

# **Transportation Geotechnics and Geoecology (TGG-2017)**

Procedia Engineering Volume 189

St. Petersburg, Russia  
17-19 May 2017

## **Editors:**

**Andrei Petriaev**

**Anastasia Konon**

ISBN: 978-1-5108-4092-8

**Printed from e-media with permission by:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571



**Some format issues inherent in the e-media version may also appear in this print version.**

Copyright© by Elsevier B.V.  
All rights reserved.

Printed by Curran Associates, Inc. (2017)

For permission requests, please contact Elsevier B.V.  
at the address below.

Elsevier B.V.  
Radarweg 29  
Amsterdam 1043 NX  
The Netherlands

Phone: +31 20 485 3911  
Fax: +31 20 485 2457

<http://www.elsevierpublishingsolutions.com/contact.asp>

**Additional copies of this publication are available from:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571 USA  
Phone: 845-758-0400  
Fax: 845-758-2633  
Email: [curran@proceedings.com](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

# TABLE OF CONTENTS

<b>Preface</b> .....	1
<b>Development of a New and an Explicit Analytical Equation that Estimates the Vertical Dynamic Impact Loads of a Moving Train</b> .....	2
<i>Niyazi Özgür Bezin</i>	
<b>Structural Response of Existed Metro Tunnels to Adjacent Large-section Pipe Jacking Construction</b> .....	11
<i>Bo Liu, Dingwen Zhang, Lei Fang</i>	
<b>The Uplift Behavior of a Subway Station During Different Degree of Soil Liquefaction</b> .....	18
<i>Ji-Lei Hu, Hua-Bei Liu</i>	
<b>Polymers for Stabilization of Soft Clay Soils</b> .....	25
<i>M. Mirzababaei, A. Arulrajah, M. Ouston</i>	
<b>Evaluation of Engineering Characteristics of Lian-Yan Railway Soft Soil Based on CPTU Data-A Case Study</b> .....	33
<i>Wei Duan, Songyu Liu, Guojun Cai</i>	
<b>Apparatus for Strengthening Soft Water-Saturated Soils by Freezing under Engineering Objects and Structures in Cold Regions</b> .....	40
<i>V. I. Moiseev, N. K. Vasiliev, T. A. Komarova, O. A. Komarova</i>	
<b>Measurement of Surface Vibration Accelerations Propagated in the Environment</b> .....	45
<i>Krzysztof Robert Czech, Wojciech Gosk</i>	
<b>The Specificities of Landslides Danger Assessment Accepted in Eurocode</b> .....	51
<i>D. D. Shubina, I. K. Fomenko, D. N. Gorobtsov</i>	
<b>The Use of Oil-contaminated Crushed Stone Screenings in Construction Ceramics</b> .....	59
<i>L. L. Maslennikova, M. S. Abu-Khasan, N. A. Babak</i>	
<b>Geotechnical Analysis of Structural Behaviour Under Complex Geological Engineering Conditions</b> .....	65
<i>Andrey V. Benin, Elena V. Gorodnova</i>	
<b>Engineering and Geological Audit in Design and Construction of Linear Transport Facilities</b> .....	70
<i>M. E. Nikulina, D. N. Gorobtsov, V. V. Pendin</i>	
