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Searching for Housing Model of 21st Century: Analysis of Chosen Polish and Dutch Concepts

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Abstract. Housing estates play the important role in planning the contemporary European cities. The urban concepts of estates are changing, especially in countries in which there are big housing needs, because fast economic development and sustainable paradigm last decades. The purpose of study is characteristics of the urban concepts and housing environment based on these important examples, chosen by the author: Marina Mokotow Estate in Warsaw, Eko Park Estate in Warsaw and Westerpark Urban District (GWL Terrain) in Amsterdam. The analysis includes: urban composition of mentioned above estates, standards of semi-public spaces, recreational spaces and provided ecological ideas, solutions of the wheeled and walking transport, the quality of architecture. The analysis showed significant differences in urban development of housing estates and the different relations to semi-public spaces and the city space. They represent different typology in creating city planning of 21st century (modernism concept "gated community", mix-used concept based on the city quarters - heterotypic solution and the concept of eco-habitat.

1. Introduction

The question about design of contemporary cities is one of the most important in the field of architecture and urban planning, particularly in the context of sustainable development, theory of compact city, processes of shrinking cities, etc. Also it is very important the role of housing estates and their place in the city space. During last twenty years in Poland and Netherlands there were constructed many interesting housing estates. Standard of housing environment, standard of flats is growing, also urban solutions are developing. Some of these realizations show new directions and give a new quality of housing in the 21st century. The purpose of study is characteristics of the housing environment of the three large housing projects: two from Poland and one from Netherlands. All mentioned concepts are different, that is why the author asks about the problem of city planning and the relation of new housing space and the city space. The study is based on very important examples chosen by the author: Marina Mokotow Estate in Warsaw, Eko Park Estate in Warsaw and Westerpark Urban District (GWL Terrain) in Amsterdam.

The scope includes analysis: for first urban composition of complexes, secondly spatial concepts of surroundings – standards of semi-public space, recreational space. Thirdly the author pays attention to sustainable aspects of estates' concepts. The author is also asking questions about solutions of the wheeled and walking transport, systems of parking, about the context and the relation to the public spaces and the access to the basic services. The applied method will allow on approval assessments of urban planning concepts, concepts - which determine clear directions of creating contemporary housing structures in 21st century.



2. Modernism ideas - Marina Mokotow Estate, Warsaw

Despite the crisis of modernist ideas in planning housing complexes, which started from the 80's and the period of prefabrication, such solutions based on urban modernistic philosophy appear in the work of many Polish architectural offices also today. The flagship example of this is Marina Mokotow Estate, located in Warsaw close to downtown. The author of this project is an office APA Kurylowicz & Associates. The project was developed in 2002-2005, and the construction in 2003-2005. Residential area is designated, inter alia, by the streets: Raclawicka and Zwirki&Wigury, has an area of 21.5 hectares. They designed here 1476 flats and 64 houses. The main intention of the authors was "an attempt to enter a new urban fabric of the existing city structure of the upper Mokotow" [1]. The main principle of urban concept was to locate the recreational area on the north-south axis, area in the form of a landscaped park, with a lake. From the North assumption closes the apartment building, designed on the plan of the curve, which - in the intention of the authors - is the frontage of the square, "court d'honneur" - entrance to the estate. From the eastern side the area of the park with a lake is surrounded by buildings in the form of 4-storey city villas, forming an irregular line of frontage; on the west side – they designed buildings of 7 floors high, designating a rigid line of frontage. The eastern part of the estate is designed on clearly defined grid of streets, which determine the various quarters of development, referring to the scale of development in adjacent quarters of Mokotow. It should be stressed that the urban layout of the entire estate is very clear, consistent, and buildings located in a hierarchical way - from large multi-family units designed around the lake, through the rectangular grid of streets lined with city villas with several apartments and single-family houses. There is no sophisticated space exploration, but the whole settlement was composed according to precisely planning principles. In that way we obtained spatial order. In the first stage three types of residential buildings were designed, which gave the benchmark for other teams to further work on specific projects. The architecture of buildings is strongly connected to neo modernism style. The proportions are very good, materials used - high quality, great finish, refined details have become the standard housing. Multi-family buildings have withdrawn last floors, where recreational spaces have been arranged on the roofs and spacious loggia; apartments located in the ground floor have direct access to gardens. The composition of the facade of buildings is based on clearly tripartite division. Colours of the buildings give them a characteristic of individualism. Architecture of urban villas and cottages corresponds with the Warsaw architecture of the thirties. However, the level of architectural solutions is diverse.

