

# Contents

2012  
6(35)  
december

**Bulletin  
of Civil  
Engineers**

Scientific-technical journal

The Founder — the Federal State Budgetary Educational Institution of Higher Vocational Education „Saint-Petersburg State University of Architecture and Civil Engineering” (SPSUACE)

The Editor-in-Chief

Ye. I. Rybnov, Dr. Sci. Ec., Professor, Honorary Worker of Higher School of the Russian Federation

Assistants to the Editor-in-Chief

Yu. P. Panibratov, Dr. Sci. Ec., Professor, Winner of the State Award of the Russian Federation and the Award of the Government of the Russian Federation, Honorary Worker of Sciences of the Russian Federation, Academician of RAACS

Ye. B. Smirnov, Dr. Sci. Ec., Professor, Honorary Worker of Higher School of the Russian Federation

V. I. Morozov, Dr. Sci. Tech., Professor, Winner of the Award of the Government of the Russian Federation (The Senior Editor)

Editorial Board

M. I. Alekseev, Dr. Sci. Tech., Professor, Winner of the Award of the Government of the Russian Federation, Honorary Worker of Sciences of the Russian Federation, Academician of RAACS

A. N. Asaul, Dr. Sci. Ec., Professor, Honorary Builder of the Russian Federation, Honorary Worker of Sciences of the Russian Federation

M. D. Bal'makov, Dr. Sci. Chem., Professor G. I. Belyy, Dr. Sci. Tech., Professor, Honorary Worker of Sciences of the Russian Federation

B. G. Vager, Dr. Sci. Phys.-Math., Professor, Honorary Worker of Higher School of the Russian Federation

A. I. Vahmistrov, Dr. Sci. Ec., Professor, Winner of the Award of the Government of the Russian Federation

V. V. Verstov, Dr. Sci. Tech., Professor, Honorable Builder of Russia

A. A. Veselov, Dr. Sci. Tech., Professor

Ye. G. Guzhuva, Dr. Sci. Ec., Professor

T. A. Datsuk, Dr. Sci. Tech., Professor

A. P. Dolgov, Dr. Sci. Ec., Professor

S. A. Evtuykov, Dr. Sci. Tech., Professor, Honorary Worker of Higher School

G. V. Yesaulov, Dr. Arch., Professor, Academician of RAACS

Yu. V. Zaytsev, Dr. Sci. Tech., Professor, Winner of the Award of the Government of the Russian Federation, Extraordinary and Plenipotentiary Ambassador

S. P. Zavarikhin, Dr. Arch., Professor, Honorary Architect of the Russian Federation

F. V. Karmzinnov, Dr. Sci. Tech., Professor, Winner of the Award of the Government of the Russian Federation

N. I. Karpenko, Dr. Sci. Tech., Professor, Winner of the Award of the Government of the Russian Federation, Honorary Worker of Sciences of the Russian Federation, Academician of RAACS

B. N. Karpov, Dr. Sci. Tech., Professor

A. N. Kim, Dr. Sci. Tech., Professor

V. A. Koshcheev, Dr. Sci. Ec., Professor

L. M. Kolchedantsev, Dr. Sci. Tech., Professor

## ARCHITECTURE, URBAN PLANNING, DESIGN

A. S. Appolonov. Architectural environment of St.-Petersburg with the account of social - demographic residence features of low mobility population groups in apartment houses of mass series ..... 5

S. F. Grishin, D. D. Ovcharenko. About the European experience of preserving the mass housing development of industrial building construction of the second half of the XX century ..... 8

## BUILDING DESIGNS

R. A. Styapin. Improving competitiveness of bendable glued wooden designs by unifying the cross section dimensions ..... 14

H. Yu. Stress and strain condition of thick-walled cylindrical and spherical containers for nuclear reactors under internal pressure and high temperature effect..... 23

