

VERSATILE CENTRE FOR A NEW MIKKELI

— Satamalahti area
- - - bicycle path
- - - pedestrian path
- - - important pedestrian connections

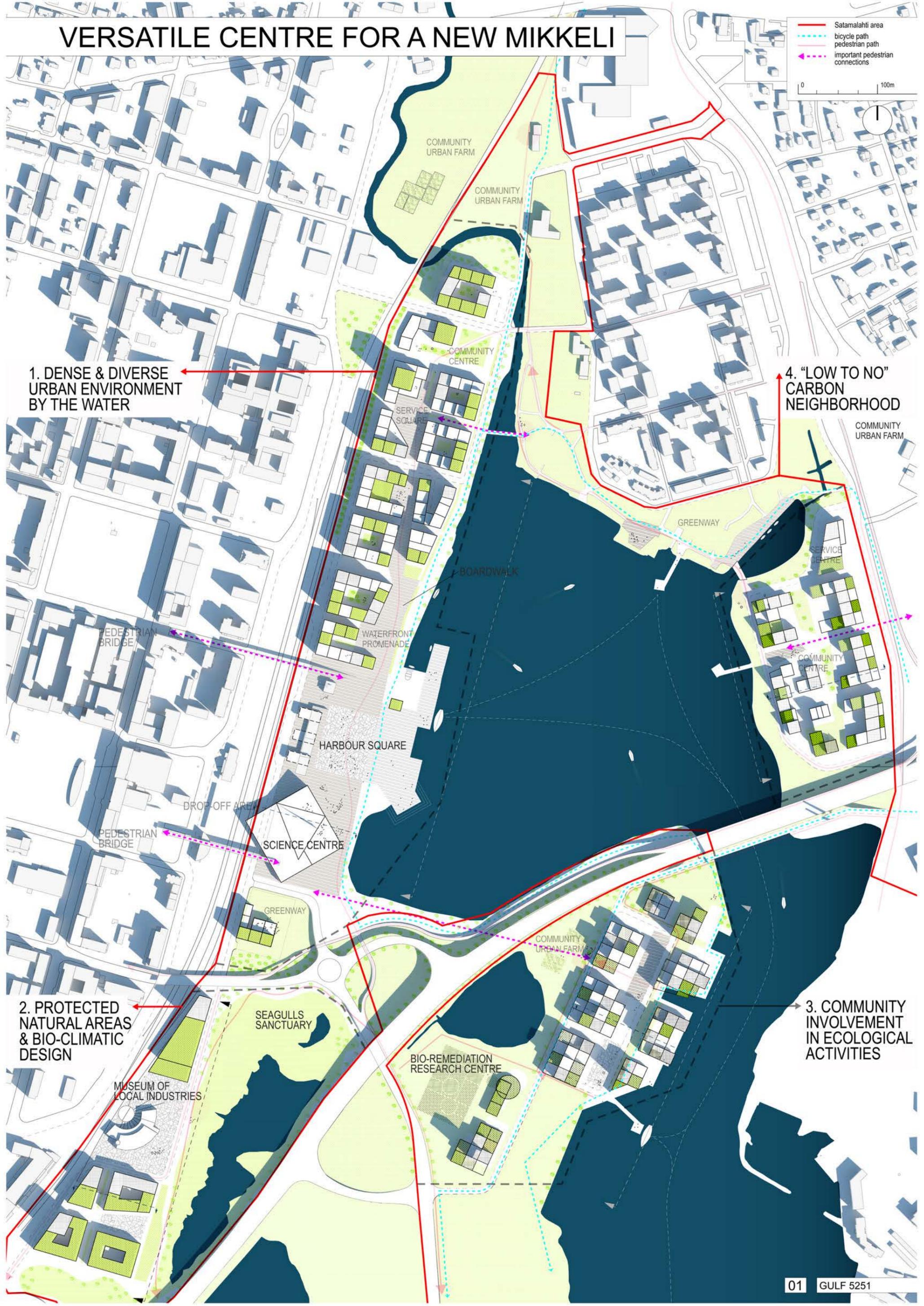
0 100m

1. DENSE & DIVERSE URBAN ENVIRONMENT BY THE WATER

4. "LOW TO NO" CARBON NEIGHBORHOOD

2. PROTECTED NATURAL AREAS & BIO-CLIMATIC DESIGN

3. COMMUNITY INVOLVEMENT IN ECOLOGICAL ACTIVITIES



VERSATILE CENTRE FOR A NEW MIKKELI

URBAN DEVELOPMENT CONCEPT

The challenges:

- sustainable integration of the lake shores into the urban development of the city
- transformation and regeneration of an old industrial area and reconnecting the city core to the water
- creating a modern and outstanding image for the city
- applying new ecologic technologies to reduce energy consumption and waste

The basic principles:

- densification and efficient use of the land by adaptive and flexible urban structures (blocks)
- improved accessibility and urban mobility by creating diverse opportunities, enabling new forms of transport and circulation and setting up interconnections (intermodal nodes)
- enhanced social cohesion by mixing of the social categories and increased social participation to community life and common actions
- sustainable use of building materials by giving priority to local resources such as wood and building traditions
- bioclimatic urban design for public buildings by applying most recent methods and techniques, involving new ways of preserving energy and reducing energy consumption
- making use of new technologies for the functioning and maintenance of public spaces and providing efficient use of urban services

The objective:

Develop the 4 zones as replicable projects based on principles and methods of intervention that could be used as guidance and models for other areas. The areas will be developed in such a way as to provide specificity and identity while also insuring connectivity and integration along the lake shore and with the city core. The old harbor area will be a nodal point of the composition and a reference area for the city and region.

