MASS HOUSING IN UKRAINE IN THE SECOND HALF OF THE 20TH CENTURY

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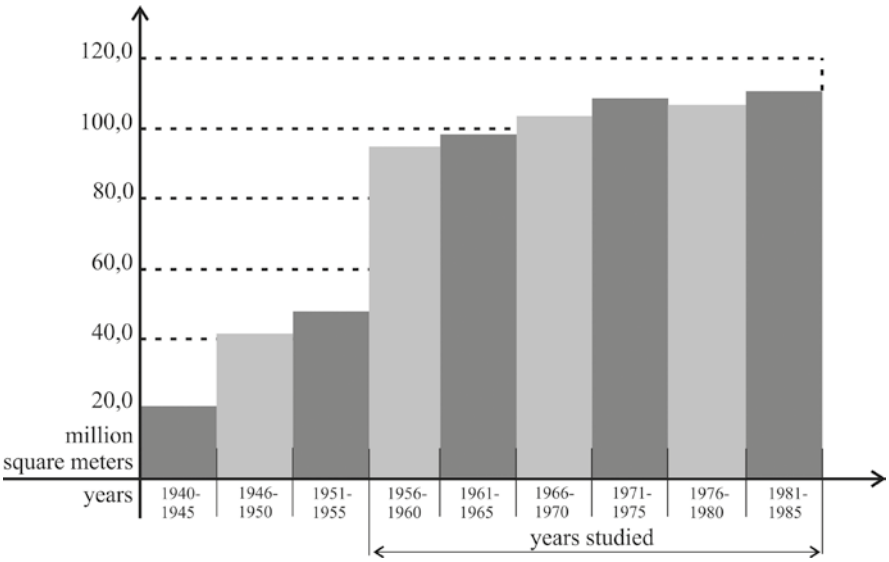
ABSTRACT: The housing issue is rightly considered one of the most acute problems of humankind. It is generated by social causes and has a social meaning. The housing issue cannot be solved with purely technical, architectural or artistic approaches. Rather, it also depends significantly on economic, political and environmental circumstances. At different times, the nature of the living environment was formed under the influence of social order, the level of development of productive forces, household and economic systems, and other factors. In the second half of the 20th century, following standard designs, Ukrainian cities mostly consisted of four- and five-story residential buildings in new residential areas. As a result, the living environment of many cities in the country acquired a common and rather modest appearance, dominated by concrete construction. At that time, this was the most effective way of mass housing construction. New technologies and design solutions were used. Such housing was cheap and purposefully met the social standards at the time. In addition, for the owners of such housing, it meant a new higher level of comfort. This publication focusses on housing construction in the second half of the 20th century in Ukraine after 1956. It is important to identify the quality of such housing and its compliance with modern requirements. Methods of systematization of historiographical materials, comparative and historical analysis, and field surveys were used to achieve the aim. Among the main achievements are the comfortable density of residential areas and fast construction times. The disadvantages of this period's mass housing construction are related to missing maintenance, ongoing destruction, often complex ownership situations and the challenge to adapt each building to current needs and regulations.

KEYWORDS: Mass housing, industrial housing construction, typification, unification, constructive solution

INTRODUCTION: People spend half of their life in a living environment, which therefore has a significant impact on a person's mental and physical health. Famous Ukrainian scientist and researcher of housing construction Genadiy Lavrik believed that everything that surrounds us in our home is a reflection of our essence, our worldview. Our home is our intimacy; it is ourselves. That might be why there are people who receive guests in public catering establishments (Lavrik, 2007).

The object of research of this article is mass housing construction in Ukraine during its intensive development period in the second half of the 20th century, starting in 1956. The aim of the study is to identify the pros and cons of housing construction in this period based on a careful analysis of mass housing construction in Ukrainian cities. A number of scientific methods have been used to achieve this goal. In particular, methods of systematization of historiographical materials, scientific works of previous researchers, architectural and design materials, and typical design solutions were used. Comparative and historical analysis was used to determine the main characteristics of residential buildings of typical projects of different series. Field inspection of the studied objects was used to determine their visual characteristics, make sketches, and take photographs.

