

BUILDING CONSTRUCTION, BUILDINGS AND STRUCTURES

DETERMINATION OF HEAT LOSSES OF BUILDINGS WITH THE HELP OF MODERN SOFTWARE

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Annotation. Calculation of heat loss is one of the most important stages in the design of buildings and structures. It is the main one for the selection of equipment in heating, ventilation and air conditioning systems. The presence of errors or errors at this stage of work increases the risk associated with the wrong selection and configuration of equipment, the appearance of additional operating costs, as well as various accidents. With the realities of the modern construction market, it is obvious that for successful work and profit, the tasks must be performed as efficiently as possible and in the shortest possible time. In place of calculations «manually» came multifunctional programs that can not only increase the speed of the tasks, but also to reduce the error of calculations, significantly reducing the likelihood of errors due to the "human factor". Each program is certified and performs calculations in accordance with applicable regulations. The article deals with the use of specialized software with the indication of its specificity. Such programs as RTI, Head Balance Lite, Auditor Energo, Audytor OZC, Temper are considered. The calculation of heat loss of a three-storey building in the climatic zone of the city of Arkhangelsk by three independent programs, as well as a comparison of the results with the calculation of the normative document.

Keywords: energy efficiency; heat loss; multilayer structures; thermal protection.

CALCULATION OF POSTTENSIONED BEAMS BY METHODS OF LINEAR MECHANICS OF MATERIALS

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Annotation. In this paper short information about posttensioned reinforcement beams are given. Some problems preventing wide use posttension technology in our country are mentioned. There are key points of approximate analysis of strength and crack capacities of posttensioned beams as well as equations for calculation of strength and crack capacities of posttensioned beams under both uniformly distributed loads and concentrated loads. Comparison of calculated and experimental values of strength and crack capacities of posttensioned beams is done. Conclusion contains information about opportunity to use given equations in approximate analysis.

Keywords: posttensioning; methods of linear mechanics of materials.

ENGINEERING SYSTEMS AND COMMUNICATIONS

FEATURES OF THE MICROCLIMATE OF SPORTS FACILITIES

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Annotation. This article discusses the parameters of the microclimate in the field of sports events in accordance with the feature of sports and the nature of sports training. The important role of the rational design of the microclimate systems of sports facilities in creating favorable conditions for employees and those involved, as well as the observance of technological standards in the formation of optimal performance in the rooms is shown. If sports are held in a room with elevated air temperature, then the state of health of the practitioner will noticeably deteriorate, and with it the exacerbation of chronic diseases. Health benefits for sports people can get only if the necessary parameters, the microclimate, that is why they should be given special attention. The article substantiates the need for the organization of air microclimate systems for the sports complexes on the basis of current regulatory documents for design, the study of space-planning solutions of buildings, as well as types of training. The necessity of carrying out complex measures to determine the optimal parameters of the microclimate in the premises of various multifunctional purposes is substantiated. It was established that none of the considered modes or their combinations can provide air, humidity and temperature comfort in space at the same time.

Keywords: sports room; temperature; humidity; air exchange; ventilation; microclimate.

PECULIARITIES OF CALCULATION OF PNEUMATIC CONVEYING SYSTEMS TAKING INTO ACCOUNT MICROCLIMATE OF ROOMS

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Annotation. The use of pneumatic conveying systems plays an important role in creating normalized microclimate parameters in rooms. A classification and description of the design features of various circuit solutions for pneumatic transport systems, which can be suction or injection, and also differ in the amount of generated pressure or vacuum is given. The features of the movement of particles in vertical and horizontal pipelines are considered, the causes of unstable trajectories of their displacement are analyzed. Theoretical studies and practical dependencies are given to determine the main parameters of pneumatic conveying systems: the speed of moving, the speed of soaring, pressure loss. The question of choosing the magnitude

of the mass concentration of the material for different transportation conditions is considered.

Keywords: pneumatic transport; bulk material; dedusting; lifting force; pipeline; suction; pressure; material concentration; pressure loss; soaring speed.

