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LIFE CYCLE MANAGEMENT OF CONSTRUCTION FACILITIES

CURRENT PROBLEMS OF RESIDENTIAL REAL ESTATE VALUATION

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This article examines the current problems of residential real estate valuation. Key issues such as insufficient valuation quality, lack of a unified methodology and transparency of real estate valuation, as well as deliberate distortion of the value of real estate have been studied. All the problems have been considered in detail, and solutions have been proposed.

Keywords: life cycle, valuation, appraiser, real estate object, SRO, market value.

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ADAPTATION OF A RATING SYSTEM FOR ASSESSING THE SUSTAINABILITY OF THE HABITAT FOR UNIVERSITY CAMPUSES

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The article formulates a set of criteria for assessing the sustainable development of the university environment, including new categories "Technological innovation and digitalization of BIM" and "Interaction with the city". The introduction of these categories is justified by ranking and adjusting them, taking into account the specifics of the university campus. With the help of an expert assessment, the consistency of opinions and the significance of criteria have been established. The maximum points are proposed for calculating the integral indicator (S-factor) of the sustainability of campus development.

Keywords: university campus, habitat sustainability, sustainable development, rating system, expert assessment

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A METHOD FOR IDENTIFYING THE STAGE OF THE CITY'S LIFE CYCLE BASED ON A SYSTEM OF INDICATORS BASED ON THE EXAMPLE OF VORONEZH

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The article is devoted to the methodology of identifying the stages of the city's life cycle based on a system of indicators covering economic, social, environmental, infrastructural and innovative aspects of development. The article considers an integrated approach that includes data collection and processing, normalization and weighting of indicators, calculation of an integral indicator and interpretation of the results to determine the current stage of the city's life cycle. The example of the city of Voronezh shows how this methodology can be applied to analyze and develop sustainable development strategies.

Keywords: life cycle, life cycle stage identification, indicators, risk zone, stability zone, thresholds, transformation.

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SCENARIO MODELING OF THE IMPACT OF THE UNIVERSITY CAMPUS DEVELOPMENT TRAJECTORY ON THE CITY

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The article presents a scenario-based modeling of the impact of university campus development on the formation of a sustainable urban environment. Three scenarios for the development of a university campus are considered. The theoretical aspects of the cognitive approach in management are analyzed, the concepts of the cognitive map are formulated, cause-and-effect relationships between the concepts are established, the weights of the connections are determined, and the consonances and dissonances of the influence of the system and the concepts are calculated.

Keywords: university campus, comfortable urban environment, scenario modeling, Fuzzy Cognitive Map, concept

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FORMATION OF ORGANIZATIONAL, TECHNOLOGICAL AND ECONOMIC MECHANISMS OF ACTIVITY OF ENTERPRISES OF THE PENZA REGION CONSTRUCTION COMPLEX

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In the context of the activities of enterprises of the construction complex, various organizational and technological situations arise most sharply, when the nature of work and development directions in the housing market change, taking into account the accumulated experience and potential. This determines the need to improve the necessary organizational and technological mechanisms and directions of their development aimed at stabilizing the entire construction industry and processes, reducing the influence of the external environment. Within the framework of this study, comprehensive analysis methods were used, including theoretical understanding of the problem, empirical approaches to studying the object of research, as well as subsequent processing, generalization and systematization of the data obtained. The research is based on fundamental scientific approaches such as dialectical, systemic, dynamic, variant, balance, and modeling methods, which allowed for a comprehensive assessment of the processes under consideration. The subject of the research is the organizational and technological mechanisms of the functioning of enterprises, as well as the patterns of their formation and application. The analysis included a study of the structure, principles, and factors influencing the effectiveness of these mechanisms. Special attention is paid to the integration of digital technologies and advanced methods of organizing material production aimed at improving the efficiency of construction process management. The use of these mechanisms at various stages of the life cycle of real estate objects helps to increase the stability and reliability of enterprises in conditions of environmental instability and uncertainty of construction production.

