THE DEPARTMENT «TECHNOLOGY AND MECHANIZATION OF CONSTRUCTION» – 55 YEARS

V. N. Lyutov

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

It details the stages of the formation of the Department. The basic directions of educational, methodical and research work of the Department, the main achievements of the Department.

Keywords: *department, staff, educational process, scientific school, teaching school.*

TO DEPARTMENT «BUILDING MATERIALS» – 55 YEARS

G. I. Ovcharenko

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

Stages of formation of department are given. The main directions of educational, methodical and research work of department are shown, the main achievements of department are given.

Keywords: *department, collective, educational process, school of sciences, methodical school.*

TO DEPARTMENT «CONSTRUCTION DESIGNS» – 45 YEARS

I. V. Kharlamov

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

Short digression to history of formation and development of Construction Designs chair is carried out. The most interesting achievements of chair in educational and methodical and research activity are shown.

Keywords: *research and educational personnel, educational and methodical work, scientific researches.*

TO DEPARTMENT «BASES, FOUNDATIONS, ENGINEERING GEOLOGY AND GEODESY» – 40 YEARS

I. V. Noskov

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

Stages of formation of department are given. The main directions of educational, methodical and research work of department are shown, the main achievements of department are given.

Keywords: *department, collective, educational process, school of sciences, methodical school.*

CREATION AND DEVELOPMENT OF «HEAT AND GAS SUPPLY AND VENTILATION» FOR 20 YEARS

V. V. Logvinenko, T. E. Lyutova

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

Department of gas supply and ventilation» was founded in year 1996 in connection with gasification edge with natural gas, development of construction of building engineering systems. From 1999 to the year 2017 698 released 60 bachelors, engineers in 08.03.01 «construction», trained graduate students. The Chair conducted all kinds of training load to standards 106 subjects in full-time, full-time-part-time (evening) and correspondence forms of training. The Department employs two honorary worker of higher and professional education of the Russian Federation. The main scientific directions of the Department are energy saving in processes of heat and ventilation, engineering networks, mathematical modelling, the use of technology «smart House», the use of geoinformation systems in distributed engineering networks, the use of mini-CHP in engineering networks of settlements. The Chair participates in extracurricular work with students, vocational orientation of pupils and graduates.

Keywords: *department of gas supply and ventilation, creation of the department, department staff, graduates, accomplishments of faculty, curriculum, academic and extra-curricula work, vocational students, the employment of graduates.*

DEPARTMENT «AUTOMOBILE ROADS AND AERODROMES» IN THE PRE-ADDITION OF THE TWENTIETHEALTH

G. S. Merentsova

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

The stages of formation and development of the department are described. The main directions of educational, research and methodical work, as well as the most important achievements of the department are given.

Keywords: *chair, road branch, teaching staff, educational process, research work, methodological developments, international activity.*

TERRESTRIAL LASER SCANNING TECHNOLOGY IN A SURVEY OF BUILDINGS AND CONSTRUCTIONS

B. F. Azarov

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

The article discusses the possibility of using ground-based laser scanning technologies while performing architectural measurements of buildings with complex shape, the implementation of supervision during the construction period, as well as to obtain a 3D model of an object. To this end was made ground laser scanning of the chapel of St. Tatiana, situated on the territory of Polzunov ASTU. Blueprints for building fasade was performed by laser scanning of the monument of architecture of «the House of merchant Poskotinov». Noted, that when pro-

cessing the scan results can be used by specialized functionality on the ScanMaster. In addition, there is also the ability to import the scan data in AutoCAD or ArhiCAD.

Keywords: *terrestrial laser scanning, point cloud, polyline, an architectural measurement, measurement drawing.*

STATISTICAL PROCESSING OF THE RESULTS REGISTER SCANNER STATIONS WHEN DETERMINING THE VOLUMES OF WORKS ON REPAIR OF THE ROADWAY

B. F. Azarov, I. V. Karelina

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

The article describes the mathematical processing of results bring the scan data into a single coordinate system-so-called scanner registration stations (standing points of the device) for road section «Aleysk-Rodino Antitrust Improvements Act-Kulunda-border of the Republic of Kazakhstan». According to the results of registration of scanner stations scheme «Serif» deskewed statistical series registration parameter estimation error of law their distribution method of Fisher, score by constructing confidence intervals and also received numeric characteristics of statistical series to make conclusions about the accuracy of registration.