Unfortunately - housing estate is a closed, gated space isolated from the city by two fences systems. The first system is the external perimeter (rampart, and the belt of bushes, kilometres of fence), the second - it's inside, it surrounds individual buildings. Semi public estate space means – except the park and artificial lake – the space of small streets along the fences (see Figure 1,2,3.)

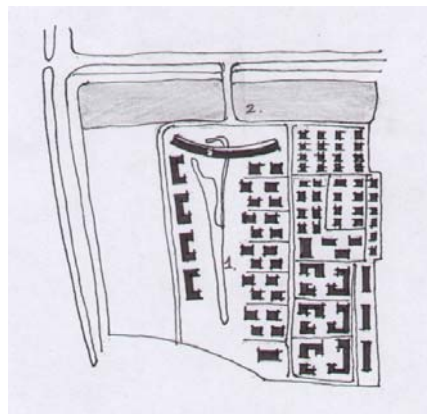


Figure 1. Marina Mokotow Estate, Warsaw - the scheme of urban plan. Source: Andrzej Tokajuk drawing based on "in situ" research and satellite map.



Figure 2. Marina Mokotow Estate, Warsaw - the view of public space with the lake. (left)



Figure 3. Marina Mokotow Estate, Warsaw - the view of point buildings and the fence. (right)

Photos author: Andrzej Tokajuk

3. From tradition city to the future housing structures - Eko Park Estate, Warsaw

A very interesting example of the exploration of urban structures of the 21st century in postindustrial city is Eko Park - the housing estate in Warsaw. It was designed by the office of APA Kurylowicz & Associates and completed at the beginning of the first decade of the 21st century. The project included master plan and design of several quarters of development. The estate was built on the area of 19 hectares, located in the district Mokotow Fields, area of previous park that is a green area on the basis of the decision of the General Plan from 1931, that separates residential areas of Mokotow and Ochota. Total investment includes the construction of about two thousand flats, giving a rate of 105 dwellings per 1 ha. Land settlement was divided into three parts of varying height and development density. These three parts, "neighbourhoods", were placed on both sides of the main communication - the boulevard, which had to be preserved because of the existing avenue of beech and which is a key element of future public space (agora). The character of agora- square is created by greenery and covered passage - a gallery, which is a compulsory part of the eastern elevation of each quarter of the western districts, and which protects the entrance to the services located on the ground floors. The boulevard bended in the mid-course in the central district area – where a few public buildings surround the agora- square. Each of the "neighbourhoods" has been divided into four to eight quarters - gathered around a green courtyard and supported by one entrance to the underground garage. The size of each quarter is 80 to 150 apartments, of the community - neighbourhood unit. Community shall have its own board, a duty of care assigned to them and the distinct nature of green architecture - the neighbourhood's identity [2]. Individual residential quarters were designed by different teams of authors, the emergence in the competitions. The main intention of the authors was to create the urban space with different character and clearly defined public spaces, while maintaining relationships with existing urban green areas and enrich it with new green spaces. That concept is formed by: green public area, which is the avenue of the boulevard, which forms the backbone of communication north - south, generally the park - green belt along the western border and green interior of residential quarters, combined with open and public spaces and green parks. The pilot quarter - Camerata – was designed on the base of the principle, that each flat should has its own individual character and the possibility of any arrangement, moreover - its own private open space - a patio, garden or terrace before, also common to all the internal garden. The entrances to the apartments are designed with half-opened galleries and staircases or private front-gardens, giving each apartment can be "home" inserted into the structure of four-storey building. Eko Park Estate is open, is available for residents of the capital. Asking about the name of estate - the authors contest, that was to be a garden-city in postindustrial city (see Figure 4,5,6.)

