OIKONET

A global multidisciplinary network on housing research and learning

# Resilient and sustainable housing: examples of student projects.

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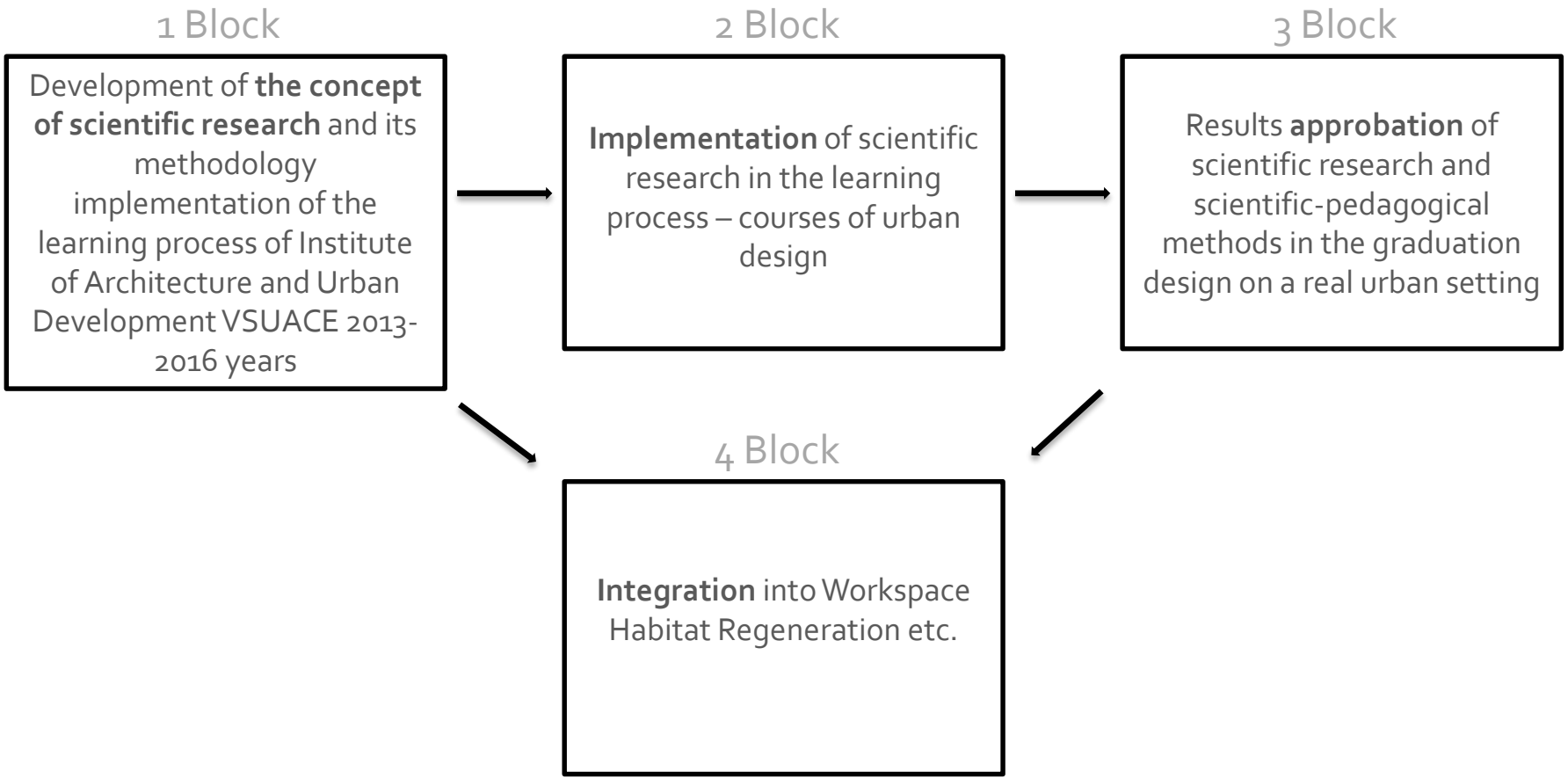
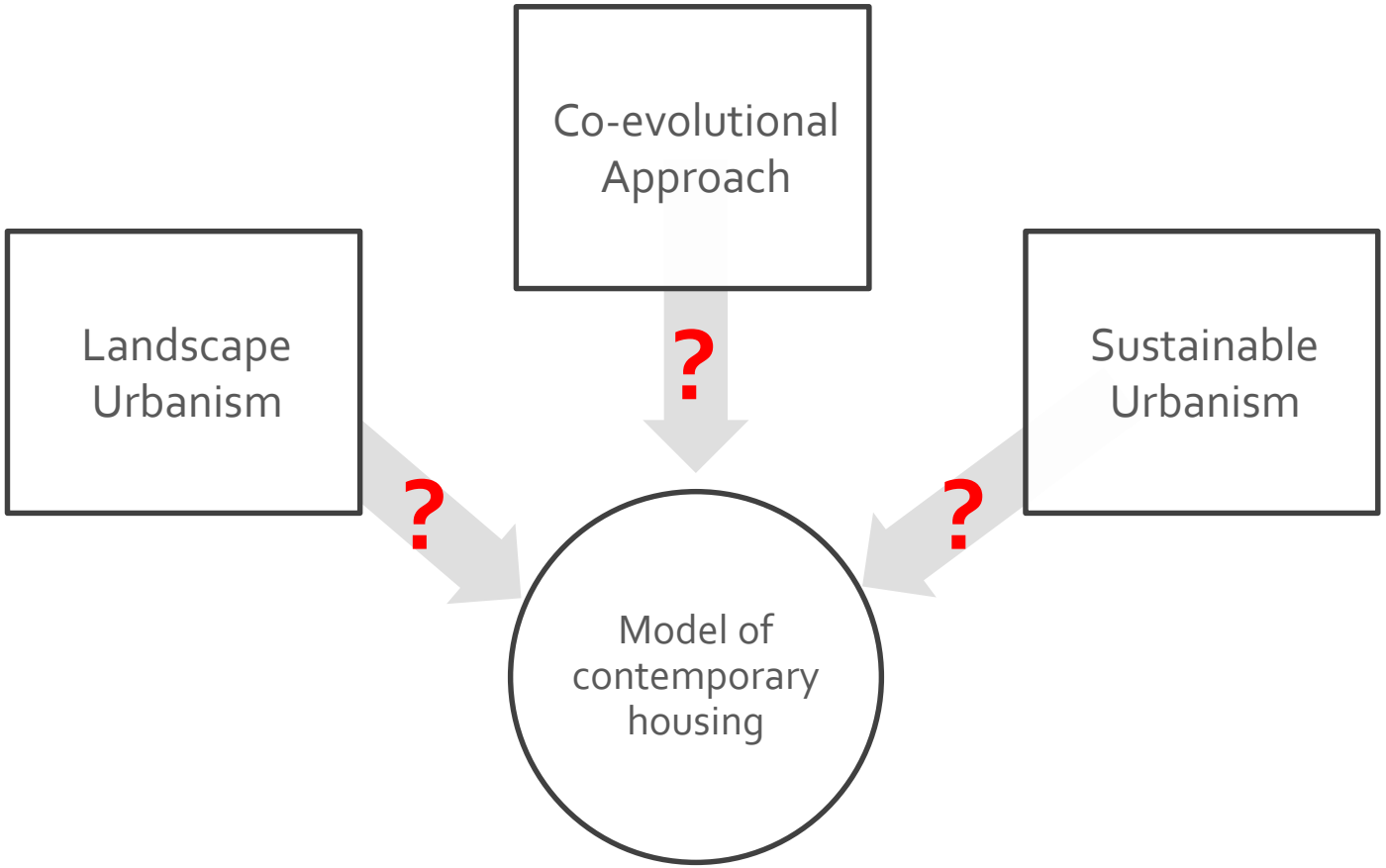
# STUDYING THEORETICAL AND PRACTICAL METHODS AND TECHNIQUES FOR DESIGNING FLEXIBLE AND SUSTAINABLE HOUSING STRUCTURES. THE INTRODUCTION OF THE TEACHING ARCHITECTURAL DESIGN AND INTEGRATION INTO THE EUROPEAN EDUCATIONAL PROCESS WITHIN THE PROJECT OIKONET



Modern directions of urban development in the context of increasing urbanization almost in all cities of the world, brought about by globalization, are directly dependent on the formation of new models of urban housing (residential structures) transformation.
At the moment, the current models of urban housing have no influence on the further development of the urban structure of the city, and because of its traditional static hamper the development of surrounding areas.
However, the formation of the modern housing (housing complex, a residential neighborhood, multi-apartment houses, etc.) should influence the development of neighborhoods, because any residential formation is not only a city-forming element in the development of the territory, but also an important element of social and urban planning structure, which requires the formation around its comfort-term urban infrastructure.

What is the model of a modern housing will contribute to a stable and comfortable urban housing environment and will be a vector for the development and transformation of neighborhoods, in the present conditions of urban regeneration?


Co-evolutional Approach
Landscape Urbanism
Sustainable Urbanism
?
?
?
Model of contemporary housing

# IMPLEMENTATION OF SCIENTIFIC RESEARCH ON THE TOPIC OFFLEXIBLE AND SUSTAINABLE GOUSING FORMATION INTO THE LEARNING PROCESS OF THE URBAN DESIGN WITHIN THE PROJECT OIKONET

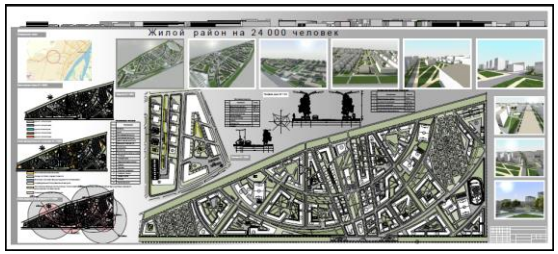
## Courses of urban design (2013-2016 years)

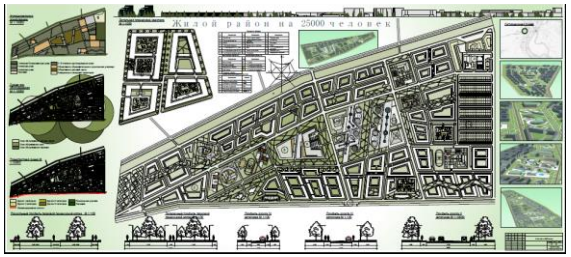
3rd year bachelors - Residential area of 25 000 inhabitants (winter semester)
3rd year bachelors - Multi-storey residential building complex (spring semester)
4th year bachelors - City 50 000 - 100 000 th. residents (winter semester)
4th year bachelors - Reconstruction of the city (spring semester)
4th year bachelors - Reconstruction of the quarter (spring semester)
5th year specialists - City 50 000 - 100 000 th. residents (winter semester)
5th year specialists- Reconstruction of the city (spring semester)
5th year specialists - Reconstruction of the quarter (spring semester)

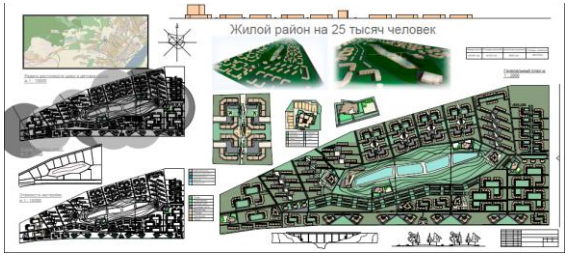
# SUMMARY

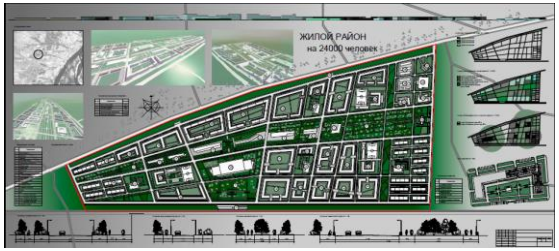
In the process of course of urban design on ”housing" bachelors 3rd year (group ARCH-1-11) was carried out in the residential area project on the actual territory of the city of Volgograd, which is based on the use of modern principles of town planning flexibility and stability in the formation of a residential neighborhood urban planning as a structural unit of the district.

