

MODERN METHODS OF LANDSCAPING ARCHITECTURAL ENVIRONMENT OF TRANSPORT BUILDINGS EXEMPLIFIED BY THE MULTISTORY PARKING GARAGES

Abstract: This paper examines search for new methods and landscape means of the transport facilities architectural environment, for exemplified of multistory parking garages. We describe modern methods of applying biotic and abiotic natural, elements of urban design in forming architectural environment of multistory parking garages. In addition, we give recommendations for using these techniques. Unfortunately, these aspects are not resolved in today's modern architecture practice.

Keywords: landscape design, architectural environment, multistory parking garages, ecology, aesthetics.

Formulation of the problem. Nowadays, the attention of architects, physicians, ecologists, sociologists, etc., is rising to the problem of harmonizing the interconnection and interaction of a person and his environment. An analysis of many years of research by many leading experts makes it possible to conclude that in the field of architectural science and creative practice a new direction – demoelectology, research and design of architectural systems of the type «*population – environment – demoecosystem*» is born in the field of architectural science and creative practice [1].

In the context of increasing the density of buildings in the largest of cities, more often there is a need for the erection of multistory parking garages for car storage. However, the importance of the multistory parking garages as one of the most visible and often controversial elements infrastructure is often underestimated. As multistory parking garages create a complex problem for ecology and organization of people's living environment. The multistory parking garage facilities are a basic part of the modern community's transportation system. Designing the parking facility requires an integrated design approach of many professionals [2, 3].

The surrounding environment of multistory parking garages, especially those located in the residential area is paid a little attention today. However, this type of structures equally add impression of the microdistricts, where multistory parking garages are place and become part of the architectural system of the type «*population – environment – demoecosystem*». The search of the architectural environment of the placement of multistory parking garages with landscape features, such as greening, terracing of the territory, etc., is becoming important.

Analysis of recent publications. Modern scientific researches prove the significance of ecological and aesthetic aspects in the architectural environment formation of multistory parking garages. We see this in the works of such foreign researchers: *Shannon McDonald* considered the use of landscape design as a protection of the environment and in general in order to improve the architecture of multistory parking garages; *Golubeva E.* considered humanization of the architectural environment of the multistory parking garages in the city structure; *M. Fakki* considered the humanization of the architectural environment of multistory parking garages in the structure of high-rise multistory residential complexes [4, 5].

The article's aim is search for new modern methods of applying biotic and abiotic natural, elements of urban design in forming architectural environment of multistory parking garages.

The main part. The development specificity of multistory parking garages for storing cars, as well as the structure of their placement in urban environments, has a particular impact on the formation of the surrounding architectural environment. Increasing the environmental sustainability of the environment and its aesthetic improvement in this case is due to minimizing the negative impact of car emissions on the immediate environment of the people's stay [6].

Ecological and aesthetic aspects in the formation of the architectural environment of the multistory parking garages play one of the key roles. It's necessary to distinguish between the two most promising directions: landscape-ecological and visual-aesthetic (table 1).

table 1

Methods of landscaping architectural environment of the multistory parking garages

Methods of implementation	1. Landscape direction			
	site landscaping	vertical garden	green roof	geoplastics, relief terracing
	2. Visual-aesthetic direction			
	linear and local light equipment	light information design	screening	

In this article, we consider the most modern methods of landscaping architectural environment of the multistory parking garages. Landscape-ecological direction is focused on improving aesthetic potential of an area by combining artificial and natural urban environment components. This helps to reduce negative effects of building upkeep on the surrounding architectural environment.

Landscape direction is oriented on the partial acquisition of the ecological potential of the territory, by the ratio of artificial and natural components of the urban environment,

which reduces the adverse effects of man-made on the formation of the architectural environment of the multistory parking garages (table 1).

The methods by which this direction is realized when organizing the architectural environment of the multistory parking garages at the urban level are:

- organization a sanitary green belt between the multistory parking garages and surrounding buildings;
- arrangement of a sanitary green zone around the multistory parking garages;
- the placement of the multistory parking garages along the edges of the blocks and in the area of residential development, such as noise-protecting screens, to provide noise protection for residents of neighboring homes from the movement of cars.

