

NEW HOUSING DEVELOPMENT OF WARSAW IN THE CONTEXT OF SUSTAINABLE DESIGN AND CLIMATE CHANGE – CITY GUIDELINES AND RECOMMENDATIONS

Anna Tofiluk✉

Faculty of Civil Engineering, Warsaw University of Technology

ABSTRACT

Residential buildings provide a very important, if not crucial, element of the human living environment. They also constitute one of the basic urban development forms. Therefore, the way housing development is designed bears consequences, including those in the field of sustainable development and climate change, for the entire urban body. Both at the EU, national and local level, decision-makers undertake a number of activities by setting standards for designing cities that take into account the requirements of sustainable development and climate responsible activities. The following paper focuses on selected documents developed for Warsaw in the last few years, in which the importance of the abovementioned issues is emphasized. The analyzed documents set regulations and standards for planning the city, including the design of buildings and housing estates. Document records are analyzed through the prism of sustainable and pro-climate design criteria. The present paper is aimed at specifying guidelines intended for architects, according to which new sustainable housing developments should be designed. Moreover, attempts to evaluate the above guidelines in relation to determinants of the designers' work are made in the present article.

Key words: Warsaw, sustainable design, climate, climate change, multi-family housing development, housing estate, Warsaw Housing Standard

INTRODUCTION

Housing building development is a key element of the human living environment, and thus constitutes one of the basic components of the urban spatial tissue. Residential buildings account for a significant part of the urban area. In Warsaw, single-family housing development (11%) and multi-family housing development (9%) make up approximately 20% of the entire city area, while approximately 40% of the area of the capital city remains undeveloped – green and agricultural areas, water reservoirs (Biuro Architektury i Planowania Przestrzennego m.st. Warszawy [BAiPP], 2006). Thus, the way buildings and housing estates

are designed and constructed, as well as the way they function, exerts a significant impact on the condition of the entire city, including on issues related to sustainable development and climate change.

According to its definition, designing for sustainable development seeks to maintain “the environmental balance and durability of basic natural processes, in order to guarantee the possibility to satisfy basic needs of particular communities or citizens of both the contemporary and future generations [own trans.]” (Ustawa z 2001 r. Prawo ochrony środowiska, art. 3 pkt 50). To put the definition of sustainable development into the practice of designing housing estates, it may be

assumed that “Housing in accordance with sustainable development fosters proper water and energy management. It is aimed at reducing its impact on the environment or at attempts to repair the damage previously caused. On an urban scale, such housing practices seek to counteract the uncontrolled city sprawl. In the utility field, they minimize the formation of structure to the scale that results from the fulfillment of actual needs. On the technical level, attention is paid to controlling the use and utilization of materials, helping to reduce resource consumption, enabling control, optimization and condition monitoring [own trans.]” (Tulkowska-Słyk, 2019, p. 9).

Thus, sustainable design of residential buildings covers a wide scope of issues – to begin with aspects concerning spatial planning and urban planning up to industry-related solutions (construction, installations), green design and architectural detail, as well as social issues (Baranowski, 1998; Edwards & Turrent, 2005; Bokalders & Block, 2010; Kamionka, 2012; Ryńska, 2012; Lorens, 2013; Stangel, 2013; Firląg, 2014; Kaliszuk-Wietecha, 2017). Designing sustainable architecture is a complex, multi-threaded issue of interdisciplinary nature. The issue is relatively new and has recently been included in the already complex process of architectural design. Sustainable design has been present in the discussion on shaping cities since the end of the 1960s. Issues related to climate change have been introduced into the scope of its goals and demands over the last 25 years (and especially over the last 10 years)¹.

The Earth’s climate is changing as a result of global warming. The phenomenon is a consequence of anthropogenic emissions of greenhouse gases into the atmosphere, mainly of carbon dioxide emission

resulting from the combustion of fossil fuels. In the aftermath of climate change, the likelihood of severe, widespread and irreversible consequences for the economy and ecosystems follows. Possible outcomes are related to an increase in temperature and extreme weather phenomena, including, in particular, more frequent droughts and floods (Malinowski, Kardaś & Popkiewicz, 2019).

In the European Union, buildings account for 40% of energy consumption, of which energy is mainly obtained from non-renewable sources. In Poland, it accounts for about 90% of all energy consumed (Firląg, 2014). The way we design buildings, including residential ones (as well as accompanying infrastructure), is crucial and exerts an impact on the climate and its changes. Designers’ decisions that determine the form and functioning of a building throughout its life cycle are one of the variables that might influence global warming and its consequences. At the same time, sustainable and pro-climate design issues apply not only to the buildings themselves, but also to the open spaces between buildings, i.e. the entire urban tissue.

