THE USE OF ELECTRONIC TOTAL STATION FOR GEODESIC ACCOMPANIMENT OF CONSTRUCTION

B. F. Azarov, N. A. Malinkin

Altai state technical university of I.I. Polzunov, Barnaul

The article discusses the advantages of using electronic total station when performing geodetic works at the construction site. Noted that the automatic correction of instrument errors when dealing with an electronic tachometer improves the accuracy of the stem axis and transfer project marks on mounting horizons. In addition, the use of electronic total station in determining roll buildings and constructions allows you to automate the process of measurement and processing them.

Keywords: *electronic total station, mounting, installations, axis horizon project, roll.*

THE USE OF BIM TECHNOLOGY (BUILDING INFORMATION MODELING) FOR RECONSTRUCTION OF ARCHITECTURAL MONUMENTS

B. F. Azarov, V. V. Opara

Altai state technical university of I.I. Polzunov, Barnaul

The article is devoted to analysis of destination and features the use of building information modeling (BIM) with the re-establishment and reconstruction of architectural monuments. Noted that full use of BIM technology for reconstruction of architectural monuments connected with the use of laser scanning. Obtained when scanning point clouds and built on them, 3D models can be used during the execution of the works on reconstruction of architectural monuments.

Keywords: *technology building information modeling, terrestrial laser scanning, point cloud, a 3D model of the building, reconstruction of monuments of architecture.*

PRACTICE OF IMPLEMENTING 3D CADASTRE IN RUSSIA

B. F. Azarov, D. V. Yankova

Altai state technical university of I.I. Polzunov, Barnaul

This article examines aspects of the use of three-dimensional cadastre of real estate in Russia. Noted that in our country there is a need for a replacement for the traditional 2D 3D cadastre. This is especially true for major cities and major metropolitan areas. Concluded that in order to maintain the three-dimensional cadastre can be terrestrial technology and mobile laser scanning and shooting with unmanned aerial vehicles (UAVs).

Keywords: *three-dimensional cadastre of real estate, real estate listings, State Cadastre, laser scanning, unmanned aerial vehicles.*

GEOTECHNICAL PROTECTIVE ACTIVITIES SYSTEMS «DRENIS»

L. N. Amosova, E. E. Erdakov

Altai state technical university of I.I. Polzunov, Barnaul

A set of protective measures for geotechnical water disposal for the buried part of the building and on the site of its deployment, a competent organization of wall drains of the Dreniz system.

Keywords*: underflooding, soil washing, ground base, ground, groundwater, waterproofing, drainage system.*

ANALYSIS AND TRENDS OF DEVELOPMENT OF THE MARKET FOR CONSTRUCTION AND PRODUCTION OF WALL CONSTRUCTION MATERIALS

O. V. Buyko, P. I. Kotenyova

Altai state technical university of I.I. Polzunov, Barnaul

Building materials are related to investment goods, that is, the demand for them is related to the construction and repair of facilities. Today, the construction market offers the widest choice of materials used for building walls. In order not to make mistakes when choosing a material, it is necessary to have an idea of what areas of construction the material is used in and to understand its key features.

Keywords: *construction, production of building materials, wall materials, market dynamics, economic trends.*

ANALYSIS OF INVESTIGATIONS IN THE FIELD OF RUBBER APPLICATION BY CRUSHED ACTIVE MARK OF RDA 0,1-1,5 FOR MODIFICATION OF BITUMEN BONDING

O. V. Buyko, E. S. Shchadnev, S. A. Ananiev

Altai state technical university of I.I. Polzunov, Barnaul

The paper presents the analysis of theoretical studies in the field of rubber application of crushed active grades of RDA 0,1-1,5 and modification of bituminous binder. Areas of application of crushed rubber chips are presented. Methods for modifying bituminous binder with additives are considered.

Keywords: *rubber, bitumen, additives, asphalt, binders.*

THE WAY OF THE ALTAI BUILDER. HOW TO OBTAIN A LICENSE FOR CONSTRUCTION

I. O. Verbitskii, E. V. Verbitskaya

Altai state technical university of I.I. Polzunov, Barnaul

The article is devoted to the description of the stages that, according to the legislation of the Russian Federation, each developer in the Altai region must pass before he receives a decision for construction.

Keywords: *construction, building permit, land surveying, cadastral work, project examination.*

ON PROBLEMS OF EFFICIENCY OF USE OF LAND SPACE IN RESIDENTIAL BUILDINGS OF BARNAUL

Yu. A. Verigin, A. S. Biketov

Altai state technical university of I.I. Polzunov, Barnaul

The article is devoted to the actuality of construction of automobile underground parking lots in Barnaul. A project is proposed for the construction of a semi-mechanized underground car parking for 220 cars. Technological requirements and method of construction are described. A marketing analysis of the problem was carried out, and the space-planning and constructive solutions of the object were considered.

