BUILDING AND ARCHITECTURE

Tang Van Lam, Bulgakov B.I., Alexandrova O.V., Larsen O.A

POSSIBILITY OF USING BOTTOM ASH FOR MANUFACTURING BUILDING MATERIALS IN VIETNAM

Industrial waste, including fuel, is the cause of the main problems of soil, water and air pollution of the environment. The ash residues, as a by-product of burning coal and brown coal dust due to the activity index, small particle size and chemical and phase composition are widely used as additives in the production of cements, concretes and mortars. Competent use of ash residues contributes to solving environmental problems, improving the operational properties of building materials and increasing the economic efficiency of their production.

Adding ash residues to concrete and mortar reduces the consumption of cement and increases their corrosion resistance by binding free calcium hydroxide to less soluble compounds, as well as saving natural non-renewable raw materials.

Key words: *industrial wastes, environmental pollution, fly ash, ash residues, cement-sand stone, compressive strength, activity index.*

Samoshin A.P., Korolev E.V., Samoshina E.N.

INTERNAL VOLTAGES IN FORMING THE STRUCTURE OF METAL-CONCRETE FOR PROTECTION FROM RADIATION

To ensure radiation protection at nuclear power facilities, one of the promising materials is metal-concrete, combining the properties of plastic metal matrixes and stone aggregate. During the manufacturing process, it becomes necessary to heat the metal matrix to the melting point. With the cooling of a skeleton-type metal-skeleton product, internal stresses arise due to different coefficients of temperature expansion, elasticity moduli of the matrix and aggregate grains, and also thermophysical properties of the components. These voltages, combined with stresses from operational influences and loads, can be the reason for reducing the physico-mechanical properties of the material. In this paper, the effect of the ratio of the modulus of elasticity of the filler Eз and the matrix Em, as well as the degree of filling of the material (determining the thickness of the binder interlayer h), is estimated on the magnitude and nature of changes in internal stresses in the radial and tangential directions.

Key words*: reinforced concrete, internal stresses, modulus of elasticity*

Anikanova T.V., Rakhimbaev Sch.M.

THE INFLUENCE OF THE THICKNESS OF THE CEMENT SHEATH IN THE CONCRETE AND CEMENT PARTITIONS IN THE FOAM CONCRETE TO SHRINKAGE DEFORMATION

It is known that during solidification could occur as the expansion and shrinkage of the stone. Ordinary cements shrink, so we are particularly interested in shrinkage deformation and stress of cement stone. In the study of the shrinkage of heavy concrete, special attention should be paid to the impact compression of the grains of the filler with cement ring, as it allows you to adjust the physico-mechanical properties, crack resistance and durability of concrete.

This work presents the results of calculation of the radial and tangential self-stresses arising in the cement sheath in the concrete and in cement wall in cellular concrete with the help of the Lame equation.

Key words: *shrinkage deformation, tangential stress, radial stress, heavy concrete, foam concrete.*

Kovalchenko O.V., Alfimova N.I.

THE QUESTION OF THE APPLICATION OF PRODUCTS OF VOLCANIC ACTIVITY IN THE MATERIAL SCIENCE

Currently, in the manufacture of building materials are the most relevant issues related to environmental management, as well as finding ways of reducing the energy intensity of manufacturing processes. In this connection, there is a reorientation of the raw material base of building materials in favor of man-made and not previously used natural raw materials. This article analyzes the use of products of the volcanic activities of various fields under the production of building materials for various purposes.

Key words*: products of volcanic activity, tuff, ash, composite, knit-ing, mineral additives, concrete, energy.*

Kosukhin M.M., Kosukhin A.M.

WATER TREATMENT ENGINEERING NETWORKS IN THE PAST, PRESENT AND FUTURE

A brief analysis of the historical and economic development of one of the most important life support systems, water supply, is presented. It is shown that today it is in a catastrophic state, which influences further prosperity of population.

A set of effective measures of the country's leadership is needed to bring the industry out of crisis.

For bringing communal systems to a satisfactory condition, a detailed analysis of their technical state made by professionals is needed.

To meet the challenges, it is necessary to develop a specific legal and regulatory framework, mechanisms for attracting highly qualified specialists to the industry.

