

## **BUILDING CONSTRUCTION, BUILDINGS AND STRUCTURES**

### **EVALUATION OF THE SIGNIFICANCE OF THE PERIOD OF THE MAIN TONE OF OWN BUILDINGS OF BUILDINGS AND STRUCTURES AS A CRITERIA DETERMINING THE TECHNICAL CONDITION OF CIVIL BUILDINGS**

**Annotation.** Existing methods of measuring the natural oscillations of buildings are considered. Theoretical approaches for determining the dependence of natural oscillations on the rigidity of structures and numerical studies of the frequencies and forms of the own oscillations of buildings have been studied. A comparison is made between the numerical and experimental studies of the frequencies of natural oscillations.

**Keywords:** basic tone of natural oscillations; durability; rigidity; compliance of soil; dynamic parameters of a building.

### **EXPRESS-METHOD OF ESTIMATION OF TECHNICAL RISKS IN CONDUCTING SURVEYS OF BUILDINGS AND STRUCTURES**

**M. I. Fedotova**

**Annotation.** The article examines the existing approaches to the assessment of the risk of hazardous production facilities, analyzes existing methods and methods for determining the risk for building structures of buildings and structures. Based on in-depth analysis of scientific and normative-technical literature, an approach is proposed to assess the risk of an accident in any building, based on the construction of an event tree, assessing the probabilities and costs of the consequences of an accident for each group of the same type. The use of this approach will significantly reduce the cost of risk assessment for buildings of the same type, since a once constructed event tree can be used for buildings of this type many times.

**Keywords:** building structures; accident risk; monitoring; inspection; technical condition.

## **ENGINEERING SYSTEMS AND COMMUNICATIONS**

### **SOME ASPECTS OF IMPROVING THE QUALITY OF HEAT SUPPLY OF BUILDINGS**

**B. P. Novoseltsev**

**Annotation.** Considered are the advantages and disadvantages of a district heating system. It is shown that when reconstructing residential houses built in the 60-90s of the last century, it is advisable to supply them with heat from individual sources of heat (IIT). The premises for the placement of IIT equipment can be

located in the basement of the building, either on the cover or can be attached to the building.

**Keywords:** centralized heat supply systems, reconstruction of apartment houses, individual heat sources and their location.

## **DYNAMICS OF THE PROCESSES OF EMERGENCY VENTILATION OF CHEMICAL MANUFACTURES**

**M. N. Zherlykina, E. V. Osipova**

**Annotation.** The results of a study of the field of concentrations of chemical hazardous substances in the entire volume of the room during the operation of emergency ventilation with a predetermined air exchange are proposed. Explosion-proofness of industrial premises is provided under condition of 10 % of the lower limit of flame spread over gas-air mixtures and observance of equality of concentrations of harmful substance in the working area and in outgoing air. The dependence of air exchange on the intensity of the entry of harmful substances into the room in case of emergency situations is determined.

**Keywords:** Ventilation; air exchange; harmful substances; molecular weight; concentration.

## **ENGINEERING SOLUTIONS FOR THE DESIGN AND SAFE OPERATION OF LIFE-SUPPORT SYSTEMS OF ORTHODOX CHURCHES**

**Y. O. Tselykh, N. A. Drapaluk, A. Y. Glushkov**

**Annotation.** The article briefly covers modern problems of safe operation of the engineering systems of Orthodox churches. Also, special attention is paid to the basics of designing life support systems, taking into account the modes of operation of religious buildings. Typical accidents in the operation of the engineering systems of Orthodox churches are analyzed. The possibility of using the life support automation system for unique structures is considered.

**Keywords:** orthodox churches; engineering systems of temples; exploitation; design; safety of engineering equipment.

## **HEAT SUPPLY OF RESIDENTIAL BUILDINGS WITH THE USE OF AEROSTATIC WIND POWER**

**B. P. Novoselcev, E. M. Bobreshov**

**Annotation.** To develop any source of energy requires a huge investment, in this regard, work is underway related to the use of renewable energy, particularly wind energy. Authors have proposed a model of power generation using

gravitational energy of the atmosphere. Electricity obtained in this way can be used in full size or as a Supplement to the already existing energy for heat or electricity buildings and structures.