Keywords*: automobile underground parking, automation, technology, materials, marketing analysis.*

THE SUBSTANTIATION OF THE SELECTION OF VENTIILATED FACADES FOR THE BUILDING OF OBJECTS IN THE ALTAI KRAI

Yu. A. Verigin, I. V. Tuboleva

Altai state technical university of I.I. Polzunov, Barnaul

Constructive analysis of existing ventilated facade systems. Test results. Features of installation and recommendations of technological use in the Altai Territory.

Keywords*: ventilated facades, elements, fastenings, construction, tests.*

EXPERIMENTAL INVESTIGATIONS OF THE INFLUENCE OF THE AGGRESSIVE PRIMING MEDIUM ON THE NEGATIVE CAPACITY OF METALLIC PILES

E. I. Vyatkina, A. S. Likarenko

Altai state technical university of I.I. Polzunov, Barnaul

The article describes ongoing research in the laboratory of the Department «Foundations, foundations, engineering Geology and geodesy» AltSTU experiment to identify the effects of aggressive soil environment on the bearing capacity of metallic piles. Theoretical analysis of the chemical composition of the water public utilities and industrial enterprises for the selection of chemical composition and concentration, pH of the experimental solutions for soaking of the soil. The following is the plan for the pilot studies and the method of their conduct.

Keywords: *load-bearing capacity of piles, soaking of soil with water of different chemical composition, change in pile section size.*

DESIGN MODELS OF SOIL BASES, IMPLEMENTED IN SCAD OFFICE PROGRAM COMPLEX

A. O. Gavrilkina[1], O. V. Dremova[1], V. S. Mikhailov[2]

[1] Altai state technical university of I.I. Polzunov, Barnaul

[2] Novosibirsk center of technical support of SCAD Office, Novosibirsk

The theoretical bases of several soil models are considered, the key moments of soil modeling in the SCAD Office software package are given. The results obtained are estimated.

Keywords: *soil model, foundation, foundation, Winkler model, Pasternak model, linearly deformable base, software complex, SCAD Office.*

ANALYSIS OF METAL BEAMS WITH PERFORATED WEB

G. A. Ganeman, A. A. Kikot

Altai state technical university of I.I. Polzunov, Barnaul

This article includes an overview of the types and features of metal beams with a perforated web. Different approaches for design methods presented. Economic efficiency of a perforated beam in comparison with a rolled I-beam analyzed.

Keywords: *beam with perforated web, types of perforation, efficiency, design methods.*

WOODEN NOT TRUSS FARM OF THE COVERING FROM BOARDS WITH GLUE JOINTS. TEST ON THE MODEL

K. M. Girda, L. N. Pantyushina

Altai state technical university of I.I. Polzunov, Barnaul

The article is devoted to the description of the developed technique for testing a woodless frame of a coating on a model by the method of simple geometric similarity and the process of manufacturing a model of the proposed construction.

Keywords*: glued wood, coating designs, modeling, static load testing, geometric similarity method.*

MAIN PROBLEMS OF EVALUATION ACTIVITIES IN THE RUSSIAN FEDERATION AND MESUARES FOR ITS IMPROVEMENT

N. A. Danilova, L. V. Kulikova

Altai state technical university of I.I. Polzunov, Barnaul

The article is devoted to the stages of development of appraisal activity in the Russian Federation, showed the structure of business services provided by Russian appraisers, analyzed the main problems in the functioning of the industry, and systematized all changes in the regulatory and legal framework for valuation activities.

Keywords: *appraisal activity, problems of the functioning of the industry, improvement of state regulation and self-regulation mechanisms, higher qualification of appraisers.*

TOPICAL ISSUES OF PROCUREMENT AND CONSTRUCTION CONTRACT WORK

A. S. Evdokimova, Yu. V. Khalturin

Altai state technical university of I.I. Polzunov, Barnaul

The rules for the procurement of construction and contract works is currently undergoing significant changes. In connection with the amendments to the legislation on town-planning activity and in the legislation governing procurement, there were some difficulties related to the determination of the estimated cost of construction and Contracting works. This article is intended to introduce the main innovations in the field of procurement and construction contract works, and also to point out the main problems that arise in law enforcement practice now and which, perhaps, may arise in the near future.

Keywords: *public procurement, auction in the electronic form for procurement of construction and contract works, the determination of the estimated cost*

ACTUAL ISSUES OF THE DEVELOPMENT LOTS AND DESCRIPTIONS OF THE PROCUREMENT OBJECT CONSTRUCTION AND CONTRACT WORK

A. S. Evdokimova, Yu. V. Khalturin

Altai state technical university of I.I. Polzunov, Barnaul

In connection with necessity of increase of efficiency of budget spending is currently acute issue of increasing the efficiency of budget expenditure in procurement for construction and contractor works. Customers independently allocate lots, when out purchasing, however, the Association in the lots must not be inconsistent with the General principles of the Law № 44-FZ. It is impossible to restrict competition and to include one lot of goods, works, services, technologically and functionally not connected, the description of the object of procurement must be objective.

