the new Satamalahti development, a system that enables the integration of renewable energy such as solar energy within the building and shift from reliance on fossil fuels, while maintaining a balance between supply and demand by storage technology, demand side management to avoid peak demand and enhanced grid communications systems. This smart grid system connected to the electricity and district heating system, from the power station in Pursiala, which already uses 65% timber-based fuel, will have a large impact on the lowering of the carbon footprint of the development. By implementing a loop around the lake, connected to the city structure and the station, great possibilities for public transport, cycle and pedestrian routes are introduced in the bay area. This will lower the need of transportation by car. Our proposal also shows how energy efficiency can be optimized through the configuration of block structures that relates to the local climatic conditions and current ecological conditions. This both brings energy efficiency and quality microclimates to the design of our public spaces and daily living environments.



Energy

## Waste

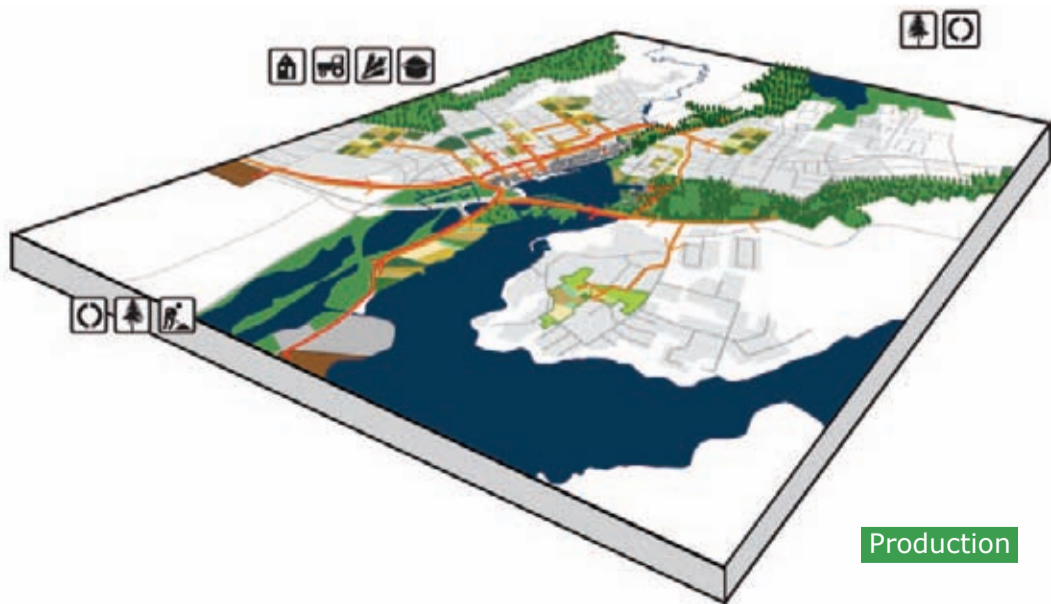
Implementing an effective waste management cycle contributes to the creation of a cleaner and more sustainable Mikkeli. After the treatment of the blackwater, the residual material can then be further utilized to improve the soil quality of the nearby agricultural fields or to create fertilizer for the urban farming fields in Satamalahti. Combustible waste from households and rest products from timber production will be used for district heating. Organic waste from households is separated and locally used as compost for the urban allotments within the courtyards or is being processed into biofuel at the power station in Pursiala. This avoids additional transport costs and CO2 emissions, because of less material being transported to the further located Metsä-Sairila's waste processing plant. Especially in the harbor large amounts of contaminated soil are found. Instead of sending the soil off for cleaning which will result in high CO2 production, we suggest to clean the soil partly by phytoremediation, where plants and trees contain, degrade or eliminate the soil toxicity without the need to excavate the contaminant material and dispose of it elsewhere. This can be coordinated in phased development in the harbor. If this turns out to be impossible, the soil should be transported to a nearby location within the southern eco-machine to be cleaned biologically. The soil that cannot be cleaned in this manner we ship to the site south east of the Graani shopping mall, where the soil is contained safely, turning the area into the Graani Ski Slope and the new drumlin of Mikkeli, a new touristic attraction point in the bay area. Within the built structures of the sub areas, we introduce various ways of how to deal with the aspect of waste on the smaller scale. In sub-area 1, the City at the Lake, we suggest to implement a centralized vacuum waste system, even though the size of the city of Mikkeli might not imply such systems. We think though that the density of the City Lake area could justify such a system.



Waste

## Production

To reach a neutral carbon footprint, not only the production of fossil free energy is a major factor, there is also the need of more localized energy friendly production. The production of food being one of the basic needs garden plots will have to be located as close as possible to the city to keep down the transportation costs and CO2 production. Within the Satamalahti area, we propose different urban farming possibilities. We propose opportunities for households to be able to grow their own crops within their courtyard as well as within the lakeside park and its extension along the branch of the Rokkalanjoki river. The area around the Mikkeliipuista Park and the vicarage at Kenkävero could be further developed as public agricultural and educational food gardens. The other basic need is housing. We want the localized timber production to be the main deliverer of the building materials in the Satamalahti area. The site should be an experimental showcase for Europe on wood construction and innovative Nordic building practices. By creating a flexible built structure and reusing the existing industrial heritage, we also introduce a big variety of possibilities for the local and low scale production of other elements. In each of the sub areas the localized production theme has been implemented to fit the site and the existing ecological conditions. This results in a rich mix of different public and private built and non-built spaces.



Production

# The local implications of the Eco-machine

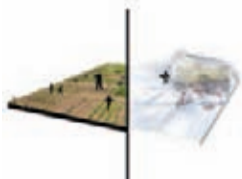
In the following diagrams we show how we implement the Eco-Machine on the local scale and within everyday life. In the built and unbuilt space, in the private and public sphere. Together they form a sustainable toolbox, an Eco-Machine handbook for the future builders and inhabitants. The diagrams are shown in connection to the different sections and elevation, to show where the actual toolbox element can be localized. In the detailed sub-areas the use of these toolbox elements is investigated further.



**Pedestrian Water Edge**  
The Lakefront circuit forms a pedestrian and bikable loop sheltered from the wind by indigenous vegetation.



**Utilize Wood Construction**  
With a wealth of local timber and intensified local planting, wood construction allows exponential sequestration of CO2. Wooden construction is highly recommended.



**Community Gardens**  
Community gardens, activate the middle of our blocks and spread along the eco-machine circuit, they assure informal local food production. Year round production is made possible with greenhouses.



**Noise Protection**  
A planted & built noise shelter keeps the communities insulated from the road's disturbance.



**Water as Energy**  
As the science center fills with visitors for summer events, cooling will be needed. Let's use the lake's cool water to regulate the temperature.



**Heated Bus Shelters**  
Bus shelters along the new bus line are connected to the central heating district to accommodate the commuters of the winter city.



Section 1:2000



**Transport of Food**  
The delivery of good is assured by train at the regional scale, inviting the citizens to pick-up fresh food directly from the market train.



**Urban Stairs**  
Orientated towards south, the terraced urban stairs provide theatrical views of the lake while connect the new lakefront promenade to the city center.



**Civic promenade**  
Pedestrians are prioritized along the lakefront as a variety of recreational and commercial opportunities make the shoreline a destination.



**Productive shore**  
Within the Lakeside Park urban agriculture plots are incorporated to increase local food production and bring the community together.



**Naturalized shoreline**  
Native plants are used along the shoreline to filter stormwater and restore animal habitats.



**Mixed habitat assisting biodiversity**  
Gardens, planted roofs, retention areas, trees and green corridors allow a variety of animals, birds, and butterflies to flourish.



Section 1:2000



**Bird Sanctuary**  
The flying biodiversity is welcomed in an extended and intensified natural milieu.



**Heated Loop**  
Bike & pedestrian paths running above the central heating district system benefit from its heat-loss allowing citizens to use it safely during summer as well as winter.



**Sustainability Reminder**  
Floating in the center of the lake, the playful round structure symbolises the sustainable goal of Mikkeli engaging a lowering of its CO2 emissions. Always part of the lake scene, it acts as a powerful reminder.



**Connected Community Services**  
At the scale of each block, community services such as saunas, laundry, and car sharing through different medias, to accommodate all generations.



**Life-Long Community**  
A variety of unit sizes and layouts are available in each block type to serve the needs of the different generations of Mikkeli.



**Creating microclimates**  
To extend the outdoor season, our climate sensitive urban design suggest to:  
- shelter from the wind  
- maximize the passive solar gain  
- allow direct solar radiation on thermic mass.



Elevation Shoreline 1:2000



**Integrated Waste Processing**  
Waste is separated and managed on the city strip through a vacuum system and accessible pick-up stations.



**The eco-machine rules and scales**  
An environmental code that works toward CO2 neutrality can be calculated and used as the basis for project approval.



**Activated Courtyards**  
A clever mix of outdoor activities encourages shaded intergenerational experiences and the feeling of community.



**Utilise Prefab Straw Panels**  
Sequestering CO2, small courtyard buildings are insulated with locally grown straw bails.



**Touch the Water**  
At key points along the civic promenade, residents are allowed to touch the water and launch their next adventure.

