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BIOSPHERE COMPATIBILITY: HUMAN, REGION, TECHNOLOGIES

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L.A. ALBOROVA

MINIMAL SURFACES IN BUILDING AND ARCHITECTURE

With connection of increasing interest in the design of complex forms, which often have an expressive architecture, the demand for structures in the form of minimal surfaces is gradually growing. A new architectural direction appeared, called "Architecture of minimal surfaces". Architects began to use the methods of forming structures proposed by geometers. In this article, types of minimal surfaces are researched, there are some examples of their practical application in architecture, construction and mechanical engineering, and their position among the objects of parametric architecture is determining.

The purpose of this research is popularization of minimal surfaces, which are not yet often used in practice, but have a number of properties that can be applied in various areas. It is shown, that more and more increasing interest in the design of structures in the form of minimal shells caused an increase in research to determine their stress-strain state. An indication of the relevant sources and literature, a systematization of new architectural trends in relation to minimal surfaces, and an illustration of their possibilities in architecture will help designers in choosing shape of the designed structure.

Keywords: *analytical surface, minimal shell, shell architecture, digital architecture, soap film.*

E.S. TSHOVREBOV

SCIENTIFICALLY-METHODICAL APPROACHES TO CREATION OF ECOLOGICALLY SAFE SYSTEM OF GATHERING AND PROCESSING OF SECONDARY RESOURCES FROM THE SOLID MUNICIPAL AND BUILDING WASTE

Research objective is formation of theoretical bases and methodical receptions of maintenance of involving of a resource component of a firm municipal and building waste in economic circulation by means working out of methods and the algorithms realising the greatest possible extraction of secondary resources from a similar waste at stages of separate gathering and preliminary processing in sources of formation: industrial platforms of building, repair, dismantle (pulling down) of objects of the real estate, housing and communal services.

In the present research attempt to resolve following scientifically-practical problems is made: to systematise and generalize the information on methods ecologically safe handling of secondary resources in considered fields of activity; to generate main principles of the organization of system processes of the reference of secondary resources; to offer the conceptual scheme of the organization of system of ecologically safe separate gathering and preliminary processing of a resource part of a firm municipal and building waste in formation sources.

In work scientifically-methodological approaches to creation of ecologically safe system of the reference of secondary resources in building and municipal complexes of municipal economy on the basis of the logistical approach and preventive methods of localization of the ecological danger, realizing mechanisms of a zero cycle of the reference of a firm municipal and building waste, protection of an environment and ability to live of people against their negative influence, economic feasibility of repeated application of resource potential are offered.

Keywords: *ecological safety, preservation of the environment, a firm municipal and building waste, building and a municipal services, separate gathering, processing, use of secondary resources, economic feasibility.*

D.V.BURKOV, E.V. BURKOVA

STUDY OF PROBLEMS OF TECHNOLOGIES APPLIED IN ORGANIZATIONS OF TRADITIONAL HEAT SUPPLY

In recent years, at the global level, more and more questions have been raised related to the negative impact of human economic activity on the ecological state of the biosphere. The results of such an influence affect not only the quality of human life, but also changes in climatic conditions. One of the main reasons for the change in the state of the biosphere is the burning of natural fuel for many years. The article discusses issues related to ensuring the environmental safety of the environment during the operation of boiler houses operating on hydrocarbon fuels: coal, gas, oil products. Using the example of the Balaklava district of Sevastopol, which is a recreation and tourism zone, the environmental impact of the results of organizing traditional heat supply is assessed. The authors proposed a diagram of the connections between the technological processes of heat production with traditional heat supply with the components of the biosphere, which allows one to fully reflect the consequences of the environmental impact from the operation of boiler houses. Existing methods for assessing the impact of boiler houses on the environment, as a rule, are based only on direct damage to the ecology of the area in which the boiler houses are located. At the same time, taking into account the development of alternative energy, it is necessary to pay attention to such criteria for assessing damage as: saved fuel, water for maintenance of boiler houses, stored oxygen, etc. The authors proposed an approach to the economic assessment of the prevented environmental and economic damage, which allows at the design stage boiler plants to predict the damage to the environment, as well as to assess the effectiveness of the applied environmental protection measures, including the creation of thermal power plants based on alternative energy sources.