<b>Experimental Study of Stoneblowing Track Surfacing Technique</b> .....	75
<i>Alexander Abrashitov, Artem Semak</i>	
<b>Crushing of Non-cohesive Soil Grains Under Dynamic Loading</b> .....	80
<i>Marek A. Patakiewicz, Katarzyna Zabielska-Adamska</i>	
<b>Non-invasive Portable Geophysical Tool to Monitor Water Content in Earthen Long Linear Infrastructures</b> .....	86
<i>S. Utilli, R. Castellanza, A. Galli, P. Sentenac</i>	
<b>Use of Waste From Aluminothermic Welding of Railroad Tracks in Structural Materials Science</b> .....	94
<i>L. L. Maslennikova, I. A. Naginskii, A. N. Troshch</i>	
<b>Finite Element Modelling of Unpaved Road Reinforced with Geosynthetics</b> .....	99
<i>Lidia Sarah Calvarano, Giovanni Leonardi, Rocco Palamara</i>	
<b>Determination of Sandy Subsoil Stiffness on the Basis of Surface Vibration Measurement</b> .....	105
<i>Wojciech Gosk, Krzysztof Robert Czech</i>	
<b>Integration of Pavement Layer Evaluation Using LWD for Road Safety Control</b> .....	111
<i>Poranic Jitareekul, Auckpath Sawangsuriya, Pruethipong Singhatiraj</i>	
<b>Transportation and Environmental Geotechnics</b> .....	118
<i>Ivan Vaníček, Daniel Jirásko, Martin Vaníček</i>	
<b>Usage of the «BRNL-FT» Program for Foundation Calculation Using the Method of the Predefined Equated Soil Settlements</b> .....	126
<i>S. I. Alekseev, S. O. Kondrat'Ev</i>	
<b>Modeling the Dynamic Behavior of the Upper Structure of the Railway Track</b> .....	133
<i>Alexey A. Loktev, Vadim V. Korolev, Irina V. Shishkina, Dmitrii A. Basovsky</i>	
<b>Unified Multimodal Transport Center – A Tool for the Development of the Environmental Geology of Transport</b> .....	138
<i>Menukhova Tatiana Anatol'Yevna, Egorov Sergey Viktorovich</i>	
<b>Structural Health and Geotechnical Monitoring During Transport Objects Construction and Maintenance (Saint-Petersburg Example)</b> .....	145
<i>Andrei Belyi, Eduard Karapetov, Yurii Efimenko</i>	
<b>Dynamic Soil Models for Backcalculation of Material Properties from Falling Weight Deflectometer Deflection Data</b> .....	152
<i>Hudsadin Sirithemmontree, Yasothorn Sapsathiarn</i>	
<b>Engineering Properties of Carbonated Reactive Magnesia-stabilized Silt Under Different Activity Index</b> .....	158
<i>Song-Yu Liu, Guang-Hua Cai, Yan-Jun Du, Heng Zhu, Ping Wang</i>	
<b>An Attempt of the Synthesis of Recent Knowledge About Mechanisms Involved in Stabilization Function of Geogrids in Infrastructure Constructions</b> .....	166
<i>Zikmund Rakowski</i>	
<b>Mechanical Stabilization of Intermediate Granular Layers in Pavement Structures – Laboratory Study</b> .....	174
<i>Leoš Horníček, Zikmund Rakowski</i>	
<b>Control Over Transverse Shifts of Rail Sleeper Lattice Which Impact on Deformation of Ballast Layer</b> .....	181
<i>G. L. Akkerman, M. A. Skutina</i>	