The basis for this study were scientific works in the field of mass housing construction by many scientists: M. Lisitsian, L. Bachynska, V. Korol, Y. Repin, B. Banykin, M. Dyomin, E. Klyushnichenko, G. Lavrik, I. Gnes, M. Bivalina, M. Gabrel, A. Inozemtseva, L. Mulyar, Yu. Piskovskii, V. Solovyov, E. Pronina, M. Posokhin, P. Rudakov, E. Fedorov and K. Malaia outline the problem



01 Housing volumes in the USSR from 1940–1985. © L. Shevchenko, 2020, p. 449.

of obsolete housing in large cities, including that of Ukraine, like Kyiv, Odesa, Kharkiv, Dnipro, or Lviv. The theoretical and methodological foundations of the housing formation, functional zoning of the residential areas and types of residential buildings are analyzed in the works of Bachynska (2004), Korol (2006), Lisitsian and Pronina (1990). Scientists such as Posokhin (1953), Rozanov (1982), Rudakov and Fedorov (1964) highlighted the structural features of large-panel construction. A number of scientific publications are devoted to the housing heritage of this period, the analysis of its current state and the possibility of its modernization in accordance with modern requirements and needs (Schreiber 1993, Gabrel 2016, and Shevchenko 2020). Housing from the second half of the 20th century is studied not only by architects but also by builders, designers and engineers.

THE RESEARCH

In Ukraine, there was a quantitative leap in housing construction in the selected period starting in 1956. The proliferation of fast-paced residential buildings at the time was one way to address the post-war housing crisis of the 1950s. At the same time, it was necessary to solve the challenges of the rapid recovery and development of industry and the creation of new urban infrastructure. Therefore, not enough attention was paid to energy efficiency, durability, quality and appropriate comfort of living. The vast majority of scientists consider such a rapid pace of housing construction a breakthrough (Meerovich and Antonenko, 2018, Shevchenko, 2020). And indeed, in around 15 years (from 1951 to 1965), more than 224,545 square meters of housing were commissioned. This is evidenced by the growth chart of housing construction in the Soviet Union in the study period from 1956–1985 compared to previous years (Shevchenko, 2020) [FIGURE 01].

In the postwar period, there was an acute shortage of separate individual housing units in Ukrainian cities. At that time, the building process took place according to the technologies of industrial housing construction with typification and unification of structural elements, planning schemes and three-dimensional solutions. Typified and often prefabricated housing predominates in the central historical districts of most cities of Ukraine.