Keywords: *public procurement, auction in electronic form, procurement and construction contract work, a description of the object of purchase, lot.*

ESPECIALLY PROCUREMENT AND CONSTRUCTION CONTRACT WORK UNDER THE FEDERAL LAW NO. 44-FZ FROM 05.04.2013 AFTER THE CANCELLATION OF THE SRO CERTIFICATES OF ADMISSION TO WORKS

A. S. Evdokimova, Yu. V. Khalturin

Altai state technical university of I.I. Polzunov, Barnaul

From 1 July 2017 entered into force the provisions of the law No. 372-FZ. They canceled the SRO certificate for construction, survey and design work. Builders only need membership in a self-regulatory organization, but this requirement will apply not to all. The remaining liability of the SRO members will increase. Introduced the new concept of «Regionalism – a new principle of self-regulation in construction».

Keywords: *public procurement, auction in the electronic form for procurement of construction and contract works, SRO, permit, certificate, SRO, the regional.*

CALCULATION OF RECTANGULAR PLATE BY METHOD BUBNOV-GALKERKIN AND CALCULATED COMPLEX SCAD OFFICE

I. K. Kalko, A. S. Babaeva

Altai state technical university of I.I. Polzunov, Barnaul

In the article the formulas are given, with the help of which the rectangular plate, rigidly embedded along the contour, is calculated, the stress diagrams. An example of calculation of a plate is given. The solution of this task was done in the same way with the help of the complex program SCAD Office.

Keywords: *calculation of thin plate, SCAD, force diagrams.*

CALCULATION OF RECTANGULAR PLATE USING THE METHOD RITZA-TIMOSHENKO AND DESIGN COMPLEX SCAD OFFICE

I. K. Kalko, Yu. A. Pereberina

Altai state technical university of I.I. Polzunov, Barnaul

In the article the formulas are given, with the help of which the rectangular plate is computed, hinged on the contour, the stress diagrams. An example of calculation of a plate is given. The solution of this task was done in the same way with the help of the complex program SCAD Office.

Keywords: *calculation of thin plate, SCAD, force diagrams.*

FEATURES OF USE OF OPERATED BUILDINGS AND STRUCTURES

R. V. Kaplun, O. S. Annenkova

Altai state technical university of I.I. Polzunov, Barnaul

The article discusses the advantage of using operated green coatings in the construction of residential and public buildings.

Keywords: *green roofs, natural conditioning of the room, reducing heat loss, reducing economic cost.*

COMFORT OF PREMISES WITH CO. TRANSLUCENT CONSTRUCTIONS IN WINTER TIME

A. S. Kolycheva, O. S. Annenkova

Altai state technical university of I.I. Polzunov, Barnaul

The article assesses the comfort of premises with translucent fences in winter conditions, examines the mechanisms for transferring thermal energy through a double-glazed window and calculates the amount of discomfort that can be quantified directly near fences in the cold season.

Keywords: *translucent constructions, low-emissive coating, heat loss, heat transfer, cold radiation.*

EFFECT OF CARBONIZATION PROCESS ON THE STRUCTURE OF HYDRATION PRODUCTS AND PROPERTIES OF SILICATE BRICK

V. K. Kozlova, A. V. Wolf, E. V. Bozhok, R. V. Migachev

Altai state technical university of I.I. Polzunov, Barnaul

The influence of carbonation on durability, water resistance and shrinkage strain of silica brick. It is shown that with increasing degree of carbonation of silicate stone is an increase in water resistance and shrinkage. Introduction carbonate-containing additives increases the resistance of silica brick to carbon dioxide corrosion. The phase composition of the products of hydrothermal synthesis lime-sand mixture with the addition of carbonates similar to the composition of hydrosilicate phases formed during carbonization.

Keywords: *bridges, silicate brick, hydration products, carbon dioxide corrosio.*

EXCEL-APPLICATION DEVELOPMENT «MANAGEMENT OF GAS DISTRIBUTION NETWORKS OF THE ALTAI REGION» USING GEOINFORMATION TECHNOLOGY

V. V. Logvinenko, V. G. Savelyeva

Altai state technical university of I.I. Polzunov, Barnaul

Developed a version of Excel application «Operation of gas distribution networks of the Altai region» using geographic information technologies on the basis of major technical decisions, directions and results of gasification of the Altai region, Scientific and technical documentation for the operation of gas pipelines. Shows the main application window, such as «select region», «choosing network timing and results», «information on unit rates online», «Call the operational documentation», «details on gas pipeline», «gas distribution network in Arc View». Describes how to work with Windows. In an application filed while four pipeline.

