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THE CONCEPT OF THE URBAN AREAS RECONSTRUCTION PLANNING ON THE BASIS OF THE SCIENTIFIC AND ENGINEERING SUBSTANTIATION

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Abstract. *The scientific substantiation concept has been proposed for the urban development and territorial planning reconstruction principles of the urban area sections with dense building and difficult engineering-geological conditions for scientific and technical support of all reconstruction processes and recommendations elaboration for a safe and balanced development of built-up territories and more efficient use of housing estates in the present social and economic conditions.*

Keywords: preservation of existing buildings; reconstruction of urban areas; territorial planning.

1. Introduction

The modern city is generally developed based on the old, the historical city, so urban planners face to complex problems of old and new combination, severe difficulties arise in the historical town when it turns into a major industrial, administrative and cultural center.

Design of reconstruction in the current formed architectural and historical environment has special features.

In Ukraine, in addition to the stratification of society, the past decade has affected and is gaining the pace the process of urban areas stratification – are allocated the "prestigious" urban areas.

This process in Ukraine differs from a similar in European countries because of special events and unique historical circumstances in which our country has evolved.

It has a cyclic heterogeneous character due to the political, ideological and socio-economic changes that took place in Ukraine in the 2000s years.

2. Statement of the problem

Significant population growth and expansion of the forces needs to build all new buildings, mostly in the city center, make reconstruction of urban areas with dense buildings as of entire architectural and historic structures.

Transformation of urban areas is based on the analyzes of the various planning areas in the structure of large cities as they are territorial and development planning, change functional saturation of planning areas and socio-spatial structure of the city, determine the interaction dynamics of the planning districts areas during the socio-economic conditions changing throughout the history of the city, based on a detailed analysis of urban planning current situation, urban processes occurring in areas of planning districts of the city, especially in a complex relief and geological features, considering the numerous problems solution that contributed to the planning districts development at different stages of the city evolution, taking into account historical development trends [1].

3. Analysis of the latest research

Rapid population growth in large cities poses the problem of selecting areas for new housing construction, usually by planning and carrying out new construction in the central districts with the dense buildings and complex engineering-geological conditions, that to a large extent dependent on the use of limited areas, equilibrium constant violation of the system"basis – buildings and constructions", and thus significantly effects on the surrounding buildings [5].

In this situation acquires exceptional importance of scientific and technical substantiation of urban redevelopment as the main stage of the contemporary spatial development of the city, significantly increases the effectiveness and implementation degree of urban planning decisions based on the creation and development of effective calculation and analysis methods of urban construction, growing importance of the scientific research as the basis of design and planning work to improve the quality of their design and the decisions validity, efficient use of limited resources in the development of cities, especially in the complex geology and dense buildings.

This concept should be specified in the schemes and projects of regional planning, master plans, projects, detailed planning as the main documents that define and solve complex problems of spatial planning, with the necessary requirements of the scientific and technical analysis of reconstruction possibilities of the urban area sections, based on creation and development of effective methods of calculation and research facilities of urban development [2].

Therefore, the formation of the sustainable urban development concept should consider all aspects of sustainable development of big cities and all the major components of its elements, and displays in public urban planning doctrine based on objective material and scientific and technical analysis and engineering support, which has become the basis for develop effective urban policy, perspective programs and master plans.

Thus, there should be a balanced approach to solving urban problems relevant for urban policy development of free intradistrict-territory, which is one of the most important and long-term objectives that will not only improve the structure of urban land use, but also functional and urban planning to streamline the existing building.

4. The concept of the urban areas reconstruction planning

The concept of reconstruction consists the consideration of the complete set of interrelated and interdependent factors, and simultaneous addressing architectural, urban-engineering, scientific and technical problems.

Provision priority to one of the branches will inevitably lead to a breach of a sustainable balance within another, which in its turn would adversely affect on the state and prospects of urban development.

At present, the sequence of procedures urban regulations that are needed to build the concept and realization of the process of reconstruction of open space residential district is the following.

As a result of the data identified based on the initial information gathering and analysis is carried out the preproject requirements specification.

Then it is developed the concept of open space specific area, with the maximum regard the interests and requirements of different sides in the development of existing formed areas due to its reconstruction.

As a result of a comprehensive analysis it is is performed the final decision selection on the architectural–planning transformation of the open space residential district.

Further the city or county administration forms design task, considering the limited funds of the municipal budget and the need to raise investors funds.