Keywords: *terrestrial laser scanning, skanner station, inverse linear-angular serif, distribution law, confidence interval, fischer method.*

TIME SPENT ON THE PRODUCTION OF TERRESTRIAL LASER SCANNING TO ASSESS THE SCOPE OF WORK IN THE REPAIR OF ROAD SECTION «ALEYSK-RODINO-KULUNDA THE BORDER OF THE REPUBLIC OF KAZAKHSTAN»

B. F. Azarov, M. A. Osipova

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

In the article the question of quantifying time spent on works by laser scanning on a stretch of highway «Aleysk-Rodino-Kulunda-border of the Republic of Kazakhstan», and also clean the scanning time. Describes the features of the production of terrestrial laser scanning to determine the volumes of works on repair of the roadway plot territorial Highway 371 IP. Shows the quantitative characteristics of the time spent on production work on terrestrial laser scanning these sites.

Keywords: *terrestrial laser scanning, laser scanner GLS-1500 TOPCON, scan time, pavement repair, surveying.*

ENGINEERING PROTECTION OF THE URBANIZED TERRITORIES AGAINST FLOODING

L. N. Amosova, E. E. Erdakov

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

The most characteristic negative geological processes for urban areas and an action for protection of the bases of buildings and constructions against flooding are given in article.

Keywords: *natural and technogenic processes, underground waters, flooding, actions for protection of the bases of buildings, a waterproofing: torkretny; asphalt; obmazochny; okleechny.*

HISTORICAL ASPECTS OF THE DEVELOPMENT OF THE DRAINAGE SYSTEMS

L. N. Amosova, E. E. Erdakov

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

This article describes the history of the development of drainage systems, organizational, economic and technical measures to improve the hydrological, soil and climatic conditions with the aim of enhancing the efficient use of land and water resources.

Keywords*: history and development of drainage systems, drainage, drainage, drainage pipe pottery, mechanization of drainage works.*

CIRCULAR HORIZONTAL DRAINAGE DEVICES-ENGINEERING PROTECTION FROM GROUNDWATER UNDERFLOODING OF BUILDINGS AND STRUCTURES

L. N. Amosova, E. E. Erdakov

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

This article describes the most typical adverse geological processes for urban areas and activities to protect the foundations of buildings and structures from impoundment.

Keywords*: circular horizontal drains, groundwater underflooding, measures for protection of building foundations.*

STRUCTURE EXCAVATION AND TERMS OF THEIR IMPLEMENTATION AND TECHNOLOGY BASIS OF THE FORMATION OF EARTH-MOVING MACHINES PARK

O. S. Annenkova

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

This article deals with the methods of forming rational Park earthmoving machines in accordance with technological and organizational conditions operated by excavation.

Keywords: *earthmoving, construction site, machinery, structure or construction, the terms of execution of works.*

IMPROVEMENT OF THE PERFORMANCE OF TECHNOLOGICAL PROCESSES ON THE BASIS OF A CHOICE OF KIT MACHINES

O. S. Annenkova

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

The article is comprehensive mechanization of technological processes of manufacture of works and choice of optimal sets of machines in accordance with technological and organizational conditions operated by excavation.

Keywords*: cars, building the object, process, structure, work, performance cars, terms of execution of works.*

RESEARCH OF THE USE OF THERMAL PANNELS IN MONOLITHIC CONSTRUCTION

A. A. Baeva, A. A. Kikot

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

Two cases of installation technology of thermal panels manufactured at site discussed in this paper. Duration of installation, labor expenditures and costs for each case is determined. Based on these data, the comparison is provided.

Keywords: *thermal panel, thermal profile, installation, labor expenditures, duration of installation.*

ORGANIZATION OF RATIONAL PARK TERRITORIES

K. I. Block, L. V. Kulikova

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

The article is devoted to organization of rational park territories within the urban space, carried out a marketing study on the subject, analyzed the regulatory framework, developed an effective system for managing the park territories.

Key words*: park territories, territory organization, recreational infrastructure, management program.*

PREREQUISITES FOR USE OF GLUED WOODEN CONSTRUCTIONS IN MODERN CONSTRUCTION

I. O. Verbitsky, E. V. Verbitskaya

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

This article discusses the relevance of applying the glued wooden constructions based on their positive performance.

Keywords: *wood, glued constructions, glued wooden constructions.*

THE BASIC CONCEPTS AND THE SYNERGETIC APPARATUS APPLYING TO TECHNOLOGICAL PROCESSES OF CONSTRUCTION

Yu. A. Verigin

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

The paper outlines the basic principles of thermodynamics of complex technological processes of construction and mechanization means, considered from the point of view of synergetics. The basic concepts, principles and rules of application for optimization of the considered processes and technologies are given.

