



The 7th International Scientific Conference
on Environmental Challenges in Civil Engineering
OPOLE, POLAND, April 20–22, 2026

7TH SCIENTIFIC CONFERENCE
**ENVIRONMENTAL CHALLENGES
IN CIVIL ENGINEERING**

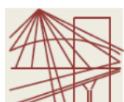
ECCE 2026
KreativEU Network Conference

Opole, Poland
April 20-22, 2026

CONFERENCE PROGRAM



Polish Association of Civil
Engineers and Technicians
Opole Branch



Opole District Chamber
of Civil Engineers



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CIVIL ENGINEERING
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Commission of Civil Engineering – Polish Academy of Sciences
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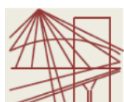


The 7th International Scientific Conference
on Environmental Challenges in Civil Engineering
OPOLE, POLAND, April 20–22, 2026

Preparation for printing: Z. Perkowski, W. Baran, D. Bęben
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i Techników Budownictwa, **Prof. Maria KASZYŃSKA**

Rector of the Opole University of Technology
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Marszałek Województwa Opolskiego, **Szymon OGŁAZA**

President of the Provincial Fund for Environmental Protection
and Water Management in Opole
Prezes Wojewódzkiego Funduszu Ochrony Środowiska
i Gospodarki Wodnej w Opolu, **Aleksandra DRESCHER**

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Polish Association of Civil Engineers and Technicians (PACET), Opole Branch
Polski Związek Inżynierów i Techników Budownictwa (PZITB), Oddział w Opolu

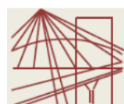
Faculty of Civil Engineering and Architecture, Opole University of Technology
(a member of the KreativEU Alliance)
Wydział Budownictwa i Architektury, Politechnika Opolska

Opole District Chamber of Civil Engineers
Polska Okręgowa Izba Inżynierów Budownictwa

Commission of Civil Engineering,
Katowice Branch of the Polish Academy of Sciences
Komisja Inżynierii Budowlanej, Oddział Polskiej Akademii Nauk w Katowicach



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Chairman

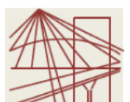
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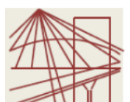
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Elisa da SILVA, University of Algarve (Portugal)
Grzegorz Sławomir ŚWIT, Kielce University of Technology (Poland)
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Joanna KUBIELAS-WALASEK, Doctoral School of Opole University of Technology

ADDRESS OF THE ORGANIZING COMMITTEE

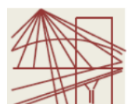
Opole University of Technology,
Faculty of Civil Engineering and Architecture
Katowicka 48, 45-061 Opole, Poland
(with a note on the envelope: ECCE 2026)

E-mail: ecce@po.edu.pl

The website: <https://ecce.po.edu.pl>



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FOREWORD FROM THE ORGANIZERS

Dear Conference Participants,

The ECCE conference has been held cyclically every two years since 2014, and its 2026 edition is organized as a KreativEU Network Conference.

We present to you a program of ECCE 2026. The included papers demonstrate that our event, to the organizers' great satisfaction, has become a platform for exchanging ideas between civil engineering science and practice. The presented materials reflect the current dynamics of change in the construction sector, where traditional engineering approaches meet modern technologies and the imperatives of environmental protection, sustainable development, and digital transformation. The papers prepared by participants at this year's conference can be divided generally into several key areas:

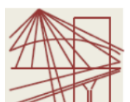
- 1) Modern materials technology
- 2) Circular economy and ecology
- 3) Durability and diagnostics of materials and structures,
- 4) Organization of construction processes
- 5) Historic buildings
- 6) Architecture, urban planning, and heritage

We hope that the interdisciplinary nature of the presentations will prove inspiring and contribute to the further development of engineering thought in our field, where weaving together many different threads is just part of the day-to-day.