Keywords: technologies for organizing heat supply, harmful emissions from boiler houses, alternative energy.

M.T. LE, M.O. GELMANOVA, I.S. SHUKUROV, M.Y. SLESAREV, V.M. NGUYEN

EVALUATING THE EFFECTIVENESS OF VEGETATION SCENARIOS TO MITIGATE URBAN HEAT ISLAND IN HANOI CITY

Hanoi city is characterized by a tropical climate, with high temperatures in the summer. The temperature of the districts located in the center of Hanoi city is higher than that of the suburban districts, this is characteristic of the urban heat island effect. This study seeks the best proportion of urban vegetation to reduce a building's energy needs through minimizing the urban heat island effect in hot and humid climates. The area selected for research is Van Phu urban area in Ha Dong district with high construction density and high population. The Van Phu urban area is compared on the cooling efficiency of the scenarios of 30% trees, 50% trees and 30% & 70% green roofs combined with green facade based on Envi-met software. In addition, the paper also compares the results of the impact of air temperature across scenarios on the thermal comfort of urban residents. Since then, this study finds the optimal dimension for reducing the heat island effect in the city.

Keywords: urban heat island, land surface temperature, green roof, ENVI-met, microclimate

E. V. SHCHERBINA, A.S.D. AL-QATRANY, M. A. SLEPNEV

LAND USE INFORMATION MODEL TO ENSURE BALANCED DEVELOPMENT FOR TERRITORIES OF BASRA GOVERNORATE

The article presents an urban information model of Basra governorate, Iraq, built with account the features of land use associated with oil and gas production, which makes a significant part of the country's budget. The article shows the negative consequences of hydrocarbon production, which lead to the formation of disturbed territories, which at the same time serve as the urban development potential of the socio-economic development of the governorate. Land use changing in period before and after the 2003 war indicate an increase in urban land, industrial and oil territories and a reduction in agricultural land and natural areas, which leads to a state of ecological imbalance.

Based on the system analysis of the land balance, an information model of land use is formulated, which is necessary for the formation of a geographical information systems (GIS) for urban planning activities, for which remote sensing data and GIS methods can be used.

The development of such a GIS will ensure the processes taking place in the "Region" system, which are necessary for solving the problems of territorial planning, land use control to achieve ecological balance and sustainable development of the governorate in the preparation of socio-economic development plans and regulatory documents for urban development.

Keywords: *territorial planning, information model, mineral deposits, natural resources, Basra governorate, territorial balance, sustainable development of the territory.*

E.V. POTAPOVA, M.S. KRASAVTSEVA, Y.V. BEZBORODOVA, A.A. MAKAROV

AREAS WITH SPECIAL CONDITIONS OF USE AND GREEN AREAS OF CITIES

The ecological state of the environment is constantly exposed to serious anthropogenic influence and depends on the accumulated harm from the long-term inefficient using of resources and territory. The sanitary and epidemiological well-being of citizens is a priority task of the Government and it is implemented through various tools. One of the ways to protect the life and health of citizens, to maintain the quality of the environment, and to operate hazardous economic objects safely is the allocation of zones with special territory usage conditions (ZwSTUC). A significant part of which, within the boundaries of settlements, belongs to green areas, the category of special purpose. The proportion of plantings required for the proper functioning of these territories is specified in the relevant laws. The purpose of the work is to identify zones with special territory usage conditions within the boundaries of cities in accordance with the classification of green areas. The legislative base of the research issue is represented by dozens of documents, including regional ones, which does not solve the problem of creation and maintenance. It is proposed to fix specific characteristics of ZwSTUC allowing to distinguish them from other zones and providing a clear understanding of their organization and functioning. There are three groups of such characteristics –legislative, substantive and profile. The last one, consisting at least 5 main groups, can be the basis of the certificate of these territories. Certification of territories according to the proposed characteristics allows you to determine the ownership and distribution of areas of responsibility accurately, and, as a result, prevent violations of their use. A brief description of ZwSTU and its greening of Irkutsk city is presented.