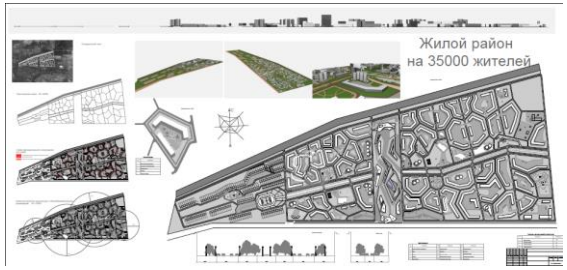
Bachelors 3rd year (group ARCH-1-11)
Prof. E.Krasilnikova , doc. V.Rusanov.



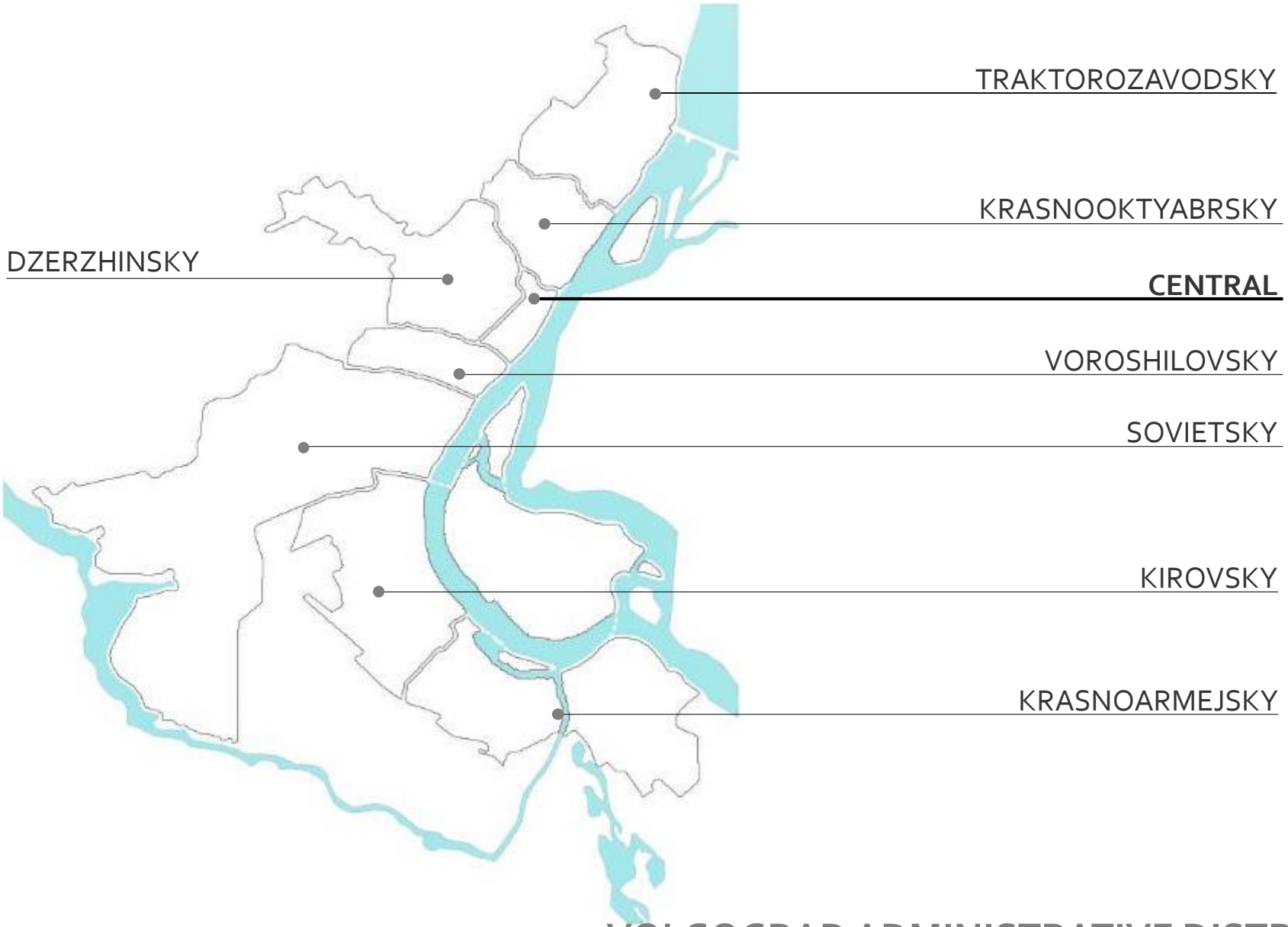



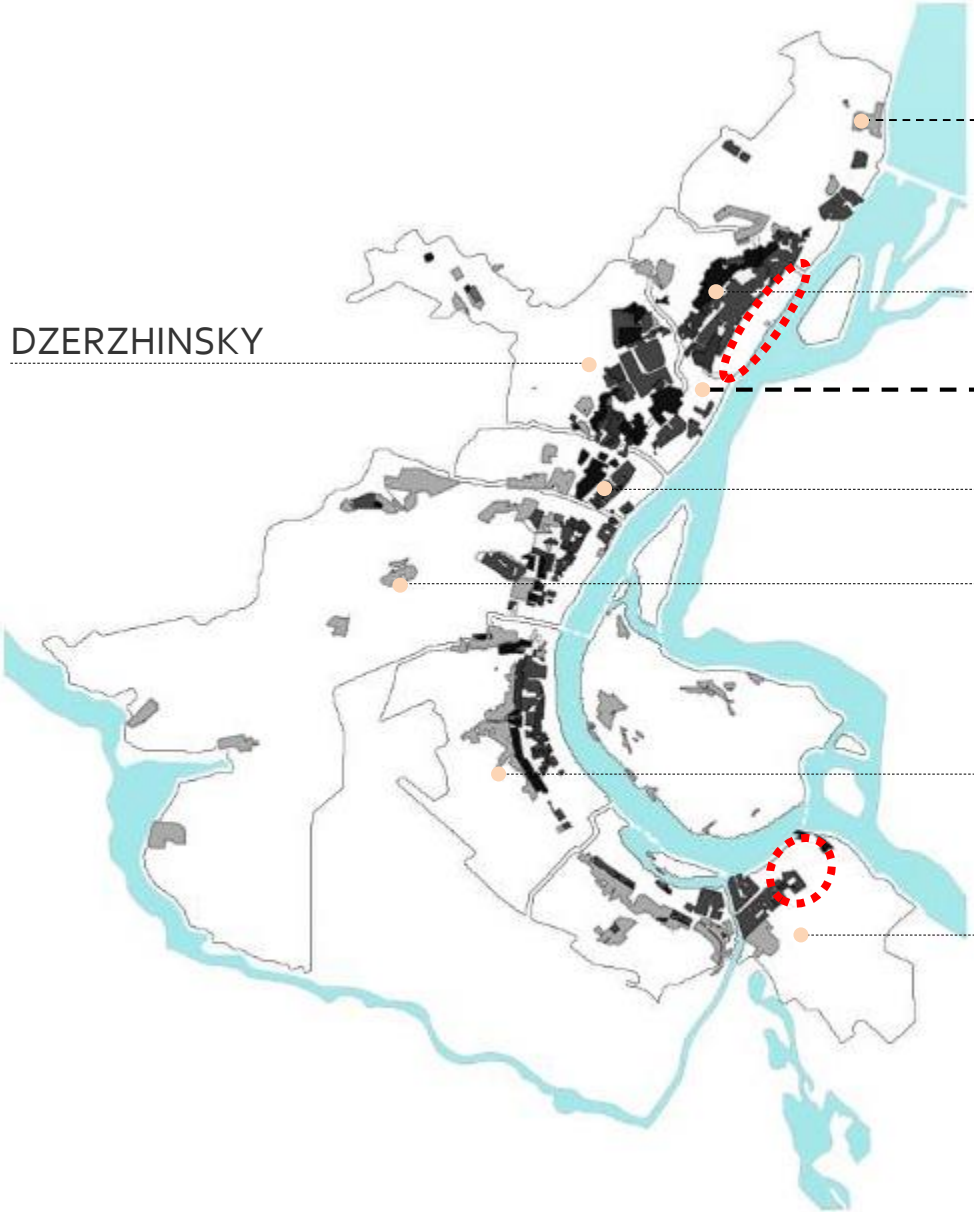



# LOCATION OF VOLGOGRAD IN EUROPE SCALE

BIG CITIES ON THE VOLGA RIVER



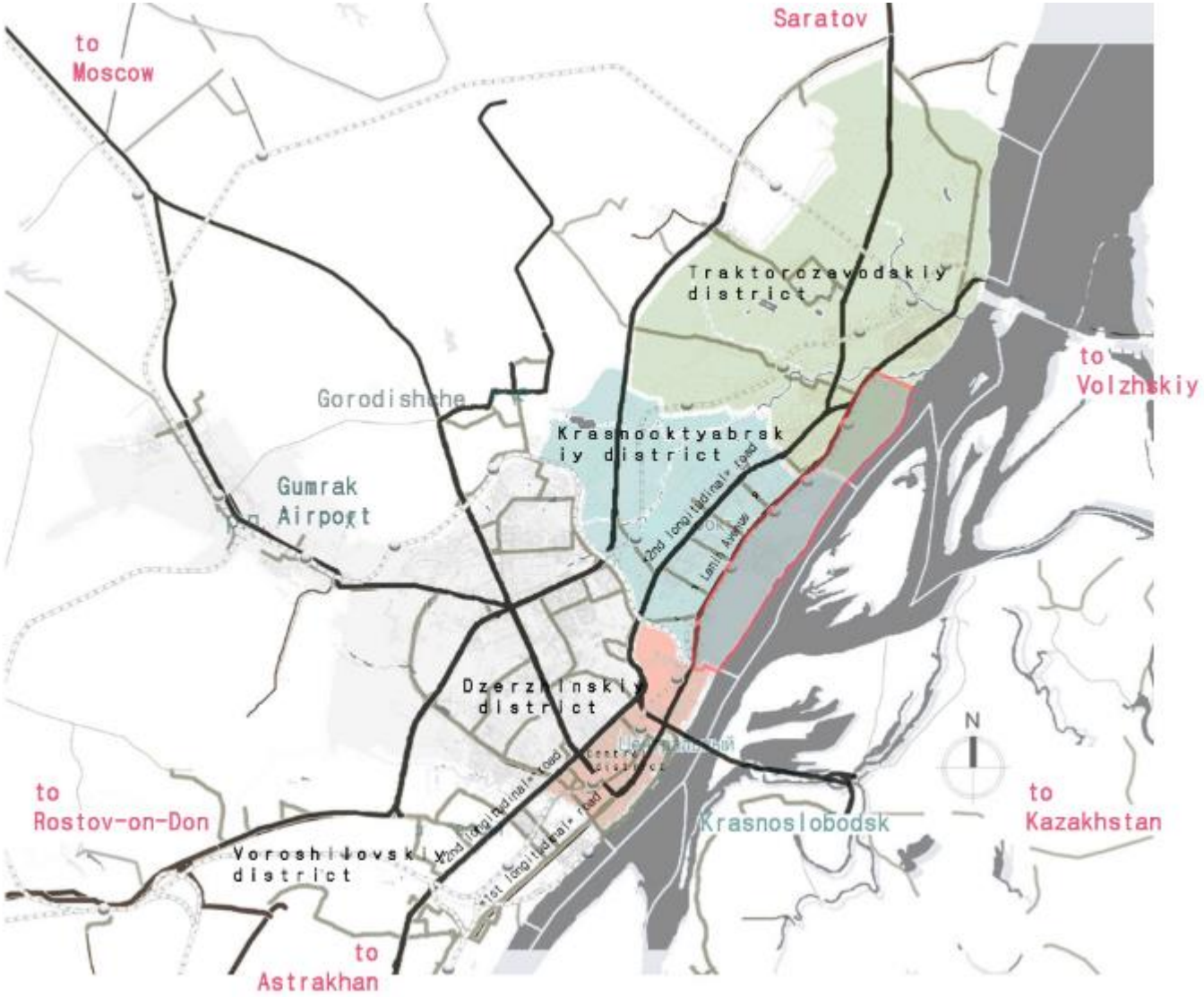

# VOLGOGRAD ADMINISTRATIVE DISTRICTS




# RESIDENTIAL AREAS &

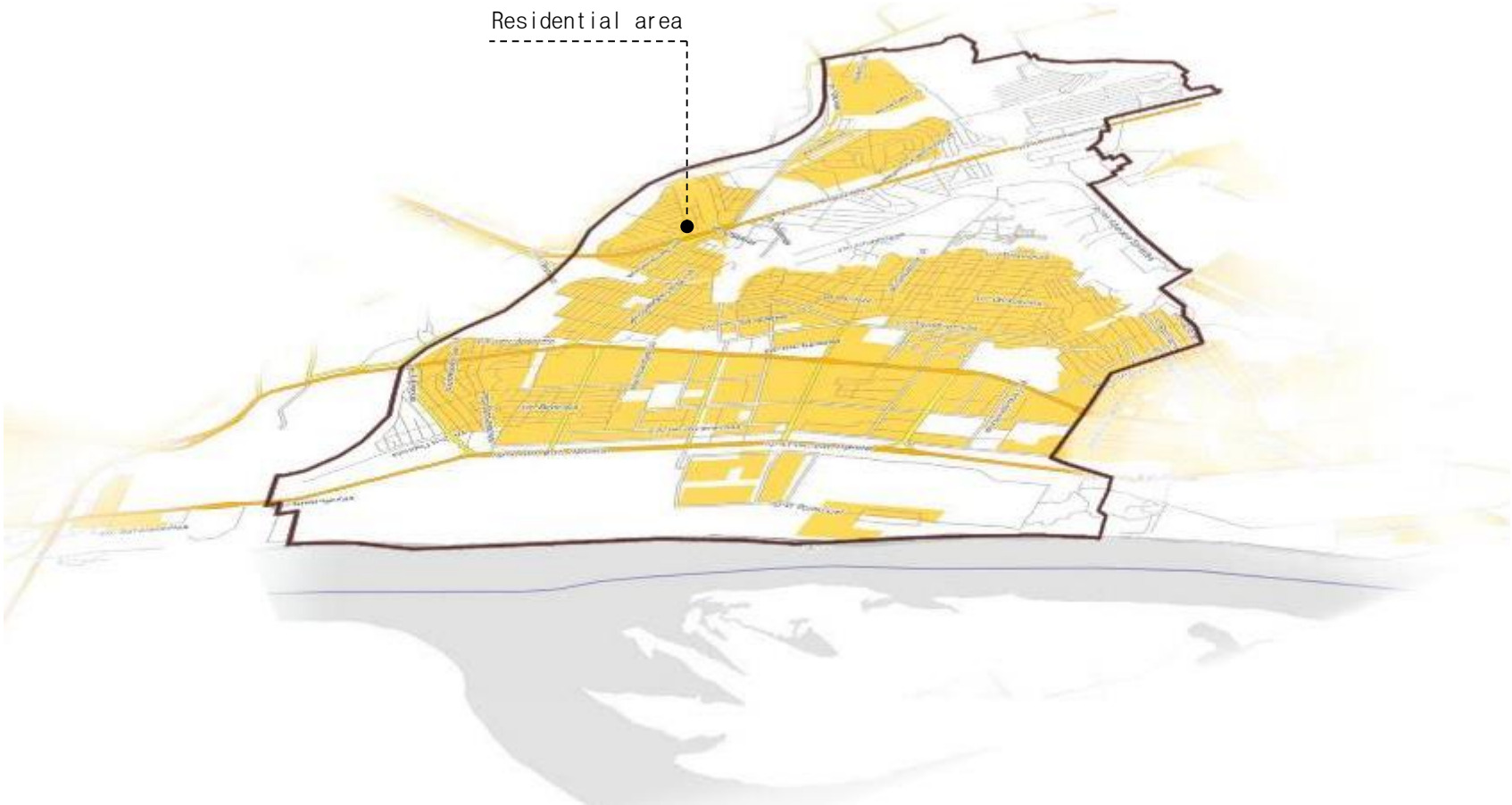
## PROPOSED RECONSTRUCTED AREAS

# SCHEME OF THE TERRITORY
# TRANSPORT CONNECTION WITH THE MAIN CITY ROADS



# KRASNOOKTYABRSKY DISTRICT
# (MASTER PLAN OF VOLGOGRAD UP TO 2025)

# KRASNOOKTYABRSKY DISTRICT: RESIDENTIAL AREA (MASTER PLAN of VOLGOGRAD)



# KRASNOOKTYABRSKY DISTRICT: RESIDENTIAL AREA (MASTER PLAN of VOLGOGRAD)

# KRASNOOKTYABRSKY DISTRICT: RESIDENTIAL AREA
# TYPES OF RESIDENTIAL BUILDINGS

Increasing the density of buildings in the quarter

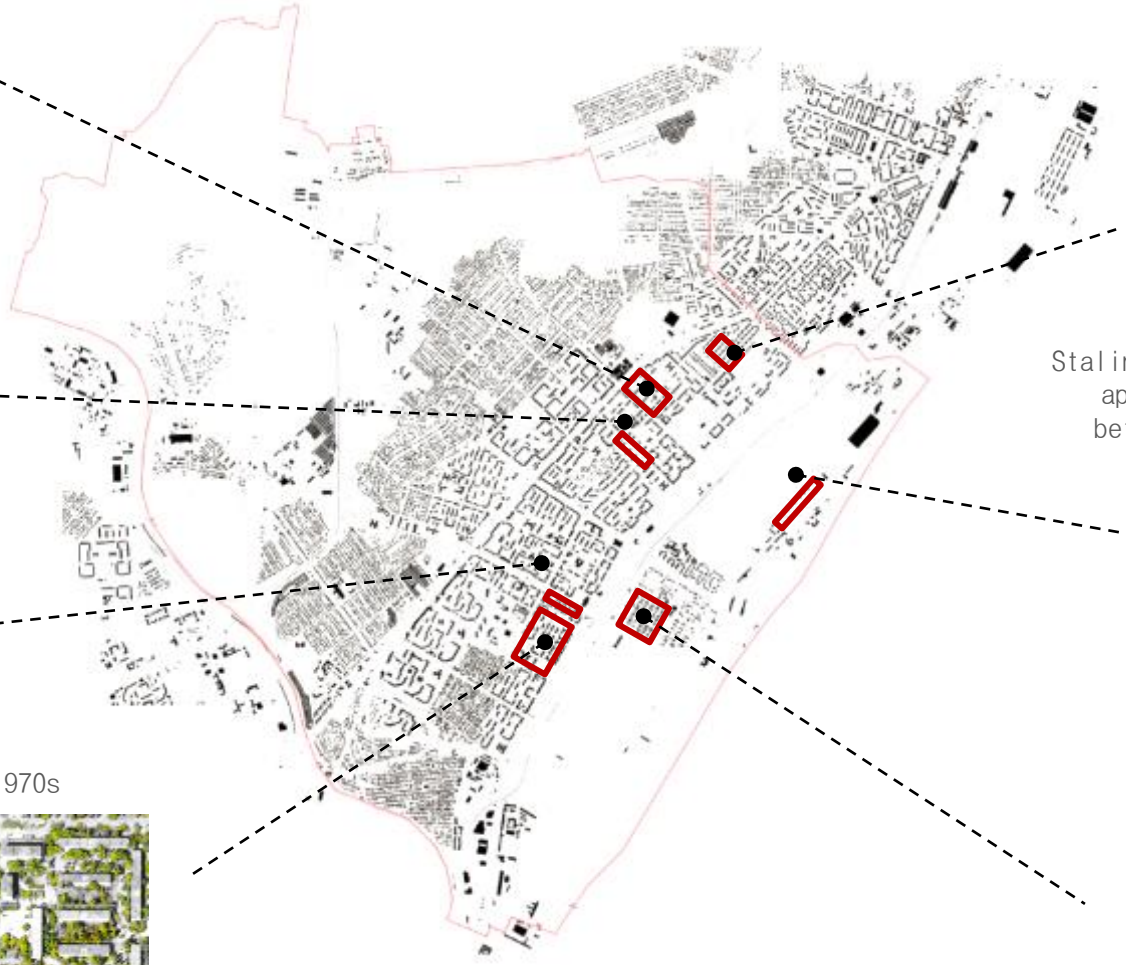
Apartments 1900s

Apartments 2000s

Big Quarter 1950-1970s

Stalingrad period apartments before 1950s

Stalingrad period apartments before 1950s

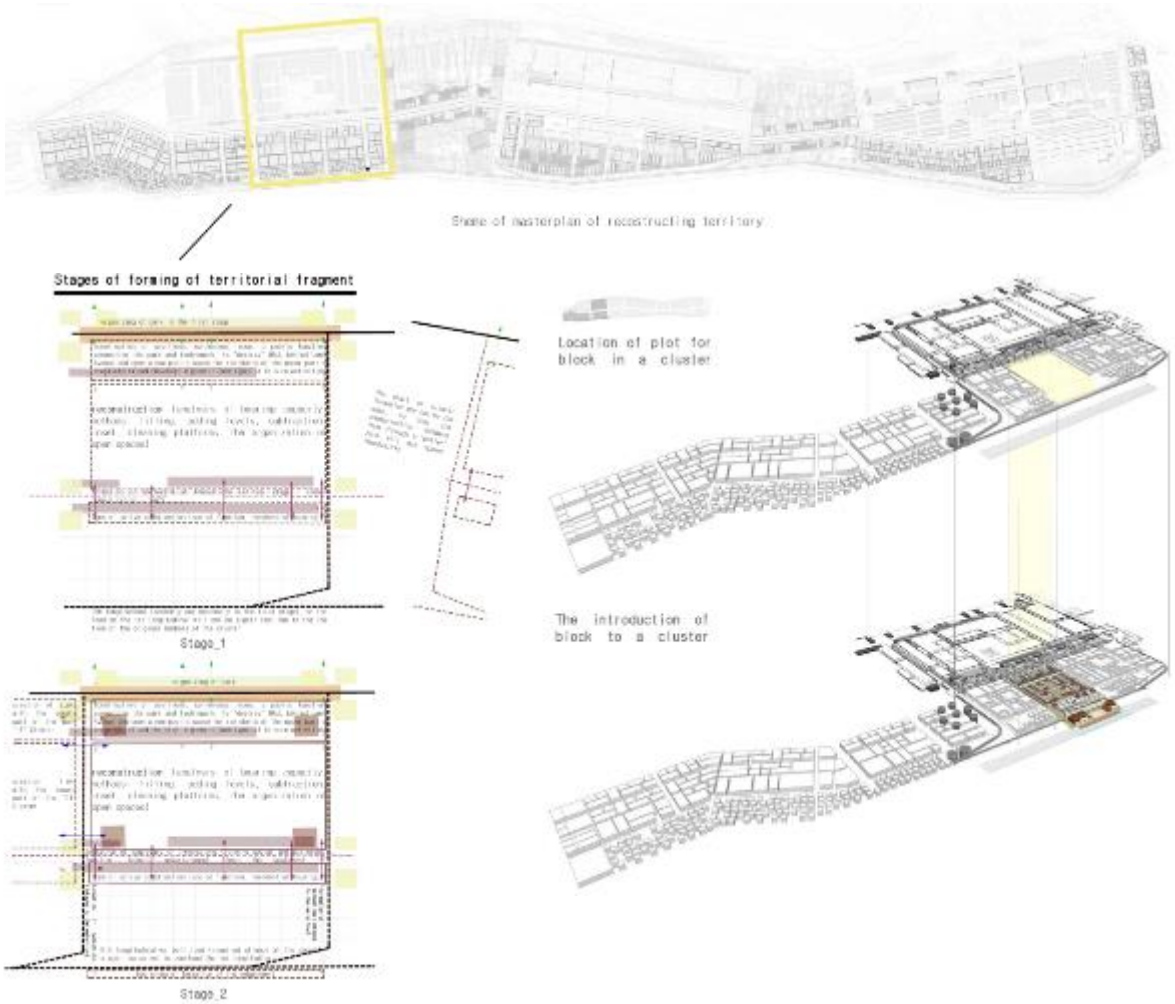


