Preface

The 13th International Conference on CONTEMPORARY PROBLEMS OF ARCHITECTURE AND CONSTRUCTION (ICCPAC) was held on October 6-8, 2021, at the National University of Architecture and Construction of Armenia (NUACA).

The Conference welcomed the participation and contributions of professionals and researchers, youth groups, and the private sector. The event brought together 57 participants from 10 different countries.

On behalf of the Organizing Committee, we would like to thank all the supporting organizations and universities, also the participants, for identifying challenging issues in the area, sharing the latest ideas and results, shaping research directions, and inspiring future breakthroughs.

Editors:

1.	Yeghiazar Vardanyan	National University of Architecture and Construction of Armenia	info@nuaca.am
2.	Manuk Barseghyan	National University of Architecture and Construction of Armenia	manuk.barseghyan@nuaca.am

Committees

Honorary Committee



Doctor of Science (Engineering), Prof. Yeghiazar Vardanyan Rector of National University of Architecture and Construction of Armenia, Yerevan, Republic of Armenia



Doctor of Science (Economics), Prof. Yevgeniy Rybnov Rector of St. Petersburg State University of Architecture and Civil Engineering, St. Petersburg, Russian Federation



Doctor of Science (Physical Chemistry), Prof. Luigi Dei Rector of University of Florence, Florence, Italian Republic



Doctor of Science (Engineering), Prof. Pavel Akimov Moscow State (National Research) University of Civil Engineering (MGSU), Moscow, Russian Federation



Prof. Zhang Ailin

Rector of Beijing University of Civil Engineering and Construction, Beijing, People's Republic of China



Doctor of Science, Prof. Václav Snášel Rector of VSB - Technical University of Ostrava, Ostrava, Czech Republic



Ph.D. in Engineering, Prof. Ali Maher Rutgers University, New Jersey, United States of America



Ph.D. in Archeology, Associate Prof. Merab Khalvashi Rector of Batumi Shota Rustaveli State University, Batumi, Georgia



Doctor of Technical Sciences, Professor, Ph.D. in Engineering, prof. David Gurgenidze Rector of Georgian Technical University



Dr. Hab. Inż., Prof. Norbert Sczygiol Rector of Czestochowa University of Technology, Czestochowa, Republic of Poland

International Scientific Committee

Republic of Armenia

Doctor of Science (Engineering), Prof. Yeghiazar Vardanyan, National University of Architecture and Construction of Armenia

Doctor of Science (Physics), Manuk Barseghyan, National University of Architecture and Construction of Armenia

Ph.D in Mathematics, Associate Prof. Vardges Yedoyan, National University of Architecture and Construction of Armenia

Associate Prof. Garnik Stepanyan, National University of Architecture and Construction of Armenia

Doctor of Science (Engineering), Prof. Eduard Khachiyan, National University of Architecture and Construction of Armenia

Doctor of Science (Mathematics), Prof. Suren Mkhitaryan, National University of Architecture and Construction of Armenia

Doctor of science (Architecture), Associate Prof. Sargis Tovmasyan, National University of Architecture and Construction of Armenia

Doctor of Science (Engineering), Associate Prof. Tigran Dadayan, National University of Architecture and Construction of Armenia

People's Republic of China

Prof. Zhang Ailin, Beijing University of Civil Engineering and Architecture

Prof. Zhang Dayu, Beijing University of Civil Engineering and Architecture

Prof. Li Aiqun, Beijing University of Civil Engineering and Architecture

Prof. Qi Chengzhi, Beijing University of Civil Engineering and Architecture

Republic of Poland

Dr Hab. inż. (Engineering), Prof. Maciej Major, Czestochowa University of Technology

Dr hab., Assoc. Prof. Malgorzata Ulewicz, Czestochowa University of Technology

Dr Hab. inż. (Engineering), Prof. Marlena Rajczyk, Czestochowa University of Technology

Russian Federation

Doctor of Science (Economics), Prof. Pavel Akimov, Moscow State (National Research) University of Civil Engineering (MGSU)

Doctor of Science (Engineering), Prof. Ashot Tamrazyan, Moscow State (National Research) University of Civil Engineering (MGSU)

Doctor of Science (Economics), Prof. Evgeny Rybnov, St. Petersburg State University of Architecture and Civil Engineering

Doctor of Science (Economics), Prof. Irina Drozdova, St. Petersburg State University of Architecture and Civil Engineering

Doctor of Science (Pedagogical Science), Irina Lugovskaya, St. Petersburg State University of Architecture and Civil Engineering