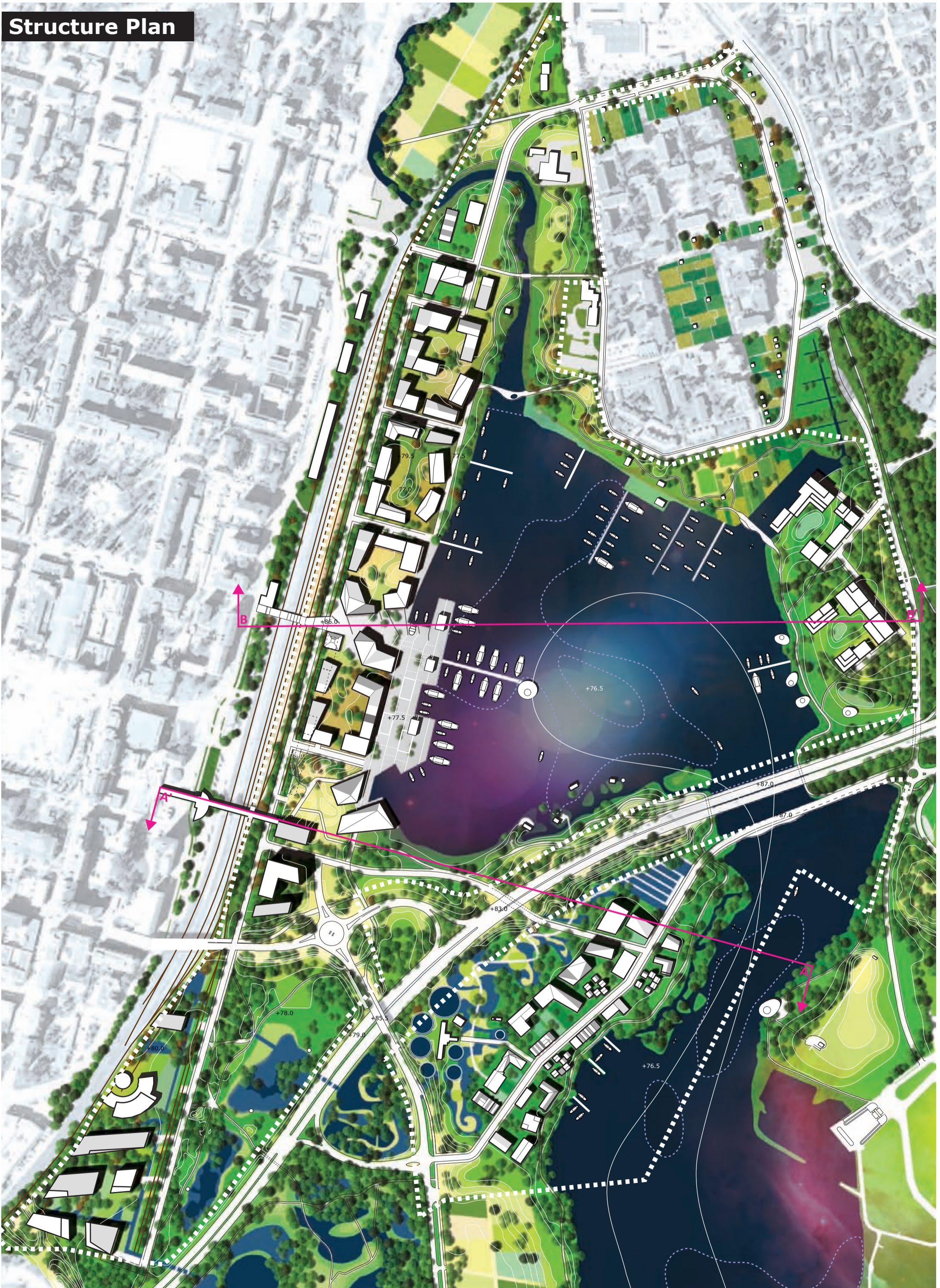


**Street trees (evergreen)**  
A balanced mix of tree species assure a colorful landscape for all seasons.



Elevation City side 1:2000

# Structure Plan



# The organisation of the plan



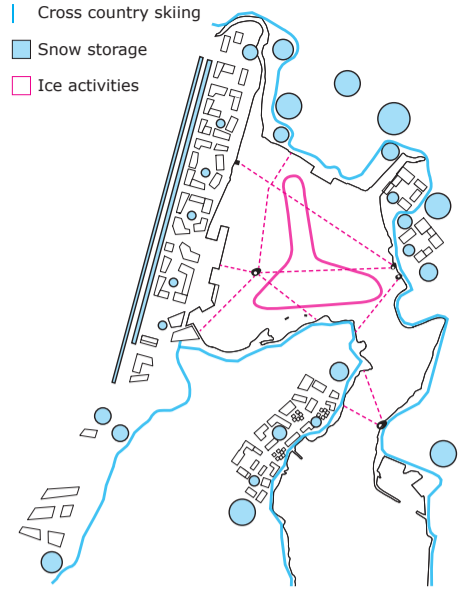
**Car Free Lakefront**  
Diagram showing bike routes and pedestrian space with a focus on the lake loop



**Green Structure + Stormwater**  
Map showing permeable surfaces and the concepts of stormwater management



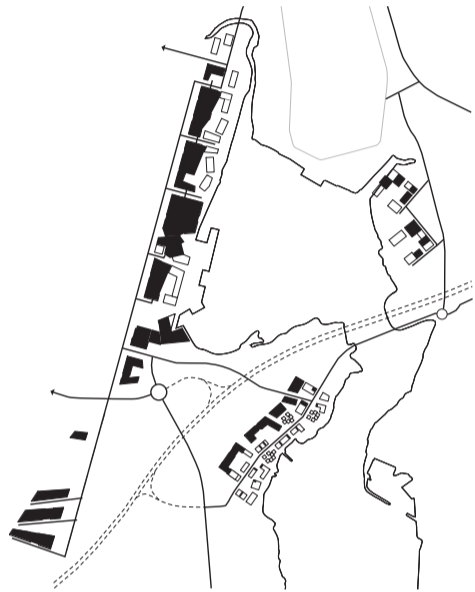
**Plus Landscape**  
A carbon positive green structure. Emphasis on aspects of the landscape community gardens, carbon sequestration & other sustainable aspects.



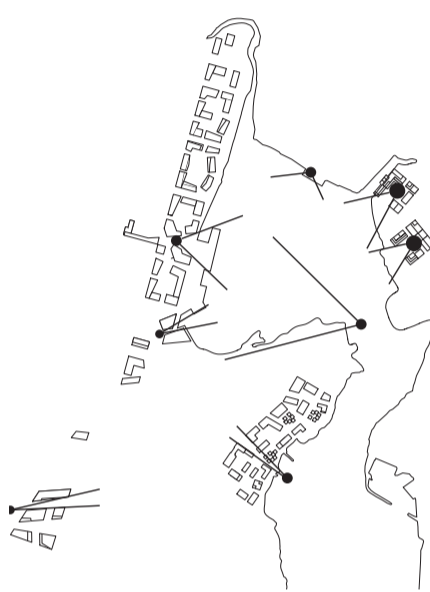
**Winter Landscape & Snow Management**  
A diagram showing winter activities, the cultural landscape & the sustainable snow management strategy.



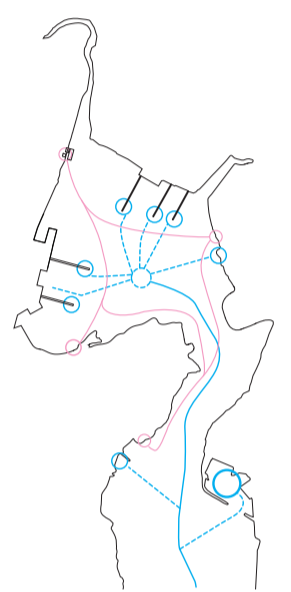
**Building footprint and Public Transport**



**Street Network + Parking**  
Map showing street organization and the main connections and parking within the area.



**Important views**  
Visual connections from inside the courtyards and longer views across the landscape.



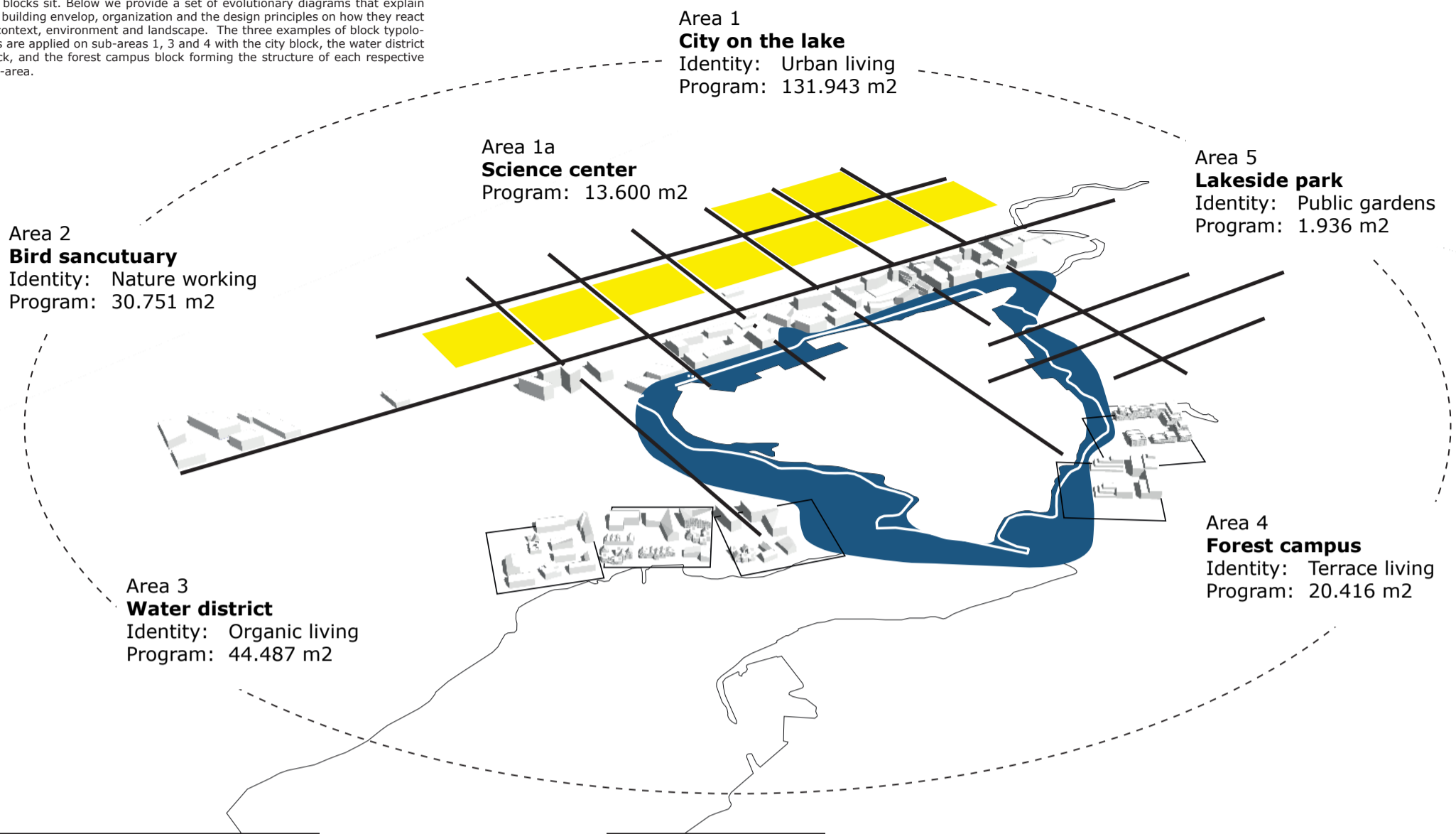
**Waterways**  
Docking matrix connecting developments on all sides of the water.



Bird's eye perspective of the area and the surrounding landscape

# Design principles

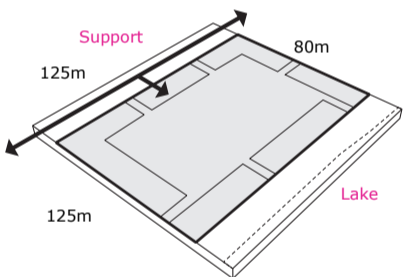
The common ground of the Eco-Machine and urban design principles results in a resilient family of block types. These block types are evolved from the 125m x 125m grid of Mikkel's center and the site conditions in which each of the blocks sit. Below we provide a set of evolutionary diagrams that explain the building envelop, organization and the design principles on how they react to context, environment and landscape. The three examples of block typologies are applied on sub-areas 1, 3 and 4 with the city block, the water district block, and the forest campus block forming the structure of each respective sub-area.