## INDIVIDUAL DWELLINGS

# THE MAIN PROBLEMS OF RESIDENTIAL AREA OF KRASNOOKTYABRSKY DISTRICT

- Lack or insufficiency of public, semipublic and private differentiation
- Unorganized area of residential quarters
- Unorganized parking
- Non safe residential area for recreation
- Low variety of residential apartment typology
- Lack of access to the waterfront because of unorganized river embankment and industrial zone

# PROPOSAL: STAGES OF FORMING OF TERRITORIAL FRAGMENT AND BLOCKS WITHIN ON AN EXAMPLE OF IT CLUSTER

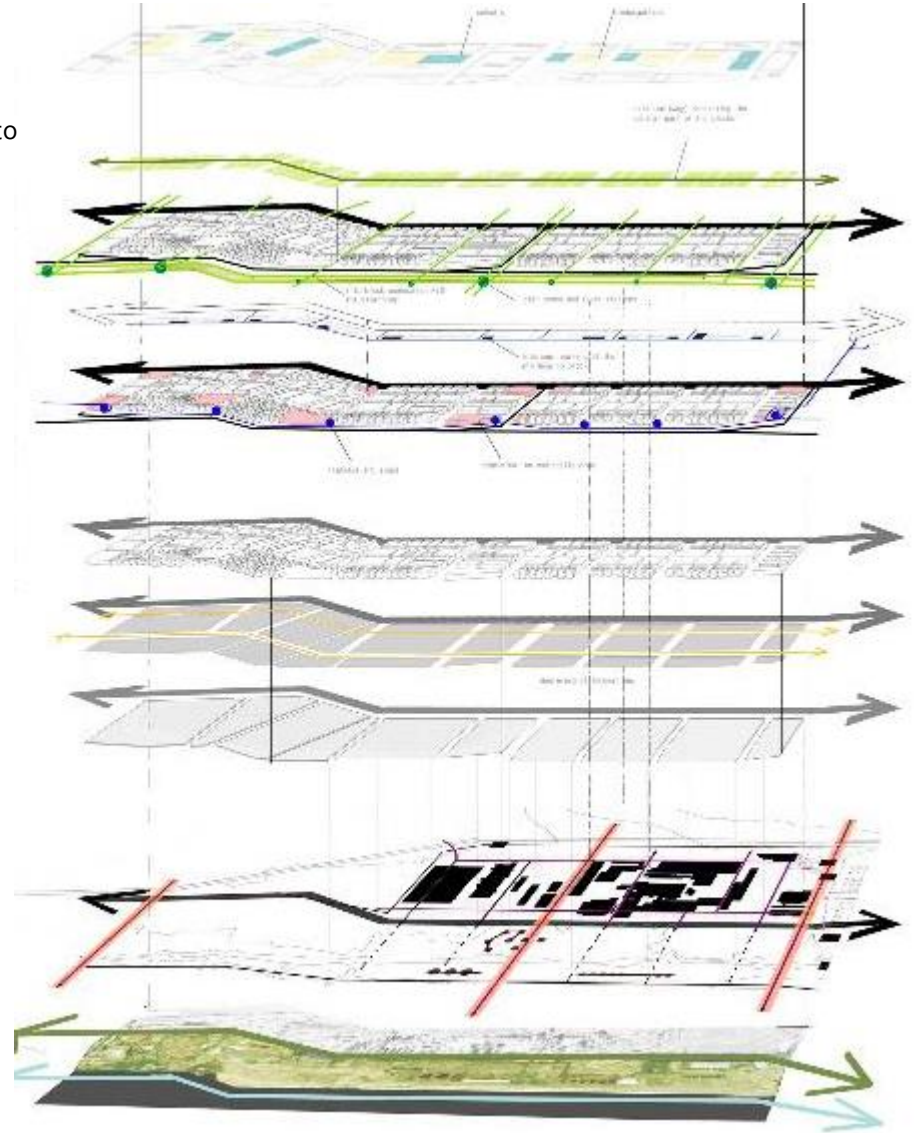


# DISTRICT LEVEL REFUNCTIONALIZATION (CLUSTER IT): THE PRINCIPLE OF FLEXIBILITY AND SUSTAINABILITY

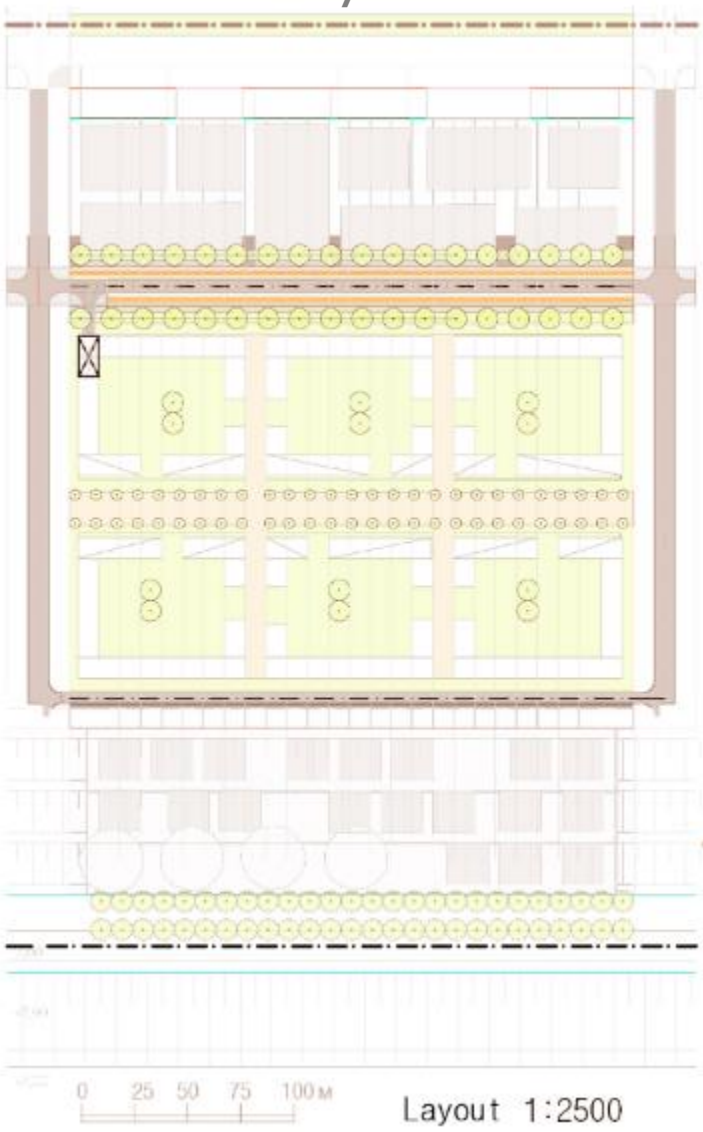
- Social infrastructure (schools, kindergartens) within walking distance is connected with housing by pedestrian connections.
- Formation interblock (visitor area) and intrablock (for residents) accessibility to the water boundary-river embankment.

  * Embankments of all the clusters have their own architectural-planning nature, also embankment has an architectural and planning variability on the territory of the cluster.

