

ANALYSIS OF THE PRINCIPLES FOR IMPROVING RECREATIONAL ZONES IN COASTAL AREAS

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The article examines the fundamental principles of integrated improvement of coastal recreational zones in freshwater areas. Universal principles for the sustainable development of recreational territories are identified. Based on a comparative analysis of domestic and foreign experience in designing embankments in major cities, trends in territory improvement are revealed: multifunctional zoning with the integration of pedestrian and cycling connections and the implementation of multi-level movement schemes; consideration of the existing landscape. A pre-design analysis of the coastal area of the city of Bobrov in the Voronezh region was conducted. It was established that the embankment improvement project must account for the flood regime and the configuration of the shoreline. The result of the research is a model of multi-level functional zoning for coastal areas—"coastal zone – supra-coastal/deep zone – rear zone"—applicable to small and medium-sized cities in Russia.

Keywords: coastal recreational zones, embankment improvement, sustainable territorial development, functional zoning, domestic and foreign experience, formation of a comfortable urban environment, city of Bobrov.

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ANALYSIS OF MODULAR CONSTRUCTION

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Today, construction companies are facing an urgent need to reduce costs, accelerate project implementation, and minimize environmental impact. In this context, modern modular construction meets the current requirements for architecture, design, comfort, functionality, energy efficiency, and environmental friendliness. Given these advantages, architects, builders, and investors should pay close attention to this construction system as a solution to the shortage of new housing and the resettlement of dilapidated buildings.

This article describes the concept of modular construction, provides a brief analysis, classification, and features of various types of modular buildings and the process of their construction, as well as the scope of application and relevance at the time of writing.

Keywords: module, modular construction, reinforced concrete, metal structures, frame, panoramic glazing, wooden structures.

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DIGITAL TRANSFORMATION OF CONSTRUCTION OBJECT LIFECYCLE MANAGEMENT: FROM BIM CONCEPT TO END-TO-END PROCESSES

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The article examines the impact of Building Information Modeling (BIM) technology on the digital transformation of capital construction project lifecycle management processes. The paper highlights key technological components of such transformation, including a Common Data Environment (CDE) and the concept of a digital twin. Promising development directions related to the integration of BIM, Internet of Things (IoT), and predictive analytics for creating intelligent asset management systems are identified.

Keywords: Building Information Modeling (BIM), object lifecycle, digital transformation, end-to-end processes, Common Data Environment (CDE), Digital Twin, asset management, construction object.

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ANALYSIS OF THE FACTORS DETERMINING THE PLANNING ORGANIZATION OF ADMINISTRATIVE BUILDINGS AS PART OF THE PRODUCTION COMPLEX

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This article analyzes and evaluates the factors determining the ABC organization as part of production complexes using the example of modern territory use and modern ABC design. A comparison of spatial planning solutions was carried out according to the following parameters: number of floors, building capacity, functional relationship with production, compact size.

Keywords: production complex, administrative and household building, functional zoning, multi-criteria analysis, spatial planning solutions, functional expressiveness.

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REGIONAL FEATURES OF THE ORGANIZATION OF TRAINING SPECIALISTS IN CONTROL AND SUPERVISORY ACTIVITIES IN CONSTRUCTION

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The article discusses the regional specifics of regulation and control in the construction industry of the Russian Federation, as well as the training of specialists to carry out these activities. The article proposes strategies for improving educational programs by identifying opportunities for new forms of educational work. It also analyzes the potential of additional education in providing specialized professionals for the regional construction industry. The article summarizes the experience of Voronezh State Technical University in developing solutions that support individual learning paths for students. The article proposes the use of independent qualification assessment tools in the final state certification of graduates of construction universities and technical universities as a mechanism for assessing their professional competencies in order to increase their competitiveness in the regional labor market.

Keywords: regional regulation, control and supervision, training of specialists, quality control, construction industry, buildings and structures, technological sovereignty

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ENVIRONMENTAL POLLUTION CAUSED BY NANOMATERIALS

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The article provides a detailed analysis of the sources of nanomaterials entering the environment, the complex processes of transformation and migration in various media, and the multifactorial mechanisms of toxic effects at all levels of biological organization, from molecular to ecosystemic. The article proposes a strategic approach to solving the problem, which includes promising areas of green nanotechnology, improving analytical monitoring methods, creating an adequate regulatory framework, and developing innovative remediation techniques. The article emphasizes the importance of international cooperation and preventive risk management within the framework of sustainable development. This article provides a comprehensive review of the multi-level environmental risks associated with NM.