RECONSTRUCTION OF THE VENTILATION SYSTEMS OF CIVIL DEFENSE CIVIL DEFENSE OF THE CURRENT STUDENT HOSTEL

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Annotation. Civil defense facilities are one of the most effective ways to protect the population from the dangers arising from the conduct of military operations or as a result of these actions, as well as in the event of natural or man-made emergencies. Organization of ventilation systems and provision of norms of heat and humidity regime of bomb shelters is important in their construction or reconstruction. In civil defense structures can be provided different ventilation schemes, designed to assimilate heat and humidity surpluses, depending on the purpose of the object. We have analyzed the technical condition and the concept of the existing ventilation systems of the built-in civil defense structure located in the climatic zone of the city of Voronezh, on the basis of which the "weak" places were identified and a scheme for the reconstruction of the object's climate control systems was developed. To enable the implementation of the proposed solutions, calculations for the assimilation of heat and humidity surpluses were made, various schemes of ventilation systems of the object and filtration of gas-air mixture were designed, measures were proposed to increase the stay of civilians in the event of an emergency, equipment was selected that meets the requirements of normative documents and literature recommendations. The models of ventilation systems with the possibility of implementation in the construction or reconstruction of premises designed to protect the population in emergency situations.

Keywords: shelter of civil defence; reconstruction of the shelter; a ventilation system; asylum; assimilation of excess heat and humidity.

CITY. RECONSTRUCTION, RESTORATION AND LANDSCAPING

THE FORMATION OF A COMFORTABLE URBAN ENVIRONMENT IN THE RESIDENTIAL AREAS ON THE EXAMPLE OF VORONEZH CITY

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Annotation. Residential development of the city is the main element of urban space. Its planning structure determines the comfort of living, urban mobility, the development of small and medium-sized enterprises, the environmental situation. Currently, at a high rate of housing construction in the cities of Russia, the living

conditions in residential neighborhoods of urban development does not meet the principles of comfort and compactness. The paper presents an urban analysis of the existing buildings, which found that the existing structure, based on the district planning, characterized by low levels of comfort. The analysis of the legal framework in the field of urban design, identified shortcomings in the design of neighborhoods, the conclusions about the benefits of quarterly development. The recommendations for the design of residential buildings aimed at improving the comfort of the urban environment. It is proposed to combine the average number of buildings with high density of development in a small area, as well as the combination of residential and commercial functions in one building or quarter, which will contribute to improving the level of comfort.

Keywords: city; development; residential quarter; housing development; urban environment.

THE ORGANIZATION OF PUBLIC SPACES IN THE REPRESENTATION OF THE URBAN COMMUNITY

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Annotation. The considered modern definitions and characteristic features of the sociocommunicative spaces of cities, which in many respects determine the quality of the urban environment. In the main residential areas, the problems of organizing public spaces are not sufficiently studied and, in practical implementation, are reduced to designing typical amenities. The primary aim of the research was examine the views of urban communities on the problem of the public spaces, need for change, the importance of functions and belonging to a local community by residents. Creating a comfortable urban environment is considered at the following local levels: courtyard, territory between quarters, the center of the residential area. The information base of the study was the data of a survey of the population of the city of Tambov. The results of a sociological survey of residents of the city of Tambov showed that the main types of leisure time organization are leisure time at the computer, combining communications with entertainment in shopping centers, visiting green areas. For recreation, residents choose places that are far enough away from their home, which confirms the lack of development of local facilities to create social zones and unite residents. Assessment of residents' satisfaction with the functional purpose of public spaces at the level of residential areas showed that parks, sports facilities, places where the people can come to enjoy various cultural events and objects of additional education have the potential to transform into publicly accessible platforms for communication of residents with different interests and values. At the level of courtyards and squares between quarters, there is a need for parking, quiet recreation areas, outdoor activities and children's games, sports events and recreation areas. In the course of transformations of the urban living environment, the

creation of a sustainable environment is required taking into account social, economic, architectural, mental factors, as well as with the participation of local communities.

Keywords: public space; social interactions; urban community; landscaping.

USING GIS FOR MONITORING AND DEVELOPMENT OF GREEN PLANTINGS OF THE CITY

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Annotation. In the system of urban planning activities aimed at solving the problem of protection and improvement of the quality of the environment in the city, a special place is occupied by green spaces, which have a whole range of environmental properties. The authors propose the structure of the geographic information system (GIS) "Green spaces", containing three main information layers (level). At the macro-level of monitoring of green spaces, the main source of information is remote sensing data, this level serves to monitor the state of the ecological wireframe and assess the level of greening over time. The use of retrospective images from space makes it possible to assess the damage from human activities and as a result of natural and technogenic disasters. At the meso-level, the tasks of monitoring the state of vegetation of individual objects of the system of green spaces are solved, mapping of green zones and collection of attributive information is carried out. The micro level of monitoring is intended for inventory and accounting of each separate tree, bush, lawn and flower bed, and an assessment of their qualitative structure. The creation of GIS "Green spaces" and the organization of a system of integrated monitoring of urban green spaces will make it possible to make more effective decisions in the field of green construction and development of the ecological wireframe of the city.