Keywords: *energy, entropy, non-entropy, nonlinearity of processes, technology, system parameters, optimization.*

HIGH-MOBILITY CONCRETE MIXES FOR COMPOSITE PORTLAND CEMENT WITH ADDITIVE OF ASHES AND DOLOMITE

A. V. Volf, E. V. Bozhok, V. K. Kozlova

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

We investigated the possibility of increasing the amount of cement paste in the composition of high-mobility concrete mixes due to the use of a two component additive consisting of high calcium ashes from the combustion of brown coal and dolomite Taininskoe field. It is shown that this additive can successfully be used in the production small amount clinker composite Portland cement for special purposes, recommended for self-compacting concrete mixes.

Keywords: *high-mobility of the concrete mix, composite portland cement.*

ANALYSIS OF THE RESULTS OF SURVEYS OF BRIDGE STRUCTURES IN ALTAI TERRITORY

A. V. Wolf, V. K. Kozlova, K. A. Mahov

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

The analysis of the survey results of a number of bridge structures operating in Altai territory. It is shown that for all considered objects is characterized by active processes of concrete corrosion. Data destruction of concrete bridge structures indicate the need for revision and enhancement of requirements to the quality and durability of concrete structures such structures.

Keywords: *bridges, survey, protection of concrete from corrosion.*

INVESTIGATION OF THE INFLUENCE OF THE AGGRESSIVE PRIMING ENVIRONMENT ON THE ABILITY OF THE PILE

E. I. Vyatkina, A. S. Likarenko

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

The article presents theoretical studies of the influence of the aggressiveness of the ground environment on the bearing capacity of piles. The decrease in the cross section of the pile and the increase in the rate of development of corrosion were determined depending on the concentration of corrosive media. The analysis of the chemical composition of the water of urban communications and industrial enterprises was carried out to select the pH of the solutions for experimental soaking of the soil.

Keywords*: load-carrying capacity of piles, soaking of soil with water of different chemical composition, change in the size of the pile section and the rate of development of corrosion.*

INFLUENCE OF PARAMETERS OF SECTION ON EFFECTIVENESS THE CENTRAL SOMPRESSED THIN-WALLED COLD-FORMED C-PROFILE

A. A. Galkina, A. A. Kikot

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

In this work analyzed the results of calculation on the stability of cold-formed C-profile in compression behavior the height of section 250 and 300 of mm. The regularity of influence of size on the profile section effectiveness. Determine the most effective parameters section.

Keywords: *cold-formed steel profile, C-section, central compression, effictiveness, ABAQUS, CUFSM.*

COMPARISON OF TECHNICAL AND ECONOMIC INDICATORS OF APPLICATION OF THE GLUED PLYWOOD BEAM AND WOODEN NOT TRUSS FARM OF THE COVERING FROM BOARDS WITH GLUE JOINTS

K. M. Girda, L. N. Pantyushina

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

The comparative analysis of the existing covering designs from glued wood is made. Calculation and comparison of technical and economic indicators of a glued plywood beam and wooden not truss farm of a covering from boards with glue joints is made. As the main criteria of comparison profitability, weight of a design and complexity of installation are accepted.

Keywords*: glued wood, covering designs, glued plywood designs, glued board designs.*

ANALYSIS OF SPACE-PLANNING AND STRUCTURAL DESIGN SOLUTIONS OF THE FIRST IN THE ALTAI KRAI ENERGY-EFFICIENT MULTICOMPARTMENT BUILDING

A. E. Gridneva, Yu.V. Khalturin, L.V. Khalturina

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

Description and analysis of space-planning, structural and utility engineering solutions of the first in the Altai krai energy-efficient multicompartment building are provided. Rationality of space-planning design solutions and compliance with energy-efficiency requirements are assessed.

Keywords: *energy-saving, energy-efficiency, multicompartment building, engineering solutions, structural solutions, space-planning solutions.*

ORGANIZATIONAL-FINANCIAL MODEL OF PROVIDING THE WARRANTY SYSTEM OF THE DEVELOPER

N. A. Danilova, Ya. G. Mozgovaya

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

Theoretical bases and practical experience of realization of guarantee obligations of the builder to owners on maintenance of quality of the constructed object of the real estate are considered. A number of problems were identified in the event of the occurrence of a guarantee event after the commissioning of an object of construction of inadequate quality. Approaches to the creation of the model «developer-shareholder» are proposed, which allows solving the organizational and financial problems of guaranteeing the developer's obligations.

Keywords: *quality assurance, lack of construction object, guarantee period, liabilities, financial collateral model, owner, developer.*

RESEARCH OF STRENGTH CHARACTERISTICS THE HYPER PRESSED BRICK

N. V. Zhdanova, R. A. Disenov

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

Researches of strength characteristics of the hyper pressed brick depending on technological conditions of his production are given in article. Dependences of durability at compression of the hyper pressed brick from the content in raw mix of a portlandtsement and specific pressure of pressing of samples are established.

