

Development of residential architecture in Astana

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ABSTRACT: New socio-economic conditions of Kazakhstan in recent years, as well as increased requirements for the most efficient use of the territory of Astana and the cities of Northern Kazakhstan, have led to new design directions, where intensive construction of a large number of new residential buildings has begun. A prestigious home appeared in terms of comfort and location. The capital city develops in its own way, different from other cities of the country. Construction trends and characteristic architectural and typological features of residential buildings of the last decade considered on the example of Astana architecture. In the urban environment, the formation of a new aesthetics of residential buildings traced. Improving the quality level became possible due to competition in the housing construction market, with the beginning of the modernization of industrial technologies and the use of new building materials. Under these conditions, the typology changes. The changes affect both the functional and planning structure of the dwelling and the appearance of residential buildings. Identification and analysis of the process of changing the economic, typological, functional and artistic content of the dwelling allows us to draw certain conclusions and predict further trends in its evolution.

1 INTRODUCTION

The construction of residential buildings is one of the complex problems of architecture, synthesizing the achievements of construction art, modern technology and architectural craftsmanship. The compositional significance of such buildings in the development of the city determines the high requirements for their architecture. It is residential buildings that are designed to create the individual face of the city's districts, to be the most expressive.

The analysis of architectural compositions of residential buildings and their conditioning on functional, hygienic, economic and technical requirements is of practical interest, despite the relatively small amount of their construction.

Leading experts in modern architecture consider residential development as the main task of modern urban planning. With their works and project proposals, they proved that economic and demographic conditions and changes in the way of life of people lead to the emergence of such problems of a large city that cannot be solved without the development of residential development.

The modern architectural practice of housing design and construction represents a great variety - this is associated with the formation of a typology in the aspect of time. The process of improving the home in accordance with changing needs is noted. Currently, in Astana, commercial residential buildings for citizens with medium and high-income levels of the sectional type of medium and variable storeys are the most common, while, for the most part, these houses are single piece objects, and individual houses of the cottage type are also common.

The previously developed typology of residential buildings, unified for the whole country, with the nomenclature of apartments intended for an average consumer, in modern conditions does not meet the requirements of the emerging new socio-economic structure of the urban population and does not always correspond to the multivariability of the lifestyle of specific

families. The recommendations of outdated norms and rules do not fully comply with the requirements for modern housing by various categories of the population.

Currently, there are not enough scientific studies analyzing all the factors that collectively affect the formation of housing in the city. A comprehensive study of space planning and composition features and development trends of residential buildings in Astana and North Kazakhstan not carried out. All this, along with the constantly changing requirements of people for the comfort of living, testifies to the relevance of the topic of this study and the need for a theoretical solution to the problem.

2 HISTORY OF URBAN DEVELOPMENT

History of North Kazakhstan's urban development in XX century's 50-60-s have especial importance. The development of virgin lands and strong growth of productive forces between 1954 -1964 in the north regions of Kazakhstan served as a powerful stimulus for the development of the city. Sharply rising of agricultural production in the region was issues of industrial, social and cultural development of the city with particular urgency. Only in the first three years of development of virgin lands between 1954 -1957 made Akmola actively building and developing city. Despite the presence of newly build large buildings, in the beginning of 1950, overwhelming majority of town remained single-story, mainly with wooden and adobe houses. Progress of construction volumes during this period led to the transition to standard projects and a series of residential buildings. One of beginning projects in the republic was residential buildings of the series 207. Town's in 1954 planning terms completely preserved the existing quarterly building and consisted of the city itself and the settlement village, which developed along the railway in the north-west direction. Streets, thoroughfares, squares, which exceeded regulatory requirements by more than 3 times, occupied the predominant part of urban areas (41.3%). Wide streets (40 m.) In the city formed tiny quarters of 0.6 to 2 m.

Construction of housing did not satisfied at all demands of growing urban population. According housing department of the city council's information, whereas needed rate of living area at a rate of nine square meters per city dweller the town has only approximately 3.6 square meters per city dweller. The existing housing stock of the city had a large percentage of depreciation, in the first place were housing municipal public utilities. Statistics represents that 88,000 square meters the living area of the city worn out by 20-40%, 71,000 square meters by 40-60%, 73,000 square meters by 60%. Repairing the housing of the municipal fund was broke systematically from year to year. For example, in 1957 only two houses repaired in the whole city. The Almaty «Gorselstroyproektom» developed first master plan of the city in 1957. Reflecting the building principles of the time, the plan considered formation of a residential area of the city from quarters of 6-10 hectares. In addition, there were trend of growth from one to five storied buildings with the corresponding zoning of the territory by the number of storied in the buildings. It was also planned distinguish a zone of individual building. Town's development and construction under this master plan were until 1961-1962. At this time, there were build 2, 3 and 4 storied buildings in Monina street, half of Mira street and numerous quarters in the eastern part of the city.