<b>High Speed Trains Geotechnics: What is a Tolerable Bump?</b> .....	186
<i>Jean-Louis Briaud, Somayeh R. Tafti</i>	
<b>Vibration Attenuation at Rail Joints Through Under Sleeper Pads</b> .....	193
<i>Sakdirat Kaewunruen, Akira Aikawa, Alex M. Remennikov</i>	
<b>Climate Change Adaptation for GeoRisks Mitigation of Railway Turnout Systems</b> .....	199
<i>Serdar Dindar, Sakdirat Kaewunruen, Joseph M. Sussman</i>	
<b>Improved Performance of Ballasted Rail Tracks Using Plastics and Rubber Inclusions</b> .....	207
<i>Buddhima Indraratna, Ngoc Trung Ngo, Cholachat Rujikiatkamjorn</i>	
<b>Wear Degree Assessment of Low-pressure Earth Dams Within Urban Landscape</b> .....	215
<i>Tamila Titova, Rasul Akhtyamov, Elina Nasyrova</i>	
<b>Application of the Light Falling Weight Deflectometer (LFW) to Test Aggregate Layers on Geosynthetic Base</b> .....	221
<i>Maria J. Sulewska, Grzegorz Bartnik</i>	
<b>Geomechanical Tasks Solving in Modelling of Temporary Support Parameters in Sochi Tunnels</b> .....	227
<i>Tatiana V. Ivanov, Vladimir N. Kavkazskiy, Mikhail I. Shidakov</i>	
<b>Geological-Engineering and Geotechnical Issues Concerning the Function of the Railway Bridge Across the Amgun' River Operated by the Far Eastern Railway</b> .....	232
<i>S. V. Kvashuk, B. N. Smyshlyaev</i>	
<b>Expanded Polystyrene (EPS) Geofoam: Preliminary Characteristic Evaluation</b> .....	239
<i>Y. Z. Beju, J. N. Mandal</i>	
<b>The Performance of Geotextile Materials Used for Filtration and Separation in Different Structures as an Important Part of Geotextiles Requirements</b> .....	247
<i>V. I. Shtykov, L. S. Blazhko, A. B. Ponomarev</i>	
<b>Assessment of Varve Clays Sensitivity to Natural Structure Disturbance</b> .....	252
<i>P. L. Klemysionok, S. S. Kolmogorova, S. G. Kolmogorov</i>	
<b>Functional Loss Risks of highroads in Permafrost Areas Due to Climate Change</b> .....	258
<i>Y. V. Trofimenko, G. I. Evgenev, E. V. Shashina</i>	
<b>Dynamic Stress Responses of Rough Pavement Resting on Layered Poroelastic Half-Space under Moving Traffic Load</b> .....	265
<i>Qian Gao, Jiangu Qian, Xiaoqiang Gu</i>	
<b>Analysis of Bridge Foundation Damage in Albania</b> .....	275
<i>Mirva Gega, Luljeta Bozo</i>	
<b>Dynamic Shakedown Analysis of Flexible Pavements under Rolling and Sliding Contact Considering Moving Speed</b> .....	283
<i>Yu-Chen Dai, Jian-Gu Qian, Yong-Gang Wang, Mao-Song Huang</i>	
<b>Geotechnical Parameters of Soil, Considering the Effect of Additional Compaction of Embankment</b> .....	291
<i>Lukasz Aleksander Kumor, Maciej Kordian Kumor, Monika Kopka</i>	
<b>Functions and Applications of Geosynthetics In Roadways</b> .....	298
<i>Jorge G. Zornberg</i>	
<b>Evaluation of Load Transfer in Geogrids for Base Stabilization Using Transparent Soil</b> .....	307
<i>Xin Peng, Jorge G. Zornberg</i>	
<b>Minimization of Negative Impact from Solid Waste Landfills with Use of Mineral Geoantidotes</b> .....	315
<i>M. V. Shershneva, E. I. Makarova, N. N. Efimova</i>	
<b>Oil Products Absorbing Properties of Foam Concretes</b> .....	320
<i>M. V. Shershneva, E. I. Makarova, M. Yu. Savelyeva</i>	
<b>Seismic and Geomechanical Monitoring of Transport Infrastructure on Undermined Territories</b> .....	325
<i>A. A. Baryakh., I. A. Sanfirov, A. G. Yaroslavtsev</i>	
<b>Experimental Estimation of Permeability of Freeze-thawed Soils in Artificial Ground Freezing</b> .....	332
<i>Go Hirose, Yuzuru Ito</i>	
<b>Design Characteristics of Road Structure Reinforced with Cell Geosynthetic Materials with Account of Dynamic Load Impact</b> .....	338
<i>P. V. Ivanov, N. N. Belyaev, A. V. Petryaev</i>	
<b>Remediation of Contaminated Fine-grained Soil by Freezing and Ion Exchange Effect</b> .....	346
<i>Takuto Inoue, Yuzuru Ito, Hideo Sakabe</i>	
<b>Reduction of Vibroacoustic Effect of High-speed Trains</b> .....	352
<i>M. Butorina, N. Minina, P. Ivanov, A. Petryaev</i>	
<b>On Vibrodynamic Impact on the Roadbed</b> .....	360
<i>Ivan S. Kozlov, Svetlana A. Rostovtseva, Mikhail I. Shmulevich</i>	
<b>Design Method of Bridge Approach Improved by Deep Mixing Methods in Highway Engineering</b> .....	365
<i>Deng Yongfeng, Jing Fei, Feng Qi</i>	
<b>Numerical Simulation of Station Tracks on Soft Soils</b> .....	372
<i>Ye. V. Fedorenko, T. S. Vavrinyuk, D. Ye. Yerchenko, A. I. Kovalsky</i>	
<b>The Service Life of Ballastless Track</b> .....	379
<i>A. V. Savin</i>	
<b>Geodetic Monitoring of Deformation of Building Surrounding an Underground Construction</b> .....	386
<i>M. J. Bryn, D. A. Afonin, N. N. Bogomolova</i>	
<b>Application of Laser Scanning Technology in Geotechnical Works on Reconstruction of Draw Spans of the Palace Bridge in Saint Petersburg</b> .....	393
<i>N. V. Kanashin, A. A. Nikitchin, E. S. Svintsov</i>	
<b>Soling, Aerating and Phosphating for Soil Strengthening and Detoxication</b> .....	398
<i>Larisa Svatovskaya, Alexander Kabanov, Maxim Sychov</i>	

