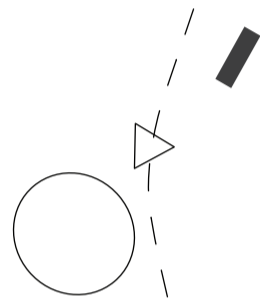


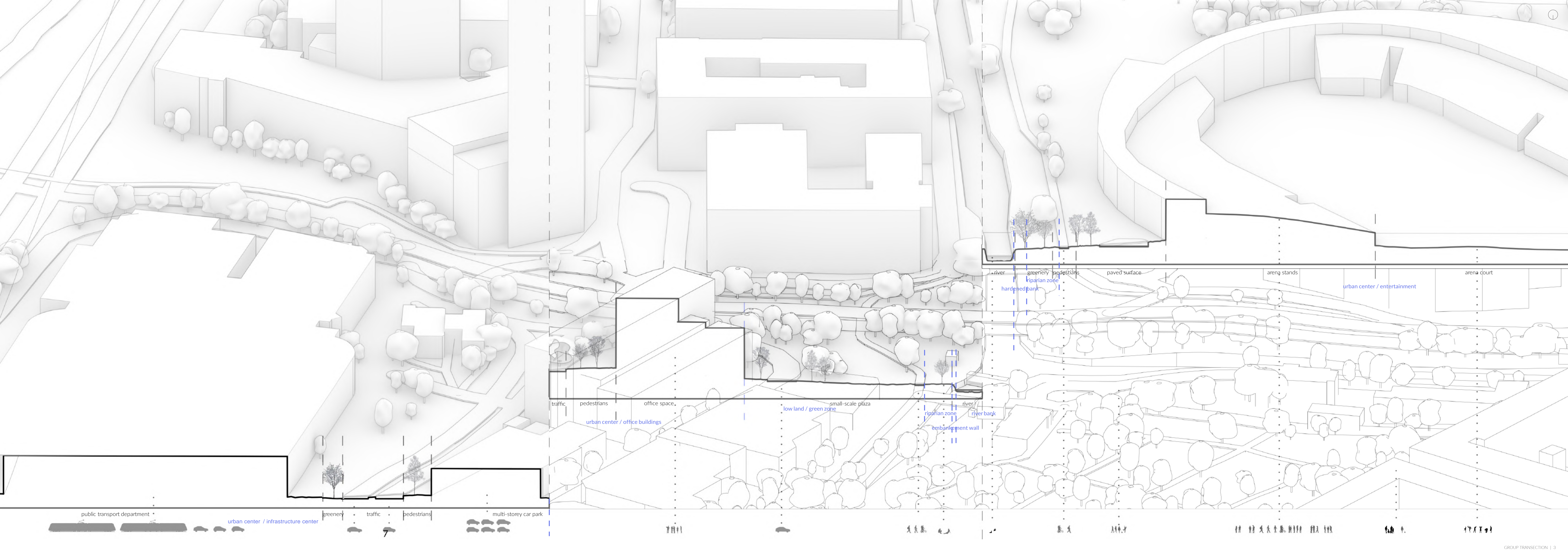
G-HUS

MÖLNDALSÅN GROUP 2 / YR 1
URBAN PROTOTYPES / MPARC
TOMASZ LEONIK



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CONCEPT PLAN & SECTION	5/6p.
ELEMENTS, GOALS AND AGENTS DIAGRAM	7p.
EXPLODED AXONOMETRY	8p.
CONTEXT PLAN & SECTION	9/10p.
PHOTOS OF MODEL	11p.
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SYSTEM GROWTH	13p.
DETAILED SECTION	14p.
PHOTOS OF PROCESS	15/19p.
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public transport department

urban center / infrastructure center

greenery

traffic

pedestrians

multi-storey car park

traffic

pedestrians

office space

urban center / office buildings

low land / green zone

small-scale plaza

river

riparian zone

river bank

embankment wall

river

greenery

pedestrians

riparian zone

hardened bank

paved surface

arena stands

urban center / entertainment

arena court



Gullbargsån

Fattighusån

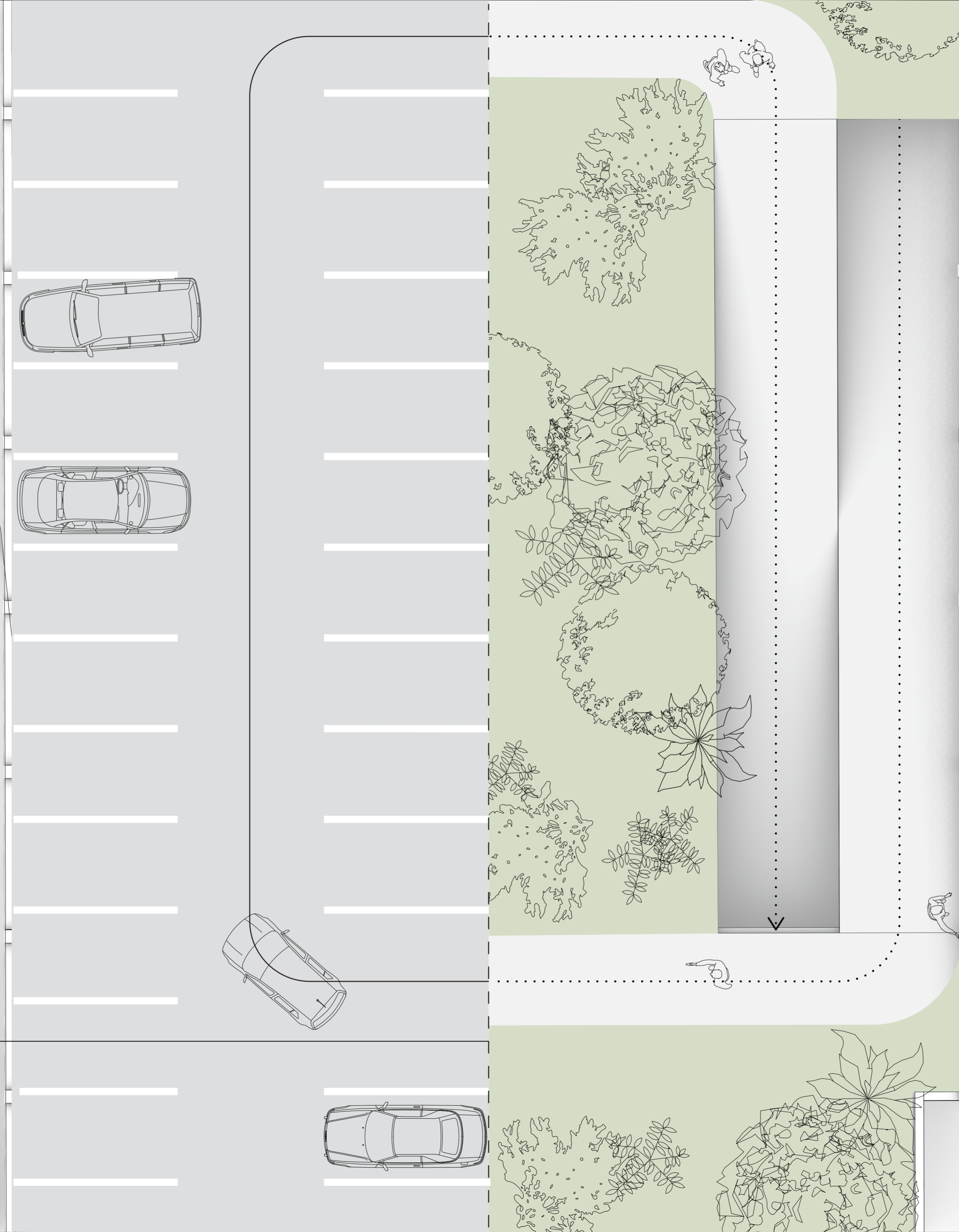
- 1. Ullevi
- 2. Fire station
- 3. Göteborgs Spårvägar AB
- 4. River dam
- ⋯ traffic noise
- ▨ zone indication
- high flood risk area
- ⋯ air pollution



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TOMASZ LEONIK

Concept presents adaptation of multi-level parking lot into water capturing, filtering and storing station. The idea is to transform every floor above ground into green roof and plant greenery that would be able to filter polluted rainwater. Plants on every level would differ according to their filtering function humidity and sunlight need. Water transfer would be guaranteed by perforation in concrete slabs. Middle floors would simulate effect of rainforests and deliver varying microclimates depending on amount of water and humidity.



Transformed building might be connected to pathway by the river, by small green alleys. Pedestrians will be lead to stray from the path and enter building's roof, while observing filtration process moving across the floors. The path would lead user back to the ground and let him exit the building the other entrance. Pedestrians will be turning back to the track by another alley.

