

3rd Scientific Conference on Environmental Challenges in Civil Engineering (ECCE 2018)

MATEC Web of Conferences Volume 174 (2018)

Opole, Poland
23-25 April 2018

Part 1 of 2

Editors:

Adam Rak
Zbigniew Perkowski

Damian Beben

ISBN: 978-1-5108-6597-6

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.

This work is licensed under a Creative Commons Attribution license:
<http://creativecommons.org/licenses/by/2.0/>

You are free to:

Share – copy and redistribute the material in any medium or format.

Adapt – remix, transform, and build upon the material for any purpose, even commercial.

The licensor cannot revoke these freedoms as long as you follow the license terms.

Under the following terms:

You must give appropriate credit, provide a link to the license, and indicate if changes were made.

You may do so in any reasonable manner, but not in any way that suggests the licensor endorses you or your use. The copyright is retained by the corresponding authors.

Printed by Curran Associates, Inc. (2018)

For additional information, please contact EDP Sciences – Web of Conferences
at the address below.

EDP Sciences – Web of Conferences
17, Avenue du Hoggar
Parc d'Activité de Courtabœuf
BP 112
F-91944 Les Ulis Cedex A
France

Phone: +33 (0) 1 69 18 75 75

Fax: +33 (0) 1 69 28 84 91

contact-edps@webofconferences.org

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
Web: www.proceedings.com

TABLE OF CONTENTS

PART 1

ENVIRONMENTAL IMPACT OF INTENSIVE FARMING IN SLOPING AREAS	1
<i>Bosco Giovanni, Simeoni Lucia</i>	
THE USE OF SUBSTATIONS WITH PCM HEAT ACCUMULATORS IN DISTRICT HEATING SYSTEM	12
<i>Nogaj Kinga, Turski Michal, Sekret Robert</i>	
QUANTIFICATION OF THE INTERNAL SPACE CLIMATE	21
<i>Häupl Peter, Hansel Frank</i>	
THE USE OF SAND DEPOSITS IN BUILDINGS FOR ENERGY STORAGE	31
<i>Ratuszny Pawel</i>	
GYPSUM PARTITIONS IN MEDICAL ROOMS	43
<i>Kania Tomasz, Nowak Henryk</i>	
METHODOLOGY FOR THE QUANTIFICATION OF CONCRETE SUSTAINABILITY	53