## Basic typologies:

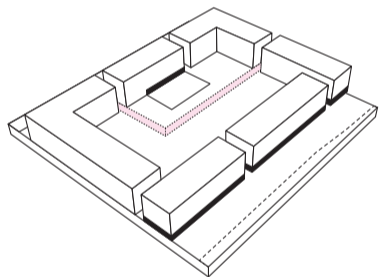
## Adapts to:

### Envelop



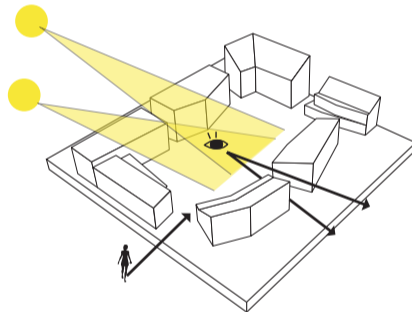
The city block provides a development zone of 80m x 125m. The organization of the block respects the lake and provides space for a civic promenade along the lake and organizes the supporting services of street access, stormwater management and noise reduction along the railway.

### Organisation



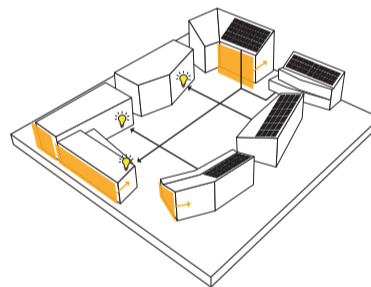
The lakefront provides commercial opportunities for restaurants & boutiques on the ground floor. A potential kindergarden or small office space utilizes the green courtyard. Parking is accessed from the street and solved with half sunken garage incorporated into the building.

### Context (receiving)



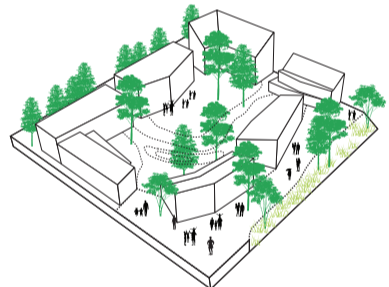
The basic block structure shifts to optimize views to the lake, natural light, and the pedestrian environment. Building are positioned to increase solar gain and create quality microclimates to maximize the potential of the courtyard.

### Environment (giving)

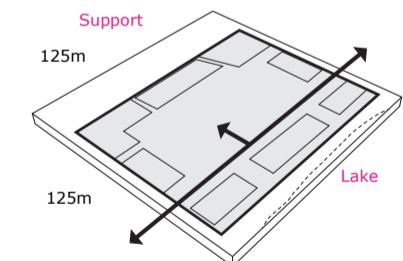


The adapted block provides opportunities for solar panels to be integrated into the roofscape. South facing facades allow for increased energy efficiency through the use of passive house principles such as heavy walls for thermic mass and second skins.

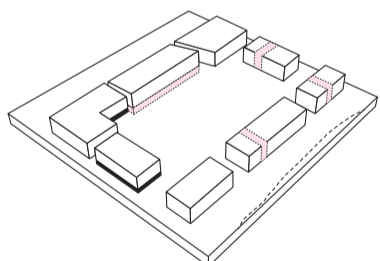
### Landscape (keeping)



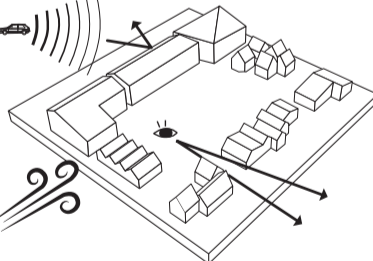
The city block incorporates the landscape to bring green living to the new residents. Stormwater to be kept on site and the courtyard has opportunities for gardens and kids play areas. Most importantly, the block structure keeps the waterfront public to all.



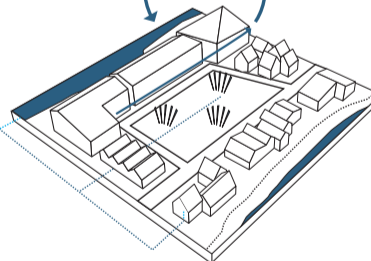
The water district block is surrounded by landscape on all four sides. A natural lake front provides orientation and water treatment wetlands make water the identity of this new area of the city. Access is provided to the block through bisecting neighborhood street.



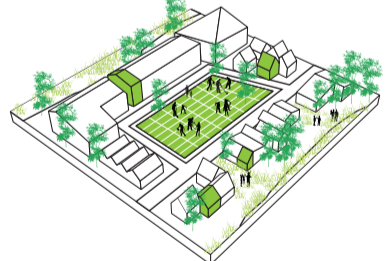
Surrounded by landscape, the buildings aim to bring qualities to both sides of the built environment. Looking out everyone should be able to see water. Looking in everyone a strong sense of community should be built around the central garden space.



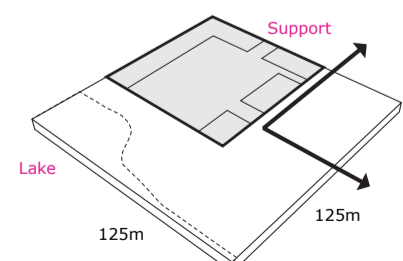
The basic block structure is organized to block the highway noise, protect against the southern winter winds and provide views to the lake. To block noise, 4-5 story apartment buildings provide a protective barrier while smaller, more varied building are organized to create microclimates and maximize views.



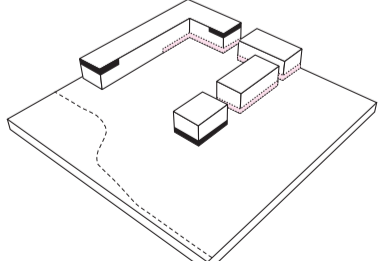
Adjacent to the cleansing wetlands, the water district strives to locally clean and reutilizes its own greywater through natural cleaning processes & the existing water treatment plant. With emphasis on water the new neighborhood has an aim to reduce usage and improve water purity.



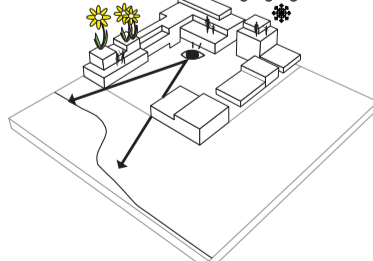
The open courtyard brings people together through the act of local food production. And residents are given the opportunity to grow food year round through the incorporation of green houses into the structure. Surrounding the block, the lakeside paths and wetland park provide recreational opportunities for all ages.



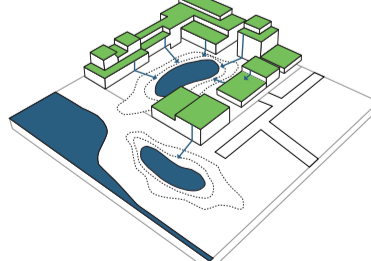
The footprint of the campus block is minimized to limit the impact of development on the existing landscape. The blocks are orientated around the lake and roads are organized to provide access in an efficient manner.



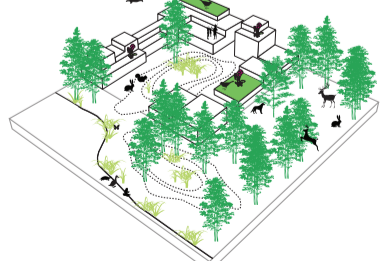
The U shaped courtyard maximizes views to the lake and allows the landscape and built environment to merge into one. Possibilities for a small restaurant, live / work flats and an assisted living center created. Parking is organized on the ground floor and accessed from the local street.



The building are organized to integrated stormwater management, terraced gardens, and views to the lake. Buildings terraces are designed to maximize stormwater holding capacity, growing space, and balcony views.



The landscape and buildings are designed to merge in the Forest Campus. Buildings are characterized by green roofs while the landscape is designed to hold and purify stormwater.



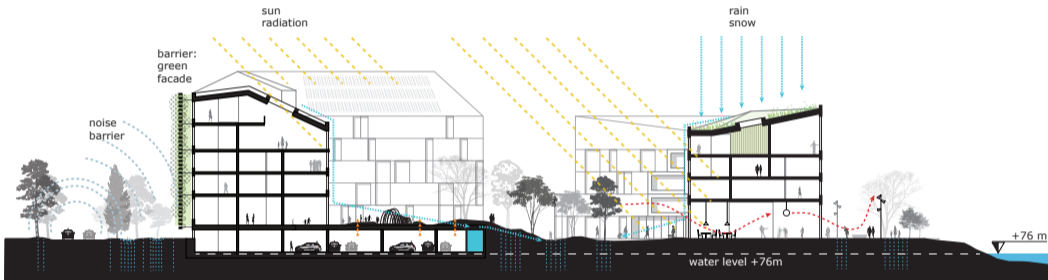
The block & the surrounding forest collectively add biodiversity to Mikkel. The green roofs host a variety of plant species that provide butterfly, hummingbird, and song bird habitat. And the diversified forest and native plants along the shoreline attract of variety of fauna.

# City on the lake

The City blocks contain the most intense and mixed program of the Satamalahti development. All blocks consist of a wide mix of program, including apartments, office space, services, restaurants, bars and larger and smaller shops. Parking is solved in half sunken parking garages, staying above groundwater level. The positioning of these garages mainly on the west side of the blocks leave way for water infiltration and tree planting in the sunny east side of the courtyards. Within the block structure, the existing warehouses (shown with dotted lines) could be kept and incorporated into our proposed structure.



Image shows the winter wonderland in the courtyard.



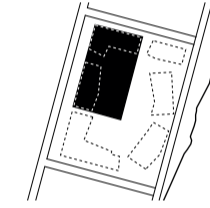
Section 1:500



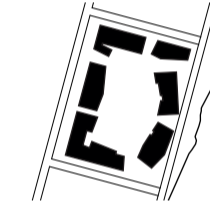
Plan 1:500

## Layers

**-1.5m Parking**

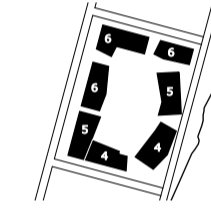


**Footprint**

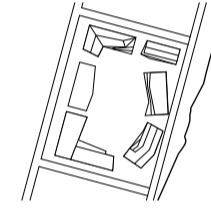


Parking is positioned in the corner to maximize areas with deep soil for trees in the courtyard. The half sunken garage is a flexible solution that can be extended. The footprint forms a clear block structure with openings to the surrounding streets and the lake.

**Building heights**



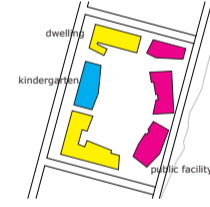
**Roofscape**



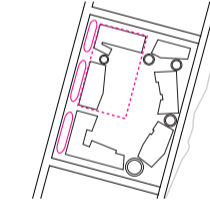
The buildings are lower on the south side and taller on the north side of the block. The different height levels within one building together with a changing roofscape create good conditions for comfortable micro climates. This clear structure maximizes sun and limits strong winds.