Czech Republic

Ph.D, Prof. Darja Kubečková, VŠB - Technical University of Ostrava

Asoc. Prof., MSc. Jiří Brožovský, Ph.D., VŠB - Technical University of Ostrava

Italian Republic

Ph.D, Prof. Saverio Mecca, University of Florence

Ph.D, Prof. Paola Puma, University of Florence

Ph.D., Anna Frangipane, University of Udine

Prof. Stefano Sorace, University of Udine

Georgia

Doctor of Science (Engineering), Prof. Gela Kipiani, Georgian State Aviation University Doctor of Science (Engineering), Prof. Gayoz Partshkaladze, Shota Rustaveli State University

United States of America

Ph.D in Engineering, Prof. Ali Maher, Rutgers University

Ph.D in Engineering, Prof. Nenad Gucunski, Rutgers University

Ph.D in Engineering, Prof. Mohsen Jafari, Rutgers University

Prof. Vahan Tanal, President at Vahan Tanal Consulting, Inc.

Prof. David Michaelyan, Tishman Turner joint venture (TTJV)

Ph.D Mark Grigorian, MGA, Structural Engineering Consultatants Inc.

French Republic

Prof. Patrick Donabe'dian, Laboratory of Medieval and Modern Mediterranean Archeology

Kingdom of Spain

Prof. Luis Ángel Ruiz Fernández, University of Valencia (Spain)

Portuguese Republic

Ph.D in Urban Planning, Prof. João-Manuel Carvalho, Technical University of Lisbon

Ph.D, Professor Auxiliar Francisco N. Oliveira, Technical University of Lisbon

Ph.D, Prof. Margarida Louro, Technical University of Lisbon

Federal Republic of Germany

Prof. Dimitris Diamantidis, Ostbayerische Technische Hochschule Regensburg (OTH-Regensburg)

Ukraine

Ph.D in Engineering, Prof. Anatoly Kovrov, Odessa State Academy of Civil Engineering and Architecture

Organizing Committee

Republic of Armenia

Doctor of Science (Engineering), Prof. Yeghiazar Vardanyan, National University of Architecture and Construction of Armenia

Doctor of Science (Physics), Manuk Barseghyan, National University of Architecture and Construction of Armenia

Ph.D in Mathematics, Associate Prof. Vardges Yedoyan, National University of Architecture and Construction of Armenia

Associate Prof. Garnik Stepanyan, National University of Architecture and Construction of Armenia

Arev Samuelyan, National University of Architecture and Construction of Armenia

People's Republic of China

Prof. Qi Chengzhi, Beijing University of Civil Engineering and Architecture **Associate Prof. Wu Xuan**, Beijing University of Civil Engineering and Architecture **Dr. Chao Ma**, Beijing University of Civil Engineering and Architecture

Republic of Poland

Dr Hab. inż. (engineering), Prof. Maciej Major, Czestochowa University of Technology Dr hab., Assoc. Prof. Malgorzata Ulewicz, Czestochowa University of Technology Dr Hab. inż. (engineering), Prof. Marlena Rajczyk, Czestochowa University of Technology

Russian Federation

Doctor of Science (Pedagogical Science) Irina Lugovskaya, St. Petersburg State University of Architecture and Civil Engineering

Doctor of Science (Economics), Prof. Irina Drozdova, St. Petersburg State University of Architecture and Civil Engineering

Doctor of Science (Engineering), Prof. Ashot Tamrazyan, Moscow State (National Research) University of Civil Engineering (MGSU)

Czech Republic

Ph.D, Prof. Darja Kubečková, VŠB - Technical University of Ostrava Asoc. Prof., MSc. Jiří Brožovský, Ph.D., VŠB - Technical University of Ostrava

Italian Republic

Ph.D., Prof. Paola Puma, University of Florence Ph.D., Anna Frangipane, University of Udine Prof. Stefano Sorace, University of Udine

Georgia

Doctor of Science (Engineering), Prof. Gela Kipiani, Georgian State Aviation University

United States of America

Ph.D in Engineering, Prof. Nenad Gucunski, Rutgers University Ph.D in Engineering, Prof. Mohsen Jafari, Rutgers University Prof. Vahan Tanal, President at Vahan Tanal Consulting, Inc. Prof. David Michaelyan, Tishman Turner joint venture (TTJV)

Sponsor

The conference was held under the sponsorship of Science Committee of Ministry of Education, Science, Culture and Sports RA.