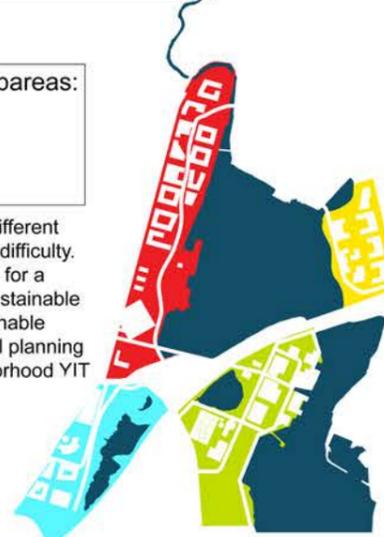
The means:

advanced urban design, ecological architectural design, high quality public spaces, wood and stone, pedestrian paths, cycling paths, farming areas

The following themes are best suited for the subareas:

- area 1_Dense & diverse urban environment by the water
- area 2_Protected natural areas & bioclimatic design
- area 3_Community involvement in ecological activities
- area 4_"Low to no" carbon neighborhood

We believe that the Satamalahti masterplan, with its four different subareas could prove to be a planning asset, rather than difficulty. The area's masterplan could be thought of as draft version for a future urban development guide in Mikkeli. With its four sustainable development examples, and expanding it with other sustainable models in the area, this guide book could act as a powerful planning tool in Mikkeli. (As for example the LEED-Certified neighborhood YIT Group plans to develop in Graani area)



NEIGHBORHOODS AND VOCATION



MAJOR FUNCTIONAL ZONING

- 1. Scenic pedestrian and bicycle routes
- 2. Bus transit and automobiles
- 3. Water bus along the Saimaa lake network

- 1. Dense & diverse urban environment by the water
- 2. Protected natural areas & bio-climatic design
- 3. Community involvement in ecological activities
- 4. "Low to no" carbon neighborhood



ACCESSIBILITY AROUND THE GULF



NATURAL VS. BUILT ENVIRONMENT



ACCESSIBILITY AND ACTIVITIES

Principles for sustainable development in Satamalahti:

- 1 Social action
- 2 Densify urban structure
- 3 Improve mobility
- 4 Sustainable building materials
- 5 Bioclimatic urban design
- 6 Use of modern technologies

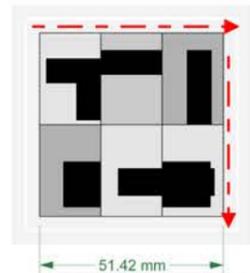
AERIAL VIEW



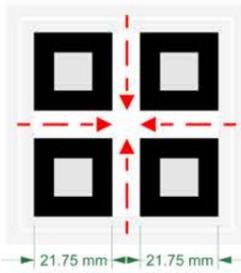
VERSATILE CENTRE FOR A NEW MIKKELI

UPDATING THE CITY BLOCK

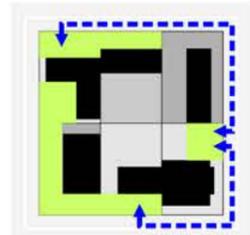
Mikkeli's current street grid has been designed by C.L. Engel to be efficient, car accessible, protective and dense. This structure makes for a fairly impermeable barrier for pedestrian flows, keeping it peripheral around the edges of these blocks. Although efficient for the density that was wanted back then, the contemporary densification proposal make an update required.



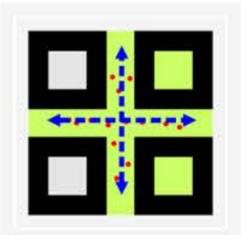
Current city block. Average 6 plots and minimal permeability to interior. City life is thus limited to the peripheries, caught between car traffic and buildings.



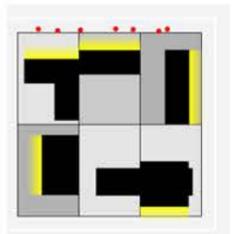
The proposed grid opens up the interior of an old 130m block by dividing it into 4 smaller ones. This allows for an infrastructure better adapted for pedestrian and bike traffic to form and for much more dense, efficient and versatile land use (double city density).



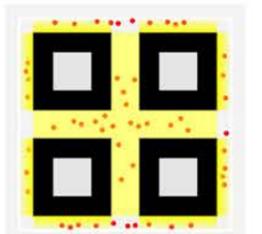
Public space is disseminated throughout the city in small doses, and is exposed to wind corridors and traffic.



Opening up the city block generates protected pedestrian streets with great vocation for socially inclusive public life.



Opening and services building fronts are fragmented.



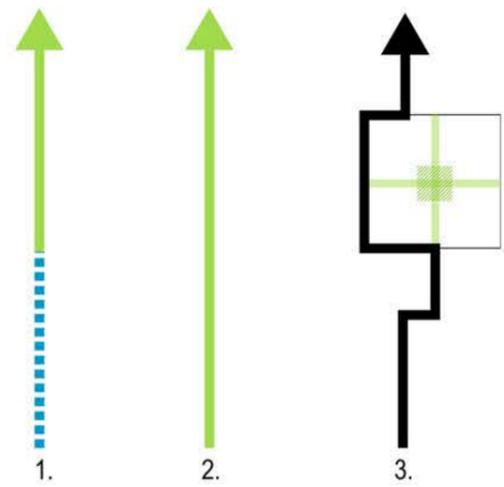
Pedestrian shopping streets are now possible, attracting new investors and raising interest in the new areas of the city.

