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SPECIFICS OF THE TRAINING ORGANIZATION CONTROL AND SUPERVISION SPECIALISTS IN CONSTRUCTION

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The article is devoted to the analysis of specific competencies that a specialist of control and supervision in construction should possess. Special attention is paid to the differences in comparison with the traditional training of a specialist in construction organization. The development and implementation of specialized educational programs dedicated to the issues of training of master's degree graduates with the necessary profile qualifications is proposed. The variants of such programs implementation are considered on the example of forming a special educational unit - engineering school in the university structure, which provides not only a set of acquired competences necessary for a graduate, but also practical testing of the acquired knowledge in solving scientific and industrial problems.

Keywords: construction, professional training, specialist in control and supervision, product quality, engineering school.

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COMPARATIVE ANALYSIS OF MODERN METHODS OF IMPROVING THE FROST RESISTANCE OF CONCRETE

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The article presents a comparative analysis of modern methods for improving the frost resistance of concrete, which is a key factor in ensuring the durability and reliability of concrete structures in cold climates. Various approaches are considered, including the use of celite-containing rocks, silica, surfactants, and the application of Kalmatron penetrating waterproofing. The effectiveness of each method is evaluated based on experimental data and theoretical research, allowing for the identification of advantages and disadvantages of different strategies.

Keywords: concrete, CSP, silica, surfactants, and Kalmatron waterproofing.

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STUDY OF THE PROCESS OF SELECTING «ABANDONED LANDS» AS PLOTS FOR CONSTRUCTION IN CONDITIONS OF LACK OF AVAILABLE TERRITORIES IN URBAN AREAS

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The study examines the factors that are taken into account when redeveloping abandoned land and developing a decision-making criterion that facilitates the selection of a site and its subsequent renovation. The main factors for selecting a site include capital investment costs, geographical location, infrastructure, connectivity (digital and energy networks), as well as accessibility and transportation, which are essential for developers to make decisions about the renovation of abandoned sites.

Keywords: abandoned lands, industrial areas, renovation, redevelopment, new construction, urban development

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INTEGRATION OF BUILDING INFORMATION MODELING TECHNOLOGIES INTO THE CHANGE MANAGEMENT PROCESS OF AN INVESTMENT-CONSTRUCTION PROJECT FOR THE ASSESSMENT AND SELECTION OF ECONOMICALLY EFFICIENT DESIGN SOLUTIONS

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The article examines the process of managing changes in an investment-construction project using data from a digital information model to make the most cost-effective design decisions. Criteria for assessing the quality of cumulative analytics on model elements for monitoring the cost of materials used are formulated. The study concludes by substantiating the implementation of a scenario for using BIM as a database for change management in an investment-construction project.

Keywords: building information modeling (BIM) technologies, digital information model, data analytics, change management.

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CALCULATION OF THE NATURAL FREQUENCY SPECTRUM OF A STRETCH CEILING MEMBRANE

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Practical experience with stretch ceilings in residential environments indicates that they can serve as a source of additional noise. Previous studies showed that the spectrum of natural frequencies for a PVC film ceiling falls within the near-infrasound and low-frequency acoustic ranges. The initial parameters for those calculations were obtained by measuring the ceiling's maximum deflection under its own weight. This paper presents an alternative method for estimating the initial parameters, which accounts for the physical properties of PVC films and the technological features of the installation process that ensure the membrane's designed tension. The results demonstrate that the vibrational spectrum of a stretch ceiling membrane is significantly influenced by the temperature difference between installation and subsequent operation.

Keywords: stretch ceiling, membrane, natural frequencies, calculation method, installation technology, temperature conditions.