At the planning level: site landscaping, vertical gardens and organization greenery of roofs; relief terracing (tonal, textual allocation of areas) of the earth; geoplastics (tiers of altered relief with fixed vegetation).

Air pollution from the ramp multistory parking garages is quite significant. Therefore, the use of greening the territory surrounding the multistory parking garage and the vertical gardening of the facades can be a solution to the problem. This planting area, which placed multistory parking garage, facades vertical gardening and landscaping of roofs (so-called «green» roofs) provide the organization functions: aesthetic; natural and climatic – giving to buildings not only external, but also internal ecological; and noise-protecting.

Usually plants are the main focus of creating architectural environment around multistory parking garages, because it offers following benefits: aesthetics function; natural function – it improves external ecology and internal ecology; chemical composition of air in the area is improved; noise reduction.

Planting methods for multistory parking garages are: ground greenery, vertical green walls and green roofs.

Two types of landscaping can be used on the territory of multistory parking garages: stationary is landing of plants in the ground and mobile is planting of plants in special mobile containers (containers, vases, etc.). Stationary and mobile landscaping are used to create architectural and landscape objects (lawns, gardens, flower beds, fields with bushes, trees, etc.) on natural and artificial elements of relief, roofs (roofing landscaping), facades (vertical gardening) of buildings and structures.

To plant greenery in the territory of the multistory parking garages, local species of shrubs should be used taking into account their sanitary-protective and decorative properties. The total size of plots intended for planting should be not less than 15% of the area of the parking lot.

When designing landscaping in area around the multi-storey parking garages, one should take into account the recreational potential of the landscape and provide for the organization of *lawns, automatic irrigation systems, flower arrangement*. It should be noted that recently, there was a possibility of compensation for planting green areas

through the organization of ecological open plan car parks (eco-parking) based on lawn lattices.

External ground greenery is the most effective strategy of protecting against heat build-up and control ambient temperatures on macro level. External landscaping on ground level can be doing using trees and shrubs. Landscaping plans of the multistory parking garages sometimes include *waterbodies* such as *fountains* to add «blue architecture» to overall «green» effect of the development.

Landscape elements (trees, shrubs, flowers) combine elements with different functions located near the multistory parking garages. Adding a green buffer makes a monotonous multistory parking garage facade more expressive. This method can be use to demarcate buildings that vary in functionality, including areas around the multistory parking garages. Trees in a transport space composition are a factor of ecological stabilization [7].

In addition, the trees create the shadow desired for motorists. This is especially appreciated on roadside sports grounds, camping. Trees are also serving natural boundary. The varieties of trees are selected according to local conditions in accordance with greening projects [8].

Plants that wove have fallen to the walls of the multistory parking garages, create this way called *vertical landscaping*. It essentially adorns the structures of asthma. Such plants are not demanding insolation. This method not only serves for an aesthetic purpose, but also for natural and noise reduction purposes. Stationary, mobile and mixed vertical landscaping may be in the multistory parking garage if it has a facade of at least 5 m in width without openings. The height of vertical landscaping is recommended to be limited to three floors.

A *roof* in a multistory parking garage can become the center of a residential courtyard. Complex improvement of the roof of a multistory parking garage can include the creation of children's, playgrounds or sports grounds with appropriate fencing, full-fledged recreation areas, planting bushes and low trees, arrangement of flower beds. Future use of existing flat roofs, especially in the old part of the city, that is, where there is a shortage of land and its high cost for car storage, can become promising. Because cars standing on a flat roof are invisible from the ground. This is how the roofs of shopping centers are sometimes used.

Places for cars storage should be focused on a special approach to landscaping expressiveness. Such means can be, for example, relief or trimming materials (paving), the spectrum of which has expanded considerably in recent years. Geoplastics in its various manifestations is one of the active means of forming the architectural environment of the multistory parking garages. Geoplastics combines the possibilities of economic use of land resources of the building with the possibility of increasing the aesthetics of the architectural environment of the multistory parking garages. Formation of the architectural environment of the multistory parking garages by

geoplastics, possibly due to: creation of artificial hills; relief profiling; creation of terraced slopes with fixed vegetation.

