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MODERN TRENDS OF THE NOOSPHERIC RECONSTRUCTION OF THE CENTRAL PART OF THE CITY AND THE LANDSCAPE ENVIRONMENT

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Annotation. Development of the city center – led to the formation of a new type of urban area – the reconstruction of the business center. «Business center of the city» is a part of a settlement where cultural, educational and economic events take place. Also – a place with a developed infrastructure, an organized market and the necessary conditions for negotiating and making transactions. Most of the world's business centers are located in cities where the largest stock exchanges, commercial and investment banks operate, or there is a major transport hub, as well as large shopping centers. The business central part appeared in the depths of a historically formed earlier public complex with a pronounced business function. Large, multi–storey business centers in the city are an indispensable part of modern big cities.

The construction of multi-storey office centers and the headquarters of hu ge corporations began more than a century and a half ago. This became possible thanks to a number of technical advances, as well as the emergence of new forms of business organization. At the same time, the problem of normalizing the socio-ecological microclimate inside the business center arose. Today, large, multi-storey business centers are an indispensable part of modern large cities.

A systematic approach to the subject of research makes it possible to use the results obtained in the design and construction of business centers. In a highly urbanized environment of large cities, the introduction of a landscape component into the structure of a business center will partially compensate for the deficit of natural greenery and enrich the architecture of buildings.

The ecological crisis of the last decade of the twentieth century in most industrialized countries influenced the rethinking of the role of landscape components both in the improvement of external territories and in the internal spaces of public buildings.

Keywords: landscape environment, central part of the city, reconstruction, green roofs, winter gardens.

Introduction and relevance of the study. Reproduction of the natural environment is becoming an increasingly urgent task for large business centers: the use of surfaces of facades and roofs of buildings, the placement of natural components in a «multi-layer» version with the spread of green surfaces in space.

In an urbanized environment, the natural complex is split into smaller and smaller areas. Simultaneously with the miniaturization of sites, more and more technological forms of integration of nature and architectural and construction objects are being invented. New tasks associated with the introduction of landscape components into an urbanized environment have revealed a specific area of architectural activity - landscape design.

Landscape design is the design and creation of a subject-spatial environment by means of landscape architecture, landscape gardening and decorative art. Public complexes are increasingly becoming an object of landscape design, which manifests itself in the structure of buildings, open spaces, decorative design of entrances to business buildings, roof gardens, interior landscaping.

Analysis of recent research and publications and problem statement. The issues of about landscape design and architecture were developed by – V.G. Antipov [1,2], I.O. Bogovaja [3,4], A.P. Vergunov [5], V.A. Gorohov [6], V.F. Gostev [7], M.F. Denisov [8], I.L. Zaitova [9], S.S. Ozegov [10], J.V. Razumovsky [11], N.A. Makoznak [12], V.S. Teodorovsky [3], L.M. Fursova [14, 15].

The issues of development of methods of park composition and theory of landscape art are highlighted. The methodology for the formation of plantations, reconstruction and restoration of historical parks is described. The advanced domestic and foreign experience in green building is summarized.

Design, reconstruction, construction and operation of public and residential buildings were studied by architectural science, including: V.V. Fedorov, I.S. Guchkin, Yu.V. Ivanov, V.I. Travin.

P.A. Henkel, G.M. Ilkun, I.I. Korshikov, V.S. Kotov, Yu..Z. Kulagin, V.P. Tarabrin dealt with the use of plants in a technogenic environment.

The analysis of psychological health in a modern city was carried out - V.I. Slobodchikov, N. Khamitov, A.G. Maslow, B.S. Bratus.

Catalogs dedicated to the development of roof gardens have been published abroad and in Ukraine. These include works by S.M. Danilov, A.V. Sagalaev, P.B. Wright, P. Blanc.

The problem of introducing the landscape component into the architecture of the reconstructed part of the city remains insufficiently studied. Thus, the «landscape component» is an independent object of research and design, which is important for work on the creation and improvement of the spatial environment for human life in the broadest sense of this problem.

The ecological microclimate of the modern reconstructed central parts of the city has significantly improved, and the elements of the artificial and natural greenary of the indoor and outdoor environment are organized on the basis of landscape architecture techniques.

The object of research is landscape design proposals in the structure of the reconstructed city center.