It should be noted that taking account of climate-related issues is now an indispensable condition for achieving greater sustainability of the human environment, including the built environment – “Overall, failing to take climate action will make it impossible to ensure Europe’s sustainable development and to deliver on the globally agreed UN Sustainable Development Goals” (EC Communication COM (2018) 773 final, p. 3²).

The concentration of the causes and effects of climate change, as well as of the lack of sustainable built environment design is particularly visible in the case of cities inhabited by the majority of Polish people (about

¹ The Intergovernmental Panel on Climate Change was established in 1988, the first climate-related UN conference was held in March 1995 (69 of them have been held to date), documents that set the directions of climate policy and methods of conduct, recently developed in the European Union, primarily include *A Clean Planet for all. A European strategic long-term vision for prosperous, modern, competitive and climate neutral economy* (EC Communication COM (2018) 773 final 2018) and *The European Green Deal* (EC Communication COM (2019) 640 final). Currently, the European Commission is working on the Climate Law. All these documents contain provisions that should be taken into account when designing the built environment, including housing.

² The UN’s Sustainable Development Goals are included in the document *Transforming our world: The 2030 Agenda for Sustainable Development* (United Nations [UN], 2015). The Agenda defines 17 goals and 169 related tasks that should be achieved by 2030. Almost all goals to a greater or lesser extent may be related to shaping the built environment (e.g. goals 6, 7, 12 and 13). The goal that directly addresses this issue is goal 11 – sustainable cities and communities.

60%; in the entire EU, the figure is over 70% of citizens, while being over 50% worldwide). Therefore, the issues of shaping the urban tissue, including housing development design, in such a way that it is sustainable and climate-responsible, are currently widely discussed and adopted by architects, scientists and municipal decision-makers. As do other European cities (Magistrat der Stadt Wien, 2009; Jones, 2018; Senatsverwaltung für Umwelt, Verkehr und Klimaschutz [SUVK], 2019). Warsaw drafts a number of documents and regulations that set relevant provisions and standards for shaping urban space and urban tissue in this context. The present paper focuses on the analysis thereof in relation to housing development. An attempt is made to define the requirements set by the municipality for designers or the recommendation made for Warsaw housing investments so that their form and operation are sustainable and climate-responsible. The analysis of the documents will focus on the main threads that determine design activities, whereas remaining issues (though also important from the point of view of housing development issues) will be left aside.

The most important studies from the point of view of architectural and urban design of residential building developments in sustainable development and climate context include the following documents:

- *Strategia adaptacji do zmian klimatu dla m.st. Warszawy do roku 2030 z perspektywą do roku 2050. Miejski Plan Adaptacji* (Urząd m.st. Warszawy, 2019).
- *Polityka mieszkaniowa dla m.st. Warszawy – Mieszkanie2030* (Urząd m.st. Warszawy, 2017) and *Program Mieszkania 2030* (Urząd m.st. Warszawy, 2018a).

The following analysis discounted the study about spatial development conditions and directions for Warsaw (BAiPP, 2006), as the document is to be modified soon. The Study adopted in 2006, though still in force, was deemed obsolete. Works on the new version have been conducted since 2018. It is assumed that the new Study will include provisions based on sustainable and climate-responsible city design. “Ensuring that the city does not sprawl into new, non-urbanized areas provides the main challenge. Building within a compact area will reduce economic and environmental costs. The study is also aimed at filling the gaps within the

existing building development in order to make better use of resources within a compact city. It is important to create multi-functional areas, i.e. places to live in, to work and rest so as to reduce the need to move around. Climate transpires as the key topic of the study. Green and blue infrastructure, i.e. greenery and water, prove equally important to building development. Only this way will Warsaw resistant to new climate challenges and friendly to Varsovians be shaped [own trans.]” (BAiPP, 2018).

City development strategy document *Strategia rozwoju m.st. Warszawy do 2030 roku* (Urząd m.st. Warszawy, 2018d) was also excluded from the analysis. The provisions of the strategy are rather general, while the documents analyzed here either specify its details or narrow the subject matter directly to the issues related to housing, sustainable development and climate problems, which are more important from the point of view under discussion. Moreover, a number of other municipal documents fail to be covered in the present articles. These include documents related to e.g. the issues of infrastructure, emissivity and mobility. Such studies relate to architectural and urban design, such as *Plan gospodarki niskoemisyjnej dla m.st. Warszawy* (Urząd m.st. Warszawy, 2015).