By order of the Kazakh Railways Administration, the contractor, construction management in the construction of the Stalin-Magnitogorsk highway, built completed architectural ensemble on Monina Street and a complex of large-panel houses along Mira Street. Rapid growth of urban construction, both in quantitative and in qualitative parameters, occurs in the early 60-ies, about which the witness the following figures. If the input of living space in 1959 was 23 thousand square meters, in 1961 it increased to 62 thousand square meters. In late 1950s, which had about 57 thousand square meters, more than half of the built-up public housing stock were low-rise houses that have poor house-improvements like courtyard. Since 1961, all of housing stock, which gets into exploitation, consists of 4-5-storeyed large-panel and stone houses, in which all the elements of apartment improvements as courtyard were present. Only in one 1962 were built about 200 residential houses and commissioned in the city.

Despite the well developed housing construction; it was not easy to solve the housing problem. In 1962, repairs needed around 70% of the city's residential area consisted of old dilapidated houses. The commission period of objects into exploitation were annually broken. Construction works extremely disorganized, existing mechanisms are often idle, and the quality of work was poor, observed gross violations of technical conditions.

In the construction of the existing part of the town, there were problems. For the reason that mass housing construction carried out by typical 4-5-story houses, were created type of different-story buildings, which was difficult to improve with the methods of volumetric-spatial composition. Moreover, the construction of the territory carried out without the presence of project with detailed planning (PDP). The construction carried out according to the projects developed for individual quarters, parts of quarters, and sometimes made the binding of single residential objects to already existing arrays. The planning and composition organization of the building and cultural-consumer services of the population did not correspond to the present achievements of urban planning. Developed in 1953 – 1957 years Akmola's master plan did not meet the prospects of development of the city as the administrative center of Tselinograd region, according to several parameters:

- Forecasts on the population for 1965-1975;
- Changes in the provision of residential area of citizens;
- The location in the city of a number of large administrative and public buildings, which were to become priority, objects of construction;
- Not matching the economy of the current stage of urban development with more than half of the housing stock: 57% were low-rise buildings, 4-story houses – 43%, 2-3-story – 31%, single-story – 26%.

Single-story buildings were 52% of the total volume of urban housing commissioned in 1957 – 1960. The desire for "light square meters" led to an irrational expansion of the urban area, an increase in the scope of works for improvement, the extension of communications of engineering equipment, a rise in the cost of housing construction. However, it did not take into account that the cost of one square meter of area in a 4-storey house is 9–10% less than in a one-story house. Akmola Regional Committee subsequently adopted a decision to ban in a single-story building along the state building and transition to a massive 3-4-story building construction based on cooperation means developers.

Starting 1960 until 1980 in the residential part of the Tselinograd based on the availability of living space per one person determined: 1965 – 7 sq. m., 1970 9 sq. m., 1980 – 15 square meters. m. New housing construction for the period from 1962 to 1980. Was 5140 thousand square meters. Including in 1962–1965. – 560 thousand square meters. m., in the years 1965–1970. – 1180 thousand square meters, in the 1970–1980's. – 3400 thousand square meters.

The abolition of the Tselinograd region in 1964 and the decline in the status of the city of Tselinograd to the regional administrative center and, as a consequence, the reduction of budget funding, could not affect the city development plans and the volume of construction work. At the same time, the city continued to grow quite dynamically, consistently and systematically improving and developing its planning structure and architectural appearance of the building.

The construction of the city was conducted mainly 4–5 story houses, mainly with the construction of large-panel construction. The houses planned taking into account the best orientation on the sides of the world, in relation to the prevailing winds, taking into account the terrain and the features of the relief. House united in residential groups, made closed courtyard spaces to neutralize constantly blowing winds. Residential houses of a tower type, 9-story houses, as high-storied the buildings, were located in different parts of the districts, on sites with good prospects. They were supposed to bring excitement and flavor to the building [1].

The architecture of residential complexes and individual residential houses of recent years favorably differs from previously erected by professional elaboration and imagery of architectural solutions. Sharply increased the number of stories of residential development. The first five-story houses appeared in the city in 1960, nine-story houses - in 1970, twelve-story - in 1980. By percentage of total number of buildings on 1.01.1989 in the city was 9–12 floors – 4%; 5 floors – 53%; 2 floors – 14.5% and one floor – 28.5% [2].

Housing construction 70-80 is different from housing construction in early 1960 with a higher professional study of design solutions, improved layout of apartments and some imaginative expressiveness of the buildings. Changing and silhouette characteristics of the city.