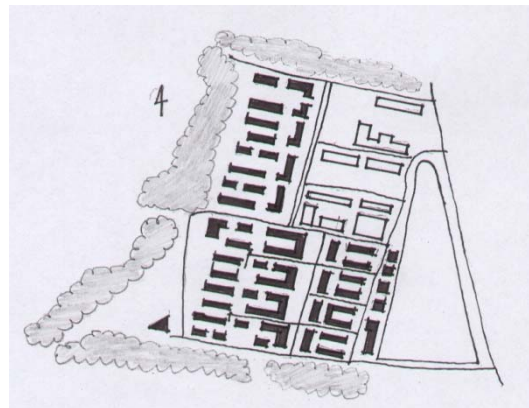


Figure 4. Eko Park Estate, Warsaw - the scheme of urban plan. Source: Andrzej Tokajuk drawing based on "in situ" research and satellite map.



Figure 5. Eko Park Estate, Warsaw - the view of quarter's courtyard example. (left)

Figure 6. Eko Park Estate, Warsaw - the view of main public square. (right)

Photos author: Andrzej Tokajuk

4. Sustainable habitat concept - Westerpark Eco District (GWL Terrain), Amsterdam

In 1989 Amsterdam city council decided that the site of Municipal Water Company on Van Hallstraat, which was abandoned by the company, should be zoned for housing. Companies operating nearby would have preferred an industrial zoning, but the inhabitants appealed to the newly-formed urban district Westerpark for car-free eco-district. The International Institute for Urban Environment looked into whether the four environmental themes of water, energy, waste and vegetation could be realised on the water company site. On the 6 hectare site 600 dwellings were to be built. It had to be a car-free area. Some number of original company buildings were retained, together with the water tower. Two long, meandering apartment buildings lie along the edges of the estate. The central area is dotted with small blocks scaled to the existing development and sited so as to guarantee a number of essential lines of vision. The open space between the blocks has given the maximum green treatment. The blocks were designed by five architectural offices [3]. The urban district planned to discourage using cars and use public transport, with paying attention for cyclists. An important target was to reduce water and energy consumption, environmentally-conscious material should be used. The cooperation with future inhabitants was very important during design urban and architectural ideas. We can see in the fact, that as many dwellings as possible would have the entrance at street level and as few as possible along the anonymous deck-access corridors. Main urban aspect was that as many dwellings as

possible have their own garden. Public and semi-public space in the district was dedicated to share for the inhabitants from higher floors to have their own area (garden). An important goal was to prevent the public space becoming anonymous where no one was responsible. After formulating such assumptions and discussions, in August 1993, the plan made by architect Kees Christiaanse (with help landscape designer Adrian Geuze) was chosen by the consultation group of inhabitants and project developer. In close cooperation with the consultation group this idea sketch was transformed into the urban plan in November 1993 [4].

4.1. *Environmental ideas*

In designing the fundamental idea of "Green Building" was the priority. That means: the integrated chain of materials (wastage is combated, recycling process), focusing on saving energy and improving efficiency, good quality materials (much durable as possible). Five environmental criteria were the most important when developing the eco-district: building materials, energy, water, vegetation and waste. Also traffic was the focus in the design the area.

The choice of materials was taken from preference list of the City of Amsterdam from 1993. This list includes all types of building materials (construction, stairs, sanitary, paints, frames, etc.). According the budget, the most environmental friendly solution was chosen. For example: brick was chosen instead of plastic insulation for facades (more expensive but also more durable), the use of 20% granulated concrete rubble in the dwellings (from the demolition), the use of pine wood instead tropical hardwood, aluminium and plastic for frames, doors, stairs as finish; use of water paints for doors and frames; sewage pipes are not glued; PVC tubes are ready for recycling, kitchen units can be reused.