Keywords: nanomaterials, environment, pollution

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THE CONCEPT OF FORMING A "GREEN RIVER" IN THE CITY OF MARIUPOL

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The article considers a proposal for the concept of a unified urban space improvement system, developed on the basis of a detailed pre-design urban planning analysis, including socio-demographic analysis, study of the city's situation, existing experience and the formation of a unified design code. The conducted research served as a platform for creating a design solution aimed at creating a new recreational space in the city of Mariupol - the «green river».

Keywords: urban planning, green architecture, green corridor, restoration of new territories, urban planning analysis.

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CREATION OF A COMFORTABLE AND SUSTAINABLE URBAN ENVIRONMENT IN THE RESIDENTIAL MICRODISTRICT OF THE SOVETSKY DISTRICT OF THE CITY OF VORONEZH

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This article presents the results of a comprehensive urban development analysis of a residential microdistrict located in the Sovetsky District of Voronezh. The article examines the structural, functional, social, and environmental characteristics of the development, including an analysis of the number of floors, technical and economic indicators, and the accessibility of social infrastructure and transportation. Key issues are identified: a lack of landscaped recreational areas, a shortage of organized parking spaces, and outdated residential buildings. Based on the analysis, a sustainable development concept for the microdistrict is proposed, aimed at improving the quality of the urban environment, improving pedestrian accessibility, expanding green spaces, and modernizing public spaces.

Keywords: urban planning analysis, residential neighborhood, sustainable development, pedestrian accessibility.

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CURRENT ARCHITECTURAL AND STRUCTURAL TYPOLOGY OF HOTEL BUILDINGS

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The article is devoted to the consideration of modern trends, principles and relevant standards for the formation of spatial planning and design solutions for hotel buildings. According to the authors, the main prospects, trends and directions in the development of planning characteristics of guest business buildings are given. Modern trends and needs of the development of domestic tourism form the principles and approaches in the design of Russian hotels and determine the principles of spatial and planning structures.

Keywords: architecture, hotel buildings, typology of architectural and structural design, spatial planning solution, structural solutions, structure of hotel complexes, spatial environment, innovations in design

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ANALYSIS OF METHODOLOGICAL APPROACHES TO THE FORMATION OF THE CONCEPT OF A BARRIER-FREE URBAN ENVIRONMENT

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The article analyzes the domestic and foreign experience in designing open spaces of the urban environment, taking into account the needs of MGN. Comfort parameters that characterize the level of accessibility are highlighted. A survey was conducted to determine the level of equipment with elements of the urban environment for MGN in the Koltsovsky Park of the Leninsky district of Voronezh.

Keywords: low-mobility population group, city, urban environment, barrier-free environment.

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ORGANIZATIONAL AND TECHNOLOGICAL SOLUTIONS FOR THE MANAGEMENT OF CONSTRUCTION WASTE IN THE DPR AND LPR

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The article considers a comprehensive approach to the reuse of construction waste and scrap in the territories of the Donetsk and Lugansk People's Republics in conditions of a critical shortage of specialized infrastructure for their processing. A review of the regulatory framework for waste management in the Russian Federation, which serves as a guideline for the region, is presented. The step—by-step processing process is described in detail, from dismantling to obtaining the finished material. A comparative analysis of the technical characteristics of materials from recycled and natural raw materials has been carried out. Based on a comprehensive analysis, adapted mechanisms for overcoming the infrastructure deficit in building materials are proposed.

Keywords: construction waste, recycling, licensing, infrastructure deficit, post-conflict reconstruction, DPR, LPR, waste management, hazard classe

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MANAGEMENT METHODS OF INNOVATIVE SOLUTIONS AT THE STAGES OF THE LIFE CYCLE OF CONSTRUCTION OBJECTS

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The article discusses modern approaches and methods of managing innovative solutions at all stages of the construction project lifecycle, from conception and design to operation and subsequent disposal. The theoretical and methodological foundations of innovative management in the construction industry are revealed. Special attention is given to building information modeling (BIM) technologies, digital twins, Internet of Things (IoT) systems, artificial intelligence (AI) algorithms, and sustainable development principles (ESG). Based on the analysis of domestic experience, the article provides recommendations for improving innovation management mechanisms in the digitalized construction sector of Russia.

Keywords: innovation, project management, construction, lifecycle, BIM, digitalization, sustainable development, ESG, digital twin, IoT.

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ENSURING THE RELIABILITY OF BUILDINGS AT THE CONSTRUCTION STAGE

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The methodology developed by the authors for ensuring the reliability of buildings at the construction stage is described, which is based on the principle of forming an integral criterion from a finite number of normalized evaluation indicators.

Keywords: reliability, life cycle, construction, control, quality, estimated indicators

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