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RESEARCH OF THE PRINCIPLES OF SPATIAL ORGANIZATION OF TOURIST CENTERS IN SMALL TOWNS OF RUSSIA

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The article examines the principles of spatial organization of tourist centers in small towns of Russia. The research is relevant in the context of strategic development of domestic tourism and regional economy. Based on the analysis of successful domestic (Kolomna, Vyborg, Veliky Ustyug, Myshkin) and international (Colmar, France; Kroměříž, Czech Republic; Takayama, Japan) experience, key principles have been identified: compactness and pedestrian accessibility, functional zoning, integration of tourist infrastructure into the urban environment, sustainability and flexibility. It is shown that systematic application of these principles enables small towns to enhance tourist attractiveness while preserving cultural identity, improve the quality of life for local residents, and stimulate sustainable regional development.

Keywords: tourism, small towns, tourist center, strategy, principles of spatial organization, development, best practices, sustainable development.

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A METHODOLOGY FOR THE COMPREHENSIVE ASSESSMENT OF THE TRANSFORMATION OF INDUSTRIAL FACILITIES IN NEW REGIONS OF THE RUSSIAN FEDERATION AT THE FINAL STAGE OF THEIR LIFE CYCLE

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This article examines the prospects for the integration of new territories of the Russian Federation, methods of effective use of industrial territories that have undergone territorial assignment, analyzes the territory of the Azovstal metallurgical plant, and conducts a SWOT analysis of the redevelopment of the industrial territory, which allowed us to get a complete picture of the existing urban situation for making further design decisions.

Keywords: new territories of the Russian Federation, sustainable development, redevelopment, urban environment, infrastructure, SWOT analysis of the territory, integrated assessment, transformation

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ANALYSIS OF RUINIZED ARCHITECTURAL OBJECTS IN TOURIST INFRASTRUCTURE

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The article is devoted to the analysis of ruined architectural objects of the Russian Federation as promising elements of tourist infrastructure. Based on a review of existing ruined objects and a study of the results of the assessment of their structural and architectural condition, six objects from different regions of the Russian Federation were identified that meet the criteria of tourist potential. According to the results of the quantitative expert assessment of these options, the final rating of ruined objects was calculated, according to which the Aniva lighthouse has the highest value of tourist and urban-planning potential. The obtained value is 20.3 % higher than that of other objects. Based on the urban-planning analysis of the Aniva lighthouse territory, it has been established that this object can serve as an anchor for a local tourist cluster in the south of Sakhalin. Development prospects include the creation of full-fledged tourist infrastructure based on the nearest settlement.

Keywords: ruinized objects, tourist infrastructure, Aniva Lighthouse, ruin conservation, domestic

tourism.

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INVESTIGATION OF THE EFFECT OF SUPERPLASTICIZERS POLYCARBOXYLATE ESTER-BASED ON THE PLASTICITY OF 3D-PRINTABLE MIXTURES

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The effect of superplasticizers based on polycarboxylate esters of various brands on the plasticity of mixtures for 3D construction printing is investigated. The plasticity was evaluated based on the values of plastic strength obtained by the penetrometric method. The rational dosage of the dry superplasticizer has been determined, which ensures the production of printed mixtures with plastic strength indicators necessary for the implementation of the 3D printing process. It is shown that a liquid superplasticizer based on polycarboxylate esters in cement composite mixtures for 3D construction printing can be replaced, if necessary, with a dry superplasticizer of a similar nature.

Keywords: construction 3D printing, cement mixture, superplasticizer, plasticity, plastic strength, plastimeter

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METHODOLOGY FOR JUSTIFYING THE STRATEGY FOR CONVERTING INEFFICIENTLY USED COMPLEXES OF INDUSTRIAL FACILITIES

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The article presents a scientifically based methodology for choosing a strategy for the transformation of inefficiently used industrial facilities of capital construction (NIPOX) at the operational stage of their life cycle. A system of four strategies is proposed - "Strategy 0" (continued operation without changes), "Strategy A" (major repairs/rehabilitation), "Strategy B" (adaptive reconstruction) and "Strategy C" (comprehensive renovation with elements of new construction), each of which is applied depending on the value of the integral indicator efficiency and relative value indicator. The methodology is based on a comprehensive assessment of economic, spatial, environmental and social aspects, which ensures the adoption of objective, sustainable and economically feasible management decisions in the transformation of industrial ACS.