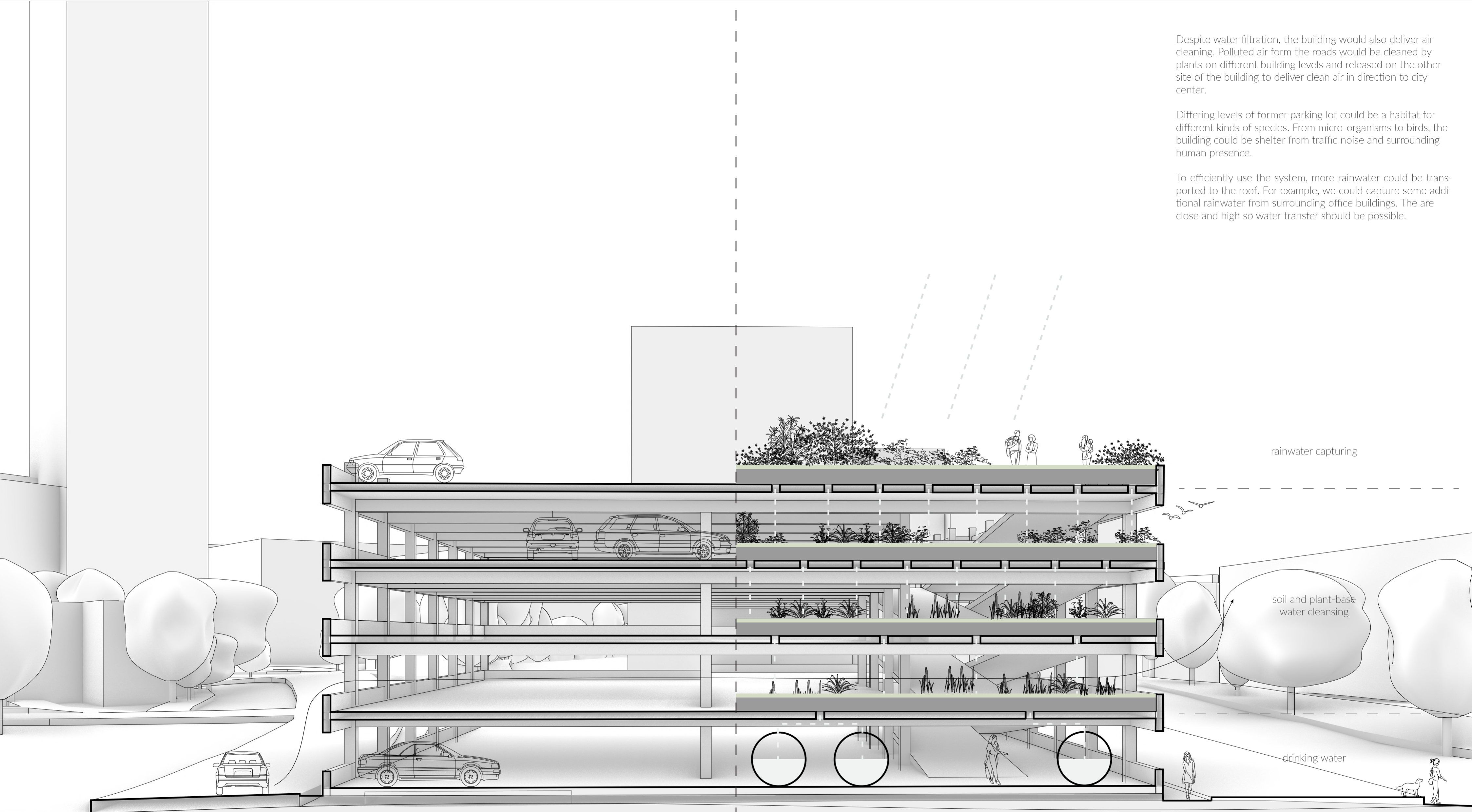
In addition to recreation function, building delivers education process. It teaches natural processes and respect to nature by showing how limited access for human, can be an incipience for wild life.

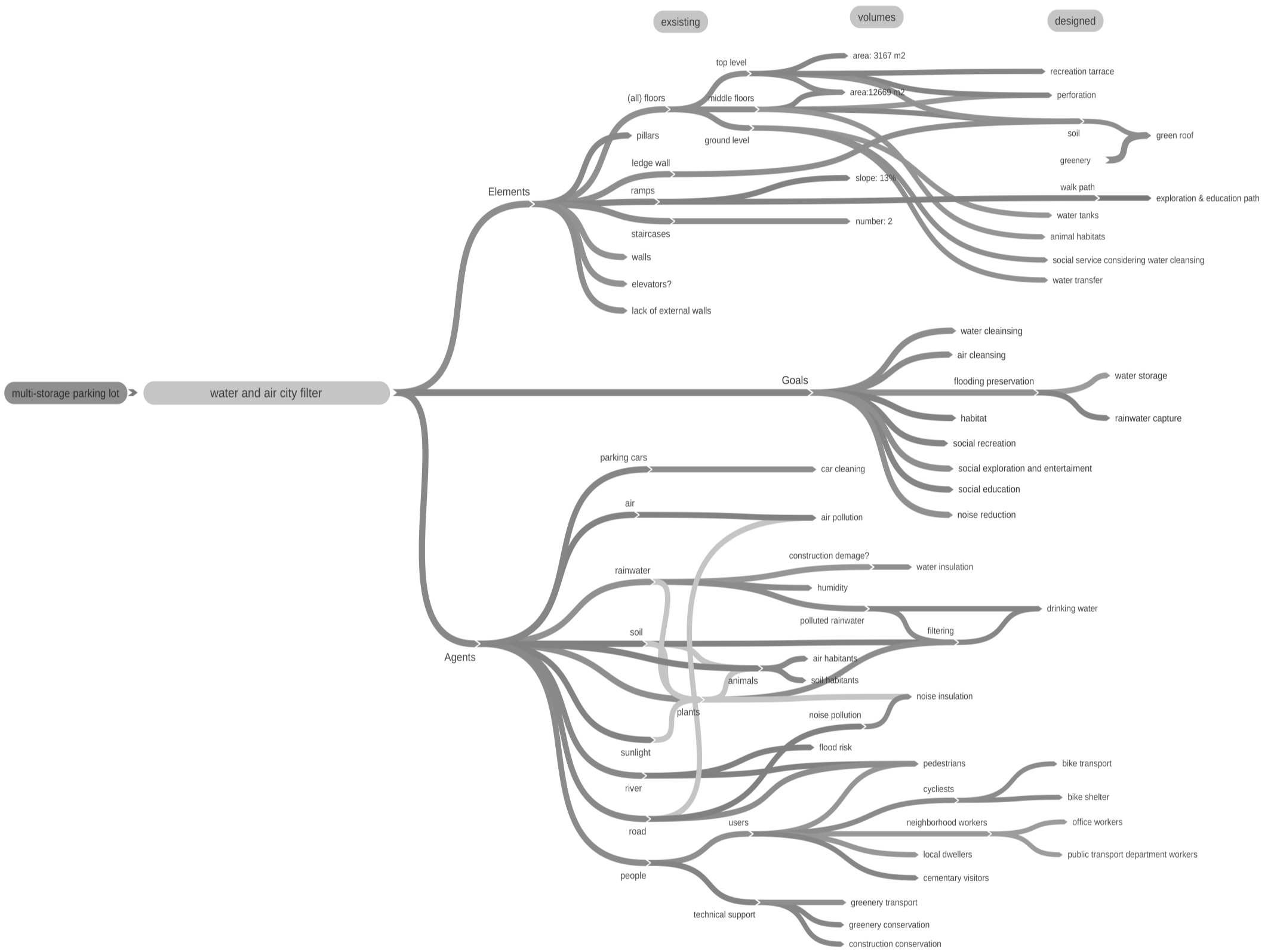


Despite water filtration, the building would also deliver air cleaning. Polluted air from the roads would be cleaned by plants on different building levels and released on the other side of the building to deliver clean air in direction to city center.

Differing levels of former parking lot could be a habitat for different kinds of species. From micro-organisms to birds, the building could be shelter from traffic noise and surrounding human presence.

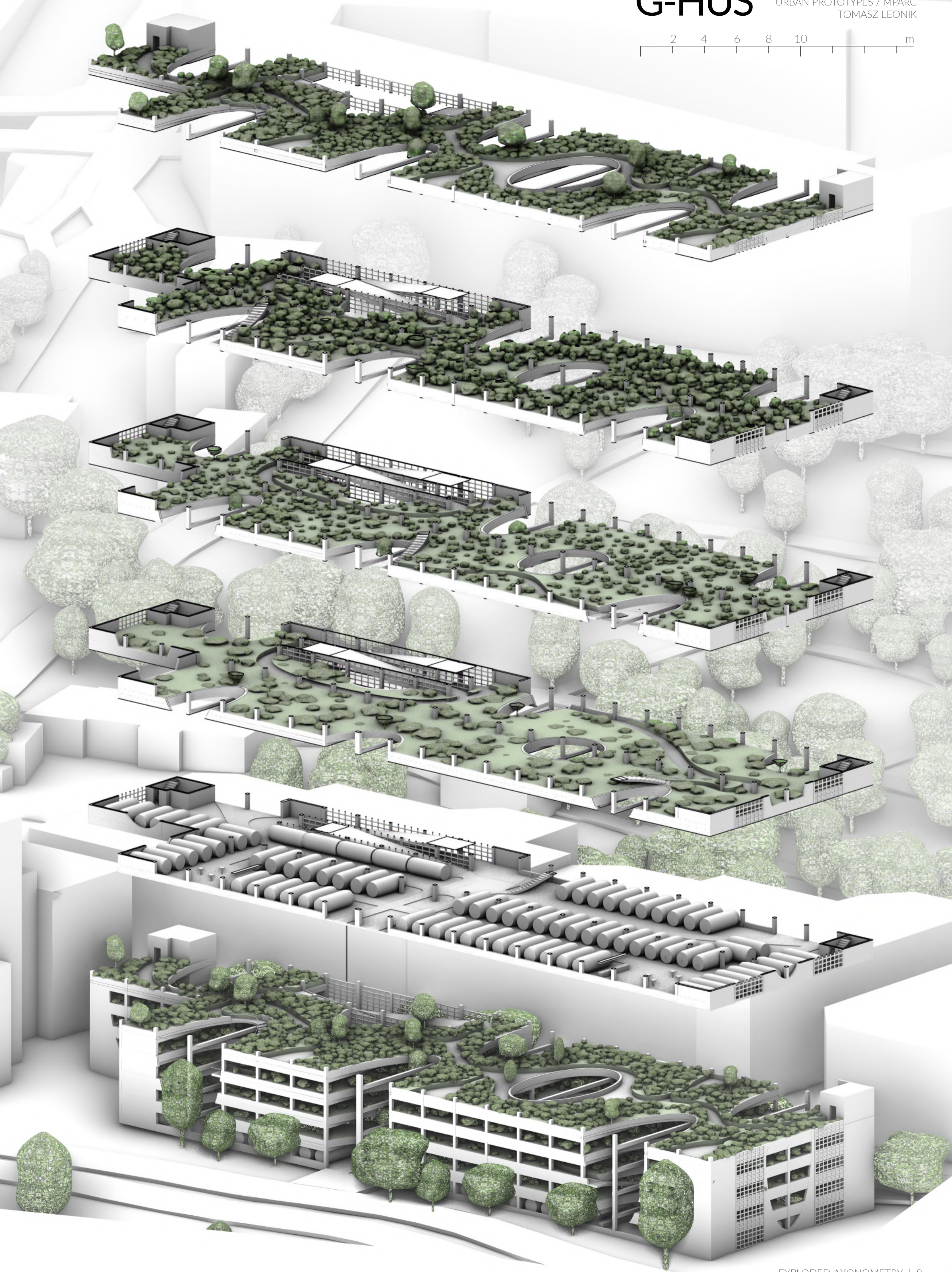
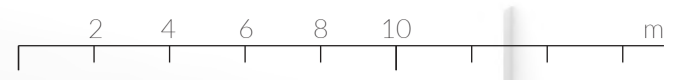
To efficiently use the system, more rainwater could be transported to the roof. For example, we could capture some additional rainwater from surrounding office buildings. They are close and high so water transfer should be possible.