<b>Ensuring Environmental Safety During the Construction and Operation of Tunnels in Residential Areas</b> .....	404
<i>L. V. Ryzhova, T. S. Titova, S. G. Gendler</i>	
<b>Finite Element Analysis of Flexible Pavement with Geogrids</b> .....	411
<i>S. K. Ahirwar, J. N. Mandal</i>	
<b>Monitoring of Transport Tunnel Deformation at the Construction Stage</b> .....	417
<i>M. Y. Bryn, D. A. Afonin, N. N. Bogomolova, A. A. Nikitchin</i>	
<b>The Construction of Transport Infrastructure on Permafrost Soils</b> .....	421
<i>Vladimir M. Ulitsky, Elena V. Gorodnova</i>	
<b>Full - Scale Study of Stress-strain State of Ballastless Upper Structure Construction of Rail Way in Terms of Train Dynamic Load</b> .....	429
<i>A. F. Kolos, T. M. Petrova, A. O. Makhonina</i>	
<b>Laboratory Investigations on Reclaimed Asphalt Pavement (RAP) for using it as Base Course of Flexible Pavement</b> .....	434
<i>Dulal Chandra Saha, J. N. Mandal</i>	
<b>Geocoprotective Properties of Binders for Transport Systems</b> .....	440
<i>L. B. Svatovskaya, M. V. Shershneva, A. B. Bobrovnik</i>	
<b>Effect of Reinforcement on Multi-tiered Fly Ash Wall</b> .....	446
<i>Ankita Kumar, J. N. Mandal</i>	
<b>Geocoprotective Technology of Transport Construction using Silica Sol Absorption Method</b> .....	454
<i>Larisa Svatovskaya, Oleg Urov, Alexander Kabanov</i>	
<b>Problems and Technologies of Offshore Permafrost Investigation</b> .....	459
<i>Andrei S. Loktev, Mikhail Y. Tokarev, Eugeny M. Chuvilin</i>	
<b>Experimental Research of Spatial Variation of Compaction Effect on Vibratory Probe Compaction Method for Ground Improvement</b> .....	466
<i>Yuan Cheng, Hehua Zhu, Fei Jing, Guangyin Du, Chao Yan, Zhibin Liu</i>	
<b>Calculations of Thermal Stabilization of Transport Embankments and their Bases</b> .....	472
<i>Vladimir N. Paramonov, Igor I. Sakharov</i>	
<b>The Impact of Work of Hydraulic Compactor Type V8 from MTS on the Level of Vibrations Propagated to the Environment</b> .....	478
<i>Krzysztof Robert Czech, Wojciech Gosk</i>	
<b>Selected Laboratory Research on Geogrid Impact on Stabilization of Unbound Aggregate Layer</b> .....	484
<i>Marcin Grygierek, Jacek Kawalec</i>	
<b>Influence Evaluation of Buildings Constructed in Protected Zone on St.Petersburg Subway Underground Structures Stress-strain State</b> .....	492
<i>A. P. Lediaev, A. N. Konkov, A. L. Novikov, D. A. Soloviev</i>	
<b>The Influence of Hazardous Geological Processes on the Transport Infrastructure within the River Valley of Aurgasa (Bashkortostan, Russia)</b> .....	500
<i>O. V. Zerkal, E. N. Samarin, I. V. Averin</i>	
<b>Innovative Technology for Repair of Culverts in Conditions of Constant Intense Water Flow</b> .....	505
<i>A. N. Perminov, I. P. Safonov, N. A. Perminov</i>	
<b>Pile Foundations of Mega Projects: New Railway Station and LRT in Problematical Soil Ground of Astana</b> .....	511
<i>Askar Zhussupbekov, Abdulla Omarov, Gyulnara Zhukenova, Gulzhanat Tanyrbergenova</i>	
<b>Study of Phosphates use in Electrochemical Treatment of Water-saturated Argillaceous Soils</b> .....	519
<i>Viktorv. Ganchits, Viktoriia A. Cherniaeva</i>	
<b>Effect of a Stiff Thin Foundation Soil Layer's Depth on Dynamic Response of an Embankment Dam</b> .....	525
<i>Talal Awwad, Modar Donia, Lana Awwad</i>	
<b>A Case Study of a Cut Slope Failure Influenced by Snowmelt and Rainfall</b> .....	533
<i>Akira Mori, Srikrishna Siva Subramanian, Tatsuya Ishikawa, Masahiro Komatsu</i>	
<b>The Problem of High-Speed Railway Noise Prediction and Reduction</b> .....	539
<i>N. I. Ivanov, I. S. Boiko, A. E. Shashurin</i>	
<b>Frost Heaving in Ballast Railway Tracks</b> .....	547
<i>Satoshi Akagawa, Michiaki Hori, Jyun Sugawara</i>	
<b>The Impact on People and Facilities of Air Flow Caused by High-speed Train Traffic</b> .....	554
<i>S. T. Djabbarov</i>	
<b>Development of Tunnel Dismantling Machine (TDM) in an Underground Railway Project</b> .....	560
<i>P. L. Ng, T. N. D. R. Barrett, G. Roux, S. Polycarpe, M. Gonzalez</i>	
<b>Transportation Structures And Constructions With Geocoprotective Properties</b> .....	569
<i>Antonina Sakharova, Marina Baidarashvili, Andrei Petriaev</i>	
<b>The Modern Structure for Storm Sewage Purification of Roads</b> .....	576
<i>Marina Baidarashvili, Antonina Sakharova, Andrei Petriaev</i>	
<b>Soil Reinforcement and Detoxication by Means of Mineral Binder Systems</b> .....	582
<i>Kristina Malchevskaya, Antonina Sakharova, Alexandr Kabanov</i>	
<b>Solution of the Problem of Providing Railway Track Stability in Joint Sections Between Railroad Facilities and Subgrade</b> .....	587
<i>G. M. Stoyanovich, V. V. Pupatenko, D. Y. Maleev, K. V. Zmeev</i>	
<b>Creation of Favourable Water – Physical Properties of Drill Cuttings with the use of Coagulants</b> .....	593
<i>L. N. Skipin, V. S. Petuhova, E. A. Romanenko</i>	
<b>Forecast for Terms of Culvert Inspection and Repair</b> .....	598
<i>M. G. Ryumin, E. S. Shepitko</i>	