Keywords*: the hyper pressed brick, strength characteristics, durability at compression, the maintenance of a portlandtsement, specific pressure of pressing.*

ANALYSIS OF THE INFLUENCE OF VARIOUS TEMPERATURE WATER MODE WHEN SOAKING LOESS SOILS FOR THEIR SUBSIDENCE

Ya. O. Zhdanova, E. I. Vyatkina
Altai state technical university of I.I. Polzunov, Barnaul

In this paper, the main property of loess subsidence soils is the subsidence and the effect of the soaking water temperature on its magnitude. A regularity is established between the deformation modulus and the compressibility coefficient and the water temperature when soaking. The speed and magnitude of the maximum subsidence during soil soaking are determined.

Keywords: *loess subsidence grounds, subsidence, temperature mode of water, size of subsidence, soil subsidence rate, modulus of deformation.*

OVERLOOK AND ANALYSIS OF EVENTS AIMED AND FOUNDATION PRESERVATION FROM NEGATIVE INFLUENCE OF FROST HEAVING FORSE

M. N. Kazantseva, B. M. Cherepanov
Altai state technical university of I.I. Polzunov, Barnaul

This article is devoted to actual problem of building constructions on heaving soils in our region. The aim of research is studying of frost-heaving phenomenon and methods of controlling with this process.

Keywords: *frost-heaving phenomenon, level f heaving, wet ground, heaving powers.*

IN-PLACE TESTS OF BUILDING CONSTRUCTIONS

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

This entry states the results of coverage double slope beam in-place tests and examination. Upon the results, the recommendations to usage opportunities are given.

Keywords*: examination, test, structural design load, reinforcement, instruments, flexometers, transit, concrete grade.*

WAYS OF SOLUTION OF BARNAUL TRANSPORTATION PROBLEM

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

This entry states ways of solving transportation problem in Barnaul. The design option is the usage of Isakova-Yadrintseva Street with the passage to Northern and Southern Passby Highway and the building of two new bridges.

Keywords*: transportation problems, highway, northern passby, new bridges, Barnaul development strategy.*

«SMART HOUSE» SUB-SYSTEMS REALIZATION EXAMPLES ON THE ARDUINO BOARD

E. R. Kirkolup, A. A. Kudriavtseva
Altai state technical university of I.I. Polzunov, Barnaul

The article considers some «smart house» sub-systems examples realized on the Arduino board. The authors give the temperature and humidity check, water leakage detection and fire alarm sub-systems description. There is given a variant of such sub-systems using in a one-story country-house.

Keywords: *smart house, the Arduino board, the temperature and humidity check sub-system, water leakage detection sub-system, fire alarm.*

INCREASE IN EFFICIENCY OF USE OF ENERGY RESOURCES AT THE ENTITIES OF THE DAIRY INDUSTRY OF ALTAI REGION

S. M. Kislyak, A. V. Bobrova
Altai state technical university of I.I. Polzunov, Barnaul

In article the main power indicators of the enterprises of the dairy industry of Troitsk, Tretyakovsky and Shelabolikhinsky districts of Altai Krai are considered. The analysis of the actual indicators (indicators) for different types of raw materials is made, comparison with standard values is carried out them.

Keywords: *fuel and energy resources, the indicator of energy efficiency, power consumption, energy efficiency, creamery.*

THE EFFECT OF SOAKING SOLUTIONS WITH DIFFERENT pH ON THE SETTLING OF LOESS SOIL

S. V. Klimenko, E. I. Vyatkina
Altai state technical university of I.I. Polzunov, Barnaul

The article presents studies of the effect of soaking water of various chemical composition on the development of subsidence of loess soils. Dependence of the general deformation of loess soil was revealed when it was soaked with solutions of vatious pH. The analisys of qualitative structure of sewage of the enterprises which are in Altay territory is executed.

Keywords: *loess subsidence ground, soaking with chemical solutions with different pH content, changing the value of the total deformation.*

RESTORATION OF DURABILITY, MOISTURE PERMEABILITY AND FROST RESISTANCE OF THE BLANKET OF REINFORCED CONCRETE BASE CONSTRUCTIONS

A. V. Krayvanov, I. V. Noskov

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

Are provided the description of polymeric compositions for hardening of a surface of concrete, a cement and sand coupler, plaster, a brick, foam concrete blocks by 2-3 times, compositions of SILOR applied to sealing, hardening and protection of concrete and other porous materials against corrosion for the purpose of extension of service life for already operated and for the new buildings and constructions.