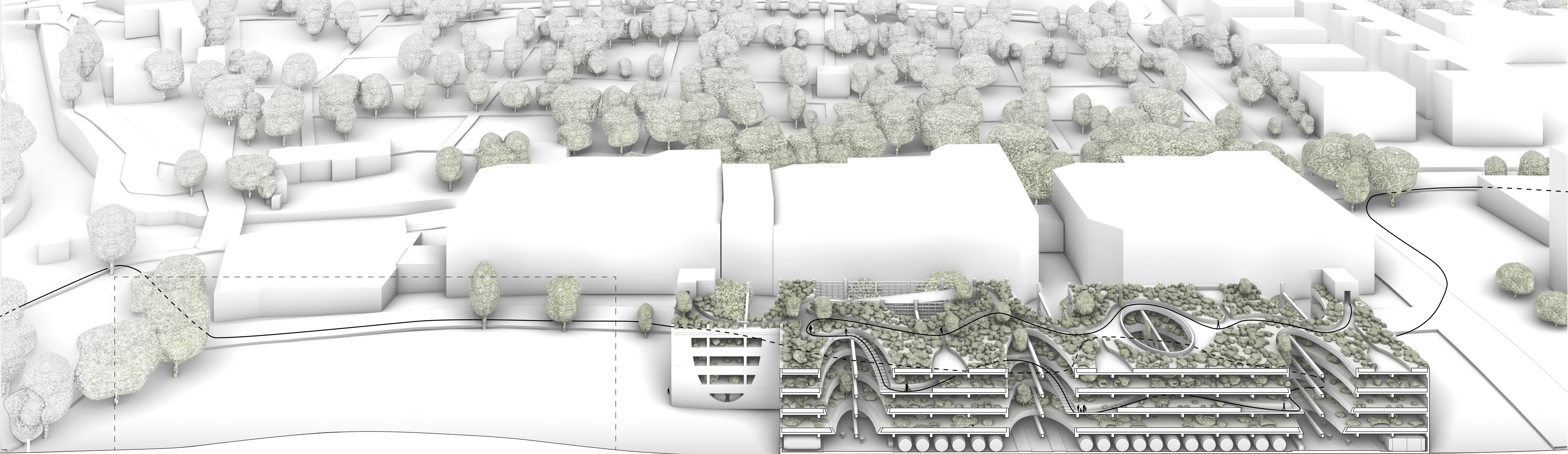




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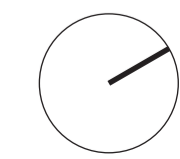
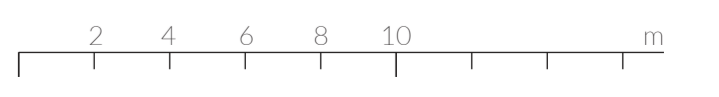
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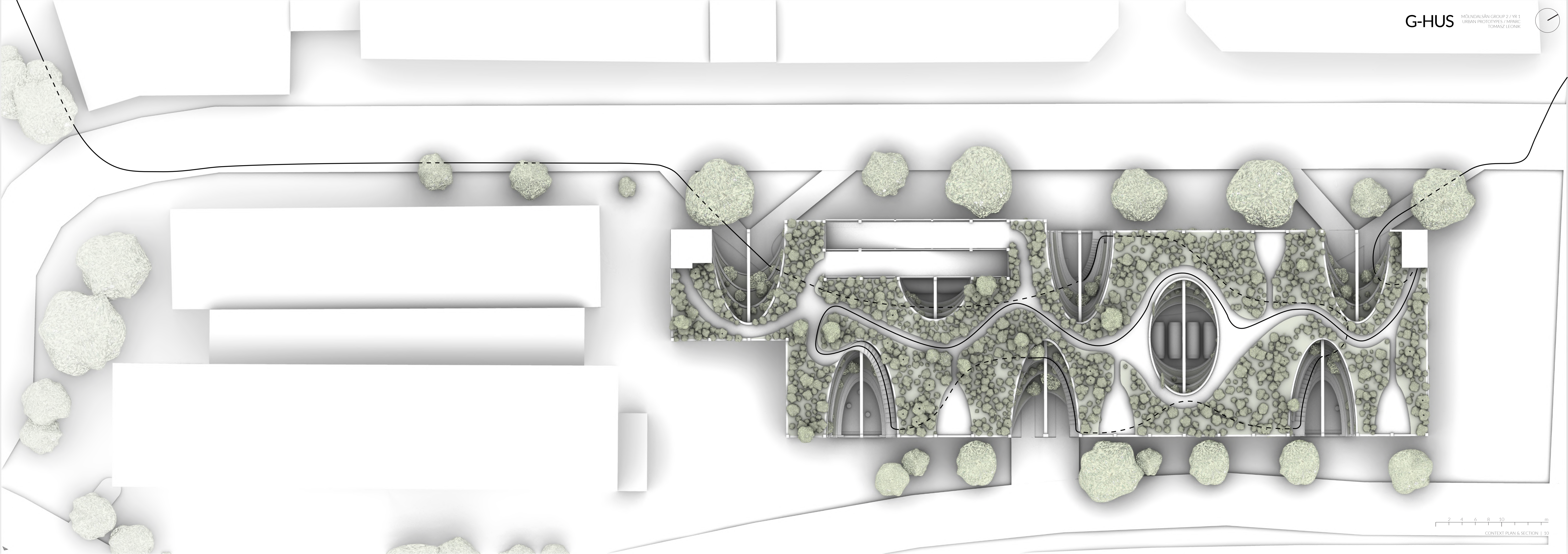