LANDSCAPING AND PLANNING SOLUTIONS FOR HOUSING

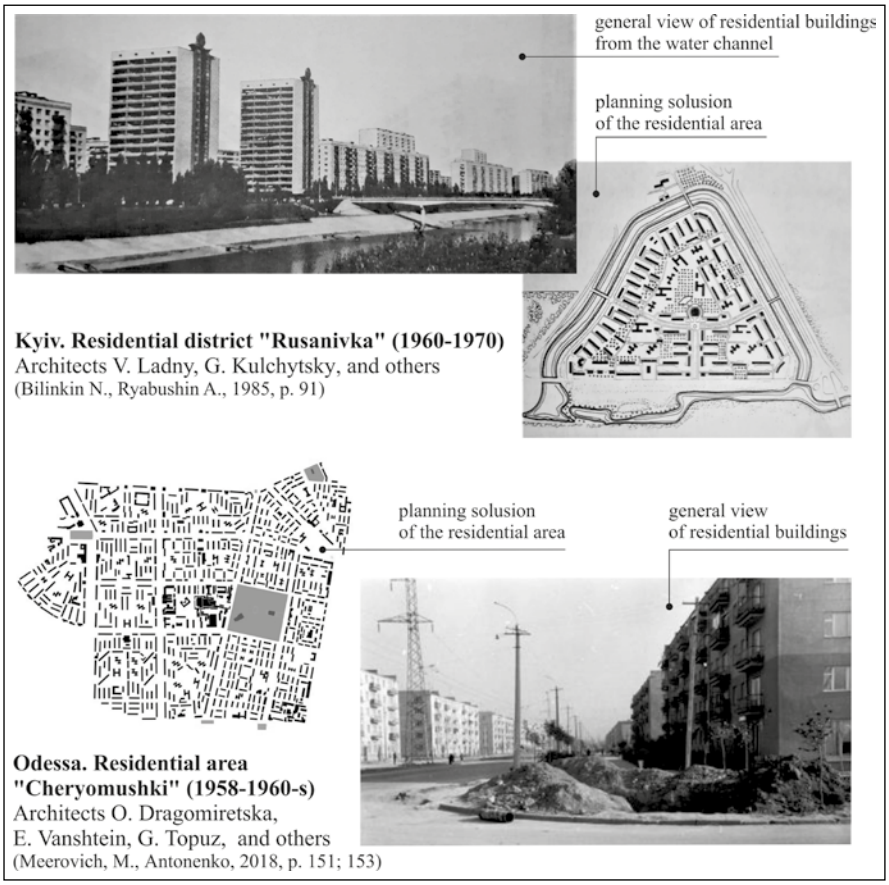
The planning structure of the city was developed after 1956. It included a system of landscaping the city and planning elements—neighborhoods, quarters, and separate housing groups. Scientists like Bilinkin and Ryabushin (1985), Lisitsian and Pronina (1990), and Shevchenko (2020) believe that the value of five-story housing in that entire period is not so much based on the building designs than on the planning structure of the neighborhoods they form. Urban planning provided a system of paths, green areas, playgrounds for children, swimming pools and other facilities for communal use. For the first time in the Soviet Union, complex landscaping with perennials such as flowering shrubs, fruit trees, vertical landscaping and hedges was used on the territory of these residential yards. This minimized the negative effects of noise and wind. Residents of the five-story apartment buildings actively used the adjacent areas and courtyards. The center of Soviet socialist life at that time was concentrated here. A comfortable microclimate with a developed social infrastructure was formed in such residential areas and was represented by household services, shops, kindergartens, nurseries, schools and clinics. There was a constant search for rational planning solutions in neighborhoods and housing quarters [FIGURE 02]. Initially, these were purely residential neighborhoods characterized by closed forms with a constant size and a more or less constant functional use of plots. This led to rather uniform living environments. Later, architects tried to preserve and emphasize the features

of the landscape. This opened up the possibility of creating expressive compositional solutions: residential yards opened to natural elements like bodies of water and green areas.

ARCHITECTURAL AND PLANNING SOLUTIONS FOR RESIDENTIAL BUILDINGS

In the period under review, the typology of residential buildings was represented by *Stalinkas* (late 1930s–late 1950s), *Khrushchevs* (1958–1985) and *Brezhnevs* (1958–early 1980s). Their names were derived from the surnames of the leaders of the then-Soviet Union who ruled the country at that specific time.

The Stalinkas were the first apartment buildings built as typified projects. Typified projects were designs of residential buildings with similar structures and details. They were intended for serial construction or repeated implementation in further construction. Such housing was realized on the basis of industrial construction methods. Reliability of construction, sufficient thermal insulation, floor height of 3.0–3.2 m, and sufficient minimum space (especially compared to the Khrushchevs) were the main positive characteristics of the Stalinkas. The walls were made of red or white brick; the floors were reinforced concrete or combined concrete-brick floors. There were two to four apartments in a section. They were mostly three or four-room apartments, rarely one or two-room apartments. The rooms could be combined or separated. The high price, lack of parking lots or underground garages, narrow corridors and the lack of a hall in most projects, in addition to the critical degree of wear and tear of communications, low energy efficiency, and lack of elevators were the disadvantages of these buildings. Typical series of buildings could be 'All-Union' or 'local', meaning that they could be used in the entire USSR



02 Rational planning solution of micro districts and quarters with residential development. © L. Shevchenko, 2022.

03 Characteristics of residential buildings of the Stalinka type. © L. Shevchenko, 2019.

or only in certain cities or territories of the USSR. All-Union series featured some differences depending on the locality [FIGURE 03].