## STRUCTURAL MECHANICS AND CALCULATION OF STRUCTURES

I. A. Isakov. Nonlinear deformation model of cross-section for calculation of reinforced concrete beams ..... 28

L. M. Kagan-Rosenzweig. About integral boundary conditions in problems of elasticity theory ..... 33

I. V. Ledovskoy, T. S. Rusakov. Determination method of elastic properties of inhomogeneous media ..... 39

M. M. Manchenko. The study the elasto-plastic bar stability in case of eccentricity application of the fast increasing load ..... 47

G. A. Naumova, S. A. Ponomarenko. The hydrodynamic way of damping bridge spans' oscillations ..... 51

B. O. Rageh. An energy approach for analysis of harp system cable stayed bridges... 60

V. D. Kharlab. To the issue of integral kinematic boundary conditions in the mixed problem of the elasticity theory ..... 68

## GEOENGINEERING

R. A. Mangushev, A. A. Veselov, D. A. Sapin. The influence of the «slurry wall» construction section form on the extra settlement of neighboring buildings ..... 71

A. V. Mel'nikov. Influence of foundation heat insulation on temperature conditions change of the seasonally frozen soil base in the area of deep seasonal freezing ..... 77

M. V. Paramonov. Investigation of linear and volume deformations of frost heaving in the laboratory conditions..... 84

A. N. Saurin, A. I. Korpach. Research of the strained-deformed condition of the foundation base on the crosstie distribution element ..... 87

## TECHNOLOGY AND ORGANIZATION OF CONSTRUCTION

A. F. Yudina, N. V. Rozantseva. Reconstruction of pitched roofs of civil buildings .... 92

## BUILDING MATERIALS AND PRODUCTS

V. A. Gladkikh, A. I. Al'bakasov, E. V. Korolev. Assessment of fillers' chemical activity for sulfur binders ..... 96

## SANITARY ENGINEERING AND ECOLOGY

A. V. Ivanova. Research of low-power gas boilers for operation in conditions of Far North ..... 102

E. V. Tarasova, A. S. Shtym. Alteration of thermodynamic parameters of the cooled air in direct contact with a natural source of cold..... 107

E. A. Fokicheva. Features of constructing a mathematical model of dephosphatation reagent process of highly concentrated wastewater ..... 113

## AUTOMOBILE TRANSPORT, TRANSPORTTECHNOLOGICAL

## CONSTRUCTION AND COMPLEXES

B. K. Azanov. Substantiation of reconstruction technologies of automobile roads with use of organic mineral technogenic materials ..... 120

A. M. Belova. Technique bases of planning the organization of allocated strips for public transport movement..... 123

N. E. Kokodeeva, A. V. Kochetkov, L. V. Yankovskiy, S. P. Arzhanukhina. Methodological bases of the risk estimation taking into account technical regulation requirements ..... 130

P. A. Kravchenko, A. M. Plotnikov. Combined traffic control on multi-lane controlled junctions minimizing road danger level..... 139

N. V. Podoprigora. Development of method for evaluation of braking parameters during road traffic accident reconstruction ..... 143

M. A. Timoshin. Perspectives of applying cement concrete structures in road construction ..... 150

## ECONOMICS AND MANAGEMENT

E. B. Aleksandrova. Self-organizing character of construction firm development from the position of system-synergetic theory..... 153

I. V. Andreeva, O. B. Betina. Value approach as the basis for overcoming the limitations in the theory and practice of personnel motivation ..... 159

V. V. Buzyrev, E. V. Kashina. Optimization of transactional expenses on the basis of the construction business value indicator..... 163

