

Contents

BUILDING AND ARCHITECTURE

ARCHITECTURE, URBAN PLANNING, DESIGN

- K. Yu. Gubinskaya.* Formation stages of the historical urban development of the city of Vyborg in the period from the XVI to the XVIII century..... 5
- A. M. Zalmanzon.* The Hunter Castle on the Krestovsky Island..... 14
- D. S. Kovalev.* Reconstruction of the pre-revolutionary period apartment buildings (on the example of the central districts of Saint-Petersburg)..... 21
- D. A. Lava, N. E. Kozyrenko.* Construction of Orthodox churches in Canada in the period from 1891 to 1917 30
- S. V. Sementsov, V. S. Speranskaya.* Lenin's plan of monumental propaganda and traditions of the imperial capital city culture 37

BUILDING DESIGNS

- N. V. Begunova, V. N. Vozmishchev.* Comparative evaluation of fire resistance of concrete structures reinforced with fiberglass and steel rebar ... 48
- G. I. Belyy, D. V. Urazgil' deev.* About stability calculation of curved bar elements of steel arches of continuous section by the flexure-torsion form ... 54
- I. A. Ladnykh.* To the problem of calculating the composite reinforcing members..... 60
- V. I. Morozov, Eh. K. Opubl, Phan Van Phuc.* To the calculation of thick conic-shaped plates on the action of evenly distributed loading..... 66
- S. V. Tsvetkov.* Determination of the lateral compression efficiency factor at triaxial proportional compression of heavy concrete 74

STRUCTURAL MECHANICS AND CALCULATION OF STRUCTURES

- L. M. Kagan-Rosenzweig.* Calculation of critical forces in elastic rods with variable cross section by means of direct integration of differential bending equation 78
- A. M. Maslennikov, B. O. Rageh.* Comparison between two algorithms for evaluating of the optimum initial tension of cables in cable-stayed bridges. 87

GEOENGINEERING

- M. B. Zavodchikova, D. V. Andreyko, R. A. Usmanov, L. N. Kondrat'eva, V. M. Kirillov.* Estimation of additional foundation bottom deformation using analytical and numerical methods..... 93
- V. V. Konyushkov, A. V. Pyatnitsa.* Numerical simulation of the alternative design of territory engineering protection measures against landslide processes 100
- Yu. V. Saenko.* Evaluation of driven pile bearing capacity in the foundation of existing buildings 106
- I. V. Khritin.* The influence of temperature deformed state of the strut system on additional forces in the shoring structures of excavation pits 112

TECHNOLOGY AND ORGANIZATION OF CONSTRUCTION

- S. A. Bolotin, A. Kh. Dadar, A. R. Malsagov.* Expert technique of averaging the measurement results obtained by various methods and tools 122
- S. G. Osmanov.* Effective regimes of concrete mix transportation with inertia conveyor 128
- E. I. Rybnov, A. N. Egorov, N. S. Gorovaya.* Development of contour crafting technology 135

BUILDING MATERIALS AND PRODUCTS

- L. Yu. Matveeva, M. A. Efremova, N. S. Scherschneva.* The study of dispersivity nature and morphology of waterproof composite material based on polyurethane rubber by high-resolution optical microscopy method..... 141
- G. M. Khrenov.* Method of determining the concrete mixture plasticity..... 147

Vestnik grazhdanskikh inzhenerov 2018 2 (67) April

Bulletin of Civil Engineers

Scientific-technical peer reviewed journal

The Founder — the Federal State Budgetary Educational Institution of Higher 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 (SPSUACE)

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 (SPSUACE)

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

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

Editorial council

A. A. Akaev, Dr., Prof., Foreign Member of the RAS (Lomonosov Moscow State University, Russia)

L. Ungvari, Dr. Sci., Professor, (Technical University of Applied Sciences Wildau, Germany)

N. V. Kazhar, Dr. Arch., Professor (Czestochowa University of Technology, Poland)

G. Kipiani, Dr. Sci. Tech., Professor (Georgian Technical University, Georgia)

H. V. Tokmajyan, Dr. Sci. Tech., Professor, Rector of SEUA (State Engineering University of Armenia)

J. Eberhardsteyner, Dr. Sci. Tech., Professor (Vienna University of Technology, Austria)

S. N. Leonovich, Dr. Sci. Tech., Professor (Belarusian National Technical University, Belarus)

Y. Iwasaki, Dr. Sci. Tech. (Geo-Research Institute, Japan)

T. Tanaka, Dr. Sci. Tech., Professor (University of Tokyo, Japan)

A. Zh. Zhusupbekov, Dr. Sci. Tech., Professor (L. N. Gumilyov Eurasian National University, Astana, Kazakhstan)

Editorial Board

05.23.00 – Building and Architecture

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

F. V. Karmazinov, Dr. Sci. Tech., Professor, Winner of the Award of the Government of the Russian Federation (SUE "Vodokanal of St. Petersburg")

