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TWO EXPERIMENTAL HOUSING CONCEPTS FROM AMSTERDAM: COMPARATIVE ANALYSIS

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Abstract

In the article the author provided an analysis of two chosen sustainable housing concepts designed and built in the end of 20th and beginning of 21st century in Amsterdam.

The purpose of the research is to identify urban, sustainable and architectural features of two case studies – untraditional, experimental housing concepts. As research methods the author used the method of comparative analysis of the case studies and critical discussion. The result of the study will be conclusions of comparative analysis ultimately revealing a better concept of sustainable housing model for the 21st century.

Streszczenie

W artykule autor przedstawił analizę dwóch wybranych zrównoważonych koncepcji mieszkaniowych zaprojektowanych i zbudowanych pod koniec XX i na początku XXI wieku w Amsterdamie.

Celem badań jest identyfikacja urbanistycznych, zrównoważonych i architektonicznych cech dwóch studiów przypadku - nietradycyjnych, eksperymentalnych koncepcji mieszkaniowych. Jako metody badawcze autor zastosował metodę analizy porównawczej studiów przypadków oraz krytycznej dyskusji. Wynikiem badań będą wnioski z analizy porównawczej, które w ostatecznym rozrachunku ujawnią lepszą koncepcję zrównoważonego modelu mieszkalnictwa dla XXI wieku.

Keywords: housing; urban concept; sustainability; architecture; flat; Amsterdam

Słowa kluczowe: mieszkalnictwo; koncepcja urbanistyczna; zrównoważenie; architektura; mieszkanie; Amsterdam

1. INTRODUCTION

The existence of avant-garde Dutch residential architecture is a fact. The rich tradition of Dutch modernism leaves many values on the basis of which contemporary architects create original combinations and spatial forms. A rational approach to the building as a geometric form is mixed here with individualism, diversity and abstractness. The modern times of globalisation dominance allow the Dutch play with 'boxes' to combine traditional space with an innovative dimension of pure, though sometimes radical forms. But there is a hidden genius in the contemporary Dutch residential architecture in embracing tradition in modern forms. Wood, concrete, brick of different colours, glass, aluminium and steel come in various configurations. The

importance of using tradition in creativity, emphasising the value of space and ubiquitous rationalism mean that Dutch residential architecture sets design trends for many European countries even today, e.g. by following the paradigms of sustainable development.

The aim of this article is to attempt an urban and architectural analysis of two experimental housing estates from Amsterdam - GWL Terrein and Funenpark. These estates set clear trends in the design of multi-family housing complexes in Europe in the 21st century. The aim of the work is to identify the characteristics of these tendencies and compare the implemented solutions. The author attempts to assess if some solutions can be implemented in Polish conditions. In his rese-

arch, the author sets up an original method of comparative analysis composed of four parts – an analysis of numerical data, features of urban solutions, introduced elements regarding sustainable development and the value of design – architecture of buildings. In each part some parameters are indicated referring to the housing concept. The article is a continuation of the research conducted by the author on the issues of contemporary urban planning of housing development.

2. RESULTS

2.1. GWL Terrein estate in Amsterdam – urban plan and architecture

The GWL Terrein housing development in Amsterdam was designed in years 1989-1993 by architects Kees Christiaanse (master plan) and landscape designer Adrian Geuze in cooperation with the International Institute for Urban Development [G. Kemme, G. Bekkers, 2010, p. 198]. The former Municipal Water Company's site was transformed from an industrial into housing quarter. On the rectangular 6-hectare site the designers planned 600 flats, located in 16 buildings (2 long and 14 short ones). A few architectural offices were invited to take part in the designs of the housing building, e.g. Meyer & Van Schooten, Liesbeth van de Pol, Willem Jan Neutlings and DKV, etc. [P. Groenendijk, P. Vollaard, 2009, p. 210]. The selection of these architects was based on their idiosyncrasy and innovativeness. For the project of greenery and landscaping Adrian Geuze was the responsible one.

The specialists from the International Institute and the main designer formulated some fundamental assumptions concerning the future experimental project (the inhabitants also cooperated in that process):

- the new housing will be a car-free eco-district,
- in the design sustainable paradigms will play the main role,
- the architecture of the buildings will be innovative, flats of different typologies,
- reach greenery in the site,
- a limited number of parking places.