O. M. Vasil'eva. Control of substandard quality products at construction enterprises ..... 171

S. A. Vladimirov. About a possible balanced macroeconomic model ..... 175

G. P. Komina, Dr. Sci. Tech., Professor  
 L. N. Kondrat'eva, Dr. Sci. Tech., Professor  
 P. A. Kravchenko, Dr. Sci. Tech., Professor,  
 Honorary Worker of the Higher School  
 of the Russian Federation  
 Yu. I. Kurbatov, Dr. Arch., Professor, Honorary  
 Architect of the Russian Federation,  
 Correspondent Member of RAACS  
 L. P. Lavrov, Dr. Arch., Professor,  
 Honorary Architect of the Russian Federation,  
 Correspondent Member of RAACS  
 N. N. Lapshev, Dr. Sci. Tech., Professor, Honorary  
 Worker of Sciences of the Russian Federation  
 S. N. Leonovich, Dr. Sci. Tech., Professor  
 L. L. S. Lyahovich, Dr. Sci. Tech., Professor,  
 Honorary Worker of Sciences of the Russian  
 Federation, Academician of RAACS  
 R. A. Mangushev, Dr. Sci. Tech., Professor, Honorary  
 Worker of the Higher School of the Russian  
 Federation, Correspondent Member of RAACS  
 A. M. Maslennikov, Dr. Sci. Tech., Professor,  
 Honorary Worker of Sciences of the Russian  
 Federation  
 S. N. Nikiforov, Dr. Sci. Tech., Professor  
 Yu. V. Puharenko, Dr. Sci. Tech., Professor, Winner  
 of the Award of the Government of the Russian  
 Federation, Correspondent Member of RAACS  
 S. V. Repin, Dr. Sci. Tech., Professor  
 S. V. Sementsov, Dr. Arch., Professor  
 V. I. Travush, Dr. Sci. Tech., Professor, Winner  
 of the Award of the Government of the Russian  
 Federation, Academician of RAACS  
 V. S. Fedorov, Dr. Sci. Tech., Professor,  
 Academician of RAACS  
 S. V. Fedosov, Dr. Sci. Tech., Professor, Winner  
 of the Award of the Government of the Russian  
 Federation, Honorary Worker of Sciences  
 of the Russian Federation, Academician of RAACS  
 V. D. Kharlab, Dr. Sci. Tech., Professor  
 A. G. Chernykh, Dr. Sci. Tech., Professor  
 E. M. Tchernyshov, Dr. Sci. Tech., Professor,  
 Honorary Worker of Sciences of the Russian  
 Federation, Academician of RAACS  
 V. M. Shelkovich, Dr. Sci. Phys.-Math., Professor  
 Editor T. V. Ananchenko, O. S. Kappol'  
 Translator T. V. Lappo  
 Proof-reader M. P. Popova  
 Computer imposition V. I. Zholobov  
 The address of the Founder and the Editorial Office:  
 2nd Krasnoarmeiskaia St. 4  
 190005, St.-Petersburg, Russia  
 Ph./ Fax: (812) 575-16-74, (812) 316-53-11  
 E-mail: vestnikspb@mail.ru,  
 morozov@spbgasu.ru  
 The contents and abstracts of articles are presented  
 on the site: <http://www.spbgasu.ru>  
 The journal is registered by Federal Agency of Supervision  
 of Legislation Observance in the sphere of mass  
 communications and protection of cultural heritage  
 of the Russian Federation.  
 The certificate on registration of mass media  
 ПИ № ФС77-18997 is dated 29.11.2004. The Journal  
 is included by the HAK of the Russian Federation  
 into the List of leading reviewed scientific magazines  
 and editions in which the basic scientific results  
 of dissertations on competition of scientific degree  
 of Doctor of Sciences are to be published  
 Requirements on representation of materials are presented  
 at the end of journal. Manuscripts not corresponding  
 to subject range of the journal and not meeting  
 the specified requirements are not accepted; articles  
 rejected by the editor are *not returned* to the author  
 Authors of the published works receive one copy  
 of journal at the personal reference in editorial office  
 In case of reprints the reference to the „Bulletin of Civil  
 Engineers” is obligatory  
 On the cover one can see the monument to the Emperor  
 Nicholas I whose name was appropriated to the Institute  
 of Civil Engineers (nowadays SPSUACE)  
 on December, 17th, 1892