Purpose of the work: to investigate the role of the landscape environment in the reconstructed central business part of the city.

Tasks. To determine the relevance of future research on the topic «Architectural and planning organization of the urban landscape in a hot climate». Identify the features of the origin and development of modern public facilities in the central part of the city. To systematize the experience of introducing landscape components into the structure of a highly urbanized city center. Develop recommendations for the use of landscape elements.

The scientific novelty lies in the fact that the study developed a new architectural and design approach to this study.

The research methodology includes field surveys, study and generalization of practically implemented architectural projects, methodological and theoretical literature, as well as scientific-theoretical and practical developments in the field of landscape design.

Research results. On the topic of the scientific manuscript, abstracts were made and written at a scientific conference. The work is determined by the solution of the set goal and objectives.

In geographical landscape studies (V.B. Sochaev, V.S. Davydchuk, F.N. Mikheli, N.A. Solntsev, G.N. Vysotsky, D.L. Armand) it is customary to distinguish four main landscape components: land, air, water, plants. In a naturally developing landscape, these components make up a single functioning system. The most stable component that ensures the stability of the system is the earth and its characteristic landforms. Forms are constantly changing under the influence of air and water. Vegetation is a derivative of the action of these forces. Green plants have a stabilizing effect on the landform. The relief determines the variety of compositional constructions, functional structure, the nature of visual perception, stability and durability of the composition [1].

In terms of size, there are 6 forms of relief (continental, mega-relief, macro-relief, mesorelief, micro-relief). On the scale of the building, mesorelief (fluctuations in heights from 1 to 10 m), microrelief (fluctuations in heights within 1 meter) and pressure relief (fluctuations in heights within 30 cm) are applicable. The vertical layout of the territories to be landscaped with the aim of architectural and artistic transformation of the relief was called «geoplastics». The development of relief can be both aesthetic and utilitarian. The presence of these both aspects testify to the modern approach to this topic, as a result of which not only an aesthetically expressive image of landscape composition is created, but also an ecologically sound environment.

The charm of water lies partly in a deep-rooted desire to return to the origins, partly in its necessity, but, most importantly, there is nothing on earth that can compare with the potential of water as an element of creativity. The most important quality of water is undoubtedly movement, an additional dimension for the contemporary artist in his constant quest. According to J. Jellicoe, water goes through three distinct phases. Firstly, in their wild hypostasis - small streams arising from springs and natural rivers. Secondly, tamed water intended to serve humans in irrigation canals, reservoirs and various structures. And, thirdly, water forms, created not only to imitate nature, but also to recreate «captive» water, when a person turned water into a work of art. As a result of the study of the methods of using water in the existing modern business centers, it is possible to add a new type of water use in the interior (Fig. 1). Namely - water steppes, aquariums and modifications of the state of water - that is, the use of steam. In many ways, the design of active aquatic forms is similar to sculpture and the attractiveness of water will increase [2].

Fig. 1 Fountains of Nur-Sultan. The fountains on Nurzhol boulevard are located near the Baiterek monument and are known in the city as the «singing» ones

Small gardens play an important role in all types of three-dimensional spatial compositions, and compositional prototypes created in the past continue to appear in different interpretations in the modern environment (Fig. 2).

In the early 90s of the XX century, they began to intensively master the «artificial nature» over underground structures and in the huge interiors of public buildings. This was influenced primarily by the high building density in business centers. External space for the use of landscape components is usually small and this leads to the integration of green spaces into the building it-

self. Based on the dendrological classification of plant types, it is possible to identify the main groups that are acceptable for use in a modern business center: trees (deciduous and coniferous), shrubs and flowers (medium and low), lianas, aquatic plants [3].

Fig. 2 Office of the insurance company WGV-Versicherungen in Stuttgart

For many years of cultivation of tropical and subtropical plants, the best ones, the most suitable for growing in greenhouses, in residential and office buildings, have been selected. The expediency of using ornamental plants is explained not only by aesthetic considerations, although the presence of beautiful plants in the interiors of office premises creates the illusion of communication with nature, calms a person, increases its mood [4].

The Winter Garden is the most perfect and most complex architectural, engineering and artistic form of interior landscaping (Fig. 3). Winter gardens in modern buildings are, as a rule, separate compositions with skillfully selected vegetation. Together with architectural elements, they form a single aesthetic and functional ensemble [5].