Finally, the 600 flats were designed on the site. According to the urban concept of a car-free idea, the architects managed to situate 2 long buildings along the western and northern sides of the quarter. These long buildings were to provide a kind of isolation from the street noise. Another 14 short new buildings were planned inside the quarter. From the old company only 3 elements were left: the water tower, the pump building changed into a restaurant – called Café Amsterdam, and a small house for guests (Fig.1, Fig.2).

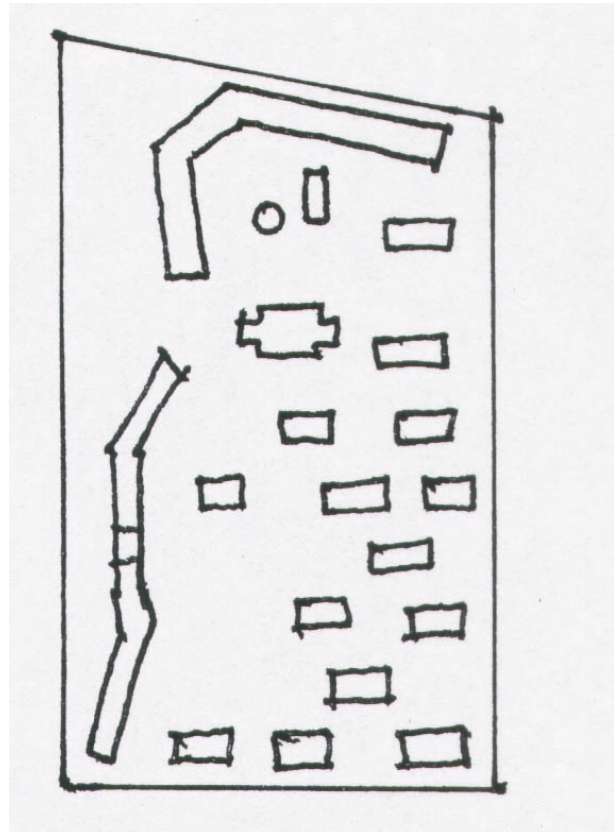


Fig. 1. GWL Terrein, Amsterdam – scheme of the urban plan; source: drawing by the author, based on in situ research (left).

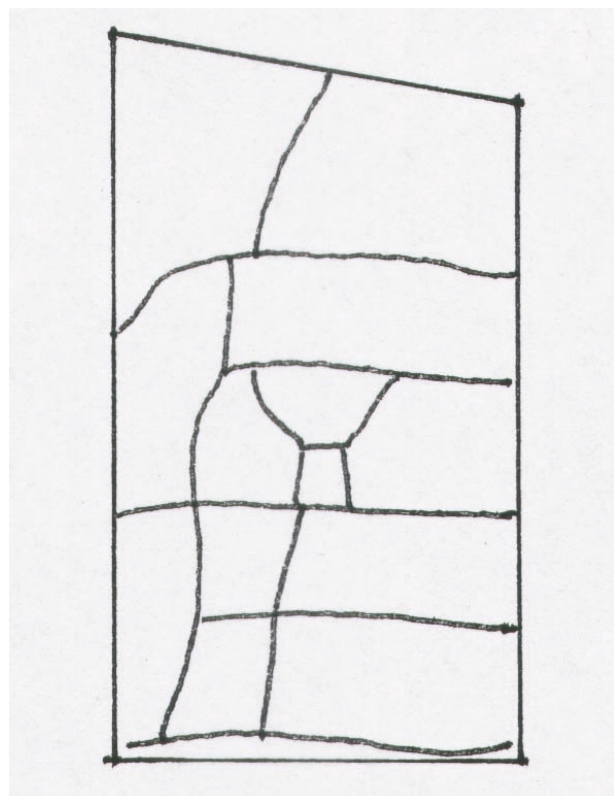


Fig. 2. GWL Terrein, Amsterdam – scheme of pedestrian paths: source: drawing by the author, based on in situ research (right).



Fig. 3. GWL Terrein, Amsterdam – view of a high new building situated along the street (left); source: photo by the author

The architects provided a wide spectrum of flat types: 2-room apartments, 3-room apartments, maisonettes, dwellings for persons with disabilities, apartments with separate entrances, a combination of back-to-back dwellings, and others. Materials for construction were taken from the list of the city of Amsterdam (preferred environmentally friendly and ready for reusing ones). All the buildings have a brick elevation, their architecture refers to the pragmatic contemporary Dutch cubic building tendency, though using of brick is a kind of a traditional element (Fig.3, Fig.5).