An integral part of the problem is the development of domestic repair and construction materials and technologies that meet modern requirements and operating conditions of engineering systems and structures maintenance. At the same time, special attention should be paid to the development of repair compounds for reinforced concrete surfaces, due to the fact that most of the existing utility networks and structures are made of it.

***Key words**: housing and communal services, history of water supply and sanitation, sewerage, treatment facilities, reinforced concrete drainage systems, dilapidated and failures of communal systems, moral and physical deterioration, repair compounds for internal reinforced concrete surfaces, overhaul, sanitization, renovation.*

Kashurkin A.Y.

ABOUT ADAPTABILITY OF NATURAL COLD FROM ICE AND SNOW IN VENTILATION AND AIR CONDITIONING SYSTEMS

Currently, the volume of world energy consumption is continuously increasing. In this connection, the general trend in the world community is aimed at the use of non-traditional energy sources and the development of energy-saving technologies, which leads to the saving of natural resources and the improvement of the ecological situation of our planet. Projects on the use of non-traditional energy sources are being implemented in various countries, such as: heat pumps, solar collectors, wind generators, etc. The introduction of energy-saving technologies to this type of equipment will significantly reduce energy consumption. Accumulation of natural cold of ice and snow is one of the renewable sources of energy, where the main source of cold is snow or ice, which in turn is an economically viable solution for reducing the energy consumption of climate systems.

***Key words:** cold accumulator, natural cold, ventilation, air conditioning, cold source*

Avdyakov D.V.

APPLICATION OF METHODS OF FRACTURE MECHANICS IN THE CONTROL PARAMETERS OF FRACTURE TOUGHNESS OF THE SECOND FORM OF THE DESTRUCTION OF THE PRODUCTS AND STRUCTURES FROM GLUED WOOD

The paper proposes a methodology based on the methods of fracture mechanics, and presents the results of experimental studies on the controlling parameters of fracture toughness of the second form of the destruction of the products and structures from glued wood.

***Key words:** control of fracture toughness, fracture toughness, laminated wood, fracture, fracture mechanics*

Gandzountsev M.I., Kondratenko V.E.

THE APPLICATION OF CONSEQUENT APPROXIMATION METHOD TO THE PROBLEM OF RC SLAB DESIGN ESTIMATION

The article proposes a method of continuous plates design supported by flexible bearings, that can be applied for design of reinforced concrete (RC) multispan slabs resting on beams inside weaving factories buildings. The solution of the problem utilizes on approximate substitution of resolving system of differential equations with the finite-difference equations of consequent approximation method. In order to illustrate the proposed method, an example of design calculation procedure for continuous two-span slab is solved. Proposed method is defined by fast convergence, algorithm simplicity which results in less grid amount needed for accurate results. This application of this method is advisable in design practice for justifying calculations, follow-up of calculations made by commercial finite-element software.

***Key words**: continuous plate, flexible bearings, finite-difference, justifying calculations, consequent approximations method.*

Nikulin A.I., Al-Havaff A.F.K.

ABOUT THE FORMATION OF THE STRENGTH CALCULATION METHOD OF THE ECCENTRICALLY LOADED REINFORCED CONCRETE ELEMENTS WITH SMALL EXCENTRICITY

For the formation of the strength calculation method of the eccentrically loaded reinforced concrete elements, which have no the stretched zone of concrete, the modified version of the deformation model of the reinforced concrete force resistance is used. This model is based on the energy approach to the transformation of the standard concrete compression diagram into the diagram of the inhomogeneous deformation, which corresponds to stress-strain state (NDS) of the eccentrically compressed constructions. The main hypotheses and resolving equations that allow us to find the required parameters for the problem under consideration are presented. Some results of numerical studies, which are performed with using the computer program developed by the authors for a personal computer, are shown.

Key words: *the eccentric compression, the reinforced concrete column, the small eccentricity, energy criterion for destruction of concrete, the diagram of the inhomogeneous compression of the concrete, the bearing capacity of a column, the numerical experiment.*

Tatarenkov A.I.

ANALYSIS AND SYNTHESIS OF THE RESULTS OF EXPERIMENTAL STUDIES OF REINFORCED CONCRETE STRUCTURES

The results of comprehensive experimental studies of reinforced concrete structures. The strengthening of the structures was performed by increasing the cross-section and from the use of static diagrams. The obtained data on the strength, deformation and bursting of nastoyaschy reinforced structures with different layout options section and the loading level.