Air and light, as landscape components, are constantly involved in solving general problems of architectural and spatial design. When it comes to the interior of a building, as well as its surroundings, more attention should be paid to the role of air and light in the emotional stress experienced by a person in the building, that is, we are talking about smell, sound, sun glare on the walls and floor, views from the windows to the surrounding space and the sky. In other words, a person should «feel» the building, the space in which he spends most of his life. An analysis of the modern experience of building business centers abroad gives us convincing illustrations of a successful combination of all these techniques [6].

The main task of any roof is to retain heat in the house and protect it from wind, rain, snow, ultraviolet rays and other adverse atmospheric factors. However, an acute shortage of places for construction and environmental problems in megacities have led to the fact that additional tasks are assigned to the modern roof (Fig. 4). One of the modern fashion trends in modern architecture is the creation of a «green roof», where you can equip a flowering lawn and even grow the necessary vegetables and herbs [7].

Fig. 3 Buffer winter garden

Fig. 4 Office of the insurance company WGV-Versicherungen in Stuttgart

From 2006 to 2009, work continued on the creation of a green roof for the public complex Blue Garden in Ostfildern near Stuttgart. The building is located in a new area called Scharnhauser Park. Until 1992, the military unit of the US Army was located. Today Scharnhauser Park is becoming the model quarter of modern Germany (Fig. 5). A European Union grant allows energy efficient buildings to be built there and renewable energy sources.

Not all city dwellers have the opportunity to fully relax in a forest clearing or enjoy the mountain air - often there is simply no time for such trips. Multi-storey buildings, cramped streets, passing car exhaust and hot asphalt have a negative impact on humans on a daily basis. That is why the owners of private houses and cottages work tirelessly to ensure that their homes are as

close to nature as possible - they use environmentally friendly materials in construction and equip flower beds and lawns [8].

Fig. 5 Green roofs of Stuttgart

An interesting technological solution came to Ukraine from the Scandinavian countries – which is a «turf earthen roof», which is often built on small houses in Norway. This design assumes the following: the roofing material is covered with a clay litter, and it serves as the basis for the formation of a sod layer 10-15 cm thick, where the grass was planted. The houses looked very attractive, but such a structure requires additional strengthening of the supports - not only is the soil «cake» itself rather heavy, snow masses were added to it in winter, and not every structure could withstand such a load [8]. Therefore, over time, sod roofs almost ceased to be equipped. Perhaps this concept would have been remained an idea if today landscape designers had remembered the use of the forgotten Scandinavian traditions.

Findings. The reconstructed central part of the city is becoming an important component of the urban ecology. Its origin is associated with the tendency to increase the density of the surrounding buildings and the proximity to powerful traffic flows. The reconstructed buildings are practically isolated from the external natural environment. The lack of natural surroundings leads to social and psychological discomfort. The study shows the current trend in the development of public buildings, consisting in the introduction of landscape design proposals into their structure.

The sociological problem of reconstructed public buildings has an ecological and aesthetic aspect. The ecological aspect includes engineering, technical and landscape-architectural direction. Based on the generalization of design materials and field surveys, a typological scheme of the internal and external space of the business center has been developed. The structural elements of the external space are: gardens, parks, squares; podiums, stylobates, garage roofs; roof of the building, open terraces, roofs of adjacent buildings. The structural elements of the interior space are: an atrium; workspace; corridors, stairs, elevator halls.

Based on a complex set of aesthetic, functional, economic requirements, the landscape design of the reconstructed public buildings forms a system, a methodological apparatus, gradually consolidates its «circle» of objects of study, design and construction.

The main principles of integrating landscape components into the business center complex have been developed and systematized: the principle of structural conformity - consists in the selection of landscape components that coincide in size and functionality with the main structural elements of the business center; the principle of levels - consists in the selection of landscape components that reduce the load on the structures as the number of storeys in the building increases; the principle of integrity - is to ensure the unity of the interior architecture and landscape com-

ponents of the business center; the principle of the leading component determines the importance of landscape components for constructing the figurative characteristics of the business center as a whole and its individual structural elements.