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 (NIISF RAACS)

L. S. Lyahovich, Dr. Sci. Tech., Professor, Honorary Worker of Sciences of the Russian Federation, Academician of RAACS (TSUAB)

V. Sargsyan, Dr. Sci. Tech., Professor (National University of Architecture and Construction of Armenia)

V. I. Travush, Dr. Sci. Tech., Professor, Winner of the Award of the Government of the Russian Federation, Academician of RAACS (RAACS)

V. S. Fedorov, Dr. Sci. Tech., Professor, Academician of RAACS (MSURE)

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 (IVGPU)

E. M. Tchernyshov, Dr. Sci. Tech., Professor, Honorary Worker of Sciences of the Russian Federation, Academician of RAACS (VSUACE)

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

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
 T. A. Datsuk, Dr. Sci. Tech., Professor
 S. P. Zavarikhin, Dr. Arch., Professor, Honorary Architect of the Russian Federation
 B. N. Karpov, Dr. Sci. Tech., Professor
 L. N. Kondrat'eva, Dr. Sci. Tech., Professor
 L. P. Lavrov, Dr. Arch., Professor, Honorary Architect of the Russian Federation, Correspondent Member 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. Sementsov, Dr. Arch., Professor
 V. D. Kharlab, Dr. Sci. Tech., Professor
 V. M. Ulyasheva, Dr. Sci. Tech., Professor
 V. M. Petrov, Dr. Sci. Tech., Professor (SPSUACE)

05.05.00 – Transport Engineering, Mining Machinery Manufacturing, Construction Machine Building

V. V. Verstov, Dr. Sci. Tech., Professor, Honorary Builder of Russia
 S. V. Repin, Dr. Sci. Tech., Professor
 V. E. Gordienko, Dr. Sci. Tech., Professor
 S. E. Maksimov, Dr. Sci. Tech., Professor
 I. I. Vorontsov, Dr. Sci. Tech., Professor
 A. E. Pushkarev, Dr. Sci. Tech., Associate Professor
 A. N. Lyalinov, Dr. Sci. Tech., Professor
 V. N. Gorshkov, Dr. Sci. Tech., Professor (SPSUACE)
 P. V. Druzhyinin, Dr. Sci. Tech., Professor, Honorary Worker of the Higher School of the Russian Federation (KMAL)
 V. A. Kuz'michev, Dr. Sci. Tech., Professor (SPbPU)

05.22.00 – Transport

S. A. Evtukov, Dr. Sci. Tech., Professor, Honorary Worker of Higher School of the Russian Federation
 P. A. Kravchenko, Dr. Sci. Tech., Professor, Honorary Worker of the Higher School of the Russian Federation
 V. N. Dobromirov, Dr. Sci. Tech., Professor
 Yu. G. Kotikov, Dr. Sci. Tech., Professor
 A. V. Bondarenko, Dr. Sci. Tech., Professor
 A. A. Kapustin, Dr. Sci. Tech., Professor
 B. D. Efremov, Dr. Sci. Tech., Professor
 R. N. Safullin, Dr. Sci. Tech., Associate Professor (SPSUACE)
 V. S. Lukinskiy, Dr. Sci. Tech., Professor (HSE in St. Petersburg)
 V. N. Lozhkin, Dr. Sci. Tech., Professor, Honorary Worker of Sciences of the Russian Federation (Saint-Petersburg University of State Fire Service of EMERCOM of Russia)

08.00.00 – Economics

A. N. Asaul, Dr. Sci. Ec., Professor, Honorary Builder of the Russian Federation, Honorary Worker of Sciences of the Russian Federation
 I. V. Drozdova, Dr. Sci. Ec., Professor
 G. A. Tokunova, Dr. Sci. Ec., Professor
 A. A. Petrov, Dr. Sci. Ec., Professor
 N. G. Pletneva, Dr. Sci. Ec., Professor
 A. P. Dolgov, Dr. Sci. Ec., Professor
 A. I. Solodkiy, Dr. Sci. Ec., Professor
 V. V. Asaul, Dr. Sci. Ec., Professor
 E. G. Guzhva, Dr. Sci. Ec., Professor (SPSUACE)
 G. F. Shcherbina, Dr. Sci. Ec., Associate Professor
 CEO (AO SSMO "LenSpetsSMU")
 L. M. Kaplan, Dr. Sci. Ec., Professor
 (St. Petersburg Union of Construction Companies)
 R. A. Faltinskiy, Dr. Sci. Ec., Professor,
 Adviser to CEO (OJSC Gazprompromgaz)