As a result of the work may be offered the following concept of planning reconstruction of urban territories with dense buildings and difficult geological conditions on the basis of scientific and technical analysis.

The strategic goal of Kyiv development in the long term perspective, that is defined by the Kyiv Master Plan and the Kyiv Development Concept for the period until 2025, is the creation of high-quality environment for population vital activities based on sustainable urban development in the new socio-economic conditions and enforcement functions of the capital of Ukraine.

Accordingly, under the regulatory control of the urban environment reconstruction has being developed the balanced approach to the urban problems solving relevant for urban engineering policy of the available intradistrict-territory construction, that is one of the most important and long-term objectives that will not only improve the structure of urban land use, but also functional planning to streamline the existing building.

This leads to the development of new and improvement of existing legal and regulatory guidance documents of the civil engineering industry in general, and urban planning activity in particular, that regulate the issue of normalization and standardization in the urban engineering.

Analysis of historical, social and economic conditions of transformation and reconstruction of urban territories provides grounds for the conclusions about the quarter reconstruction should be aimed at addressing most important social urban challenges — increasing the housing fund, improving the sanitary and hygienic conditions of the population living, creating a complete recreation system, modernization of saved housing fund, constructioning or accommodation of new maintenance facilities, thus providing the most efficient use of urban territories.

The results of architectural–planning, engineering–geodesic and engineering–geological surveys is number of possible locations for the planning, design and reconstruction of urban territories.

As part of this, architectural–planning composition of the city which is reflected in the master plan and is the basis for the three-dimensional solutions for the city as a whole as well as its individual parts.

Enhance the aesthetic qualities of urban development, creating new expressive architectural ensembles achieve architectural unity of the whole city is the most important creative challenges that arise in the urban reconstruction.

An indispensable conditions for the urban reconstruction are measures to environmental protect the urban landscape, that should be taken into account when reconstructing areas of the city, and the organization of all the ensembles most accomplished architecturally sections of the urban area should be based on feature of locality. E.g., in the cities of rugged terrain using high-altitude relief in terms of which offers beautiful views and where the most important and interesting architecturally societies, building, visible from everywhere.

Features of the Kyiv relief should be considered while the existing areas building of the complex relief preconditions for architectural expression that brings together the diversity of existing and new buildings in a single unit.

Under the modern approach, the study is performed an urban setting trends: the current state of the urban environment and urban land use center (that defines urban areas value) and includes the following: historical and urban analysis, analysis of functional zoning, characteristic of building fund, analysis of the land use intensity; economic characteristics – determines the rental value of the city: the differentiation value of the territories with materials from monetary valuation of settlements, the relative value of the territory, territories differentiation by market indicators in land value; relative value of the territory, territories differentiation by market indicators in land value, territorial analysis of investments in residential and public buildings in cities.

An analysis has allowed to reveal the features and problem areas, depending on the rental value of the territory on the characteristics of the urban environment.

Due to these various problems and complications of the factors influencing the effectiveness of spatial planning decision of the urban object, as the center of the city, and the change dynamics, that in recent decades has increased enormously, it is necessary to attract many sciences to predict these complex processes.

Scientific researches, based on the principle of problematic aspects, have acquired the interdisciplinary direction.

This approach is fundamentally shift in science, because the change of mono-disciplinary knowledge (the essence is in the subject) came problem–interdisciplinary approach (the essence is in the connections and relations).

The problems of communication and relationships have defined strategic forecasting urban planning issues both horizontally (planning, composition, spatial, infrastructure and network) as well as vertically (the legislative, regulatory, planning, inventory etc), and have derived the basic tasks of city planning — formation of high-quality environment for the population life in terms of sustainable urban development.

To determine the possible scope of reconstruction it is necessary to carry out a comprehensive investigation of the construction influence extent on a new bases state of the adjacent existing buildings, that requires the solution of complex scientific problems, associated with the methods of continuum mechanics in the overall approach to the proposed methodology of scientific and technical substantiation the reconstruction of urban territories.

The solution to this complex problem of reliable analysis tasks connected with the investigation of the combined space, namely the interaction of solid deformable bodies with the soil mass, based on the laws of the nonlinear theory of elasticity and plasticity, nonlinear soil mechanics, variational methods of nonlinear programming and efficient numerical methods [3, 4].

The processes of urban territories reconstruction with a dense housing related to the deep excavations arrangement and underground structures construction, one of the main issues which impact on the existing adjacent building is to ensure its preservation and normal operation.