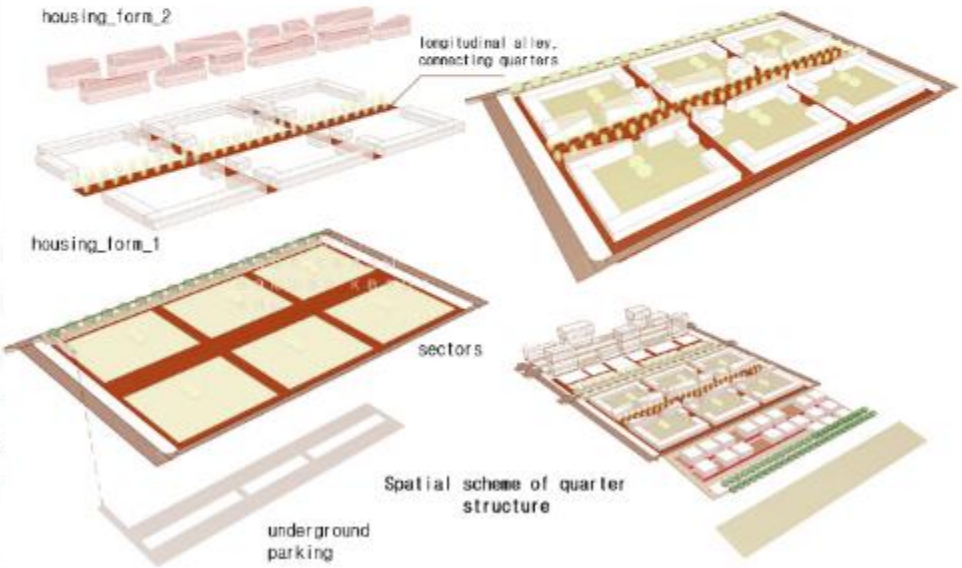
- Provide the users of the territory (residents and temporary visitors) with the availability of high-speed public transport connecting the different parts of the city along the river.
- Intercept parking at the entrance and the underground parking block make the area safe for pedestrian traffic.
- Formation of communications and public (retail and entertainment, small business) areas in the planning fabric.
- The planning flexibility of internal space blocks, which allows to form a typological and morphological diversity of buildings (residential and mixed) and private, semi-private spaces.
- Longitudinal internal pedestrian traffic axis (street, avenue, a system of small and medium-sized parks) connecting hybrid blocks.
- Formation boundaries hybrid blocks.
- Main longitudinal axis of the industrial landscape forming the upper limit of development. Transverse axis of the industrial landscape, forming highways and local streets axis.
- Natural (the Volga) and Landscape (differential relief) factors forming the lower boundary of building.