The heating and hot water systems were realised by installing the CHP gas station with a limit of 750 cubic meters gas consumption (more than 50% less than the norm at that time). The architects decided to implement robust water management (e.g. rainwater for flushing toilets, the rest into the ground and canals) as well as install water-saving toilets, taps and showers in flats. No car traffic was planned in the quarter – pedestrian and bicycle paths were preferred (Fig.4). The architects provided only 129 parking places, additional 5 for car sharing and 2 for people with disabilities. The

dwellers were forced to use public transportation. The reach greenery was planned in the estate site: more than 60 fruit trees, lots of bushes and 85 communal gardens to share by the inhabitants [A. Tokajuk, 2019, p.1-9]. All the greenery was organised between the buildings. On the ground level of long buildings some services were designed with the access from the street side. The construction was ready in 1998.

2.2. Funenpark estate in Amsterdam – urban plan and architecture

During last three decades the Eastern Dock Area in Amsterdam was a district developed into a residential and work zone. At that time several housing projects were started and implemented. One of them is Funenpark – a housing estate situated at the Oostelijk Havengebied, an old harbour called Funen. So far, the site was used as a former railway station marshalling yard. The municipality of Amsterdam decided to revitalise that urban quarter. In 1998 urban designer Frits van Dongen designed the urban plan of the Funenpark. Following the plan, several architectural studios designed



Fig. 4. GWL Terrein, Amsterdam – view of pedestrian and bicycle paths with new buildings and greenery (right); source: photo by the author



Fig. 5. GWL Terrein, Amsterdam – view of a new housing building; source: photo by the author

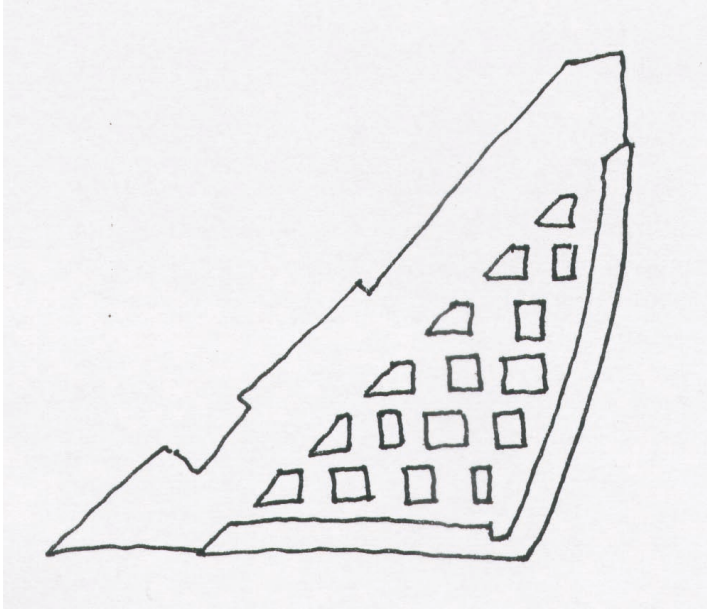


Fig. 6. Funenpark, Amsterdam – scheme of the urban plan; source: drawing by the author, based on in situ research and Landlab office (left)