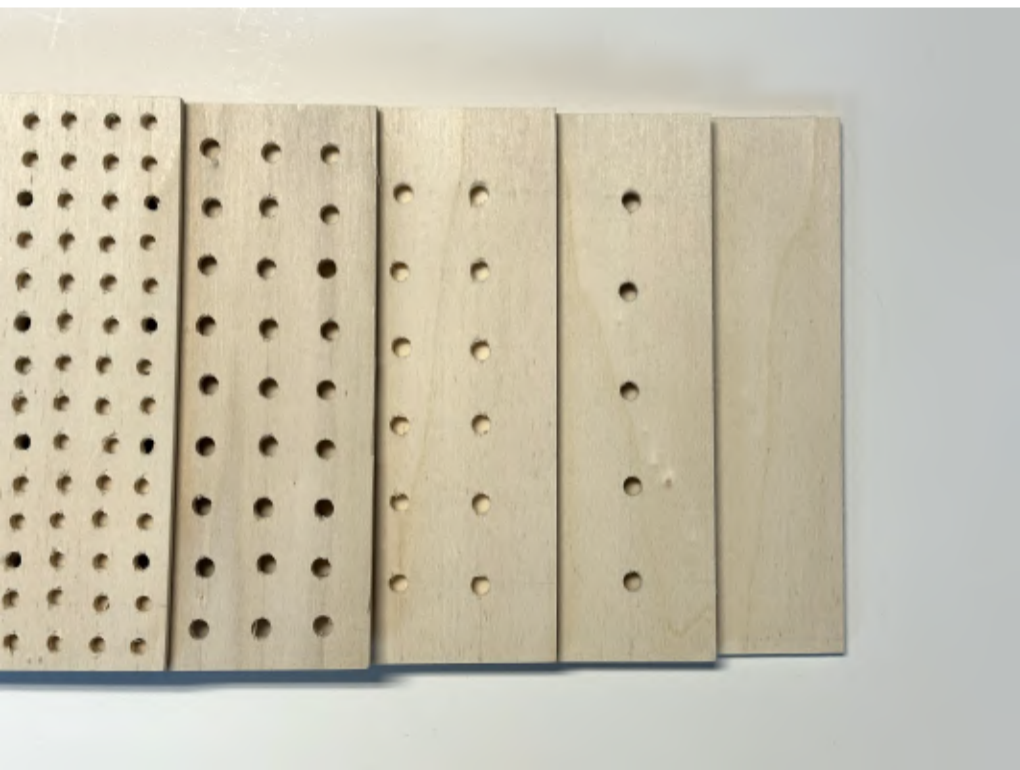


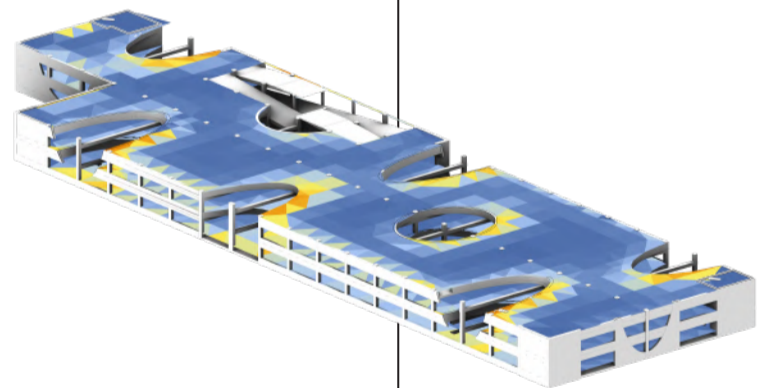
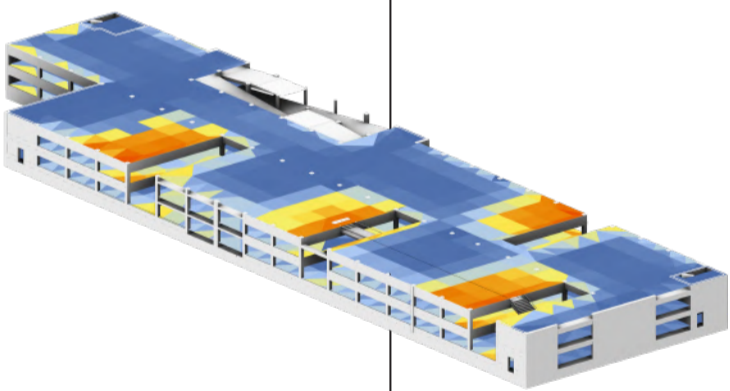
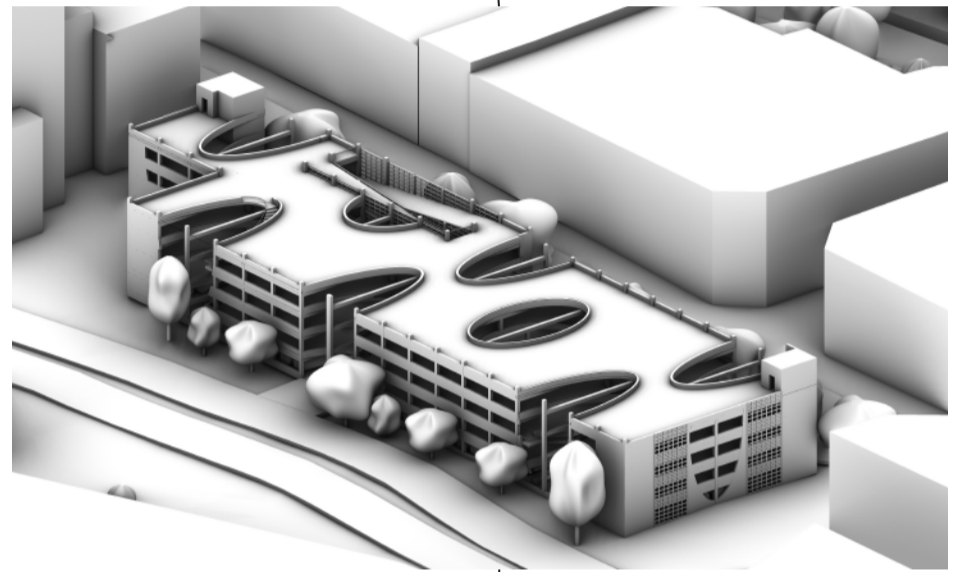
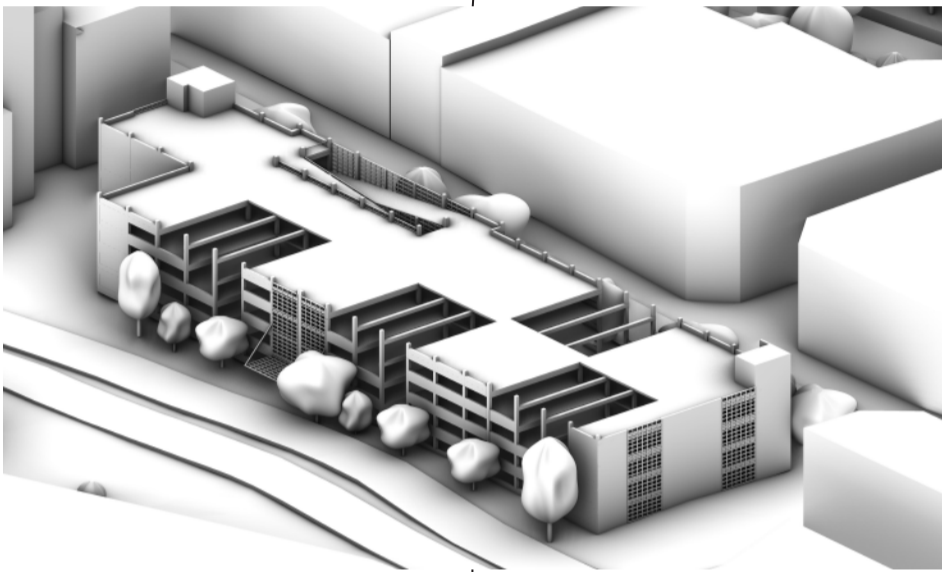
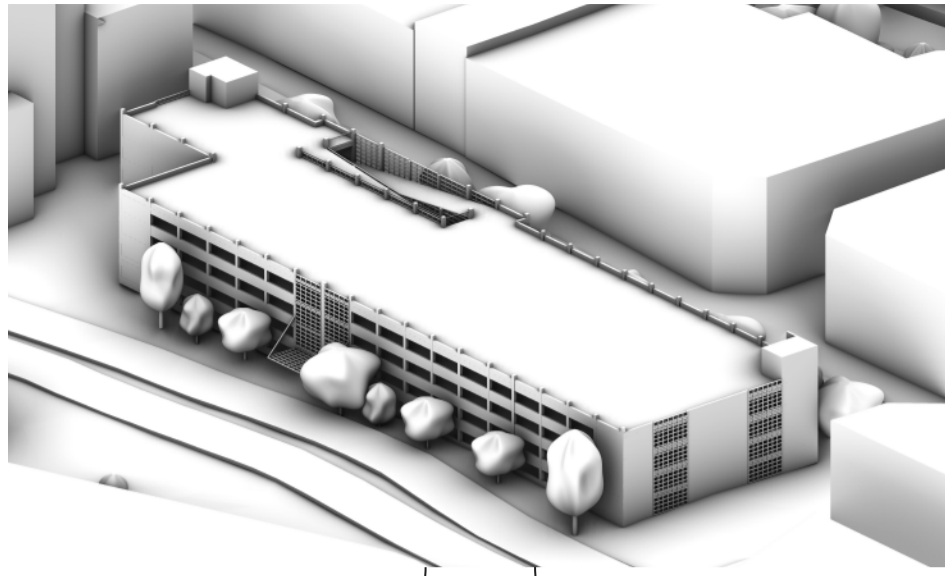
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 URBAN PROTOTYPES / M/PARC
 TOMASZ LEONIK

Building is not placed directly by the river, but one alley further. It means that some kind of green corridor path is needed to lead to the project. Main path throughout the project leads through all floors. It is an educational path, where users can watch how different environment appear on different slabs. The other way to enter the building is by existing ramp - it is a recommended way for cyclists or parents with carriage. Next way to enter the building is by existing staircases that are one both ends of the building. This is the way for people who would like to enter top floor without going through all floors. The last way is by using elevator, which is located in one of the staircases, which is a recommended way for people with disabilities.