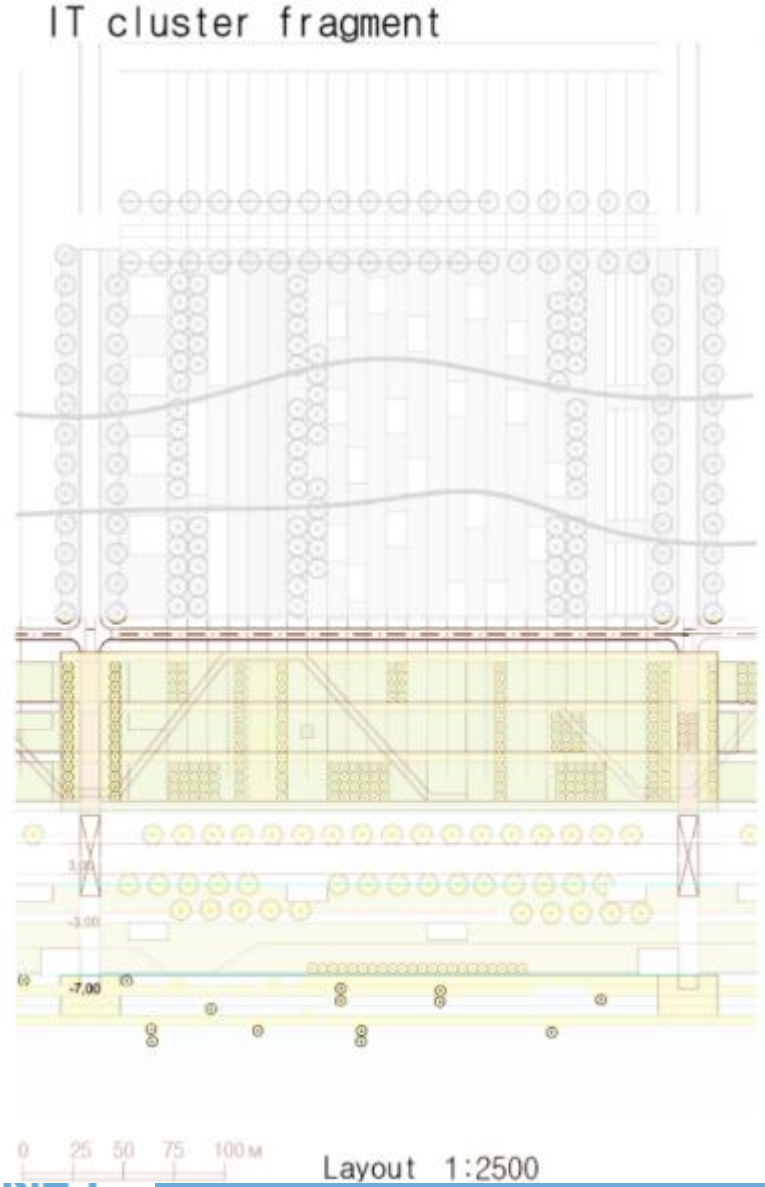
# HOUSING STRUCTURES TYPOLOGIES of IT-CLUSTER (typological variability in architectural and planning solution of block core)

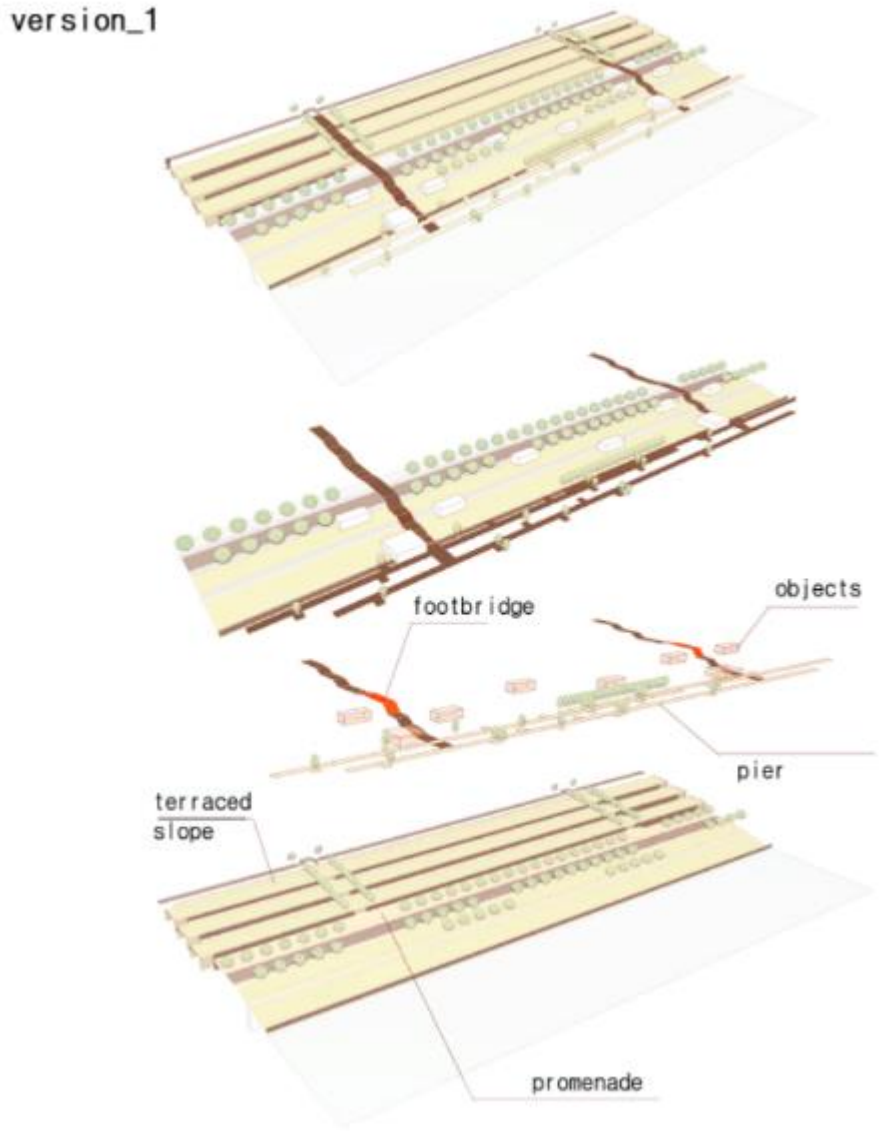



| Location of a blocks in the quarter | Number of blocks | Housing fund, м2 | | Number of parking places |
|---|---|---|---|---|
| | | form_1 | form_2 | |
| outside | 4 | 2 fl ×1310 =2620 м 2 | 4 fl ×700 =2800 м 2 | 4×5420 м 2/80=270 |
| | | 5420 | | |
| middle | 2 | 2 fl ×1410 =2820 м 2 | 4 fl ×700 =2800 м 2 | 2×5620 м 2/80=140 |
| | | 5620 | | |
| Entire quarter (S=47000 м 2) | | 32920 | | 410 |

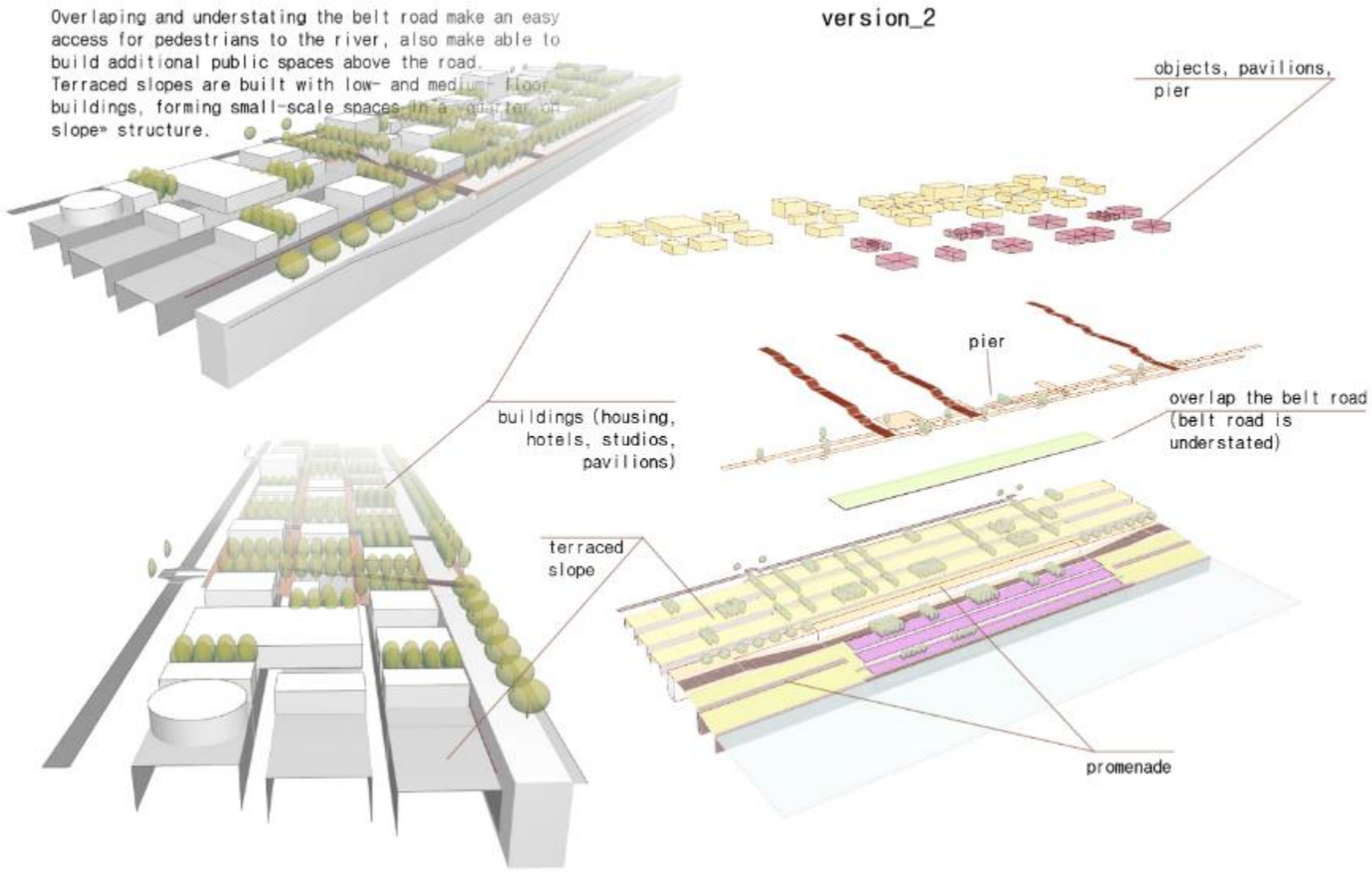


# FORMING OF IT AND AGRICULTURAL CLUSTERS IN A STRUCTURE OF PROJECTED EMBANKMENT - AS MULTIFUNCTIONAL PUBLIC AND RECREATIONAL AREAS