Key words*: experimental study, reinforced concrete structures, strengthening, the level of loading, a change in the statistical scheme.*

Ginzburg A.V., Kozhevnikov M.M.

FEATURES OF THE ORGANIZATION OF CONSTRUCTION AND CONTROL OF BRIDGE STRUCTURES IN MODERN CONDITIONS

Currently, the problems that arise when organizing the construction of bridge structures are becoming increasingly important. At this stage it is especially important to solve not only the tactical tasks of maintaining the level of the technical condition of structures but also the strategic tasks of improving existing ones and the construction of new artificial structures to create a transport network in perspective directions which is feasible only on the basis of a systematic approach at all stages starting with the analysis of design an assessment of the degree of equipment and readiness of construction organizations and ending with ensuring the quality of the work performed and the delivery of the finished object. The article deals with the problematic issues of the organization of road and transport construction presents conclusions on the analysis of domestic and foreign experience and outlines the prospects for the development of the organization of the construction of bridge structures. The work also shows the interaction scheme of the main construction participants an analysis of the functions of construction control and proposals for improving the organization of bridge construction by introducing information modeling in the activities of resident engineers of construction control.

Key words: *organization, bridge structures, information modeling, construction, control, technology.*

Aleksanin A.V., Markevich A.I.

THE USE OF ADDITIVE TECHNOLOGIES IN THE CONSTRUCTION OF BUILDINGS

The development of scientific and technological progress contributes to the improvement of old and the emergence of new technologies for the construction of buildings and structures. In the presented article the technology of 3D printing and prospects of its application in the construction industry is considered, real experience of some companies on building buildings with the help of 3D printers is given. One of the main features of the construction industry are material consumption, long terms of production, impact on the environment. Using 3D technology can help address these issues. Special attention is paid in the article to the advantages of 3D technology over traditional construction methods. The construction of objects with the help of 3D printers has great potential due to the reduction of the cost and quality of construction products, the reduction in the terms of production, as well as the high degree of automation of construction processes.

Key words: *technology of construction, 3D technology, efficiency, 3D printing.*

Drebezova M.Yu.

MODERN ADDITIVE TECHNOLOGY IN A LOW-RISE CONSTRUCTION

Today in all spheres of our life comes to the fore the search for new, more modern methods and technologies that meet the principles of sustainable development. New approaches should be more effective from the point of view of preserving the finite resources of our planet have a minimal impact on the environment, and provide a higher final product quality. Construction is no exception. One of the new promising technologies in low-rise construction is the technology of 3D printing. 3D printing is the process of recreating a real object on the model of the 3D model. The unique ability of this technology will significantly reduce costs by reducing costs of materials and improve performance, discover new creative approaches to create a variety of architechwriter etc.

***Key words**: three-dimensional printing, additive technology, 3D printing, construction.*

Kovrizhkina O.V., Rybalkina N.A.

PRINCIPLES OF PROPORTIONAL SYSTEMS IN CONSTRUCTION OF ORTHODOX TEMPLES

In this article, we consider the volume-planning composition of Orthodox churches, proportional systems of stone and wooden churches, irrational relations, Old Russian measures, used in the breakdown of plans and height dimensions in the construction of churches.

***Key words:** orthodox architecture, volumetric-planning composition, proportional systems, wooden frame, stone chamber, tent temple.*

Shapiro G.E.

THE NINE-POLE TYPE OF SYNAGOGUES : GENESIS, PECULIARITIES OF VOLUME-PLANNING AND CONSTRUCTIVE SOLUTION

In recent years, particular interest is researching and restoration of monuments of the Jewish sacral architecture of the south of Russia, as the most important objects of the region's material culture, as well as significant architectural monuments of artistic value. The works of Jewish religious architecture represent in this context unique and poorly studied example of the synthesis of a multi-century national culture and regional identity of the Jewish Diaspora. This article discusses the issue of borrowing and influencing the synagogue architecture of the Region of the Troops of the Don and the Caucasus in the context of pan-European trends in synagogue architecture. A special place in the evolutionary process of synagogue architecture is occupied by the nine-pole type of synagogues, which originated at the turn of the XVIII-XIX centuries in Central Europe. This type assumes the presence of four vertex supports and nine forming vault fields. Such a constructive system has become widespread in the Baroque, and in the classic, and eclectic synagogues. In the process of the evolution of constructive systems and building technologies, the nine-field system was transformed, but the main ideas embedded in it concerning the semantics of the sacral space are also traced in the synagogue buildings of the late 19th and early 20th centuries.