<b>Geocoprotective Technologies of Storage of used Wooden Sleepers.....</b>	<b>605</b>
<i>L. B. Svatovskaya, M. V. Shershneva, M. Yu. Savelyeva</i>	
<b>The Soil Effect to Efforts in Rails of Continuous Welded Rail Track on Bridges .....</b>	<b>610</b>
<i>V. N. Smirnov, A. O. Dyachenko, L. K. Dyachenko, L. A. Andreeva</i>	
<b>Criteria of Geocoprotection in Construction.....</b>	<b>616</b>
<i>Marina Baydarashvili</i>	
<b>Construction of Deep Foundation Ditch under a Reconstructed Multi-storey Building on the Main Avenue of St.Petersburg.....</b>	<b>622</b>
<i>R. Mangushev, A. Osokin</i>	
<b>Detection Method of Pollution with Heavy Metals Ions of the Soil .....</b>	<b>630</b>
<i>M. Baydarashvili, N. Shrednik, A. Spasovskaia</i>	
<b>Account of Irregularity in the Stress Distribution along Wood and Concrete Sleepers from a Perspective of Granular Media Mechanics.....</b>	<b>637</b>
<i>A. V. Moshenzhal</i>	
<b>Lithological Profiling of Rocky Slopes using GeoReader Software Based on the Results of Ground Penetrating Radar Method .....</b>	<b>643</b>
<i>V. V. Pupatenko, Y. A. Sukhobok, G. M. Stoyanovich</i>	
<b>Effective Repair and Refurbishment Compound for the Strengthening of a Road Concrete Pavements .....</b>	<b>650</b>
<i>T. I. Boykova, V. Y. Solovyova, D. V. Solovyov</i>	
<b>Performance of Ballast Layer Reinforced with Geosynthetics in Terms of Heavy Axle Load Operation .....</b>	<b>654</b>
<i>Andrei Petriaev, Anastasia Konon, Vyacheslav Solovyov</i>	
<b>Stress Response Analyses of Ballasted Rail Tracks, Reinforced by Geosynthetics.....</b>	<b>660</b>
<i>Andrei Petriaev</i>	
<b>Improving of Performance Characteristics During Mechanical Stabilization of Quarry Haul Roads with Stiff Polymeric Tensar Triax Hexagonal Geogrid.....</b>	<b>666</b>
<i>G. V. Solovyev, K. I. Vatchnadze</i>	
<b>Scientific Substantiation of Constructive-technological Parameters of St. Petersburg Subway Underground Structures .....</b>	<b>673</b>
<i>Y. S. Frolov, A. N. Konkov, A. A. Larionov</i>	
<b>A Method of Obtaining Geoniseoprotective Foam Concrete for Use on Railway Transport.....</b>	<b>681</b>
<i>Anastasia Sychova, Maxim Sychov, Ekaterina Rusanova</i>	
<b>The Increase of the Durability and Geoprotective Properties of the Railway Subgrade .....</b>	<b>688</b>
<i>Anastasia Sychova, Andrey Solomahin, Anatoly Hitrov</i>	
<b>Evaluation of Effectiveness of Separating Layers in Railroad Track Structure Using Life Cycle Cost Analysis.....</b>	<b>695</b>
<i>Vladimir Beltikov, Eugeny Shehtman, Oleg Malikov</i>	