We would like to especially thank the authors of the plenary lectures for their very valuable contribution, i.e.:



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- Piotr Podkowa, Seweryn Stęplowski, Cementownia “Odra” S.A., Poland: *Implementation of a Modern Calciner in the Production Line of Cementownia “Odra” S.A.*
- Mariusz Pustelnik, Mostopol Sp. z o.o., Poland: *Flood in Southern Poland in 2024: Immediate and Final Reconstruction of Bridge Structures*
- Maurizio Scarciglia¹, Anna Szczegliński², Luca Trabattoni²; ¹Breda University of Applied Sciences, The Netherlands; ²Opole University of Technology, Poland: *Degrowth, Demographic Change, and Spatial Justice: A Joint Educational Model for Rural-Urban Planning*

We would like to give special thanks to all the authors of the submitted paper proposals. We are very pleased to inform you that after passing the final editing process, the positively reviewed papers will be published as chapters in a special post-conference monograph by *Springer* under the working title *Environmental Challenges in Civil Engineering IV* or as articles in the PACET journal *Inżynieria i Budownictwo*.

We also extend our special thanks to the sponsors, exhibitors, and media patrons, and we invite you to listen to their presentations and read their information materials.

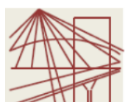
The conference website is available at <https://ecce.po.edu.pl/>.

We wish all participants of the ECCE 2026 conference fruitful debates and a pleasant stay in Opole.

Organizers



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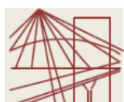
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HABA-BETON
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Cementownia Odra



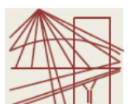
ES TEST SYSTEMS
drżania ♦ akustyka ♦ termowizja ♦ szybkie kamery



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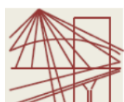
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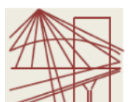


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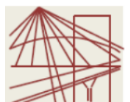


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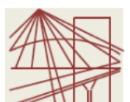
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PRZEGLĄD budowlany



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The 7th International Scientific Conference
on Environmental Challenges in Civil Engineering
OPOLE, POLAND, April 20–22, 2026

CONFERENCE VENUE REGISTRATION DESK

On April 20, 2026:

OPOLE UNIVERSITY OF TECHNOLOGY
FACULTY OF CIVIL ENGINEERING AND ARCHITECTURE
Prof. Oswald Mateja Assembly Hall
Katowicka 48, 45-061 Opole, Poland
Website of the faculty: <https://wbia.po.edu.pl>

On April 21–22, 2026:

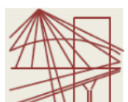
HOTEL MERCURE OPOLE
Krakowska 57/59, 45-018 Opole, Poland
Website of the hotel: <https://all.accor.com/hotel/3405/index.en.shtml>

OPOLE CITY TOUR WITH A GUIDE

On the third day of the Conference, Wednesday, 22 April, at 14.30–16.30, a guided tour around the city of Opole is organized. Please inform the organizers of your willingness to participate in the tour during registration.



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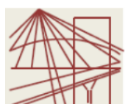
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PRESENTATION OF PAPERS

- 1) The plenary papers will be delivered during the first session on April 20, 2026, in 25-minute presentations.
- 2) The thematic papers will be delivered in six sessions on April 21–22, 2026, as a 10-minute presentation with a discussion of up to 5 minutes. To prepare the paper presentations, we recommend using the template available on the ECCE 2026 website.
- 3) The sponsor and exhibitor presentations will be delivered in the individually agreed form.



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The 7th International Scientific Conference
on Environmental Challenges in Civil Engineering
OPOLE, POLAND, April 20–22, 2026

GENERAL CONFERENCE PROGRAM

MONDAY, APRIL 20, 2026

OPOLE UNIVERSITY OF TECHNOLOGY, FACULTY OF CIVIL ENGINEERING AND ARCHITECTURE
Katowicka 48, 45-061 Opole, Poland

14:00 - 16:00	Registration	17:15 - 19:15	Plenary session
16:00 - 17:00	Opening ceremony	19:30	Welcome reception
17:00 - 17:15	Coffee break		