Design and construction of buildings and structures in districts with dense urban construction with complicated engineering–geological conditions associated with the need to deal with complex geotechnical issues to ensure the normal operation of existing and newly built structures, and to prevent emergency situations.

In the case complicated engineering-geological situation is necessary to develop appropriate measures for strengthening the soil bases and protecting surrounding territories.

It is necessary the further development of normative documents regulating the implementation of the basic processes of construction engineering works and taking into account the current situation in the construction of urban environment and its impact on existing nearby buildings that have included a special section on scientific substantiation and scientific–engineering support of the reconstruction.

The whole complex of of these measures when working in reconstruction areas of dense urban areas and complicated engineering-geological conditions should be included in the project design and regional

planning schemes with appropriate scale reconstruction substantiation.

During the reconstruction of urban territories through new construction in a dense housing, including large-scale use of underground space in complex geological conditions, there is additional activation processes in soil base areas and foundations of existing buildings.

The need to predict the consequences of this activation has become an urgent problem, not only in design and construction, as well as long-term planning of development of urban areas.

This kind of problem while connected with such scientific fields as nonlinear theory of elasticity and plasticity, nonlinear soil mechanics, structural mechanics of combined structures, engineering geology, the deep foundations analysis and design, the soil mass strengthening structures calculation, and the study of the existing structures buildings behavior in the changed conditions.

To solve such problems of the scientific and technical substantiation of the urban territories reconstruction making in the above circumstances, it is necessary these sciences association of civil engineering industry within the general setting, i.e. taking into account geometrical and physical nonlinearities, subject to the boundary condition at different stages of heterogeneous materials deformation, interaction riznomodulnyh materials, solids of the a continuous elastic-plastic medium, etc.

The optimization of urban solutions on engineering preparation of urban territories is based on multifactorial evaluation considering the principles of technology and organization of construction, as well as technical, economic and social grounds.

As part of the technology and organization of production reconstruction should be considered a decision on the design, construction, reconstruction, given the conditions of buildings, structures and systems, and related technologies used by organizations construction and installation processes associated with the erection, reconstruction, restoration, repair of buildings, structures and systems, particularly in special circumstances.

Social-economic efficiency of the complex issues of implementation proposals for the reconstruction of open spaces can be proved by using multifunctional management of investment and construction projects of the real estate.

The effectiveness of this approach is to form the legal framework for further operation on a limited budget spending the formation of a legal entity – a corporation of area residential area for the release of open space in a separate facility administrative and business activities and issues of financing and management of open spaces within residential areas in order to increase the efficiency of their use and improve their architectural environment.

The next stage is the formulation and adoption of recommendations on planning, design and reconstruction of urban territories considering multifactor assessment of urban planning decisions at different phases and stages of specific objects reconstruction, and generalization the results can be built the overall concept of the reconstruction planning and design of urban areas with dense buildings and the difficult geological conditions.

5. Conclusions

Thereby, in the reconstruction of urban areas with dense buildings and the difficult geological conditions, final decision-making should take place at appropriate stages of the results of its implementation on the basis of the above mentioned factors, developing the appropriate engineering documentation of the construction and installation works and monitoring facility adjacent buildings and areas, and with the required scientific and technical support carrying for the urban, architectural, structural–engineering and construction–technological problems resolving, for safe carrying the all reconstruction processes of urban areas with dense buildings to preserve and protect the urban territories.

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Д.Е. Прусов. Концепція планування реконструкції міських територій на основі науково-технічного обґрунтування
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Запропоновано концепцію наукового обґрунтування розвитку містобудування, територіального планування і реконструкції ділянок міської місцевості з щільною забудовою, складними інженерно-геологічними умовами для науково-технічного супроводу всіх процесів перетворення, вироблення рекомендацій для безпечного і збалансованого розвитку територій та більш ефективного використання житлових комплексів у сучасних соціально-економічних умовах.
Ключові слова: збереження існуючої забудови; реконструкція міських районів; територіальне планування.

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Предложена концепция научного обоснования развития градостроительства, территориального планирования и реконструкции участков городской территории с плотной застройкой, сложными инженерно-геологическими условиями для научно-технического сопровождения всех процессов преобразования, разработки рекомендаций для безопасного и устойчивого развития территорий и более эффективного использования жилых комплексов в современных социально-экономических условиях.
Ключевые слова: реконструкция городских территорий; сохранение существующей застройки; территориальное планирование.

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