Stalinkas were distinguished by their architectural and planning solution and have preserved the rigor and conciseness of the architectural forms of Neo-Classicism (the so-called Stalin Empire or Socialist Realism) and comfortable planning. They attracted attention, especially elite nomenklatura houses, designed for the residence of party and business leaders, employees of power structures, famous scientists and creative persons.

Khrushchev is the name of prefabricated four- or five-storey buildings that were actively built in the USSR from 1956–1985. These buildings served to temporarily solve the country's housing problem. They were designed for a service period of 25 to 50 years but have remained in operation to this day. The history of buildings of this type dates back to 1948, when the first frame-panel houses were built. In the 1950s, a number of pieces of legislation were issued on housing construction. Among these documents are the Resolution of the Council of Ministers of the USSR No 1911 "On Reducing the Cost of Construction" (1950), the Resolution of the Central Committee of the Communist Party of Ukraine and the Council of Ministers of the USSR "On Development of Prefabricated Reinforced Concrete Structures and Construction Parts" (1954), the Resolution "On the Elimination of Excessivenesses in Design and Construction" (1955), and the Resolution "On the development of housing in the USSR" (1957). These state documents have become a powerful basis for urbanization and the creation of a new type of housing. In addition to frame-panel houses, the construction of frameless-panel houses began in various large cities. The construction of 402 factories for prefabricated structures made of reinforced concrete and the organization of the production of standard parts were driven forward. The early Khrushchevs were the least comfortable and habitable.

In the 1960s, more than 5,000 five-story large-panel residential buildings were built in Ukraine [FIGURE 04]. These were mainly houses of the series 1-438, 1-464 and 1-480. They were built with maximum use of prefabricated reinforced concrete structures. The foundations were strip foundations consisting of precast concrete and reinforced concrete blocks. The walls were made of concrete panels or brick. Flat slabs or tent panels (more often tent panels to save concrete) were used. The tent panels were flat reinforced concrete slabs framed with four ribs along the entire contour. Such panels were used mainly in large-panel residential buildings. The roofs consisted mostly of flat slabs combined with a sloping roof (Kyiv real estate, 2018).

At the same time, ergonomic research was conducted. It formed the basis for the development of projects for the Khrushchev apartments to perform a variety of actions using minimum sizes. Compactness was the main requirement for the kitchen of a small apartment. This requirement was satisfied thanks to the proper organization of processes carried out in kitchens and the compactness

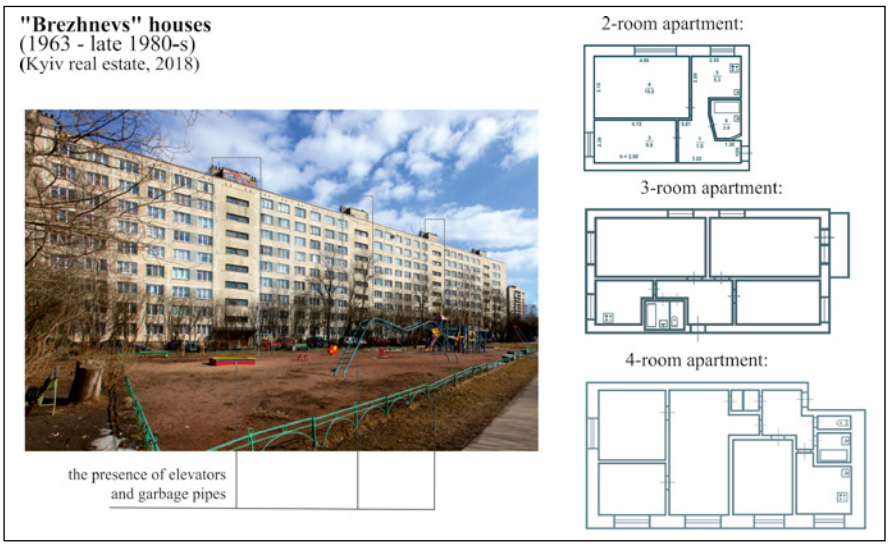
04 Characteristics of residential buildings of the Khrushchev type. © L. Shevchenko, 2019.