SATAMALAHTI AREA GRANULARITY. PROPOSED + EXISTING scale 1:4000



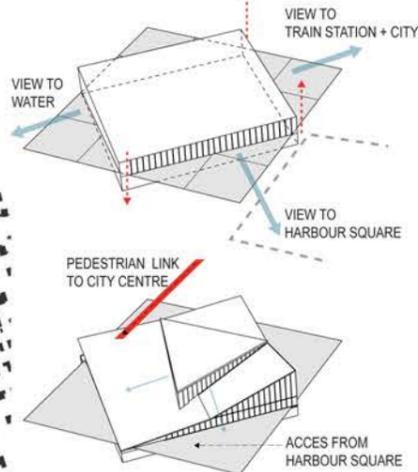
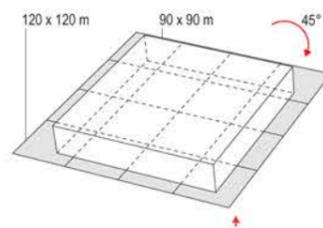
IMPROVED ACCESSIBILITY IN AND AROUND THE AREA

1. Smart, integrated public transport. The existing bus system, largely inefficient, will be improved by integrating it with a water bus route that will connect central Mikkeli with the southern neighborhoods on the shore of lake Saimaa. Also, integration of urban informatics systems will help for a better connection to the users and better bus frequency.
2. Direct bicycle and pedestrian routes - 5 minute Satamalahti. The existing bicycle and pedestrian routes will be extended. A special attention will be shown to the "Saimaa walkway", a circular path running uninterrupted around the Savilahti bay and connecting the four proposed neighborhoods.
3. Indirect car routes - cars are out of sight in Satamalahti. The shortest way is usually not by car. The availability of alternative mobility options and functional proximity makes the car quasi-unnecessary.

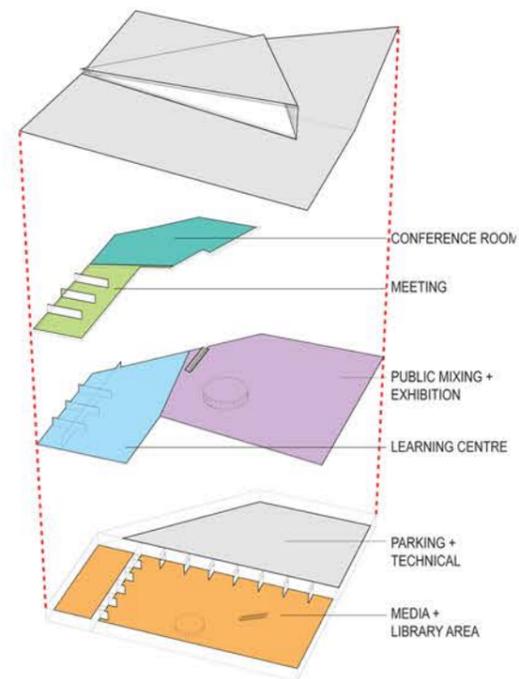


CONCEPTUAL APPROACH FOR THE SCIENCE CENTRE

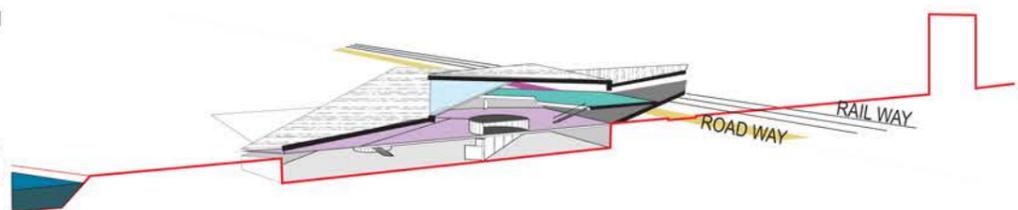
1. Building connected to landscape and existing conditions
2. Building acting as icon for Satamalahti area and entire Mikkeli
3. Community-oriented functional layout
4. Minimize outside volume. The volume of the building is compact and simple. Part of the building is buried
5. Excellent insulation of outside shell
6. Maximizing daylight
7. Use of informatics systems for efficient energy use