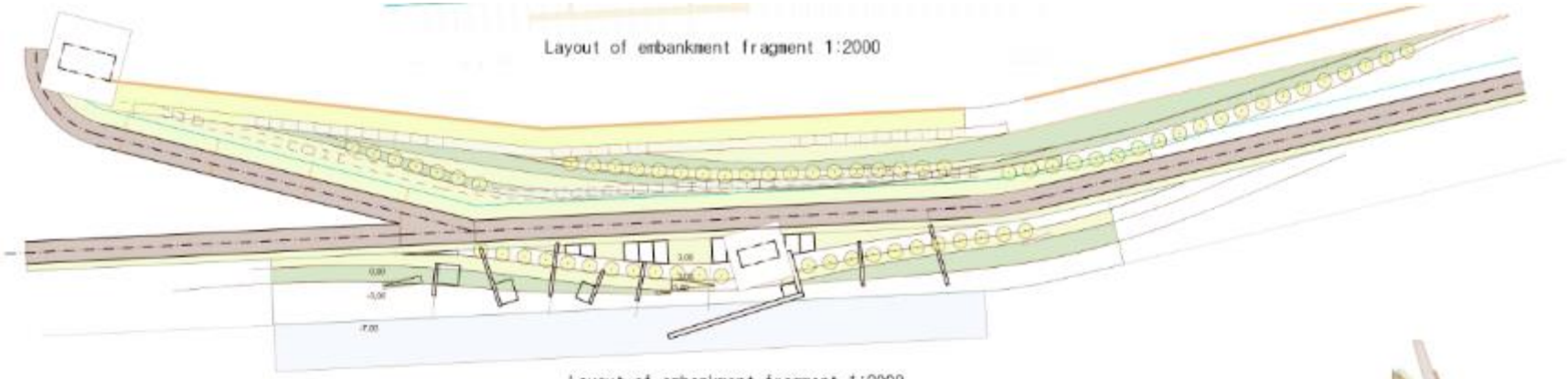


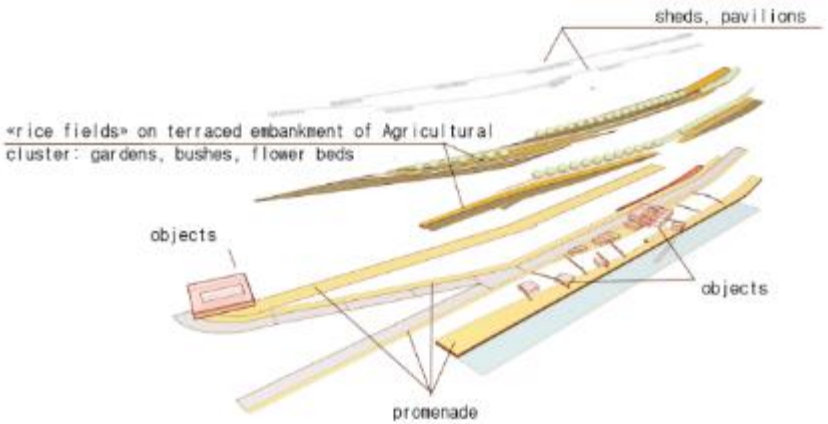
# FORMING OF IT CLUSTER IN A STRUCTURE OF PROJECTED EMBANKMENT -AS MULTIFUNCTIONAL PUBLIC AND RECREATIONAL AREAS

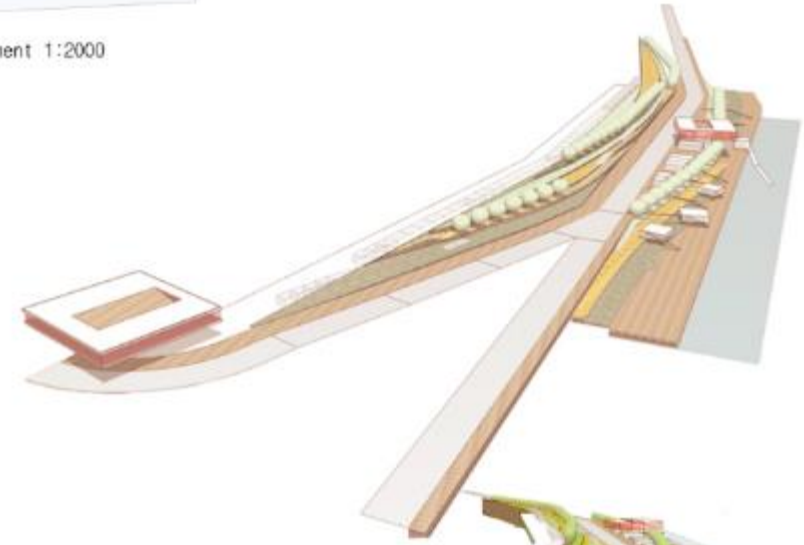


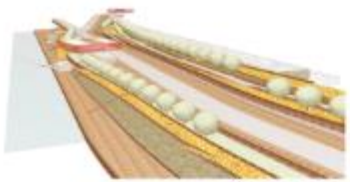
# FORMING OF AGRICULTURAL CLUSTER IN A STRUCTURE OF PROJECTED EMBANKMENT -AS MULTIFUNCTIONAL PUBLIC AND RECREATIONAL AREAS

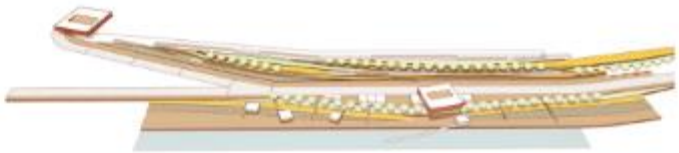


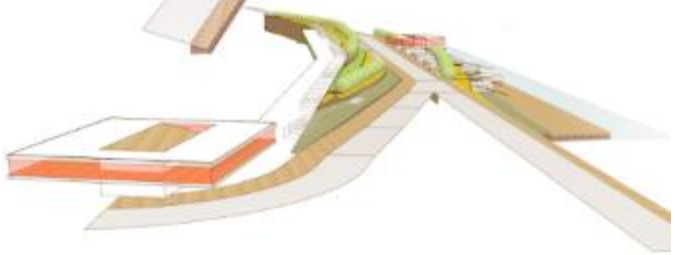

Layout of embankment fragment 1:2000



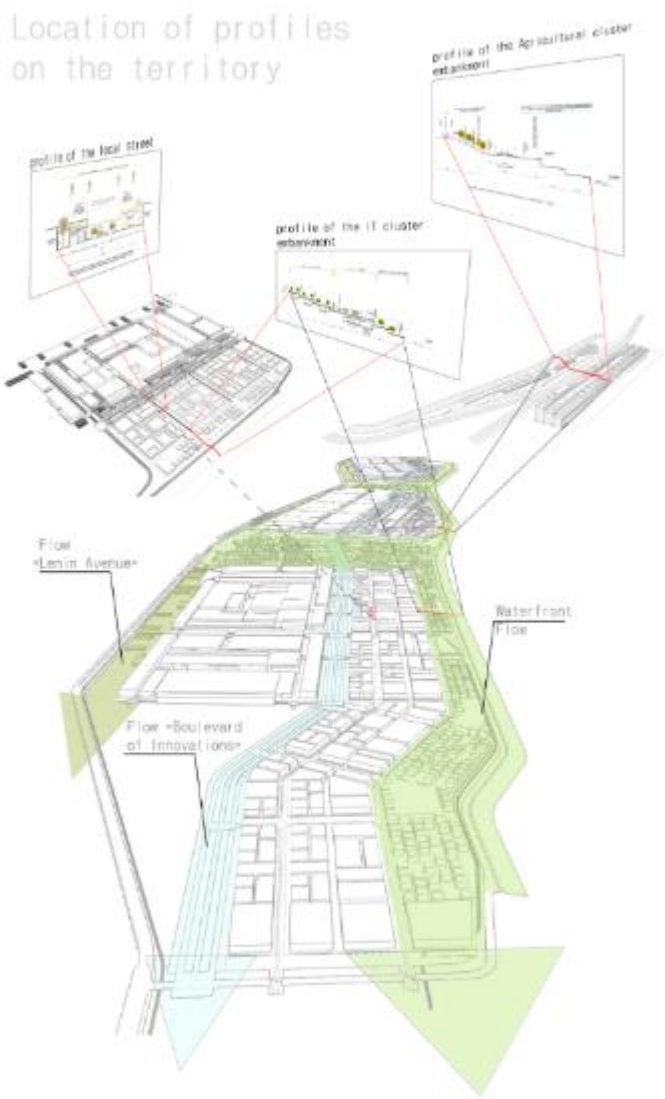





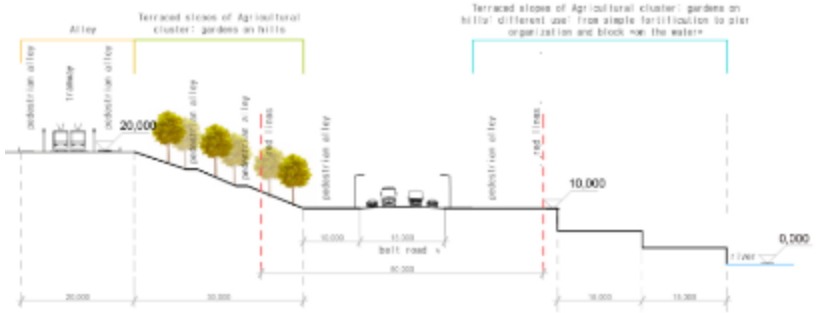




# PROFILES




Profile of the local street: additional pibic spaces and elevated lits between blocks