***Key words:** nine-pole synagogues, "bima-support", Aron-kodesh, four-pillar type.*

Silin R.V., Korbut E.E., Kositsyna E.S., Chernysheva N.V.

TO THE QUESTION ABOUT THE STATE OF GREEN AREAS OF COMMON USE AND THEIR VLIYANIYE ON THE QUALITY OF THE URBAN ENVIRONMENT MOGILEV

In conditions of ecological trouble plant capacity is one of the effective factors in the improvement of the human environment. You green areas-perform sanitary-hygienic and psycho-physiological functions: produce sour-rod, assimilate carbon dioxide, precipitated dust, gaseous chemicals, microorganisms, radionuclides, mitigate climate parameters, reduce the intensive-ness of the infrared solar radiation. In this regard, all the more urgent becomes the task of finding ways to mitigate adverse impacts on the population increasing anthropogenic pressures. One of the ways of its solution is the rational distribution of green space in the city plan, keeping in mind the greenery, the configuration of green space common areas, and location relative to residential construction. Green spaces is an integral part of the urban complex. They are an important tool in improving air basin, the creation of favourable microclimatic and sanitary-hygienic conditions for work and rest of the population, contribute to the functional organization of urban areas, are effective factor in enhancing the artistic expression of architectural ensembles.

***Key words**: town planning structure, green spaces and General restricted, the level of ozelenen*

Tribuntseva K.M.

THE APPEARANCE AND CONSTRUCTION OF THE BELGOROD DEFENSE LINE

The study addresses the emergence and construction of the Belgorod defense line and received the latitudinal development of the settlement system, based on the occurrence of fortresses and settlements in the period of development of the "wild field". Considered the formation of the urban structure of the historic small towns of the Belgorod region. Describes the historical process of development of the Belgorod defense line (XVI century) and the characteristics of the terrain that influenced the spatial development of the present territory of the Belgorod region.

***Key words**: urban development, spatial development, historical development, settlement system, small towns, the fortress city, historical and cultural potential.*

Gorozhankin V.K.

SYSTEM PARADIGM AND THE ARCHITECTURAL MORPHOLOGY

Abstract: System principles of ontological modeling are read in the semantics of architectural forms of organization which relate the natural and artificial components of the material. Among the morphological types are distinguished: is isomorphic to – iconic signs, which replicate the natural flow of the parts and the indivisibility of the natural object; the changelings are paired images of the insignia that shows the process or steps shape changes during the simulation; Paramore – the sign of organization forms of artificial type is in fact of architectural thinking. Languages of architecture associated with different principles of the categorical circuit, forming a system integrity of the material, procedural and structural type, appeared in different periods of history and manifested in different creative techniques.

Key words: isomorphism, metamorphosis, paramorphism in the language of architecture.

Kovrizhkina O.V., Vovzhenyak P.Yu.

COMPOSITION. CREATIVITY. CERAMICS

"Composition" as a basic discipline consists of lecture and practical courses. A large amount of theoretical materials in spatial composition, model compositional practice and graphic art together play a leading role in the effective development of artistic and compositional ideas of pupils in their first stage of education in high school. The outcome of the study of this discipline "Composition", is an examination paper consisting of theoretical and practical questions. A figurative painting of a round-shaped plate is required to be designed in the practical section of the exam. An engobed painting of real ceramic products was made from gathered materials at a practical training in an industrial plant- " Borisov Ceramics".

***Key words**: volumetric spatial composition, shaping, modeling, proportioning, engobe composition, painting.*

CHEMICAL TECHNOLOGY

Mamaev V.V., Petrov S.I., Novikov S.A., Zaycev S.V., Prohorenkov D.S.

