

Bulgarian Scientific and
Technical Union of Civil Engineering

Federation of the Bulgarian Technical Unions

Bulgarian Building and
Construction Chamber

Chamber of Engineers in
the Investment Design

Varna Free University "Chernorizets Hrabar"

Foundation "Evrika"

International Conference

on Civil
Engineering
Design
and Construction
(Theory and Practice
for a Sustainable Future)

Official media partner "Stroitel" newspaper

With the support of



GLAVBOLGARSTROY
HOLDING AD

20 – 22 September 2018

Varna Free University
"Chernorizets Hrabar",

Varna, Bulgaria



Научно-технически съюз по строителство в България

Сборник с доклади на X Юбилейна международна научна конференция
„Проектиране и строителство на сгради и съоръжения“
(Теория и практика за устойчиво бъдеще)

Редактори: Ячко П. Иванов, Венцеслав Ал. Стоянов

Онлайн издание:

ISSN 2683-071X

Българска, първо издание София, 2018

Научно-технически съюз по строителство в България
Камара на строителите в България
Федерация на научно-техническите съюзи
Камара на инженерите в инвестиционното проектиране
Варненски свободен университет „Черноризец Храбър“
Фондация „Еврика“

СБОРНИК С ДОКЛАДИ

X Юбилейна

международна научна конференция

**„ПРОЕКТИРАНЕ И СТРОИТЕЛСТВО
НА СГРАДИ И СЪОРЪЖЕНИЯ“
(Теория и практика за устойчиво бъдеще)**

20 ÷ 22 септември 2018 г., Варна, ВСУ „Черноризец Храбър“



The logo features the letters 'DCBV' in a large, bold, italicized font with a 3D effect and a gradient. Below it, the year '2018' is written in a similar bold, italicized font with a 3D effect.

Bulgarian Scientific and Technical Union of Civil Engineering
Bulgarian Construction Chamber
Federation of the Bulgarian Technical Unions
Chamber of Engineers in the Investment Design
Varna Free University "Chernorizets Hrabar"
Foundation "Evriska"

PROCEEDINGS

X Jubilee International Conference

**on CIVIL ENGINEERING DESIGN AND CONSTRUCTION
(Theory and Practice for a Sustainable Future)**

20 ÷ 22 September 2018 г., Varna, Bulgaria
Varna Free University "Chernorizets Hrabar"

International Scientific Committee

Chairman:

Acad. Yachko Ivanov – Bulgaria

Vice Chairman:

Prof. Emmanuel Gdoutos – Greece

Members:

Prof. Andrzej Garbacz – Poland
Prof. Anna Nedyalkova – Bulgaria
Prof. Asterios Liolios – Greece
Prof. Doncho Partov – Bulgaria
Prof. Dubravka Bjegović – Croatia
Prof. Faruk Karadoğan – Turkey
Prof. Giliano Panza – Italy
Prof. Heinz Brandl – Austria
Prof. Ivan Vaniček – Czech Republic
Prof. Ján Ravinger – Slovakia
Prof. Jurai Kralik – Slovakia
Prof. Liberato Ferrara – Italy
Prof. Marinela Barbuta – Romania
Prof. Mogens Nielsen – Denmark
Prof. Nikolay Vatin – Russia
Prof. Radomir Folić – Serbia
Prof. Rao Surampalli – USA
Prof. Rüdiger Höffer – Germany
Prof. Valeriy Denisov – Russia
Prof. Veronika Shendova – Macedonia
Prof. Vlastimir Radonjanin – Serbia
Assoc. Prof. Milena Kichekova
Assoc. Prof. Robert Eadie – UK
Eng. Ivan Karaleev, PhD
Eng. Iliyan Terziev
Eng. Nikolay Stankov

National Scientific Committee

Chairman:

Prof. Doncho Partov

Members:

Prof. Bogomil Petrov
Prof. Dimitar Nazarski
Prof. Dimitar Toshev
Prof. Fantina Rangelova
Prof. Ivelin Ivanov
Prof. Ivan Markov
Prof. Ivanka Paskaleva
Prof. Konstantin Kazakov
Prof. Krasimir Enimanev
Prof. Lyuben Totev
Prof. Petar Staikov
Prof. Rumen Guglev
Prof. Stoyan Bratoev
Prof. Teodor Roshavelov
Prof. Todor Barakov
Prof. Totyu Daalov
Prof. Tzveti Dakovski
Prof. Vasil Kavardjikov
Assoc. Prof. Chavdar Kolev
Assoc. Prof. Georgi Godinyachki
Assoc. Prof. Georgi Linkov
Assoc. Prof. Ivan Torodov
Assoc. Prof. Lachezar Hrishev
Assoc. Prof. Vencislav Stoyanov
Assoc. Prof. Ventseslav Stoyanov
Eng. Antoni Chipev
Eng. Georgi Kordov
Eng. Miroslav Maznev

Organizing Committee

Chairman:

Assoc. Prof. Ventseslav Stoyanov

Vice Chairman:

Assoc. Prof. Lachezar Hrishev

Members:

Assos. Prof. Aneta Georgieva
Assos. Prof. Gencho Panicharov
Assoc. Prof. Daria Mihaleva
Assoc. Prof. Ivan Pavlov
Assoc. Prof. Ivan Hr. Pavlov
Natasha Baklarova, PhD
Eng. Svetulka Ruseva
Radostina Stefanova