URBAN DESIGN CONCEPT



CONCEPTUAL FUNCTIONAL LAYOUT



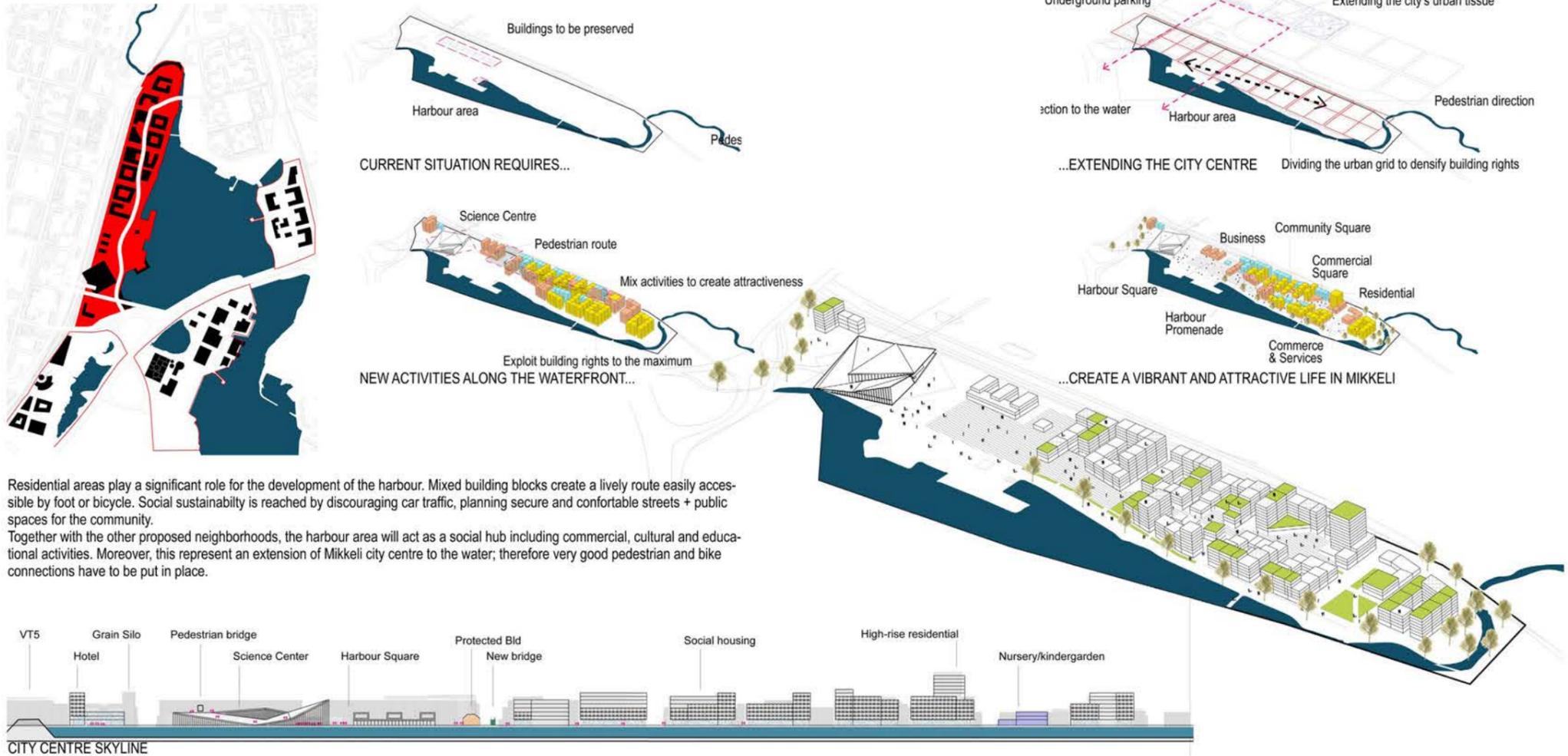
CONCEPTUAL CROSS SECTION

HARBOUR SQUARE VIEW TOWARDS THE SCIENCE CENTRE



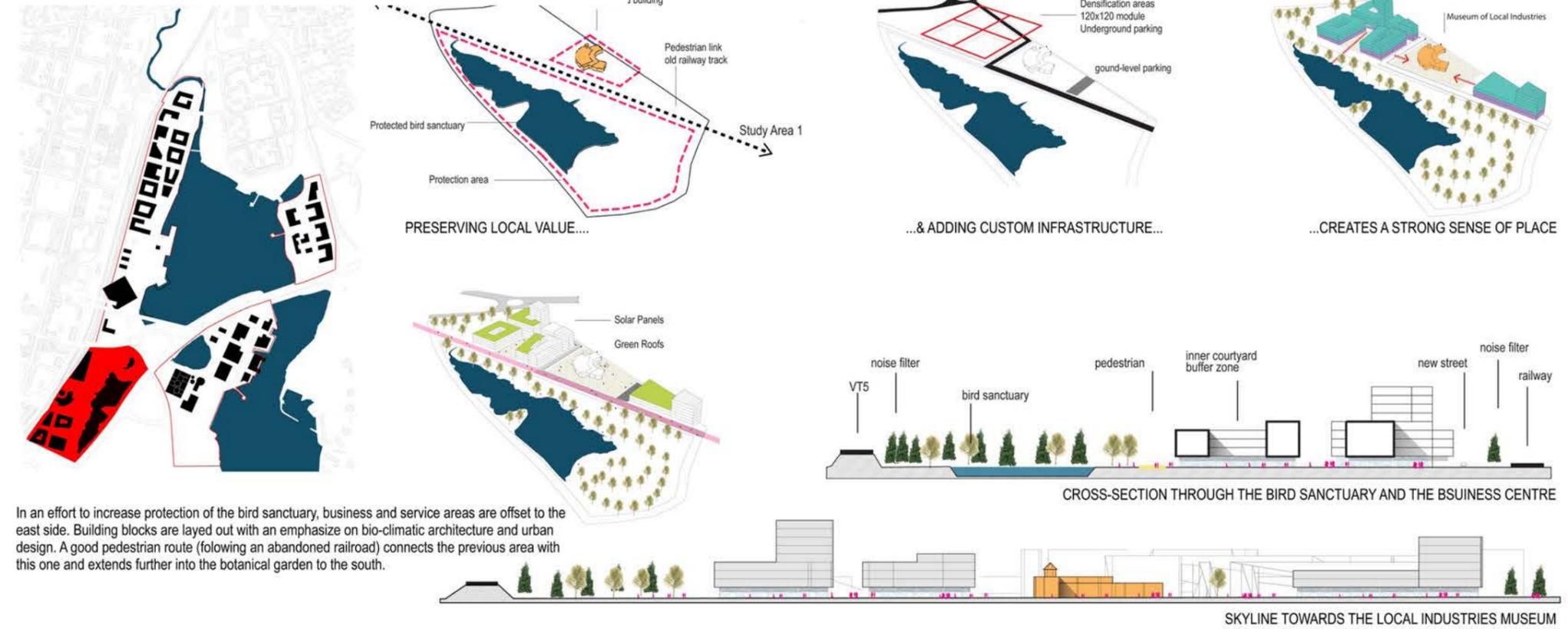
VERSATILE CENTRE FOR A NEW MIKKELI

1. DENSE AND DIVERSE URBAN ENVIRONMENT BY THE WATER



Residential areas play a significant role for the development of the harbour. Mixed building blocks create a lively route easily accessible by foot or bicycle. Social sustainability is reached by discouraging car traffic, planning secure and comfortable streets + public spaces for the community. Together with the other proposed neighborhoods, the harbour area will act as a social hub including commercial, cultural and educational activities. Moreover, this represent an extension of Mikkeli city centre to the water; therefore very good pedestrian and bike connections have to be put in place.

2. PROTECTED NATURAL AREAS & BIO-CLIMATIC URBAN DESIGN



In an effort to increase protection of the bird sanctuary, business and service areas are offset to the east side. Building blocks are laid out with an emphasize on bio-climatic architecture and urban design. A good pedestrian route (following an abandoned railroad) connects the previous area with this one and extends further into the botanical garden to the south.