THE INFLUENCE OF CONDITIONS OF FORMATION OF HETEROSTRUCTURES BASED ON NITRIDES OF III GROUP, ON THE STRUCTURAL PERFECTION OF THE INSTRUMENT STRUCTURES FOR MICROWAVE TRANSISTORS, AND OPTOELECTRONIC DEVICES IN THE ULTRAVIOLET RANGE

It is shown that using high temperature buffer layer AlN/AlGaN grown on strongly mismatched substrates by MBE using ammonia and extremely high temperatures (up to 1150 ºC), allows you to dramatically improve the structural perfection of the active layers and lower dislocation density up to values of 4-5.109 cm^{-2}. The results of growing AlN layers using Ga as the surfactant. In heterostructures with two-dimensional electron gas grown with the use of surfactant was achieved carrier mobility up to 2000 $cm^2/V{\cdot}s$. The resulting transistors range with an efficiency of 50 % at a power density of 5 W/mm at 4 GHz. The results of growing buffer layers $Al_xGa_{1-x}N$ with high Al content (x=70%) for the nitride. The dislocation density in the layer of the $Al_{0.7}Ga_{0.3}N$ immediately adjacent to the active area, made up of 1-2·109 cm^{-2}. Was obtained by UV photo cathodes, which showed the quantum efficiency in transmission of 14–16 %.

***Key words**: nitride heterostructures AlN/AlGaN UV photo cathodes, microwave transistors, the density of dislocations.*

MECHANICAL ENGINEERING AND MACHINE

Mamaev V.V., Petrov S.I., Novikov S.A., Zaycev S.V., Prohorenkov D.S.

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***Key words**: nitride heterostructures AlN/AlGaN UV photo cathodes, microwave transistors, the density of dislocations.*

Zeman D.A., Shishkin S.F., Shishkin A.S., Barakovskikh D.S.

EXPERIMENTAL DETERMINATION OF THE RELATIVE SPEED OF PARTICLES IN THE CONDITIONS OF PNEUMOTRANSPORT

The scheme of the experimental device for the determining of the velocity of particles in pneumatic transport conditions was given.

The method of magnetic marking was used.

The pneumatic transport system was implemented on the basis of a pneumatic chamber pump. The particle velocity was measured on a straight section with steady motion.

The mode parameters of the two-phase flow were varied: air flow, concentration, pressure. The experiments were carried out with various bulk materials. Comparison of the experimental and calculated values of the relative particle velocity was given in respect to various known dependences.

***Key words**: pneumatic transport, two-phase flow, air flow, relative particle velocity, indicator particle.*

Uralskiy V.I., Sinitsa E.V., Uralskaya L.S., Farafonov A.A.

CENTRIFUGAL UNIT OF COMBINED METHOD OF MILLING

The article presents scientific and technical developments on the creation of a centrifugal grinding unit of the combined grinding method, whose design allows to improve the quality of the finished product by providing a dry and wet method of grinding the material in one unit, and to increase the productivity of the unit by providing a continuous grinding process.

***Key words:** centrifugal aggregate, combined method, grinding, dry method, wet method, energy saving.*

Teterina I.A., Lubimyi N.S.

METAL-METAL/POLYMER FLAT SURFACE PROCESSING OF SHAPING PART OF MOLD

The paper proposes a solution to the problem of a quality assurance of jointing surfaces of metal-polymer molds. The results of experimental research for achieving the required roughness of metal-polymer shaping part are presented by the authors. The justification for selection of processing method of grinding as the most appropriate to ensure the quality of metal-polymer surfaces are given in the paper.

***Key words:** Metal polymer, shaping part, grinding, roughness, mold, surface processing.*

Boyko A.F., Pereverzev S.S., Loyko A.M., Shinkaryov I.Y.

ANALYSIS OF AN ERROR OF MOVEMENT OF A COORDINATE TABLE OF THE ELECTRICAL DISCHARGE MACHINE 04EP-10M

Results of researches of accuracy of movements of a coordinate table of the electrical discharge machine of model 04EP-10M are presented in article. The technique of definition of an error of the specific manual drive of cross movement of a table has been developed and experimentally approved. It is established that

the relative error of movement has made 1 %. Inexact installation of the micrometric screw on a corner of his turn concerning the direction of movement of a table is the reason of an error. As a result of calculations it is established that the error of installation makes about 1˚. By results of researches the method of elimination of the revealed error has been offered and realized.
Key words: *electrical discharge machine, coordinate table, movement error, experiment, micrometric screws.*