Keywords: *Excel-application, operation of the gas distribution networks, electronics manufacturing, the application window, the gas distribution network in Arc View, operation of gas pipelines on the basis of geographic information systems.*

DEVELOPMENT OF EXCEL-APPLICATION «EFFICIENCY CONDENSING BOILERS IN LOW-TEMPERATURE HEATING SYSTEMS IN ALTAI KRAI»

V. V. Logvinenko, T. S. Shkironkova

Altai state technical university of I.I. Polzunov, Barnaul

Excel application designed for numerical justification efficiency use of condensing boilers and low-temperature heating systems in Altai Krai. The main blocks-calculation of dew point of flue gases, flue gas enthalpy, their moisture content, calculation of low-temperature heating systems cottage, number of partitions, the estimated density of heat flow sections, natural gas consumption, his savings for each heating season the year 2016 3:00. Shown in the example of a specific cottage, that the use of low-temperature heating systems and condensing boilers in the Altai region was justified.

Keywords: *Excel-application, low-temperature heating systems, boilers, gas saving calculation of hourly during the heating season the year 2016, increase the number of partitions, the justification of the use of condensing boilers in Altai Krai.*

FEATURES AND INNOVATIVE TECHNOLOGIES GAS HEATING

T. E. Lyutova, M. S. Kolokoltsova

Altai state technical university of I.I. Polzunov, Barnaul

The results of the review and analysis of the characteristics and capabilities of modern innovative technologies of gas heating. Are con-structural types, advantages and disadvantages process equipment systems that are sufficiently well established in practice.

Keywords: *gas heating, innovative technology, heat, suspended and floor gas heating.*

FEATURES, PROPERTIES, STRUCTURE AND UST-ROYSTVA TECHNOLOGY OF BULK FLOORS IN TRADE-EXHIBITION COMPLEXES

V. N. Lyutov, M. M. Edacheva

Altai state technical university of I.I. Polzunov, Barnaul

Features, properties, the organization and technology of the device of the bulk floors applied to trade exhibition complexes are considered; structures of each type of coverings of such bulk floors and also the sequence of performance of technological transactions of the device of bulk floors are brought.

Keywords: *trade-exhibition complexes, a bulk floor, types, features and structures of bulk floors, the organization and technology the device of a bulk floor.*

CONSTRUCTIVE-TECHNOLOGICAL PARAMETERS AND FEATURES TECHNOLOGIES FOR HEATING INDIVIDUAL HOUSES WITH POLYURETHANE FOAM IN THE CONDITIONS OF ALTAY REGION

V. N. Lyutov, V. E. Odnodvortsev

Altai state technical university of I.I. Polzunov, Barnaul

The review and analysis of constructive and technological parameters and characteristics of technologies for heating individual houses with polyurethane foam in the conditions of Altay region; the composition , particularly constructive solutions and methods of applying polyurethane foam on the surface of the structures.

Keywords: *polyurethane foam, technological options, technology features insulation, insulation of individual houses.*

ANALYSIS OF METHODS AND INNOVATIVE TECHNOLOGIES OF DEVICE OF STRENGTHENING OF BRICK WALLS AND MULTI-LAYERED CONSTRUCTIONS BY COMPOSITE MATERIALS AND SPIRAL BARS

V. N. Lyutov, Ye. O. Romanova

Altai state technical university of I.I. Polzunov, Barnaul

A review over and analysis of modern methods of strengthening of brick walls of building are brought with the use of composite materials, and also through spiral bars from stainless steel; the features of technology of strengthening are considered, dignities and lacks of each are educed of methods on that it is necessary to lean at the choice of decisions on strengthening of brick walls of building.

Keywords: *strengthening of constructions, bricking, methods of strengthening of brick walls, composite materials, spiral bars.*

ORGANIZATIONAL DESIGN FEATURES OF THE DEVICE TECHNOLOGY OF STRETCH CEILINGS IN ROOMS WITH LARGE AREA

V. N. Lyutov, A. A. Ponimash

Altai state technical university of I.I. Polzunov, Barnaul

The results of the review and analysis of organizational and structural features device technology, modern suspended ceilings with a large area. The analysis of the currently existing technologies of the major systems of fixing suspended ceilings and their constructive solutions when installing in premises with a large area.

Keywords: *ceilings, organizational design features, basic system technology fastening of suspended ceilings in areas with a large area.*

FACTORS AFFECTING THE LONGITUDE OF ASPHALT-TONS AND OPERATING RELIABILITY OF ASPHALT CONCRETE COATINGS

G. S. Merentsova, Y. A. Goryunova

Altai state technical university of I.I. Polzunov, Barnaul

The main factors influencing the formation and longevity of asphalt-concrete are revealed. A significant impact on the operational reliability of asphalt-concrete coatings is rendered with bitumen and contact interaction of the mortar part of asphalt concrete with mineral aggregate. A modification of the organic binder and asphalt concrete is recommended.

Keywords: *asphalt concrete, adhesion, bitumen, aggregate, modification, additives, durability, operational reliability, factors, adhesion, reliability.*

EFFECTIVE METHODS TO COMBAT DESERT IN SOUTHERN REGIONS OF WESTERN SIBERIA

G. S. Merentsova, N. V. Medvedev, N. V. Misul

Altai state technical university of I.I. Polzunov, Barnaul

To reduce the negative impact of ice on roads and to improve road safety in southern areas of Western Siberia, which include the Altai Territory, the Kemerovo Region and the Republic of Khakassia, modern methods of combating ice that have not previously been used in these regions have been developed. The methods considered are quite effective and require small capital investments, which indicates their availability for road organizations that serve roads that are prone to ice formation.

