BIOSPHERE COMPATIBILITY: HUMAN, REGION, TECHNOLOGIES

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Contents

S.A. KIZILOVA

THE ROLE OF THE FUTUROLOGICAL CONCEPTS OF THE XX CENTURY IN THE SPATIAL ORGANIZATION OF MODULAR ARCHITECTURAL OBJECTS IN THE AQUATIC ENVIRONMENT

The aim of the research is identifying the role of the futurological theories of the XX century in the modern design of modular structures in the water environment. The leading research approach is based on the analysis of the principles of habitat organization from the point of view of the main visionary concepts of the XX century, which developed the idea of life on the water in the future, such as: architectural "metabolism", "mobile" architecture, arcology, architectural biomimetics and bionics. The approaches outlined in the framework of the futurological concepts of the last century include modularity, interchangeability of structural elements, adaptation to changes in climatic conditions, application of the principles of growth and aggregation in natural systems to the architecture.

The revealed approaches have been elaborated in the contemporary architectural concepts devoted to the development of the extreme water environment. Based on the analysis of implemented and conceptual projects of the floating structures on the water, the types of spatial organization of modules are identified: linear, continuous, multiple, arbitrary, centralized. A graphical diagram illustrating the mechanism of aggregation of modules for each type is made. These typologies can be applied in further design and experimental developments and theoretical studies in the field of biosphere-compatible architecture in the context of the aquatic environment.

Keywords: *architecture in water environment, architectural futurology, futurological forecast, eco-sustainable architecture, floating objects, modular architecture, arcology*

R.V. KHRESTENKO, E.V. SOKOLOVA, V.N. AZAROV

AIR POLUTTION FROM EVAPORATION OF OVERFLOWS AND LEAKS OIL PRODUCTS IN URBAN AREAS

Possible locations in the urban environment where overflows and leaks of oil products may occur are indicated. It is noted that the number of overflows and leaks of oil products in the urban environment is large and they occur constantly. The problems of air pollution in the urban environment from overflows and leaks of oil products are considered, on the example of petrol filling station. It is underlined that air most pollute at overflows and leaks of oil products in urban areas due to evaporation of oil products. The insufficiency of the applied measures at overflows and leaks of oil products is indicated. It is noted that the volume of a single leak of oil products is not known, as a rule. It is indicated that the volume of leak characteristic of the urban environment can be up to fifty liters in accordance with the regulatory and technical document. The areas of petrol leaks, which are typical for the urban environment, are calculated. The intensity of evaporation of petrol is calculated and mass flows of evaporation petrol from areas of petrol leaks are calculated on the base of obtained values. The quantitative assessment of mass flow of evaporation petrol from areas of leaks is carried out. The dispersion of petrol into atmospheric air from one square meter of leak is calculated by software. It is shown that there is an exceeding of the maximum single maximum permissible concentration of petrol in the atmospheric air at a distance of several tens of meters from the place of the leak even with insignificant single leak of petrol. It is indicated that there are cases when two or more leaks of oil products occur simultaneously in the urban environment. It is underlined that urbanized areas are characterized by a high density of objects where oil products are applied. It is noted that in the atmospheric air in the urban environment there are already background concentrations of petrol, which are close to the maximum permissible concentration of petrol. Increase of the concentration of petrol in the atmospheric air, which comes from the evaporation of the leak, can lead to an excess of the maximum permissible concentration. The task of updating measures to collect overflows and leaks of oil products is set in the urban environment.

Keywords: *overflows, leaks, oil products, petrol, evaporation, intensity of evaporation, pollution, atmosphere, urban environment.*

V. L. BONDARENKO, E. D. KHETSURIANI, A.B. ILYASOV, E.A. SEMENOVA

METHODOLOGICAL FRAMEWORK FOR THE ASSESSMENT OF ZONES OF INFLUENCE OF TECHNOLOGICAL WATER SYSTEMS MULTIPURPOSE WATER SUPPLY URBAN HOUSEHOLDS AND THE ECONOMY