<i>Teplý Bretislav, Vymazal Tomáš, Rovnaníková Pavla</i>	
CONCRETE PROPERTIES IN DIAPHRAGM WALLS EMBEDDED IN NON-COHESIVE SOILS	60
<i>Czopowska-Lewandowicz Magdalena</i>	
APPLICATION OF INVERSE METHODOLOGY TO ESTIMATION OF CHLORIDE DIFFUSION COEFFICIENT IN CONCRETE OF PRESTRESSED PRECAST SLAB	70
<i>Szweda Zofia, Bulinski Zbigniew</i>	
OPTIMIZATION OF VENTILATION SYSTEM IN THE OPEN OFFICE SPACE	80
<i>Suszanowicz Dariusz</i>	
REGIONAL SOLAR CONDITIONS IN THE CONTEXT OF SUSTAINABLE DEVELOPMENT	89
<i>Rudniak Joanna</i>	
INTERPRETATION OF THE RESULTS OF MONITORING OF THE DISPLACEMENT OF THE TRESNA DAM IN 2016	99
<i>Lach Stanislaw</i>	
THE MOISTURE CONDITION OF THE BRICK WALLS IN THE BASEMENTS OF A MEDIEVAL MONASTERY	110
<i>Hola Anna</i>	
ENERGY EFFICIENCY OF THE ACCUMULATION WALL WITH A TRANSPARENT INSULATION	119
<i>Swirska-Perkowska Jadwiga, Jeglet Karolina</i>	
THE INFLUENCE OF TYPE OF CEMENT ON THE DEGRADATION OF MICROSTRUCTURE AND TRANSPORT PROPERTIES OF CEMENT MORTARS EXPOSED TO FROST INDUCED DAMAGE	127
<i>Wieczorek Alicja, Koniorczyk Marcin</i>	
COMPARISON OF RESISTANCE TO DAMAGE OF UNALLOYED CARBON STEELS UNDER THE INFLUENCE OF HYDROGEN	135
<i>Pietkun-Greber Izabela</i>	
EXPERIMENTAL INVESTIGATIONS OF WOODEN AND CONCRETE COMPOSITE BEAMS SUBJECT TO LONG-TERM LOAD	145
<i>Czabak Mariusz, Perkowski Zbigniew</i>	
EVALUATION OF CHANGES IN THERMODIFFUSION PROPERTIES OF MINERAL WOOL RESULTING FROM TREATMENT WITH WATER AND RE-DRYING	155
<i>Perkowski Zbigniew, Grygorowicz Maciej, Jez Kamil</i>	
ENERGY PERFORMANCE OF BUILDING HEATING - THEORY AND REALITY ON THE EXAMPLE OF EDUCATIONAL BUILDINGS	165
<i>Lis Piotr, Lis Anna</i>	
SENSITIVITY ANALYSIS OF FIRE RESISTANCE OF A COMPOSITE FLOOR SLAB	174
<i>Kaliszuk Joanna, Grochowska Elzbieta</i>	
THE PARAMETERS OF THE ACOUSTIC INSULATION CAPACITY OF A REINFORCED WOODEN CEILING	184
<i>Grochowska Elzbieta, Kaliszuk Joanna, Gil Jaroslaw</i>	
SUSTAINABLE TRANSPORT DEVELOPMENT AND PASSENGER TRANSPORT DEMAND IN POLAND	193
<i>Szczuraszek Tomasz, Chmielewski Jacek</i>	