Profile of the Agricultural cluster embankment


Profile of the IT cluster embankment

# TOWN-PLANNING ANALYSIS OF THE KRASNOARMEYSKY DISTRICT

Scheme the Krasnoarmeysky district

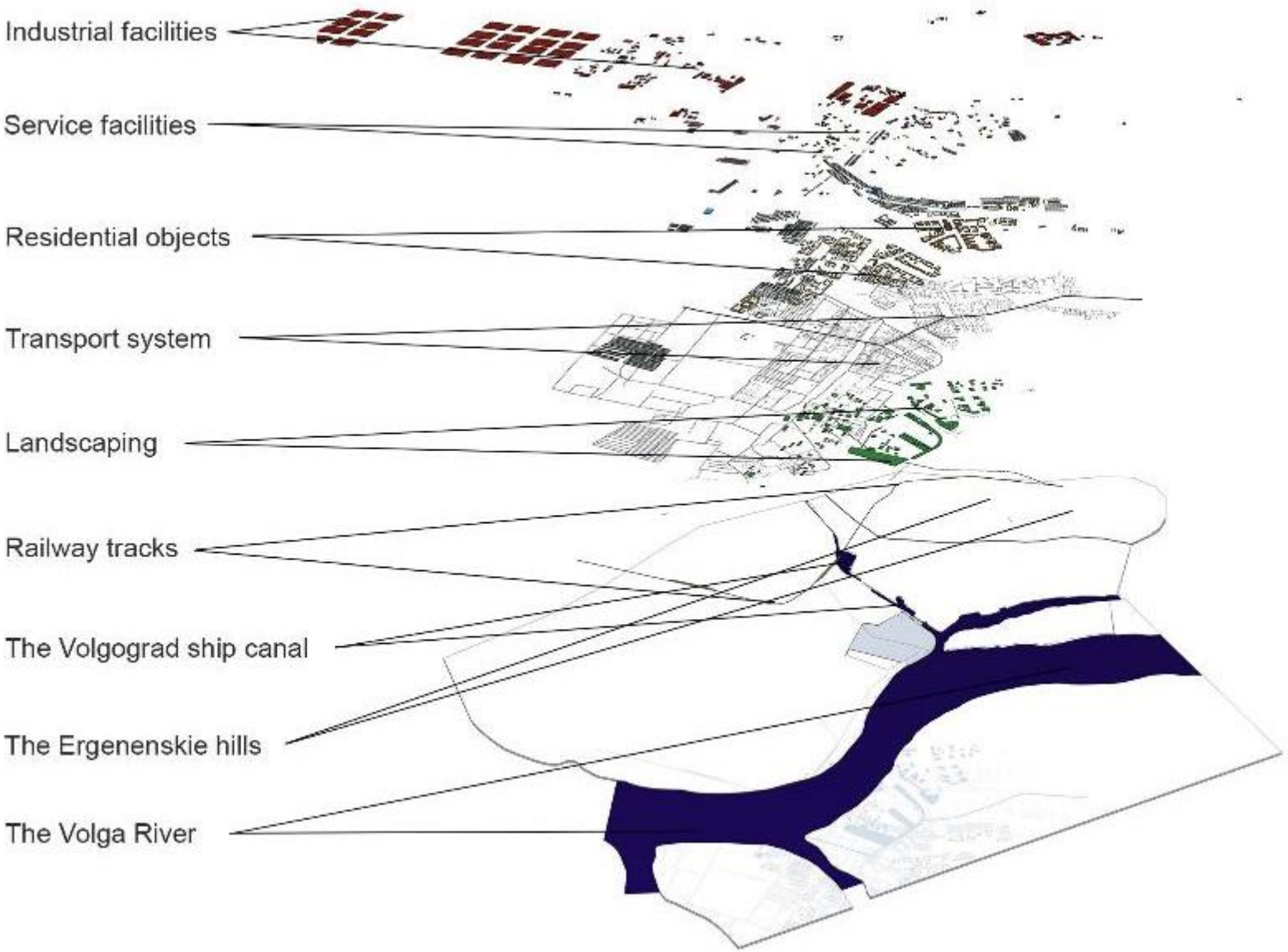
Accommodation of the industrial enterprises

Zone of social activity

Scheme of transport connection the territory with main city roads

Location of the Krasnoarmeysky district in the city of Volgograd

# STRUCTURE OF KRASNOARMEISKY DISTRICT



# RESIDENTIONAL FUND OF KRASNOARMEYSKY DISTRICT

1.Individual residential homes

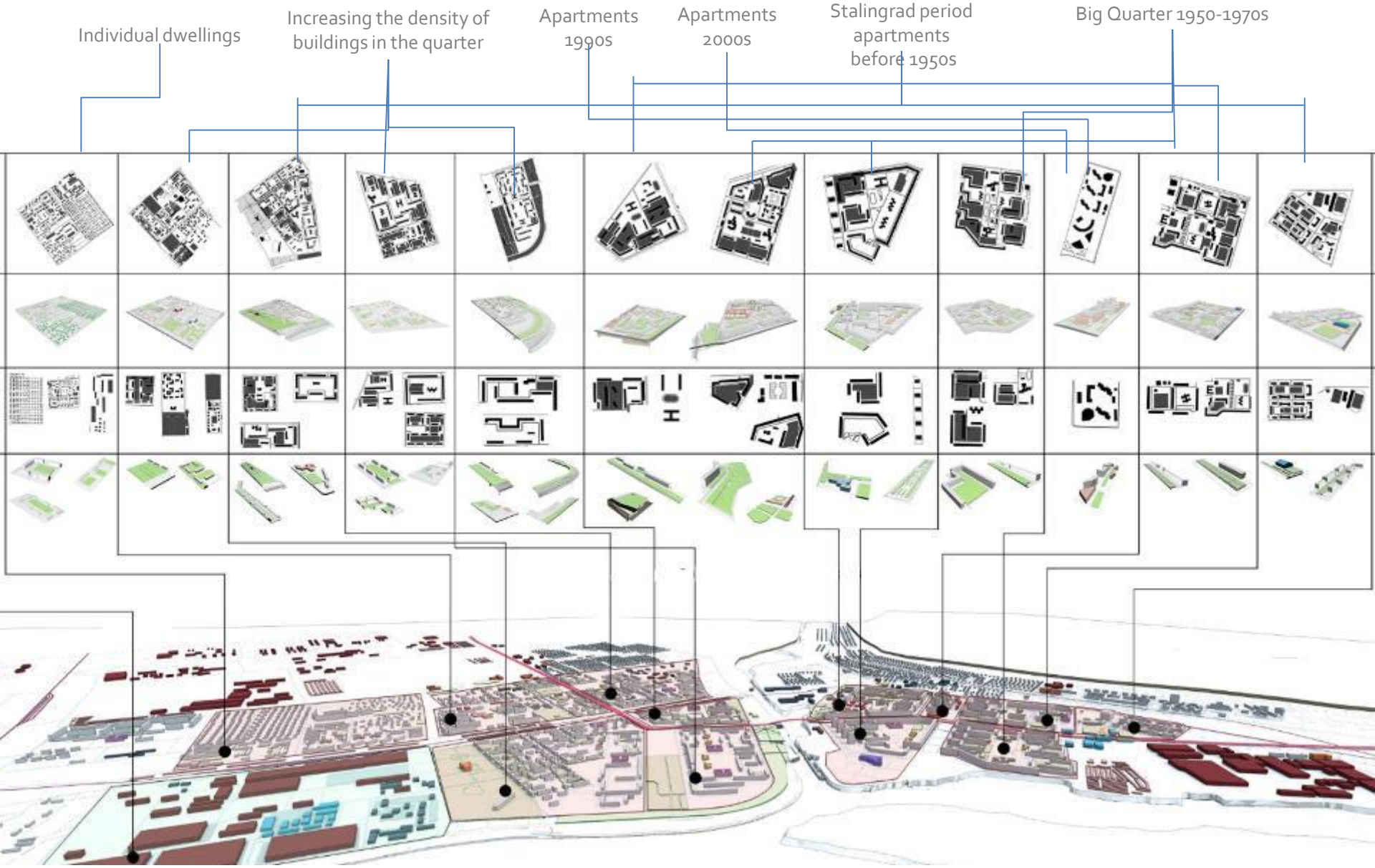
2. Low-rise House 1930 and 1950 's

3. Five-story home of the Khrushchev period

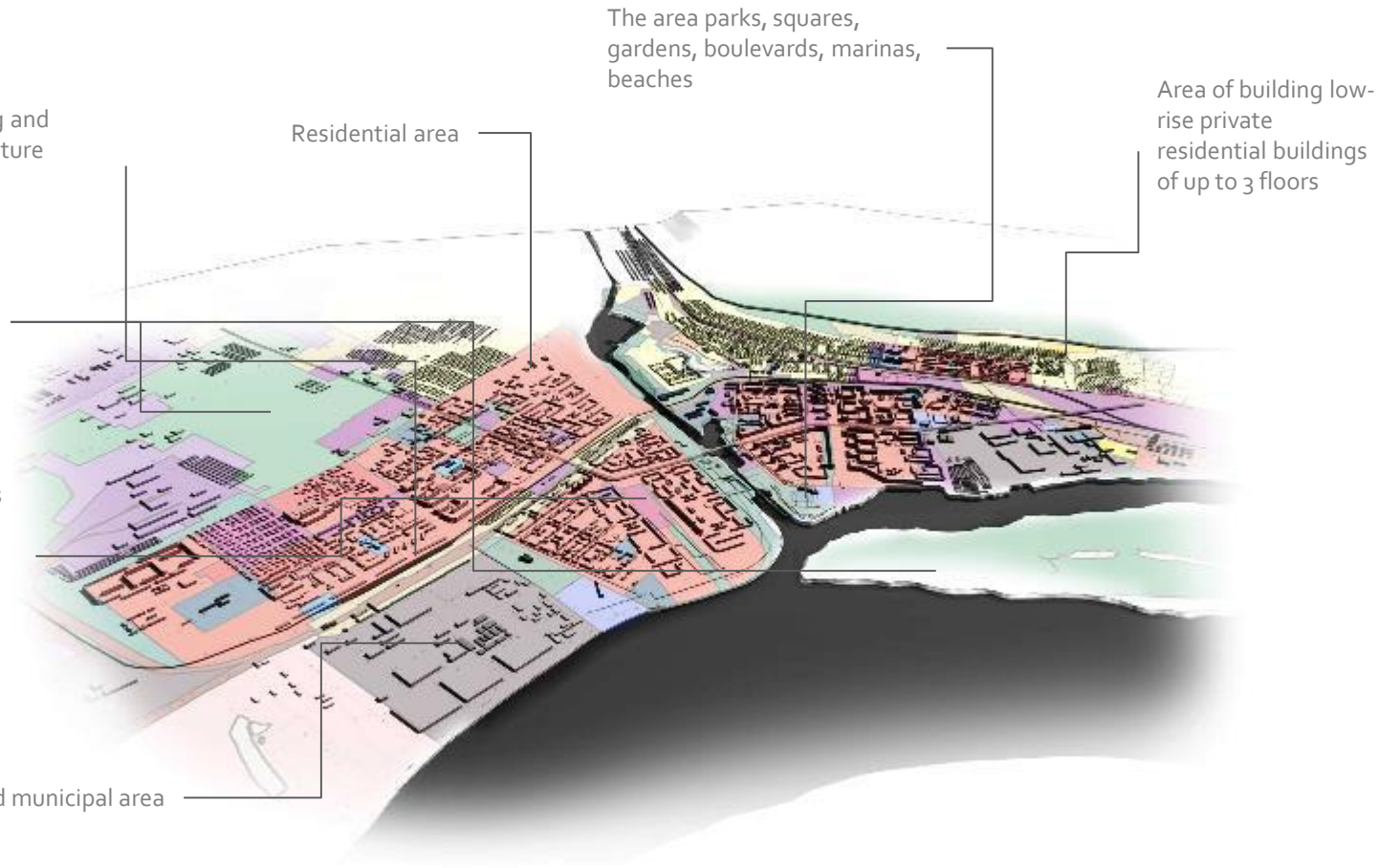
4. House of middle-rise of the Stalinist period.