Pchelkin V.M., Duyun T.A.
RESISTANCESTRENGTHENINGCOATINGSMETAL-TOOLING TOOLSIN CONDITIONSSHOCK LOADS
The results of experimental studies of the durability of hardening coatings of carbide-tipped plates during the turning of corrosion-resistant heat-resistant steel 08X18H10T are presented. The experiment was conducted in production conditions with the use of existing industrial equipment, technological equipment and tools. As a work piece, a tee was used - a connecting piece of pipelines. The peculiarity of the experiment was the intermittent nature of cutting with impact loads. The stability of carbide-tipped plates with various methods of applying hardening coatings was investigated. Using the electron microscope, the microstructure of the cutting inserts is analyzed after the thermal, force and impact loads of the cutting process have been affected. The effect of technological modes of turning on the tool's durability is established, the wear characteristics are revealed depending on the method of applying the hardening coating. The obtained results allow reasonably assigning technological regimes and predicting the tool's stability when turning heat-resistant steel under shock loads.
Key words*: wear-resistant coatings, Method of coating, Turning corrosion-resistant heat-resistant steel, Resistancecarbide tools, Results of micro-study of cutting inserts.*

Maslova I.V., Chetvericov B.S.
THE DEFINITION OF DISTORTION OF LARGE PARTS OF THE ANALYSIS OF THE PROJECTION OF THE CORRECT GEOMETRIC SHAPES ON A CURVED SURFACE
The article considers the issues arising in the process of implementing remote control of geometrical characteristics of large parts and assemblies, as well as determining the distance to them. Provides a rationale for the choice of a non-contact method of controlling the shape of the curved surface, based on the analysis of the figures, the projected fotometrica to the controlled object, and analyses the advantages and disadvantages of modern control and measuring tools used in manufacturing. A study of the possible variants of the projected figures in the determination of deviations of the product shape and dimensions and distance. Thus, it is established that the proposed method of contactless control provides the most adequate image of lines shapes, and use as a diffraction grating – holographic nozzle that generates a rectangle with control points, allows to achieve the required accuracy of determining the deviation of the part shape.
Key-words*: technical vision, projection, touchless control, form error.*

INFORMATION TECHNOLOGY AND CONTROL SYSTEMS

Shpichyack S.A.
AUTOMATION ACCESS CONTROL TO THE RESOURCESOF AUTOMATED CONTROL SYSTEM IN BUILDING INDUSTRY AND UTILITIES
Model of the process of ensuring access to the resources of the process control system of building industry, the basic structure of automated access management subsystem and method of operative access control based on a combination of access policies, schemes preliminary distribution of authenticators and full of secret sharing. The algorithms provide regular access to and timely provision of temporary access in case of contingency and emergency situations using the evolution of authenticators. Given the composition of hardware and software components of the automated subsystem control access to the resources of ACS of water supply utilities.
Key words*: automated control systems, access control, authentication, technological resources.*

Shcherbinina O.A., Shcherbinin I.A.

THE USE OF THE PROGRAM DIALyx TO PERFORM THE LIGHTING CALCULATION ARENA DS «SPACE» WITH THE USE OF MODERN LIGHT SOURCES

When designing a lighting installation it is necessary to solve the following issues: to choose a lighting system and light source type, set the type of fixtures to produce the positioning of the fixtures, specify number of lamps.

It should be borne in mind that the illuminance of any point inside the premises has two components: a straight line that is created directly by the lamps and reflected, which is reflected from the ceiling and walls luminous flux.

Initial data for lighting calculations are: the normalized value of the minimum or average illumination, type of light source and lamp mounting height of the lamp, the geometric dimensions of the illuminated space or open space, the reflectance of ceiling, walls and settlement of the surface premises.

***Key words**: lighting engineering calculation program DIALyx, modern light sources.*

Ryazanov Yu.D.

REDUCING THE NUMBER OF PUSHDOWN SYMBOLS IN ONE-STATE PUSHDOWN RECOGNIZERS

The article deals with the task of equivalent transforming of a one-state pushdown recognizer into a more compact recognizer. The size of a recognizer is reduced due to reducing the number of pushdown symbols. To reduce the number of pushdown symbols a relation for a set of symbols is introduced, which possesses the equivalence property, so that "contraction" of an equivalence class into a symbol produces a recognizer, equivalent to the initial one. An algorithm of partitioning a set of pushdown symbols to equivalence classes and an algorithm of developing a recognizer, equivalent to the initial one, but with smaller (not larger) number of pushdown symbols, have been suggested. The suggested algorithm can be used at developing formal language processing programs.

