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ARCHITECTURAL PROBLEMS OF IMPLEMENTATION OF RESIDENTIAL DEVELOPMENT IN VORONEZH (ISSUES OF URBAN DEVELOPMENT)

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Statement of the problem. Using the example of the leading construction organization in Voronezh, the article analyzes the shortcomings of the implementation of urban development projects and considers ways to solve them. Recently, the state of the natural environment of our cities has become a more urgent problem. This analysis will help designers in solving the problems of improving the architectural quality of the environment of new residential areas of the city of Voronezh.

Results. As a result of the review and analysis of a number of implemented objects and the object planned for construction, ways to improve the architectural and artistic image of new districts are proposed, taking into account the features of the existing urban environment of Voronezh and current trends in advanced urban planning.

Conclusions. Since any developer is primarily interested in the economic benefits of construction, he cannot express the true interests and needs of citizens, follow the historical traditions of the city. In the first stages of design, work should be performed on a competitive basis by order of the municipal authorities, even if the developer is the owner of the site intended for construction. The best project should be put up for auction among developers, providing the winner with the right to build in this territory.

Keywords: problems of urban planning, mass construction, quality of construction, block sections, modern trends, organization of development

Introduction. A retrospective analysis of the activities of the leading construction organization in the city of Voronezh in the field of urban planning is aimed at assisting specialists involved in the construction of large cities in comprehending the genuine reasons for the successes and failures in implementing mass development projects. Unfortunately, in scientific literature little attention is being paid to the issues of architectural and artistic originality in modern construction of residential areas [1, 2, 3, 4, 5].

Meanwhile, the convenience and aesthetic nature of the environment encourages a sense of patriotism, love for their hometown, street, etc. in youth. [9, 10]. An in-depth analysis of the project for a new residential area in a former meat-packing plant would enable the developer to reverse urban planning mistakes and make future buildings more attractive for citizens.

Nowadays the relevance of issues of the functional and aesthetic quality of the development of new residential areas is growing. The overall quality of the urban environment sees a significant improvement. While choosing a future place of residence, the primary criteria are not only the amenities and size of the apartment. This does not suffice to cater for the needs of today's city dwellers. The major goal of the research is to set forth ways to address the problem of improving the quality of the urban environment in new residential areas of Voronezh as well as to assist the design and construction community in making the city more attractive and comfortable to live in.

1. Analysis of the implementation of projects for the mass construction of a house-building plant in Voronezh. In the 1970s, during the design of micro-districts of the Northern District (Fig. 1, 2, 3), specialists of the Voronezhgrazhdanproekt Institute had to frequently contact the management of the House Construction Plant (DSK) regarding the implementation of development projects.

Fig. 1. Northern residential area of Voronezh. Project of Detailed Planning of the Northern residential area of Voronezh designed from typical block sections for mass construction, 1974.

Authors of the project: S. A. Gilev, Yu. M. Vlasov. Photo: I. P. Nemchenko

Fig. 2. Northern residential area of Voronezh. Microdistricts 12, 13, 17 of the Northern residential area of Voronezh.

Author of projects: S. A. Gilev. Photo: I. P. Nemchenko

Back then the society was in need of an architectural variety of projects for mass construction (the initiator of designing a house construction system from large panels throughout the nation was A. G. Rochegov, a Soviet and Russian architect [10]) so corner and rotary block sections made an appearance. Diverse design options for facades of residential buildings were suggested, and a project was even performed in order to raise large-panel sections onto a frame for placement on the first floors of cultural and consumer services. Unfortunately, not all of these projects saw the light of the day, most of them remained only on paper. The classic names in architecture and urban planning such as A. V. Ikonnikov, A. E. Gutnov, V. L. Glazychev, a practitioner of Soviet architecture and urban planning, A. G. Rochegov repeatedly raised the issue of the architectural composition of mass development and ways to tackle its diversity in their studies [4, 5, 6, 7, 8]. Given the meager possibilities of DSK for finishing facades of residential buildings, development of new micro-districts tended to be extremely dull and monotonous.

