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BIOSPHERE COMPATIBILITY: HUMAN, REGION, TECHNOLOGIES

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E.L. BELYAEVA

FEATURES OF BEAUTIFICATION OF NATURAL AND LANDSCAPED AREAS WITH A SPECIAL STATUS AND REGIME OF USE. PART I

The article examines the peculiarities of the methodology and methods of design under the status of a specially protected natural area of regional significance and a protected zone of a cultural heritage site on the example of the Rozhdestveno recreation area with ponds, located in the Mitino district in Moscow.

It is shown that the presence of nature protection or historical and cultural status does not exclude the possibility of using the territory for periodical or even daily recreation, although it limits the construction of capital structures, laying of communications, not related to the main purpose of the territory; stabilizes the visitor and recreational loads, which can be associated with the improvement of the territory. Even if the beautification does not provide objects for mass visitation, the problem of taking into account environmental, water conservation, historical and cultural requirements and regulations in the design is complex in methodological terms. The content and methodology of design in relation to the activities for the improvement of territories are insufficiently developed.

Keywords: *beautification, landscaping, reconstruction, status and regimes of protected areas environmental requirements, conservation, valuable natural objects and complexes, red-listed species, pre-project studies, design methodology*

D.A. ILCHEVA

THE SIGNIFICANCE OF CULTURAL AND HISTORICAL HERITAGE AND IT'S REFLECTION IN MODERN ARCHITECTURAL AND PLANNING SOLUTIONS IN SEVASTOPOL

The modern variety of categories and types of housing, formed over many years of the history of architecture, today it provides us with many options and a limited number of decent options, at the same time. This is due to the fact that the understanding of housing in society has changed, and to the fact that for a certain period the historical component of the place was relegated to the background. Historical and cultural-aesthetic stages have their own significance in the perception of the city and life in it, determining its appearance, its perception. At the same time, it is cultural, aesthetic and historical milestones, that provide the value and significance of a particular area or city, they convey certain unique things, traditions, specifics, strengths and weaknesses, potential and prospects inherent only in this place. This forms in people's minds an attitude (positive or negative), a desire to relate to a given place, interconnectedness or to leave it. Thus, this article will consider the historical milestones that have shaped the city from the point of view of architectural, planning and artistic and stylistic aspects, in order to find competent housing solutions and prove the significance of the continuity of historical experience for a particular territory. It will be the seaside cities that will be considered, since most often they have the most complex cultural and historical layer, demand in residential areas and the extreme importance of preserving and demonstrating their history. The city of Sevastopol is taken as an example.

Keywords: *cultural and historical heritage, architecture, housing, seaside towns, architectural and historical city code, sea facade, coastline, Sevastopol*

Y.G. STRASHNOVA

SOCIO-ECOLOGICAL SIGNIFICANCE OF RECONSTRUCTION'S METHODS OF A FIVE-STORY RESIDENTIAL BUILDING WITHOUT DEMOLITION

The article reveals the socio-ecological significance of "not be demolished" or preserved methods of reconstruction of a five-story residential building during the period of mass housing construction. Modern urban planning, social and environmental trends in the development of the metropolis are described, using the example of the city of Moscow. These trends make necessary the development of fundamentally new systemic solutions to the problems of maintaining comfortable, human-scale indicators of residential development, ensuring the environmental safety of the residential environment, and reorganizing the cultural and community services for residents. The article outlines new environmentally oriented, nature-preserving approaches to improving the quality of the living environment. The disclosed approaches take into account the scientific experience of effective development of the territory: the urban planning philosophy proposed in the middle of the 20th century by Paolo Soleri - arcology, as a synthesis of 2 sciences, architecture and ecology; the principle of integrated development of the territory of the reconstruction quarter with the maximum use of all methods of spatial and planning reorganization (modernization of the building, installation of 1-4-storey additional structures, construction between the buildings, etc.); the principle of changing the balance of the elements of the intra-quarter territory with an increase in the share of natural and recreational areas due to the movement of parking lots into the underground space. The use of the above approaches to improving the quality of the living environment will increase the efficiency indicators (provision of the population with living space, objects of cultural and community services, etc.) and the social and environmental significance of reconstruction methods without demolition.

The proposed ideas also take into account the research and design experience of the author over 25 years of professional activity on the topic of the reconstruction of unbearable five-story buildings and the formation of the social facilities of the city.

Keywords: *socio-ecological aspects of reconstruction, complex reconstruction without demolition, methods of preserving and improving the living environment, environmentally-oriented approaches, housing ecology, cultural and community facilities.*

E. N. AL HADDAD

PRINCIPLES OF ARCOLOGIZATION AND METHODS OF FORMING A RESIDENTIAL ENVIRONMENT IN THE KEY OF ECO-ETHNO-URANISTICS OF SYRIA

The article discusses current problems and trends in the construction and architecture of residential buildings in Syria. The ethno-social aspects of the Syrian architecture are considered. The author indicates the main factors and regional features that affect the design and formation of residential buildings. The author formulates the principles that, in the author's opinion, are important for new construction in the region, including those concerning the formation of the corporate identity and archetype of modern Syrian architecture. The questions of the evolution of the form of the courtyard in many parts of the Arab and Islamic world, as well as the concept of "Arabic house" are discussed. The regional design experience and current trends in the development of the architecture of the countries of the Arab world are considered. The author argues that the further development of Syrian architecture should be based on the design of the house, based on the social and functional needs of the individual person and his family, as well as taking into account environmental and climatic issues. On the other hand, the design must respect cultural identity through the continuity of local and traditional housing solutions according the methods of modern requirements.