Paving the tracks can be made by sidewalk tiles of different colors. Due to the application of methods of organizing the architectural environment by the landscape-ecological direction it's possible to indicate the interconnections between the multistory parking garages and their surrounding buildings.

In addition, elements of the landscape (lawns, flower beds, reservoirs) combine different in functionality of the elements of space, located next to the multistory parking garages.

Elements of «green» landscaping and objects of improvement (paving, retaining walls, fences, parapets) allow to navigate and give directions for the search of objects of the city's transport infrastructure, such as multistory parking garages. These facilities enrich the surrounding buildings of multistory parking garages, add aesthetic, psychological comfort to their perception.

Conclusions. The problem of landscape and aesthetic organization architectural environment of the multistory parking garages is a problem of preservation of natural systems in the city structure. Global experience of the multistory parking garages provides as a set of methods, including landscape-ecological ones, for forming architectural environment of the parking garages from convenience point of view.

The analysis made it possible to determine the principle of repeated compensations for environmental and spatial damage of the location of the multistory parking garages in the city structure and to identify its components, such as:

1. compensation of unfavorable man-made influences from the multistory parking garages is solved by: rational spatial solutions; an effective functional and planning organization; optimization of the development area;
2. creation of ecological protection of territories adjacent to objects of cars storage: organization of necessary gaps between the multistory parking garages and surrounding buildings; creation of a sanitary protection zone; placement of the multistory parking garages on the outskirts of residential areas in the role of noise-protecting screens.

Література:

1. Джонгман Р. Г. Г. Анализ данных в экологии сообществ и ландшафтов / Р. Г. Г. Джонгман, С. Дж. Ф. Тер Браак, О. Ф. Р. Ван Тонгерен / Пер. с англ. – М., 1999. – 306 с.
2. Кисиль С. С. Ecological means of forming architectural environment for multi-storey parking garage in large cities / С. С. Кисиль. // Междунар. электронный науч.-образов. журнал «Архитектура и современные информационные

технологии» АМІТ. – 2015. – №3 (33). – [URL]: <http://marhi.ru/AMIT/2015/4kvart15/kisil/abstract.php>

3. Кисіль С. С. Екологічні напрями проектування та будівництва багатоповерхових автостоянок у найзначніших містах / С. С. Кисіль // Містобудування та територіальне планування: наук.-техн. збірник. – К.: КНУБА, – 2013. – № 47. – С. 283 – 290.

4. McDonald S. The Parking Garage: Design and Evolution of a Modern Urban Form / Shannon S. McDonald. – Washington: Urban Land Institute, 2007, 250 p.

5. Голубева Е. А. Гуманизация архитектурной среды паркингов в структуре города: на примере г. Екатеринбурга: автореф. дис. ... канд. арх.: спец. 18.00.01 / Е. А. Голубева. – Екатеринбург, 2007. – 20 с.

6. Simon Henley The Architecture of Parking: Henley Simon / New York, NY: Thames & Hudson, Inc, 2007.

7. Десятов В. Г. Типология в архитектуре ландшафта. Монография. – Екатеринбург, 2006. – 76 с.

8. Нефедов В.А. Городской ландшафтный дизайн. – Спб. : Любавич, 2012. – 320 с. : ил.

Аннотація

У статті висвітлюється дослідження, що пов'язане з пошуком нових методів та засобів благоустрою архітектурного середовища транспортних споруд, на прикладі багатоповерхових автостоянок. Описані сучасні прийоми застосування форм живої та неживої природи, елементи міського дизайну при формуванні архітектурного середовища багатоповерхових автостоянок.

Ключові слова: ландшафтный дизайн, архітектурне середовище, багатоповерхова автостоянка, екологія, естетика.

Анотация

В статье раскрывается исследование, что связано с поиском новых методов и средств благоустройства архитектурной среды транспортных сооружений, на примере многоэтажных автостоянок. Описаны современные приемы применения форм живой и неживой природы, элементы городского дизайна при формировании архитектурной среды многоэтажных автостоянок.

Ключевые слова: ландшафтный дизайн, архитектурная среда, многоэтажная автостоянка, экология, эстетика.