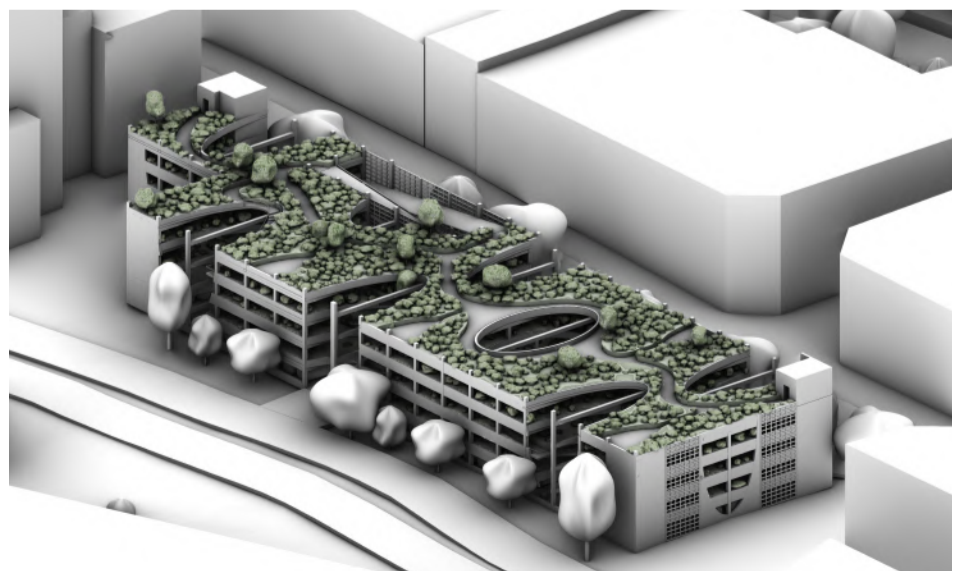
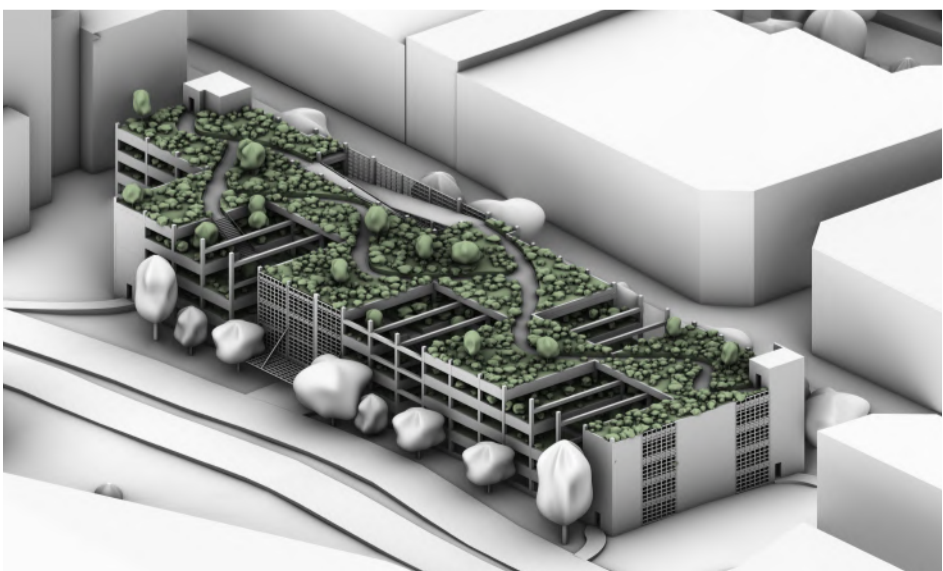






Rectangle openings succeeded in bringing sunlight into middle floors of the building, but also created a big disproportions in amount of light reaching certain areas on the floors. Therefore focus on replacing rectangle openings by curvatic ones has been put.

Opening in eiptical shapes occured to bring less amount of direct sun on the most exposed areas, but on the other side spreaded light more gently on the area of full floor which is more effective in terms of greenery groth in the whole building.





Olskroken P-hus

Ceres P-hus

Johan Pa Gårdas Garage

Tomtegatan P-hus

Aimo Park P-hus

Parking garages

Parkeringshus Liseberg Södra

Parkering Grafiska Vägen

Bilja Mölndal BMW

P-hus Krokslättis Fabriker

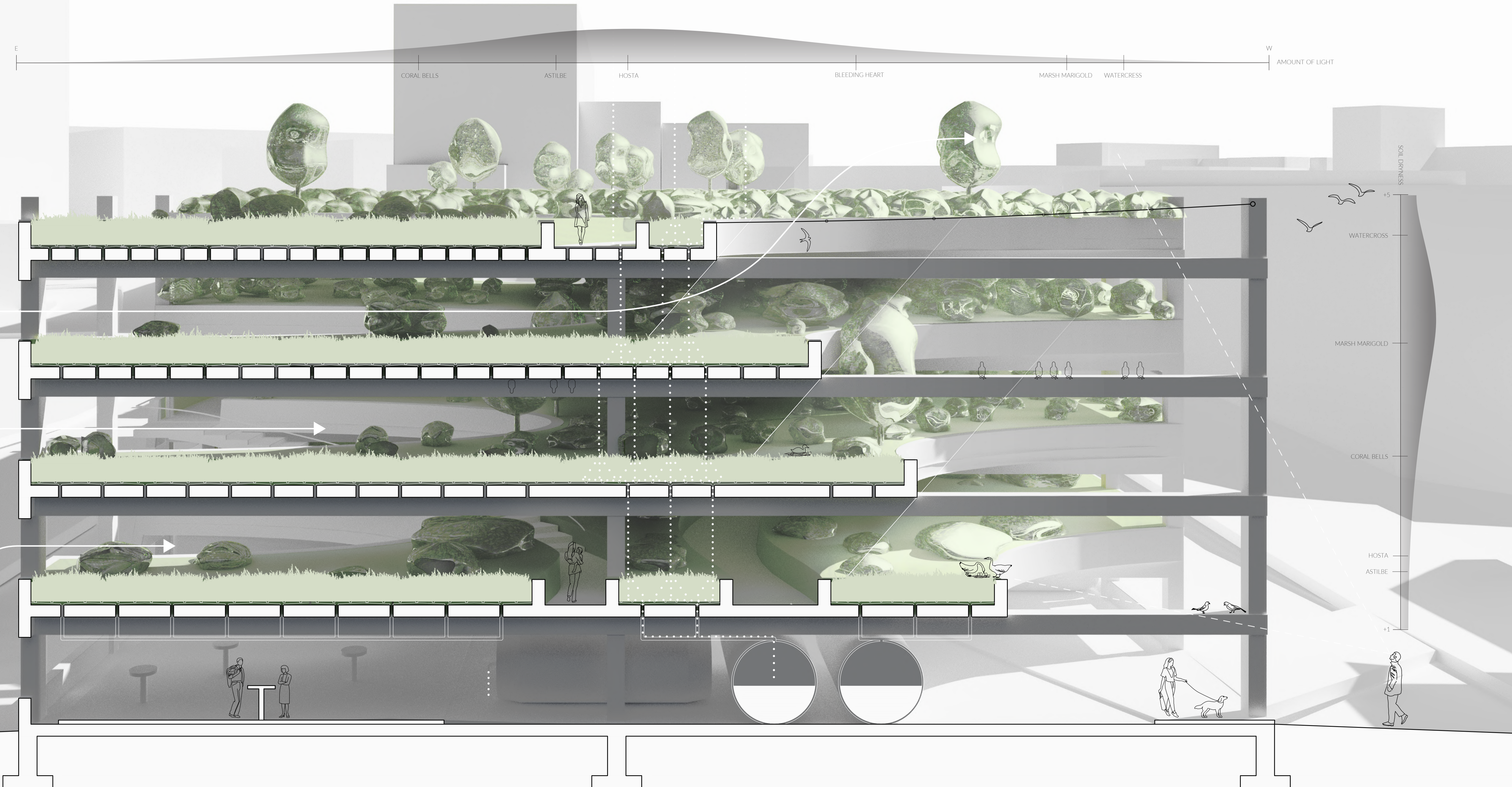
Södra Ägatan P-hus

PROJECT ORIGINALLY LOCATED BY RANTORGET SPEAKS AS AN EXAMPLE OF HOW A LOT OF BUILDINGS OF SIMILAR STRUCTURE CAN BE TRANSFORMED IN FUTURE WHEN CAR TRAFFIC WILL DECREASE. BUILDINGS THAT QUALIFY TO BE TRANSFORMED SIMILAR WAY TO MY PROJECT ARE OTHER MULTILEVEL PARKING LOTS AND COMERCIAL AUTOMOTIVE CORPORATIONS SHOWROOMS. BUILDINGS WILL CREATE A NET OF WATER FILTERS AND EQUIP CITY THE CITY IN DRINKING WATER. IN RELATIONSHIP TO THE RIVER, THE BUILDINGS TOGETHER WILL CATCH BIG AMOUNT OF RAINWATER AND STORE IT IN PLANTS AND SOIL TO PREVENT FLOODING.

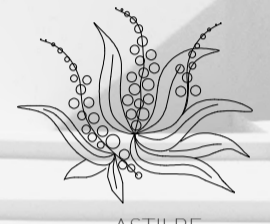
G-HUS

MÖLNDALSÅN GROUP 2 / YR 1
URBAN PROTOTYPES / MPARC
TOMASZ LEONIK

TRANSFORMED PARKING HOUSE ANSWERS COUPLE OF ENVIRONMENTAL EMERGENCIES. FIRST IS WATER POLLUTION. BUILDING WORKS AS A SCALED-UP RAINWATER FILTER THAT CLEANS WATER ON EVERY LEVEL FROM TOP TO GROUND FLOOR. WHEN DRINKING WATER IS COLLECTED, THIS USAGE OF RAINWATER HELPS PREVENTING FLOODING OF MÖLNDAL RIVER. NEXT PURIFICATION ASPECT OF THE PROJECT IS RELATED TO AIR POLLUTION. BUILDING IS SITUATED BETWEEN THE RIVER AND HIGH-TRAFFIC ROAD. THEREFORE THE GREENERY ON THE BUILDING WILL WORK AS AN AIR PURIFIER TO THE RIVERSIDE - THE RECREATION AREA. ANOTHER ASPECT FOR THE GREEN SLABS IS A POTENTIAL SHELTER FOR FLYING ANIMALS. ELLIPTICAL CUT-OUTS WILL NOT ONLY DELIVER SUNLIGHT FOR THE GREENERY GROWTH BUT ALSO DEVELOP HABITAT SPACE FOR ANIMALS AND INSECTS. THE OPENINGS, ESPECIALLY THOSE WHO ARE ABOVE ENTRANCES TO THE BUILDINGS, WILL MAKE AN IMPRESSION OF GATE INHABITED BY WILDLIFE.