Keywords: green spaces; ecological wireframe; monitoring; geoinformation systems; remote sensing data.

ECOLOGY AND SAFETY OF THE URBAN ENVIRONMENT

ANALYSIS OF THE STRUCTURE OF THE COLLECTION AND TRANSPORTATION OF HOUSEHOLD WASTE IN THE CITY OF VORONEZH

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Annotation. The analysis of administrative and financial interaction of subjects involved in the organization of collection and transportation of municipal waste in the urban district of Voronezh. The participants of waste transportation were identified, the main of which are specialized transport companies that enter into contracts with organizations engaged in the maintenance of residential and public buildings.

Schemes of administrative and financial interaction of organizations engaged in the field of household waste management have been developed. The main problems associated with the removal of municipal waste are identified. It is established that the conclusion of contracts is carried out without taking into account the territorial proximity of the parties to the contract, which leads to irrational movement of specialized transport. The location of specialized transport companies in the territory of Voronezh is studied. The cartographic schemes illustrating the irrationality of the existing system of contracts between serviced buildings, management organizations and transport companies are given. A number of proposals aimed at optimizing the existing system of municipal waste collection have been formulated.

Keywords: municipal household waste; waste collection and transportation; optimization of waste transportation; transport companies; waste management.

ASSESSMENT OF THE ENVIRONMENTAL SITUATION IN THE AREA OF ACCOMMODATION OF THE ENTERPRISE OF ECOTERM-SERVICE LLC G. ROSTOV-ON-DON

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Annotation. The main factors affecting the state of the environment in the location of OOO «Ecoterm-Service» in Rostov-on-Don are considered. As the main parameters determining the environmental situation in the study area, the climatic characteristics of the location of the enterprise, the state of the atmospheric air and soil, and physical factors were identified. A quantitative calculation of these parameters was carried out, taking into account the value of the indicator for the integrated assessment of the state of the environment. Formed a conclusion about the environmental situation in the area of location of the company OOO «Ecoterm-Service», Rostov-on-Don.

Keywords: environmental situation; environmental safety; atmospheric air; state of the environment; integrated assessment.

ROAD TRANSPORT, AGRICULTURE AND CONSTRUCTION MACHINES

DEVELOPMENT OF BIKE INFRASTRUCTURE IN VORONEZH

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Annotation. The world experience of creating programs for the development of bicycle transport and its positive impact on the environment and transporting infrastructure is analyzed. Conducted studies that revealed the current situation with urban cycling in Voronezh. As a result of the sociological survey, the interest of citizens in the development of the bicycle infrastructure of the city of Voronezh was noted. The concept of urban cycling routes has been proposed for organizing a bicycle sharing system (bicycle rental system) in Voronezh. In developing the routes, the existing transport infrastructure and the

location of the places of greatest attraction were taken into account. A scheme has been developed for the location of parking stations for bicycles, taking into account the promising construction of intercepting car parks. A variant of the re-design of the upper tier of the North Bridge, taking into account its adaptations for cycling, is presented.

Keywords: cycling; bicycle transport; cycle route; bike paths; pedestrians; motorists; bicycle infrastructure; ecology.

ECONOMICS AND ORGANIZATION OF CONSTRUCTION

VARIATIONS, TECHNICAL FEATURES AND CONDITIONS OF OPERATION OF SUPPLY DEVICES

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Annotation. The intake valves are considered, which are technical means capable of solving the problem of the lack of sufficient air exchange of natural thrust, in connection with the installation of sealed windows in houses. Describes the negative effects that affect the person and the room, if the natural ventilation is not working properly. Classification of inlet valves according to the method of regulation and the place of installation is proposed. A description of the parameters to which special attention should be paid when choosing a valve is given. Different types of infiltration valves are considered, such as wall and with the possibility of installation in a window frame. A comparative table is presented in which are given: technical and economic parameters, control method, cost, installation, country of manufacture, air consumption.

Keywords: natural ventilation; hygro-regulated ventilation; ventilation of residential buildings; quality of indoor air; microclimate.