The dwellings are built according the energy performance norm (EPN) of 750 cubic meters (natural gas per year). It compares with 1400 cubic meters as the standard that time. This was gained by using of insulation of walls, floors and roof. Thanks to south-north orientation of apartment buildings in the middle of the district passive solar energy could be used. The CHP station was applied on the district area (an innovation that time)- that means combined heat and power, because CHP uses heat from generating electricity. The heated water (55-60 temp. degree) is supplied to the buildings through underground pipe. Each apartment has a heat unit (heat exchanger), which provides hot water and heating in the dwelling [5]. The CHP station operates automatically. There is no energy production from sun or wind. Natural gas is used for cooking. Mechanical ventilation is used in flats. Saving water is a special aspect of implemented technological solutions in the project. First, special toilet saving water were used in all dwellings (they took only 3,5-4 litres of water when flushing instead of 6 litres in standard). Also rain water was taken to flush toilets (apart from high long blocks 1 and 2) - it was taken from roofs to reservoirs out of dwellings and then pump to toilets. This system did not work successfully, the filters blocked, it cost a lot of energy. It turned out that now it is not used in most of buildings. Also, showerheads and water limiters were used in the buildings. In the district a lot of plants and greenery were implemented in public, private and shared (semi-public) gardens. The various areas of the site have been divided by hedges. They also surround six areas on the site with shared gardens. Moreover, there are more than 60 fruit trees in the district; other trees on the site are: elm trees, acacias and chestnuts. There are 85 communal gardens on the site maintained by inhabitants. The vegetation green roofs were designed on the high buildings (blocks 1 and 2), because they cannot be combined with grey-water system (in high buildings there were too many dwellings). Rainwater was also captures on the site. Two third of the inner area is unpaved - here rainwater is absorbed into the ground; on the rest of the site the rainwater is led not to the sewage system but directly to the open canals on the surface. The whole district was designed as free car area, only emergency cars are allowed on the site. The car free ground level protects from bad gases, traffic noise and parked cars. Children can play safely. The paths inner area were designed for pedestrian and cyclists only. Parking places in the districts are limited. There are only 129 parking places (for 600 dwellings), mainly located on the western side of the district. Apart from, there are additional 5 places

for car sharing and 2 places for disabled. The parking norm is very low - less than 0.3 [5]. There is a problem with parking concerning mainly visitors of cafe-restaurant Amsterdam. People are pressed to use bicycle or public transportation system (tram and bus stops are on the edge of the district) (see Figure 7,8,9).

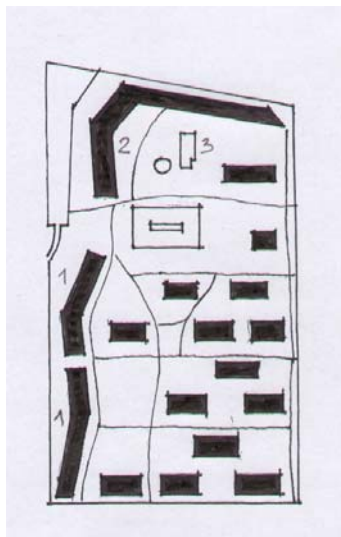


Figure 7. Westerpark Urban District (GWL Terrain), Amsterdam - the scheme of urban plan. Source: Andrzej Tokajuk drawing based on "in situ" research and satellite map.



Figure 8. Westerpark Urban District (GWL Terrain), Amsterdam - the view of green gardens inside the quarter, housing buildings on the second plan. (left)

Figure 9. Westerpark Urban District (GWL Terrain), Amsterdam - the view of pedestrian and bicycle path with new buildings and old ones on the second plan (Water Tower, Turbine Building). (right)

Photos author: Andrzej Tokajuk

5. Results and discussions

All three housing estates which are subject of above analysis carry clearly defined urban schemes, which are different to each other and have their specific features. Polish examples combine a high level architecture of the buildings and a very good quality of construction. In addition, in Marina and Eko Park Estates - the buildings are equipped with elevators (or ramps), adapted them for use by people with disabilities, just solved the problem of parking through the use of underground garages. Standard of semi-public spaces is also high. These aspects should be evaluated as a certain step forward in the design of modern residential complexes in Poland at the beginning of the 21st century comparing to many Polish estates built in 20th century [6]. But comparing Polish analyzing examples