WARSAW ADAPTATION STRATEGY FOR CLIMATE CHANGE UNTIL 2030 WITH A FORECAST TO 2050

Strategia adaptacji do zmian klimatu dla m.st. Warszawy do roku 2030 z perspektywą do roku 2050. Miejski Plan Adaptacji is a document adopted by city councilors in July 2019. The strategy diagnoses the situation of the capital city in the context of climate change and its consequences for the urban body. It determines which groups of inhabitants and sectors of city life are exposed to undesirable changes. The document also describes the climate of Warsaw and indicates areas (districts) and threats likely to occur in their area. The city districts have been divided into groups: of moderate climatic risk and substantial climatic risk, of high climatic risk, of immense climatic risk and of the greatest climatic risk. In general, the key problems that Warsaw may face are thermal (urban heat island) and hydrological threats (flooding in the aftermath of torrential rains and floods). From the designer’s point

of view, the division into groups of threats is valuable, while familiarization with its description may influence design decisions.

Under the so-called adaptation options, the strategy also lists activities, including those related to design, the implementation of which will contribute to mitigating climate change and adapting to it. The above-mentioned measures fall under the scope of activity of municipal authorities, but they can also be a valuable guide for private investors and designers on how to shape the built environment, including residential areas.

Solutions recommended in the strategy that can also be applied in private investments include:

- construction of fountains, water curtains and drinking fountains;
- green roofs and walls;
- protection of greenery, mainly trees, increasing green area surfaces;
- unsealing of impermeable surfaces, permeable road surfaces, increasing the share of biologically active surfaces;
- introducing shady places;
- construction of water playgrounds;
- adaptation of recreational infrastructure to perform a retention function; system management of rainwater, ensuring natural ground retention, collecting rainwater (ponds, polders, underground reservoirs); use of rainwater for plant watering.

The Strategy emphasizes that it is only by “Introduction to spatial planning such guidelines that take into account the adaptation of the city to climate change, can the effects of climate threats be reduced [own trans.]” (Urząd m.st. Warszawy, 2019). It can therefore be assumed that in the upcoming urban planning documents binding for designers and drafted by the city, climate issues and adaptation to its changes will be present.

WARSAW HOUSING POLICY AND PROGRAM UNTIL 2030

Housing policy *Polityka mieszkaniowa dla m.st. Warszawy – Mieszkania2030* was adopted by the Warsaw City Council in December 2017. It presents a long-term forecast for the development of housing in the capital, with particular emphasis on the develop-

ment of urban housing reserves – this housing policy sets the objectives for the development of housing in Warsaw. One of these is to improve the quality of housing conditions of current and future Warsaw residents, in council housing, housing associations (Towarzystwo Budownictwa Społecznego) and projects on the private market. Currently, the city’s housing stock comprises approx. 84,000 dwellings, which is 9% of all dwellings in Warsaw. Local government authorities may improve the quality of living in the remaining part of the housing stock by implementing a responsible planning policy, setting the trends in construction (housing innovation) and fostering the development of strong supporting communities.

The document addresses the issue of climate change and the need for appropriate resource management, it assumes that the city will be shaped in a sustainable manner. Sustainable development is assumed to have the following dimensions: urban-planning and architectural, technical and construction-related (energy efficiency) and social. Warsaw authorities will strive to develop housing buildings in line with the concept of sustainable development, which may be defined as:

- reducing the chaotic urban sprawl;
- increasing the polycentricity of the city;
- multifunctional housing estates equipped with diverse infrastructure and common spaces;
- improving the quality of common spaces;
- increasing the energy efficiency of buildings and saving resources;
- formation of strong communities based on increased social participation, taking into account the diversity of residents, both female and male;
- testing innovative housing models.

Moreover, based on the current structure of households and demographic trends, it may be assumed that in newly designed housing estates, housing adapted to the needs of single and two-person households will dominate.

Document *Program Mieszkanie2030* describes an operational program for Warsaw development strategy until 2030 and provides details to the assumptions of the Warsaw housing policy until 2030 outlined above. Concurrently, the version of 28 September 2018, available on the website of the City Hall, is defined as the version subject to consultation. Nevertheless,

the document contains a number of interesting and valuable guidelines from the point of view of a designer of future municipal investments in Warsaw and is, thus, worth discussing. Three appendices – Warsaw Housing Standard (Warszawski Standard Mieszkaniowy), Housing Renovation Standard (Standard Remontów Mieszkań) and Biodiversity in Investment (Bioróżnorodność w Inwestycji) constitute an integral part of the program.

The program outlines 11 objectives of the municipal housing policy. These include: increasing the availability of housing, improving the quality of the existing reserve, supporting functional diversity in urban housing investments, supporting social diversity in urban housing, biodiversity as an element of a good neighborhood, strengthening neighborhood communities, counteracting housing/social exclusion, model tenement houses setting new trends, raising the standard of managing urban housing and servicing tenants,

implementation and promotion of good practices in housing construction, monitoring the rental market and providing knowledge thereof.

All of the abovementioned goals are part of the concept of sustainable development and are related to the way buildings will be designed or modernized. Some of them, however, are of particular importance to potential designers of urban investments.

The table shows the most important architectural and urban issues assigned to the selected goals.