area1_WINTER ACTIVITIES IN THE HARBOUR SQUARE, BY THE WATER

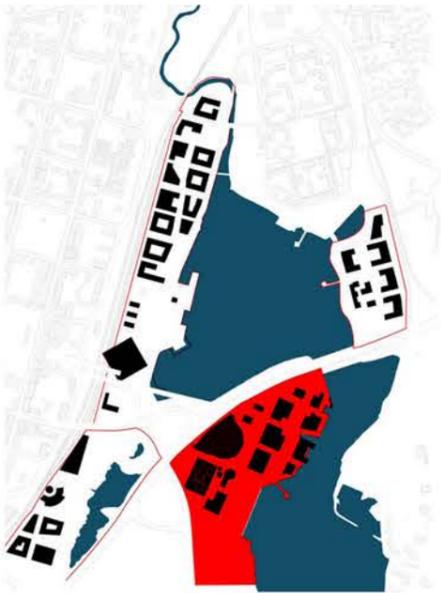


area2_WALKING TOWARDS THE BOTANICAL GARDEN IN THE SOUTH. ALONG THE PEDESTRIAN ROUTE



VERSATILE CENTRE FOR A NEW MIKKELI

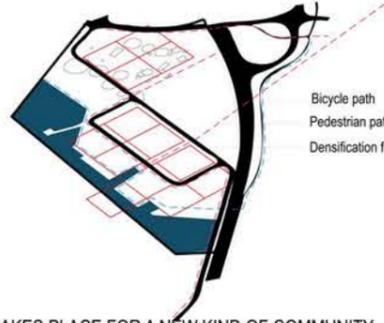
3. COMMUNITY INVOLVEMENT IN ECOLOGICAL ACTIVITIES



1. RELOCATION OF THE WATER TREATMENT PLANT



Possible connection to the city



2. MAKES PLACE FOR A NEW KIND OF COMMUNITY

Bicycle path
Pedestrian path
Densification from 120m X 120m grid



3. A SUSTAINABLE COMMUNITY, LIVING & WORKING IN A HEALTHY ENVIRONMENT

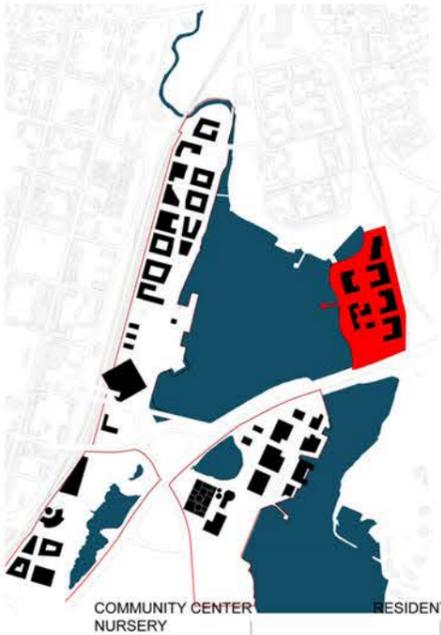
bio-remediation research centre
community urban farming
community services
high rise residences

Using the soil as a resource and drastically changing the place, the Bio - Research Centre focuses on phytoremediation technologies and research laboratory. Bioremediation facilities, coupled with urban farms, are accessible also to the community. The neighborhood could become (in time) a producer instead of a taker.