M. S. Vlasova, O. V. Sukhanov. Technical means for struggle against plagiarism with a view of improving the educational process quality .....	187
I. A. Gonchar. Problem issues of providing modernization processes in construction and methods of solving them .....	193
S. V. Gorev. Practical aspects of construction cost estimation.....	200
P. V. Gromakov. Technology platform as a perspective means for enhancing competitiveness and innovation activity of enterprises .....	208
R. V. Ershov. Energy saving in heat supply systems as an objective in realization of the enterprise's investment programs .....	212
S. A. Ershova, T. N. Orlovskaya. Interrelation of territorial planning and strategic development of the transport complex in St. Petersburg .....	217
V. V. Znovets. The role and features of self-regulation in construction industry in the Russian Federation.....	222
A. S. Ivanov. Evolution of the development function in the regional investment and building sector .....	227
O. I. Kolmogorov. Energy-efficient upgrading at the overhaul of the housing stock objects.....	234
E. M. Korshunova. Formation and realization of management strategy of historical housing stock reconstruction.....	238
D. I. Lokot'. Methodological approaches to formalization of self-regulatory tools for reducing the risk of external interaction at realization of investment and construction projects.....	242
P. B. Lyulin. Characteristics of IBC subjects as living systems.....	249
A. O. Mikhailova. Self-organizing systems and their influence on self-regulation in construction.....	255
S. I. Morozov. Major stages of developing the methodology of forecasting the scientific and technical progress.....	258
A. A. Oltianu. About pricing at major repairs of apartment houses .....	264
N. V. Osipova. Analysis of provision of the population with culture objects as a function of investment management in building of social infrastructure objects..	271
V. V. Pavlov. Problems and directions of the capital construction development in the Russian Federation .....	277
I. S. Petrov. Phase analysis of housing construction volumes in Saint-Petersburg for the period from 1991 till 2010 .....	281
S. S. Pirogov. Differentiation of stock management strategies on an example of spare parts storage of a car dealer.....	286
N. V. Ryaskova. Study of foreign experience in scientific personnel training: structural and economic aspects.....	290
V. K. Sevek. Problem issues of building organizations' development at escalating housing construction volumes.....	294
G. F. Tokumova. Composition and structure of the construction cluster's subjects (on the example of the organizations in the North-West of Russia) .....	303
S. Kh. Khalimova. About economic feasibility of the overhaul and modernization of apartment buildings with the purpose of improving energy efficiency.....	314
A. V. Kharitonovich. The role of labour potential in the investment building complex development.....	320
E. V. Khokhlova. The analysis of the efficiency criterion of commercial lending to enterprises' production activities taking into account profit taxation features .....	324
<b>PEDAGOGICAL, SOCIOLOGICAL AND PSYCHOLOGICAL SCIENCES</b>	
V. A. Artemyeva. The research of the locus of control level as a characteristic of life attitude (on an example of students of SPSUACE) .....	327
L. V. Vlasenko. About human resources of the construction industry in Saint-Petersburg.....	330
N. N. Dar'enkova. The activities of curators of academic groups on adaptation of first-year students to the educational environment at the technical higher school.....	337
A. T. Zhapparova. Bank managers' views about the components of professional success .....	343
T. V. Lappo. Practical aspects of teaching a foreign language in a technical higher school with the purpose of realizing the principle of education's intensification .....	349
E. A. Solov'eva, E. K. Veselova. Ethical and psychological aspects of training engineer-architects.....	353
I. V. Troitskaya, Ch. N. Mongush. Motivation and professional self-determination of the future architects, engineers, economists .....	359
<b>THE HUMANITARIAN SCIENCES</b>	
S. Yu. Kargapol'tsev. Archaeological investigation on the territory of the unbuilt St. Kharlampi's monastery in Gatchina (season of 2012) .....	365
I. Yu. Lapina. «...He was always well certified and worth being promoted and awarded with an order of excellent service» (About the first Director of the Higher School of Civil Engineers) .....	371
<b>CHRONICLE</b>	
We congratulate on the anniversary .....	375
Abstracts .....	377
Submitting materials requirements.....	399
Subscription rules.....	400