5. Nine-floor houses of mass housing construction.

# KRASNOARMEISKY DISTRICT: RESIDENTIAL AREA
## TYPES OF RESIDENTIAL BUILDINGS



# KRASNOARMEISKY DISTRICT
# (MASTER PLAN OF VOLGOGRAD UP TO 2025)



# KRASNOARMEISKY DISTRICT: RESIDENTIAL AREA (MASTER PLAN of VOLGOGRAD)

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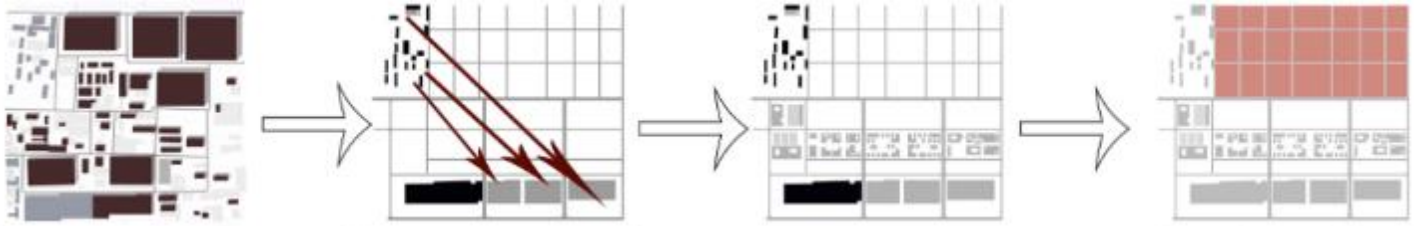
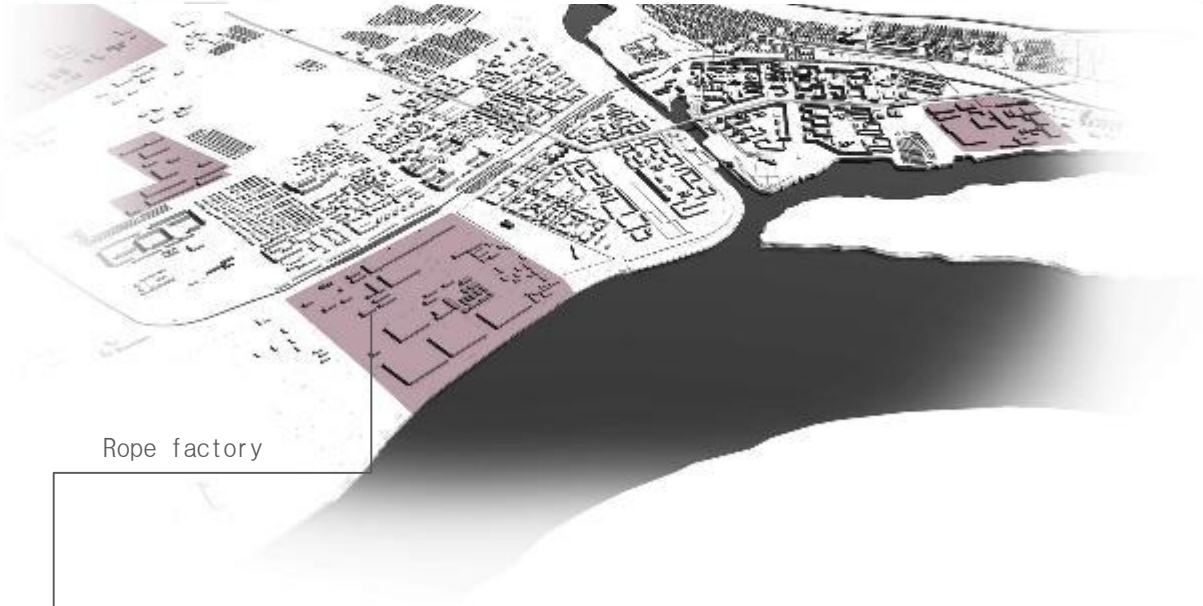
# THE MAIN PROBLEMS OF RESIDENTIAL AREA OF KRASNOARMEISKY DISTRICT

- Lack or insufficiency of public, semipublic and private differentiation
- Unorganized area of residential quarters
- Unorganized parking
- Non safe residential area for recreation
- Low variety of residential apartment typology
- Lack of access to the waterfront because of unorganized river embankment and industrial zone

# REGENERATION OF THE INDUSTRIAL AREA
# KRASNOARMEYSKY DISTRICT

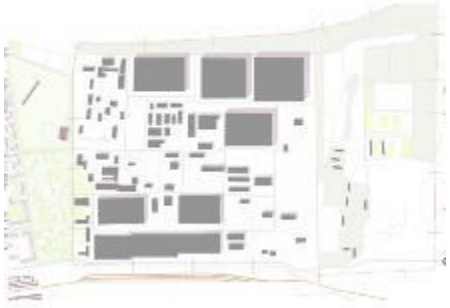
Stages of regeneration of industrial territory





Planning feature rope factory is that the area is sandwiched in a housing estate

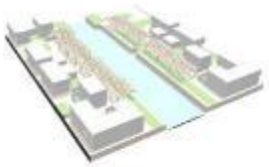
Rope factory



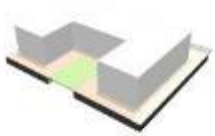
Analysis of the industrial zone

# FORMATION OF FLEXIBLE and SUSTANABLE LIVING ENVIROMENT

On the territory is supposed to create a flexible, sustainable and socially-oriented residential environment, the introduction of flexible residential structures.

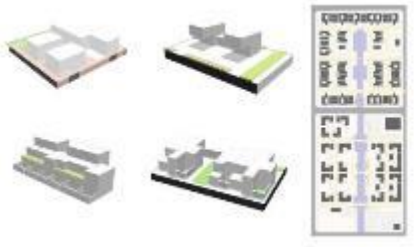


Formation of the embankments along the transport channels



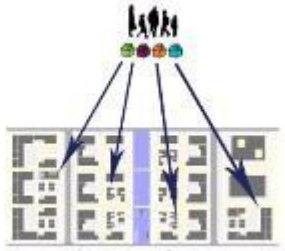
Formation of public gardens in residential areas

Formation of silent walking zones and streets



Typological variability housing

Walking distance to service facilities

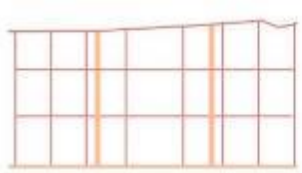


Social sustainability

Human scale environment



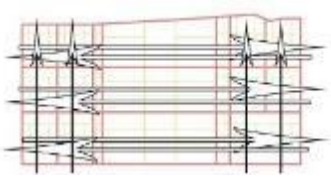
The interaction of the streets and buildings



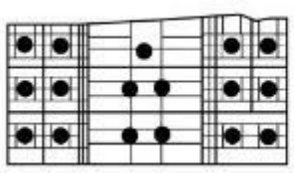
Transport system



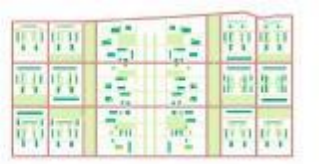
Promenade



Open quarters



Public zones of quarters



# MORPHOTYPES OF QUARTERS

Morphotypes of quarters

1 morphotype

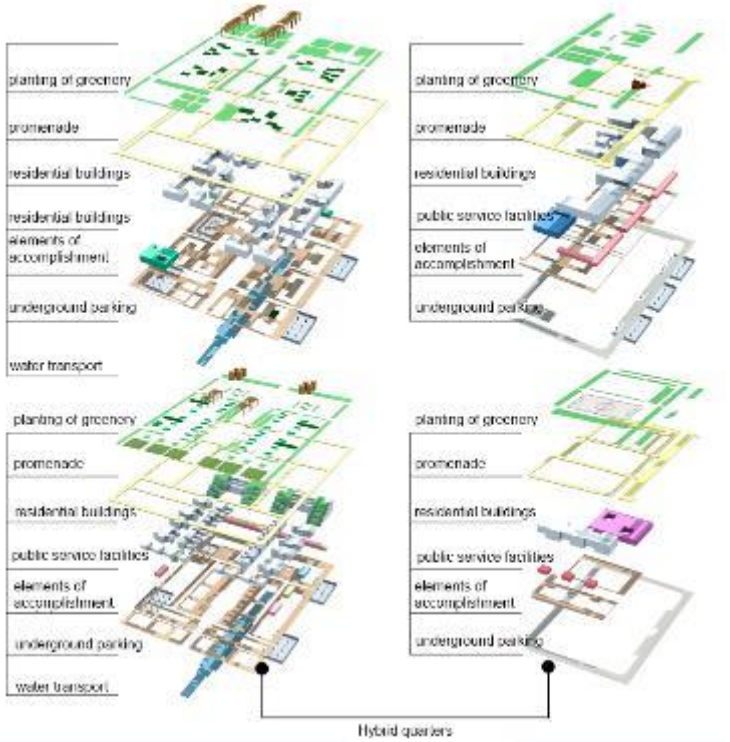
2 morphotype

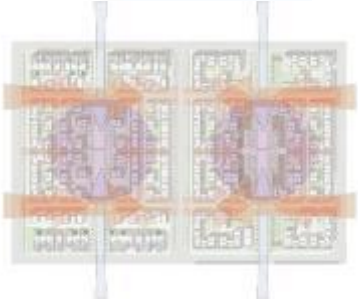
3 morphotype

4 morphotype

5 morphotype

6 morphotype



As a basis for planning the quarter was taken regular system, by which all planning districts to become interconnected and open, these links are promenade areas, ie quarters open to all people, but through the use of principal typologies of housing we create private and semi-private area

# ANALYSIS OF MORPHOTYPES OF INHABITED FORMATIONS OF DESIGNED TERRITORY

In the conditions of reconstruction of the industrial zone, we used different types of dwellings. Structure of the quarter clearly accountable and functional zoning is a universal environment for people of different age groups. All parking lots are under ground, which eliminates movement within the quarter.

The quality of the living environment and sustainability, will also depend on public participation in the preservation and development of the environment.

# STUDYING THEORETICAL AND PRACTICAL METHODS AND TECHNIQUES FOR DESIGNING FLEXIBLE AND SUSTAINABLE HOUSING STRUCTURES. THE INTRODUCTION OF THE ARCHITECTURAL DESIGN TEACHING AND INTEGRATION INTO THE EUROPEAN EDUCATIONAL PROCESS WITHIN THE PROJECT OIKONET

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| STAGE 1 | The concept of scientific research | First International Conference in Barcelona, Spain |
| STAGE 2 | The implementation of scientific research; contribution with OIKOnet partners (Workspaces etc.); approbation of the scientific research | Second International Conference in Bratislava, Slovakia |
| STAGE 3 | The introduction of the architectural design teaching and integration into the European educational process within the project OIKOnet | Third International Conference in Preston, UK |

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