Keywords: *concrete, polymeric composition, impregnation, hardening, durability, frost resistance, reliability.*

RESTORATION OF DURABILITY, MOISTURE PERMEABILITY AND FROST RESISTANCE OF THE BLANKET OF REINFORCED CONCRETE BASE CONSTRUCTIONS

A. V. Krayvanov[1], I. V. Noskov[2]

[1] Limited liability company «GeoProyektStroyAltay», Barnaul

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

Are provided the description of polymeric compositions for hardening of a surface of concrete, a cement and sand coupler, plaster, a brick, foam concrete blocks by 2-3 times, compositions of SILOR applied to sealing, hardening and protection of concrete and other porous materials against corrosion for the purpose of extension of service life for already operated and for the new buildings and constructions.

Keywords: *concrete, polymeric composition, impregnation, hardening, durability, frost resistance, reliability.*

THE MODERN MODEL OF MANAGEMENT RESIDENTIAL PROPERTY

L. V. Kulikova

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

The article is devoted to the main features of residential real estate management, the main problems in this industry are analyzed, the stages of effective operation of residential real estate are given, which allow to ensure its rational use throughout the life cycle.

Keywords*: residential property management, real estate market structure, efficient operation, rational use of residential real estate.*

ANALYSIS OF COLD-FORMED PURLING SYSTEMS

T. E. Legalova, A. A. Kikot

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

Analyzed schematic arrangement of purlins from cold-formed profiles, calculations for Z-shaped profiles on the vertical gravity and lift (wind load) are made. The most rational schemes of arrangement purlins for Z-shaped profiles are determined.

Keywords: *steel thin-walled cold-formed profile, purlin, Z- shaped cross-section, CFSteel 3.1.*

THE CALCULATION OF THE FACADES IN THE SOFTWARE PACKAGE SCAD SUBJECT ICE LOADS

O. V. Lobanova, G. M. Busygina

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

The article describes the calculation of the facade to the action of ice and wind loads. Loads are defined with different coefficients depending on the applicable normative documents. Comparison efforts is provided for the supporting structure of the facade. The calculation is performed using the software package SCAD.

Keywords: *suspended facade, ice loads, wind loads, SCAD.*

MAIN ASPECTS OF INCREASING THE TECHNOLOGICAL RELIABILITY OF GAS DISTRIBUTION NETWORKS

T. E. Lyutova

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

The current problems of operational technological reliability of gas distribution networks are analyzed. The main reasons for the occurrence and prediction of failures are considered and methods for increasing the reliability of operation and throughput of gas pipelines are considered. The analysis of en. The prerequisites for creating an integrated system for monitoring gas distribution networks to enthe factors influencing the operation of gas pipelines and valves on their reliability of operation is givsure reliable and safe distribution of gas are determined.

Keywords: *gas pipeline, gas networks, failures, operational reliability, monitoring system.*

CONSTRUCTIVE-TECHNOLOGICAL FEATURES AND PERSPECTIVITY OF THE USE OF MODERN FLOODING FLOORS IN THE TRADING AND ENTERTAINMENT COMPLEXES OF BARNAULA

V. N. Lyutov, M. M. Yedacheva

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

The review and analysis of structural and technological features, possibilities and prospects of using modern liquid floors in shopping and entertainment complexes in relation to the conditions of Barnaul; types of self-leveling floors, their technological and operational parameters, features of laying. technology.

Keywords: *constructive technological features of self-leveling floors, installation of a bulk floor, types and characteristics of self-leveling floors, shopping and entertainment complexes.*

TYPES AND CHARACTERISTICS MODERN STRETCH CEILINGS, ANALYSIS, CONSTRUCTIVE SOLUTIONS THE TECHNOLOGY OF THEIR INSTALLATION IN AREAS WITH A 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 the types and features of modern stretch ceilings, their technological and operational parameters. The analysis of the currently existing technologies of the major systems of fixing suspended ceilings and the peculiarities of their design decisions when installing in premises with a large area.

Keywords*: constructive-technological features tension-persuasions, the unit elements of the stretch ceiling, the basic systems of mounting tension ceilings in rooms with a large area.*

OPTIMIIZATION OF STRUCTURAL FORMATION OF STRENGTHENING SOILS G. S. Merentsova

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

A set of studies was carried out to determine the ways and means for the widespread use of local materials and industrial waste in road construction. Rational compositions of fortified soils of increased strength and frost resistance.