In 1960, the first five-story houses appeared in the city, which occurs the leveling of the building at this level. In the 1970–1980ies built 9-12-story houses, used to highlight urban sites as high-rise dominants [3].

In 1970, the first 9-storey residential building commissioned at the intersection of Monina and Mira streets, according to the typical project 1-447s-41. The dwelling house consisted of one section and had 36 apartments with a total area of 1374 sq. m. The next multi-story residential building commissioned in 1973. Further multi-story housing built every year, therefore the volume of housing construction of small and medium-storied buildings started decrease.

In the 1970s, similar multi-story residential buildings with inexpressive architecture built, but already at this time, architects began to build in and attach various kinds of people serving the population. In those years, it dominated by the type series 9-storey residential buildings 1p-447s-25m. In total, the 70-ies of nine 9-storey residential buildings built.

In the early 1980s built a complex of apartment buildings, located on both sides of the avenue consisted of two pairs of 12-storey and 9-storey single-section residential homes on an individual project. At that time, the complex was differed from the same type of urban development, as the number of floors, and architecture. At mid-1980s put into operation similar houses on the “students” avenue (today Al Farabi Avenue) in the monument district, dedicated to the victims in Afghanistan. It should note that the 80-ies multi-story housing construction is gaining momentum. Fifty-one multi-story apartment house built in the years, mostly 9-storey, in some cases 10-12-storey building. The prevailing model series were 86 and 83 series [4].

3 DEVELOPMENT OF MODERN ARCHITECTURE

With Kazakhstan’s independence in 1991, marked the construction of multi-story housing slump, it lasted until the transfer of the capital in 1997 from Almaty to Astana. As a result, there have been dramatic changes in the development of high-rise housing in Astana. The city begins to develop as a capital. Mainly being build individual multi-story residential buildings, the first of them are two 26-storey residential buildings along Bogembai Prospekt, and the people called buildings - “Candles”.

In 2000–2001, the development of the planning structure has defined and development of the city in accordance with the General Plan developed by a group of “Saudi Bin Laden” and approved by the Government. The program of this stage included the beginning of work on the formation of a new planning structure of the city, the active demolition of existing dilapidated buildings and the construction of new facilities in their place, corresponding to the metropolitan standards and requirements. Along with domestic construction companies and organizations in the construction of Astana, foreign construction companies began to take an ever more active part.

Significant contribution to the development of Astana, in the formation of its architectural appearance of the building made of Switzerland, Great Britain, the Czech Republic, Turkey and Other De countries. From the beginning Kazakhstan independent, the construction of the new capital of Kazakhstan were active participation of Turkish construction firms: for example, the Turkish construction company «Ahsel Ins. Investment “on-site wetland at the beginning of Republic Avenue in 1999 built a new residential district” Samal “on the 718 apartments.

In order to create a favorable investment climate and attract funds from domestic and foreign companies, in January 2002, the President of the country signed a decree “On Introduction of the Regulations of the Free Economic Zone -” Astana - New City “. As a result, the number of domestic and foreign companies that want to invest in the construction of the new capital of Kazakhstan has sharply increased and take an active part in the construction of modern residential complexes, facilities for maintenance, trade and entertainment. Almost all the construction in Astana, with the exception of social and city facilities, as well as the transport and engineering infrastructure of the city, began financed by private investors. In this regard, it

should be noted these domestic and international investors, property developers, as “Basis-A”, “Kuat”, “of Bi GROUP», «HIGHVILL», « Ceylan”, “Sembol”, “Okan” and “Axel” that investing considerable funds for the construction of ultra-modern residential complexes and unique buildings and structures, made a great contribution to the formation of an expressive architectural appearance of the new capital of Kazakhstan. However, the President set the task to the designers and builders not just to build a typical, a beautiful city, but the city corresponding to the level of achievements of modern architectural and town-planning ideas, the city XXI century. To the architectural appearance of Astana meet the following requirements - model city XXI century, it was necessary to raise sharply the level of the art-planning solutions to the level of creative search for new directions in the development of architecture. To this end, the outstanding architects of the present began to be involved in the design of the most significant facilities built in Astana on the instructions of the President of the Republic of Kazakhstan. The then President of the International Union of Architects Vasilisa Sgutasa and president of the International Academy of Architecture Georgi Stoilov exerted all possible assistance to the city akimat. Due to their help, a number of world-famous architects took part in international competitions for the development of projects of the most significant facilities in Astana. It has become the practice of the system construction of large projects with urban importance in shaping the architectural appearance of the main streets and squares, only for projects selected in the competition [5].

