



# European Council of Civil Engineers

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## NEWS FROM:

- Cyprus
- Hungary
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- U.K.

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## 2018 European Year of Civil Engineers - An ECCE initiative to celebrate Civil Engineering

Join the European Council of Civil Engineers in 2018 for the European Year of Civil Engineers, a year when Civil Engineering will be celebrated across Europe.



### PROCLAMATION

Dear Community of Civil Engineers, Dear Colleagues,

Civil engineering belongs to the oldest domains of human activity – its history is as long as the history of civilization. The social role of civil engineering in the development of mankind has always been of fundamental importance because the standard of human life has been so highly dependent on its progress. This can be observed from the beginning of human history up to the present day. Civil engineering deals with all aspects of the built environment (either physical or natural) and can be dated to the first time someone placed a roof over his or her head or laid a tree trunk across a river to make it easier to get across. And we can be confident that the role of civil engineering will continue to grow into the future.

Civil engineering as a domain of technological activity is a key element of the national and international economy. Economic progress is impossible without adequately developed social and physical infrastructure, including, for example, buildings, water distribution networks, and service and transport infrastructure networks.

Contemporary achievements of civil engineering, thanks to the progress of building knowledge and science, are spectacular. This is exemplified by numerous tall buildings, dams, large bridge structures, water infrastructure, motorways, sport stadiums and halls, theater houses, etc., constructed in the last decades and strongly influencing urban and extra-urban areas and landscapes. On the other hand, we should also note less spectacular but equally important achievements for social and economic reasons, such as residential buildings, smaller bridges, roads, industrial buildings, etc. The first field can be considered as extraordinary examples of civil engineering, illustrating its especially high level of achievement, while the second one can be considered as 'the work of the day' of civil engineers. Both of them are equally important.

The social, economic and cultural progress of every country is impossible without the contribution of civil engineers, based on their education, professional knowledge and experience. The impacts of their activity can be evidently observed in the form of buildings and structures of various types. Civil engineers are in general socially accepted or in many cases admired. In spite of its dynamic development and its very considerable modern achievements, civil engineering is commonly treated as a rather traditional domain of technology. This situation can be observed in many countries world-wide including in Europe.

However, the reality is that the role of civil engineers in advancing social, economic and cultural progress is especially high. Moreover, civil engineering is a profession that enjoys the highest level of public confidence. Civil engineers are ultimately responsible for the safe utilization of buildings and structures. This is an especially important and often forgotten aspect of the social role of civil engineers. Apart from their technological activities, civil engineers also increasingly consider the social effects of engineering decisions. To meet this condition, civil engineers continue to widen their knowledge of the economic and social sciences.

Ultimately, civil engineering is a very exciting profession. At the end of the day civil engineers can see the results of their work, whether this is a completed bridge, a port, a high-rise building, a subway station, a tunnel, a highway, a hydroelectric dam or even a small house.

Looking to the future, the civil engineering profession will play a fundamental role in dealing with many of the challenges that society will face. The world is becoming increasingly and relentlessly urbanized and this is bringing with it unprecedented social, economic and environmental stresses. Added to this will be the impacts of climate change and environmental degradation. While all aspects of civil engineering will be put to the test, there will be a particular focus on the areas of transportation, energy and water. Civil engineers will be tasked with providing infrastructure which is both sustainable and resilient to address these challenges.

The profession will also be challenged to proactively address the opportunities and efficiencies which will be brought about by the digital revolution, also known as the fourth industrial revolution. Digital technology will drive increasing automation in our industry and there will be opportunities to use the rapidly expanding ocean of data to better design, construct, operate and maintain physical infrastructure.

Taking into account the situation briefly presented above, the European Council of Civil Engineers (ECCE) has decided to proclaim year 2018 as the European Year of Civil Engineers (2018 EYCE). The main goals of this proclamation have been to reinforce the fundamental role of civil engineers in society in improving the standard of human life, to make the case for the prestige of the civil engineering profession in the social community of European countries and to stress the pivotal role that civil engineers will play in addressing the challenges that will face society in the future.

Włodzimierz Szymczak  
Acting President of ECCE

2018 will see activities and initiatives organized by the ECCE member countries all around Europe to get people interested and involved in civil engineering. The opening event was held on 2 December 2017, in Nicosia, Cyprus where the Cyprus Association of Civil Engineers held its 25th General Assembly and celebration of its 25th Anniversary. The closing of the 2018 EYCE will take place in London, during the week of 22-26 October 2018, when the Global Engineering Congress will be held to celebrate the 200th Anniversary of the U.K. Institution of Civil Engineers (ICE) in combination with the 50th World Federation of Engineering Organizations (WFEO) Anniversary, the Triennial with the American Society of Civil Engineers (ASCE) and the Canadian Society of Civil Engineers (CSCE) and the 68th ECCE General Meeting.

#### What are the goals of the 2018 EYCE?

- To reinforce the fundamental role of civil engineers in society in improving the standard of human life.
- To make the case for the prestige of the civil engineering profession in the community of European countries.
- To stress the pivotal role that civil engineers will play in addressing the challenges that will face society in the future.

#### How are we going to achieve them?

- Wide dissemination of the 2018 EYCE proclamation
- Designated logo to denote 2018 as the European Year of Civil Engineers
- Organization of various types of events related to the civil engineering profession by our Member Countries across Europe
- Designated standard presentation to be delivered during all EYCE events
- Marketing of the initiative through press, media, our website and our journal
- Free access to the two ECCE book editions "Civil Engineering Heritage in Europe" and "Footbridges – small is beautiful"
- Communication of our initiative to the European authorities

The European Council of Civil Engineers offers as part of the celebration of the European Year of Civil Engineers **free access to its two book editions Civil Engineering Heritage in Europe and Footbridges – Small is beautiful.**

Both books are downloadable and can be found at the ECCE website at the following links:

[ECCE Edition Civil Engineering Heritage in Europe](#)

[ECCE Edition Footbridges – small is beautiful](#)

[2018 EYCE Calendar of events \(pdf format\)](#)

Please visit the [ECCE website](#) to stay tuned.

## The European Year of Civil Engineers (2018 EYCE) has already started! Opening event in Cyprus



**CyACE President Platonas Stylianou opening the 2018 EYCE**



**ECCE Vice President/President-Elect Aris Chatzidakis speech at the opening event of 2018 EYCE**

The opening event of the 2018 EYCE was held on December 2, 2017 in Nicosia, Cyprus at Filoxenia Conference Centre. A numerous participation of Civil Engineers and representatives of Authorities and other engineering fields had the opportunity to celebrate the historical event.

The celebration started with the reading of the EYCE 2018 proclamation by the president of the Cyprus Association of Civil Engineers Mr. Platonas Stylianou. The event took place during the 25th General Assembly of the Cyprus Association of Civil Engineers and the celebration of the 25th anniversary since its establishment, in the presence of the Minister of Interior, the ECCE President Elect Mr. Aris Chatzidakis and all the previous presidents of the Association. The event was held under the auspices of the President of the Republic of Cyprus Mr. Nikos Anastasiades.

The participants expressed their appreciation for the decision of ECCE to celebrate Civil Engineering and to highlight the fundamental role of Civil Engineers in society offering their services with pride.

The President elect of ECCE gave a speech titled "The professional who shaped the modern world. The birth of the science of construction, a small retrospective and current thought". The speech enhanced the above fundamental role of Civil Engineers through the presentation of a historical approach of the development of the profession.

## 3rd European Engineers Day "Concerns about Engineering Excellence"

5 October 2017, Haus der Ingenieure, Vienna



**What is "engineering excellence"? Does the EU need it? Will it be available in the future? What are encouragements and hindrances for its occurrence?**

About 150 participants from all over Europe discussed this question very passionately at the 3rd European Engineers Day in Vienna on 5 October 2017:

Most of them fully agreed to what **Commissioner Violeta Bulc** stated in her video message: There is indeed a need for engineering excellence in Europe, as transport - her field of competence – clearly shows. It is a preliminary requirement for building transport infrastructure.

Speakers from various backgrounds approached the question of securing the availability of engineering excellence in the future from different angles:

**Hubert Gambs**, responsible Director for the modernization of the Single Market in the European Commission stressed the importance of the quality of engineering services. At the same time the aim of the Commission is to reduce regulation to the necessary minimum in order to enhance economic growth and – by an increase of mobility – also the availability of engineering services.

**Leo Chini**, Professor at the University of Economics and Business in Vienna criticized this approach due to its undifferentiated treatment of different forms of services and regards deregulatory measures for regulated professions as a potential hazard to engineering excellence and – as studies in Austria have shown – not efficient in reaching the





**3rd EED Speakers**  
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European Commission's economic targets.

**Jean-Louis Marchand**, President of the European Construction Industry Federation (FIEC) as well as **Maxime Cerutti**, Director of Social Affairs at Business Europe, put a strong focus on the problem of the shortage of employees in engineering companies and on providing the right engineering skills to better meet companies' needs. The high level engineering education as an important column of engineering excellence was also the focus of **Ioannis Golias**, Rector of the National Technical University of Athens. Also the panellists – **Michaela Ragoßnig-Angst**, an Austrian surveying engineer, **Rudolf Kolbe**, President of the European Council of liberal professions and member of the EESC, **Bernard Remaud**, President of ENAEE and **Paul Coughlan** from ICE agreed on the importance of education for engineering excellence. Their discussion focused on possible

ways to attract young people and also migrants and refugees to such engineering educations.

**Philippe de Buck**, Former Director of Business Europe and EESC member approached the question on a broader basis. He questioned if the current policies of the EU are overall adequate to deal with challenges and chances of the changing world and raised the question of how opportunities for engineers could be better exploited.