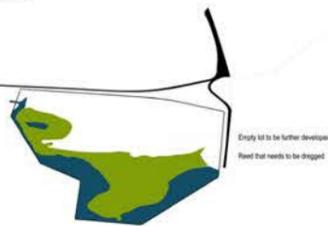


SKYLINE OF THE NEIGHBORHOOD AND BIO-REMEDIATION RESEARCH CENTRE AREA

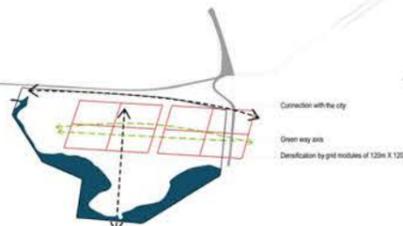
4. "LOW TO NO" CARBON NEIGHBORHOOD



1. AN EMPTY LOT THAT NEEDS REED DREGGING

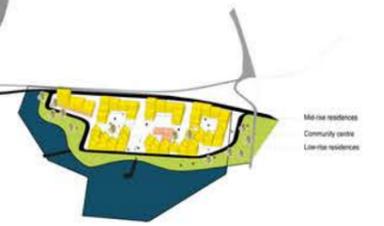


2. MAKES ROOM FOR A NEW NEIGHBORHOOD



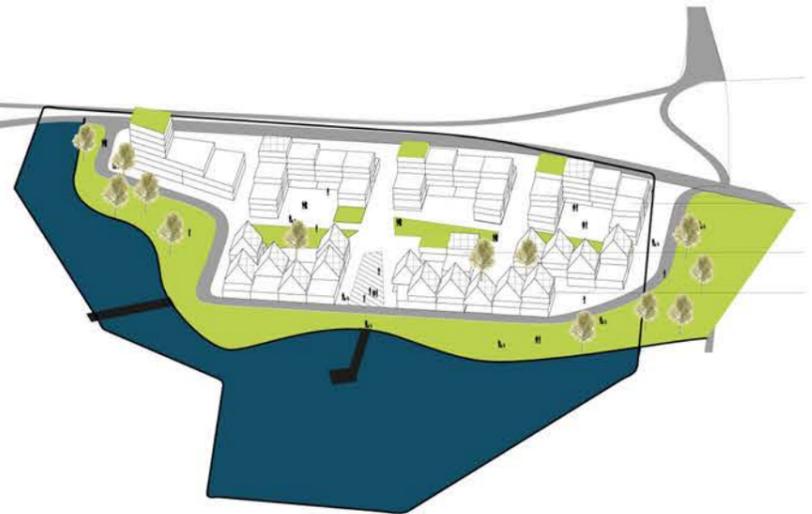
Connection with the city
Green way axis
Densification by grid modules of 120m X 120m

3. CLOSE TO NATURE



Mid-rise residences
Community centre
Low-rise residences

The new neighborhood cooperates with the natural habitat and sensibly blends in the landscape. Being a residential area, special attention has been paid to the various living typologies. Employing low-carbon materials and technologies, efficient energy use and integrated waste recycling helps the community to achieve a low - and eventually - no carbon footprint.



"LOW TO NO" NEIGHBORHOOD SKYLINE

area 3_SPENDING TIME IN THE COMMUNITY. URBAN FARMING NEXT TO BIOREMEDIATION RESEARCH CENTRE

area 4_COMING BACK FROM THE CITY IN A CONFORTABLE, SAFE NEIGHBORHOOD



VERSATILE CENTRE FOR A NEW MIKKELI

ECOLOGICAL DEVELOPMENT STRATEGY

1. Involve (+ set regulations)

Key words: empower community, engage institutions (local + national), incentivise enterprises, lead the way

The first step in developing an ecological development plan is, in our view, the most important also. The local community has to be involved in the ecological planning and designing process. It can act as a driving force pushing local authorities into passing new sustainable regulations.

The development of Satamalahti area means involving various actors both on local and national levels. For this, Finland already has institutions active in ecological development of urban areas. TEKES, Sitra and VCC funds could act as partners/coordinators along with local authorities in setting up new regulations.

2. Reduce (carbon footprint)

Key words: efficient use of resources, low carbon / carbon depository building materials, prefabricated building, smart energy consumption, centralised waste disposal, move around by walking, cycling, taking the bus

The second step in developing a comprehensive ecological strategy is to reduce the current carbon foot-print. We propose a "low to no" type of approach in which the first actions are directed towards a smaller carbon foot-print. In later stages, this variable could even be cut down to zero. Making Satamalahti a carbon neutral area.

3. Produce (food + energy)

Key words: community urban farming; photovoltaic / solar heating panels; medium scale heat pumps; bio-mass, bio-gas

Renewable energy production is already employed in Mikkeli by using wood in the Pursiainen powerplant. In solar power production, Satamalahti is also a high potential area, setting up photovoltaic panels could help in lowering conventional energy use. In terms of wind energy, the area is not a suitable candidate. Wind power could nevertheless be produced offsite, in South Savonia region. Renewable energy production: on site (solar and photovoltaic panels, heat pumps), near site (bio-mass, bio-gas, Pursiainen powerplant), off site (wind, solar and geothermal)

Urban farming is also an important part of the ecological strategy. Satamalahti residents could and should produce part of their food locally. A local food network could be developed with support from the community.