CASE STUDY OF NEGATIVE IMPACT OF CONCAVE COAL BASIN ON LONG RIBBON BUILDING DEVELOPMENT	203
<i>Parkasiewicz Beata, Kawulok Marian</i>	
IMPACT OF CHIMNEY ON LOW EMISSION.....	213
<i>Drozdol Krzysztof, Jarzynski Pawel</i>	
CONTEMPORARY BUILT ENVIRONMENT IN THE CONTEXT OF EVOLUTION OF ENERGY-EFFICIENT SOLUTIONS IN ARCHITECTURE.....	222
<i>Wehle-Strzelecka Stanislawa</i>	
ASSESSMENT OF THE LIFE CYCLE OF MASONRY WALLS IN RESIDENTIAL BUILDINGS	232
<i>Korentz Jacek, Nowogonska Beata</i>	
INTERACTIVE SANDWICH FACADE MADE OF RENEWABLE RESOURCES	239
<i>Gelbrich Sandra, Petzoldt Carolin, Gliniorz Ralf, Ehrlich Andreas, Kroll Lothar</i>	
THE ROLE OF SUSTAINABLE CONSTRUCTION IN SUSTAINABLE DEVELOPMENT	246
<i>Czajkowska Agnieszka</i>	
GREEN INITIATIVE IN SURANAREE UNIVERSITY OF TECHNOLOGY IN THAILAND.....	255
<i>Benjaoran Vacharapoom, Parinyakulset Patranid</i>	
STRUCTURE AND SERVICE SAFETY OF DEEP DISPOSAL LANDFILLS - CASE STUDY	265
<i>Bajno Dariusz, Grzybowska Agnieszka, Tews Rafal, Bednarz Lukasz</i>	
INVESTIGATION ON APPLICATION OF A TYPICAL MORTAR FOR CLINKER IN PREFABRICATED FAÇADE PANELS - TEST'S RESULTS	275
<i>Kaluza Marta, Hulimka Jacek, Kubica Jan, Kozdron Kamil</i>	
LOG HOUSES MOVING AS AN ELEMENT OF SUSTAINABLE DEVELOPMENT IN ARCHITECTURE.....	285
<i>Repelewicz Aleksandra</i>	
SUSTAINABLE RESIDENTIAL HOUSING FOR SENIOR CITIZENS - CONTEMPORARY PROJECTS	293
<i>Strzelecka-Seredynska Monika</i>	
OPTIMIZATION OF BUILDING DESIGN PROCESS BY USING ENERGY SIMULATION TOOLS	302
<i>Ziembicki Piotr</i>	
TAP WATER AS A SOURCE OF INDOOR RADON IN HOUSES	312
<i>Klosok-Bazan Iwona, Boguniewicz-Zablocka Joanna, Naddeo Vincenzo, Domanowska Alina</i>	
PLANNING THE OPTIMAL SOLUTION FOR WASTEWATER MANAGEMENT IN RURAL AREAS - CASE STUDY	319
<i>Boguniewicz-Zablocka Joanna, Klosok-Bazan Iwona, Capodaglio Andrea G., Ploskonka Joanna</i>	
THE BATTERY OF SILOS FOR RAPESEED - THE IMPACT OF THE BUILDING QUALITY AND EXPLOITATION CONDITIONS ON THE TECHNICAL STATE OF THE OBJECT.....	329
<i>Wróbel Krystyna, Kubiszyn Wieslaw</i>	
IMPACT OF BLUE SPACE IN ARCHITECTURE AND POSSIBILITIES OF USING	340
<i>Cákyová Katarína, Vranayová Zuzana</i>	
SPATIAL AND ECONOMIC CONDITIONS OF THE SOLAR ENERGY USE IN SINGLE-FAMILY HOUSES - A CASE STUDY	348
<i>Kolendo Lukasz, Krawczyk Dorota Anna</i>	
STRENGTH AND PERMEABILITY OF PERVIOUS COMPOSITE PREPARED BY USING POST-CONSUMER PLASTIC WASTE BOTTLES	357
<i>Solanki Pranshoo, Bhattarai Samikaran</i>	
USE OF FLY ASH FROM FLUIDIZED BED BOILERS IN CLINKER-SLAG-ASH BASED BINDERS	365
<i>Janowska-Renkas Elzbieta, Kowalska Jolanta</i>	
THE EFFECT OF NANO-ADDITIVE TiO₂ ON THE FAILURE PROCESS OF SELF-COMPACTING CONCRETE ASSESSED USING THE ACOUSTIC EMISSION METHOD.....	376
<i>Niewiadomski Pawel</i>	
INFLUENCE OF THE FLY ASH AND THE PRIOR FREEZING AND THAWING ON THE SULPHATE RESISTANCE OF CEMENT MORTARS	385
<i>Marczewska Julia</i>	
UTILIZATION OF WASTES FROM MEDIUM DENSITY FIBERBOARDS PRODUCTION AS AN AGGREGATE FOR LIGHTWEIGHT CEMENT COMPOSITE.....	394
<i>Malaszkiewicz Dorota, Sztukowska Magdalena</i>	
CEMENT-FLY ASH MORTARS DURABILITY, WITH FLY ASH FROM FLUIDIZED BED BOILERS AND CONVENTIONAL COMBUSTION, EXPOSED TO AGGRESSIVE ENVIRONMENT INFLUENCE	404
<i>Janowska-Renkas Elzbieta, Kowalska Jolanta, Janus Grzegorz, Kaliciak Agnieszka</i>	