The objectives of the *Program Mieszkania2030* and the tools for their implementation have been specified in the attached documents. From the point of view of sustainable architectural and urban design of new residential investments, the specifications will primarily be found in the Warsaw Housing Standard³.

Warsaw Housing Standard is “a set of rules according to which good quality apartments are to be built in the capital city. (...) The guidelines included in the

Table. Design issues – sustainable and climate-responsible design guidelines for new investments in document *Program Mieszkania2030* (Urząd m.st. Warszawy, 2018a)

Specific goal	Design issues – sustainable and climate-responsible guidelines for new investments
1. Increasing the availability of housing	Newly constructed housing should meet the requirements set out in Attachment 1 – Warsaw Housing Standard (Urząd m.st. Warszawy, 2018b).
	The new investments are to support the sustainable development of the city. Therefore, they should be based primarily on the densification of the urban tissue (use of already developed areas and their infrastructure, in order to prevent excessive urban sprawl). Although this goal is a certain simplification of the document provisions, it can be assumed that the closer the investment is to the city center, the better. The least desirable investments include those away from the center and in the suburbs, they are conditioned by the criterion of communication and concentration of buildings, of which factor has the potential to shape a local center (improvement of services, social and cultural offer).
	Newly built housing is to be divided into two groups – compact and universal standard constituting at least 20% of apartments. The universal standard is to be adapted to the needs of an aging society and should be easy to adapt to the needs of the disabled. Compact may be understood as “smaller apartments that make it possible to lower the rent [own trans.] (p. 77)”.
2. Improving the quality of the existing reserves	–

³ This standard was developed by a panel of experts consisting of: Justyna Biernacka (substantive coordination), Joanna Erbel (coordination of the housing policy for the capital city of Warsaw – *Mieszkania2030* and program *Mieszkania2030*, Biuro Polityki Mieszkaniowej, Sabina Augustynowicz (management), Tomasz Duda (environmental psychology and public health), Beata Gawryszewska, (nature), Piotr Jurkiewicz (building and yard), Krystyna Krzekotowska (legal issues), Andrzej Rajkiewicz (energy efficiency).

Table (cont.)

Specific goal	Design issues – sustainable and climate-responsible guidelines for new investments
	New investments will also be provided with space for social and commercial purposes. The program assumes that a minimum of 10% of the usable area of multi-family housing buildings will be allocated to commercial and service functions. As a result, the investments will be characterized by a functional mix (including residential, recreational, service and workplace-related functions).
3. Supporting functional diversity in urban housing investments	<p>If the municipal investment is being built as an element of frontage development, there will be commercial premises on the ground floors of the building.</p> <p>The document lists the planned investments which:</p> <ul style="list-style-type: none"> – are based on the idea of a functional mix; – are served by public transport, which eliminates the need to own a car and design a place for it; – they provide areas for open public spaces and neighborhood spaces.
4. Promoting social diversity in city housing (social mix)	Apartments in new investments are to be based on the idea of a social mix, some of them are to be intended for young people, other ones for people in need of support, other still are to be intended for the creative sector, and 20% are to be designed in the abovementioned universal standard. Hence, various sizes of apartments – min. 10% are to be studios (M1), at least 20% of apartments for two people (M2), min. 30% of family housing (M1, M2, M3). It is recommended to (temporarily) connect smaller apartments in order to obtain apartments for large families (with many children, multi-generational).
5. Biodiversity as an element of good neighborhood	New investments should meet the requirements set out in Attachment 3 – Biodiversity in the Investment (Urząd m.st. Warszawy, 2018c).
6. Strengthening neighborhood communities	In order to enable the integration of new residents and the building of neighborly bonds in new investments, a place for neighborhood meetings should be provided inside the building. One of the commercial premises should be dedicated to this function. It is possible not to design such a room as long as there is a local activity center or other similar space nearby and the investment itself includes a small number of apartments (several or more units).
7. Counteracting housing/social exclusion	–
8. Model tenement houses set new trends	The document lists planned investments – tenement houses, which are treated as innovative and pilot projects. Shared use rooms are provided in the described buildings. There are solutions such as: green walls, green roofs, gray water recovery systems. In addition, one of the investments is planned as co-living – flats with minimum dimensions with accompanying common spaces. “The purpose of all these projects is to test social and technological innovations [own trans.] (p. 103)”, which also seems to provide an opportunity for interesting, sustainable and innovative architectural projects in the local area.
9. Raising the standard of city apartment management and services for tenants	–
10. Implementation and promotion of good practices in housing construction – cooperation with private investors (Warsaw Housing Standard for developers)	The activity assigned to this goal is defined as “Creation of a certification system for investments compliant with the Warsaw Housing Standard in terms related to energy efficiency and circular economy, greenery quality, social dimension of investments and innovation of applied solutions [own trans.] (p. 106)”. The emergence of such a standard would undoubtedly exert an impact on design works.
11. Monitoring the rental market and providing knowledge thereof	–

Standard will apply to investments conducted by the Capital City of Warsaw on lands being the property of the city. For private companies in the construction industry, the Standard will serve as a code of good practice [own trans.]” (Urząd m.st. Warszawy, 2018b, p. 4).