## Life

**Hot Spots**



**Bike + community car**



The mix of functions in the city block creates a place where residents and visitors meet. People of different ages meet in the gardens, at the day care or in the bar on the lake promenade side. Places for bikes are well positioned by the entrances of the block. The car sharing is situated in the garage and along the surrounding streets serves the community.

**Green summer**



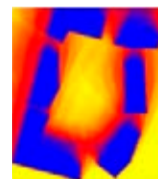
**Snow landscape**



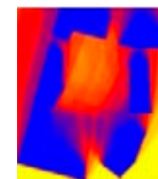
In the summer the courtyard is flourishing in all colors. Balconies and higher terraces become extensions of the courtyard landscape. In the winter the topography of the landscape creates exciting places to play in. As part of the city's snow management strategy, snow is stored in the wide green areas along the street, creating extra shelter from the wind.

## DSR

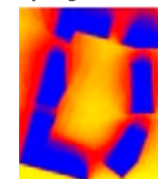
**Autumn**



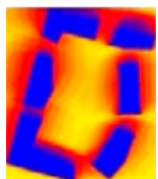
**Winter**



**Spring**



**Summer**

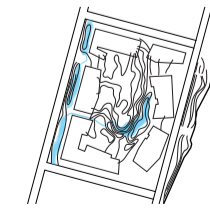


The configuration of the block and the variation of building heights generate a pleasant courtyard microclimate. The studies of the block show the sun radiation and the albedo of the facades. In the most critical time of the year the block structure shows a good radiation level in the courtyard and lower parts of the buildings.

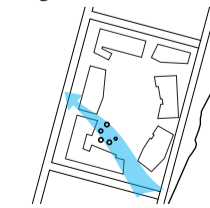
The radiation in the spring and summer shows how the courtyard and lower part of the buildings receive a high level of direct solar radiations (DSR). The trustworthy radiation in the central space creates good conditions for small gardens, vegetation and filtration in stormwater detention areas.

## Land

**Storm water**

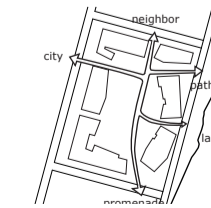


**Organic waste**

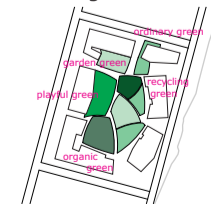


Rain water from the buildings is collected underground and reused for sanitarian functions in the block. The open air rain water is collected along the street, as part of larger system and a retention area is located in the southern part of the courtyard. Next to it containers for organic waste is strategically placed. The wind blows throughout the openings of the block cleaning the air.

**Movement**



**Gardening**

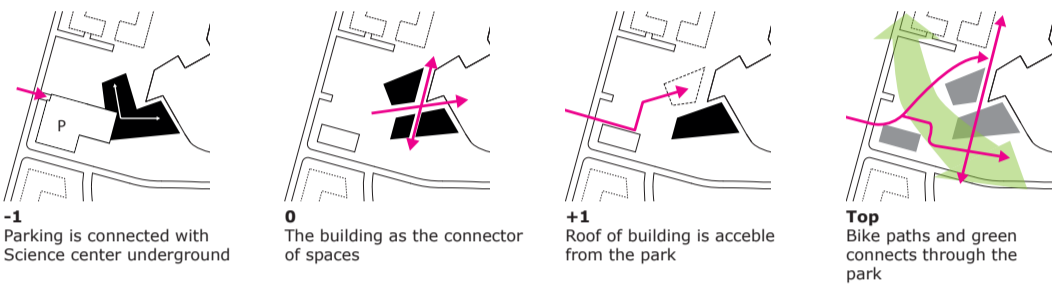


The city block communicates with the neighborhood. Public program on ground floor, openings between the buildings and inviting spaces generates a transparent block. The excitement of the flourishing landscape is being shared between the local residents and strollers on the lakeside promenade.

# Science center

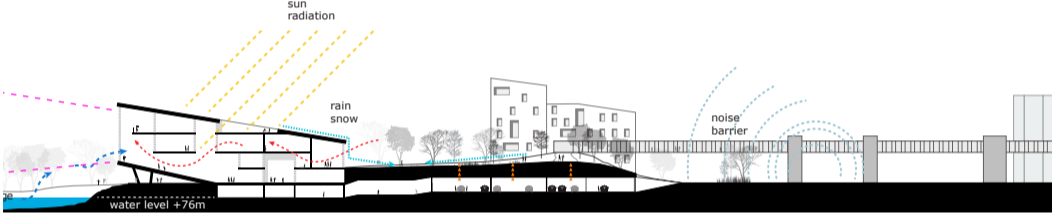


Image shows the science center and the park between the buildings

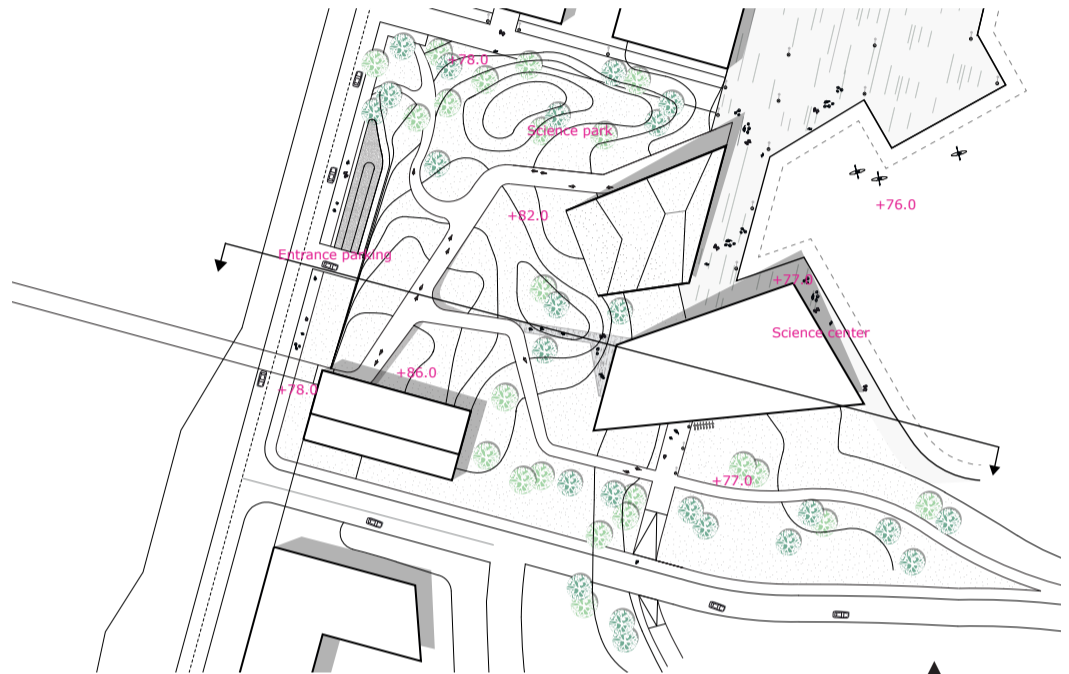


Integrated into the landscape and positioned on the lake, Mikkeli's Science Center is part landscape, part building. The buildings are part of the surrounding park that creates a strong connection point allowing cyclists to fluidly cross the train tracks and ride along the lakefront. Visitors to the Science Center can enjoy views of the lake, fun educational

opportunities for kids or the evening sun on the restaurants terrace. The Science Center plays a big part in the research and development of the system, and the effect of the many Eco-Machine toolbox elements will be shown in the Science Center. In this way, the Science Center will function both as Expo, Info and Coordination Center.



Section 1:1000

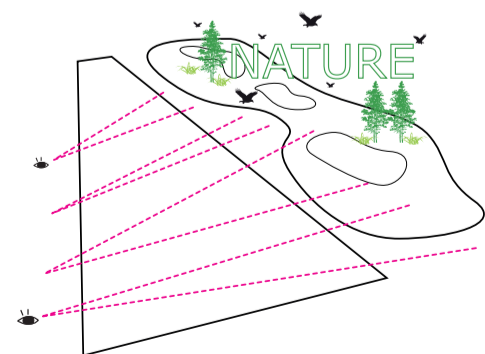


# Bird sanctuary



Image shows the boardwalk in the bird sanctuary

In the direct vicinity of the Veturitallit's wetland, the Bird Sanctuary, four new linear office blocks are immersed in nature. They are positioned to provide views to the wetland and keep a respectable distance to the bird habitat. Rain water is handled through an open system that cleans, collects, and mitigates any additional runoff to keep the bird sanctuary in pristine conditions. The Bird Sanctuary has several boardwalks inserted carefully to minimize ecological disturbances and allow for bird watching. The office blocks hover on the landscape and are positioned on half sunken parking garages that stay above the ground water level. Ground level studio possibilities are combined with larger office spaces on the upper floors. The round heritage building on the site is reused as a service and Bird Sanctuary info building.



**Create views**  
By securing important view lines visual connections are established from the train tracks to the bird sanctuary.

Small interventions in the facade of the buildings invites the bats.

Homes for various species of birds as part of the building facade.



**Merge landscapes**  
The openings between the buildings allow the landscape to come into the built environment. The landscape corridors strengthen the biodiversity and habitat for the birds, bats and insects in the area.



**Enriching the systems**  
Storm water is filtrated on site. In wet seasons a system of carefully design lower areas lead water into the bird sanctuary. To ensure the quality of the water in the bird sanctuary a separate system leads grey water to the city's water system network. A network of paths allows people to enter the area and visit the bird watching towers.





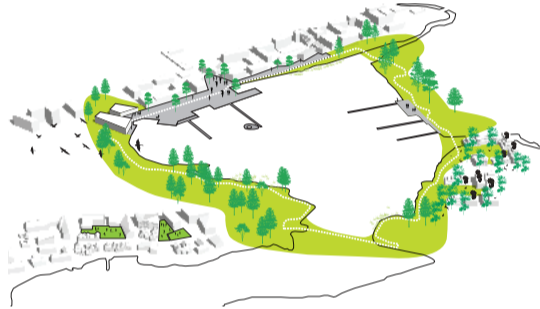


# Lakeside park



Image shows the life on the ice, seen from the lake balcony

The Lakeside Park gives the Saksala housing area an enhanced front on the Savilahti bay. At the same time, it provides the whole Satamalahti development with a public park that contains sport facilities, dock and boat access, and community food gardens. More easily accessed with two new bridges, the park's orientation blesses it with year round sun and the park is designed to allow Mikkeli's residents to recharge their batteries on the sun balconies. From the various balconies, visitors have differing views of the new development of the lakefront and the landscape helps clean water before it



The connection around Savilahti

enters Savilahti Bay. During the winter festival, the park is filled with snow sculptures and throughout the winter ice skating is featured as the winter qualities of the stately trees shows through. The diverse shoreline of Savilahti Bay is tied together through a sequence of public spaces that makes the lakefront accessible to all of Mikkeli's residents. The loop is designed to provide identities to adjacent neighborhoods and integrate the built environment into the existing ecological conditions of the lake. The spine of the Lakefront loop is a bike and pedestrian path that connects the 5 characters

of Satamalahti. With efficient connections to the proposed development the lakefront allows future residents to efficiently bike to work or enjoy an evening stroll amongst nature with their loved ones. It is in this diversity that the Lakefront Loop gets its power. Tomorrow people will come to enjoy the Civic Promenade, Science Park and Urban Stairs in the City on the Lake district while future residents will enjoy the year round qualities of the Lakeside park, the pure water coming from the Wetland Ponds, and the home grown tomatoes of their terraced gardens.