In the development of a specialized type of natural and technical systems (PTS) "Natural water environment-water Intake technological complex-multi - purpose water supply System" ("P. V. S. - V. T. K.-S. M. V.") of urban households and economic objects on the basis of the results of long-term studies of the existing "V. T. K." in the Lower reaches of the Don river, the methodological basis for assessing the zones of their influence in the considered spatial limits of the basin geosystem has been developed. On the basis of the formulated principles of ecological acceptability of the used constructive and technological solutions on the basis of "V. T. K." quantitative and qualitative criteria environmental indicators of environmental safety, which are manifested in the established boundaries of the zones of influence in the considered region of the basin geosystem, have been developed. The main quantitative criteria are: preservation of the diversity of fauna and flora in the water body as a water source, protection of the water treatment system "S. M. V." from blue-green algae and river dreysen . The results of the research are implemented in the Alexander "V. T. K." urban farms of Rostov-on-don, Aksai and Bataysk .

Keywords: *water intake technological complex,. natural and technical system, ecological state, ecological safety, criteria of ecological safety, zones of influence.*

D.N. VLASOV, V.V. RASOV

FORMATION METHODOLOGY OF MULTIMODAL PASSENGER TRANSPORTATION SYSTEM OF MOSCOW AGGLOMERATION, USING GRAPH THEORY

The article considers the prerequisites for the creation of a unified transport infrastructure in Moscow and the Moscow region. High-speed passenger transport is proposed as the basis of such a system, its advantages are considered. The environmental aspects that must be taken into account are defined. The role of transport hubs in transit-oriented development of the agglomeration territory is revealed. The analysis of documents of territorial planning, domestic and foreign scientific experience for determination of the most perspective direction of research on this problem is carried out. The necessary elements of graph theory for the study are considered. The methodology of the study is determined. Analogies are drawn between urban planning terminology and definitions used in graph theory. The boundaries of the studied territory are determined. The analysis of urban-planning documentation on the basis of which transport and planning characteristics of communities are revealed is carried out.

Conclusions are drawn about the prospects for further research in this direction, as well as about the environmental aspect in the development of transport infrastructure in the Moscow region.

Keywords: *multimodal system of passenger transport, rail high-speed passenger transport, commuting hub, transit-oriented development, conurbation, «green urban planning».*

D. V. KLIMOV, S. S. FEOFANOVA

MUNICIPAL CONCEPT OF URBAN DEVELOPMENT OF THE REGION

The article is devoted to the sustainable development of municipality. To develop a long-term strategy for sustainable development, the authors use the methods of generalization of scientific literature and modeling of a balanced system of elements of sustainable development and the subjects of goal-setting, the formation of the concept of a balanced model and forecasting its development. The authors reveal the ways of interaction of actors in the municipal formation. Particular attention is focused on the creation of successful public-private partnership and the strategic potential of the territory. The results indicators and methods of their determination for actors are considered. The authors give a description of economic, social and environmental instruments of sustainable development. On the basis of the accepted aspects of sustainable development and the selected factors, the municipal formation sustainability matrix was created. At the moment, the model of sustainable development of the state is defined as the most relevant.

Keywords: *municipal formation, sustainable development, strategic potential of municipal formation, territory marketing, actor, public-private partnership, sustainability matrix, balanced model of sustainable development.*

N.G. VOLKOVA, E.Y. TSESHKOVSKAYA

ECOLOGICAL ASPECTS OF THE MICROCLIMATE IN RESIDENTIAL AND PUBLIC BUILDINGS

The quality of the indoor environment depends on the comfort and safety of people living inside. Scientists are working to overcome the negative impact of the environment on the population in the cities. Nevertheless, the existing residential areas of the country often do not meet today's environmental hygienic requirements. When choosing building constructive solutions and microclimate support systems for buildings, it is necessary to take into account the factors leading to the entry of harmful substances that pose a real threat to the health and life of people. Intensive use in residential construction of new polymer materials and other impacts on the internal environment of buildings can lead to a decrease in the quality of the internal environment of the buildings. It is crucial to take into consideration these factors when choosing building solutions and creating comfort with engineering systems providing the microclimate of buildings.