Warsaw Housing Standard is divided into five parts (defined as areas): Investment preparation, Location, Nature, Building and courtyard, Property administering and management. Each of these parts contains guidelines and recommendations on how the building and its surroundings should be designed. The most important guidelines related to sustainable and climate responsible design are listed below.

Investment preparation

- Warsaw Housing Standard promotes comprehensive and interdisciplinary investment programming and design. It assumes that investments should be attended by a panel of specialists appointed at the initial stage of work, responsible for the diagnosis of the current condition. Apart from specialists typically appointed to investments (architects, engineers of various industries, cost estimators, landscape architects), they should also include members of such branches as economists, sociologists, psychologists, ecologists. The panel’s task is to analyze the urban context, conduct consultations with stakeholders, develop an investment program and guidelines for the architectural contest.
- The investor is obliged to analyze the urban context. The list of issues that should be included in the analysis contains a number of points and includes issues specific to a given area, e.g. planning conditions and requirements, functional conditions of the area adjacent to the investment, infrastructure conditions. Conclusions from the conducted analysis are to indicate the directions for further actions. The analysis itself should consist of a text part and graphics, the scope of which is defined by the Warsaw Housing Standard.
- When starting a new investment, the investor (in cooperation with local authorities) is obliged to conduct public consultations with stakeholders. The consultations’ conclusions should be collected in a report to indicate those postulates of stakeholders that deserve consideration in further design work.
- Urban housing investments should result from an urban-planning/architectural contest.
- The project team should be multidisciplinary and consist of specialists from various industries (as well as the team responsible for diagnosis). Due to the enlarged team and scope of works, the investment budget should be increased by 10% compared to the previously held, similar procedures.
- Recommends the implementation of integrated design process and building information modeling (BIM) tools.

Location

- The basic feature of the investment in the context of its location is compliance with the idea of “near everywhere”. Warsaw Housing Standard determines the maximum distances of a residential investment from services, including educational and cultural ones, as well as the proximity of public transport.
- Warsaw Housing Standard considers the issues of comfortable and safe pedestrian traffic a priority. “Having completed a housing investment, the previously functioning passages through the investment area should be restored or another possibility of free passage through this area should be provided [own trans.]” (Urząd m.st. Warszawy, 2018b, p. 18).
- Warsaw Housing Standard emphasizes the role of bicycle transport and determines the recommended number of parking spaces depending on the function of the facilities.
- Warsaw Housing Standard promotes the idea of car-sharing (providing dedicated parking facilities) and electric vehicles (provision of charging points and parking spots).
- The number of parking spots for traditional cars should be limited. The document provides numerical guidelines, e.g. maximum 0.5 spaces per apartment.
- Parking spots being a part of an investment should not be assigned to a specific apartment.

Nature

The document emphasizes the role of the natural environment and biodiversity, indicates the need to protect the existing species of plants and animals that inhabit

the investment area (especially the protected one), as well as the existing greenery layouts and systems. The presence of trees is particularly important e.g. “Having abstracted the area delimited by the development outline, the investment area should be covered with tree crown projections in 25% in residential areas of urban development and in 50% in residential areas of suburban development (this amount should be obtained 20 years from the completion of the investment, ensuring the diverse age of the population of planted trees and shrubs) [own trans.]” (Urząd m.st. Warszawy, 2018b, p. 28).

- Designed greenery should be divided into four groups: ecospot, community gardens or residents’ gardens, estate greenery, greenery on buildings. Warsaw Housing Standard contains recommendations for each of these groups regarding their formation and maintenance, as well as plant species and supplementary issues.
- Traffic routes should be impermeably hardened only where absolutely necessary.
- A compost bin should be installed on the investment site (cultivation by residents), and the greenery should be irrigated with rainwater or recycled gray water.
- The document recommends the use of green roofs and green walls (intensive roofs and climbers rooted in the ground are preferable choices), trellis and pergola systems, and the shaping of the facade in such a way as to enable the cultivation of potted plants.
- The document draws attention to the need to provide the largest possible natural active area (powierzchnia przyrodniczo aktywna – PPA) in accordance with the provisions of the local development plan) and indicates various management options under possible natural active area, as well as possible weights assigned to them.
- Ecospot should constitute at least 40% of the undeveloped plot area.

Building and courtyard

- Each investment should be provided with an information board, placed at its main entrance, containing the year of construction, authors of the project, energy efficiency class and other relevant information.