In his final statement, **ECCE Vice President / President Elect Aris Chatzidakis** mentioned that engineers have been facing rapidly changing, complex and increasingly demanding problems in an environmentally sensitive world. Nowadays, when our world is at a very critical point with the climate change, the rapidly advancing technological innovations, the digitalization, etc., engineers will need to master new and broader skills and have a multi-disciplinary profile rather than the traditional profile engineers used to have. Engineers are required to have the ability to draw upon a broad and comprehensive body of knowledge to make focused discretionary judgments about optimal solutions to unique, complex problems in the interest of enhancing public health, safety, and welfare. Engineers are required to have a holistic approach to problem - solving and decision - making which will be achieved through both education and training on not only the traditional engineering fields but also in humanities, economics, social sciences, communication, management, etc. Lifelong learning and Continous Professional Development are necessary for engineers in the so rapidly changing world we live in. Also, leadership in the ethical practice of engineering and the need to hold paramount public health, safety, and welfare wherever engineering is practiced, independent of its origin and destination is very important. He highlighted the importance of the role that the Engineering Professional Associations play in achieving all the above mentioned skills and in regulating engineering practice for the sake of society, enforcing ethical and deontological codes of practice ensuring: honouring public interest; security and protection against unlicensed practice; efficient use of natural resources; environmental protection; vulnerability reduction to natural disasters and climate change. He concluded that a global scenario, in which the engineering profession contributes decisively to improve the quality of life of mankind, is necessary in order to establish sound partnerships between those who share common interests, for the benefit of our professional Engineers and society as a whole.



**Final statement by ECCE Vice President / President Elect Aris Chatzidakis**  
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**3rd European Engineers' Day**  
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**Background:**

The "3rd European Engineers' Day" was an event co-organized by a number of European Engineering Organizations on a regular basis: The European Council of Engineering Chambers (ECEC), the European Federation of National Engineering Associations (FEANI) and the European Council of Civil Engineers (ECCE) together with the European Network for Accreditation of Engineering Education (ENAEE). These organizations represent a wide variety of European Engineering branches and a high number of European Engineers.

For more information about the event please visit the [ECCE website](#).

# 66th ECCE General Meeting

4 October 2017, Vienna, Austria



**66th ECCE General Meeting group photo**

The [66th ECCE General Meeting](#) was held on 4 October 2017, in Vienna, Austria at the "[Haus der Ingenieure](#)" hosted by the Federal Chamber of Architects and Chartered Engineering Consultants / Section for Chartered Engineering Consultants / Federal Expert Group for Civil Engineering. On 3 October, the ECCE Executive Board meeting was held.

The 66th ECCE General Meeting was very well attended with delegations from almost all of the ECCE Member organizations. The meeting was chaired by the ECCE Vice President / President Elect Aris Chatzidakis. The opening speech was made by the President of the Austrian Federal Chamber of Architects and Chartered Engineering Consultants Christian Aulinger who welcomed all the participants and introduced to them the structure and functions of the Austrian

Chamber. The ECCE General Secretary Maria Karanasiou read a letter on behalf of the ECCE Acting President Włodzimierz Szymczak who was not able to attend to this meeting and conveyed his message to all the participants.

Among the distinguished guests were WCCE President Alfonso Gonzalez, WCCE Past President Emilion Colon, EAMC President Adil Al Hadithi, and EAMC Secretary General Nicola Monda.

In the meeting, the [ECCE activity report June - September 2017](#) was presented by the ECCE Vice President / President Elect Aris Chatzidakis describing briefly the ECCE activities since our last meeting in June, in Antalya. The main activities of ECCE during this period of time were focused mainly on the preparation of the [3rd European Engineers Day](#), the organization of the "2018 European Year of Civil Engineers", the finalization of the two Position Papers that had been elaborated over the past few months, as well as matters of internal organization and function.

During the 66th ECCE General Meeting ECCE's position and ECCE Vice President / President Elect's main opening remarks in the [3rd European Engineers Day](#) that was held the following day were discussed. Also, the progress regarding the organization of the [ECCE initiative "2018 European Year of Civil Engineers"](#) was presented by the Steering Committee for the 2018EYCE member Paul Coughlan (UK National Delegate). As part of the topic about the 2018EYCE, a [briefing on the ICE 200](#) (Institution of Civil Engineers' 200th Anniversary) was delivered by Ingrid Farmer (UK delegate). A Global Engineering Congress will be held in London on 22-26 October 2018 celebrating the bicentennial of the ICE, the 50th WFEO Anniversary, the Triennial with the American Society of Civil Engineers and the Canadian Society of Civil Engineers, as well as the 68th ECCE General Meeting which will also be the closing event of the 2018EYCE.

During the 66th ECCE General Meeting the first two ECCE Position Papers were adopted by the ECCE General Assembly. The [Position Paper on "Infrastructure and water management"](#) was prepared by George Demetriou from the Cyprus Council of Civil Engineers in collaboration with a technical committee which consists of water experts from Cyprus, Greece and Slovenia. The Position Paper on "[Appropriate regulation for the practice of civil engineering in Europe](#)" was prepared by Jose Francisco Saez Rubio from the Colegio de Ingenieros de Caminos, Canales y Puertos (Spain) in collaboration with ECCE Vice President / President Elect Aris Chatzidakis from the Association of Civil Engineers of Greece. Both Position Papers will be widely disseminated in the following weeks. During this session the importance of the contribution of ECCE members with new proposals and ideas for Position Papers as well as for other deliverables and activities was highlighted. A number of ideas were discussed which will be submitted in written during the following weeks.

The ECCE Financial matters were also presented and discussed. ECCE Vice President / Treasurer Dimitar Natchev described the ECCE financial report until the end of September for the information of the members. He also presented the proposed ECCE Budget for 2018 which was unanimously accepted by the ECCE General Assembly. As a final point he presented the [ECCE Financial Rules](#) document which was prepared by him and approved by the ECCE Executive Board aiming to better regulate the finances related ExBo's functions.

Another interesting point during the meeting was the presentation about the STEM & Gender Assessment (SAGA) Project, a global UNESCO project aimed at identifying and addressing gender gaps in STEM fields at all levels of



**President of the Austrian Federal Chamber of Architects and Chartered Engineering Consultants Christian Aulinger**



From left to right: ECCE General Secretary Maria Karanasiou, ECCE Vice President/ Treasurer Dimitar Natchev, Austrian Chamber President Christian Aulinger, ECCE Vice President/ President Elect Aris Chatzidakis, ECCE ExBo Member Andres Piirsalu, ECCE ExBo Member Jose Francisco Saez Rubio

education and research. This project proposal was presented by ExBo member and WCCE Executive Director Jose Francisco Saez Rubio. As civil engineers represent more than half of world population of all engineers worldwide, at national, regional and international level, UNESCO SAGA Team has offered WCCE's Standing Committee on Women in Civil Engineering to contribute to such project by designing and carrying out this survey to collect accurate sex-disaggregated data on a specific objective of the STI GOL, the STI GOL 4.8 "Ensure gender equality in S&E professional certifications, in particular in engineering" in order to improve the measurement of the status of women and girls in engineering as an overall objective.

Finally, the forthcoming ECCE General Meetings were discussed. The [67th ECCE General Meeting](#) will be held on 30 May 2018 – 2 June 2018, in Tallinn, Estonia. ExBo Member and Estonia National

Delegate Andres Piirsalu delivered a presentation about the meeting that will be hosted by the Estonian Association of Civil Engineers which is also going to be combined with an International Conference organized as part of the 2018 EYCE initiative. The 68th ECCE General Meeting will be held in London, during the week of 22-26 October 2018. To finish, an official proposal was submitted by ECCE Vice President / Treasurer Dimitar Natchev from the Union of Civil Engineers of Bulgaria to host the autumn ECCE General Meeting in 2019, in Bulgaria.

***The European Council of Civil Engineers would like to express its gratitude to the Austrian Federal Chamber of Architects and Chartered Engineering Consultants for the successful organization of 66th ECCE General Meeting and their exceptional hospitality.***

## Workshop Reforming Professional Services

*11 July 2017, Brussels, Belgium*



ECCE Vice President / President Elect Mr. Aris Chatzidakis, attended the Workshop "Reforming Professional Services" that was held on 11th July 2017, in Brussels. Policy Department A organized for IMCO Committee this workshop on reforming professional services. The workshop was chaired by MEP Nicola Danti. Two expert panels focused on economic effects of regulating professional services and recommendations for policy -makers. The panels were followed by a roundtable with industry experts.

[Programme](#)

[Presentations of the workshop](#)

MEP Nicola Danti was recently assigned as European Parliament Rapporteur on the regulated professions file in response to the [Commission Communication on reform recommendations for regulation in professional services](#). MEP Danti's office got in touch with ECCE suggesting a meeting with MEP Danti in order to exchange views and discuss our opinion on the above mentioned matter. ECCE invited ECEC to attend a joint meeting with MEP Danti on the same day of the Workshop. ECCE and ECEC's fruitful cooperation resulted to a common statement on "Appropriate regulation for a mobile (civil) engineering profession in Europe" which was submitted to MEP Danti.

## Be an ECCE Member (EUCivEng)

### ECCE Individual Membership



#### The European Civil Engineer

The profession of the Civil Engineering is mostly performed where the construction is being made, in Europe or in any part of the world.

Today, within the European Union, construction companies have activities in many countries, so civil engineers have to move to foreign countries and to work all over Europe.

To allow this professional movement EU published a Directive on Professional Mobility, to facilitate the recognition of Civil Engineers across Europe.

Nevertheless the Directive considers under this title, professionals with quite different academic or professional backgrounds, what can lead to unclear situations for society.