Keywords: enterprises of the construction complex, organizational, technological and economic mechanisms, development directions, life cycle.

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TECHNOLOGY AND ORGANIZATION OF CONSTRUCTION

PUNCHING SHEAR RESISTANCE OF MONOLITHIC REINFORCED CONCRETE FLOOR SLABS WITH DEFECTS CONSTRUCTION WHICH IS BASED ON METAL COLUMNS WITH VARIOUS SHAPES OF COLUMN HEADS

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Using the example of a real building, the combined effect of construction defects and the different shapes of metal column heads on the punching shear resistance of a girder less monolithic reinforced concrete floor slab has been studied. The study was conducted based on the results of an inspection of the technical condition of the floor slab, which revealed a significant deviation of the actual concrete strength class (on average for the slab B12.5) from the specified in the project (B35). Verification calculations of the slab for punching shear resistance were performed for the effect of concentrated force and bending moments according to the standard methodology. It was found that the punching shear resistance of the floor slab is not ensured in the places where it rests on T-shaped and L-shaped column heads beyond the boundary of the transverse reinforcement, as well as in areas near corner columns with L-shaped column heads with a through hole in the support area in the presence of transverse reinforcement.

Keywords: monolithic reinforced concrete slab, construction defect, strength, punching, column head, calculation, section, basic control perimeter.

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PLANNING OF EXPERIMENTAL STUDIES OF STRUCTURES WITH DISPERSED REINFORCEMENT

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At the initial stage of experimental research, after selecting an object, setting goals and objectives of the experiment, the most important factors affecting the strength of experimental structures are selected. The method of a priori ranking of factors is used as an expert method to select the most significant factors. The characteristics of the experimental samples are given. The method of testing beams for alternating effects is presented. The results of statistical processing of the obtained experimental data are presented.

Keywords: a priori ranking of factors, experimental planning, experimental samples, experimental methodology, statistical processing

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THE MAIN DIRECTIONS OF USING AND LEARNING ALGORITHM OF NEURAL NETWORKS IN THE CONSTRUCTION INDUSTRY IN ORDER TO INCREASE EFFICIENCY AND REDUCE THE NEGATIVE IMPACT ON THE ENVIRONMENT

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An algorithm for learning a neural network is considered, which allows for analytical calculations, whether it is analyzing possible events, monitoring resources and equipment, which will allow both at the planning stage and in the future to reduce production costs and avoid downtime during construction and installation work due to the rational allocation of work and resources over time, when entering provide the necessary data and suggest options for improving and optimizing the construction process in order to reduce the negative impact on the environment.

Keywords: construction organization, construction technology, neural network, learning algorithm.

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RESEARCH OF CONSTRUCTIVE SOLUTIONS OF EXTERIOR ENCLOSING STRUCTURES OF LOW-RISE RESIDENTIAL BUILDINGS AT THE DESIGN STAGE

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The article highlights the issues of justifying the choice of building materials for external enclosing structures in order to reduce their thickness. At the same time, the thermal insulation characteristics of the building are preserved and the construction time is shortened. Based on the thermal engineering calculation,

the general principles of comparing structures are considered. Analysis of the cost of building materials and installation of construction allows you to choose the best option for exterior enclosing structures for low-rise residential buildings.

Keywords: energy efficiency, building materials, heat loss, thermal conductivity coefficient.

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FEATURES OF CONSTRUCTION CONTROL DURING THE CONSTRUCTION OF ENERGY-EFFICIENT LIFE CYCLE BUILDINGS

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In the context of the development of sustainable and integrated territorial development in Russia, the task of increasing energy efficiency is one of the fundamental tasks for all branches of construction production. The problem of building energy-efficient multi-family apartment buildings depends on how well the construction control was carried out. The article discusses the main stages of the implementation of possible defects in the enclosing structures of an apartment building. Their systematization is given. The reasons for the occurrence and suggestions are presented to reduce the negative impact of poorly performed construction control of enclosing structures for further study. Approaches to the formation of construction control are outlined, taking into account the prospects for the development of sustainable architecture. Solutions have been identified to reduce the negative impact of various deviations that occur during construction in the field of energy efficiency, and various control measures have been proposed to identify and prevent such influences, including the use of digitalization of control measures.