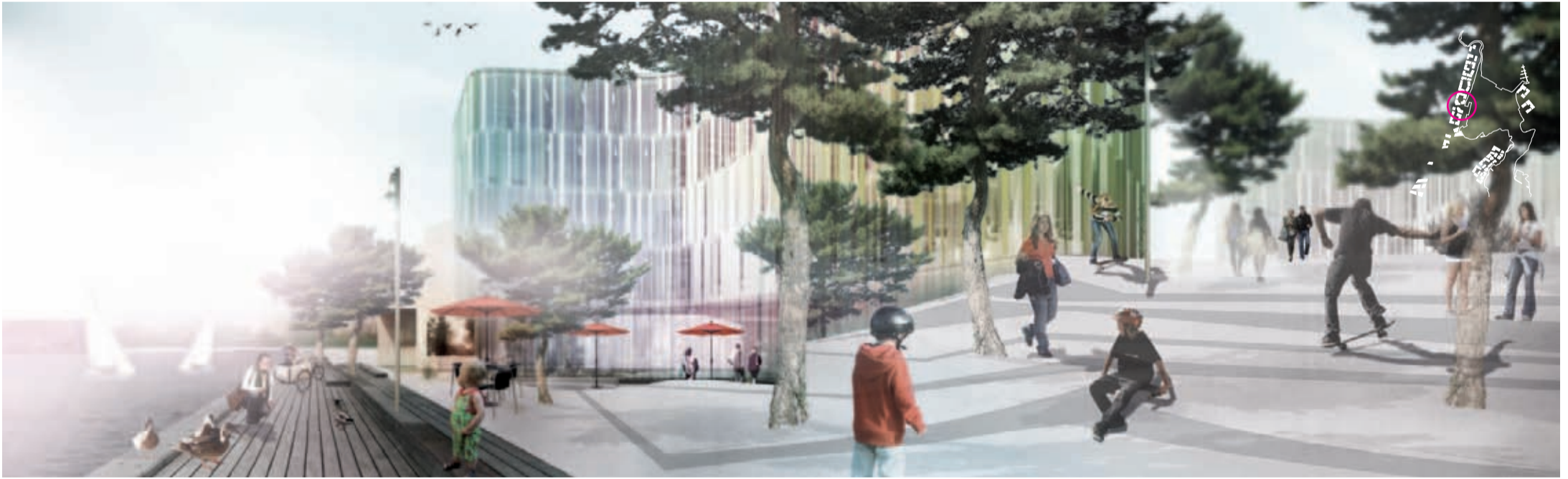
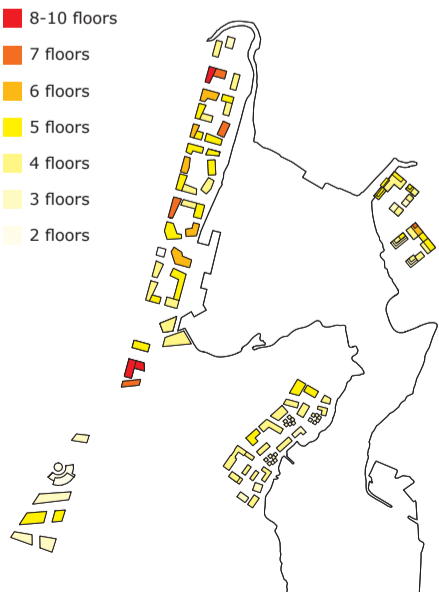
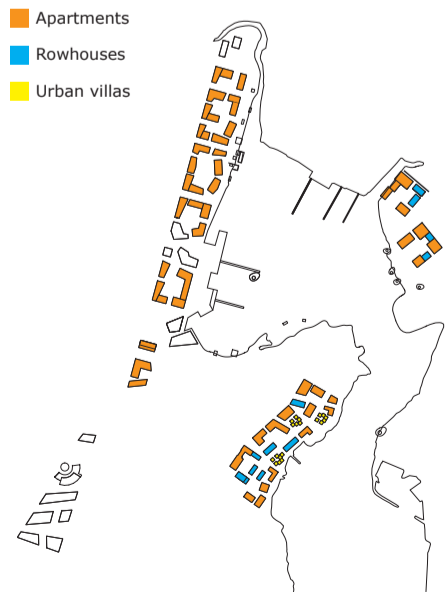


Image shows the urban stairs connecting the city on the lake and Mikkeli center.



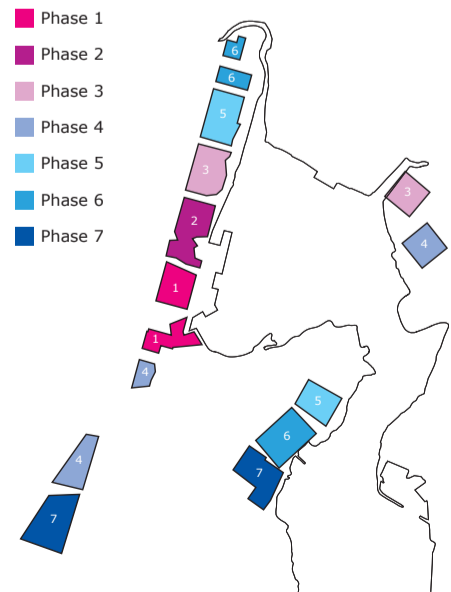
Building Heights



Program (living typologies)



Program (Commercial + service and business)



Phasing  
Yearly development of 6-8000m2 divided in seven phases. The proposed total is 243133 m2.

**AMOUNT OF BUILDING RIGHTS  
M2 FLOOR AREA**

**TOTAL AMOUNT M2 ALL FLOORS**

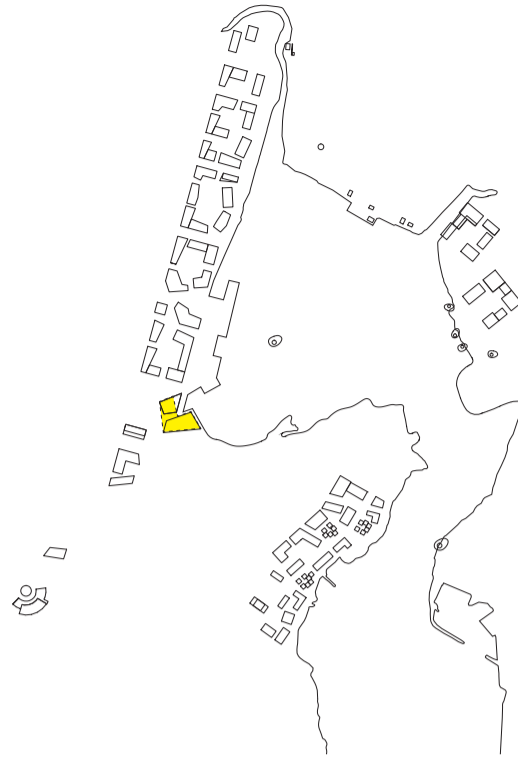
- Residential (Red): 145,907 M<sup>2</sup>
- Services (Yellow): 35,235 M<sup>2</sup>
- Business (Blue): 61, 991 M<sup>2</sup>
  
- Total: 243,133 M<sup>2</sup>

**LEVEL -1**

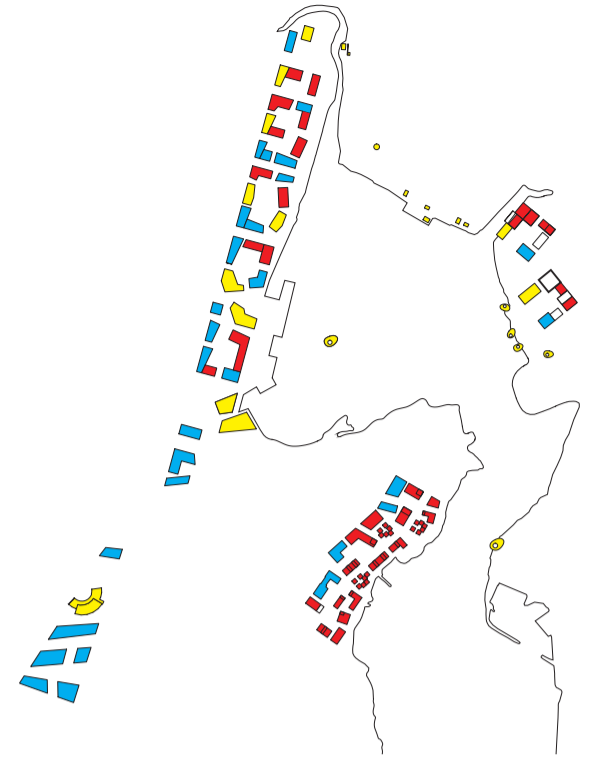
- Residential: 0 M<sup>2</sup>
- Services: 2,929 M<sup>2</sup>
- Business: 0 M<sup>2</sup>

**GROUND FLOOR**

- Residential: 17,080 M<sup>2</sup>
- Services: 13,102 M<sup>2</sup>
- Business: 21,825 M<sup>2</sup>