Keywords: *residential development in Syria, Arabic house, courtyard, archetype, ethnic-settlements, traditional architecture, sustainability.*

P. A. ZHURAVLEV, A. M. MARUKYAN, S.B. SBORSHCHIKOV

THE STRUCTURE OF PRE-PROJECT STUDY IN THE INVESTMENT AND CONSTRUCTION PROCESS OF BUILT-UP URBAN AREAS

The process of increasing the role of cities and urban culture in the development of society's life is accompanied by urban planning activities for the development of urban areas and settlements, expressed in the form of territorial planning, urban zoning, territory planning, architectural and construction design, reconstruction, landscaping and major repairs. An important component of the implementation of urban planning activities is the organization of preliminary study of pre-design solutions, which consists in step-by-step collection, analysis of information, preparation of justifications and initial permits for the subsequent implementation of the architectural and construction design stage. On the basis of an integrated approach, the requirements and principles of decision-making on pre-design study are formulated, including an assessment of the possibility of construction (reconstruction) of capital construction facilities in a particular case, identification of potential problems and risks with the determination of their solutions, as well as the development of a preliminary concept of the facility and the adjacent territory. It is presented that within the framework of the pre-project study, an assessment of the ecological state (situation) of built-up or built-up territories is given and a forecast of the consequences of construction on the hydrogeological conditions of the territory is carried out. It is noted that on the basis of information about the peculiarities of the use of the territory, environmental management regimes, requirements for the engineering protection of the territory and development are formed for the adoption of functional, constructive, architectural and urban planning, sanitary and hygienic, environmental and engineering solutions for the implementation of an investment and construction project.

Keywords: structure of pre-project study, architectural concept, composition of pre-design solutions, initial permits, architectural and construction design, environmental assessment, hydrogeological modeling, engineering protection of the territory

GEBREGZIABHER AREGAWI GEBREMESKELA, SVETLANA L. SHAMBINAB,
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NET ZERO ENERGY BUILDING: DEFINITION AND IMPLICATIONS FOR SUSTAINABLE DEVELOPMENT-REVIEW

Buildings account for a large share of global energy use and carbon emissions, and they play a critical role in developing long-term development policies. In recent years, there has been a surge in interest in zero energy buildings (ZEBs). The definition of ZEB highlights demand-side or supply-side tactics, as well as whether fuel switching, and conversion accounting are applicable to fulfill a ZEB's target. ZEBs contain two design strategies: decreasing the need for energy usage in buildings (particularly for heating and cooling) using energy-efficient measures (EEMs) and implementing renewable energy and other technologies (RETs) to cover the remaining energy needs. This paper illustrates the review of ZEBs definition and its consequences for sustainable development related to renewable energy and other technologies to meet the minimum necessary energy requirements. The definition of the zero-energy goal has an impact on the decisions de-signers make in order to reach it. The advantages and disadvantages of four well-documented definitions of net-zero site energy, net-zero source energy, net-zero energy costs, and net-zero energy emissions are examined. RETs include photovoltaic/building-integrated photovoltaic (PV/BIPV), wind turbines, solar thermal, heat pumps, and district heating and cooling (DHC).

Keywords: Zero Energy Buildings, renewable energy, sustainable development

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M.YU. SLESAREV, E.S. TSHOVREBOV

CLOSED CYCLE OF CONSTRUCTION PRODUCTS IN THE ECO-FRIENDLY PROCESS OF LIFE SUPPORT OF RESIDENTIAL AREAS

The relevance of the topic is due to unresolved problems and contradictions that have developed in the process of handling urban waste, most of which continues to be sent to landfills and landfills, creating an increased level of environmental danger. The object of the study is the process of waste management as a source of environmental danger in settlements. The following research methods are defined: comparative and comparative analysis, systematization, classification, analogy, generalization, qualification, exposure, composition, grouping, integration. The results of the study: the structure and characteristics of construction waste as sources of environmental hazard are determined, the principles of safe life support of residential areas are formulated, an attempt is made to characterize the essence of the phenomenon of "construction waste", the stages and features of the appearance of construction waste are specified, the commonality of the stages of the life cycle of construction products and waste is reflected, the composition of the stages of the life cycle of construction waste and their resource component is updated. According to the results of the study, additions can be made to the documents on standardization of the category "Resource Conservation" in terms of supplementing the composition of the stages of the waste life cycle, the procedures for applying methods of environmental control and monitoring of the resource component of construction and municipal waste are updated.