The EU Directive on Mobility proposes the creation of a European Database of Civil Engineers, interconnected through national organizations.

ECCE appeared in 1985 to promote the quality of Civil Engineering with a professional recognition where academic/professional quality is guaranteed by the national organizations.

ECCE as representative of those organizations, and to promote quality in professional recognition, is opening its membership to individual members, allowing for their image recognition as European Civil Engineers.

**Join ECCE, be a EUCivEng!**

#### ECCE goals:

- To present in Brussels the views of the European civil engineers.  
(ECCE participates in the High Level Tripartite Forum for Construction in EU)
- To establish international contacts with other associations.  
(ASCE, JSCE, KSCE, ECCREDI, Mediterranean countries, etc.)
- To promote the relevant professional information across Europe  
(Publication of e-journal, books, reports, etc.)
- To organize Conferences across Europe about Civil Engineering  
(See the conferences presentations in ECCE website)

#### May I become an Individual ECCE Member?

Yes, although ECCE is an association of national organizations, individual civil engineers may also be Individual Associate Members, with access to all the information and discussion forums, but they may not vote in ECCE General Assemblies.

Being an ECCE individual member you will have the reference EuCivEng.

#### What do I get as an ECCE Individual Member?

- **If you just want to be an ECCE member**, you will receive:  
The e-journal and all relevant information from EU Commission
- **If you want to come to our meetings**, you will get:  
Participation in 2 International conferences per year;  
Participation in 2 General assemblies per year;  
Participation in Brussels Engineers Day each 3 years;  
To be in contact with civil engineers across Europe (EU and nonEU).
- **But if you want to be really active**,  
You are welcome to participate in the discussion forums or to propose position papers to be submitted to Brussels.



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Yes, although ECCE is an association of national organizations, individual civil engineers may also be Individual Associate Members, with access to all the information and discussion forums, but they may not vote in ECCE General Assemblies.

Being an ECCE individual member you will have the reference EuCivEng.

### And you get also the ECCE membership card !

- The ECCE card identifies you, through your national organization, as a Professional of Civil Engineering in your country and a **EUCivEng** in ECCE.
- It is expected that in the future the card will allow an automatic civil engineering identification across Europe, according to the EU Mobility Directive, when national organizations implement their database of Civil Engineers.

### How can I become an ECCE Individual Member?

Please send to ECCE headquarters ([ecce\\_sps@otenet.gr](mailto:ecce_sps@otenet.gr)):

1. [Registration Form](#)
2. Document from your ECCE National Organization as a proof that you are member of it
3. [Excel sheet with your information](#)
4. Photograph
5. [Excel sheet with your name and address](#)

After receiving the notification of acceptance of your application from the ECCE General Secretary, you will be asked to proceed to the **Payment of the Subscription Fee** according to the **Payment Details** that follow.

### What are the Payment Details?

- To be an ECCE individual member there is an **annual fee of 20 euros**.
- If you are **older than 65 you pay only once 30 euros** and you become member with unlimited validity.
- You can pay in packages of 3 years (60 euros) or 5 years (100 euros), **plus 8 euros, with each package, for mail and printing of a new card.**

The payment should be sent by bank transfer to:

#### National Westminster Bank plc, Charing Cross Branch

**BIC** NWBK GB 2L  
**IBAN** GB28 NWBK 6072 1408 5260 60  
**Bank Address:** National Westminster Bank plc, PO Box 113, Cavell House, 2A Charing Cross Road, LONDONWC2H 0PD  
**Account Name:** European Council of Civil Engineers  
**Account Number:** 550/00/08526060  
**Sort Code:** 60-40-05

**Please ensure that your payment includes your name as a reference.**

After payment send a copy of the bank transfer to [ecce\\_sps@otenet.gr](mailto:ecce_sps@otenet.gr) and you will become ECCE member and you will receive the membership card.

**[Join us now!](#)**  
**[Become an ECCE Member \(EUCivEng\)](#)**

# Optimum Design of Braced Barrel Vault Systems Using Cold-Formed Steel Sections

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## Abstract

Steel braced barrel vault systems are one of the most popular ways to cover long-span areas with fewer columns. They have a simple network structure consisting of longitudinal, transverse and diagonal elements with curvature in one direction. The configuration of the braced barrel vault, namely the size of the structural members, play significant role onto structural performance, esthetic and expenditures. This paper presents an artificial bee colony algorithm and an application programming interface (API), which is developed to optimize the design of braced barrel vault systems using cold-formed steel sections partaking in a new generation of building elements that are sustainable environmentally friendly, due to their durability, safety and aesthetics as well as being nearly recyclable. The application programming interface is used for the structural analysis process to connect the analysis software via the programming language with the artificial bee colony algorithm. The results show the effectiveness of the application programming interface as a powerful interface tool for the analysis of large-scale structures such as steel braced barrel vault systems and at the same time they prove the stability on the fast convergence performance of the artificial bee colony algorithm to achieve the optimum results.

**Keywords:** Structural Optimization, Steel Braced Barrel vault Systems, Artificial Bee Colony Algorithm, Application programming Interface, Cold-Formed Steel Sections

## 1. Introduction

The braced barrel vaults are one of the oldest types of space structures used since ancient times. Such constructions are lightweight and cost-effective structures used to cover large areas such as exhibition halls, stadiums, markets and concert halls without using excess interior columns. In the beginning, the steel braced barrel vaults were built as single layer structures. Nowadays, double layer steel braced barrel vault systems are more widely used to cover large-spans (Makowski, 2006). Double layer barrel vaults are generally statically indeterminate. The risk of instability might be nearly removed due to rigidity in such systems. In such systems, due to rigidity, the risk of instability can be almost immediately removed. Utilizing of such barrel vault systems increases the rigidity and provides large-capacity structural systems with a span of over 100 meters (Kaveh et al., 2014).

Structural optimization has become one of the most interesting branches of structural engineering in the last decade and many metaheuristic algorithms have been developed for the optimization of steel trusses and frames (Degertekin et al., 2007, 2008; Esen and Ulker, 2008; Kelesoglu and Ulker, 2005). Each metaheuristic method consists of a group of search agents exploring the feasible region based on random selection and certain rules. The rules are often inspired by the laws of natural phenomena. The nutritional search behaviors of the bees in the nature have been inspired by the designers and in the end, the Artificial Bee Colony Algorithm (ABC) has been developed (Karaboga and Basturk, 2007a). In ABC, all the behaviors of the bees are not exactly modeled, and besides some assumptions are made. These assumptions are that there is only one employee bee in the extraction of each nectar. Therefore, it is necessary that the number of food source and the number of employee bees in the algorithm are equal to each other. Another assumption is the numbers of employee bees are equal to the number of onlooker bees. Even if such an assumption is not made the employee bee whose food source has been abandoned becomes a scout bee. The higher the quality of a food, the better the fitness of that source. Thereby, it is tried to obtain optimum solution with ABC. In this point, whether the goal of the algorithm user is maximization or minimization, the nectar quality corresponds to the suitability value of the solution (Karaboga and Basturk, 2007a, 2007b; Akay, 2009).

Although there are many studies on the optimization of truss structures using metaheuristic algorithms, there are several studies on the optimization of double layer braced barrel vaults. Kaveh and Eftekhari (2012) present the IBB-BC algorithm for optimal design of double layer barrel vaults. In another study, the optimum design of some single layer barrel vaults and a double layer barrel vault is represented by Kaveh et al. (2012). In several studies, a practical model of the braced barrel vault is optimized by using ant colony optimization (Hasancebi and Carbas, 2011; Hasancebi et al., 2011). Hasancebi and Kazemzadeh Azad (2013a, 2013b) utilized a reformulated Big Bang-Big Crunch (BB-BC) algorithm to obtain optimal design of a steel braced barrel vault.

The use of structures constructed from cold-formed steel elements in the building industry provides environmental construction opportunities because it requires less material to carry the same load than other types of materials and

leads to a reduction in the amount of waste material on construction sites (www.isover.com, 2017). In this study, an artificial bee colony based solution algorithm is proposed for optimum design of double layer braced barrel vaults made of using cold-formed steel sections. A circular hollow steel section list taken from ASTM-A500 (2013) is used in the optimization. Stress, displacement and slenderness limitations have been applied to optimum design procedures according to ASD-AISC (Allowable Stress Design-American Institute of Steel Construction, 1989). Software in Visual Basic that works with SAP2000-API is encoded.

## 2. Mathematical Model of Design Problem

The objective function of the minimum weight problem of steel braced barrel vault is expressed in Equation 1.

$$(1) \quad W = \sum_{m=1}^{N_m} \rho_m L_m A_m$$

where W refers to the weight of the dome;  $\rho_m$ ,  $A_m$ ,  $L_m$  are cross-sectional area, length and unit weight of the m-th truss member, respectively.

The steel braced barrel vault system discussed in this study is solved under the limitations of stress, displacement and slenderness.

$$(2) \quad g_m = \frac{\sigma_m}{(\sigma_m)_{all}} - 1 \leq 0 \quad ; \quad m = 1, \dots, N_m$$

$$(3) \quad s_m = \frac{\lambda_m}{(\lambda_m)_{all}} - 1 \leq 0 \quad ; \quad m = 1, \dots, N_m$$

$$(4) \quad \delta_{jk} = \frac{d_{j,k}}{(d_{j,k})_{all}} - 1 \leq 0 \quad ; \quad j = 1, \dots, N_j$$

In Eqs. (2-4), the functions  $g_m$ ,  $s_m$  and  $\delta_{j,k}$  are referred to as constraints being bounds on stresses, slenderness ratios and displacements, respectively;  $\sigma_m$  and  $(\sigma_m)_{all}$  are the computed and allowable axial stresses for the m-th member, respectively;  $\lambda_m$  and  $(\lambda_m)_{all}$  are the slenderness ratio and its upper limit for m-th member, respectively;  $N_j$  is the total number of joints; and finally  $d_{j,k}$ , and  $(d_{j,k})_{all}$  are the displacements computed in the k-th direction of the j-th joint and its permissible value, respectively. In the present study, these limitations are implemented according to ASD-AISC (1989) code provisions.