Keywords: *room comfort, internal environment, microclimate, hygiene, harmfulness*

A. M. REPEVA

THE PRINCIPLES OF "URBAN VILLAGE" AS A SOLUTION TO THE PROBLEM OF URBAN CONFLICT AND IMPROVING LIFE QUALIT

The article discusses the principles of the «urban village», in which it is possible to design a new type of residential areas in the context of increasing migration. It was revealed that the idea of urban settlements is aimed at creating a living environment with an increased level of socialization of the population, environmental protection, the priority of using public transport, etc. This study was aimed at using the principles of urban villages to improve the quality of life of citizens and leveling urban conflicts. The results of the study showed that in the arrangement of such habitat options with features such as the protection of natural resources and a combination of natural and anthropogenic environments, using efficient, integrated and human-based transport, leisure activities for all categories of citizens, a sense of belonging, identity and others features, residents will feel safe in an urban environment free of conflicts.

Keywords: *sustainable residential area, urban villages, township stability, sustainable development, life quality, urban conflict*

V. F. ASMININ, U. YU. PAVLOVA

CHARACTERISTIC OF PASSENGER SHELTERS AS OBJECTS OF THE URBAN ENVIRONMENT AND RECOMMENDATION FOR EXPANSION OF THEIR PROTECTIVE FUNCTIONS

Passenger shelter constructions perform some functions such as traffic safety, creation of comfortable conditions of public transport expectation and the general visual impression of city road & street. Passenger shelter constructions are urban environment protection against acoustic pollution in the city local territory not far from bus stop. In addition, passenger shelter constructions have informative functions for person adaptation in the urban environment.

The analysis of passenger shelters functions and the recommendation for their design with noise protective function of the urban environment is submitted in work. Natural researches of the acoustic pollution of the urban environment created by a motor transportation in bus stop places and not far from them are conducted.

Keywords: *comfortable urban environment, transport infrastructure, acoustic pollution, public transport, passenger shelter constructions, passenger shelter, noise protective function, the additional shielding panel, informational content of the urban environment.*

I.V. RUDAKOVA, E.G. TSUBLOVA

TO THE QUESTION OF IMPLEMENTATION OF THE SYSTEM FOR THE SEPARATE COLLECTION OF MUNICIPAL WASTE POPULATIONS OF THE CITY (ON THE EXAMPLE OF THE CITY OF BRYANSK)

The article presents an analysis of the effectiveness of the mechanisms used to implement the system of separate waste collection: the results of pilot projects on the organization of separate collection of municipal solid waste (MSW) are analyzed. As the results of sociological research to identify the attitude of the population of the city of Bryansk to the issue of a new system of solid municipal waste management, residents know and understand what a " system of separate collection of solid waste." However, such awareness still does not fully provide the necessary activities. Most of the population, even in the presence of special containers do not use them, as a rule, because of the reluctance to waste their time, and not understanding the importance of this action. In fact, Bryansk residents broadcast the all-Russian trend.

The main shortcomings on the part of the subjects creating conditions for compliance with the requirements of the legislation in the implementation of pilot projects are identified: the lack of a clear indication of waste separation for the population, untimely removal of accumulated garbage, collection of separated garbage in one garbage truck.

Detail the technology of creation of appropriate conditions for compliance with requirements for separate collection of waste, an analysis of necessary elements: determination of the number of components that will share the resulting residential waste, number of containers for separate waste collection, organization of placement of containers for separate waste collection, organization of separate waste collection. The main factor that allows the population to comply with the requirements of the legislation on separate waste collection is the discipline and responsibility of people. These qualities are brought up for a long time, so to speed up the process and improve its efficiency, it is advisable to use the following methods: creating conditions for meeting the requirements for separate waste collection, constant propaganda of the need for separate garbage collection, financial interest of the population (direct payments for the delivery of certain types of waste to reception points, indirect-due to changes in the tariff if the requirements for separate waste collection are met), monitoring compliance with the requirements for separate garbage collection.

Conclusions are drawn about the development of state and social institutions as a way of transition to a new system of waste management and a number of measures for the introduction of an effective system of separate waste collection are proposed.

Keywords: *municipal solid waste, separate collection, sociological research, municipal waste disposal, secondary raw materials, landfills.*