- The building should be flexible – changing the layout of the apartments and their size, as well as modifications inside the units (e.g. adaptation to the needs of the disabled), should be possible and presented in concept drawings.
- A maximum of eight apartments can be accessed from one staircase on a given floor.
- Warsaw Housing Standard describes two housing standards and requirements provided for them, namely the compact standard and the universal standard, previously defined in the main document. It specifies the surfaces of apartments (minimum for the universal standard and maximum for the compact standard), special requirements for the minimum dimensions of individual rooms, issues related to the requirements of the arrangement of functions in the apartment and the sizes assigned to them (e.g. issues of separating the toilet and the kitchen).
- “The design should include drawings that present the furniture arrangement for each apartment [own trans.]” (Urząd m.st. Warszawy, 2018b, p. 30). It is especially important for universal flats.
- Each apartment should be assigned a locker or a storage room.
- On the investment site, rooms, where residents’ meetings will be held, should be designed.
- It must be possible to store prams in every building.
- It is obligatory that staircases and corridors, if possible, should be lit with daylight.
- The building should be accessible to disabled people in accordance with the documents and regulations cited in Warsaw Housing Standard. The building design will be subject to an accessibility audit.
- Warsaw Housing Standard indicates the principle of “security by design” as significant when designing new investments and defines a number of design procedures and tools that will allow to shape a safe living environment.
- Warsaw Housing Standard strongly advises against fencing housing estates.
- Buildings should be designed to be healthy and comfortable, i.e. so that no need arises to install active cooling systems (windows to be opened in

- all habitable rooms, natural ventilation, including ventilation through the building and corner ventilation systems) and the high quality of internal air is ensured. Moreover, for rooms where no need to be lit naturally exists, according to the applicable regulations, this possibility should be provided, also directly through glazing between the rooms.
- Even if the regulations do not specify the issue, it is preferable when rooms are lit by natural light from different directions.
 - Buildings should be shaped in such a way as to ensure that residents can maintain their privacy.
 - Warsaw Housing Standard draws attention to the importance of the view from the apartment windows and recommends that designers pay attention to its attractiveness.
 - Buildings should be designed as nearly zero-energy buildings, i.e. they should be energy efficient and use renewable energy sources. “The issues of energy saving are not limited exclusively to operating energy (energy consumed by a functioning building), but also to embedded energy (used to produce and deliver building materials and devices, their incorporation into a building, demolition and reuse thereof) [own trans.]” (Urząd m.st. Warszawy, 2018b, p. 35).
 - Warsaw Housing Standard specifies requirements, definitions, design guidelines and recommendations related to energy efficiency. The quality of the project related to energy issues should be confirmed by an obligatory leak test and thermovision test and subsequently (during the operation of the building) with energy inspections.
 - In municipal housing investments, water-saving solutions should be provided, with the use of rainwater (watering, cleaning, flushing toilets), and rainwater retention (e.g. containers, green roofs, rain gardens, permeable surfaces).
 - Warsaw Housing Standard promotes the idea of resource management in a closed cycle and thus strives to reduce the amount of waste.
 - In the design of residential units, space for waste segregation should be provided.
 - Materials and devices used in the project should be produced from local raw materials in an energy-efficient and resource-efficient manner with respect

for the natural environment. They should be repairable (not “disposable”) and recyclable or reusable after disassembly.

- The open common space (courtyards) should be multifunctional and shaped in accordance with the idea of universal design. It should be equipped with comfortable seating, space to play and a drinking fountain.

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

In all the analyzed documents, the issue of designing a sustainable and climate-responsible living environment is present and crucial. The authors of the documents, as well the city authorities are aware of the impact these issues exert on the quality of life in the capital city, both currently and in the near and distant future. Both the intentions of the authors’ document and the resulting method for shaping building development for housing purposes are consistent with the state of scientific research relating to sustainable and pro-climate design.

The analysis of the documents provides a chance to ponder the question of to what extent the application of their provisions in design and implementation practice can contribute to the introduction of desired changes in the urban tissue and what obstacles may arise.

Strategia adaptacji do zmian klimatu dla m.st. Warszawy do roku 2030 z perspektywą do roku 2050. Miejski Plan Adaptacji is a relatively general document that indicates directions and lists basic activities. At the same time, as noted in the “Relations with planning documents section”, it is only by relevant provisions in urban planning documents that authentic actions are guaranteed. Urban planning documents – studies, and especially local development plans (or in the case of amendments to Act on Spatial Planning and Development, the documents replacing them) – are binding both upon city authorities and decision-makers, as well for upon designers. However, it is worth noting that this strategic document is valuable from the design point of view, as it contains a detailed analysis of climatic conditions in individual parts of the city that constitute potential investment locations.

It also indicates recommended solutions, including, most importantly, the significance of water management and the presence of greenery and biologically active surfaces.