Accordingly, the maximum slenderness ratio is limited to 300 for tension members, and it is taken as 200 for compression members. Hence, the slenderness related design constraints are formulated as follows:

$$(5) \quad \lambda_m = \frac{K_m L_m}{r_m} \leq 300 \text{ (for tension members)}$$

$$\lambda_m = \frac{K_m L_m}{r_m} \leq 200 \text{ (for compression members)}$$

where,  $K_m$  is the effective length factor of m-th member ( $K_m=1$  for all members), and  $r_m$  is its minimum radii of gyration.

The allowable tensile stresses for tension members are calculated as in Eq. (6):

$$(6) \quad (s_t)_{all} = 0.60 F_y$$

$$(s_t)_{all} = 0.50 F_u$$

where  $F_y$  and  $F_u$  stand for the yield and ultimate tensile strengths, and the smaller of the two formulas is considered to be the upper level of axial stress for a tension member.

The allowable stress limits for compression members are calculated depending on two possible failure modes of the members known as elastic and inelastic buckling, Eqs. (7-9).

$$(7) \quad C_c = \sqrt{\frac{2\pi^2 E}{F_y}}$$

$$(\sigma_c)_{all} = \frac{\left[1 - \frac{(K_m L_m / r_m)^2}{2C_c^2}\right] F_y}{\frac{5}{3} + \frac{3(K_m L_m / r_m)}{8C_c} - \frac{(K_m L_m / r_m)^3}{8C_c^3}} ; \lambda_m < C_c$$

(8) (inelastic buckling)

$$(\sigma_c)_{all} = \frac{12\pi^2 E}{23(K_m L_m / r_m)^2} ; \lambda_m \geq C_c$$

(9) (elastic buckling)

In Eqs. (9-11), E is the modulus of elasticity, and  $C_c$  is referred to as the critical slenderness ratio parameter. For a member with  $\lambda_m < C_c$ , it is assumed that the member buckles inelastically, and its allowable compression stress is computed according to Eq. (8). Otherwise ( $\lambda_m > C_c$ ), elastic buckling of the member takes place, in which case the allowable compression stress is computed as to Eq. (9).

### 3. Artificial Bee Colony Algorithm

Artificial Bee Colony (ABC) algorithm mimics the intelligent foraging behavior of a honey bee colony (Karaboğa and Basturk, 2007a, 2007b). In the artificial bee colony algorithm, there are three types of bees which carry out different tasks. The first group of bees is the employee bees that locate food source, evaluate its amount of nectar and keep the location of better sources in their memory. These bees when fly back to hive they share this information to other bees in the dancing area by dancing. The dancing time represents the amount of nectar in the food source. The second group is the onlooker bees who observe the dance and may decide to fly to the food source if they find it is worthwhile to visit the food source. Therefore foods sources reach in the amount of nectar attract more onlooker bees. The third group is scout bees that explore new food sources in the vicinity of the hive randomly. The employee bee whose food source has been abandoned by the bees becomes a scout bee. Overall, scout bees carry out the exploration, employee and onlooker bees perform the task of exploitation. Each food source is considered as a possible solution for the optimization problem and the nectar amount of a food source represents the quality of the solution which is identified by its fitness value. The artificial bee colony algorithm consists of four stages. These stages are initialization phase, employee bees phase, onlooker bees' phase and scout bees phase.

1. **Initialization phase:** Initialize all the vectors of the population of food sources,  $X_p$ ,  $p=1, \dots, n_p$ , by using Eq. 10 where  $n_p$  is the population size (total number of artificial bees). Each food source is a solution vector consisting of  $n$  variables ( $X_{pi}$ ,  $i=1, \dots, n$ ) and it is a potential solution to the optimization problem under consideration.

$$x_{pi} = x_{li} + \text{rand}(0,1)(x_{ui} - x_{li}) \quad (10)$$

where  $X_{li}$  and  $X_{ui}$  are upper and lower bound on .

2. **Employee bees phase:** Employed bees search new food sources by using Eq. 11.

$$v_{pi} = x_{pi} + \phi_{pi}(x_{pi} - x_{ki}) \quad (11)$$

where  $k \neq i$  is a randomly selected food source,  $\phi_{pi}$  is a random number in range [-1,1]. After producing the new food source its fitness is calculated. If its fitness is better than  $X_{pi}$  the new food source replaces the previous one. The fitness value of the food sources is calculated according to Equation 12.

$$\text{fitness}(x_p) = \begin{cases} \frac{1}{1 + f(x_p)} & \text{if } f(x_p) \geq 0 \\ 1 + \text{abs}(f(x_p)) & \text{if } f(x_p) < 0 \end{cases} \quad (12)$$

3. **Onlooker bees phase:** Unemployed bees consist of two groups. These are onlooker bees and scouts. Employed bees share their food source information with onlooker bees. Onlooker bees choose their food source depending on the probability value  $P_p$  which is calculated using the fitness values of each food source in the population as shown in Equation 13.

$$P_p = \frac{\text{fitness}(x_p)}{\sum_{p=1}^{np} \text{fitness}(x_p)} \quad (13)$$

After a food source  $X_{pi}$  for an onlooker bee is probabilistically chosen, a neighborhood source is determined by using Equation 11 and its fitness value is computed using Equation 13.

4. **Scout bees phase:** The unemployed bees who choose their food sources randomly called scouts. Employed bees whose solutions cannot be improved after predetermined number of trials become scouts and their solutions are abandoned. These scouts start to search for new solutions.
5. Phases 2-4 are repeated until a termination criterion is satisfied.

#### 4. Optimum Design Algorithm with Discrete Variables

The solution of the discrete optimum design problem given in Eqs. 1 to 9 is obtained using the ABC algorithm. In the optimum design algorithm based on ABC the sequence number of the cold-formed circular hollow sections in the lists created according to ASTM-A500 (2013) are treated as design variable. For this purpose a design pool is prepared that contains separate values (so-called R1 to R114) for each design variable is considered from which the optimum design algorithms select the cross sectional dimensions. Once a sequence number is selected, then the sectional dimension of a cold-formed thin-walled open section becomes available for the algorithm. The ABC algorithm assumes continuous design variables. However the design problem considered requires discrete design variables. This necessity is resolved by rounding the numbers obtained through each algorithm. For example Eq. 10 of ABC algorithm is written as

$$(14) \quad I_{pi} = I_{\min} + INT[\text{rand}(0,1)(I_{\max} - I_{\min})] \quad , \quad i = 1, \dots, ng \quad , \quad p = 1, \dots, np$$

where  $I_{pi}$  is the integer value for  $x_{pi}$ , the term  $\text{rand}(0,1)$  represents a random number between 0 and 1,  $I_{\min}$  is equal to 1 and  $I_{\max}$  is the total number of values in the discrete set.  $ng$  is the total number of design variables and  $np$  is the number of bees in the colony which is equal to  $(\text{neb} + \text{nob})$  where  $(\text{neb})$  is the number of employee bees and  $(\text{nob})$  is the number of onlooker bees.

#### 5. Application Programming Interface

The Application Programming Interface (API) is a powerful tool that allows users to automate most of the processes required to create, analyze, and design models and to obtain customized analysis and design results. Also it allows users to connect SAP2000 with third party software and information of model to make two way exchanges with other programs. Most important programming languages can be used to access SAP2000 via API (CSI, 2011). In this study, the Visual Basic technical calculation language is used to access SAP2000 with API, while the Visual Basic has been used for the optimization process through ABC.