05 Innovations in the early Khrushchev apartments. © L Shevchenko, A. Demchenko, 2018

of the relevant equipment (Cherykover, 1944, p.7). As a rule, the size of the kitchen in the Khrushchevs varied from 5 to 7 square meters. The kitchen was equipped with a furniture set, a table and chairs and a cold storage. One of the innovations in the early apartments was a special cold storage underneath the window, which was used to store food. Another innovation was the window in the wall between the bathroom and kitchen. It served as a natural light source for the bathroom and to protect the wall structure in the event of a gas explosion [FIGURE 05]. Over time, these innovations have become shortcomings for modern apartment dwellers as the cold storage acts as a thermal bridge and the visual connection of kitchen and bathroom is perceived as outdated.

Brezhnev is the general name of prefabricated houses from 1963-1964. However, the construction of early Brezhnevs began in the 1950s during the construction of the Khrushchevs. They are brick, block or panel buildings in the style of Functionalism. Compared with the Khrushchevs, the apartment footprint was increased, the toilet and bathroom were separated, and the living rooms were isolated. The number of storeys in the residential building increased to 9–12 floors. The forms of buildings became more diverse in height, section width and shape. Also, garbage pipes and an elevator were already provided in the houses of that period. The average ceiling height in the apartments was 2.65 m. This type of building also had wider stairwells and marches and improved planning solutions. Thermal insulation was reduced if the batteries were mounted in the wall; in this case, residents had to install additional radiators [FIGURE 06].

06 Characteristics of residential buildings on the Brezhnev type. © L. Shevchenko, 2018.



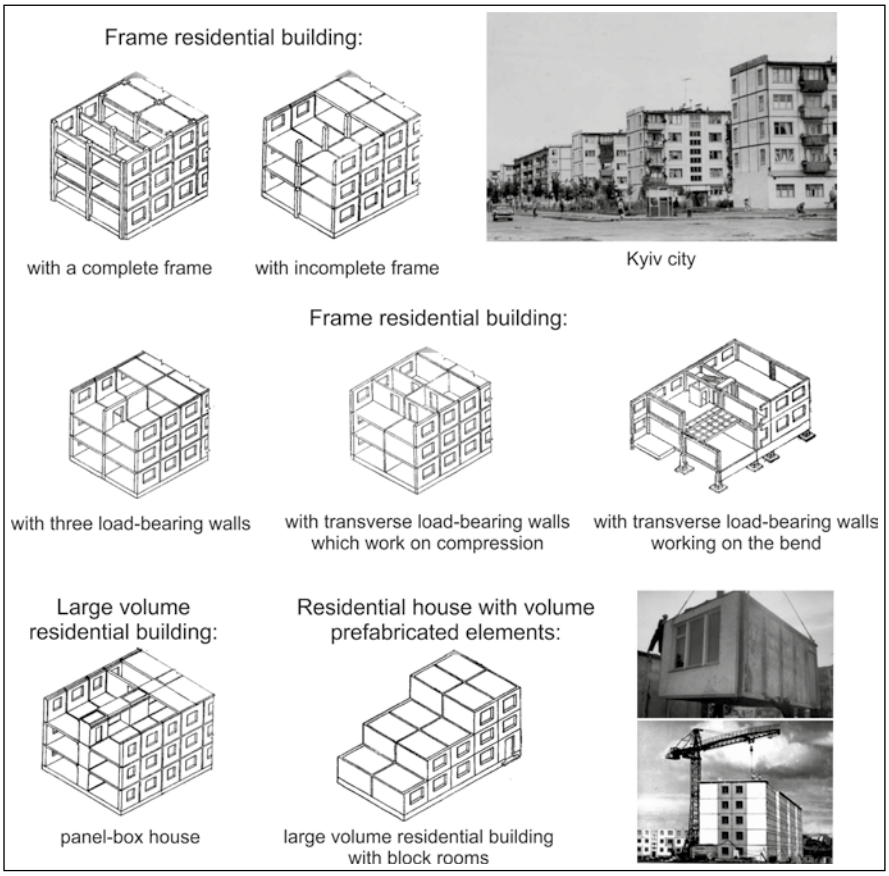
CONSTRUCTIVE SOLUTIONS FOR RESIDENTIAL BUILDINGS