SUSTAINABLE MATERIALS

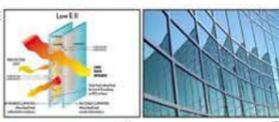
Main goal to achieve: Reduce asphalt and concrete footprint, clean contaminated areas

BUILDING

- eco concrete
- CLT (Cross Laminated Timber) - preferred material



- low emissivity glass (Low E glass)



- board walk (local woods)
- natural stone



ENERGY PRODUCING

- photovoltaic panels
- solar panels



- heat pumps



URBAN ENVIRONMENT

Main goal to achieve: densification, bioclimatic buildings and public space, ensure natural environment proximity, improve accessibility (improve walking and cycling connections, smart bus system integrated with water bus service for entire Mikkeli), urban farming network (grow and buy locally)

- bioclimatic public space



- natural environment proximity



- urban mobility



- urban farming



NATURAL ENVIRONMENT

Main goal to achieve: Ensure a continuous vegetation layer in throughout the Satamalahti area. Make use of bioremediation plants to clean up contaminated areas (medium, long term action)

ENDEMIC

- white birch trees (*Betula*)
- spruce (*Picea abies*)
- scots pine (*Pinus sylvestris*)



HIGH VEGETATION

- lake reed (*Cytisus scoparius*)



MEDIUM VEGETATION

- green carpet (*Herniaria glabra*)
- dandelion (*Taraxacum officinale*)
- wood anemone (*Anemone nemorosa*)
- finnish mushroom (*Boteluis edulis*)
- blueberry (*Vaccinium corymbosum*)



LOW VEGETATION

BIOREGENERATION (phytoextraction and accumulation of metals - lead, cadmium, zinc, nickel - degradation of PAHs in soils)

- poplar (*Populus* spp.)
- honey locust (*Gleditsia triacanthos*)
- willow (*Salix* spp.)



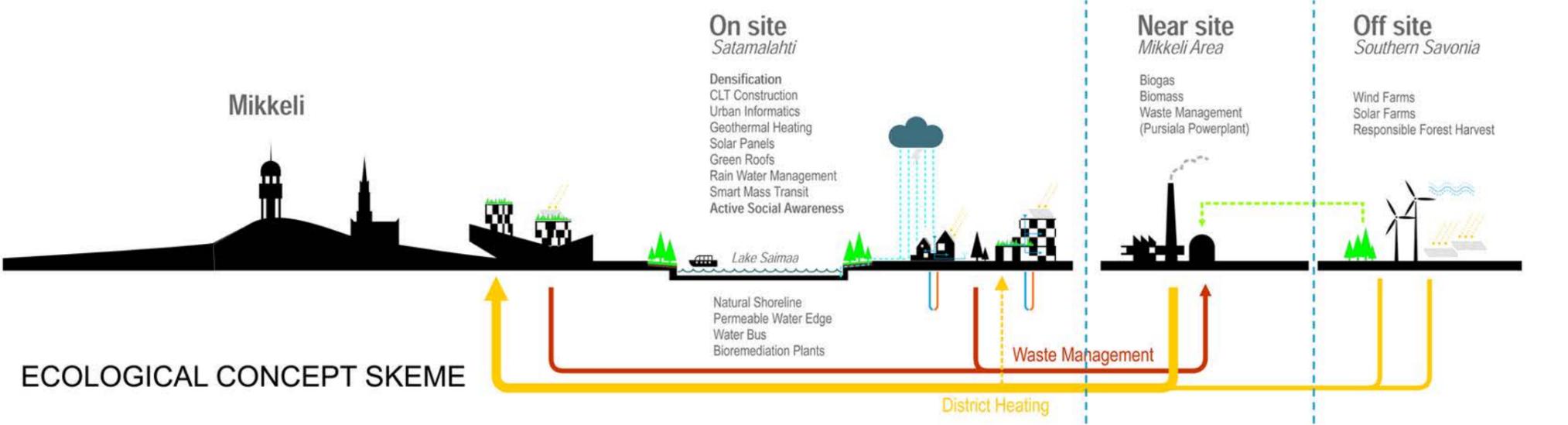
HIGH VEGETATION

- sunflower (*Helianthus annuus*)
- buttercup shrub (*Potentilla fruticosa*)
- common foxglove (*Digitalis purpurea*)



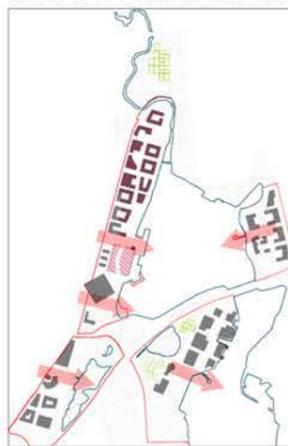
MEDIUM VEGETATION

- alpine pennycress (*Thlaspi caerulescens*)
- white clover (*Trifolium repens*)
- blue gamma grass (*Bouteloua gracilis*)