Keywords: energy efficiency, construction control, apartment building, enclosing structure, sustainable architecture, violations of construction technology, the life cycle of objects.

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URBAN PLANNING, PLANNING OF RURAL SETTLEMENTS

PRE-PROJECT ANALYSIS AND ORGANIZATION OF TOURIST ROUTES USING THE EXAMPLE OF PLES, IVANOVO REGION

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This article discusses the methodology for creating tourist routes based on a preliminary analysis of cultural heritage sites. An analysis and classification of the cultural heritage sites in the city of Ples, in the Ivanovo region, has been carried out. A city planning analysis has also been conducted, on the basis of which the structure for the directions of pedestrian tourist routes has been formed.

Keywords: pre-project analysis of the territory, tourism, small towns, tourist route, cultural heritage sites.

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ENVIRONMENTAL SAFETY OF CONSTRUCTION AND URBAN ECONOMY

THE ROLE AND PLACE OF LANDFILLS IN THE ECOLOGICAL AND ECONOMIC SYSTEM OF URBAN INFRASTRUCTURE

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The primary task of the urban environment is to manage the environmental situation. Waste management is an important component of the environmental sustainability of urban infrastructure. The article analyzes waste management processes in the Russian Federation, the impact of landfills of solid household waste on the environment and the population. The SPZ of the polygon's influence has been determined. For the reclamation and further use of the territories of the landfill, field studies were conducted, including several stages. In order to minimize the risk of possible emergencies and the consequences of their impact on the operating system, a set of engineering and technical measures has been proposed.

Keywords: production and consumption waste, solid household waste, landfill, environment, damage, reclamation

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RENOVATION OF AN APARTMENT BUILDING AFTER A GAS EXPLOSION AND SUBSEQUENT FIRE

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Research materials on the condition of structural elements after the elimination of gorenje are presented. The degree of structural damage was determined, the strength characteristics of concrete and reinforcement were experimentally determined, a calculation equation was derived, and the heating of the supporting reinforcement of the floor slabs in the fire was calculated. The structural elements that need to be replaced have been identified. An opinion was issued on the possibility of restoring the house; as a result, the house was restored and put into operation within three months.

Keywords: explosion, fire, building structures, residential building, household gas, experimental study of materials, analytical study of heating tasks, restoration of buildings.

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SYSTEM ANALYSIS, MANAGEMENT AND INFORMATION PROCESSING (IN CONSTRUCTION AND ARCHITECTURE)

JUSTIFICATION OF THE INFORMATION PROCESSING METHOD TO IMPROVE THE ACCURACY OF THE SHORT-TERM FORECAST OF ELECTRICITY CONSUMPTION (USING THE EXAMPLE OF A COMPLEX OF UNIVERSITY ENGINEERING CAMPUS FACILITIES)

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This article presents a new method for short-term forecasting of electrical load, which focuses on the integration of calendar data and a unique time coding method. The analysis showed that weather variables have little effect on the accuracy of forecasts. In this regard, a new approach is proposed that allows models to better understand temporal patterns using sinusoidal and cosine transformations of minutes, hours, days of the week, and year. Machine learning models were used to predict the load: LSTM (long-term short-term memory), Bi LSTM (bidirectional LSTM), CNN-LSTM (convolutional neural network with LSTM) and CNN-Bi-LSTM. According to the experimental results, Bi-LSTM showed the best accuracy.

Keywords: energy consumption forecasting, time series, machine learning, hybrid approaches.

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