Keywords: life cycle, life cycle stage, operation, conversion strategy, redevelopment, revitalization, integral assessment, sustainable development, industrial capital construction facilities, inefficiently used.

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MODERN APPROACHES TO CONVERTING ABANDONED INDUSTRIAL TERRITORIES INTO SUSTAINABLE URBAN SPACES

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The article presents a comprehensive analysis of the territory of the former Voronezh Excavator Plant (VEKS), located in the Kominternovsky District of Voronezh, in order to justify its redevelopment as a sustainable multifunctional urban space. Based on GIS analysis, the buffer zone method, and a multi-criteria assessment of sustainable development, the article quantifies the infrastructure deficit, transport accessibility, and socio-demographic potential of the territory. An architectural and urban planning concept has been developed, including a shopping center, exhibition space, business center, sports complex, and hotel, while preserving the industrial heritage site. The results obtained confirm the high feasibility of the project as a tool for correcting urban heterogeneity and improving the quality of the urban environment.

Keywords: excavator factory (VEKS), urban environment, revitalization, sustainable development, and landscaping.

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A SYSTEMATIC APPROACH TO DESIGNING THE LIFE CYCLE OF ECOLOGICAL TRAILS IN THE TERRITORIES ADJACENT TO LAKE BAIKAL

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The article presents the results of a comprehensive analysis of the Baikal region using geoinformation systems. The recreational potential of the coastal zone of Lake Baikal has been studied for the design of ecological trails. An analysis of the surrounding settlements, tourist attractions, existing infrastructure, and transport hubs has been conducted. Based on the identified tourism problems in the region, a SWOT analysis has been conducted, resulting in the development of a universal roadmap for the implementation of the eco-trails project, with an example of its practical application.

Keywords: analysis of the Baikal region, Lake Baikal, tourism, eco-trails, geographic information systems (GIS), SWOT analysis, project roadmap.

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ANALYSIS OF THE INFLUENCE OF THE CLIMATIC PARAMETERS OF THE KAMCHATKA REGION ON THE FORMATION OF THE CONCEPT OF OPEN SPACE DESIGN USING INNOVATIVE SOLUTIONS

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The article is devoted to the analysis of approaches to the development of the concept of landscaping open public spaces with the introduction of innovative solutions adapted to the extreme conditions of the Kamchatka Territory. The negative impact of low temperatures, strong winds, difficult terrain and a short growing season on the comfort and durability of the urban environment is considered. The classification of modern innovative solutions in six key areas is presented: smart infrastructure, earthquake-resistant structures, innovative coatings, adaptive landscaping, inclusive spaces and windproof solutions, the use of which will contribute to the formation of a reliable, favorable and expressive environment. The objective

function of a multi-criteria assessment of the effectiveness of landscaping has been developed, which makes it possible to quantitatively compare project scenarios and select optimal combinations of solutions, taking into account the priorities of a particular territory.

Keywords: effectiveness, landscaping, innovative solutions, natural conditions, open spaces, Kamchatka Krai, objective function.

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INFLUENCE OF LOW TEMPERATURES ON THE PROPERTIES OF POLYMER ROOFING MEMBRANES

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The article examines the influence of low temperatures on the performance characteristics of polymer roofing membranes and their behavior during winter installation. It analyzes the preservation of strength, flexibility, and watertightness of PVC, TPO, and EPDM materials, as well as the technological and organizational features of construction works carried out in cold climates. Typical problems of northern regions are identified, and solutions are proposed to improve the reliability and durability of membrane roofing systems under low-temperature conditions.

Keywords: polymer roofing membranes, low temperatures, winter installation, watertightness, durability.

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