HOSTA



ASTILBE



CORAL BELLS



MARSH MARIGOLD



WATERCRESS



BLEEDING HEART



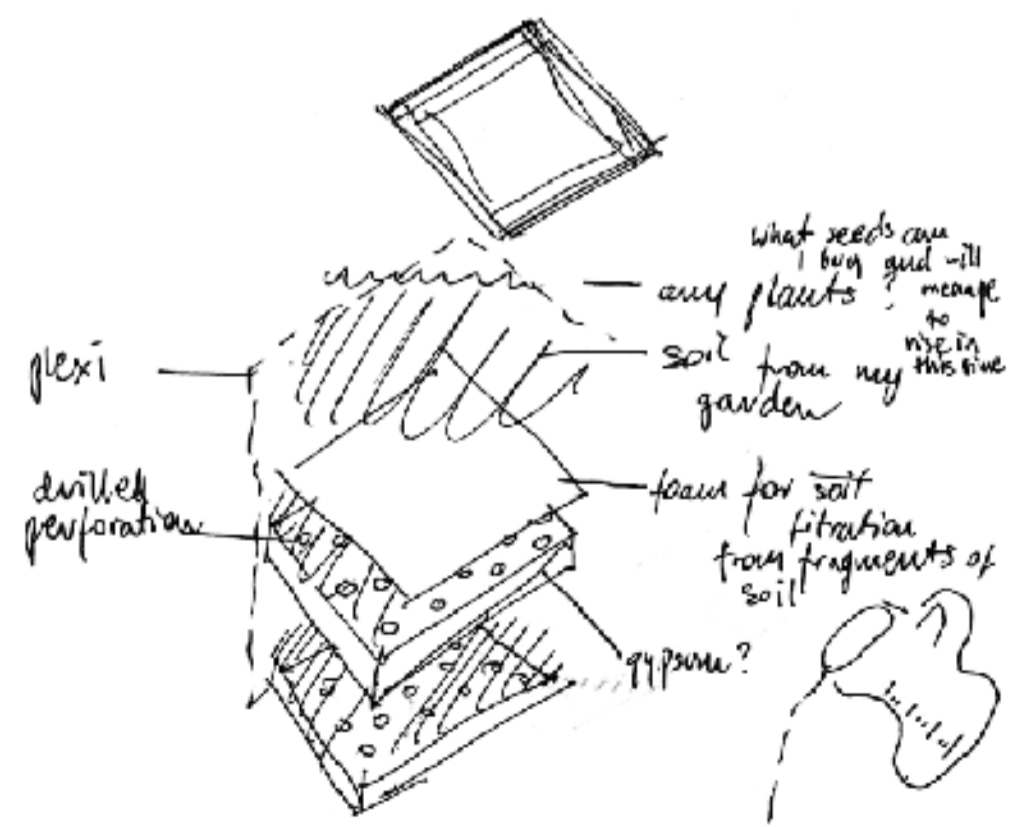
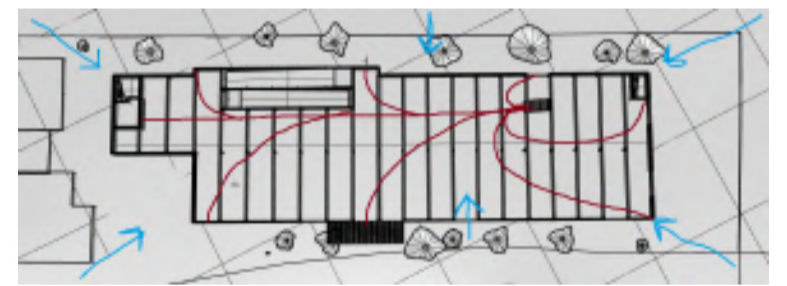
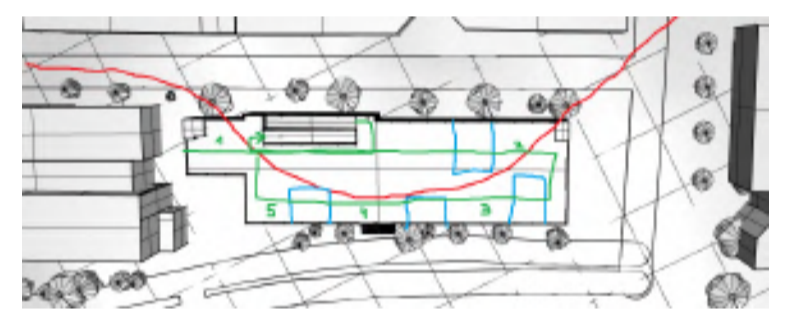
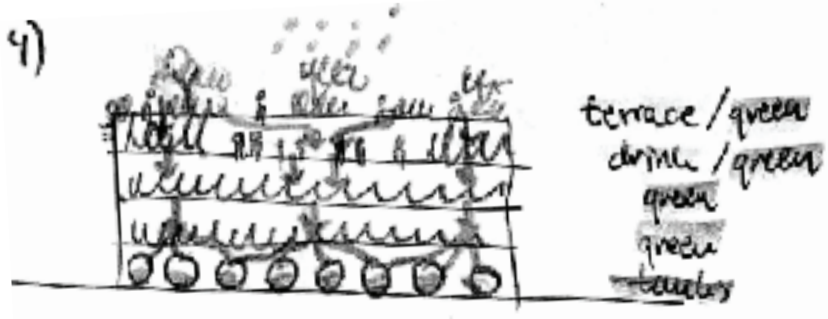
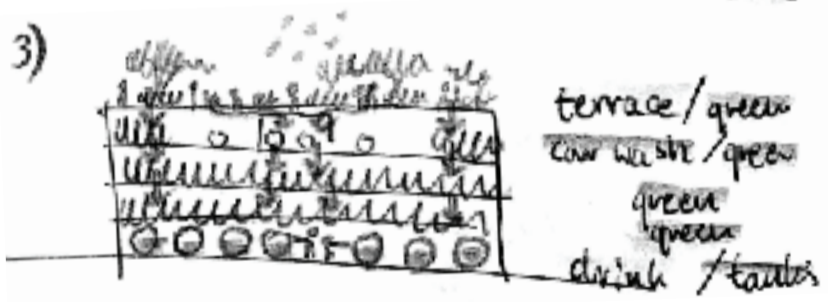
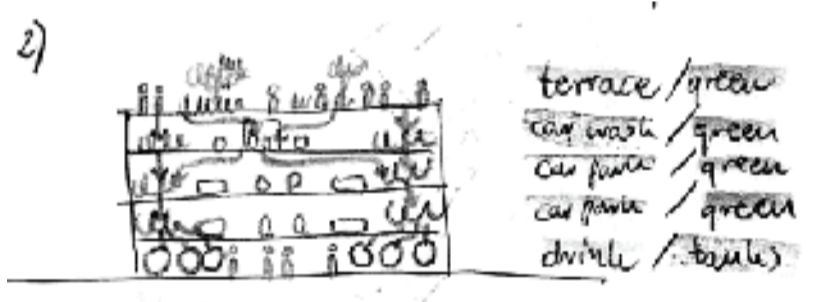
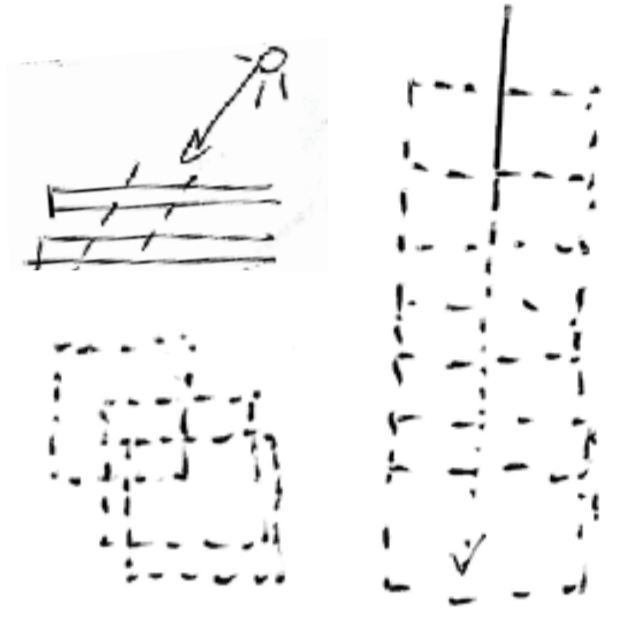
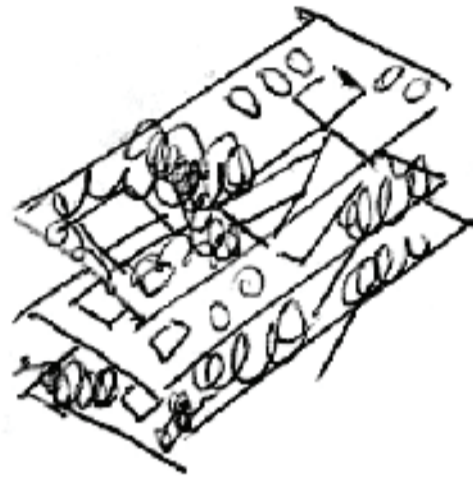
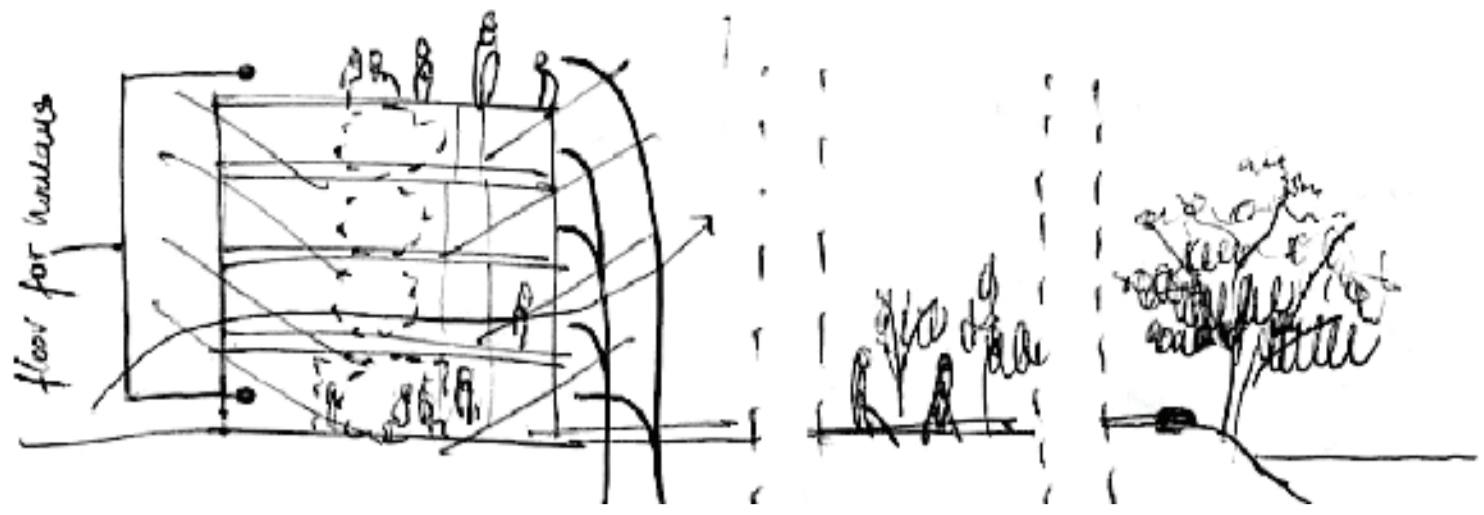
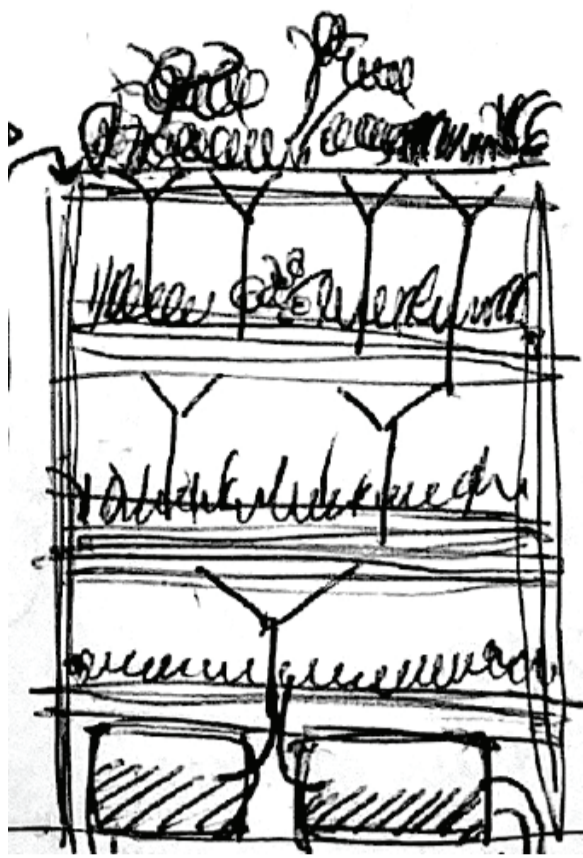