Fig. 3. Northern residential area of Voronezh. Development of microdistrict 8 of the Northern residential area of Voronezh.

Author of the project: S. A. Gilev. Photo: I. P. Nemchenko

It cannot be said that the leadership of the Voronezh House Construction Plant did not attempt to improve the quality of construction. In the early 1980s, on the initiative of the chief engi-

neer of the Voronezh DSK, a group of designers was put together comprising employees of the standard design department of the Voronezhgrazhdanproekt Institute and technologists of the Voronezh House Construction Plant. As a result of their joint effort, fourteen projects of block-sections of various configurations and number of storeys were accomplished to be approved as standard projects of zonal series 90 (Fig. 4). Unfortunately, not all of the designed sections were mastered by construction, which limited the possibilities of architects in designing building structures [2, 3, 12, 13]. Houses of this series are still designed filling the spaces of urban areas. As a result, instead of the expected uniqueness of the city's development, the outcome was a dull monotony.

Fig. 4. Project of block-sections of zonal series 90.

Authors of the project: S. A. Gilev, V. V. Pankin. Photo: I. P. Nemchenko

In the 1990s, interest in panel construction was waning. Active construction of residential complexes made of brick and monolithic reinforced concrete got underway. Apartments in these complexes were more spacious, and the facades of residential buildings were more appealing. In lots of large cities, house construction factories got closed and the construction of large-panel houses in the city center was banned. The program for the withdrawal of troops from Germany

had a significant toll on the quality of mass construction. It is worth recalling the classic names in modern foreign architecture and urban planning such as O. Niemeyer, Le Corbusier, A. Perret, V. Gropius who made an enormous contribution to the development of modern architecture in projects for new cities and mass housing [16, 18, 19, 20]. The construction of the “Voronezh Town” and “Boguchar Town” showed that the seams in the panels of the outer walls may not leak if thoroughly filled, and the facade decoration can be of sufficient quality and durable if nice paint and other finishing materials are applied appropriately (Fig. 5).

Fig. 5. Development project “Voronezh Town” in the Northern District.

Authors of the project: S. A. Gilev, P. V. Mikhin in collaboration with the company “Hopro” (Berlin).

Photo: S. A. Gilev

By the way, despite the fact that a German firm won the bidding for the right to design the “Voronezh Town”, most of the buildings were erected by Slovaks, Belarusians and Voronezh residents. Three-layer panels of the outer walls were produced at the KPD 2 panel house construction plant of the Voronezh house construction plant. It should be said that the management of DSK in a turbulent time for the construction industry showed sufficient flexibility organizing structural units for the construction of bricks and monolithic reinforced concrete. This enabled the house construction plant to remain leaders among all the construction organizations in Voronezh.

In the early 2000s, the Voronezhproekt Institute yet again had to design projects for the DSK division. A complex project of a residential complex with built-in public premises and a two-level parking lot was implemented by DSK with top-quality construction work. It should be

noted that the complex is designed in monolithic structures with a wide column pitch and an unusual planning structure (Fig. 6).

Fig. 6. Residential complex on Friedrich Engels Street in Voronezh.

Authors of the project: S. A. Gilev, A. V. Bozhko. Photo: S. A. Gilev, A. V. Bozhko

Recent years have seen the house construction plant being actively designed in new areas: seventeen-story block sections have been completed, modern types of finishing materials are employed, large-panel sectional houses are combined with monolithic tower-type buildings. All of this allows one to hope that the compositional capabilities of architects, authors of projects of individual microdistricts will expand significantly. However, the plans for the residential districts “Otradnoye” and “Shilovo” presented by the house construction plant fail to impress with a diversity of architectural methods of development. The composition is comprised of seventeen-storey sectional large-panel houses, placed mainly meridionally, and monolithic tower-type houses of higher storeys. The spaces formed by these buildings are very monotonous and not large-scale. Block-sections of meridian and tower-type houses mostly consist of one-bedroom apartments. This might trigger serious social problems in the years to come as the narrow spacing of the transverse load-bearing walls does not allow for the reconstruction and expansion of apartments. Ac-

According to the projects presented and the first fragments of the completed development, the new districts of Voronezh are going to be dull and monotonous, and the scale of the spaces being designed is to become even more depressing.