Technology played a major role in the mass construction of the 1950s and 1960s. From 1950 to 1954, the world–first manufacturing plants for prefabricated reinforced concrete elements with a conveyor production method were created in Kyiv, the capital of the Ukrainian USSR. In only four years, from 1954 to 1958, the production of precast concrete in the country increased more than four times. As a result, factory and construction processes were accelerated, the cost of construction was reduced, the quality of manufacturing elements was improved, and the accuracy of installation on the construction site was increased. Since the second half of the 1950s, housing construction was based on the use of prefabricated elements. The five-storey residential building with a simple rectangular configuration became the leading type of housing in the plan layout. It was considered the most economical type because it did not need an elevator. This principle was reflected in the construction of many new residential areas in Ukrainian cities.

Experimental construction became important during the transition to new methods of industrialization. Not only various planning decisions for residential buildings of that period but also methods of building housing groups and neighborhoods, and landscaping were practiced and tested. Similar experiments concerned the fundamental constructive solutions, elements, components and parts of residential buildings (brick, brick-block and cinder-block walls, expanded clay concrete load-bearing panels and others) [FIGURE 07]. In most cases in Ukraine, single-layer and double-layer load-bearing and three-layer self-load-bearing external wall panels were used. Single-layer and double-layer panels were recommended for use in residential

buildings with longitudinal load-bearing walls, and three-layer panels for buildings with transverse load-bearing walls. Two-layer panels could also be used as self-supporting elements in houses with transverse load-bearing walls (Rozanov, 1982). Reinforced concrete, expanded clay concrete, thermo-concrete and others were used as materials for different types of wall panels.

The transition to industrial construction required the maximum typification and standardization of residential projects. Scientific and design organizations were working on the most economical and structurally simple series of residential apartment sections. The method of serial design, proposed in 1938, was developed and improved and became dominant in the typification of mass residential and public buildings of the second half of the 20th century in various cities of the country.



07 Construction schematics of large-panel housing construction. © L. Shevchenko, 2022.

CONCLUSIONS

Housing development in the second half of the 20th century solved the problem of lack of separate individual housing units for Ukrainian families. The residential buildings of the study period from 1956 to 1985 were a breakthrough—both in the level of comfort and in construction technology. Architectural and planning decisions of new residential buildings were simplified, both at the level of design works and at the level of construction. Mass housing construction has its pros and cons. The positive achievements of that time include:

- Providing a large number of Ukrainian families with separate and individual housing units that were more comfortable than their previous ones (especially compared to barracks or communal apartments).
- The lowest possible cost of such individual apartments in these buildings, which was important in the post-war reconstruction of the country.
- Creation of a new construction industry in the country (Meerovich, 2018, p. 147), which contributed to the introduction of standardized large-scale panel construction and flow conveyor production of building elements.
- Rapid construction of residential buildings by assembling structures and elements on the construction site.
- Maximum functionality of small living areas.
- Creation of comfortable density of residential areas with cozy yards and quickly accessible service infrastructure (shops, kindergartens, schools, etc.).

However, over time, it became clear that these houses had an ascetic and monotonous appearance. The typology of housing was sharply reduced as a result of the introduction of typification in the construction sphere. But at the same time, the city became a comfortable living space for various segments of the population—from ordinary workers, officials and intellectuals to the Soviet party's scientific and technical elite. This period of mass housing construction has largely led to the problem and challenges that arose in post-Soviet Ukraine. It causes the need for a thorough modernization of these residential buildings to comply with modern requirements and needs.