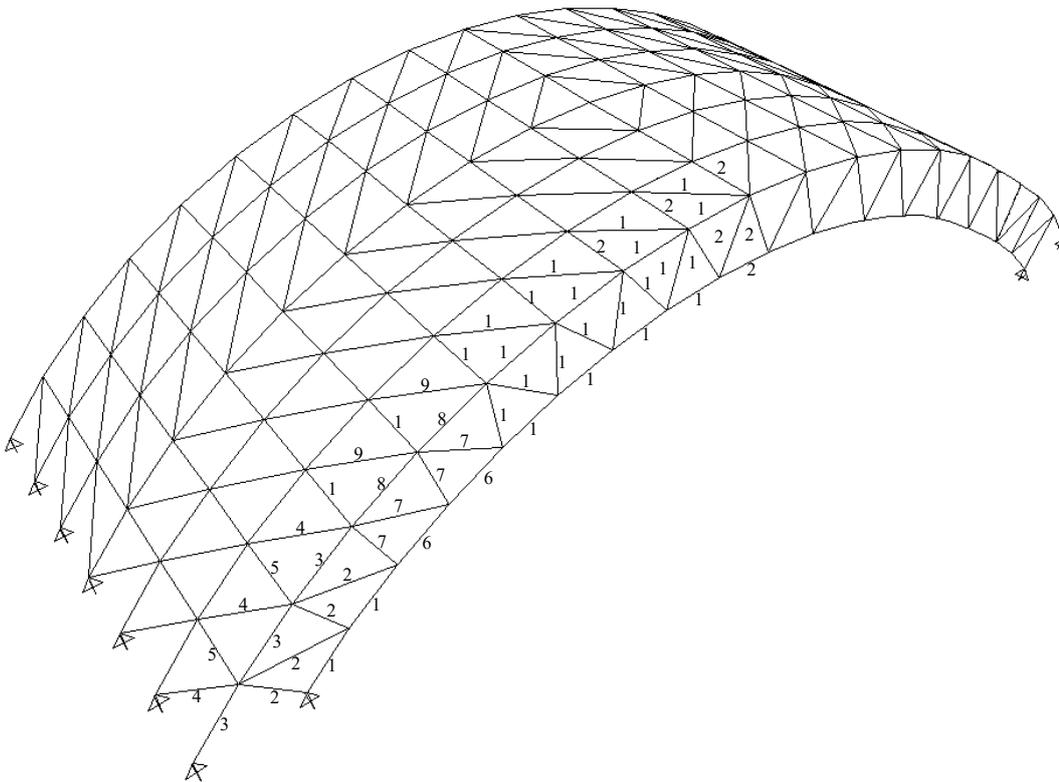
#### 6. Design Example

3D braced steel barrel vault system which has 259 joints and 693 members has been selected as the design example in this study (Ramaswamy et al., 2002). An optimum design of this structure has been investigated by Hasancebi and Carbas (2011) using improved ant colony algorithm for hot rolled steel sections. In the example, density, modulus of elasticity (E) and yield stress ( $F_y$ ) of the steel material are respectively taken as 0.2836 lb/in<sup>3</sup> (7850.021 kg/m<sup>3</sup>), 29000ksi (199947.962MPa), and 42ksi (289.579 MPa). 3-D, front and plan views of the structure are shown in the Figure 1(a), Figure 1(b) and Figure 1(c) respectively. Structure members are grouped into 23 independent design variables in the case of that practical requirements and symmetry of the structure are taken into account. Barrel vault is exposed to 35 kg/m<sup>2</sup> uniform dead load (DL) pressure, 160 kg/m<sup>2</sup> positive wind load (WL) pressure and 240 kg/m<sup>2</sup> negative wind load (WL) pressure. According to the design requirements, these loads are factored as follows:

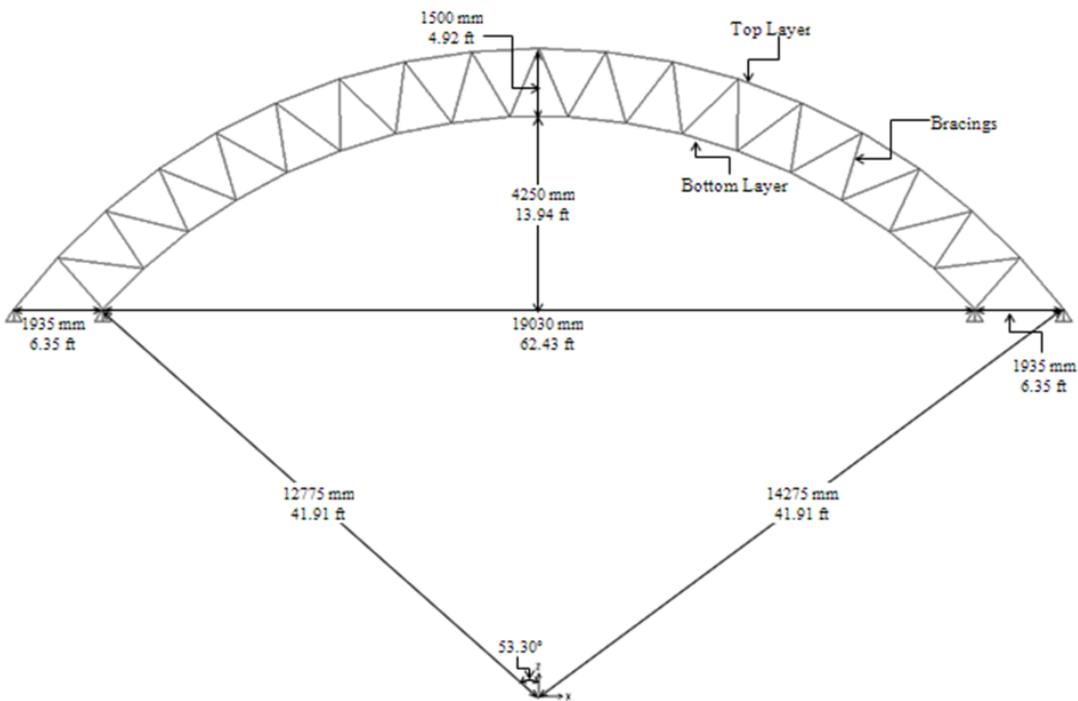
- (i)  $1.5DL + 1.5WL = 1.5(35 + 160) = +292.5 \text{ kg/m}^2$  (+2.87kN/m<sup>2</sup>)  
(ii)  $1.5DL - 1.5WL = 1.5(35 - 240) = -307.5 \text{ kg/m}^2$  (-3.00kN/m<sup>2</sup>)

In the structure, the displacements of all joints for global x, y and z directions are restricted as 0.1 inch (0.254 cm).

Strength and stability constraints of the cold-formed steel profiles which form the structure are defined according to ASD-AISC (1989) design code. Sections of the structural members are selected from section list having 114 different pipe sections which are available in ASTM-500 (2013).



a) 3-D view.



b) Front view.

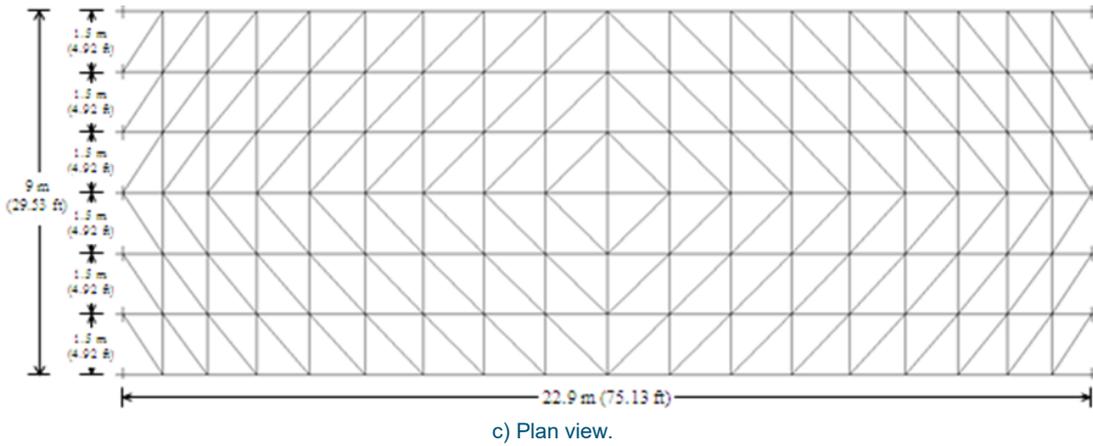


Figure 1 693-members steel braced barrel vault; a) 3-D view, b) Front view, c) Plan view.

The design example is independently optimized by ABC algorithm using different search parameters. After the optimization process, search parameters of the algorithm having the best result are described as: size of ant colony=60, maximum cycle number=150, limit to abandon food source=15 and maximum iteration number=10,000. ABC algorithm has found the minimum weight of the barrel vault structure as 64.708kN (6598.379kg). Sections and design details of the optimum solution have been illustrated in Table 1. It is clearly seen in the table that the value of the maximum displacement is very close to the limit value which means the displacement constraint is dominant in the optimization problem. Whereas, the maximum stress ratio (0.385) does not have an effective role in the optimization process due to the fact that the ratio is far away from the limit value (1.0). In light of these results, it is clear that the optimization process has been controlled by the displacement constraints. Search history of the best design for the ABC algorithm is shown in Figure 2.

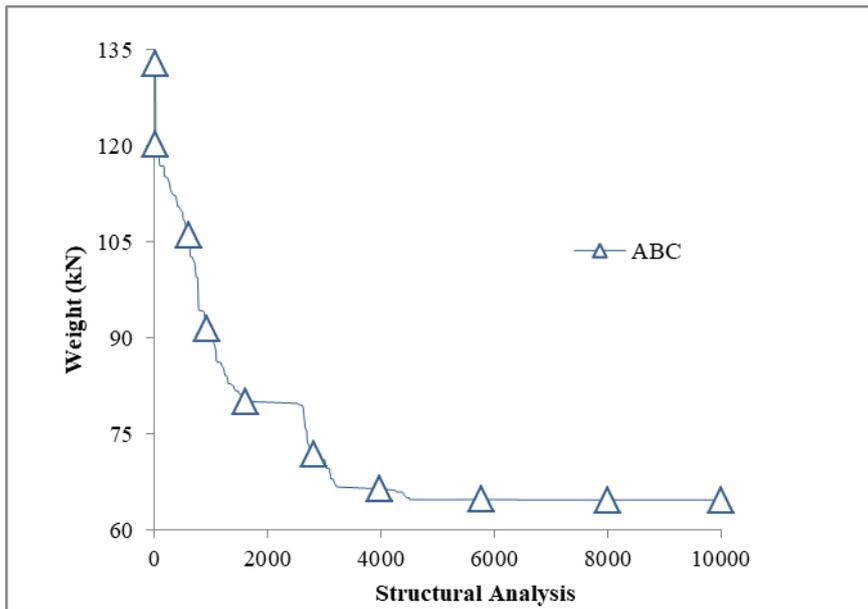


Figure 2 Time history graph for steel braced barrel vault.

Table 1 Optimum design results of steel braced barrel vault.