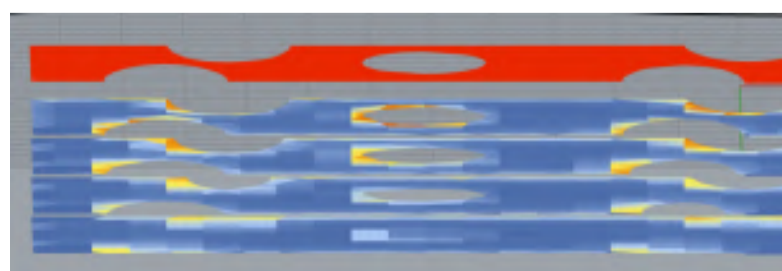
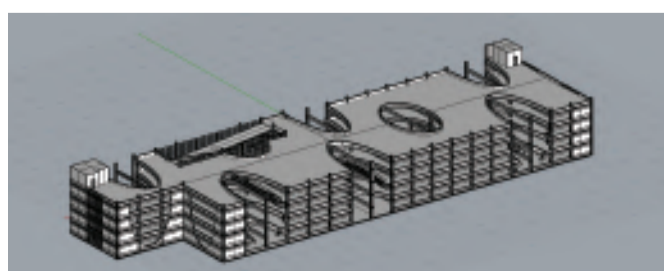
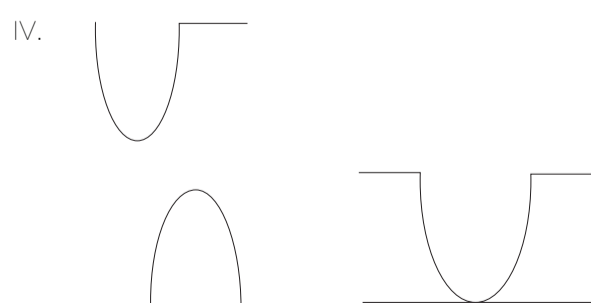
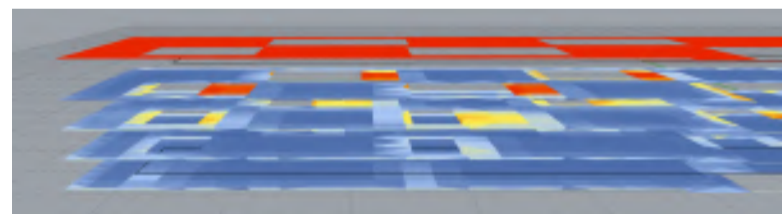
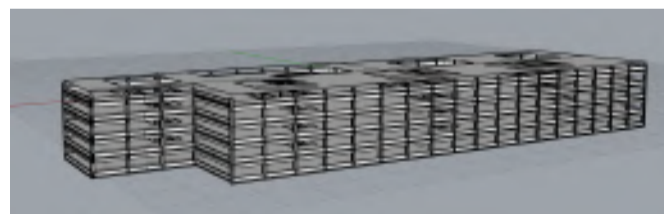
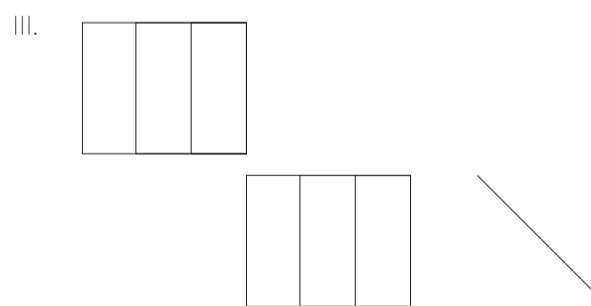
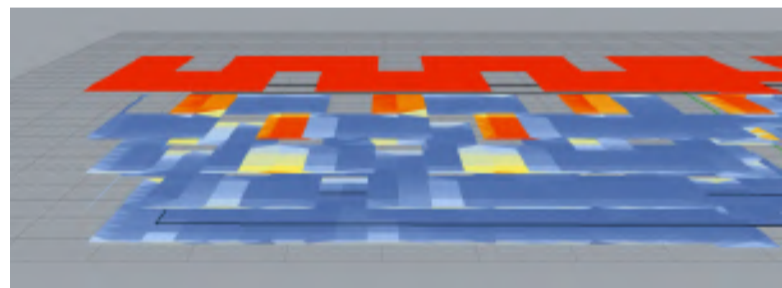
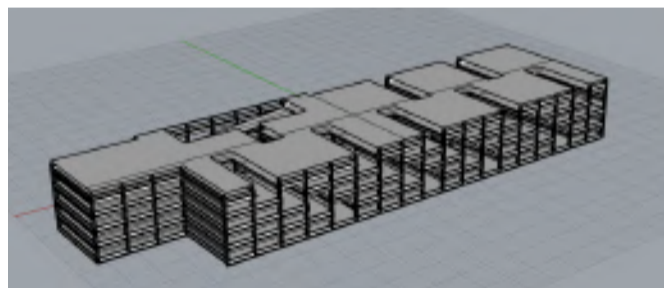
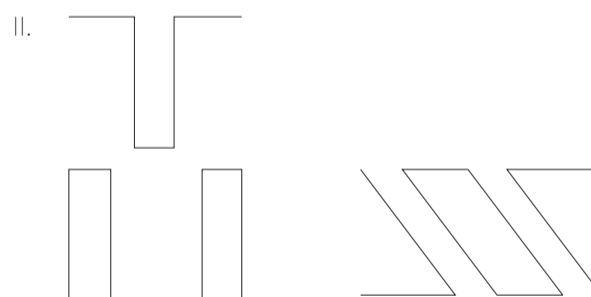
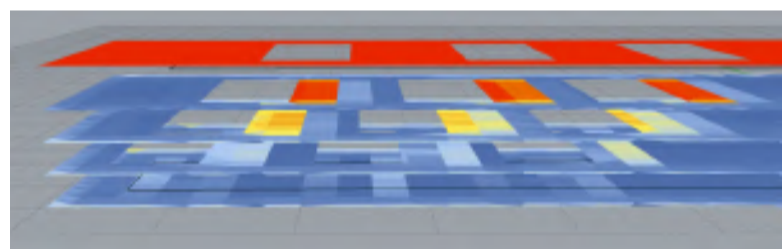
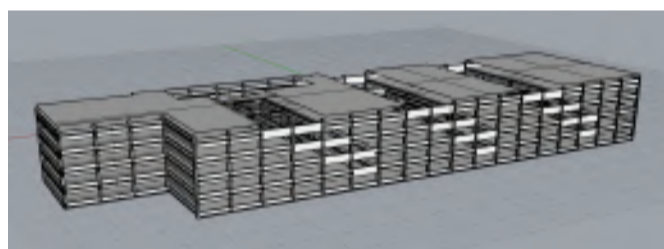
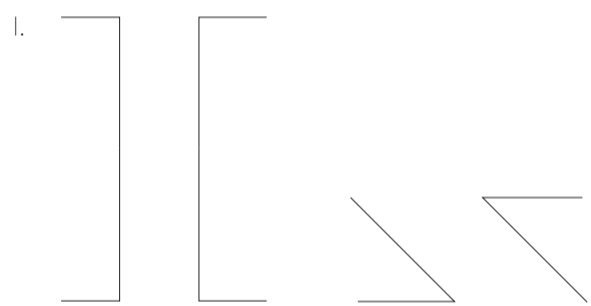
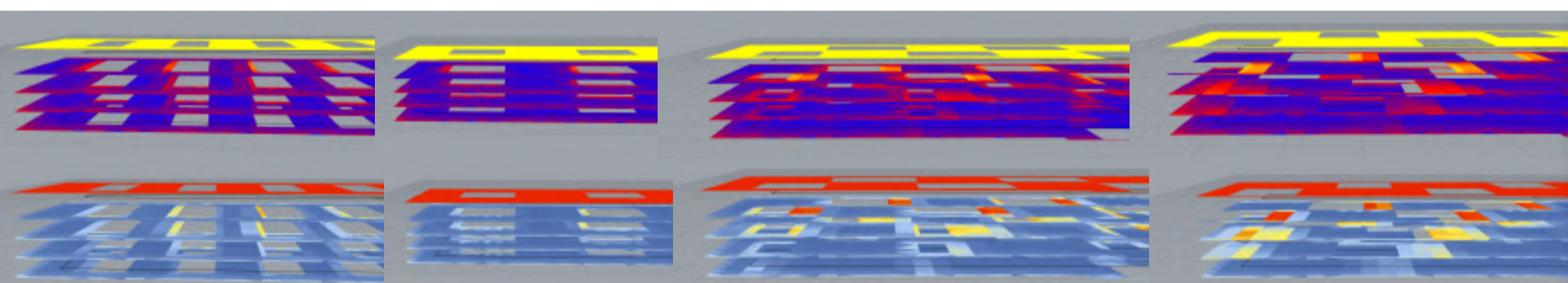
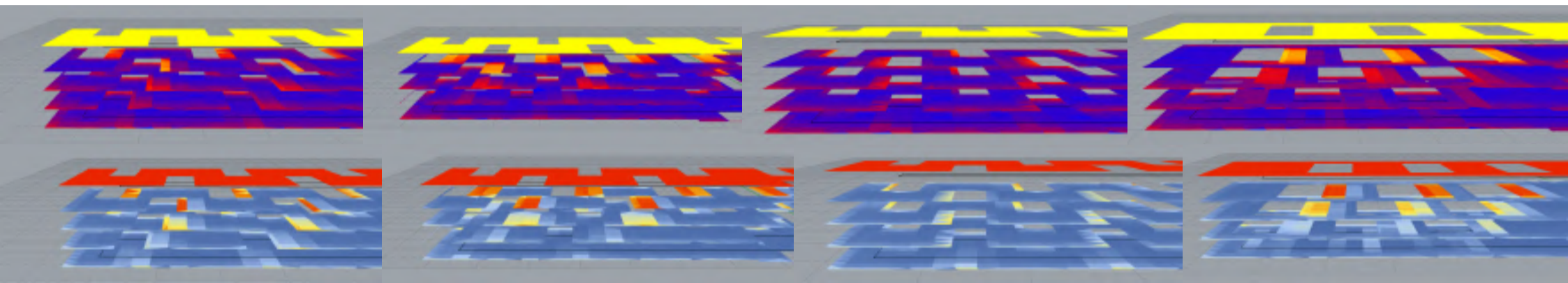
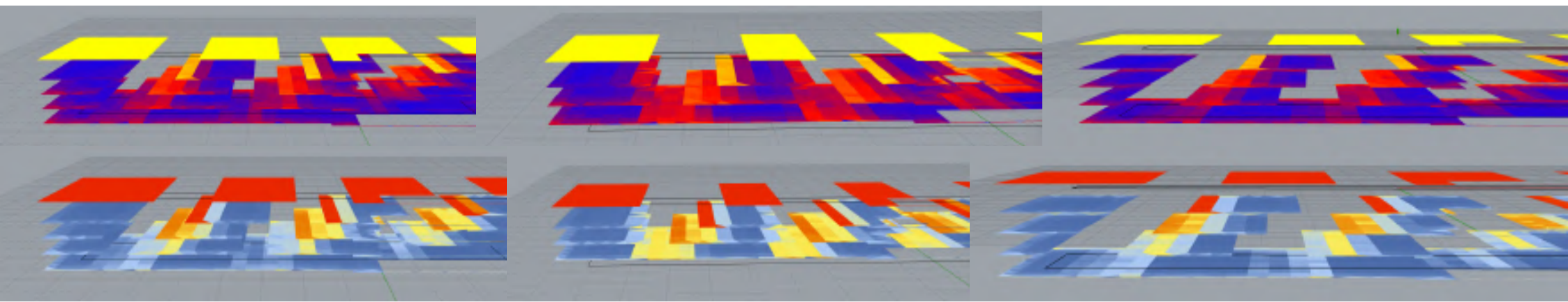
IJM Rimbayu