Keywords: construction and urban management, environmental protection, environmental safety, solid municipal and construction waste, waste life cycle, secondary construction products

A.A. ULIANOV, B.I. SHILIN, E.A. GORYUNOVA

EXPERIMENTAL STUDY OF THE QUALITY OF PURIFICATION OF WATER-OIL EMULSIONS BY FILTRATION IN THE CONDITIONS OF SYSTEMS OF URBAN SETTLEMENTS

The stability of oil emulsions depends on the size of water globules (its dispersion), density and viscosity of oil, the content of light fractions of hydrocarbons, emulsifiers and stabilizers of the emulsion, as well as on the composition and properties of emulsified water. The stability of most of them such as "water in oil" increases over time. In the process of emulsion aging on water globules, the emulsifier layer increases and, accordingly, its mechanical strength increases. When such globules collide, they do not coalesce due to the presence of a strong hydrophobic film. To merge the globules of water, it is necessary to destroy this film and replace it with a hydrophilic layer of any surfactant. The aging of emulsions occurs intensively only in the initial period after their formation, and then slows down noticeably. Features of aging reverse emulsion depend on the composition and properties of oil, reservoir water, emulsion formation conditions (temperature, intensity of mixing phases). Utilization and neutralization of waste water is one of the most important environmental problems of the present time, and in this direction a variety of technological techniques have been developed.

As a result of the research, development and implementation of active multifactorial experiment the quality of cleaning of oil-water эмульсий constructed the response surface and their cross-section, which made analysis of the results of the experiment and on their basis to draw conclusions and to obtain exact mathematical dependence of the efficiency of purification from the three selected factors that helps to determine the design of the filtering partition and determine the appropriate filtering mode.

Keywords: emulsion, multiple-factor experiment, response surface, dispersion composition, the optimal mode of filtration.

I.A. KUZOVLEVA, O.S. POTAPENKO, V.K. DANILOV

ECONOMIC TOOLS FOR THE MANAGEMENT OF WASTE WATER TREATMENT IN THE CITY WITH THE PURPOSE OF INCREASING ENVIRONMENTAL EFFICIENCY

One of the important elements of the municipal infrastructure of the city is the city sewerage system due to its impact on the ecology of the city and surrounding areas. In the course of the study, it was found that the development of a management system for wastewater disposal and wastewater treatment in the city should be focused on achieving targets for improving environmental and economic efficiency. In this regard, the systematization of the results of scientific research on the problems of implementing programs for the development of sewerage and wastewater treatment in the city was carried out. At the same time, the authors consider the elements of the management system for the implementation of such programs and propose approaches to ensuring the effectiveness of their planned activities in the field of sewage and wastewater treatment.

The article shows that in order to improve the process of development and implementation of regional and municipal environmental programs, it is important to take into account a set of requirements, the implementation of which will be facilitated by the use of the results obtained by the authors. These include: allocation of elements and functions of the regional and city management system for the development of the sewerage sector; systematization of external and internal factors affecting the reproduction and operation of sewer facilities of the city; building a system of criteria-based target indicators for the efficiency of sewer management and wastewater treatment in the city. To achieve these results, an analysis was made of the experience of implementing investment projects for the development of treatment facilities in the Chuvash Republic and the Samara region.

The proposed approaches to the management of the considered communal system, taking into account regional and local characteristics, will ensure the environmental and socio-economic efficiency of the investment process in the urban sewerage sector.

Keywords: *urban sewerage system, environmental efficiency, sewerage management system*

O.V. YANTSEN, V.S. KANHWA, E.S. GOGINA

MANAGEMENT OF TECHNICAL AND TECHNOLOGICAL RISKS OF WASTE WATER TREATMENT PLANTS AT ALL STAGES OF THE LIFE CYCLE

Risk assessment and management methods are widely used in the implementation of investment and construction projects. It is also advisable to introduce the practice of risk assessment at any stage of an engineering project. Today, the issue of the construction of new and reconstruction of existing waste water treatment plants is quite acute. Technology and technology do not stand still.

Complex risk analysis of wastewater treatment plants is important not only at the design stage, but also at the operational stage, in particular, when assessing the need for reconstruction. The paper considers the existing methods of risk assessment applicable to the assessment of the necessity and priority of the reconstruction of the SBR-reactor.

The paper describes the main technical solutions for the reconstruction of wastewater treatment plants of urban wastewater, a new technological scheme using batch reactors has been developed. The calculation of operating costs before reconstruction and after. The method of expert assessment of technical and technological risks of sewage treatment plants is considered. A typical matrix of external and internal risks of existing sewage treatment plants is presented, a qualitative risk analysis is performed, and measures to minimize risks are proposed. The practical significance of this work consists in the development of an assessment method and an algorithm for managing production risks based on expert assessments. The algorithm includes a step-by-step assessment of the technical and technological risks of the project. Risk analysis of existing treatment facilities allows you to place emphasis on priority areas of reconstruction of the facility.

When analyzing existing treatment facilities, such a risk assessment will make it possible to more accurately determine the order of repair work and reconstruction activities.

Keywords: *Technological risk management, batch reactor, technical risk, technological risk, expert risk assessment, wastewater treatment*