**LEVEL -1**



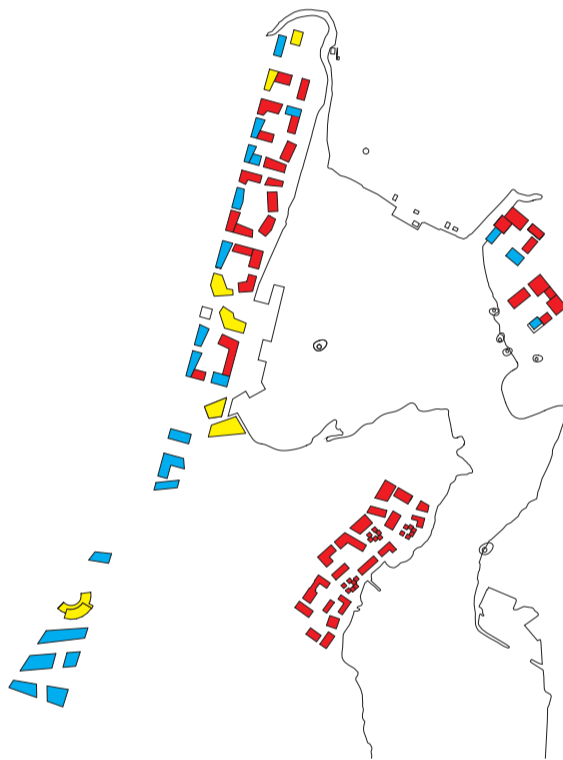
**GROUND FLOOR**

**1ST FLOOR**

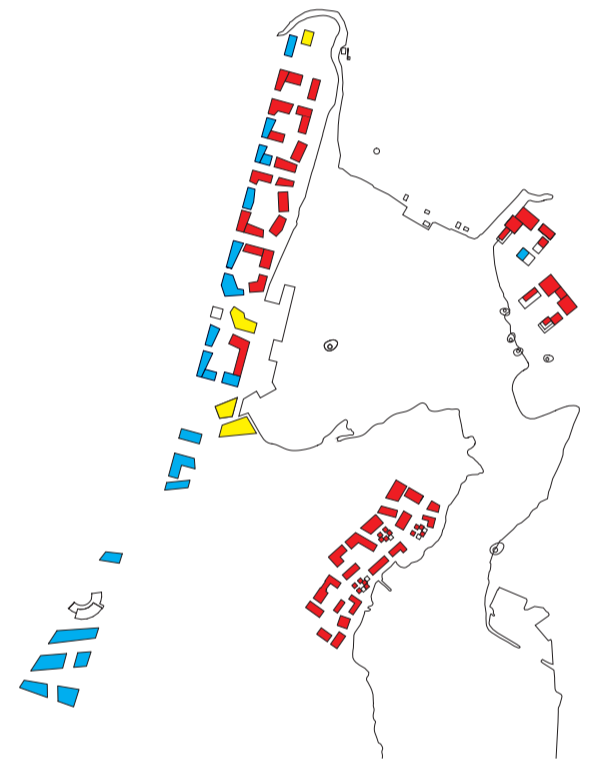
- Residential: 28,936 M<sup>2</sup>
- Services: 8,022 M<sup>2</sup>
- Business: 16,750 M<sup>2</sup>

**2ND FLOOR**

- Residential: 29,205 M<sup>2</sup>
- Services: 4,503 M<sup>2</sup>
- Business: 16,805 M<sup>2</sup>



**1ST FLOOR**



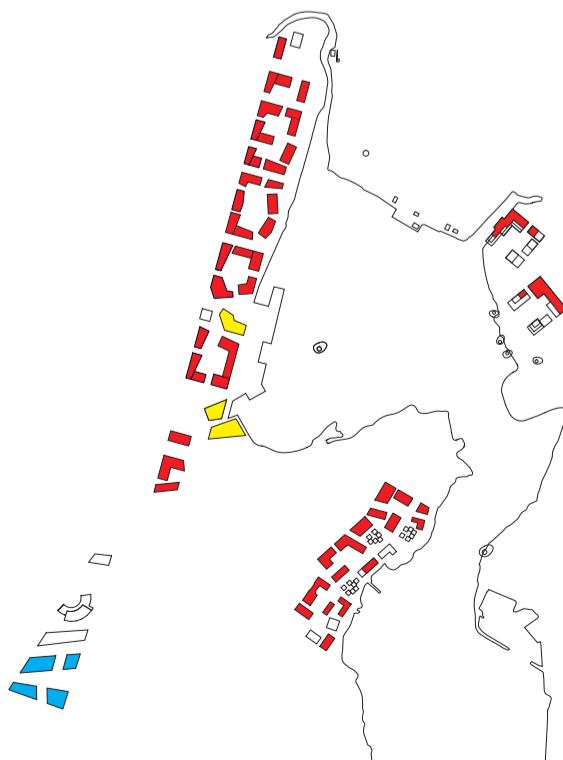
**2ND FLOOR**

**3RD FLOOR**

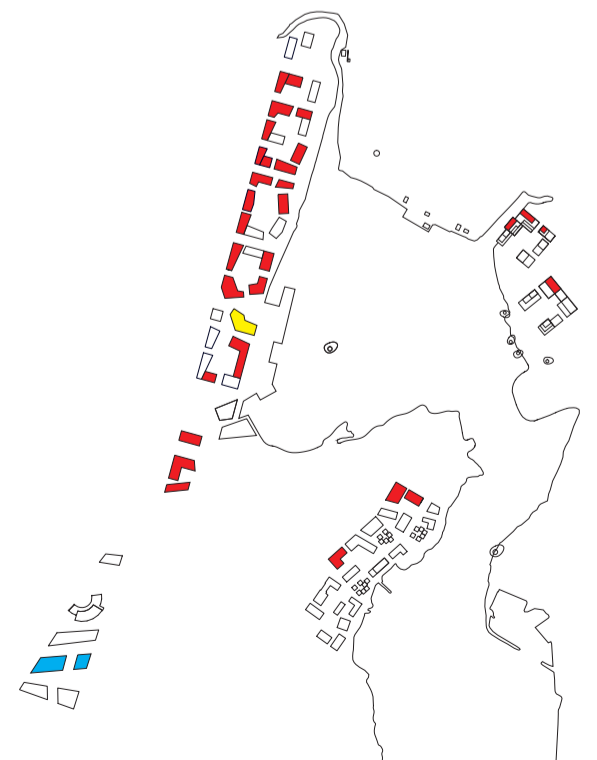
- Residential: 34,665 M<sup>2</sup>
- Services: 4,005 M<sup>2</sup>
- Business: 4,399 M<sup>2</sup>

**4TH FLOOR**

- Residential: 19,661 M<sup>2</sup>
- Services: 1,337 M<sup>2</sup>
- Business: 2,212 M<sup>2</sup>



**3RD FLOOR**



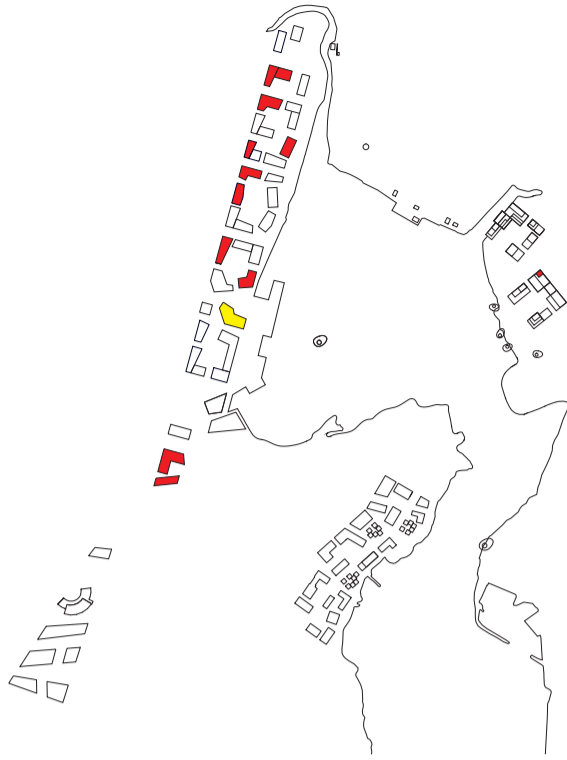
**4TH FLOOR**

**5TH FLOOR**

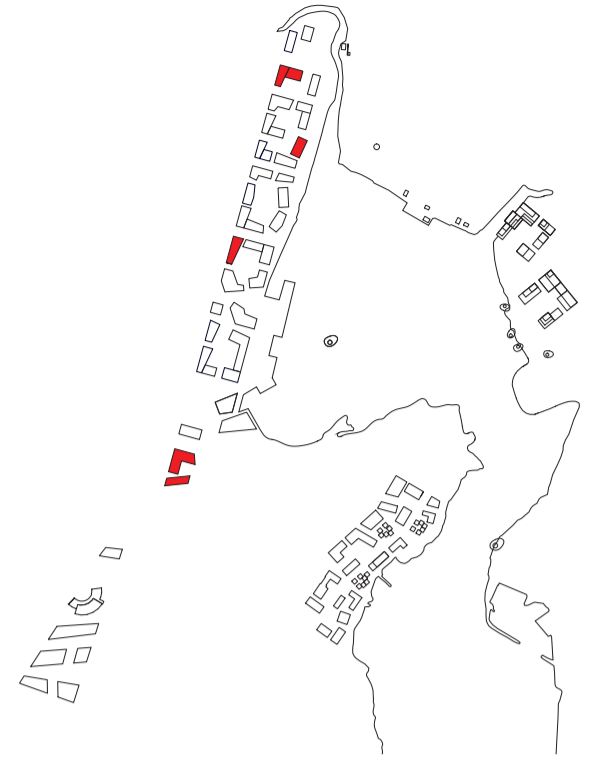
- Residential: 8,181 M<sup>2</sup>
- Services: 1,337 M<sup>2</sup>
- Business: 0 M<sup>2</sup>

**6TH FLOOR**

- Residential: 4,565 M<sup>2</sup>
- Services: 0 M<sup>2</sup>
- Business: 0 M<sup>2</sup>



**5TH FLOOR**



**6TH FLOOR**

**7TH FLOOR**

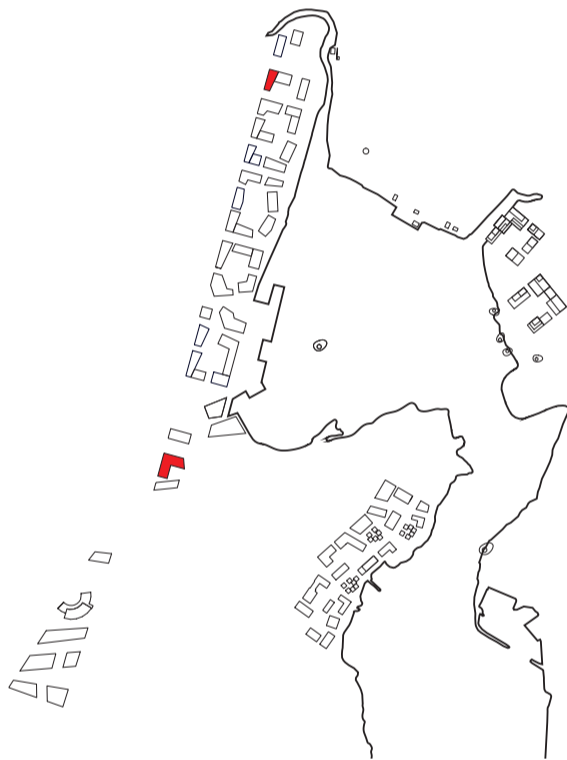
- Residential: 1,873 M<sup>2</sup>
- Services: 0 M<sup>2</sup>
- Business: 0 M<sup>2</sup>