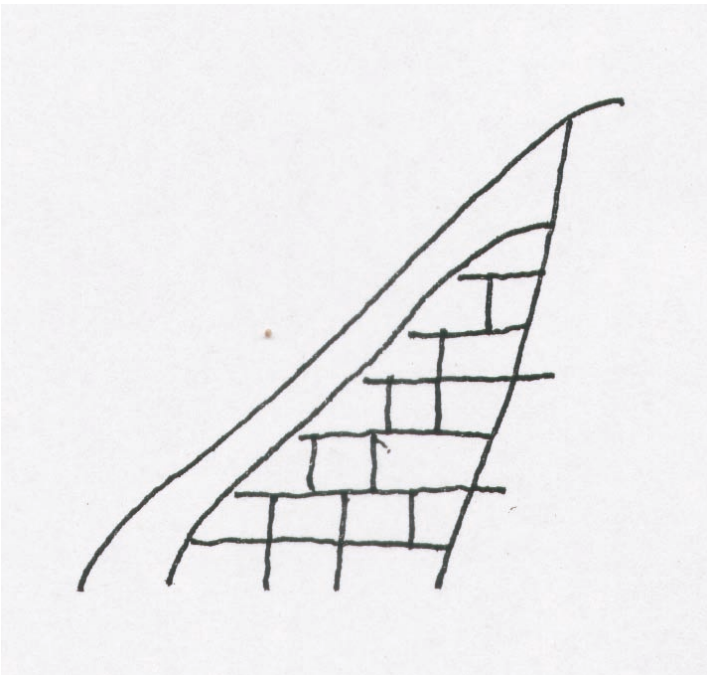


Fig. 7. Funenpark, Amsterdam – scheme of pedestrian paths; source: drawing by the author, based on in situ research and Landlab office (right)

16 residential urban villas (De Architecten Cie, Sanbeek & van Veen, Geurts & Schulze, Dick van Gameren, etc.). The Funenpark site has a triangular shape, it stretches across 3.5 hectares, and is located between the railway line and the neighbouring Czaar Peterstaat. The urban designer based his idea on the 'villas in the park' model. According to the plan, the selected architectural offices developed 16 residential villas (Fig.6, Fig.7). On the site a huge number of 565 dwellings were provided in total, also with other functions, such as: shops, commercial places, an underground garage, social facilities, etc. [P. van der Putt, 2011, p. 156-164]. The residents are allowed to walk around grass areas. Some dwellings have terraces or decks at the park level. The majority of apartments in the urban villas are accessed from its side, using halls, but in some blocks ground-based flats have front doors directly from the outside. The project was a starting point of revitalisation of the whole neighbourhood area. The Funenpark quarter – in contrast to many Dutch residential neighbourhoods with their traditional layout of streets, pavements, front and back gardens – has been designed in different way. Instead of traditional layout the whole area is flanked by a hook-shaped long building, which limits the estate from two sides. The space around 16 buildings and apartment blocks is treated as one courtyard. This continuous courtyard is not split in any way, the private gardens are saved from parking cars (Fig.8). The parking places have been planned in an underground garage.

Landscaping ideas were developed by the LANDLAB office. It was the concept of an open park consisting of 3 ingredients: grass spaces, a special 3-coloured pavement and trees. The simplicity of combining the three ingredients resulted in an outdoor space experienced as a continuous flow and linking together the landscape and the architecture. The quarter constitutes a milestone in forming new ideas of urban housing at the beginning of the 21st century, in a certain way coming back to the Le Corbusier's housing schemes [K. Frampton, 2007, p. 149-161]. The buildings represent original dwellings to its residents and unique architectural solutions. Although they vary in terms of their original details, materials, shapes, they still have the same good scale (Fig.9, Fig.10).

The designs aim is to balance the economical, ecological and social aspects of sustainable development. Local people, professionals made their contribution to the research team during the design process. The materials were taken from the Amsterdam list, big attention was paid to the functionality and flexibility of different typologies of flats.



Fig. 8. Funenpark, Amsterdam – view of the main pedestrian path along the higher building, source: photo by the author



Fig. 9. Funenpark, Amsterdam – a building situated inside the quarter with original details, 6-floor high (left); source: photo by the author



Fig. 10. Funenpark, Amsterdam – a building situated inside the quarter with a passage passing through it, sophisticated architectural form (right); source: photo by the author

2.3. Comparison of the chosen estates' features

Tab. 1. Comparison evaluation matrix – quantity data

Category/feature	Estate GWL	Estate Funenpark
Density	105 flats per hectare	150-160 flats per hectare
Site area	6 ha	3.5 ha
Number of flats	600	565
Hight of the buildings	Inside the quarter – 4-5 floors; on the edge – 7-8 floors	Inside the quarter – 3-6 floors, on the edge – 6-8 floors
Number of buildings	14 + 2 (along the streets) + 3 old ones (water company)	16 villas + 2 (along the streets)

Source: prepared by the author

It appears that the GWL Terrein estate has lower density than the Funenpark, the number of buildings is similar (there are more in the Funenpark, which makes the density higher). Also, the site of Funenpark is much

smaller than the GWL, it has a triangular shape; hence it can be concluded that the spaces between the buildings inside the quarter are smaller (semi-public spaces) – the buildings are situated closer to each other.