These proposals for the use of landscape elements, their assortment list and methods for organizing spaces at different levels. It has been established that the system of landscape components includes: main types (land, water, air, vegetation); and subtypes (trees, shrubs and flowers, fountains, streams and cascades, water «mirror», water «walls», macro-relief, micro-relief, light and wind, environmental and sensual phenomena, installation, graphite, stained glass, collage and artificial greenery). The landscape design of business centers forms its own conceptual and terminological system, methodological apparatus, gradually consolidates its «circle» of objects of study, design and construction.

References

[1] Antipov, V.G. (2000). *Dekorativnaja dendrologija.* Dizajn PRO [in Russian].
[2] Antipov, V.G. (1975). *Parkib Belorussii.* Urozaj [in Russian].
[3] Bogovaja, I.O. & Fursova, L.M. (1988). *Landsaftnoje iskustvo.* Agropromizdat. Moskva. [in Russian].
[4] Bogovaja, I.O. & Teodorovsky, V.S. (1988). *Ozelenenie naselennych mest.* Agropromizdat. Moskva [in Russian].
[5] Vergunov, A.P. (1980). *Arhitekturnaja kompozicija sadov i parkov.* Strojizdat [in Russian].
[6] Gorohov, V.A. (1981). *Gorodskoje zelenoje stroitelstvo.* Strojizdat [in Russian].
[7] Gostev, V.F. & Juskevich, N.N. (1991). Proektirovanije sadov i parkov. Strojizdat [in Russian].
[8] Denisov, M.F., Vergunov, A.P., Ozegov, S.S. (1991). *Landsaftnoje Proektirovanije.* Vysshaja skola [in Russian].
[9] Zaitova, I.L. & Mochalov, I.V. (2004). *Dekorativnyje drevesnyje gruppy.* Bruns Pflanctn [in Russian].
[10] Ozegov, S.S. (2004). *Istorija landsaftnoj Landsaftnoj Architectury.* Architectura-S [in Russian].
[11] Razumovsky, J., Fursovs, L., Teodorovsky V. (2021). *Landsaftnoje Proektirovanije.* Izdatelstvo: Infra-M [in Russian].
[12] Makoznak, N.A. (2010). *Osnovy sadovo-parkovogo hozjajstva.* Minsk [in Russian].
[13] Teodorovsky, V.S. & Bogovaja, I.O. (2003). *Objekty Landsaftnoj Architectury.* Ozelenenije naselennh mest. MGUL [in Russian].
[14] Fursova, L.M. (2018). *Landsaftnoje projektirovanije.* Izdatelstvo: "Infra-M, Forum" [in Russian].
[15] Fursova, L.M. (2016). Istoriya sadovo-parkovogo iskusstva. Drevnij mir i Vostochnoe Srednevekov'e. Moskva: Forum [in Russian].
[16] Bratus, B.S. (2000). *Russian, Soviet, Russian psychology*. Flint [in Russian].
[17] Vergunov, A.P. (2001). *Glossary of terms.* Landscaping. MARKHI.
[18] Vladimirov, V.V., Mikulina, E.M., Yargina, Z.N. (1983). *City and landscape.* Thought [in Russian].
[19] Gelfond, A. (2006). Architectural design of public buildings and structures. Architecture-S.
[20] Nefedov, V.A. (2002). Landscaping and environmental sustainability. Polygraphist [in Russian].
[21] Vasilenko, A. & Koniuk, A. (2019). Light Facilities Complex in Architectural Design. *Proceedings of the 2nd International Conference on Building Innovations ICBI 2019*. Springer. *Lecture Notes in Civil Engineering,* 73: 491-590. [Electronic resource] Retrieved from: https://www.scopus.com/record/display.uri?eid=2-s2.0-85086992970&origin=resultslist&sort=plf-

f&src=s&sid=b13a6e0bb504648c7f90ac63a92400c2&sot=b&sdt=b&sl=55&s=TITLE%28Light+Facilities+Complex+in+Architectural+Design%29&relpos=0&citeCnt=0&searchTerm=
[22] *Roof gardens: a new word in modern landscape design* [Electronic resource] Retrieved from: https://zstrela.ru/projects/magazine/sections/dizayn-sada/sady-na-kryshe-novoe-slovo-v - sovremennom-landshaftnom-dizayne
[23] Green roofs of cities [Electronic resource] Retrieved from: http://ecopeterburg.ru/2018/12/10/green roofs of cities/.