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REFERENCES

BACHYNSKA, L. G. (2004). *The architecture of the dwelling. Problems of theory and practice of structure creation*, Gramota, Kyiv.

BANYKIN, B.N. (1963). *Design and construction of large-panel houses*, Gostroyizdat, Moscow.

BILINKIN, N. & Ryabushin, A. (Eds.). (1985). *Modern Soviet architecture*, Stroyizdat, Moscow.

BOYCHENKO, A.M., Ginzburg, Sh.M., Zherdetsky, P.F. & Prisedko, B.S. (1961). *Construction of residential buildings from large panels. From the experience of Glavkievstroy*, Gosstroyizdat, Moscow.

CHERIKOVER, L.Z. (1944). *Types and dimensions of kitchen equipment and the layout of kitchens of small apartments*, Publishing House of the Academy of Architecture of the USSR, Moscow.

DYOMIN, M. & Byvalina, M. (2005). Locality and social and economic nutrition of the reconstruction of the territory of the five-overhead large-panel forgetfulness. In *Mistobuduvannya and territorial planning*, Vol: 20, pp. 90-94.

ELIZAROV, V.D. & Medvedeva, M.I. (Eds.) (1961). *Large-panel housing construction*, Gosstroyizdat of the Ukrainian SSR, Kyiv.

INOZEMTSEVA, A.S., Mulyar, L.Kh., Piskovskii, Yu.I. & Solovyov, V.P. (1988). *Housing construction in the Ukrainian SSR*, Budivelnyk, Kyiv.

GABREL, M.M. (2016). Problems and principles of humanizing the residential environment of microdistricts built in the 70s of the 20th century. In *Modern problems of architecture and urban planning*, Vol: 45, pp. 160-169.

KOROL, V.P. (2006). *Architectural design of housing: a study guide*, Fenix, Kyiv.

KYIV REAL ESTATE. (2018). http://kievbuilding.com.ua/index.php/about Accessed Jan. 15, 2019.

LAVRIK, G.I. (2007). *Methods for assessing the quality of housing. Research, design, expertise: Textbook for universities*, BSTU n.a. V.G. Shukhov, Belgorod.

LISITSIAN, M.V. & Pronina, E.S. (1990). *Architectural design of residential buildings*, Stroyizdat, Moscow.

LIVEJOURNAL (2016). *Housing construction in the USSR and the RSFSR from 1918 to 1990*. https://burckina-faso.livejournal.com/1527935.html Accessed Feb. 07, 2019.

MALAIA, K. (2021). Transforming the Architecture of Food: From the Soviet to the Post-Soviet Apartment. In *JSAH*, December, Vol: 80, Issue 4, pp. 460-476.

MEEROVICH, M. & Antonenko, N. (2018). Initial phase of khrushchevsky housing re-forming in Ukraine (on the example of residential area Cheryomushki, Odessa). In *Scientific Bulletin of Construction*, pp. 145-155.

POSOKHIN, M.M. (1953). *Architecture of large-panel buildings. From design experience*, Moscow worker, Moscow.

ROZANOV, N.P. (1982). *Large-panel housing construction*, Stroyizdat, Moscow.

RUDAKOV, P.G. & Fedorov E.P. (1964). *Urban housing construction. Experience in the application of standard projects*, Construction Literature Publishing House, Moscow.

SCHREIBER, A.K. (1993). Technical and economic assessment of options for organizational and technological solutions in the design and reconstruction of residential buildings. In *Construction Economics*, Vol. 3, pp. 25-27.

SHEVCHENKO, L.S. (2020). *Second life of the residential building area of the middle of the 50s—Early 80s of the twentieth century in Ukraine: Opportunities and perspectives*. doi:10.1007/978-3-030-42939-3_45.

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Damage to the Derzhprom building, Kharkiv.
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