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Tab. 2. Comparison evaluation matrix – urban, environmental and architectural features

Category/feature	Estate GWL	Estate Funenpark
Urban:		
Urban type	Eco habitat concept	Villas in the park model (modernism concept)
Parking solution	car-free estate, limited parking places	car-free estate, underground parking
Pedestrian ways	pedestrian and bicycle priority in the estate area	pedestrian and bicycle priority in the estate area
Relation to the city	estate integrated with the city	estate integrated with the city
Semi-public spaces	green courtyards inside the quarters	park on the site with semi-public spaces, special 3-coloured pavement
Infrastructure	restaurant in the area, small services in the ground-floor space along the streets, some communal spaces for inhabitants in the buildings	shops, commercial places, social and cultural facilities in the ground-floor space along the streets, etc.
Others	estate on the former industrial site	estate on the former industrial site
Sustainability:		
Rain water collecting	rainwater used in flats	no
Saving energy concepts	elevations of buildings oriented to the sun	no
Saving water devices	yes	yes
Renewable sources of energy	no; gas heating, no photovoltaic (ready for installation)	no; gas heating, no photovoltaic (ready for installation)
Gardens/greenery	85 gardens shared by inhabitants, some green roofs	a park between 16 buildings, some green roofs
Trees	a lot of fruit trees on the site	a kind of park on the site
Others (rain water circulation)	water directed to canals and to the ground instead of sewage system	water directed to the ground
Design		
Architecture	brick architecture designed by different offices, similar character	high quality, different concepts of sophisticated forms
Materials	eco-friendly materials from the Amsterdam city list	materials from the Amsterdam city list
Details	high quality	very high quality
Others	human scale, many different types of flats	human scale, functional and flexible flats

Source: prepared by the author

Tab. 3. Comparison evaluation matrix – decisive features

GWL Terrein Estate	Funenpark Estate
+++ Sustainability priority	+ Not many sustainable ideas implemented
++ Good architectural level	+++ Architecture priority
++ More greenery inside the quarter	- Pedestrian pavement sometimes very close to the flats' windows at the ground level
- No renewable energy solutions implemented	- No renewable energy solutions implemented
+ More space between buildings	- Buildings in close distance to each other in some cases
++ Social infrastructure on the site	++ Social infrastructure on the site
++ Car-free quarter, pressure for public transportation use	++ Car-free quarter

Source: prepared by the author

3. DISCUSSION

Based on the performed analysis, the following statements can be formulated. Both the analysed cases of Dutch housing estates – the GWL Terrein and the Funenpark show some common elements as well as differences. The common features include the fact that both urban concepts introduce the idea of a 'car-free' zone inside the quarter, with the priority of pedestrian and bicycle paths, both are based on one large quarter (4.5-6 ha) and were created in post-industrial areas. Hence, they are the result of revitalisation activities. In both development concepts, the authors designed basic infrastructure devices (basic services and activity rooms for residents). Both the analysed estates envisage a high level of architecture and a sense of materials (P. Zumthor, 2017, p. 8-9], i.e. ecological materials from the Amsterdam code, but included in the traditional materials of Amsterdam's housing construction. In case of the GWL Terrein estate, it is a pragmatic, very rational architecture. Rectangular solids of residential buildings with brick facades have a noble character.

In case of the Funenpark housing estate, the forms of the buildings are real works of architectural art, works of architecture in a contemporary European city – as B. Gronostajska writes about Dutch architecture [B. Gronostajska, 2008, p. 315-319]. Facade compositions and architectural details are developed at the highest level, and the estate itself takes the form of an open-air architectural art gallery. When it comes to adapting to the principles of sustainable develop-

ment, good rainwater management solutions have been implemented in both projects, though the GWL has considerably more of these solutions. Based on the research, a relatively small use of renewable energy was identified (in the GWL, passive use – orientation of building facades to the sun) – this may be due to the fact that the concepts were created approximately 20 years ago. Today, these problems are perceived in a different manner. A great role of trees is worth emphasising in shaping the green areas of both housing estates; the author of the analysis wants to point out that not only green areas are important in shaping the housing environment – deciduous trees play an extremely important role in purifying urban air and supplying oxygen, their role has already been noticed by some researchers [B. Gronostajska, 2007, p. 173-177].