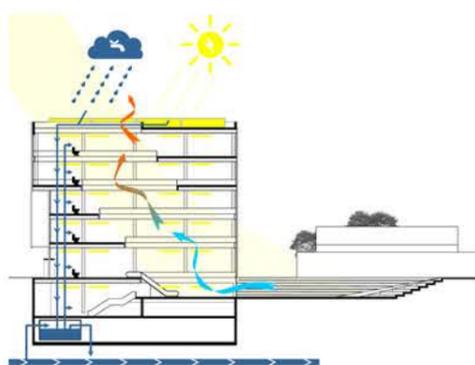
ECOLOGICAL CONCEPT SKEME

BIOCLIMATIC & FLEXIBLE BUILDINGS

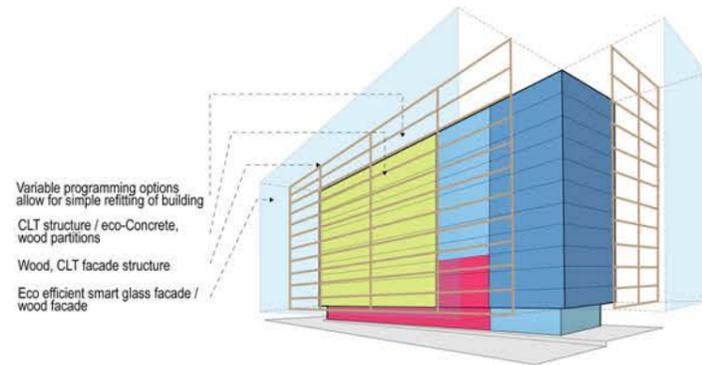


The masterplan is sensible to bioclimatic conditions in the Satamalahti Area. All proposed buildings take into account major wind directions and are positioned for maximum solar exposure. Water and plant proximity are also important.

Bioclimatic buildings use low carbon footprint building materials and employ a full range of energy reducing build technologies.



CROSS SECTION FOR BIOCLIMATIC OFFICE BUILDING IN SATAMALAHTI AREA



FLEXIBLE BUILDINGS CONCEPT

URBAN FARMS NETWORK



Growing and buying locally produced food is an important part of the masterplan's ecological concept. This helps not only in lowering the city's carbon foot-print, but also in creating an attractive framework for community involvement and "place building".

URBAN FARMS EXCHANGE SYSTEM



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Area 1: total=138256 mp

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AMOUNT OF BUILT AREA(ground floor area):

Residential	-> 13275 mp
Service + public equipment	-> 8075 mp
Business	-> 5850 mp
Science center	-> 4500 mp
TOTAL:	31700 MP

GREEN AREAS : 14480 mp

AMOUNT OF BUILDING RIGHTS (total floor area):

Residential	-> 75850 mp
Service + public equipment	-> 28000 mp
Business	-> 31500 mp
Science center	-> 14000 mp
TOTAL:	149350 mp

*AREA DENSITY: 0.23 (23%)

*BLOCK DENSITY: 1.08 (by area)

*PARKING:	per property	-> 11377 mp
	Public	-> 8925 mp
TOTAL:		20302 mp

Area 2: total=105712 mp

PROTECTED NATURAL AREAS & BIO-CLIMATIC URBAN DESIGN

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AMOUNT OF BUILT AREA (ground floor area):

Culture	-> 1789 mp
Business	-> 19636 mp

TOTAL: 21425 mp

GREEN AREAS : 61762 mp

AMOUNT OF BUILDING RIGHTS (total floor area):

Culture	-> 1814 mp
Business	-> 30657 mp
Services + public equipment	-> 16484 mp

TOTAL: 48955 mp

*AREA DENSITY: 0.20 (20%)

*BLOCK DENSITY: 0.46 (by area)

*PARKING:		
Public		7071 mp

Area 3: total=146993 mp

COMMUNITY INVOLVEMENT IN ECOLOGICAL ACTIVITIES

Using the soil as a resource and drastically changing the place, the Bio - Research Centre focuses on phytoremediation technologies and research laboratory. Bioremediation facilities, coupled with urban farms, are accessible also to the community. The neighborhood could become (in time) a producer instead of a taker.

AMOUNT OF BUILT AREA (ground floor area):

Service+ public equipment	-> 9450 mp
Business	-> 0
Parking	-> 7875 mp

TOTAL: 17325 mp

GREEN AREAS : 50032 mp

AMOUNT OF BUILDING RIGHTS (total floor area):

Residential	-> 49500 mp
Service+ public equipment	-> 13757 mp
Business	-> 8100 mp
Parcarking	-> 8775 mp

TOTAL: 80132 mp

*AREA DENSITY: 0.12 (12%)

*BLOCK DENSITY: 0.54 (by area)

*PARKING:

Residential	-> 7425 mp
Public	-> 3278 mp

TOTAL: 10704 mp

Area 4: S total=47392 mp

"LOW TO NO" CARBON NEIGHBORHOOD

The new neighborhood cooperates with the natural habitat and sensibly blends in the landscape. Being a residential area, special attention has been payed to the various living typologies. Employing low-carbon materials and technologies, efficent energy use and integrated waste recycling helps the community to achieve a low - and eventually - no carbon footprint.

AMOUNT OF BUILT AREA (ground floor area):

Residential	-> 6525 mp
service + public equipment	-> 2555 mp
parking	-> 2623 mp

TOTAL: 11703 mp

GREEN AREAS: 5545 mp

AMOUNT OF BUILDING RIGHTS (total floor area):

locuire->	29037 mp
service + public equipment	-> 3005 mp
parking	-> 4103 mp

TOTAL: 34665 mp

*AREA DENSITY: 0.25 (25%)

*BLOCK DENSITY: 0.73 (by area)

*PARKING:

residential	-> 4356 mp
Public	-> 450 mp

TOTAL: 4806 mp