to the Dutch one it seems, that Marina Estate and Eko Park Estate are not too innovative and do not give new impulse for the creation new quality from the environmental and sustainable points of view. The analysis showed however significant differences in the way of urban development and the relationship to public spaces and ecological aspects in Marina Estate, Eko Park Estate and Westerpark Urban District (GWL Terrain). Marina Mokotow - is a city in the city, in most is reversed from the surrounding buildings, is a product of alienated, creating an artificial world with artificial lake, the "forbidden city" - without the possibility of entry. Interesting spatial solution is an artificial lake - with stone edges, streams and bridges, the center of the assumptions in the plan of authors - the area of public land available to residents of the capital, after the construction – gated community. A question mark is the design of so large recreation areas separated from the town; it is rather successful marketing. For the urban structure it would be better probably to transfer them to the public spaces and reduce it inside the settlements. In terms of urban planning and architectural forms of buildings - Marina is the quintessence of main stream of neo modernism style of the twentieth and twenty-first century. Eko Park Estate has a legible urban plan, which is the consequence of imposed and adopted regulations. The original solutions as a result of work of many project teams create a high aesthetic coherence each of the 21 quarters and high quality architecture. The quarters are partially open to the public spaces, and a general plan of the settlement assumed from the beginning of a very conscious shaping of public spaces with good integration with the city. There was provided the location of trade, services, on the ground floors of buildings and public facilities. Through the multi-functionality Eko Park Estate has become an example of heterotype in the urban structure. Finally, the presented Westerpark Urban District (GWL Terrain) - housing from Amsterdam - is very interesting, successful example of eco habitat in the existing city. The whole concept was based on the paradigms of sustainable development and was created in the frame of revitalization of the area of old water supply company. In the project we can find e.g. the idea of reducing energy consumption, materials friendly to environment, the idea of green gardens with lots of plants, etc. Thanks to many implemented ecological ideas and multi-purpose functional structure GWL Terrain is also an example of urban heterotype. Good proportions, scale of architecture and greenery show the good way how to combine sustainable aspects with good quality urban and architectural space. Also, in the example from Amsterdam, we can see the solution of car-free housing concept; it is not ideal in practice - because of location the restaurant and other services on the housing area. But this concept requires new mentality from inhabitants and visitors - do we really need so many cars, living in the centre of the city? It makes us to rethink our needs of our living environment. Maybe it is better to have more gardens inside the quarter instead of "hard surface" parking places and expensive underground garages? (see Table 1.)

Table 1. The comparison of implemented space and environmental features of the chosen estates concepts.

Estate	Urban concept	Parking solution	Relation to the city	Semi-public space	Infrastructure/ services	Sustainable ideas
Marina Estate	- Modernism concept of space	+ Underground	- Gated community	+/- Big area with lake, courtyards with key access	-	-/+ Artificial lake for collecting rain water
Eko Park Estate	+ Quarters with typical streets plus public space (square)	+ Underground	+/- Estate integrated with the city, with guarded access the the quarters	+ Courtyards inside the quarters for inhabitants	+ Shops, basic services, offices	- The name of estate does not correspond with ecology
Westerpark Urban District (GWL Terrain)	++ Eco habitat concept	++ Car-free estate, limited parking places, pedestrian and bicycle priority on the estate area	++ Estate integrated with the city	++ Gardens shared ny inhabitants, courtyards inside the quarters,	++ Restaurant on the area, small services along the streets, some communal spaces for inhabitants in the buildings	++ Many ecological solutions (eco friendly materials, gardens, rain water collecting, saving energy concept, saving water devices, etc.)

Source: The study made by Andrzej Tokajuk

6. Conclusions

Analyzed in this study examples of settlements - because of the urban and architectural solutions - without hesitation can be regarded as the three main directions of planning housing estates in the beginning of 21st century. Two Polish examples - Marina Estate and Eko Park Estate are the icons of contemporary Polish housing architecture. Marina Estate is rather a summary of modernist ideas in designing living environment, but because of large public space inside and gated character it should not carry any innovative aspects. Moreover, it divides the city space. Eko Park Estate, based on the scheme of quarters and streets, gives traditional character of city space, but it does not carry any sustainable ideas. In the end, Westerpark Urban District (GWL Terrain) is a very good trial of new thinking about the sustainable housing in the 21st century. It shows the new direction of design, implementing many ecological solutions, it is a kind of experiment of car-free estate (because of the location in the middle of the city), pressing for use public transportation system and bicycles. In conclusion we can put the thesis, that only second example of Eko Park Estate can be partly accepted and the third example of Westerpark Urban District (GWL Terrain) should be promoted in planning and designing housing in contemporary European cities. The ecological and sustainable solutions, correct relationship of housing environment and public spaces, good incorporation into the existing

urban plan, mixed-use concept are the features, which should characterize the housing environment of 21st century in European cities.

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