Keywords: *settlement, legislation, plantings, territory profile, environment.*

P. A. ZHURAVLEV, S.B. SBORSHIKOV

ORGANIZATIONAL FEATURES OF THE FORMATION OF TECHNICAL SOLUTIONS FOR ENGINEERING PROTECTION OF THE TERRITORY AT THE STAGES OF THE LIFE CYCLE AND THEIR REENGINEERING (Part 2)

Sustainable development of territories includes a set of measures, when implementing urban development activities, which consist in creating safe and favorable conditions for human life and development, reducing the adverse impact of economic functioning on the environment, possible adverse consequences of natural and man-made emergencies, ensuring the safety of constructed and constructed objects. One of the principles of urban development of territories is engineering training and protection of the territory. The aim of this work is to determine problematic issues of sustainable development of territories in terms of adoption of organizational and technical solutions to ensure the engineering protection of territories in the implementation of urban development and to formulate principles (criteria) and requirements when deciding on the structure of engineering protection of territories and objects of construction with the ability to ensure implementation of reengineering in spatial organization (development) areas. The features of providing engineering protection of the territory and capital construction objects at the stages of territorial planning and territory planning, architectural and construction design and during the preparation of the construction site are considered. The need for an integrated approach to the engineering protection device at each stage of planning, design and development of the territory is noted, which is based on the variable elaboration of design solutions, optimization of design, assessment of the prevented damage, justification of investments and preliminary calculation of the enlarged estimated cost.

Keywords: reengineering; territorial planning, territory planning, architectural and construction design, engineering protection of territories and buildings

I.A. MAMIEVA

ANALYTICAL SURFACES FOR CHILDREN PLAYGROUNDS

Beginning after 1859, children, sport, and park playgrounds are built in all countries for development of physical and cultural abilities for the children. Playgrounds of new generation are planed already with taking into account behavior of adults come with children. Earlier, children playgrounds contained swings, roundabouts, flexible elements for rope-climbing and rigid structures for pulling, but now they contain rod and shell structures in the form of different surfaces. It gives rise to mathematical curiosity from children. Designers must study theory of analysis of thin shells and rod systems. This paper makes up a deficiency in study of small objects of parametrical architecture, in broadening of circle of problems which parametrical architecture of small objects solves. In published literature, examples of the application of analytical surfaces for garden-and-park architecture, for the structures of children playgrounds and in small form architecture are not presented. In spite of it, there are very interesting objects of different forms in many countries.

Keywords: children playground, sport playground, analytical surface, parametrical architecture, architectural style "geometrical high-tech", rod system, thin shell, middle surface of shell.

I. D. TEPLOVA

**URBAN PLANNING APPROACH TO THE FORMATION PUBLIC
SPACES OF CITY STREETS
(EXPERIENCE OF BERLIN AND MOSCOW)**

The modern spatial development of cities considers the street not only as a linear object that serves for the distribution of traffic and pedestrian flows, but also as a public space. The creation of high-quality public space on city streets will expand the possibilities of the streets. Multifunctional streets contribute to improving the quality of life, economic growth and social activity, and changing the environmental situation. The article considers the urban planning approach to the formation public spaces of streets on the example of the cities of Berlin and Moscow. The object and functional content of city streets is analyzed. According to the results of field surveys of the streets of Berlin and Moscow, the main functional zones of the street territory are identified, depending on the use of public space and various scenarios of people's behavior. Conclusions are drawn on the urban development of the territory of city streets to create a comfortable urban environment.

Keywords: *public space, city streets, urban planning approach, comfortable urban environment.*