PARAMETERS OF HARDENED CONCRETE WITH THE ADDITION OF METAKAOLIN	417
<i>Kotwa Anna</i>	
LIGHTWEIGHT SINTERED AGGREGATE AS CONSTRUCTION MATERIAL IN CONCRETE STRUCTURES	425
<i>Grygo Robert, Pranevich Victor</i>	
SAND-LIME COMPOSITES WITH BASALT FIBERS	433
<i>Kostrzewa Paulina, Stepień Anna</i>	
THE UNCERTAINTY OF A DYNAMIC MODULUS OF ELASTICITY MEASURING IN VIEW OF NONDESTRUCTIVE TESTS OF CONCRETE COMPRESSIVE STRENGTH	442
<i>Jurowski Krystian, Kaleta Alina, Krepa Bronisław</i>	
AUTOCLAVED MATERIALS WITH CHALCEDONITE ADDITION	451
<i>Dachowski Ryszard, Kostrzewa Paulina, Brelak Sylwia</i>	

PART 2

EFFECT OF SULPHATE CORROSION ON THE DURABILITY OF AIR-ENTRAINED CEMENT MORTARS	459
<i>Knap Monika, Piasta Wojciech</i>	
THE POSSIBILITY OF SHRINKAGE STRAIN REDUCTION IN CEMENTS MORTARS	468
<i>Gruszczynski Maciej, Bajorek Grzegorz</i>	
CHANGING THE METHOD OF COMPACTION OF AUTOCLAVED BUILDING MATERIALS MODIFIED BY DIABASE AND BARITE AGGREGATE.	479
<i>Komisarczyk Katarzyna, Stepień Anna, Dachowski Ryszard</i>	
SCANNING ELECTRON MICROSCOPY IN THE TESTS OF FIBRE-CEMENT BOARDS	488
<i>Adamczak-Bugno Anna, Swit Grzegorz, Krampikowska Aleksandra</i>	
POST CRACKING BEHAVIOUR OF FIBRE REINFORCED CONCRETE WITH MINERAL WOOL FIBERS RESIDUES	498
<i>Kosior-Kazberuk Marta, Krassowska Julita, Piña Ramírez Carolina</i>	
A STUDY OF SELECTED PROPERTIES OF AUTOCLAVED BRICKS.	508
<i>Komisarczyk Katarzyna, Dachowski Ryszard</i>	
INVESTIGATION OF MECHANICAL PROPERTIES OF LIMESAND BRICK UNDER DYNAMIC LOADING	516
<i>Bragov Anatolij, Lomunov Andrey, Konstantinov Alexander, Lamzin Dmitriy, Kruszką Leopold</i>	
MODIFIED STEPPED SCHEME FOR MODELLING THE DYNAMIC BEHAVIOUR OF 3D POROVISCOELASTIC SOLIDS	524
<i>Igunnov Leonid, Ipatov Aleksandr, Litvinchuk Svetlana</i>	
FRACTURE TOUGHNESS OF RC BEAMS WITH DIFFERENT SHEAR SPAN	535
<i>Vegeva Pavlo, Vashkevych Rostyslav, Blikharskyy Zinoviy</i>	
USE OF THE KOLSKY METHOD FOR DYNAMIC TESTS OF BRITTLE MEDIA	543
<i>Bragov Anatolij, Igunnov Leonid, Lomunov Andrey, Konstantinov Alexander, Lamzin Dmitriy, Kruszką Leopold</i>	
MODELLING OF ELASTIC-PLASTIC BEHAVIOR OF CABLES	553
<i>Shimanovsky Oleksandr</i>	
MODELLING AND VERIFICATION OF BRIDGE BEHAVIOUR	564
<i>Bujnak Jan, Bujnakova Petra, Jedraszak Bronisław</i>	
ON THE ASSESSMENT OF EXISTING CIVIL ENGINEERING STRUCTURES	574
<i>Chmielewski Tadeusz</i>	
NUMERICAL ANALYSIS OF SUCTION INFLUENCE ON THE BEHAVIOUR OF UNSATURATED ELASTO-PLASTIC SOIL MEDIUM	583
<i>Fedczuk Pawel</i>	
BUILDING DIAGNOSTICS VERSUS EFFECTIVENESS OF REPAIRS	591
<i>Stawiski Bohdan, Kania Tomasz</i>	
RENOVATION OF THE HISTORIC BUILDING AFTER DAMAGE CONNECTED WITH FOUNDATIONS SUBSIDENCE - CASE STUDY	599
<i>Ukleja Janusz</i>	
OCTAHEDRON-BASED SPATIAL BAR STRUCTURES - THE FORM OF LARGE AREAS COVERS	610
<i>Pilarska Dominika</i>	
THE CONSTRUCTION HISTORY AND ASSESSMENT OF TWO HERITAGE INDUSTRIAL BUILDINGS IN WROCLAW	620
<i>Berkowski Piotr, Dmochowski Grzegorz, Baranski Jacek, Szolomicki Jerzy</i>	