It is not always possible to plant large amounts of tall greenery in the designed residential areas – it is very difficult in the case of underground car parks under courtyards, but in the GWL and Funenpark housing estates, greenery designers took care of a large number of deciduous trees. Finally, the study shows an appropriate human scale of housing development, the designed buildings within the quarters do not exceed the height of 5-6 floors inside the quarters (correct proportions of the height of buildings and the space between them) – it is necessary to remember about the downtown location of these investments.

The conducted study also shows differences in the two analysed Amsterdam concepts.

The main difference is the approach to urban planning solutions within the teams. It is important to note a parallel arrangement of residential buildings in the GWL and a rather free arrangement of residential buildings in the Funenpark – with access to the sun, air and greenery. However, a comparison of the teams indicates the use of interesting additional solutions in the projects. In both cases, the quarters were shielded from the city streets by long, taller buildings, 8-9 floors high. In the Funenpark, an insulating barrier was obtained from communication lines on two sides – from the north side the housing estate is connected to the city through a park, in case of the GWL – from two sides. Despite the different philosophies of the location of the buildings, controlled access to the interior of the estate was obtained in both analysed projects by virtue of gates and several legible entrances to the estates. And even in case of the Funenpark – where the composition of the buildings inside resembles modernist ideas – it is possible to obtain the final concept of centripetal development, so characteristic of the Dutch tradition [S. Wojtkiewicz, 2006, p. 94-96]. Such a combination of a peripheral development with a looser quarter development can be described as a hybrid development type.

When it comes to shaping green areas, the two concepts are clearly different. In the Funenpark, the designers treated the space inside the quarter as one green courtyard, interspersed and divided by buildings, the path being the connecting element. Architecture and landscaping are the most important elements here. One can argue that in the Funenpark urban planning is just a pretext. But nature is conducive to the perception of modern residential architecture with all the senses [J. Pallasmaa, 2012, p. 51]. Nothing is the disturbing factor here, there is high quality in diversity, green space is a perfect binder. In the GWL estate, apart from several dozen trees, a large number of shrubs and 65 allotment gardens 'for rent' by the residents are used. The interior of the quarter is quite saturated with greenery. Various forms of greenery become an important element of space, they enrich the process of perceiving the environment and the way of perceiving rectilinear architectural objects, the sense of depth, colour and size [K. Sobczyńska, 2021, p. 40-47]. In addition to the positive impact on the perception of architecture, the idea of allotment gardens helps to build social bonds, facilitate neighbourly contacts, and is conducive to spending time outdoors. The idea of neighbourly contacts was very important in the concept of a social housing estate, which began before World War II and developed after 1945. Neighbourly contacts also affect the level of security and space control by the residents.

CONCLUSIONS

The conducted comparative analysis of two Amsterdam housing estates – the GWL Terrein and Funenpark showed common features and differences between these concepts. GWL Terrein solutions – an eco-quarter and 'villas in the park' in the Funenpark – although they differ from each other, they are a starting point for discussion and search for new models of residence (also in the Polish reality). Urban planning of multi-family housing complexes in Poland, but also in other countries, has been in crisis for many years, and in the last 20 years there has been a return to quarter development – the idea of a 19th-century city [A. Tokajuk, 2010, p. 75-86]. Poland lacks innovative concepts and here the analysis of Amsterdam housing estates is very helpful. The GWL Terrein and Funenpark solutions can – to some extent – indicate new design trends. The study showed that not only in the aspects of implementing environmental and material solutions (sustainability), but also in architectural, urban and social aspects, these concepts are very original and innovative. Of course, they can be supplemented and modified by adding elements, such as renewable energy sources – it is necessary at the present time. One aspect is certainly debatable – we as a society are not fully prepared for the idea of a 'car-free estate', but due to the current energy crisis, such forms of development even force the use of public transport systems.

It seems that the author's 'evaluation matrix' method proposed in the study, based on four elements (quantity indicators – numbers, urban, sustainable and design – NUSD) was a good research tool. Finally, one more conclusion is worth emphasising – in both the analysed housing estates, urban planning and architecture complement each other very well. The words 'to live means to inhabit' incorporate the words of prof. Janusz Włodarczyk by means of projects and their realisations [J. Włodarczyk, 1997, pp. 5-20]. There is a kind of harmony between urban planning (centrifugal – hybrid solutions), the scale and quality of architecture, landscape, sustainable and technological solutions. Estates designed in this manner have resulted in the creation of a housing environment of the 21st century.

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