Keywords: *fortified soils, structure formation, additives, destruction, frost resistance, mechanical durability, strength, industrial wastes.*

INCREASING THE STABILITY AND DURABILITY OF ROAD CONCRETE

G. S. Merentsova

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

The main factors affecting the operational reliability of road concrete are described. It is established that the condition of road surfaces is determined by a complex of properties of road concrete: strength, crack resistance and frost resistance. The knowledge of the mechanism of the processes of the formation of road concretes allows us to manage these processes so that eventually we obtain concrete with given mechanical properties.

Keywords: *road concrete, cement concrete, asphalt concrete, operational reliability, crack resistance, frost resistance, contact zone, durability.*

ANALYSIS OF REASONS FOR EDUCATION AND RECOMMENDATION OF MEASURES OF STRUGGLE WITH THEM ON ROAD ROADS AND ARTIFICIAL CONSTRUCTIONS

G. S. Merentsova, N. V. Medvedev

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

In order to reduce the waterlogging of the roadbed of highways and, to improve road safety, an analysis of the main conditions under which they were formed was conducted in the areas of ice formation. The most frequent sites of ice formation in the regions of Western and Eastern Siberia, the Far East and Central Russia were considered. To solve this problem, the most effective methods of combating icing are proposed, which give a positive result and improve the road conditions.

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

LAND MANAGEMENT IN THE CITY OF BARNAUL

G. I. Muradova

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

01 January 2015 entered into force the Resolution of a city administration of Barnaul «On approval of the municipal program «Management of land resources of the city of Barnaul for the period 2015-2019». The main objectives of the Programme are the improvement of land administration of the city and ensuring revenues to the city budget funds from land use. The article reflects the policy of the municipality in the field of land management, outlines the key interventions and implementation mechanism of the Program.

Keywords*: land resources, state cadastre, efficiency, land, lease, property, financial risk.*

THE DESIGN OF THE COMPOSITION OF HEAVY CONCRETE USING MICROSOFT EXCEL

D. M. Nazarov, V. V. Sokolova

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

Considered highlights of the calculations when designing the composition of the concrete. Developed the software in Microsoft Excel using the Visual Basic programming language. The resulting program allows to significantly reduce time in the design of the composition of heavy concrete on the basis of tests of all materials entering into its composition.

Keywords: *concrete mix, Microsoft Excel, concrete, true density, cement.*

TONGUE-AND-GROOVE FENCES WITH STEEL ELEMENTS

I. V. Noskov, K. A. Vagner

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

Constructive solutions of a tongue-and-groove fences of construction pits with use of steel elements are provided. It is shown that at design of a tongue-and-groove fence from steel elements efficiency of application in each case depends on town-planning, geological, hydrogeological, technological and other conditions of the building site.

Keywords: *soil, pile, construction pit, steel element, the dip technology.*

GENERAL PROVISIONS FOR THE CALCULATION OF HELICAL CONE-SPIRAL PILES

I. V. Noskov[1], A. V. Kopylov[2]

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

[2] Limited liability company «GeoProyektStroyAltay», Barnaul

The nomenclature of piles, the description of screw conical and spiral piles, the basic general provisions by calculation of the bases on the screw, conical and spiral (PSCS) piles and their bases according to the existing normative documents are provided.

Keywords: *a spiral, the forged cone, hot galvanizing, a pile screw, calculation, limit states.*

MATERIALS AND CONSTRUCTIONS CONTACT HARDENING FROM CONCRETE WASTE (part 1)

G. I. Ovcharenko, A. V. Viktorov, A. A. Dorofeev, M. G.Pupinin

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

The strength of pressed stone at 20 and 40 MPa from the mortar part of concrete scrap fraction 0-5 mm with the addition of 10 and 20% of high-alumina slag (HSH), 5 and 10% Portland cement (PC) was investigated. It has been established that 1- and 90-day strength of compacted materials from concrete scrap increases 2.5-3 times with the addition of HSH. Such a material can be used in the construction of a road foundation with the coefficient frost resistance of at least 0,75.

The addition of PC to such compositions does not significantly change the strength of the stone. At the same time, a pressure limit of 40 MPa was detected, at which the negative effect of mixing of PC and HCV disappears.

Keywords: *concrete scrap, contact hardening, high-alumina slag additive, stone strength, frost resistance, road base.*

MATERIALS AND CONSTRUCTIONS CONTACT HARDENING FROM CONCRETE WASTE (part 2)

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

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

The strength of a stone pressed from a mortar part of a concrete scrap of three fractions: 0-1,25; 0-2,5 and 0-5 mm with the addition of 10 and 20% high-alumina slag (HGS), as well as 10 and 20% of calcined at 1000° C wollastonite of the same fractions of the scrap. It is established that all the compositions provide strength for the production of wall material of M125-M150 grades with frost resistance of 25 cycles.