***Key words:** context-free language, pushdown recognizer, pushdown symbol, transition, equivalent transforming.*

ECONOMIC SCIENCES

Shpichyack S.A.

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***Key words:** context-free language, pushdown recognizer, pushdown symbol, transition, equivalent transforming.*

Karamyshev A.N.
ANALYSIS OF UNIVERSAL METHODOLOGIES OF THE PROCESS-BASED MANAGEMENT OF INDUSTRIAL ENTERPRISES
Large global corporations apply one or several process-based management methodologies in order to improve their business processes and economic performance indicators. As a rule, each methodology is designed for application in a limited field of activity. However, there are several universal methodologies, the application of which is possible in any field of activity. The article presents analysis of the most practically common universal methodologies, in particular, "Hammer", "SCOR" and "BPTrends Associates". The article also reveals their advantages, disadvantages and specifics of application.
***Key words:** process-based management, universal methodology, business process, enterprise improvement.*

Gukova E.A.
METHODOLOGICAL BASIS OF DETERMINING THE ESTIMATE VALUE IN THE BUILDING INDUSTRY
In the fierce competition at the present stage of economic development special attention is paid to the problem of pricing in the construction industry. The article examines such issues as the peculiarities of the mechanism of pricing in construction, pricing items, as well as its principles and objectives. In the course of this study indicated the author's approach to the pricing system as a factor of competitiveness of enterprises in the construction industry
***Key words:** pricing, competitiveness, the system of the estimated pricing, the estimated valuation, the construction industry.*

Adgamova L.R.
ANALYSIS OF LABOR PAYMENT EXPENSES` EFFICIENCY: COMPLEX APPROACH (ON THE EXAMPLE OF GLASS INDUSTRY COMPANIES)
The successful functioning of the economic entity is directly related to the effectiveness of its staff; this is one of the main internal factors that determines the enterprise`s position in the market. The crisis phenomena, which observed in the industries, points to the need for a more efficient labor costs managing system, which, on the one hand, would ensure the achievement of the result, and on the other, would not lead to an unjustified increase expenses. In this study, by setting targets for enterprise activity in three microeconomic markets, indicators are set for a comprehensive assessment of the labor payment expenses` efficiency. The author's model "Balanced Scorecard - Key Performance Indicators" is given in the work, which can be used to build labor remuneration within the framework of achieving a strategic goal involving an increase in business activity. Applicability of theoretical conclusions in practical analytical activity will be based on the example of glass industry enterprises.
***Key words**: expenses` efficiency, labor compensation, balanced scorecard, key performance indicators*

Chizhova E.N., Balabanova G.G.
PRODUCTIVITY AS A CRITERION OF THE LEVEL OF DEVELOPMENT ENTERPRISES OF CONSTRUCTION MATERIALS INDUSTRY

Currently, the problem of increasing the productivity acquired the status of national programmes, since the level of development of the economy, its growth rate is directly dependent on factors determining productivity. This article identifies the reasons for the decline in labor productivity in the building materials industry. Revealed reserves of growth, the relationship between the growth rates of labor productivity and the degree of wear of equipment, wages, measures of increasing productivity in the industry.
Key words: *productivity, depreciation of equipment, capital intensity, capital productivity, training.*

Doroshenko Y.A., Malykhina I.O., Brezhnev A.N.
MODEL OF INITIATION OF INVESTMENT PROJECTS AS THE TOOL OF ACTIVIZATION OF INVESTMENT AND INNOVATIVE ACTIVITY OF THE REGION

In modern conditions of functioning of world economic system the cluster approach to ensure the integrated development of investment and innovative activity of regions is gaining popularity. This is due to the presence of positive experience of application of this approach in the developed world, which have proved the efficiency of the network structures in terms of strengthening of competitive advantages not only the individual regional economic systems, but also the state as a whole. Thus, the use of the cluster approach will provide flexibility and greater efficiency of the innovation process and innovation activities in the region, which will increase its attractiveness. The model of initiation of investment projects can serve as a basis for the implementation of incentives for the implementation of investment and innovation activities in the region to achieve the targets of the strategic development of regional economic system, Strategy of innovative development of the Russian Federation for the period up to 2020.
Key words*: model, initiation, project, region, investment and innovative activity.*