Polityka mieszkaniowa dla m.st. Warszawy – Mieszkania2030 is a document based on the assumptions of sustainable urban development in all of its aspects. Its provisions should be interpreted as a declaration of readiness to act, the practical issues of which are covered in the detailed *Program Mieszkania2030*.

The solutions presented in the program, and especially in the Warsaw Housing Standard, an attachment to it, constitute a set of guidelines. They include location issues (“near everywhere”, providing services of public transport to the investment, preventing urban sprawl), promoting pedestrian movement and cycling traffic, the presence of greenery and biologically active surfaces, as well as biodiversity, energy efficiency, responsible water management, the use of renewable energy sources, circular economy, universal design and building strong local communities with the integration of residents.

From the architectural and urban-planning point of view, Warsaw Housing Standard document is most relevant in comparison to the other discussed documents. While slightly generalizing the assessment of the provisions (thematically diverse and with varying degrees of detail) contained in the standard, it is worth mentioning that the authors of the document approached the issue of sustainable and climate-responsible design of the urban housing environment in the most comprehensive, careful and insightful way possible. If the rules of conduct and patterns presented in Warsaw Housing Standard were introduced into the design and implementation practice, Warsaw residential buildings and the capital city itself would become a better place to live.

The available version of Warsaw Housing Standard is, however, not final (nor is the entire *Program Mieszkania2030*). According to the information available on the website of the City Hall, it is known that the document is still subject to consultations, modifications and new details. The latest update of the information was performed over a year ago (January 2019), which is somewhat disturbing and may raise concerns that the document is stranded, while its fate is uncertain.

Concurrently, the fact that the document remains at the preparation stage leads to believe that its final version will be slightly changed because although the entire attachment should be assessed positively, some of its passages are debatable.

A list of the most important author’s comments and suggestions worth considering when proceeding with *Program Mieszkania2030*, including the Warsaw Housing Standard document in particular, is provided as follows:

- The principle of interdisciplinary design and holistic approach to investment implementation, though undoubtedly proper, seems to be overly developed in the Warsaw Housing Standard document. Architectural design is an interdisciplinary process that involves multiple specialists, whose participation is dictated by regulations and the decision of the chief designer. The list of people included as participants in the design process at its various stages, mentioned by the Warsaw Housing Standard documents, is long and seems not to apply to all potential investment processes. It appears that it is necessary to clarify the situations in which the standard set of specialists should be extended. Assuming that the specialists mentioned in the Warsaw Housing Standard documents are participants in each investment process, a significant increase in costs (over 10% mentioned in the document) should be expected and so does a prolongation of investment time. In addition, the procedures for the cooperation of such a large number of specialists of various fields should be clarified, while the distribution of decision-making and responsibility in such a process should be specified.
- A large part of the investment preparation is devoted to the diagnosis of the current condition. This extremely important stage also seems too extensive in terms of the number of necessary works and participants. It appears that, among other issues, the additional analysis of the existing state (presented as a text part and a graphic part) duplicates in many aspects the stages conducted as a part of the traditional design process.
- Investments to which the provisions are to relate were not differentiated, for example, in terms of the number of inhabitants or apartments or the plot

area. This is a far-reaching simplification. Some of the Warsaw Housing Standard guidelines seem to be dedicated to slightly larger assumptions (a multi-block housing estate) and may be extremely difficult to implement, e.g. in relation to infill buildings, on a small plot of land and with a small number of storeys. These comments concern, among other issues, the obligation to design service premises or rooms dedicated to residents' meetings, guidelines relating to the planned greenery or the size of the ecospot.

- Some of the provisions of the Warsaw Housing Standard document, however correct they may be, are obvious and seem to be taken directly from a students' design textbook. Their obviousness results from the obligation to implement urban-planning regulations (provisions of the study and from local development plans) and from the Construction Law. Their presence seems to emphasize the lack of trust in urban-planners (who author urban-planning documents in force in a given area) and in investment designers, or may even raise an accusation that designers are not familiar with the regulations or procedures. Examples of such excerpts may include the following entries: "When analyzing the urban context, the following issues should be taken into account: planning conditions and requirements, (...), places subject to the protection of cultural heritage (...), natural conditions (...), arduousness and threats related to noise (...), the presence of inundation areas, areas of pollution, landslides, etc., infrastructural conditions", "The rooms in the apartment should be designed in a way that allows the household members to move freely, as well as to enable ergonomic and functional furniture arrangement", "Buildings should be designed in such a way as to provide tenants with thermal comfort in their apartments throughout the year", "Rooms should be lit by natural light, taking into account the provisions on insolation and shading [own trans.]" (Urząd m.st. Warszawy, 2018b, p. 34).
- As mentioned above, the provisions of the Warsaw Housing Standard document are comprehensive and cover all issues important from the point of view of sustainable design. Many of them, such as the issue

of greenery within the investments, are described in great detail, other matters are discussed much more generally, while the document leaves greater freedom interpretation thereof. Against this background, more specific recommendations for sustainable and energy-efficient building technologies, solutions and materials are particularly deficient.