<b>Main Geotechnical Problems of Railways and Roads in Kriolitozone and Their Solutions.....</b>	<b>702</b>
<i>Valentin G. Kondratiev</i>	
<b>Enhancement of Subgrade's Bearing Capacity in Low Water Permeable (Clay) Soils .....</b>	<b>710</b>
<i>Ludmila S. Blazhko, Valerii I. Shtykov, Evgenii V. Chernyaev</i>	
<b>Transport Interchanges Design Features in Seismically Dangerous and Densely Built-Up Areas .....</b>	<b>716</b>
<i>D. V. Serebryakov, V. G. Lebedeva, V. V. Govorov</i>	
<b>Evaluation of the Geosynthetic Reinforcement on Railroad Subgrade.....</b>	<b>721</b>
<i>Erol Güler, Samad Kazemi Khosrowshahi</i>	
<b>Monitoring of Deformation Processes in Buildings and Structures in Metropolises .....</b>	<b>729</b>
<i>M. G. Mustafin, V. A. Valkov, A. I. Kazantsev</i>	
<b>Monitoring of Quarry Slope Deformations with the Use of Satellite Positioning Technology and Unmanned Aerial Vehicles .....</b>	<b>737</b>
<i>D. V. Beregovoi, J. A. Younes, M. G. Mustafin</i>	
<b>Prediction of Natural and Technogenic Negative Processes Based on the Analysis of Relief and Geological Structure.....</b>	<b>744</b>
<i>A. A. Kuzin, E. N. Grishchenkova, M. G. Mustafin</i>	
<b>The Impact of Engineering-Geologic Conditions on the Development of Railway Subgrade Design Solutions .....</b>	<b>752</b>
<i>V. A. Alpysova, N. S. Bushuev, S. V. Shkurnikov, D. O. Shulman</i>	
<b>Geotechnical Aspects of Security for Long-operated Underground Collectors in Conditions of Weak Soils and Increasing Technogenic Influences.....</b>	<b>759</b>
<i>A. N. Perminov, N. A. Perminov</i>	
<b>The Behavior Estimation of the Soil Constructions at Transport Infrastructure with Its Reinforcement by Man-made Materials with Using of Physical Modelling and Testing .....</b>	<b>767</b>
<i>V. V. Vinogradov, A. A. Zaytsev, Y. K. Frolovsky</i>	
<b>Embankment on Permafrost Eastern Polygon of Baikal-Amur Mainline.....</b>	<b>774</b>
<i>Sergey A. Kudryavtsev, A. V. Alexei V. Kazharsky, Elena D. Goncharova, Zhanna I. Kotenko, Danil O. Grigoriev</i>	
<b>Different Approaches to the Reconstruction of Vosstaniya Square in St. Petersburg .....</b>	<b>783</b>
<i>Yu. A. Nikitin, Antonina I. Ushakova</i>	
<b>Deformation Properties of Decomposed Peat Under Vibration and Dynamic Load Impact .....</b>	<b>792</b>
<i>A. F. Kolos, V. S. Ryzhov, M. I. Shmulevich, G. L. Akkerman</i>	
<b>Concrete for Road Pavements.....</b>	<b>800</b>
<i>Tatyana Boikova, Dmitry Solovyov, Valentina Solovyova</i>	
<b>Compaction of the Railway Embankments During the New Highspeed Lines Construction.....</b>	<b>805</b>
<i>Anatoly I. Kistanov</i>	