TUESDAY, APRIL 21, 2026

HOTEL MERCURE OPOLE
Krakowska 57/59, 45-018 Opole, Poland

09:00 - 11:00	Thematic session I	13:15 - 14:45	Lunch
11:00 - 11:15	Coffee break	15:00 - 16:30	Thematic sessions III and IV
11:15 - 13:15	Thematic session II	19:00	Gala dinner

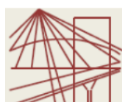
WEDNESDAY, APRIL 22, 2026

HOTEL MERCURE OPOLE
Krakowska 57/59, 45-018 Opole, Poland

09:00 - 11:00	Thematic session V	12:45 - 13:00	Closing ceremony
11:00 - 11:15	Coffee break	13:00 - 14:30	Lunch
11:15 - 12:45	Thematic session VI	14:30 - 16:30	Opole city tour with a guide



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The 7th International Scientific Conference
on Environmental Challenges in Civil Engineering

OPOLE, POLAND, April 20–22, 2026

FULL CONFERENCE PROGRAM

MONDAY, APRIL 20, 2026

OPOLE UNIVERSITY OF TECHNOLOGY, FACULTY OF CIVIL ENGINEERING AND ARCHITECTURE
PROF. OSWALD MATEJA ASSEMBLY HALL
Katowicka 48, 45-061 Opole, Poland

14:00 - 16:00 REGISTRATION

16:00 - 17:00 OPENING CEREMONY

Chairs: Zbigniew Perkowski, Dominika Bysiec

Speeches by the organizers and invited guests

(representatives of the authorities of Opole University of Technology and Opole Voivodeship)

Concert of the el12 Opole Politechnic Band – Generacja 2.0

17:00 - 17:15 COFFEE BREAK

17:15 - 19:15 PLENARY SESSION

Chair: Damian Bęben

25-min paper presentations

1) Piotr Podkowa, Seweryn Stęplowski

Cementownia „Odra” S.A., Poland

Implementation of a Modern Calciner in the Production Line of Cementownia “Odra” S.A.

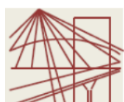
2) Mariusz Pustelnik

Mostopol Sp. z o.o., Poland

Flood in Southern Poland in 2024: Immediate and Final Reconstruction of Bridge Structures



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3) **Maurizio Scarciglia¹, Anna Szczegielniak², Luca Trabattoni²**

¹ Breda University of Applied Sciences, The Netherlands

² Opole University of Technology, Poland

Degrowth, Demographic Change, and Spatial Justice: A Joint Educational Model for Rural-Urban Planning

4) **Sponsor presentations (2 x 15 min)**

PORR

Andrzej Ernst

Modernizacja linii kolejowej nr 131 na odcinku Chorzów Batory – Nakło Śląskie

ADAMIETZ

Sławomir Babik, Małgorzata Kałuża-Swoboda

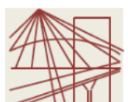
Od koncepcji do realizacji – rola generalnego wykonawcy w procesie projektowo-budowlanym na przykładzie zrealizowanych inwestycji. Doświadczenia generalnego wykonawcy ADAMIETZ Spółka Akcyjna.

19:30

WELCOME RECEPTION



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TUESDAY, APRIL 21, 2026

HOTEL MERCURE OPOLE
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09:00 - 11:00 THEMATIC SESSION I: BUILDING MATERIALS ENGINEERING