Gordon Matta-Clark

Pérez Art Museum Miami







SWOT ANALYSIS OF THE PROJECT

STRENGTHS

- The innovative concept focuses on converting each floor above ground into a green roof, utilizing diverse vegetation strategically selected for their water-filtering capabilities. Cleaned water will be stored on the ground level and might be used in building in water drinking station placed on the ground floor or can be transported outside of the building for public use.

- The greenery incorporated across multiple levels contributes to reducing air pollution, fostering a healthier environment for the surrounding area. It works as a filter from east, where high traffic roads deliver high polluted air, to west, where is an recreation area by the river.

- The project deliver habitat space for birds and flying insects, fostering ecological balance within the urban landscape and keeping friendly environment for growth of biodiversity.

- The incorporation of a water storage system aids in preventing flooding of Mölndalsån river, by managing water that used to rain on hard surfaces of parking lot and that used to transfer directly to city system, that fails during flooding periods.

WEAKNESSES

- Elliptical cutouts in existing construction of the building need coordination from construction engineer. Reinforcement of existing concrete slabs had been designed in a way to lean on both sided beams. What such a shaped cutout does is take away the support of one beam, transforming the slab's construction from a traditional double-supported structural element into a cantilevered structure.

- The building is in the neighbourhood of the river, but does not appear directly by the riverside. Office building that covers access to the river works as urban barrier between the project and the river.

- Gothenburg's short vegetation period poses a challenge for maintaining year-round greenery. This limitation may impact the visual appeal and functionality of the green roofs.

- Coordinating simultaneous water collection in multiple tanks may present operational challenges, requiring careful planning and management.

WATER PURIFICATION

- The system's efficiency can be enhanced by collecting additional water from surrounding buildings. To enhance the efficiency of this cleaning device, not only the amount of water can be increased but also the level of its pollution. The four levels of green roofs have the potential to purify more contaminated water than rainwater alone. Therefore, water from various sources, such as rainwater collected from surrounding roads polluted by car traffic, could be transferred via pipes to the top level of the building.

- Following opportunity in terms of water purification is collaboration with companies requiring purified water f. e.g. some food producents where extremely clean water is needed in production processes.

AIR POLLUTION

- The project has the potential to positively impact the health of both human and animal users, promoting well-being through a harmonious coexistence with nature.

HABITAT

- Designing the green roofs to support wintering of some animals adds an extra layer of sustainability, fostering biodiversity throughout the year.

- The project also delivers educational aspect in terms of relation between humans and animals. Users are not allowed to interrupt wildlife growing in the building, but can observe it.

FLOODING PRESERVATION

- The expansion of the system involves implementing the same approach in other multilevel parking lots across the river valley or throughout the entire city. This initiative aims to bring Gothenburg closer to the concept of a sponge city, as illustrated in the system growth illustration. In this vision, the buildings serve not only for water production, air purification, and animal habitat but also play a crucial role in preventing flooding in the city.

THREATS

STRUCTURAL CHALLENGES

- After consultations with constructor, there might be needed a step backwards to previous iteration of the project seen on evolutionary tree, where rectangular cutouts don't violate construction of the building.

URBAN BARRIER

- The building's distance from river pathways poses a threat to user engagement. Strategic land development may be required to ensure intuitive access. Roads leading to the project after adding some greenery and small architecture can work as small-scale green corridors.

SHORT VEGETATION PERIOD

- The condition of plants, aside from the vegetation period, combined with the limited sunlight hours and frequent rainy weather, might result in an unpleasant experience for the users. To address this issue, incorporating perennial plants such as coniferous shrubs could provide greenery throughout the year. Furthermore, during the winter months, additional decorative lighting inspired by Gothenburg's Christmas lighting can be implemented. This approach could transform the building into a tourist attraction, during the winter season.

WATER COLLECTION

- The potential lack of sufficient transporting machinery for water is logistical challenges of the system. To prevent situation of having all the tanks filled at the same time, some automatization of system might be added. For instance some pipes that leads to some containers might be closed to fill firstly the other tanks, that would be firstly ready to transport and use outside of the building.

- Another concern is the risk of slab overflow, which could potentially compromise the structural integrity of the building due to the weight of moistened soil. To mitigate the risk of overflow, an emergency drainage system should be installed to prevent any damage to the building.