Therefore, although the discussed documents, the Warsaw Housing Standard document in particular, contain a number of noteworthy guidelines, they also require certain modifications, additional details and clarifications in the abovementioned areas. Moreover, the document itself, apart from design issues, also discusses other related issues not directly associated with the work of an architect. Thus, in the light of the above comments, the document is of a very complex nature and, from a practical point of view, it is difficult to use as a guidebook of good practices and solutions. It seems that a need arises to define clear, coherent and possibly lapidary guidelines dedicated to architects for designing buildings constructed under *Program Mieszkania2030*. The solution could also lie in a certification system, mentioned in the program, for Warsaw Housing Standard-compliant investments. One of the activities required for the implementation of goal 10 of the program was defined as: "Creation of a certification system for investments consistent with the Warsaw Housing Standard in terms of energy efficiency and circular economy, greenery quality, social dimension of investments and innovation of applied solutions [own trans.]" (Urząd m.st. Warszawy, 2018a, p. 106).

Certification system criteria would clearly define the desired solutions, which would significantly simplify design works, as well as interpretation of the Warsaw Housing Standard provisions.

To summarize the above considerations, the author would like to emphasize that it is worth appreciating and emphasizing the efforts taken by authorities of the capital city, officials and authors involved in the preparation of the discussed documents with view to improving housing developments in Warsaw, making them more sustainable, climate-responsible and comfortable for the residents. The critical remarks contained in the above text are not intended to depreciate the enormous and very important work done in the field of creating

the provisions for the discussed documents. The comments are rather intended to highlight issues that require some adjustments, and as *Program Mieszkania2030* is still being developed, modifications thereof are possible. The author is convinced that the implementation of the actions described in the documents is crucial to ensure a high quality of life in Warsaw.

To conclude, it is worth paying attention to two important provisions of Warsaw Housing Standard. Both of them provide superb tools leading to improvement in the quality of the designed objects, not only in the climatic and sustainable context. The first of the provisions states that “Municipal housing investments should be prepared through an urban or architectural competition [own trans.]” (Urząd m.st. Warszawy, 2018a, p. 15). The second one requires placing an investment information card at its main entrance. The card should contain at least such information as the year of construction, the authors of the project and the energy efficiency class.

The aspect of competitiveness and competition is the best method for the creation of valuable objects. However, the formulation of contest terms and the composition of the jury obviously play a key role in this case.

Moreover, the lack of anonymity of the designer may be seen, on the one hand, as ennoblement and may emphasize the importance of the designer. On the other hand, it imposes responsibility, even greater than the one specified by law and guidelines, on the architects for the effects of their work than, as well as mobilizes to strive at even better performance.

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NOWA WARSZAWSKA ZABUDOWA MIESZKANIOWA W KONTEKŚCIE PROJEKTOWANIA ZRÓWNOWAŻONEGO I ZMIAN KLIMATYCZNYCH – MIEJSKIE WYTYCZNE I REKOMENDACJE

STRESZCZENIE

Budynki mieszkalne są bardzo istotnym, jeżeli nie najistotniejszym, elementem środowiska życia człowieka. Są one również jedną z podstawowych form zabudowy miejskiej. Sposób jej projektowania implikuje więc konsekwencje dla całego organizmu miejskiego, także te związane ze zrównoważonym rozwojem oraz zmianami klimatycznymi. Decydenci na szczeblach Unii Europejskiej, krajowym oraz lokalnym podejmują wiele działań, wytyczając standardy kształtowania miast, które mają na uwadze wymagania zrównoważonego rozwoju i działania odpowiedzialne klimatycznie. Praca koncentruje się na wybranych dokumentach miejskich opracowanych w ciągu ostatnich kilku lat dla Warszawy, w których podkreślono znaczenie tych zagadnień. Przeanalizowane dokumenty wyznaczają przepisy i standardy kształtowania miasta, w tym projektowania budynków i osiedli mieszkaniowych. Ich zapisy analizowane są przez pryzmat kryteriów projektowania zrównoważonego i proklimatycznego. Celem opracowania jest wyszczególnienie wytycznych adresowanych do architektów, zgodnie z którymi nowa zrównoważona zabudowa mieszkaniowa powinna być kształtowana. Praca podejmuje również próbę oceny tych wytycznych w odniesieniu do uwarunkowań determinujących pracę projektanta.

Słowa kluczowe: Warszawa, projektowanie zrównoważone, klimat, zmiany klimatyczne, zabudowa wielorodzinna, osiedle, Warszawski Standard Mieszkaniowy