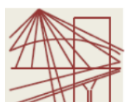
Chairs: Damian Bęben, Marco Lindner

10-min paper presentations with a 5-min discussion after each paper

- 1) Ferdinand Senf, Marvin Abstoß, Enrico Rudolph, Marco Lindner, Christian Müller, Sandra Gelbrich**
Chemnitz University of Technology, Germany
Development of a Two-Component Mixing System for 3D Concrete Printing (3DCP) with Fast-Setting Calcium Sulfoaluminate (CSA) Cement Blends
- 2) Michał Cisiński¹, Elżbieta Janowska-Renkas¹, Paweł Niewiadomski², Martyna Nieświec²**
¹ Opole University of Technology, Poland
² Wrocław University of Science and Technology, Poland
Preliminary Research on the Applicability of Spent Catalytic Cracking Catalyst as a Novel Type II Additive to High-Performance Concrete
- 3) Marco Lindner¹, Sandra Gelbrich¹, Peter Schneider²**
¹ Chemnitz University of Technology, Germany
² thoenes® Dichtungstechnik GmbH, Germany
Technology Development for the Production of Fiber-Based Curved Reinforcement for Concrete
- 4) Amanda Akram, Marta Stowik**
Lublin University of Technology, Poland
Comparative Analysis of Two Aggregate Types in Terms of Their Influence on Concrete Properties and Environmental Impact
- 5) Marvin Abstoß, Henrik Funke, Ferdinand Senf, Sandra Gelbrich**
Steinbeis Innovation Center FiberCrete, Germany
Hybrid Additive Manufacturing for Small-Scale Modular Housing: Enhancing Sustainability Through Concrete Waste Valorization



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- 6) **Ralf Gliniorz, Marvin Abstoß, Henrik Funke, Sandra Gelbrich**
Chemnitz University of Technology, Germany
*Application of Circular Economy Principles to Recycled Concrete
Components from Additive Manufactured and Milled Structures*

- 7) **Sponsor presentations (2 x 15 min)**

XELLA

Wojciech Łasut

Buduj szybciej, taniej i mniejszym zespołem

WIENERBERGER

11:00 - 11:15 **COFFEE BREAK**

11:15 - 13:15 **THEMATIC SESSION II: BUILDING MATERIALS ENGINEERING**

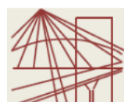
Chair: Arkadiusz Mordak

10-min paper presentations with a 5-min discussion after each paper

- 1) **Rezan Javed, Henrik Funke, Sandra Gelbrich**
Chemnitz University of Technology, Germany
*Characterization and Alkaline Activation of Linz-Donawitz (LD) Steel
Slag for Use as a Sustainable Cementitious Binder*
- 2) **Stefania Grzeszczyk¹, Aneta Matuszek-Chmurowska¹, Alina
Kaleta-Jurowska¹, Krystian Jurowski¹, Piotr Podkowa², Seweryn
Stęplowski², Tomasz Rajczyk³**
¹ Opole University of Technology, Poland
² Cementowania „Odra” S.A., Poland
³ Piława Górna Mine, Kompania Górnicza LLC, Poland
*The Influence of Waste Migmatite-Amphibolite Dust on Cement
Properties*
- 3) **Elżbieta Kuźmińska, Mateusz Zakrzewski, Jacek Domski**
Koszalin University of Technology, Poland
*Shrinkage of Cement Composites Incorporating Waste Polystyrene
Aggregates*



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4) **Alina Moşiu**^{1,2}, **Rodica-Mariana Ion**^{1,2,3,4}, **Iasmina Onescu**²

¹ Valahia University of Targoviste, Romania

² Polytechnic University of Timisoara, Romania

³ ICECHIM Bucharest, Romania

⁴ Academy of Romanian Scientists, Romania

Eco-Compatible Lime-Based Mortars Enhanced with Hydroxyapatite for the Sustainable Conservation of Historic Masonry under Environmental Stress

5) **Jakub Jędrzejczak**^{1,2}, **Gabriel Sobczak**^{1,2}, **Alicja Wieczorek**¹,
Marcin Koniorczyk¹

¹ Lodz University of Technology, Poland

² Atlas Sp. z o.o., Poland

Cement-based, Flexible Waterproofing Micro-Mortars. Requirements and Properties. Prospects for the Use of Alternative Binders.