NUMERICAL SIMULATION OF BEAM-TO-COLUMN JOINTS WITH FLANGE CLEATS	630
<i>Jablonska-Krysiewicz Agnieszka, Golowczyk Jakub</i>	
ANALYSIS OF RETAINING WALL STABILITY IN AREAS SPECIFIED IN REGISTER OF OBJECTS OF CULTURAL HERITAGE	639
<i>Chmielewski Ryszard</i>	
TECHNICAL DIAGNOSTICS OF THE HISTORIC APARTMENT HOUSE LOCATED AT NO. 31 IN DOBRA STREET IN WARSAW	649
<i>Bukala Michal, Chyla Andrzej, Kruszka Leopold, Muzolf Pawel</i>	
SELECTED PROBLEMS OF PROTECTION OF HISTORIC BUILDINGS AGAINST THE RAINWATER AND THE GROUNDWATER	660
<i>Chmielewski Ryszard, Muzolf Pawel</i>	
REINFORCEMENT OF BRICK HISTORIC BUILDINGS THREATENED BY STRUCTURAL DAMAGES OR BY FAILURE	670
<i>Kruszka Leopold</i>	
UNCONSCIOUS DECISIONS CAUSING A FAILURE CONDITION OF THE 19TH CENTURY BRICK CEILING	679
<i>Bajno Dariusz, Grzybowska Agnieszka, Tews Rafal</i>	
RESEARCH OF POST-TENSIONED CONCRETE COMPOSITE SPANS WITH II-BEAMS OF ROAD VIADUCT	686
<i>Mordak Arkadiusz, Manko Zbigniew</i>	
ASSESSMENT OF THE LOAD CAPACITY OF THE ANCHORAGE SYSTEM CONNECTING THE TEXTURED LAYER WITH THE STRUCTURAL WALL OF LARGE SLAB BUILDINGS IN THE LIGHTS OF EXPERIMENTAL RESEARCH AND FEM ANALYSIS	697
<i>Szlendak Jerzy K., Jablonska-Krysiewicz Agnieszka, Tomaszewicz Dariusz</i>	
RESTORATION OF THE INTERIOR OF THE SUMMER LUBOMIRSKI PALACE IN RZESZOW	708
<i>Wróbel Krystyna, Kubiszyn Wieslaw</i>	
APPLICATION OF THE AGGREGATED CALCULATION ALGORITHM EA FAHP AND FUZZY TOPSIS METHODS IN THE EVALUATION OF RAILWAY CULVERTS SERVICEABILITY	719
<i>Fabianowski Dariusz, Jakiel Przemyslaw</i>	
ASSESSMENT OF TECHNICAL CONDITION OF HISTORIC PENNY BRIDGE IN OPOLE IN THE CONTEXT OF ITS RESTORATION	729
<i>Jakiel Przemyslaw, Bajno Dariusz</i>	
BIONIC FORMS IN SEARCH OF STRUCTURAL MODELS IN ARCHITECTURE	739
<i>Nowak Anna, Rokicki Wieslaw</i>	
PROBLEMS CONCERNING RECONSTRUCTION OF OLD POSTINDUSTRIAL BUILDING OF A CLOSED COAL MINE AND ITS ADAPTATION TO A NEW UTILITY FUNCTION	749
<i>Hulimka Jacek, Kubica Jan, Kaluza Marta</i>	
EXPERIMENTAL AND THEORETICAL INVESTIGATION OF COMPOSITE TRUSS BEAMS	759
<i>Bujnak Jan, Michalek Peter, Baran Wieslaw</i>	
THE EFFECT OF MINE INDUCED TREMORS ON SEISMIC RESPONSE OF SOIL-STEEL BRIDGES	767
<i>Maleska Tomasz, Beben Damian</i>	
BEHAVIOUR OF CORRUGATED STEEL PLATE BRIDGE WITH HIGH SOIL COVER UNDER SEISMIC EXCITATION	777
<i>Maleska Tomasz, Beben Damian</i>	
LEGAL BASES AND ECONOMIC CONDITIONS OF APPLYING RENEWABLE ENERGY RESOURCES IN CONSTRUCTION INDUSTRY	788
<i>Ramczyk Marek</i>	
ANALYSIS CONSTRUCTION INDUSTRY ON THE BASIS OF PRICE TRENDS OF LABOR COST	796
<i>Przywara Daniel, Rak Adam</i>	
ENVIRONMENTAL INTERACTIONS TO COMPOSITE ELEMENTS OF ALL-GFRP KOLDING FOOTBRIDGE	803
<i>Stankiewicz Beata</i>	
CLASSIFICATION OF POLISH VOIVODESHIPS WITH REGARDS TO THE ACCIDENT RATE IN THE CONSTRUCTION INDUSTRY	811
<i>Nowobilski Tomasz, Baginska Irena, Gawron Krzysztof</i>	
BICRITERIA PROBLEM OF DISCRETE OPTIMIZATION IN PLANNING A MULTIUNIT CONSTRUCTION PROJECT	819
<i>Podolski Michal</i>	