Keywords: *highways; artificial constructions; culverts; Ice; Ice on roads; methods of combating ice.*

MANAGEMENT OF STRUCTURAL FORMATION OF ROAD OF TEMPERATURES

G. S. Merentsova, A. S. Pobedenny

Altai state technical university of I.I. Polzunov, Barnaul

The results of the research allowing to reveal the physico-chemical and mechanical mechanism determining the directed structure formation of road concretes with the purpose of improving the indicators of reliability and durability of the road structural layers are presented. The recommended technological methods allow to purposefully regulate the processes of the formation of road concretes, improving the physico-mechanical and deformative properties of structural layers of highways.

Keywords: *structurization, road cement concrete, strength, gold-binding cement, technological method, durability, durability, reliability, mechanical activation, chemical action, hydrodynamic activation, destructive processes, process kinetics, process control, deformative properties.*

PROTECTION AND RESTORATION OF ASPHALT COVERINGS

G. S. Merentsova, V. V. Popova

Altai state technical university of I.I. Polzunov, Barnaul

Are established by technological way of protection and restoration of asphalt-concrete coverings of highways in III and IV road-climatic zones. This is achieved by using the impregnating formulation of the Dorsan PAB. Impregnation allows to reduce the water saturation of asphalt concrete and protects the coatings from peeling and dyeing.

Keywords: *asphalt pavement, protection, restoration, impregnating composition, testing, peeling and chipping, manual method, mechanical method, adhesion, distribution, avtogudronator, defects, efficiency of impregnation.*

OPTIMIZATION OF TECHNOLOGIES FOR THE CONSTRUCTION OF BASES FROM ASPHALT GRANULES BY THE METHOD OF COLD RECYCLING ON THE ROAD IN THE ALTAI TERRITORY

G. S. Merentsova, A. A. Silaev

Altai state technical university of I.I. Polzunov, Barnaul

The technology of production of works on cold recycling of asphalt-concrete coatings of highways with reinforcement of portland cement and application of polymer-mineral additive has been developed. The installation of an experimental site in the Smolensk district of the Altai Territory was carried out. The use of the additive allowed to increase the solid performance of the constructive layer of pavement, improve the defective properties and increase the crack resistance of the asphalt concrete road surface.

Keywords: *cold recycling, asphalt-concrete coatings, polymer-mineral additive, mechanical properties, automobile road, deformation properties, crack resistance, asphalt-granulate, cores, regeneration technology.*

THE INFLUENCE OF VARIOUS FACTORS ON STRENGTH BUILDING BLOCKS, PRODUCED BY THE METHOD VIBROCOMPRESSION

O. Yu. Mizanova, L. G. Plotnikova

Altai state technical university of I.I. Polzunov, Barnaul

The article presents the results of a study of the influence of the properties of the original material and process parameters on strength after YOUR building blocks, manufactured by the method of vibro-compacting. The possibility to get the desired strength characteristics of the products changing the temperature and humidity of the concrete mix.

Keywords: *hard concrete, heat treatment, strength, modulus of fineness, pulverized and clayey matter.*

THE APPLICATION OF GIS FOR THE ANALYSIS OF ACCIDENT RATES OF THE ROADS IN THE ALTAI KRAI

I. M. Mikhailidi, K. N. Bochkarev

Altai state technical university of I.I. Polzunov, Barnaul

The main task of this work is identifying the most emergency-dangerous regional roads in the Altai Krai. The application of GIS for creating interactive road accident maps is described. Road accident maps are used for analyzing road accidents on the regional highways of the Altai Krai and justifying measures to reduce the number of accidents. Based on the traffic police (GIBDD) data on road traffic accidents for the period 2014-2016, six the most emergency-dangerous regional highways of the Altai Krai were identified, in particular, the road K-02, Barnaul-Kamen-na-Obi – Border of the Novosibirsk Oblast, which has the highest accident rates. Based on the results of GIS analysis and experimental analysis, the construction of transverse rumble strips and shoulder rumble strips was proposed as measures for increasing road safety.

Keywords: *automobile roads, regional roads of the Altai Krai, road accident, accident rate, accident rate indices, geographic information systems (GIS), database, measures for reducing accidents,* rumble strips.

THE SUBSTANTIATION OF THE REFERENCE PARAMETERS OF THE TECHNOLOGY OF LOTS SOIL INJECTION

I. V. Noskov, S. A. Ananyev, A. V. Kanygin

Altai state technical university of I.I. Polzunov, Barnaul

The article considers the supporting parameters of the technology of injection of loess soils in the construction of foundations of residential and public buildings and the grounds of motor roads of general use.