Keywords: *concrete scrap, contact hardening, high-alumina slag additive, stone strength, frost resistance, wall material.*

CONTACT-CONDENSING PROPERTIES OF HYDRAULIC PHASES OF CEMENT STONE

G. I. Ovcharenko, A. O. Sadrasheva, O. E. Aladikova, G. V. Frolova

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Compositions capable of contact hardening have been studied. Compositions form a strong and water-resistant stone at the moment of approach of particles during pressing. Such properties are possessed by the main hydrates of the cement stone – the C-S-H phase. It is shown that synthesized calcium hydrosilicates C-S-H, as well as in combination with portlandite and in combination with alumina gel, form a strong stone after pressing without additional heat and moisture treatment.

Keywords*: contact hardening, calcium hydrosilicates C-S-H, portlandite, pressing, high-alumina slag, strength, water resistance.*

THE EFFECTIVENESS OF THE MINERAL WOOL SLABS OF INCREASED RIGIDITY WITH A GIVEN STRUCTURE

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The article deals with the modeling of the heat transfer process of mineral wool slabs of various structures and the control of the structure of slabs.

Keywords: *mineral matrix, conductive component of air thermal conductivity, product form stability, correlation coefficient, constructive quality coefficient.*

CONSTRUCTIVE METHODS OF PROTECTION OF SLOPES BARNAUL FROM DEVELOPMENT OF LANDSLIDE PROCESSES

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The main constructive methods of engineering protection of slopes against development of landslides are considered. The events against landslide held in Barnaul are listed.

Keywords: *slope, slope, landslides, geosynthetics, methods of deduction of the landslide massif.*

EFFECTIVE SYSTEMS OF DRAINAGES FOR ENGINEERING PROTECTION OF LANDSLIDE SLOPES IN CITY BARNAUL

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The characteristic of landslide districts of Barnaul is given. Geomorphological features and engineering-geological conditions of the city are described. The main systems of drainages for engineering protection of landslide slopes are considered.

Keywords: *landslides, geomorphology, remoistening, drainage, drainage.*

ISSUES OF THE PROVISION OF LAND PLOTS FOR CONSTRUCTION AND THEIR SOLUTIONS

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The issues of the provision of land plots for construction are considered. The procedures of bidding organizing in Russia are analyzed. The main issues of the course of bidding for the provision of land plots to developers are distinguished. Possible solutions are suggested.

Ключевые слова*: land plot, construction, development of built-up areas, bidding, developer, lease.*

COMPLEX DEVELOPMENT OF THE AREA OF POTOK IN BARNAUL

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Issues that appear during the development of built-up territories are examined. Positive experience of their solution is analyzed. The suggestions for improvement of the efficiency of Barnaul's territory usage are made, especially for the area of Potok.

Keywords: *general plan, development of built-up territories, renovation, emergency housing, settlement, developer, financing.*

ECONOMIC TUSTIFICATION TECHNOLOGICAL SOLUTION OF ERECTION OF MONOLITHIC EXTERIOR WALLS VERTICAL CYLINDRICAL CHANNELS FILLED WITH POLYSTYRENE CONCRETE

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Developed construucdtive-technoloqical solution of erection of monolithic claydite-concrete exterior walls with vertical cylindrical channels populated polystyrene concrete, which provides increased heat indicators monolithic txterior walls in the process of implementation of concretinq. The cost effectiveness of the proposed solution derived from the calculation of net discounted revenue, profitability index, payback period of investment.

Keywords: *economic feasibility, construction processes, monolithic claydite-concrete exterior walls, investment, NPV, profitability index.*

OBTAINING BINDING MATERIALS BASED ON THE SYNTHESIZED PHASE OF C-S-H AND HIGH-ALUMINA SLAG BY METHOD OF CONTACT-CONDENSING TIERNATION

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In studies it was shown that the compositions based on the synthesized phase of C-S-H combined with the highly aluminous technogenic component (high-alumina slag) during pressing make it possible to obtain a strong water-resistant stone.

Keywords: *contact hardening, calcium hydrosilicates C-S-H, portlandite, pressing, high-alumina slag, strength, water resistance.*

INTENSIFICATION OF PROCESSES OF PROCESSING OF FINELY DISPERSED MEDIA IN THE PRODUCTION OF CONSTRUCTION MATERIALS

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The process of fine grinding materials, the calculation of the energy of grinding from the standpoint of mechanics vibroisolating process, established the inter-relationship between the parameters of vibroisolating and energy shredding the laws of motion, on the basis of which the technique of substantiation of parameters of modes of vibra-tional grinders.