**8TH FLOOR**

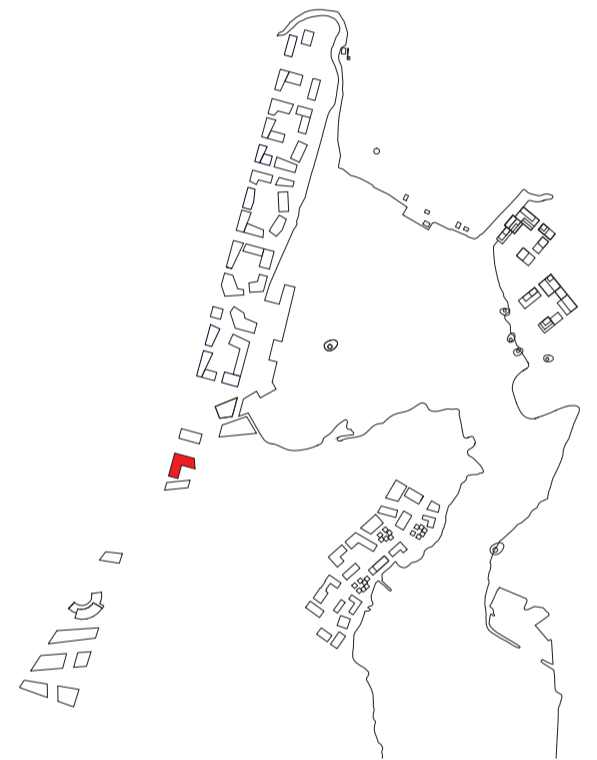
- Residential: 1,292 M<sup>2</sup>
- Services: 0 M<sup>2</sup>
- Business: 0 M<sup>2</sup>

**9TH FLOOR**

- Residential: 449 M<sup>2</sup>
- Services: 0 M<sup>2</sup>
- Business: 0 M<sup>2</sup>



**7TH FLOOR**



**8TH FLOOR**

**TOTAL AMOUNT M2 PER SUB AREA**

**SUB AREA 1**

- Residential: 88,024 M<sup>2</sup>
- Services: 28,495 M<sup>2</sup>
- Business: 29,024 M<sup>2</sup>

- Total: 145,453

**SUB AREA 2**

- Residential: 0 M<sup>2</sup>
- Services: 3,554 M<sup>2</sup>
- Business: 27,197 M<sup>2</sup>

- Total: 30,751

**SUB AREA 3**

- Residential: 41,467 M<sup>2</sup>
- Services: 0 M<sup>2</sup>
- Business: 3,020 M<sup>2</sup>

- Total: 44,487

**SUB AREA 4**

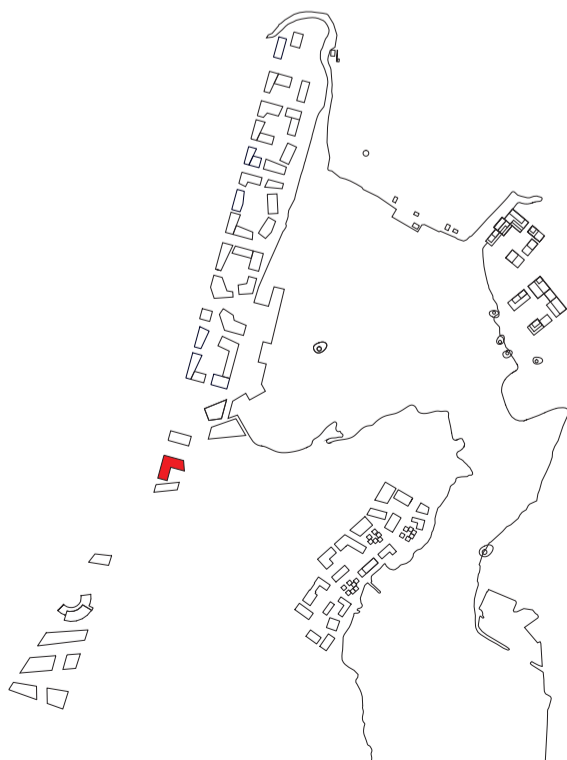
- Residential: 16,416 M<sup>2</sup>
- Services: 1,250 M<sup>2</sup>
- Business: 2,750 M<sup>2</sup>

- Total: 20,416

**EXTRA COMPETITION AREA**

- Residential: 0 M<sup>2</sup>
- Services: 1,936 M<sup>2</sup>
- Business: 0 M<sup>2</sup>

- Total: 1,936



**9TH FLOOR**

**GREEN AREAS AND PARKS**

- SUB AREA 1: 43,787 M<sup>2</sup>
- SUB AREA 2: 86,162 M<sup>2</sup>
- SUB AREA 3: 29,952 M<sup>2</sup>
- SUB AREA 4: 27,366 M<sup>2</sup>
- OTHER AREA: 33,137 M<sup>2</sup>

**TOTAL AREA: 219,906 M<sup>2</sup>**

**BOATS**

- SUB AREA 1: 423 M DOCK
- SUB AREA 2: 0 M
- SUB AREA 3: 166 M DOCK
- SUB AREA 4: 90 M DOCK
- OTHER AREA: 652 M DOCK

**TOTAL LENGTH: 1331 M DOCK**  
**# OF BOATS: 350**

**AREA DENSITY**

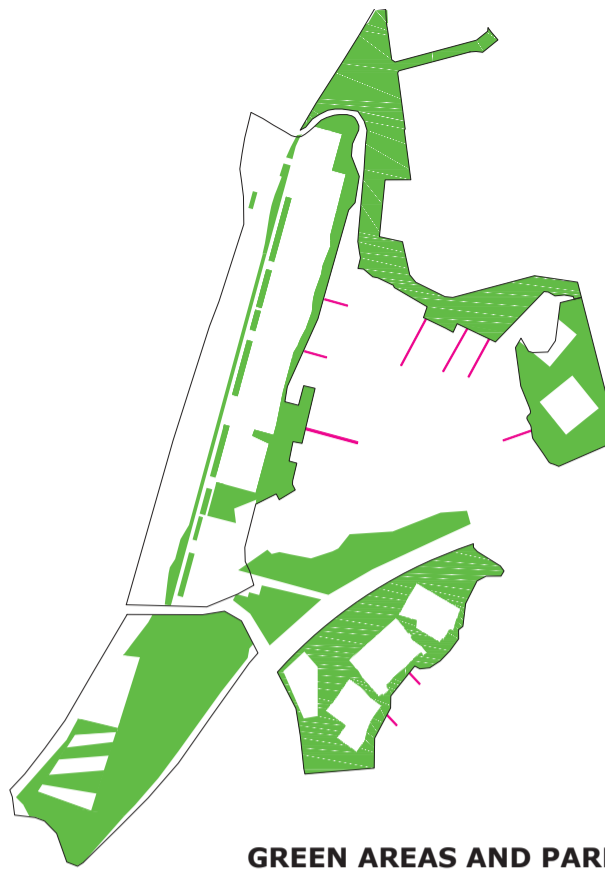
The area density is measured by dividing the gross floor area with the total m<sup>2</sup> of the sub area: FSI = m<sup>2</sup>/m<sup>2</sup>

- SUB AREA 1: 0,76
- SUB AREA 2: 0,28
- SUB AREA 3: 0,54
- SUB AREA 4: 0,56
- OTHER AREA: 0,03

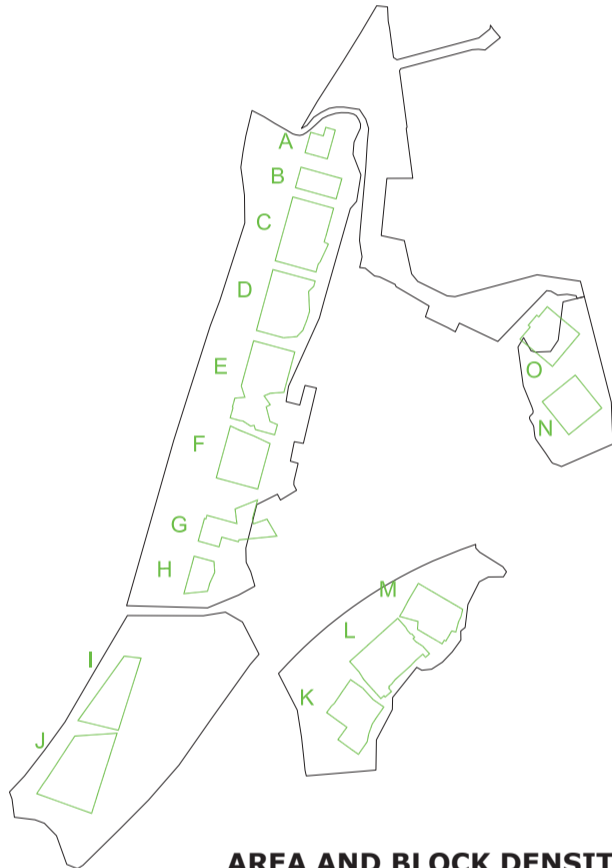
**BLOCK DENSITY + PARKING**

The block density is measured by dividing the gross floor area with the total m<sup>2</sup> of the block area (not including streets): FSI = m<sup>2</sup>/m<sup>2</sup>

	DENSITY	P- SPACES
- A:	1,89	0
- B:	3,46	58
- C:	2,67	259
- D:	2,28	248
- E:	2,61	517
- F:	2,22	196
- G:	2,84	148
- H:	5,91	138
- I:	0,71	0
- J:	1,96	367
- K:	1,61	103
- L:	1,66	152
- M:	2,03	152
- N:	1,57	81
- O:	1,59	91



**GREEN AREAS AND PARKS**



**AREA AND BLOCK DENSITY**



**PARKING PER PROPERTY/AREA**

**PRIVATE PARKING**

Most parking within the different properties is solved with half sunken parking garages. In subareas 3 and 4 part of parking is solved on ground level within the built structures. This way the garage can still be above groundwater levels and be naturally ventilated.

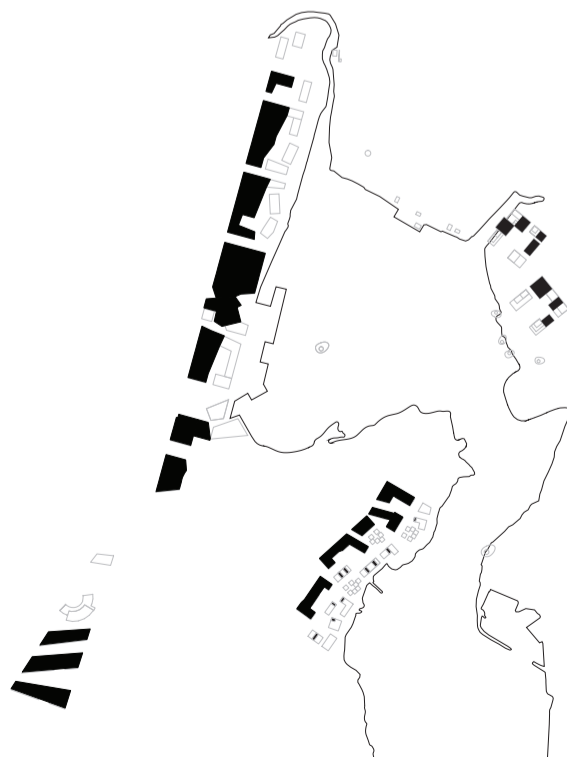
- SUB AREA 1: 1564
  - SUB AREA 2: 367
  - SUB AREA 3: 407
  - SUB AREA 4: 171
  - OTHER AREA: 0
- TOTAL PRIVATE PARKING: 2509

**PUBLIC PARKING**

Public parking is situated mainly on the street, though part of the public parking could take place in private parking garages as well.