***Keywords**: injector, mortar pump, laboratory tests of soils.*

DESIGN OF THE BASES FROM SCREW CONICAL-SPIRAL PILES IN SEISMIC COUNTRIES

I. V. Noskov, K. A. Vagner

Altai state technical university of I.I. Polzunov, Barnaul

General provisions on design of screw conical-spiral piles at seismic influences are provided, calculation of the bearing ability of screw conical-spiral piles on the vertical squeezing and pulling-out loadings at seismic influences, including by results of field tests, are provided.

***Keywords:** soil, seismic influences, a pile screw, design, the bearing ability, calculation.*

ANALIZ OF EFFICIENCY AND WORKING CAPACITY THE REINFORCED SOIL BASES

I. V. Noskov, A. S. Vdovydchenko

Altai state technical university of I.I. Polzunov, Barnaul

Various ways of improvement of properties of the soil bases are given: constructive methods, replacement, consolidation, fixing and reinforcing of soil. Various ways of reinforcing of the bases, such as reinforcing of the top contact layer are considered; one- and multirow reinforcing by horizontal layers (layered reinforcing); reinforcing by vertical and inclined one-dimensional elements; the mixed reinforcing by two-dimensional and one-dimensional elements of various orientation. One of the main reinforcing materials for today – geosynthetics, are presented.

***Keywords:** soil, basis, deformations, reinforcing, soil massif, geosentetik, reinforcing methods, efficiency, working capacity.*

CALCULATION OF THE SCREW CONICAL-SPIRAL PILES (PSCS) ON DEFORMATIONS ON JOINT ACTION OF VERTICAL AND HORIZONTAL FORCES AND THE MOMENTAT SEISMIC INFLUENCES

I. V. Noskov, M. V. Mashkin

Altai state technical university of I.I. Polzunov, Barnaul

General provisions of calculation for deformations of screw conical-spiral piles on joint action of vertical and horizontal forces and the moment , for coherent and incoherent soil at seismic influences, are provided. Calculation of the bearing ability of a pile of SVKS on horizontal load depending on pile trunk durability of a bend, with definition of movement of the head of a pile of SVKS at seismic influences, are provided.

***Keywords:** soil, seismic influences, a pile screw, the loading bearing ability, calculation.*

HIGHT SLUMP CONCRETE MIXES ON THE BASE OF HIGH-CALCIUM FLY ASH

G. I. Ovcharenko, D. B. Boykov, M. V. Nagel

Altai state technical university of I.I. Polzunov, Barnaul

The compositions of plasticized high slump concrete mixes P4, P5 with an increased fraction of fine-dispersed component (PC + ash) up to 600-700 kg / m^3 were developed with a corresponding decrease in the share of crushed stone to 750-900 kg / m^3. The optimal co-relations between PCs and ash are determined, which ensure savings of 16-18% of cement and 6-7% of crushed stone. The positive effect of the high calcium ash in concrete is shown to eliminate the negative phenomena typical for mixtures with high fluidity: water separation, separation concrete mixes, shrinkage.

***Keywords**: high- fluidity mixes, high-calcium ash, shrinkage, water separation, separation concrete mixes.*

INFLUENCE OF THE SYNTHESIZED WOLLASTONITE ON THE STRENGTH OF PRESSED MATERIAL FROM CONCRETE SCRAP

G. I. Ovcharenko, A. V. Viktorov, N. S.Kolaev

Altai state technical university of I.I. Polzunov, Barnaul

The strength of pressed stone at 20, 40 and 60 MPa of concrete scrap with the addition of a fine mortar calcined at 1000°C cement-sand mortar (selected by sifting the original concrete scrap through a sieve with the size of cells 5 mm, with separation of the solution part). Dependences of development of strength of a stone on the amount of additive added, fractions of concrete scrap and specific pressure of pressing are established. The optimal pressure of pressing the stone and the required fraction of concrete scrap are determined.

***Keywords:** concrete scrap, pressing, synthesized wollastonite, strength, optimal fraction.*

ANALYSIS OF GEOECOLOGICAL SITUATION IN BARNAULA

M. A. Osipova, K. I. Blok

Altai state technical university of I.I. Polzunov, Barnaul

The state of the geoecological situation in the city of Barnaul and the Altai Territory is described. The volume of emissions of pollutants is analyzed. The territory of the city of Barnaula is described, the city's development is analyzed taking into account green plantations and industrial enterprises.

Keywords: *geoecology, infrastructure, pollution, emissions.*

ASSESSMENT OF THE EFFICIENCY OF THE DRAINAGE SYSTEM TERRACE OF NAGORNO PARK IN CITY BARNAUL

M. A. Osipova, S. I. Koryagin

Altai state technical university of I.I. Polzunov, Barnaul

The engineering-geological conditions of the territory of the Nagorny Park in Barnaul are described. The type of soil of the upper terrace is determined. The device of the drainage system on the territory of the Nagorny Park is described. The effectiveness of the existing drainage system was assessed.