Glagolev S.N., Buhonova S.M., Sidorin Y.M.
THE PRINSIPS OF FINANCING OF REGIONAL INVESTMENT PROJECTS VIS CREDIT ORGANISATIONS PARTICIPATION

Currently, the investment activities of Russian enterprises have taken expressive regional specific features. The mains investment projects of actual social and economical development of country have been realizes on the territories of subjects of federation. The current specific features of regional investment projects have been studied. The necessity for the development and introduction of innovative approaches of financing for region economic has been substantiated. Some perspective approaches for regional investment financing have been characterized.
Key words: *regional investment projects, investment crediting, innovative approaches of development of regional investment projects, regional investment financing.*

Gerasimenko O.A., Avilova Z.N., Semibratsky M.V.
ECONOMIC DEVELOPMENT AND PUBLIC INTERESTS OF THE PUBLIC-PRIVATE PARTNERSHIP CONCEPT OF PROJECTS IN THE ROADFULNING SPHERE

The article is devoted to the description of the most important functions of the public sector in the process of PPP formation: stimulation and acceleration of the rates of social and economic development and protection of state interests. The article outlines prospects for road users and local people, including public participation, social and environmental guarantees, including identification and minimization of negative consequences, for example, land confiscation and resettlement, negative impact on the environment, as well as positive and negative impacts on Categories of the population with low incomes. It also discusses institutional reforms in the sector, human capacity development and training and the expansion of opportunities for private business, including contractual relations, advisory services and financing.
Key words: *public-private partnership, project, infrastructure, concession, road sector.*

Moiseev V.V.
ACTUAL PROBLEMS OF RUSSIAN STATE ECONOMIC POLICY

The article deals with topical problems of state economic policy, the reasons for the insufficient economic development of the Russian Federation in modern conditions. On extensive factual material, the author analyzes the reasons for the need for transformations in the Russian economy with a view to moving from raw to innovative development. A significant place in the study is the analysis of problems, without the solution of

which Russia can not yet become a prosperous country. The author makes a substantiated conclusion that the new economic strategy, which is the basis of state regulation of the economy, can become a catalyst for the growth of the gross domestic product and not solve this many social problems of modern Russian society.
***Key words**: economic strategy, Western sanctions, state regulation of the economy.*

Vinnik A.E., Pryadko S.N.
THE USE OF TOOLS TO ASSESS THE REGIONAL CORE COMPETENCIES OF BUSINESS DEVELOPMENT
The article substantiates the necessity of developing key competencies in the management of regional economic systems within the framework of the resource approach. Classification of the key competencies of the organization, including the construction industry, is presented on the following grounds: carrier, content of key competence, stage of life cycle, sphere of manifestation, etc. In conclusion, the matrix of the attractiveness of the Belgorod region market and the level of coincidence with key competencies in business are presented.
***Key words**: key competencies, resource-based theory of the firm, building industry.*

Yurakova T.G., Chernositova E.S., Levitskaya K.M.
TOPICAL ISSUES OF ENSURING THE QUALITY OF STEEL AS THE MAIN MATERIAL FOR THE PRODUCTION OF ENGINEERING PRODUCTS
The results of statistical processing of data on the quality of the steel used for the manufacture of seamless pipes are presented. The calculated indices of the technological processes of production and estimated actual and the predicted level of defective products. Recommendations on the use of indices of potential of the processes in the quality control of products.
***Key words:** steel, statistical processing of data on the quality, indexes of the capabilities of processes, the level of defective products.*

Parfenyukova E.A., Shirina N.V.
LEGAL BASES AND REGULATION OF EVALUATION ACTIVITIES
The fundamental provisions of regulating evaluation activities in the Russian Federation nowadays are presented, namely, the current system of evaluation activities regulation, consisting of the Federal Law №135-FZ and the system of standard documents, is considered; a clear demarcation between the three levels of evaluation activities regulation system and between the decision authorities in this sphere is provided.
***Key words:** evaluation activities, self-regulated organizations, Federal standards of evaluation, evaluation activities regulation.*