With the approval of the Government of the Republic of Kazakhstan Astana Master Plan, developed by the research group led by Dr. K. Kurokawa, with the official presentation of the new General Plan as a project embodying the philosophy and theory of urban development postulates XXI century, large-scale work on their active implementation, the formation of a new planning structure and architectural appearance of the city. The main part of construction work was moved to the left side of river Yesil.

In 2004, the Corporation “Basis-A” has commissioned houses “Nurly -Dala” and “Zhan Saya.” At the same time, large-scale works developed to reconstruct the old part of the city.

In 2001, commissioned 231 thousand square meters. Meters of housing, and in 2005 – 1 million 67 thousand square meters. The capital housing stock of the capital increased from 4 million 768 thousand square meters in 2000 to 7 million 204 thousand square meters in 2005. In the old part of large-scale demolition of dilapidated housing and construction of modern residential complexes started in the areas of Soldier and Cossack suburb, Central Market, Valikhanov, Potanin Tlendiev and others streets. They began actively build up high-rise residential complexes areas south of the Water-Green Boulevard. Within the framework of the state program “Affordable housing” designed by architects, “Astanagenplan” project organization turned the construction of urban complexes.

In 2006, the corporation “Basis-A” has started construction of a super contemporary multi-functional residential complexes of the original architecture “Emerald Quarter”, “Northern Lights” and “Triumph of Astana”.

In 2006–2007, there were incompatibility on real of population growth rates and predictions, which led new conditions and opportunities created by the dynamics of the country’s economic and social progress. Situation in the city put before the architects and city planners of the capital a number of problematic tasks related to the adjustment of the current master plan and beyond with the corresponding changes in the urban development policy of the city development. Taking into account the analysis of the results of town-planning activities for of the Master Plan, bans made to unreasonably high-density of buildings in of the old part of the city. Due to the growing number of citizens made mandatory as part of the residential complexes and parking buildings including parking at the rate of not less than one parking space per apartment. Also were established strict requirements for compliance with the regulatory density of buildings and insulation of residential apartments and territories.

In order to create conditions that would make buildings mutual and holistic as complex, it was decided to move from the method of “dotted” development of local plots to the method of integrated development of the block or its most part by one investor-developer. An example of such an integrated apartment complexes, “HighVill” and “Grand Astana”, erected with all the objects of social and cultural-leisure purpose, necessary for serving the inhabitants of the microdistrict. In 2007, “Astana genplan” in conjunction with the “Kazgor” based on the

study and understanding of international experience developed updated standards of urban planning, designed for the conditions of Astana. In the future, an adjustment of the Master Plan of Astana using urban-regulating documents will be carried out only based on these standards, relevant international standards and local conditions.

For the consideration of projects of large objects and the most individual problems, and to develop the most effective strategy was established by President of Kazakhstan urban development of Astana in 2007. The Council, along with well-known architects of Kazakhstan involves the most respected masters of world architecture. All these measures, approaches and principles were the basis for urban development policies pursued by the akimat of the city and the Department of Architecture at the new stage of development of the capital. However, not only the organizational and technical measures and activities influenced architectural appearance of the buildings in this period.

Middle and late of 2010's of XXI century, characterized by the appearance of new factors that raise the architectural appearance of the capital to a new level. Such factor was the active participation of architects around the world to design unique objects of Astana. Currently, the various stages of implementation are objects constructed in a project of outstanding masters of world architecture. Momysuly prospect were construction of high-rise modern apartment complex. New residential areas with original architecture grows in the southern and western parts of the city.

4 CONCLUSIONS

Capital of Kazakhstan strongly and greatly growing upwards and outwards, causing widespread astonishment and delight. So on based of close cooperation and competition of Kazakh architects with bests of world architecture, powerful innovation, making the necessary adjustments and changes to the adopted programs and plans of construction the Astana – became city of the future, the city of XXI century.

Regional features influence the architecture of residential buildings in the city of Astana and the cities of Northern Kazakhstan: natural and climatic, socio-economic, national, architectural and artistic factors. Recently, much attention has been paid to energy saving and environmental qualities of individual residential buildings.

Housing is an important part of the architectural environment of the city, which reflects the structure of the structure of society, culture and social ties. The global changes of recent decades that have taken place in Kazakhstan require a serious revision of the concept of the formation of an urban, in particular, residential environment.

The option to solve the design problem lies in the field of environmental design of residential buildings. This approach can be justified based on regional features: climatic conditions, local construction conditions and increased use of local materials with a long life. Taking into account all modern trends, a new regional quality should be developed based on this principle. Only taking into account regional differences can a cost-effective, individual nature of a residential structure be created.

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