Group Number	SAKA	
	Ready Section	Area, in <sup>2</sup> (cm <sup>2</sup> )
1	R45	2.111 (13.618)
2	R1	0.531 (3.427)
3	R18	1.274 (8.221)
4	R1	0.531 (3.427)

Group Number	SAKA	
	Ready Section	Area, in <sup>2</sup> (cm <sup>2</sup> )
5	R1	0.531 (3.427)
6	R40	1.914 (12.351)
7	R7	0.776 (5.006)
8	R7	0.776 (5.006)
9	R1	0.531 (3.427)
10	R1	0.531 (3.427)
11	R45	2.111 (13.618)
12	R24	1.463 (9.437)
13	R40	1.914 (12.351)
14	R1	0.531 (3.427)
15	R1	0.531 (3.427)
16	R1	0.531 (3.427)
17	R18	1.274 (8.221)
18	R74	6.578 (42.437)
19	R1	0.531 (3.427)
20	R1	0.531 (3.427)
21	R1	0.531 (3.427)
22	R12	1.039 (6.701)
23	R1	0.531 (3.427)
Minimum weight	64.708 kN (6598.379 kg)	
Maximum displacement	0.0998 in (0.2535 cm)	
Maximum stress ratio	0.385	
Analysis number	7012	
Maximum iteration number	10000	

## 7. Conclusions

In this study, artificial bee colony (ABC) algorithm has been proposed for the solution of double layer braced barrel vault system having cold-formed steel sections. Usage of the cold-formed steel sections in the civil engineering industry provides a sustainable building design as less material is required than other types of buildings with the same loading condition. In order to find solution of the optimum design, a computer program has been developed which works simultaneously with SAP2000 software using application programming interface (API). The proposed optimization algorithm is tested with optimum design of the 693 member double layer braced barrel vault having discrete design variables. According to the design details and the search history, it has been proved that ABC based optimization algorithm has efficient performance for the solution of the optimum design of the cold-formed steel braced barrel vault structure problem. Therefore, the developed algorithm is a robust and efficient tool for the solution of structural optimization problems, especially for double layer steel braced barrel vault system which can be evaluated as large scale structure.

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## News from ECCE Members

### Cyprus



From left to right: Panikos Flouris (Member), Giannos Poumpouris (General Secretary), Kyriakos Tsioupanis (2nd Vice President), Andreas Theodotou (President), Evangelitsa Tsoulofta (1st Vice President), Andreas Constantinides (General Treasurer) and George Demetriou (Member).

The General Assembly of the Cyprus Association of Civil Engineers took place on December 2, 2017. The newly elected board of the Association is:

- Andreas Theodotou (President)
- Evangelitsa Tsoulofta (1st Vice President)
- Kyriakos Tsioupanis (2nd Vice President)
- Giannos Poumpouris (General Secretary)
- Andreas Constantinides (General Treasurer)
- Panikos Flouris (Member)
- George Demetriou (Member)

**ECCE would like to extend its congratulations to the newly elected board of the Cyprus Association of Civil Engineers and to wish them success and a fruitful term of office.**

### Hungary

IDEA  
CONFERENCE  
2018



The Hungarian Chamber of Engineers, in partnership with the KÉSZ Group and the Budapest University of Technology and Economics organizes an international conference under the brand IDEA (Innovation, Design, Engineering and Architecture) from March 7th – 9th 2018 in Kecskemét, Hungary.

The main aim of the conference is to present various innovative engineering projects, and the technical knowledge behind them, constructed either with reinforced concrete or steel structures. The conference is scheduled to be organized on the following topics:

- Presenting projects whether finished or in progress, having significant importance in the field of innovation, new technical solutions, and the use of the BIM method
- Lectures on design methods of steel structures, considering the latest news of Eurocode
- Lectures on the design of reinforced concrete structures, considering the latest developments in theory, testing, the requirements of sustainability and environmental aspects.
- Design of special structures, composite structures, structures covering large areas, such as stadiums, etc.

In the conference there will be an excellent possibility to have discussions among professionals, well known engineers, personalities of various field of structural engineering. A professional site visit will be organized to the nearby steel plant of the KÉSZ group.

The program, held in the beautiful city situated at the geographical centre of the country is part of the programs of the European Year of Civil Engineers. The common award of the Hungarian Chamber of Engineers and Institution of Civil Engineers named after Tierney Clark, the designer of the Chain Bridge in Budapest is scheduled to hand over on this occasion.

MSc Civil Eng. G. Szöllőssy  
National Delegate of Hungary in ECCE

## Poland

### PCCE Conference “Ethics and Professional Responsibility of Civil Engineers – the Foundation of Public Trust”



On 16 March 2017 the Polish Chamber of Civil Engineers organized, as part of the celebrations for the 15th anniversary of the establishment of the professional self-government, a conference on the responsibility and trust in professions of public trust entitled: “Ethics and Professional Responsibility of Civil Engineers – the Foundation of Public Trust”. *“The entire investment process is subject to appropriate legal provisions, guidelines, standards and regulations, but there is a single more general underlying principle. It stems from the fact that we are a profession of public trust. Those who come to us with a problem can expect that our answer will be prepared in good faith, according to the current state of knowledge and in compliance with the principles contained in our Code of Professional Ethics of the PCCE members”*, said Andrzej Roch Dobrucki, President of the Polish Chamber of Civil Engineers, when opening the conference. *“There is no doubt that improving the effectiveness of our self-government is an indispensable aspect of our profession.”*

The PCCE conference was attended by, among others, Andrzej Adamczyk, Minister of Infrastructure and Construction; Tomasz Żuchowski, Deputy Minister of Infrastructure and Construction; Stanisław Piotrowicz, Chairman of the Parliamentary Justice and Human Rights Committee; Stanisław Żmijan, Deputy Chairman of the Parliamentary Infrastructure Committee; Jacek Szer, Chief Building Supervision Inspector, and the representatives of self-governments of professions of public trust, universities, construction industry organisations and companies. *“Professional ethics must accompany engineers implementing and supervising investment projects, also designers – all those who participate in the investment process. Integrity in practising the profession is necessary. Town planning and construction code drawn up by the Ministry of Infrastructure and Construction puts considerable emphasis on professional responsibility”*, said Andrzej Adamczyk, Minister of Infrastructure and Construction, at the conference.

Session 1 was dedicated to ethical issues in regulated professions, including the profession of civil engineer. The introductory lectures were delivered by Professor Irena Lipowicz from the Cardinal Stefan Wyszyński University in Warsaw, Professor Hubert Izdebski from SWPS University of Social Sciences and Humanities and Professor Kazimierz Flaga from the Kraków University of Technology. Professor Irena Lipowicz spoke about: Legal and ethical duties in regulated professions. She pointed out that professions of public trust are a group of professions deliberately selected by the legislator in view of their social importance and usually very high professional and ethical requirements. The consequences of being set apart from other professions include changes in the legal relationships, i.e. acquiring certain rights, but also particular obligations not applicable to representatives of other professions. However, these are no legal privileges, but additional rights and obligations going beyond the standard employment regulations. Currently, the right to a good administration also includes ethical standards, such as integrity.

*“The law is necessary for systematising social relations, but ethics is the binder that keeps it all together. The law is overloaded, ethics, in turn, applies not only to relations between a client and an entrepreneur or an entrepreneur and another entrepreneur, but also to public authorities. Ethics is also binding for public authorities in dealings with regulated professions. These professions are subject to public trust, so they should be practiced so that this trust can be satisfied”* – this statement concluded the lecture of Professor Lipowicz.

Professor Hubert Izdebski addressed the issue of the scope and form of responsibility in regulated professions. He pointed out, among other things, that architects and civil engineers have a dual responsibility: professional responsibility as persons performing independent technical functions – for violations of criminal law or the law on petty offences and other acts referred to in Article 95 of the Construction Law, as well as disciplinary responsibility under the rules of professional self-governments of architects and civil engineers, as members of the relevant Chamber – for a culpable violation of the obligation to comply with the regulations and rules of technical knowledge, as well as internal law, starting with the code of professional ethics. Professional responsibility takes precedent before disciplinary responsibility. He added that the Code of Professional Ethics of the PCCI members was one of few such codes to also contain a reference to the relation between Chamber members and society and the environment.

Professor Kazimierz Flaga addressed the practical aspects of ethics and professional responsibility of a civil engineer. *“The issue of ethical aspects of professional work is an inseparable element of shaping the rules of practising the profession of civil engineer as a profession regulated by applicable laws. It is an inseparable component of the construction services market, designed to create mutual trust between the service provider and the customer. However, this is by no means easy. The nature of the professional activity of civil engineers, architects or other similar professions is important. This is usually a unique activity of largely creative nature, also involving professional risk”*, stressed Professor Flaga.

Session 2 of the conference focused on ethical standards as a determinant of professional responsibility. During this session, Dr Leszek Mellibruda discussed the results of a survey entitled “Ethics and professional responsibility of civil engineers in times of complex political and economic changes”. The aim of the survey was to learn the opinions and attitudes of the community of civil engineers representing various specialities in the area of professional ethics and responsibility. An additional objective was to collect the opinions of investors, both in the business sector and administration.

Respondents most often considered integrity and care for the transparency of relationships in business dealings with investors and counterparties, as well as high standards of behaviour, including in particular following the norms and principles of social relations, as the most important aspects in gaining social trust by civil engineers. Respondents most often stressed the need for greater care about the professional image among engineers and the entire sector.

Among factors that threaten the image of the profession of civil engineer, the opinions of unsatisfied customers and social stereotypes and the common tendency of Poles to complain were named most frequently. The awareness of the consequences of the engineers' activity including threats to health and safety of people was mentioned most often among the main goals of the civil engineering industry as recorded in the Code of Professional Ethics of the PCCI. Second was the concern for the public good and the principles of professional and personal integrity.