2. Study of the project for the development of a residential complex in the territory of a former meat processing plant designed for a house construction plant. The house construction plant is currently designing a lot in the central part of the city. Not all objects are in keeping with the historical environment dearly loved by Voronezh residents. The classical composition of the building of the center requires designers and builders' meticulous work and care [9, 15]. In this situation, the main priority is to do no harm, not to damage what was created by previous generations. Therefore, acquaintance with the project of a residential complex in the territory of a former meat processing plant was of immense interest (Fig. 7). In the outset, the project seems fairly interesting: a high-quality professional graphic presentation, a bold composition of a sketch of the future development of the entire area, a detailed study of the landscaping and facades of buildings do not fail to produce a favourable impression. However, as the project is studied more precisely, one changes their mind about that.

Fig. 7. Residential area development sketch. The project is presented by DSK

Let us look at the building density of the complex.

The project does not indicate the boundaries of the territory where the calculation of technical and economic indicators was performed. Therefore, it is not executed correctly.

In the officially designated area, the building density coefficient is 3.6 (according to the current standards in accordance with SP 42.13330.2011 “Urban Planning. Planning and Development of Urban and Settlements” (updated edition of SNiP 2.07.01.89) as well as in accordance with the Regional Standards of Urban Planning approved by the order of the management of architecture and urban planning of the Voronezh region dated 09.10.2017 No. 45-01-04 /115, for residential areas in the conditions of reconstruction-1.6. If at the same time we subtract the territory occupied by the administration complex, approximately 1.5 hectares, the building density coefficient will be more than 4.0, which is 2.5 times more than the standard. Accordingly, the authors of the project failed to put the required number of guest parking lots, children's, sports and utility grounds in the master plan.

Even these sports and utility grounds designed in small numbers are located at a distance from the windows of residential buildings in violation of the SP 42.13330.2011 “Urban Planning. Planning and Development of Urban and Rural Settlements” (updated edition of SNiP 2.07.01.89) (much fewer normative ones).

It is worth noting that the absence of planned floors of residential buildings does not allow one to inspect the conditions for insulation of apartments and fire safety requirements, which is essential in the conditions of close development.

Let us look at the number of storeys of the designed residential complex.

Out of the 13 residential buildings on the suggested buildings, seven are significantly higher than 25 floors (30-storey or 33-storey), which will not only require the achievement of special conditions (according to the current standards, the maximum number of storeys is 25 storeys based on SP 54.13330.2011 Residential Buildings) but will also significantly complicate the fire safety and technical requirements for buildings.

The projected development is located in the vicinity to the heart of the city center formed following the Great Patriotic War (90% of the city of Voronezh got destroyed) [11].

In compliance with the master plan for the city's restoration (the master plan was performed by a group of designers led by the architect L. Rudnev), Voronezh was restored in the classic traditions “Stalinist Classicism” [8]. High-rise buildings were projected for emphasis at the turns of Koltsovskaya Street. One of such buildings is located nearby, i.e., the corner of Koltsovskaya Street and 20-Letiya Oktyabrya Street in Voronezh (Fig. 8).

At the same time, the architect L. Rudnev (the author of the Moscow University complex [8]) was aware of the fact that the scale of these buildings could not be identical to that in Moscow. Instead, the buildings were supposed to be in harmony with the scale of the individual and the city [7].

The authors of the project failed to make sure their ensemble was in alignment with the historical buildings of the city. This can be seen in a segment along Voroshilov Street (Fig. 8). The newly designed building is disproportionate to the scale of the historical building [4, 6, 7].

Fig. 8. A segment along Voroshilov Street in Voronezh. The project is presented by DSK

It is worth noting that the projected residential complex is located in the vicinity to a large industrial defense enterprise (mechanical plant, KBKhA) whose territory will be clearly visible from the windows of the upper floors of all the residential buildings of the complex (Fig. 7).