6) **Adrian Sowa**

Łukasiewicz Research Network, Poland

Curing Conditions Influence on Strength Development of Concretes Made with Reduced Carbon Footprint Cements

7) **Sponsor presentations (2 x 15 min)**

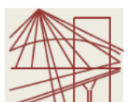
HABA-BETON

FAMAR

13:15 - 14:45 **LUNCH**



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15:00 - 16:30 **ROOM A**

**THEMATIC SESSION III: BIOENGINEERING, BUILDING MATERIALS
ENGINEERING, MATERIALS TESTING**

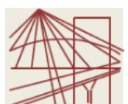
Chair: Zbigniew Perkowski

10-min paper presentations with a 5-min discussion after each paper

- 1) **Vaida Vitkauskaitė, Saulius Vasarevičius**
Vilnius Gediminas Technical University, Lithuania
*Experimental Study of Lead and Copper Immobilization in Soil Using
Bacillus sp. J4*
- 2) **Anna Jurkiewicz, Ryszard Walentyński**
Silesian University of Technology, Poland
*Mycelium-Based Composites for Sustainable Construction:
Environmental Performance and Early Numerical Modelling*
- 3) **Przemysław Brzyski, Krystian Patyna, Wojciech Zbyszyński**
Lublin University of Technology, Poland
*The Influence of Animal Glue on Selected Mechanical and Moisture
Parameters of Lightweight Clay Composites*
- 4) **Fabian Nendel, Denise Lenk, Sandra Gelbrich**
Chemnitz University of Technology, Germany
*Enhancing the Durability of Timber Elements by Applying a Natural
Fiber-Reinforced Polymer (NFPR) Encapsulation*
- 5) **Rafał Kurpiela, Mariusz Czabak, Andrzej Marynowicz**
Opole University of Technology, Poland
*Reinforced Concrete Beams with Steel and Carbon Fiber Bars: A
Comparative Analysis*
- 6) **Jan Czmiel¹, Zbigniew Perkowski¹, Daniel Frączek¹, Robert
Jurczak²**
¹ Opole University of Technology, Poland
² West Pomeranian University of Technology, Poland
*Friction Coefficient of Cement Concrete Road Surface Measured
Using the ViaFriction and SRT-3 Devices*



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7) **Szymon Kasprzyk¹, Ferdinand Senf²**

¹ Łukasiewicz Research Network, Poland

² Chemnitz University of Technology, Germany

The Use of Roman Cement in 3D Printing

15:00 - 16:30 **ROOM B**

**THEMATIC SESSION IV: CONSTRUCTION ORGANIZATION,
HISTORIC BUILDINGS**

Chair: Adam Rak

10-min paper presentations with a 5-min discussion after each paper

1) **Adam Rak, Adrian Czubak**

Opole University of Technology, Poland

Sustainable Planning of the Inland River Port Construction: A Case Study

2) **Andrzej Szewczak**

Lublin University of Technology, Poland

The Use of BIM Technology in Multidimensional Building Life Cycle Modeling

3) **Marcin Molewski, Agnieszka Grzybowska¹, Izabela Kasprzyk¹,
Dariusz Bajno², Julian Polański³**

¹ Bydgoszcz University of Science and Technology, Poland

² Wrocław University of Science and Technology, Poland

³ University of Bydgoszcz, Poland

Optimization of the Construction Process of an Inland Marina: A Case Study of a Hydrotechnical Facility

4) **Łukasz Agaś, Agnieszka Grzybowska¹, Izabela Kasprzyk¹,
Dariusz Bajno², Łukasz Lewandowski¹**

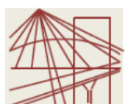
¹ Bydgoszcz University of Science and Technology, Poland

² Wrocław University of Science and Technology, Poland

Delays in the Implementation of Construction Projects as an Engineering Problem: Identification of Causes and Possibilities for Their Mitigation



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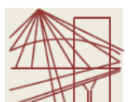
- 5) **Małgorzata Kałuża-Swoboda, Andrzej Marynowicz**
Opole University of Technology, Poland
Management of the Investment Process in a Building Entered in the Register of Historic Monuments on the Example of the Opole Cathedral
- 6) **Tomasz Szkuta**
Polish Association of Civil Engineers and Technicians, Toruń Branch, Poland
Analysis of the Potential and Technical Solutions for Straightening the Dansker Tower of the Castle in Kowalewo Pomorskie Using the Method of Controlled Ground Weakening