Among the often-mentioned causes of unethical conduct were insufficient knowledge of the laws, regulations and provisions of the Code of Professional Ethics of the PCCI members, and the organizational culture of some companies, which overlooks the ethical behaviour of people on a daily basis.

During Session 2, discussions focused on topics such as ethical competencies of a civil engineer, conduct contrary to the ethical standard in terms of building the prestige of the profession, codified ethical standards.

The moderator of Session 2 was Dr L. Mellibruda, and the panelists included: Andrzej Baszkowski, Mieczysław Bąk, Jacek Bojarowicz, Ryszard Grobelny, Konrad Kucza-Kuczyński, priest Krzysztof Kietliński, Mieczysław Molencki and Anita Oleksiak.

The topic of Session 3 was “Disciplinary proceedings as a safeguard of ethics and trust in the profession of civil engineer – enforcement of responsibility”. During the debate, issues related to professional responsibility in view of different qualifications and professional licenses, criminal liability and professional liability were dealt with in the context of criminal law, civil and administrative law. During this session, data were also presented regarding professional responsibility and disciplinary proceedings. According to these figures, in 2016, regional professional responsibility spokesmen of the PCCI instituted proceedings in 537 cases, including 62 involving disciplinary responsibility (11.55%) and 475 concerning professional responsibility (88.45%). In the same period, regional disciplinary tribunals of the PCCI passed guilty verdicts in 86 cases, in 7 cases found the accused not guilty or refused to meet out a punishment, discontinued the proceedings in 38 cases, and in three cases a decision was taken to strip the accused on the license to perform independent functions in construction. 75% of those penalised were site managers.

During this session, participants also spoke about the benefits of using the mediation procedure in disciplinary proceedings and about practical experiences of the professional responsibility spokesman and disciplinary tribunals of the PCCI.

The moderator of Session 3 was Dr Barbara Pawlak from SWPS University of Social Sciences and Humanities, and the panelists included: Robert Dziwiński, Ryszard Kowalski, Andrzej Maciążek, Gilbert Okulicz-Kozaryn, Grażyna Samulska, Jacek Szer, Waldemar Szleper and Andrzej Zwara.

The fourth (and the last) session, was dedicated to the ethics of co-operation between engineers/regulated professions and contracting parties and its importance for building relations in the market according to the social market economy standard. This part was moderated by Professor Zygmunt Meyer, and the following persons took part in the debate: Leszek Korczak, Ryszard Gruda, Zbigniew Janowski, Grzegorz Kiełpsz, Joanna Makowiecka, Jacek Mięcina, Andrzej Porawski, Karol Kasprzak, Tomasz Żuchowski and Jan Styliński.

During the discussion, Tomasz Żuchowski, Deputy Minister of Infrastructure and Construction, stressed that ethics is a fundamental and irrefutable matter in the profession of civil engineer. *“Persons performing a profession of public trust such as the profession of civil engineer are subject to both ethical standards resulting from certain universal values as well as professional ethics contained in the Code of Ethics of the members of the Polish Chamber of Civil*

*Engineers. The self-government is responsible for the Code of Ethics of the members of the Polish Chamber of Civil Engineers. The self-government is responsible for the observance of ethical standards by its members, and should also place more emphasis on the observance of ethical principles in its training courses”, said Tomasz Żuchowski.*

The conference stressed the fact that values such as standards of conduct, integrity and reliability are the basis for shaping each profession of public trust. Speakers emphasized that professional ethics fostered confidence in social life, which in turn translates into creativity, productivity and building proper relations when carrying out construction investment projects.

One of the aims of the conference was to strengthen the sense of professional responsibility in the community and to improve the image of the profession of civil engineer as well as to specify the role of professional self-government in building mutual trust between the members of the chamber and the recipients of their services.

At the end of the conference, Andrzej Roch Dobrucki, President of the PCCI, stressed the importance of this event and added that, in reality, the conference was not ending. It would be continued in the form of other activities aimed at popularising ethical standards in professions of public trust and their effective enforcement.

## Status of Polish Civil Engineer



From left to right: dr inż. Jacek Szer, Prof. Irena Lipowicz, Prof. Zygmunt Meyer

The year 2018 has been proclaimed by the European Council of Civil Engineers (ECCE) as the European Year of Civil Engineers. As a part of the preparations for this great event, Łódzka Okręgowa Izba Inżynierów Budownictwa (Lodz Chamber of Civil Engineers), already in May 2017, initiated a debate on the issues around the engineering profession with a plenary panel entitled “Status of Polish Civil Engineer” which was held in Lodz, in the context of The X European Economic Forum – Lodzkie 2017.

The plenary panel, moderated by mgr inż. Barbara Malec (MSc Eng.) – the head of ŁOIIB (Lodz Chamber of Civil Engineers), hosted Prof. Irena Lipowicz, Prof. Zygmunt Meyer and dr inż. Jacek Szer (PhD Eng).

Prof. dr hab. Irena Lipowicz – the professor of The Cardinal Wyszyński University in Warsaw, Faculty of

Law and Administration and Local Government, the Polish Commissioner for Human Rights between 2010-2015, spoke about the duties of civil engineers as representatives of a profession that enjoys the highest level of public confidence.

Professor Lipowicz outlined the goals of such jobs and the role of the trade self-government and its legitimacy at the same time, suggesting some solutions. Reminding the French definition of “an engineer”, which says that “an engineer is a citizen who ensures the links between science, technologies and the community” (where it is the citizen’s responsibility to contribute for their community), she remarked that in order to survive, stay competitive, educate the next generations and enjoy the highest prestige not only in Europe but also in the more and more economically demanding World, the engineer community has to stay united and aware of its principles.

It is a duty of engineers to meet professional standards and demand the same from their colleagues. The members of trade self-government have the right to develop and upgrade these standards and to protect these standards against unfair competitors who try to undermine them from outside, e.g. by pressing on cost cutting which results in substandard quality or even by enemies within who do not follow the worthy principles causing damage to the image of the whole engineering society. Similarly, the Government has to respect the constitutional autonomy of the trade self-government and to protect the engineers’ profession. It should also protect and support the trade self-government in executing delegated, public administration tasks. No one denies the National Government should possess the controlling powers, but the crucial thing is that it should be politically neutral and create the climate of safety and stability.

The trade self-government is supposed to update and amend the existing regulations according to new challenges (in technology but also legal and ethical ones) the represented professionals are confronted with. Tackling these new challenges is not achievable solely by law-making; our current law seems to be “overloaded” and far too complex. However a lack of reaction in the events of professional standard breaching may ruin the trust placed in the trade self-government and its members which may lead to its reduction and finally – abolition.

Where does this standard undercutting come from? Very often the reason is some internal human weakness or external; clients’ or superiors’ pressure. The consequences of such bad practices seem to be far away but a dramatic situation on the job market, the prospect of unemployment or losing a client is something that affects us immediately. It is a serious conflict. The administrative law is not able to help us resolve this issue; in many cases it is inconsistent, slow and dramatically imprecise. Hence the pressure of the trade self-government to establish the Building Code and finding an appropriate solution to the urgent issue of the Land Use Planning, the lack of which will have a negative impact on our engineering community.

The key part of the engineer’s job is to manage conflicts. If we ignore a problem, we are inviting a crisis. That is why the trade self-government’s job is to support effective conflict management. This is the ratio legis of such a



**mgr inż. Barbara Malec (MSc Eng.) – the head of ŁOIIB (Lodz Chamber of Civil Engineers)**

high status of trade self-government bodies. What can we do to cope with that? The trade self-government has some tools: the disciplinary court, impact through informal contacts and talks. An integrative approach is essential – we are trying to work out a solution which would be legally and ethically acceptable. "Soft towards a human, hard towards the problem" (first, an attempt to reach something hidden behind formal statements, a long list of possible solutions and agreeing on the criteria which describe the best option is essential, after which the best one, acceptable for everybody, can be finally selected). However, if there is no solution that would satisfy everybody, an option might be an ethics advisor – a commonly respected person who everybody is willing to ask "what would you do in such a situation". There is an "ethics advisor boom" in the biggest companies all over the world.

Why? Simply because with digital globalization, a tiny error or damage to the company's image has never cost that much. Another suggestion is an internal mediator – a professional acting according to some defined procedures. On the market there are mediating companies, and at some higher schools there are resolving conflict centres. These forms of mediation could be utilised within the trade self-government.

What can we do? We can work on improving ourselves in conflict management skills with the aid of the trade self-government. We can initiate or make use of systemic support from the Chamber and promote reliable disciplinary judiciary. Monitoring of achievements will prove the strength and usefulness of the trade self-government. The Chamber can support conflict management skills through encouraging engineers to self development (and trainings in applicable procedures, which are like "a piece of armour for the weak" but not their enemies and bureaucracy), creating and developing institutions and other forms of support for engineers in the field of prevention and dispute resolving drawing on standards of the profession, cooperate with both theoreticians and practitioners, and also with other trade self-governments.

It is also necessary to monitor the law and dysfunctions of regulations, and react to them (a bad regulation might lead to unjustified responsibility of engineers and construction disasters). The Professor suggested forming a team of ethics advisors working as mentors. Regional cooperation is just as important. And, as trade self-governments enjoy a certain autonomy, a joint committee of the government and the trade self-government should be appointed, which would facilitate communication and cooperation.

The Status of the Civil Engineer in the Country and Abroad is the subject of the address of Prof. dr hab. inż. Zygmunt Meyer – vice-president of the European Council of Engineers' Chambers (ECEC), head of the Section of Soil Mechanics and Foundation ZUT in Szczecin, chairman of the Westpomeranian Council OIIB, chairman of the Committee for Cooperation with Foreign Countries PIIB.