The address of the Founder and the Editorial Office:
 2nd Krasnoarmeyskaya St. 4, 190005, St. Petersburg, Russia
 Ph./ Fax: (812) 575-09-17, (812) 316-53-11
 E-mail: vestnikspb@mail.ru

The contents and abstracts of articles are presented on the site: <http://vestnik.sbgasu.ru>

The journal is registered by the Federal Service for Supervision of Communications, Information Technology and Mass Media (Roskomnadzor). The registration certificate of the mass media organization is ПИИ № ФС77-69753, of 05.05.2017.
 The journal is included by the Higher Attestation Commission (HAC) of the Russian Federation into the List of leading reviewed scientific journals and editions in which the major scientific results of theses on competition for the academic degree of the Doctor of Science are to be published.

In case of reprinting, the link to the "Vestnik grazhdanskikh inzhenerov – Bulletin of Civil Engineers" is obligatory.
 On the cover one can see the monument to Nicholas I, the Emperor, in honour of whom the Institute of Civil Engineers (nowadays SPSUACE) was named on December 17, 1892.

SANITARY ENGINEERING AND ECOLOGY

V. K. Averyanov, V. M. Ulyasheva, G. A. Ryabev. Numerical simulation of heat transfer process through insulated and non-insulated floor155
 V. R. Taurit. Saving the energy resources at cooling the environmentally-friendly vegetable production at mound storage.....161
 S. V. Fedorov, V. M. Vasil'ev, A. M. Telyatnikova. Development of the sewerage network conceptual model168
 I. I. Ivanenko, A. M. Novikova. CR(6+) biological recovery with aerobic microorganisms of different taxonomic groups175

DESIGN AND CONSTRUCTION OF ROADS, SUBWAYS, AIRFIELDS, BRIDGES AND TUNNELS

M. P. Klekovkina. The issues concerning the placement of cement concrete layer of variable stiffness in the design of road clothes184
 A. V. Kulikov. Condition and tasks of providing maintainability of cement concrete pavement of highways.....189
 D. N. Kharlamova. Problems of adjusting of the structural and technological parameter solutions of crushed-stone road bases.....194

TRANSPORT ENGINEERING, MINING MACHINERY

MANUFACTURING, CONSTRUCTION MACHINE BUILDING

B. S. Dobroborskiy, E. E. Medres, V. V. Smirnov. Means of reducing the perforator crank vibration and ensuring the efficiency of drilling with portable pneumatic drilling hammers199
 V. S. Isakov, N. P. Chukhryaev, Nguyen Duy Thanh. Justification of variable parameters of adaptive cutting drill bits.....204
 R. A. Litvin. Experimental study of the resonance damping process in vibrating construction machines using a shock absorber212

TRANSPORT

A. A. Belekhov. Elaboration of an algorithm for carrying out the preliminary technical expertise220
 G. V. Karpova, G. A. Julmukhamedova. Estimating human capital loss due to traffic-related death226
 E. V. Kurakina. On the effectiveness of studies carried out at places of road traffic accident concentration231
 D. A. Lutov, A. A. Shimanova. Perspective directions of improving the traffic safety system in the Russian Federation238
 V. D. Timokhovets, V. N. Sitnikov, A. A. Testeshev, D. A. Sysuev. Type design of streets and roads of the largest cities in the Russian Federation for remote transport stream satellite monitoring.....246
 A. V. Shemyakin, K. P. Andreev, V. V. Terentyev, D. S. Ryabchikov, A. V. Marusin. The development of the project of road traffic organization254

ECONOMICS

E. M. Korshunova, A. I. Vishnivetskaya. Current problems of built-up areas` development258
 V. A. Koshcheev, Yu. A. Tsvetkov. The first experience of reforming the system of pricing and estimate regulation at the present stage.....264
 S. B. Sborshchikov, N. V. Lazareva, R. E. Vvedenskiy, E. E. Bakhus. Sustainable development of investment and construction activities in the energy industry269
 O. A. Tarutko. Comparative analysis of entrepreneurial structures` competitiveness in the investment-construction field.....276

CHRONICLE

We mourn and remember285

Abstracts286

Submitting materials requirements304

Subscription rules305