- SUB AREA 1: 180
  - SUB AREA 2: 33
  - SUB AREA 3: 104
  - SUB AREA 4: 78
  - OTHER AREA: 0
- TOTAL PUBLIC PARKING: 395

**TOTAL PARKING: 2904**



**PRIVATE PARKING**



**PUBLIC PARKING**

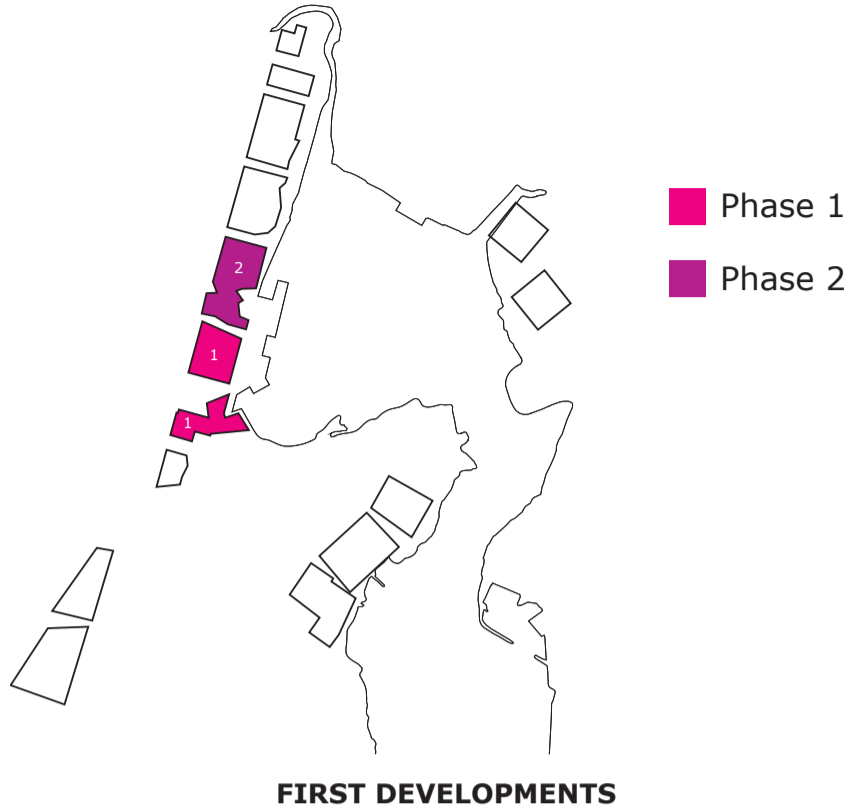
**PHASING**

Resilient Mikkeli is proposed to be spread out over 7 phases that recognize the annual development rate of 6,000 to 8,000 m2. Phases are set for 3 to 5 year periods with an overall development period between 20 and 30 years.

**THE FIRST DEVELOPMENTS**

The Science Center and surrounding lakefront development begins to establish Mikkeli's new presence on the water. A mix of commercial, residential and services activate the public life and provide early opportunities for synergetic development. Areas of contaminated soil are treated through phytoremediation and temporary activities begin to activate undeveloped or underdeveloped portions of the shoreline.

- PHASE 1 34,659 M<sup>2</sup>
- PHASE 2 30,111 M<sup>2</sup>

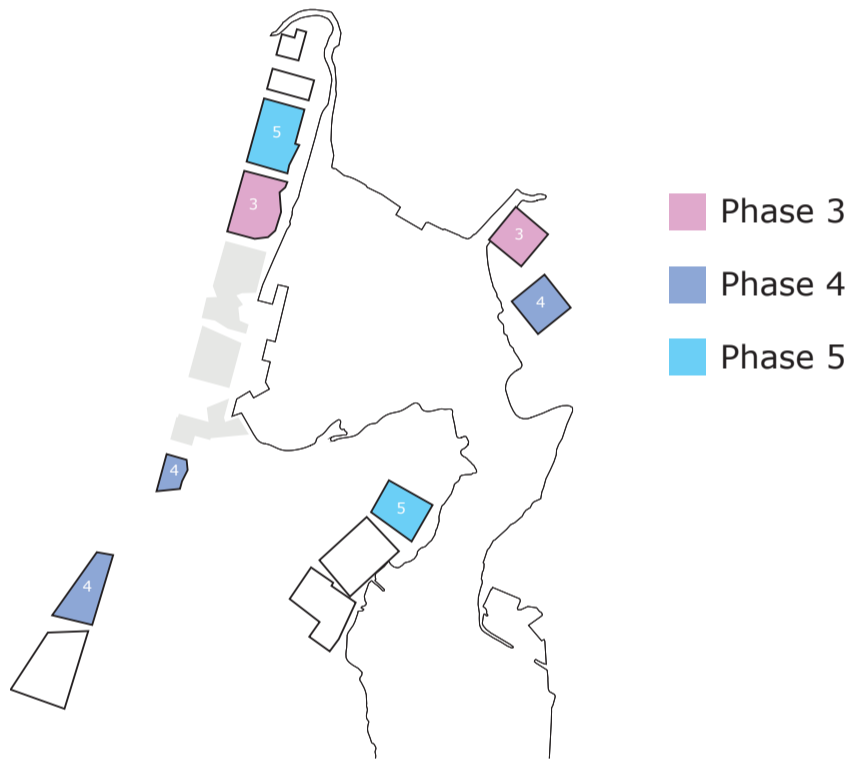


**FIRST DEVELOPMENTS**

**AN EVOLVING LAKEFRONT**

With the Science Center established life around the bay has taken on a prominent image in the city. The sustainable infrastructure & energy efficient block structure is paying dividends for residents. The civic promenade and community garden plots have become integral parts of living by the bay. The Forest Campus has been developed with strict construction practices that has limited soil compaction and effects on the landscape. This has helped produce a neighborhood that has added biodiversity to the animal life around the lakefront.

- PHASE 3 32,512 M<sup>2</sup>
- PHASE 4 32,029 M<sup>2</sup>
- PHASE 5 41,987 M<sup>2</sup>

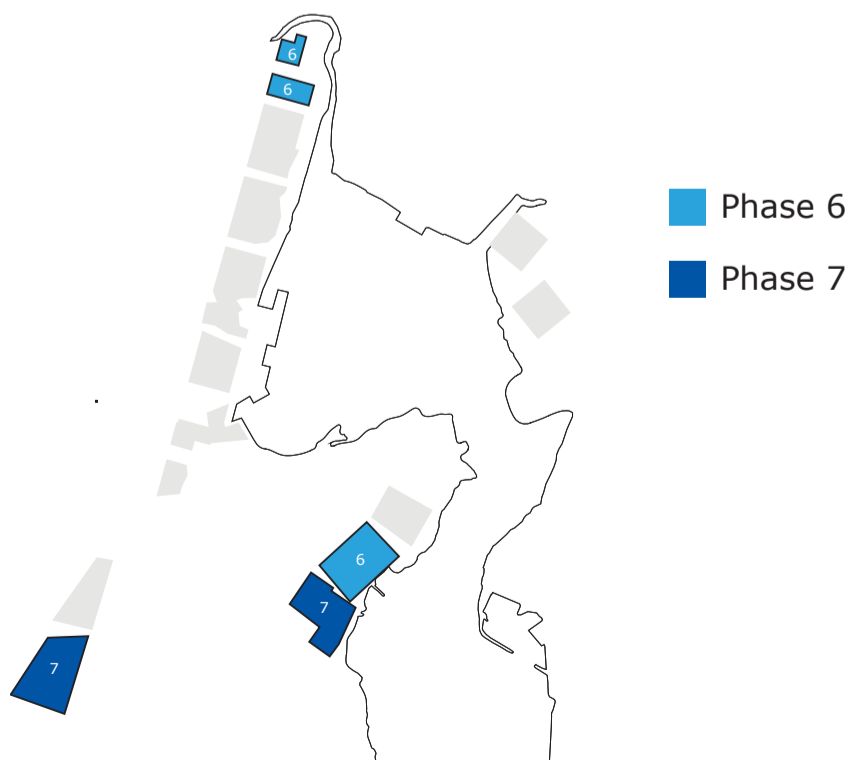


**AN EVOLVING LAKEFRONT**

**SUPPORTING ADDITIONS**

The final phases of bringing new office space and residents to Mikkeli. A variety of projects and unit types are built to add diversity to the living conditions around the lake. The waste water plant has been reduced to minimal sized and is now fitted neatly into an ecological water treatment park. The public loop is now complete and allows all Mikkeli residents access to their beautiful and ecologically performative waterfront.

- PHASE 6 32,411 M<sup>2</sup>
- PHASE 7 37,497 M<sup>2</sup>



**SUPPORTING ADDITIONS**

## PUBLIC FACILITIES

- Sports
- Public Services
- Bath House Pavillion



**PUBLIC FACILITIES**

## CIRCULATION

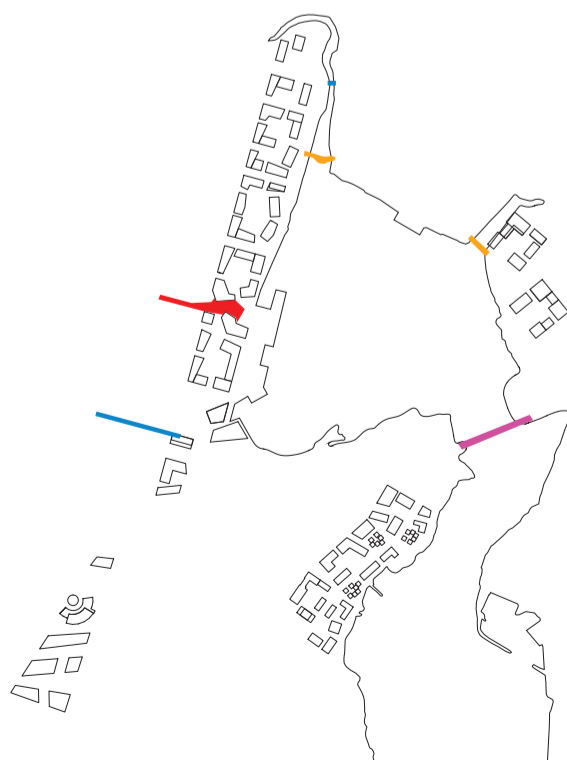
- Pedestrian and Bicycle
- Cars and Bicycle
- Highway



**CIRCULATION**

## BRIDGES

- Existing Bridges
- New Bridges:  
Pedestrian and Bicycle
- New Bridge:  
Pedestrian - Public Space
- New Bridge:  
Car, Bus & Bicycle



**BRIDGES**