Keywords*. grinding, dispersion, aggregation, power density, grinding bodies, intensification.*

THEORETICAL AND METHODOLOGICAL PROBLEMS OF ESTIMATION OF COST OF REALISATION OF INVESTMENT CONSTRUCTION PROJECTS IN THE FEASIBILITY STAGE

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This article examines the existing integrated indexes and rates to assess the estimated cost of construction, questions of drawing up of inves-tor estimates. A comparative analysis of the results of the calculation of the estimated cost of an apartment building with rough estimate-normative base (NCS-2014) and results of the consolidated estimate calculation made with the help of elemental estimate-normative base (GESN-2001).

Keywords: *investment project, pricing, investor estimates indicators and prices.*

PILE FORMULA AND ANALISIS ACCORDING TO THE CONE PENETRATION TEST AND CALCULATION METHOD: EVIDENCE FROM TERRITORY OF BARNAUL

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At the present time the cone penetration test is one of the most promising methods in engineering geology because it allows analyzing undisturbed soil at great depth with comparatively low material costs. The main purpose of this study is to compare the data of ultimate pile resistance obtained from the cone penetration test and pile load capacity determined by the calculation method.

Keywords: *pile, pile load capacity, field loading test, cone, cone penetration test, calculation method.*

MISSTEPS IN DESIGN, ASSEMBLY AND MAINTENANCE OF BUILDING STRUCTURES

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The article identifies the main causes of defects and damages in building structures at the design, assembly and maintenance stage.

Keywords: *defects of buildings structures, causes of defects and damages in building structures, missteps in design building structures, missteps in assembly building structures, missteps in maintenance building structures.*

LOW QUALITY OF CONSTRUCTION ACTIVITIES AS THE RESULT OF INAPPROPRIATE CONTROL AND SUPERVISION

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A problem of quality improvement of construction activities is reviewed: inappropriate implementation of state construction supervision was one of the reasons of reaching the ultimate limit state of a significant part of the building only three months after commissioning.

Keywords: *quality of construction activities, construction supervision, non-compliance with project documentation, technical regulations (national standards, body of rules).*

OVERLAPPINGS FROM STEEL PROFILED SHEETS, BENT ON A SINUSOID, AND MONOLITHIC FOAM CONCRETE

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In the article the technique of calculation of overlap from steel profiled sheets bent on a sinusoid and monolithic foam concrete is presented. Modeling of the existing grades of the profiled sheet bent on the sine curve by means of the Autodeck AutoCAD software is performed. The main geometric characteristics of sections of slabs have been calculated and graphically. A relationship between the load-bearing capacity of a profiled sheet and the magnitude of the amplitude of a sinusoid is derived.

Keywords*: profiled sheet, bearing capacity, sinusoidal, flexural rigidity, foam concrete, noise insulation of multilayer structures.*

UPDATING OF THE EXISTING RESIDENTIAL DEVELOPMENT OF BARNAUL

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

INVESTIGATION OF THE MODES OF HEAT EXCHANGE OF THE WALL WITH THE LAYER OF THE GRANULATED FAN

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The problem of energy saving in the modern construction of the RF is the most urgent. Existing enclosing structures meet the requirements for thermal resistance formally, but they do not withstand the requirement for vapor permeability and the requirements for equal durability of all elements of wall structures. In this situation, the development could be the development of such a thermal insulation design, which would have zero resistance to vapor permeability, would be as long as possible, provide automatic thermal contact of the insulation with the wall, and possess the effect of dynamic thermal insulation. Could be ventilated all year round.

Keywords: *bulk insulation, vapor permeability, thermal resistance.*

INVESTIGATION OF OPERATING PROPERTIES OF VENTILATED FRONT FACADES

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For effective insulation of the existing housing stock, a heat-insulating material with high vapor permeability, durability and maintainability is required. Such a material can be a backfill heater made of expanded polystyrene foam granules, which provides the effect of dynamic thermal insulation and is able to self-ventilate all year round. In our work, we investigated the effect on the thermal resistance of the material or the diameter of the insulation fraction, the effect on the thermal resistance of the heat flow power and the blowing speed for all materials and the diameter of the insulation fraction, determined the proportion of each of the three heat transfer methods in all insulation materials (radiant, convective).

Keywords*: thermal resistance of insulation, heat conductivity, heat transfer.*

RESEARCH INSTALLATIONS FOR THE DETERMINATION OF EFFICIENCY OF SELECTIVE COVERINGS OF SOLAR COLLECTORS

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The article describes the research facilities for determining the main indicators of the efficiency of selective coatings of solar collectors created in the laboratory of energy audit of AltSTU for the purpose of preparing master's theses.

Keywords: *renewable energy, solar energy, solar panels, selective coatings*