19:00

GALA DINNER



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WEDNESDAY, APRIL 22, 2026

HOTEL MERCURE OPOLE
Krakowska 57/59, 45-018 Opole, Poland

09:00 - 11:00 **THEMATIC SESSION V: DURABILITY OF MATERIALS AND STRUCTURES, HISTORIC BUILDINGS**

Chairs: Łukasz Drobiec, Piotr Bońkowski

10-min paper presentations with a 5-min discussion after each paper

1) Olexandr Shimanovsky¹, Wiesław Baran²

¹ V.N. Shimanovsky Ukrainian Institute of Steel Construction, Ukraine

² Opole University of Technology, Poland

Enhancing the Load-Bearing Capacity of a Suspended Roof System for an Exhibition Pavilion

2) Anna Piontek, Piotr Bońkowski¹

¹ Opole University of Technology, Poland

Stiffness Identification in Multispan Beams Using Rotation Rate Sensors

3) Anna Hoła

Wrocław University of Science and Technology, Poland

Research on the Structure, Humidity, and Salinity of the Brick Walls of the Medieval Refectory

4) Dariusz Bajno¹, Agnieszka Grzybowska², Mateusz Banaś³

¹ Wrocław University of Science and Technology, Poland

² Bydgoszcz University of Science and Technology, Poland

³ GODBAN Sp. z o.o., Poland

Assessment of the Technical Condition and Biological Degradation of Historic Timber Structures Based on a Residential-Commercial Building Case Study

5) Joanna Drobiec¹, Łukasz Drobiec²

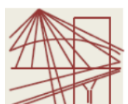
¹ University of Zielona Góra, Poland

² Silesian University of Technology, Poland

New Possibilities for Diagnosing the Structure of Historic Buildings Using Ultrasound



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- 6) **Andrzej Kucharczyk, Andrzej Marynowicz, Piotr Lewko**
Opole University of Technology, Poland
*Application of Thermographic Measurements in the Analysis of
Capillary Rise in Selected Building Materials*

7) **Sponsor presentation**

EC Test Systems

11:00 - 11:15 **COFFEE BREAK**

11:15 - 12:45 **THEMATIC SESSION VI: ARCHITECTURE, URBAN PLANNING,
HERITAGE**

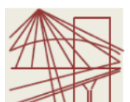
Chairs: Justyna Kleszcz, Luca Trabattoni

10-min paper presentations with a 5-min discussion after each paper

- 1) **Silviu Miloiu**
Valahia University of Targoviste, Romania
*Eco-Cultural Infrastructures: A Systems-Based Framework for
Integrating Heritage into Sustainable Urban and Spatial Planning*
- 2) **Anabela M. Moreira**
Polytechnic University of Tomar, Portugal
*Early Twentieth Century Urban Buildings in Portugal: Main Sanitary
Requirements for Dwellings and Their Impacts in Working Class
Housing*
- 3) **Lucia Nováková**
Trnava University in Trnava, Slovakia
*Reconstruction and Adaptive Operation of Historic UNESCO Hydro-
Technical Infrastructure: From Aqueducts and Qanats to Tajchy*
- 4) **Justyna Kleszcz, Anna Szczegielniak**
Opole University of Technology, Poland
*Improving Architectural Accessibility of a Market Square Through
User-Assisted Research: The Case of Dobrodzień*



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5) **Aleksandra Repelewicz**

Czestochowa University of Technology, Poland

Urban Church Garden: On the Example of the Parish of St. Peter and Paul the Apostles in Częstochowa

6) **Justyna Kleszcz¹, Piotr Kmiecik²**

¹ Opole University of Technology, Poland

² The Angelus Silesius University of Applied Sciences, Poland

Londzina Street in Zabrze: Architecture and Urban Planning Between the City and the Ironworks

12:45 - 13:00 **CLOSING CEREMONY**

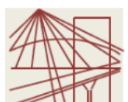
Chair: Zbigniew Perkowski

13:00 - 14:30 **LUNCH**

14:30 - 16:30 **OPOLE CITY TOUR WITH A GUIDE**



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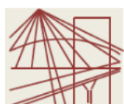
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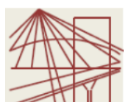
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