Keywords: *geological survey, determination of soil type, drainage system, landslide.*

THE MAIN STAGES OPTIMIZATION OF SYSTEMS OF WARM SUPPLY BY MEANS OF THE ELECTRONIC ZULU MODEL ON THE EXAMPLE OF SITES OF THERMAL NETWORK OF THE SITY OF BARNAUL

O. E. Panfilova, I. A. Bakhtina, T. Yu. Ivanova

Altai state technical university of I.I. Polzunov, Barnaul

Main types of calculations by optimization of systems of heat supply by means of the electronic Zulu model on the example of various sites of thermal network of Barnaul are given. The main stages of optimization of systems of the centralized heat supply are given.

Keywords: *system of heat supply, optimization, electronic model, settlement model, hydraulic mode, thermal mode, program Zulu complex.*

CHANGES IN THE MARKET COST OF OBJECTS OF THE REAL ESTATE IN URBAN DEVELOPMENT OF BUILD-UP TERRITORIES

V. V. Perfiliev, P. T. Avkopashvili, I. O. Nemchenko, A. V. Iliakhin

Altai state technical university of I.I. Polzunov, Barnaul

The problems which appear during the development of built-up territories are examined. The analysis of positive experience in their solutions is conducted. The suggestions about rising Barnaul's territory using efficiency are made.

Keywords: *objects of the real estate, the development of built-up territories, renovation, tumbledown and emergency accommodation, settlement, developer, financing.objects of real estate.*

HEATPUMP INSTALLATIONS FOR THE ORGANIZATION AUTONOMOUS SYSTEMS OF HEATING, VENTILATION AND CONDITIONING

O. A. Propostina, I. A. Bakhtina, V. M. Ivanov

Altai state technical university of I.I. Polzunov, Barnaul

The main classifications of thermal pumps are given, the main schemes and the principles of the organization of autonomous systems of heating, ventilation and conditioning by means of thermal pumps are shown, advantages of thermal pumps and the prospect of their application to Barnaul are proved. The main stages of optimization of systems of the centralized heat supply are given.

Keywords: *thermal pumps, autonomous systems, system of heating, ventilation system, air conditioning systems, renewable sources, classification.*

USE OF ASPHALT CRUMB IN ROAD CONSTRUCTION

V. A. Puchkin, A. N. Ivkuchev, K. A. Tugunov

Altai state technical university of I.I. Polzunov, Barnaul

Possible ways and methods of using asphalt-concrete granulate in road construction are considered. Positive and negative factors of application of rubber crumb in road construction are revealed.

Keywords: *asphalt crumb, asphalt concrete, asphalt-concrete granulate, curbs, abutments.*

ANALYSIS OF METHODS OF WINTER CONCRETING AND CHOICE OF OPTION DEPENDING ON CONDITIONS OF PRODUCTION OF WORKS

M. M. Reshetov, O. S. Annenkova

Altai state technical university of I.I. Polzunov, Barnaul

In article the main characteristics of modern domestic types of winter concreting with the indication of their main advantages and shortcomings are considered. Short recommendations about the choice of a method of winter concreting depending on conditions of production of works are provided.

***Keywords**: methods of winter concreting, thermos method, antifrosty additives, methods of artificial warming up.*

CONTACT-CONDENSATION HARDENING MATERIALS BASED ON LOW BASIS CALCIUM SILICATE

A. O. Sadrasheva

Altai state technical university of I.I. Polzunov, Barnaul

The article deals with the mechanism of contact-condensation hardening of low-basic calcium hydrosilicates, which make it possible to obtain a wide range of building materials.

***Keywords:** contact hardening, calcium hydrosilicates, pressing, strength, water resistance.*

TECHNOLOGY OF GREENING FACADES OF BUILDINGS

V. A. Tur, A. V. Wolf

Altai state technical university of I.I. Polzunov, Barnaul

The main technologies of greening facades of buildings are considered and studied. The purpose of this study is the development of constructive, technical and technological solutions for the installation of «living green walls» of building facades, adapted to the climatic conditions of the Siberian region.

***Keywords:** facade system, green facade, green wall.*

ANALYSIS OF COSTS ON THE PRE-INVESTMENT STAGES OF MANAGEMENT OF THE PROJECT OF CONSTRUCTION WITH DETERMINATION OF THE SCALE OF THE PLANNED OBJECT

G. E. Franzen, A. O. Berdnikova

Altai state technical university of I.I. Polzunov, Barnaul

In this article, the proportions of the necessary investment of funds for the investor at the stages of the pre-project stage and the design stage are determined. Relevance of the topic: the need to make informed decisions based on consolidated indicators at the pre-investment stage of project management.

***Keywords:** pre-project stage, pre-investment stage, costs, investment justification, land plot, land surveying, request for investment intentions, feasibility studies.*

PROBLEMS OF OPERATION OF THE RESIDENTIAL FUND

G. E. Franzen, N. A. Danilova

Altai state technical university of I.I. Polzunov, Barnaul

The basic problems of management and operation of the housing stock are considered. The main goals of the management company and the owner of the real estate are disassembled. Analysis and creation of reserve resources before the developer to ensure the quality of the constructed property. The identified basic defects that can occur at different time periods after putting the MKD into operation. The revealed advantages and disadvantages of ways of managing an apartment building.