СУЧАСНІ ТЕНДЕНЦІЇ НООСФЕРНОЇ РЕКОНСТРУКЦІЇ ЦЕНТРАЛЬНОЇ ЧАСТИНИ МІСТА ТА ЛАНДШАФТНЕ СЕРЕДОВИЩЕ

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Анотація. Розвиток центру міста - привело до формування нового типу містобудівної території - реконструкція ділового центру. «Діловий центр міста» - це частина населеного пункту, де відбуваються культурні, освітні, господарські події. Так само - місце, яке має розвинену інфраструктуру, організований ринок і необхідні умови для ведення переговорів і укладання угод. Більшість світових ділових центрів розташовано в містах, де працюють найбільші фондові біржі, комерційні та інвестиційні банки або знаходиться великий транспортний вузол, а також великі торгові центри. Ділова центральна частина з'явилася в надрах історично сформованого раніше громадського комплексу з вираженою діловою функцією. Великі, багатоповерхові ділові центри в місті є обов'язковою частиною сучасних великих міст.

Будівництво багатоповерхових офісних центрів і штаб-квартир великих корпорацій почалося більше півтора століття назад, це стало можливим завдяки цілому ряду технічних досягнень, а також виникнення нових форм організації бізнесу. Одночасно з цим виникла і проблема нормалізації соціально-екологічного мікроклімату всередині ділового центру. На сьогоднішній день великі, багатоповерхові ділові центри є обов'язковою частиною сучасних великих міст.

Системний підхід в дослідженні дає можливість використовувати отримані результати в проектуванні і будівництві ділових центрів. В умовах високо урбанізованого середовища великих міст впровадження ландшафтного компонента в структурі ділового центру, частково компенсує дефіцит натуральної природи і збагачує архітектуру будівель.

Екологічна криза останнього десятиліття двадцятого століття в більшості промислово розвинених країн вплинув на переосмислення ролі ландшафтних компонентів як у благоустрою зовнішніх територій, так і у внутрішніх просторах громадських споруд.

Ключові слова: ландшафтне середовище, центральна частина міста, реконструкція, зелені дахи, зимові сади.

СОВРЕМЕННЫЕ ТЕНДЕНЦИИ НООСФЕРНОЙ РЕКОНСТРУКЦИИ ЦЕНТРАЛЬНОЙ ЧАСТИ ГОРОДА И ЛАНДШАФТНАЯ СРЕДА

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Аннотация. Развитие центра города - привело к формированию нового типа градостроительной территории - реконструкция делового центра. «Деловой центр города» - это часть населенного пункта, где происходят культурные, образовательные, хозяйственные события. Так же - место, имеющее развитую инфраструктуру, организованный рынок и необходимые условия для ведения переговоров и совершения сделок. Большинство мировых деловых центров расположено в городах, где работают крупнейшие фондовые биржи, коммерческие и инвестиционные банки или находится крупный транспортный узел, а также крупные торговые центры. Деловая центральная часть появилась в недрах исторически сформировавшегося ранее общественного комплекса с выраженной деловой функцией. Крупные, многоэтажные деловые центры в городе являются обязательной частью современных больших городов.

Строительство многоэтажных офисных центров и штаб-квартир огромных корпораций началось больше полутора веков назад, это стало возможным благодаря целому ряду технических достижений, а также, возникновению новых форм организации бизнеса. Одновременно с этим возникла, и проблема нормализации социально-экологического микроклимата внутри делового центра. На сегодняшний день крупные, многоэтажные деловые центры являются обязательной частью современных больших городов.

Системный подход к предмету исследования дает возможность использовать полученные результаты в проектировании и строительстве деловых центров. В условиях высоко урбанизированной среды крупных городов внедрение ландшафтного компонента в структуре делового центра, частично компенсирует дефицит естественной природы и обогащает архитектуру зданий.

Экологический кризис последнего десятилетия двадцатого века в большинстве промышленно развитых стран повлиял на переосмысление роли ландшафтных компонентов как в благоустройстве внешних территорий, так и во внутренних пространствах общественных сооружений.

Ключевые слова: ландшафтная среда, центральная часть города, реконструкция, зеленые крыши, зимние сады.