Let us look at the service provision of the designed residential complex.

The project does not allow for the construction of a school despite 667 places being required for the calculation in compliance with the Regional Standards for Urban Planning as approved by the decree of the Department of Architecture and Urban Planning of the Voronezh Region dated 09.10.2017 No. 45-01-04 /115. There are no school buildings available within walking distance.

Meanwhile, in recent years, a large number of residential buildings has been designed in the neighbourhood (e.g., a residential complex on the opposite side of Voroshilov Street located in the territory of the stadium, and a number of residential buildings in Moiseyev Street) without the provision of standard places in schools and kindergartens.

The project allows for the construction of a kindergarten for 140 children, but according to the calculation, 308 places are required, in accordance with the Regional urban planning standards of the Voronezh region dated 09.10.2017 No. 45-01-04 /115. However, there is no regulatory area of approximately 0.6 hectares with isolated group exits.

Given the insufficient number of sports grounds and the absence of a school sports complex, it is critical to locate closed gyms (including those for team sports) as described by the authors of the project in an explanatory note.

However, such premises cannot be found in the plans of the first floors of the designed buildings. Unfortunately, the liquidation of the stadium on the opposite side of the street, the insufficient number of sports grounds in the project of the residential complex are not in agreement with the Government's decisions on the development of physical culture and sports and

are in violation of the requirements of SP 42.13330.2011. “Urban Planning. Planning and Development of Urban and Rural Settlements”.

It should be noted that most places for permanent storage of cars are outside the designated area, and three-level underground parking lots do not have isolated ramps as required by SP 113.13330.2016. “Car Parking”.

Let us look at the structure of the designed residential complex.

The authors of the project argue that “this layout is in keeping with the planning system of European cities and is the foundation for a lot of modern quarters”. E.g., we can turn to the creativity of innovators of the twentieth century in urban planning and architecture made of reinforced concrete, e.g., Le Corbusier, V. Gropius, O Niemeyer, A. Perret and look at the development through the prism of the “international style” proposed by them. When considering the contributions of these architects, it becomes unclear what is meant by the word “quarter” and how 13 tower-type houses can be brought together by “closed residential yards”. What is not entirely clear is how the authors intend to organize the “isolated nature of operation” of the complex (Fig. 9).

Fig. 9. Volumetric model, projected structure of the complex in the territory of the meat processing plant in Voronezh. The project is presented by DSK

The modern tendency in the organization of the development of residential areas may be the quarter development which serves to revive the traditional urban planning concepts: street,

square, courtyard, square, park [1]. At the same time, playgrounds for young children should be located inside the quarters, and guest parking lots, schools, sports grounds should be in public streets, parks and squares.

The composition set forth by the authors of the project with a high density and number of storeys of buildings can be utilized in public and business sectors. As a rule, public facilities are designed in the lower floors of buildings, while the upper floors can house apartments, hotels, special types of housing that do not provide for permanent residence of families with children [3].

Conclusions. The construction of a residential complex in the designated area cannot be implemented according to the suggested project.

For further work on the implementation of the project, the following must be done:

1. The density and number of storeys of buildings must be reduced;
2. A school and a kindergarten with standard areas must be provided;
3. "In-yard spaces" must be formed in the projected residential complex.

Based on the analysis of the experience of designing and organizing projects for the mass construction of residential areas and a detailed study of the project on the territory of the meat processing plant, it is concluded that the organization of the design of urban development should be approached in a different manner.

The projects must be submitted and accomplished on a competitive basis commissioned by the municipal authorities, even if the developer is the owner of the construction site. The best project must be put up for auction among developers granting the winner the right to build in this territory.