***Keywords:** management company, real estate owner, developer, property, maintenance and operation of MKD, quality of housing and communal services, shortage of the construction site, maintenance and life support of MKD, warranty period, obligations, quality assurance, maintenance, overhaul.*

ANALYSIS OF ENGINEERING DECISIONS APPLIED FOR EMERGENCY ENERGY EFFICIENCY OF RESIDENTIAL HOUSES ON THE STREET SMIRNOV, 67 IN BARNAUL

Yu. V. Khalturin, A. E. Gridneva

Altai state technical university of I.I. Polzunov, Barnaul

Experience of designing and construction of the first energy-efficient multi-apartment apartment house in the Altai Territory is described. The description and characteristics of the engineering solutions used in the design and construction of this house are given.

***Keywords:** energy saving, energy efficiency, apartment building, engineering solutions, energy-saving equipment.*

THE CHOICE OF SYSTEM OF AUTOMATIC CONTROL WHEN DEVELOPING INDIVIDUAL THERMAL POINT

A. A. Khoroshina, I. A. Bakhtina, V. V. Sokolova

Altai state technical university of I.I. Polzunov, Barnaul

The systems of automatic control of the systems of heating of buildings are analysed. The most optimum system of automatic control for design of the automated individual thermal point is chosen.

***Keywords:** system of automatic control, system of heating, individual thermal point, system parameters.*

MEASURES TO ELIMINATION OF NEGATIVE INFLUENCE OF FROST HEAVING FORCES ON THE BUILDING FOOTINGS AND CONSTRUCTIONS PREVAILING IN SIBERIAN CONDITIONS

B. M. Cherepanov, M. N. Kazantseva

Altai state technical university of I.I. Polzunov, Barnaul

This article traverses the actual for Siberia problem of building and construction works on the heaving grounds. The purpose of this study is the research of the frost-heaving phenomenon by itself and priority methods of struggle against it in our region.

Keywords: *frost-heaving phenomenon, level of heaving, saturated soil, frost heaving force, struggle against frost-heaving phenomenon.*

THE ANALISIS OF THE CONE PENETRATION TEST EFFECTIVENESS AT CALCULATIONS OF PILE LOAD CAPACITY

B. M. Cherepanov, K. A. Smolskaya

Altai state technical university of I.I. Polzunov, Barnaul

In construction practice at pile foundation work various methods of pile formula are used. The calculation method is simpler, it doesn't require any additional efforts for carrying out in-place tests, but it doesn't provide the most economical version of foundations. Experimental methods are more laborious but in the end they often allow reducing the estimated cost of foundation work. The main purpose of this study is to compare the foundation cost of buildings designed on the basis of pile load capacity (calculated by the usage of penetration test) and calculation method. This type of research will help optimize the foundation cost.

Keywords: *pile, grillage, cone, foundation, pile load capacity, field loading test, cone penetration test, calculation method, collapsible soils.*

HISTORY OF THE DEVELOPMENT OF MOBILE BUILDING

A. S. Shipulina, A. A. Kikot

Altai state technical university of I.I. Polzunov, Barnaul

The article considers the history of the development of mobile construction in Russia and abroad. The reason for the emergence of mobile buildings. Advantages and disadvantages in comparison with permanent building. Problems of mobile buildings are highlighted.

Keywords: *mobile buildings, temporary, unified, interchangeable, prefabricated, typification, unification, pneumatic structures.*

DEVELOPMENT OF A PROGRAM COMPLEX ON STRENGTHENING OF METAL BEAMS OF DOUBLE-T SECTION

N. V. Yakovlev, I. V. Kharlamov

Altai state technical university of I.I. Polzunov, Barnaul

The technique of test calculation of metal beams with defects is developed. The comparative analysis of results of calculation of a beam with defects by the developed technique and by the technique given in «A grant on design of strengthening of steel structures (to Construction Norms and Regulations of II-23-81 is made)». The technique of the accounting of defects in a program complex and tasks of elements of strengthening is developed (on the sites demanding it). The program complex on strengthenings of metal beams realizing the developed technique for test calculation and allowing to carry out test calculations taking into account the entered strengthening elements is created.*

Keywords: *strengthening of metal beams, test calculations, the reduced section, strengthening elements, programming, «Need beam strengthening?»*

Статьи опубликованы в авторской редакции

Компьютерная верстка, макет: И. В. Карелина

Издательство Алтайского государственного
технического университета им. И. И. Ползунова
656038, г. Барнаул, пр-т Ленина, 46

Подписано в печать 16.11.2017. Формат 60×84 1/8.
Усл. п. л. 29,64.
Тираж 100 экз. Заказ 2017 –

Отпечатано в типографии АлтГТУ
656038, г. Барнаул, пр-т Ленина, 46
тел. (8-3852) 29-09-48