<b>Appraisal of Highway Tunnels Construction on the Active Railroad Tunnel Operational Reliability in the City of Sochi</b> .....	811
<i>Y. S. Frolov, A. N. Konkov, E. S. Svintsov</i>	
<b>Oscillation of Combined Strut-Framed Systems of Buildings and Structures in Conditions of Vibration Subgrade</b> .....	818
<i>V. V. Egorov, A. N. Sudakov</i>	
<b>The Development of a High Performance Material for a Ballast Layer of a Railway Track</b> .....	823
<i>Valery Kondratov, Valentina Solovyova, Irina Stepanova</i>	
<b>Methods of Noise and Vibration Protection on Urban Rail Transport</b> .....	829
<i>E. P. Dudkin, L. A. Andreeva, N. N. Sultanov</i>	
<b>Application of Fiber-reinforced Concrete in Tram Track Foundation</b> .....	836
<i>V. V. Garbaruk, E. P. Dudkin, V. A. Ivliev</i>	
<b>Development of the Fastening Design of the Underground Structure Immersed in Water-saturated Soils of St. Petersburg, from Floating up</b> .....	841
<i>Andrei A. Ananov</i>	
<b>Justification and Expansion of Spheres of Application of the Tram</b> .....	848
<i>E. P. Dudkin, K. A. Smirnov, S. A. Doronicheva</i>	
<b>Method of Tram Track Structures Feasibility Study</b> .....	854
<i>E. P. Dudkin, E. N. Zaitsev, S. V. Kolankov</i>	
<b>Integrated Approach to Using Technology of Reclaimed Asphalt Pavement (RAP)</b> .....	860
<i>M. A. Lyubarskaya, V. S. Merkusheva, P. A. Osian, A. A. Ilin, E. S. Svintsov</i>	
<b>Transport Construction Negative Impact on the Environment</b> .....	867
<i>N. A. Babak</i>	
<b>Subgrade Strengthening on the Sections for Cars Interchanging with Axle Load of 25 T and More</b> .....	874
<i>E. S. Ashpiz, A. V. Zamukhovskiy</i>	
<b>Protection of the Transport Infrastructure from Influence of Landslides by Suspension Grouting</b> .....	880
<i>A. A. Ponomarev, O. V. Zerkal, E. N. Samarin</i>	
<b>The Application of Anisotropy of Soil Properties in the Probabilistic Analysis of Landslides Activity</b> .....	886
<i>I. K. Fomenko, O. V. Zerkal</i>	
<b>The Study of Subgrade Operating Conditions at Bridge Abutment Approach</b> .....	893
<i>Dmitry Serebryakov, Anastasia Konon, Evgeniy Zaitsev</i>	
<b>Geosynthetic-Reinforced Slopes in Cohesive Soils Subject to Seismic Action</b> .....	898
<i>Akram H. Abd, Stefano Utili</i>	
<b>Change of Ballast Strength Properties During Particles Abrasive Wear</b> .....	908
<i>Alexey Kolos, Anastasia Konon, Pavel Chistyakov</i>	
<b>Mathematical Model for Forecasting of Rail Track Ballast Bearing Capacity</b> .....	916
<i>Alexey Kolos, Irina Darienko, Anastasia Konon</i>	
<b>Rail Trackbed and Performance Testing of Stabilised Sub-ballast in Normal and High-speed Environments</b> .....	924
<i>M. Horton, D. P. Connolly, Z. Yu</i>	
<b>Influence of Chemical Additives on Shrinkage and Swelling Characteristics of Bentonite Clay</b> .....	932
<i>M. V. Shah, H. J. Pandya, A. D. Shukla</i>	
<b>Author Index</b>	