**Keywords:** heat; static electricity; air speed; power; wind power.

## **CHANGES OF HYDRAULIC AND THERMAL MODES OF OPERATION OF THE EXISTING HEATING SYSTEM IN A MULTI-QUARTER RESIDENTIAL HOUSE AFTER UNAUTHORIZED RESERVATION OF PREMISES**

**V. O. Vasilieva, R. A. Sheps, M. V. Agafonov, A. V. Shashin**

**Annotation.** Currently, there are a number of problems associated with the maintenance and operation of engineering systems for new buildings and for existing buildings. The heating system is the most problematic component, because throughout life, from the moment of putting the house, it made various changes. Which further leads to disturbances in normal operation and complete failure. This article calculated and analyzed some of the options for changing the hydraulic and heat modes of operation of the existing heating system of the apartment house.

**Keywords:** heating system; heat supply; hydraulic mode; thermal comfort; heating device capacity; radiator; heating system.

## **THE SYSTEM OF INDIVIDUAL ENERGY SAVING VENTILATION IN OFFICE SPACE**

**D. V. Lobanov, A. A. Mershev, S. A. Solovyov**

**Annotation.** The features of the calculation of ventilation and design of ventilation systems in office buildings, which are assessed according to current regulatory requirements and recommendations. The proposed scheme of providing a comfortable air parameters in premises of intellectual labor, equipped with permanent jobs with a PC (office space). Given a description of promising air distribution devices for organizing personal ventilation system.

**Keywords:** personal ventilation; energy saving ventilation scheme ventilation; ventilation of office space; microclimate; indoor air quality; comfortable air parameters.

## **CITY. RECONSTRUCTION, RESTORATION AND LANDSCAPING**

## **STUDY ON THE COATING PROCESS OF A PLASTER SOLUTION ON A PROCESSED SURFACE MECHANICALLY**

**E. E. Burack, U. A. Vorob'yeva, S. P. Egorova**

**Annotation.** As a result of experimental research forms are installed separate spots and distribution solution in them depending on constructive solutions to the output holes and principle of action used injectors. Defined rational parameters for the nozzles of various designs with minimal losses.

**Keywords:** plastering works; nozzles; rational parameters.

## **ANALYSIS OF REDUCING THERMAL EFFICIENCY OF OBSERVERS CONSTRUCTIONS BUILDING IN THE OPERATION PROCESS**

**Y. A. Vorob'eva, T. A. Vasilyeva, A. V. Lunina, D. M. Sovpel**

**Annotation.** The results of the assessment of physical wear of residential buildings constructed according to standard designs taking into account their number of storeys and wall materials are presented. The influence of various building damages on the state of its heat balance is considered. Dependences of the decrease in the thermal protection of the enclosing structures of buildings in houses with characteristic physical wear are revealed. The main recommendations for improving the energy efficiency of buildings are proposed, which allow to minimize heat losses and provide comfortable microclimate parameters in the premises.

**Keywords:** thermal protection; deterioration of buildings; energy saving.

## **ECOLOGY AND SAFETY OF THE URBAN ENVIRONMENT**

### **STUDY OF POLLUTION OF ENVIRONMENT FROM EMISSIONS OF HARMFUL SUBSTANCES IN INDUSTRIAL ENTERPRISES WITH REGARDING CLIMATE PECULIARITIES OF THE REGION**

**K. V. Garmonov, T. V. Shchukina, M. N. Zerlykina, O. B. Kukina,  
Y. R. Pokramovich**

**Annotation.** The analysis of dispersion of harmful substances in the emissions of industrial enterprises on the example of Voronezh region, and identified areas of environmental th risk on the territory of the city district. The mathematical experiment and the refinement in the methodology for calculation of environmental pollution, taking into account climatic characteristics of the region. The method of construction of situational maps depending on the actual wind speed at the rhumbs.

**Keywords:** advharmful substances; environment; dispersion of harmful substances; concentration; ecological risk.

## **ECONOMICS AND ORGANIZATION OF CONSTRUCTION**

### **RETROSPECTIVE FORECASTING OF THE TECHNICAL CONDITION OF CONSTRUCTION STRUCTURES**

## **G. D. Shmelev, N. V. Golovina**

**Annotation.** The article considers an example of a judicial construction and technical examination of a residential building, which is an object of cultural heritage of regional importance, aimed at assessing the need to perform repair and restoration work for the past period of time. The experience of practical application of the method of non-linear prediction of physical wear indicators of building structures and engineering systems of residential buildings is described, with considerably limited information on the forecasting object. The retro-predictive forecast made it possible to give a reasoned enough and justified answer to the technically complex questions of the court about the need to carry out repair and restoration works on the building in the past, as well as their contents for separate structures, engineering systems and types of work.

**Keywords:** forecast; retrospective; building structures; physical wear; technical and capital repairs; forensic technical expertise.