PLANNING THE DEVELOPMENT OF SPATIAL MANAGEMENT AND TRANSPORT SYSTEM OF A CITY FROM THE POINT OF VIEW OF ENVIRONMENTAL IMPACT	827
<i>Chmielewski Jacek, Szczuraszek Tomasz</i>	
FEASIBILITY STUDY OF CONSTRUCTION PROJECT IN COMPLIANCE WITH BANK INVESTMENT SUPERVISION REQUIREMENTS	837
<i>Konior Jaroslaw</i>	
STRUCTURAL ENGINEERING BY WAY OF BIM.....	847
<i>Baran Wieslaw, Zymanczyk Bartosz</i>	
ANALYTICAL MODELLING OF A THREE-LAYER WALL SYSTEM OF STRENGTHENING FOR LARGE-PANEL SLAB BUILDINGS BY MEANS OF BONDED ANCHORS.....	859
<i>Szlendak Jerzy K., Jablonska-Krysiewicz Agnieszka, Tomaszewicz Dariusz</i>	
INFLUENCE OF STATIC LONG-TERM LOADS AND CYCLIC FREEZING/THAWING ON THE BEHAVIOUR OF CONCRETE BEAMS REINFORCED WITH BFRP AND HFRP BARS.....	869
<i>Kosior-Kazberuk Marta, Wasileczyk Rafal</i>	
ANALYSIS OF THE DEPENDENCE BETWEEN THE NUMBER OF ACCIDENTS AT WORKPLACES THAT INVOLVE SCAFFOLDING AND CHANGES IN WORK EFFICIENCY	878
<i>Sawicki Marek, Szóstak Mariusz</i>	
TECHNICAL AND ECONOMIC ISSUES OF RECONFIGURATION OF A COAL-FIRED DISTRICT HEATING SOURCE.....	888
<i>Tanczuk Mariusz, Olszewski Eligiusz, Goluzda Alfred</i>	
CONSCIOUS APPROACH TO URBAN AND EXTRA-URBAN SPACE RESTRUCTURING AS SEEN IN THE DESIGNS OF ARCHITECTURE STUDENTS.....	896
<i>Gil-Mastalerczyk Joanna</i>	
RESEARCH OF RC COLUMNS STRENGTHENED BY CARBON FRP UNDER LOADING.....	904
<i>Blikharskyy Yaroslav, Khmil Roman, Blikharskyy Zinoviy</i>	
Author Index	