References

1. Glazychev V. L. *Gorodskaya sreda. Tekhnologiya razvitiya* [Urban environment. Technology of development]. Moscow, Lad'ya Publ., 1995. 240 p.
2. Glazychev V. L. *Urbanistika* [Urbanistics]. Moscow, Evropa Publ., 2008. 220 p.
3. Gutnov A. E., Baburov A. V., Lezhava I. G. *Novyi element rasseleniya: na puti k novomu gorodu* [A new element of settlement: on the way to a new city]. Moscow Stroiizdat Publ., 1966. 127 p.
4. Gutnov A. E., Glazychev V. L. *Mir arkhitektury: litso goroda* [The World of Architecture: the face of the city]. Moscow, Molodaya gvardiya Publ., 1990. 358 p.
5. Gutnov A. E. *Evolutsiya gradostroitel'stva* [Evolution of urban planning]. Moscow, Stroiizdat Publ., 1984. 256 p.
6. Ikonnikov A. V. *Arkhitktura goroda. Esteticheskie problemy kompozitsii* [Architecture of the city. Aesthetic problems of composition]. Moscow, Stroiizdat Publ., 1972. 220 p.

7. Ikonnikov A. V., Stepanov G. P. *Osnovy arkhitekturnoi kompozitsii* [Fundamentals of architectural composition]. Moscow, Iskusstvo Publ., 1971. 224 p.
8. Ikonnikov A. V. *Mastera arkhitektury ob arkhitekture* [Masters of architecture about architecture]. Moscow, Iskusstvo Publ., 1972. 343 p.
9. Enin A. E., Chesnokov G. A., Sergeev I. M. *Istoriko-kul'turnyi potentsial TsChER i problemy ego sokhraneniya* [Historical and cultural potential of the Central Black Sea Region and problems of its preservation]. Voronezh, FGBOU VO «Voronezhskii gosudarstvennyi tekhnicheskii universitet», 1991.
10. Esaulov G. V. Epokhi v zerkale arkhitektury. K stoletiyu A. G. Rochegova [Epochs in the mirror of architecture. to the centenary of A. G. Roch'gov]. *Academia. Arkhitektura i stroitel'stvo*, 2017, no. 1. 160 p.
11. Karmazin Yu. I. *Tvorcheskii metod arkhitekora* [Creative method of the architect]. Voronezh, VGU Publ., 2005. 496 p.
12. Krainyaya N. P. Odnoobrazie i raznoobrazie v gradostroitel'stve [Monotony and diversity in urban planning]. *Academia. Arkhitektura i stroitel'stvo*, 2019, no. 4, pp. 83—86.
13. Kuznetsov S. O. Konformizm rozhdaet posredstvennost' [Conformism gives birth to mediocrity]. *Literaturnaya gazeta*, 2019, no. 9.
14. Prokof'eva E. Yu., Vasil'ev N. V. Sovremennye tendentsii reabilitatsii antropogennykh territorii [Modern trends in the rehabilitation of anthropogenic territories]. *Academia. Arkhitektura i stroitel'stvo*, 2019, no. 4, pp. 87—93.
15. Firsova N. V., Kapustin P. V., Gur'eva E. I. Evolyutsiya prirodnogo kompleksa goroda Voronezha: funktsiya, obraz, smysl [Evolution of the natural complex of the city of Voronezh: function, image, meaning]. *Ekologiya urbanizirovannykh territorii*, 2016, no. 2, pp. 98—10.
16. Gropius W. F. G. Scope of Total Architecture. New York, Harper and Bros, Library of Congress catalog card number, 1955. P. 287.
17. Francis D. K., Jarzombek M. M., Prakash Vikramaditya. *A Global History of Architecture*. Hoboken, N.J., John Wiley & Sons, 2007. P. 816.
18. Corbusier L. A. *New spirit in architecture*. New York, Whitney Library of Design, 1975.
19. Niemeyer O. *Architecture and society*. Moscow, Progress Publ., 1975. P. 192.
20. Perret A. Sozdanie novykh tsentrov v istoricheski slozhivshikhsya gorodakh (Gavr, Koventri, Kassel') [Creation of new centers in historically established cities (Le Havre, Coventry, Cassel)]. Available at: <http://townevolution.ru/books/item/f00/s00/z0000016/st052.shtml>