Professor Z. Meyer referred to the causes of the deregulation, based on the belief that the increase of the national income is growing in proportion to the increase in construction investment, and regulated professions somehow 'hinder' the economic growth so they should be opened, making the profession accessible for everybody. Fortunately, after discussions, the idea of profound changes and a complete opening of the profession was abandoned. International engineer organisations play an important role in presenting the views and preparing materials dealing with issues which are important for the community. One of such organisations is the ECEC – the European Council of Engineers' Chambers which prepared the information about the functioning of regulated professions in various European countries (the way of organising a trade self-government, rights and education) for the European Commission. The results of these studies – as presented by Professor Meyer – are very interesting.

Estonia, Finland, Sweden, Norway and Denmark – here there are no engineers' chambers formed on the basis of a Parliament act, and trade self-governments do not grant any rights. Instead of self-governments there is administration, which publishes lists of companies or persons who work effectively, there are fewer accidents etc.

Poland, Slovakia, the Czech Republic, Hungary, the Balkan countries, Austria, Italy, Spain, Portugal – these are the countries with civil engineers' chambers, mainly based on the formula of an act of Parliament. They grant building rights recognised by national institutions. There is a similar system of granting building rights in Germany.

France, Holland, Belgium – here building rights are of local character, granted by certain regional authorities or companies. There is no universal approach to the trade self-government resulting from an act of Parliament.

In this context Great Britain has a special significance, as it had to create its own system, having been a developing empire in the past. There, building rights are granted by an organisation of engineers, formed 150 years ago. It was not established on the strength of an act of Parliament – it is a sort of association which introduced standards, examinations, models of rights granting privileges and regulating employment, later emulated all over the world.

In Russia it is the president who appoints the main qualifying committee, there is no equivalent of a civil engineers' chamber, there is only an association representing engineers, where membership is voluntary. A similar situation is in Ukraine.



In comparison, in the United States the president appoints the head of the American qualifying committee. This committee has its equivalent bodies in particular states, which have slightly different models of granting rights (state regulations allow for some exceptions).

Speaking of education, we could notice that the countries which have civil engineers' chambers, mutually accept the qualifications of their members. Excellent qualifications of Polish engineers are recognised and held in high regard. There is a problem connected with the vocational training formula expressed by the EC (it concerns engineering qualifications not gained at university, but during trainings, courses and other practical forms of professional development e.g. in Austria).

Hence we can say that our bill gives us significantly greater possibilities of protecting our profession, the level of public confidence and the trade self-government.

Professor Z. Meyer informed us also about the issues currently dealt with by the ECEC. He pointed out that the European Committee is trying to use indexes characteristic of economic and business development, whereas the ECEC talks about a completely different sphere – a social one, conveying the idea that we, engineers, want to build, observe safety rules, fill the space in harmony with the already existing structures and achieve our goals in a balanced, socially accepted way. Taking into consideration only economic indexes is a huge simplification and we cannot accept the engineering profession to be treated instrumentally, as part of the free business market.

Professor Z. Meyer reminded us that the year 2018 had been proclaimed the European Year of Civil Engineers. The main aim of this proclamation is drawing the attention of the society to the basic role of civil engineers in the development of the human living standard and increasing their status in the societies of European countries.

Dr Jacek Szer (PhD Eng), the chancellor of the Technical University of Lodz, acting as the Main Construction Supervision Inspector between 2015-2017 (appointed on September 1. 2016), deputy Construction Supervision Inspector from September 2011, spoke about the status of the Polish engineer in the investment process.

While discussing certain aspects of the building code, he stressed numerous duties of civil engineers, the roles they play in the construction process and their practical determinants. A civil engineer in the construction process is burdened with duties, pressured by the investor and the society. He is perceived nowadays through the responsibility standard, his mistakes are emphasised (they occur, but it is more or less one per mille of his work), whereas the issue of his numerous duties is often ignored.

It is connected with the need to restore the image of the civil engineer as a profession with a high level of public confidence. Dr J. Szer pointed out positive associations connected with the origins of the word engineer: in French *ingénieur* means 'a man with a creative mind, an inventor, constructor, designer and contractor in one person'; in Latin *ingeniosus* (Italian – *ingegnoso*) means a skilled person and stems from another Latin word *ingenium* (character, intelligence, talent). It proves the high rank of this profession and that is why we must nowadays fight to restore it.

Speaking about the broadly defined responsibility of the engineer, Dr Szer stressed the importance of the trade self-government and trainings organised by the chamber. The mistakes which occur are not deliberate, merely resulting from lack of knowledge of a multitude of laws and regulations.

All the panellists' speeches and the discussion were recorded electronically – links to the films available on [www.lod.piiib.org.pl](http://www.lod.piiib.org.pl) (bookmark "Kalendarium").

Renata Włostowska

Translated by Tomasz Wołoszczyk and Małgorzata Pietrzyk

## Turkey

**“7th Steel Structures Symposium” took place on 26-27 October 2017 in Gaziantep, Turkey on 26-27 October 2017, organized by the Turkish Chamber of Civil Engineers-TCCE.**



On behalf of the Turkish Chamber of Civil Engineers, the 7th Steel Structures Symposium organized by Gaziantep and Erzurum Branches was held on 26-27 October 2017 in Gaziantep.

The Symposium was welcomed by TCCE's Gaziantep Branch President Gökhan Çeliktürk and TCCE's Erzurum Branch President İlhan Tohumcu. Then, TCCE President Cemal Gökçe, NCTR President Seran Aysal, and Metro-

politan Mayor Fatma Şahin made speeches at the opening of the symposium held at the Şehitkamil Culture and Congress Center.

At the symposium, developments in "Steel Structures" were discussed at home and abroad. In addition, sessions were held on strengthening of the structures with steel and designing of structures in accordance with the newly prepared earthquake regulations. At symposium, Presentations of 32 Articles, accepted by the Scientific Committee, were made in different sessions.

"Called Speakers" Prof. Dr. Viorel Ungureanu from University Politehnica of Timisoara, Prof. Dr. Teoman Peköz from Cornell University and Prof. Dr. Ertuğrul Taciroğlu from University of California were presented their papers at Symposium.

The symposium, which all Public Institutions, Universities and Organizations provided a wide participation, was realized with great success and focused on the increase steel usage in construction by taking the advantages of steel into consideration.

Turkish and Foreign Universities participated to the Symposium with variety of Articles.

One of the Article named as "**Optimum Design of Braced Barrel Vault Systems Using Cold-Formed Steel Sections**" written by Osman Tunca and Serdar Carbas from Karamanoglu Mehmet Bey University and Ibrahim Aydogdu from Akdeniz University, is published in this bulletin page 9.



United Kingdom

ice

## Institution of Civil Engineers (UK) Update November 2017

### Professor Lord Robert Mair, ICE President 2017 – 2018

Professor Lord Robert Mair's speech, [which he gave in November](#) to an audience of members and industry figures at One Great George Street, marks the handover of the presidency from Professor Tim Broyd.

The new ICE President's theme for the year addresses how civil engineering has changed radically over 200 years and outlines how civil engineers today are as innovative and dedicated to solving problems now as ever they were. Tackling challenges such as climate change, population growth and rapid urbanisation is how civil engineers transform millions of people's lives for the better.

In his speech he looked at how the profession can use technology to improve infrastructure assets, transforming the industry and the societies it serves. He also set out the opportunity for civil engineers of today to solve current global challenges and encourage the next generation to become engineers.

Professor Lord Mair also introduced his [eight Future Leaders](#). The ICE President's Future Leaders Scheme, formerly the President's Apprentice Scheme, is open to all technicians and ICE graduate members working towards their professional qualification. Since the first intake in 2005 the scheme has offered a unique opportunity to gain experience, develop skills, learn about the industry and be mentored by the ICE President.

### Engineering 'Invisible Superheroes' to take centre stage at ICE 200 exhibition

As [ICE gears up to host a year of activities for our 200th anniversary](#), the Infrastructure Learning Hub at One Great George Street will unveil a brand new 'Invisible Superheroes' exhibition.

Launching in December this year, the exhibition will tell the story of how civil engineering has helped transform lives and shape the world in which we live. It will stress how civil engineers safeguard the future for people and their families.

By adopting a comic book superhero theme the exhibition aims to inspire a new generation of civil engineers, promoting civil engineering as a career that is a creative, rewarding and fun.

The exhibition will also feature significant engineering projects from around the world submitted as part of a 200 people and projects shortlist, that showcases the best civil engineering of the past 200 years.

For example, the London Sewer Network designed by Sir Joseph Bazalgette, as well as the new major London sewer upgrade Tideway project, which also launches in 2018. Tideway is the first industry partner to sponsor the exhibition.

'Invisible Superheroes – how civil engineers transform lives and shape the world around us' will open at ICE's One Great George Street headquarters in December 2017 and run throughout 2018.

#### ICE backed review commits to further improving safety culture

The tragedy of Grenfell Tower prompted an ICE-led industry review of how infrastructure is delivered and operated. The review was led by past president Peter Hansford who convened a panel of experts which identified the need to strengthen lines of defence in terms of knowledge, applications and assurances throughout the lifetime of infrastructure assets.

The report [In plain sight – reducing the risk of infrastructure failure](#) makes nine recommendations in three key areas:

**Lesson sharing:** ICE should work with other infrastructure organisations to improve how the sector shares information from safety reviews, accidents, failures and near misses.

**Competence:** ICE should investigate the robustness of its continuing professional development (CPD) regime and professional code of conduct. ICE should also review the effectiveness of arrangements for professional oversight of assets in different sub-sectors of infrastructure.

**Governance:** ICE should work with other infrastructure organisations to identify if improvements can be made to the role played by governance in the development and management of assets. This should include the competence of boards, scrutiny systems and the presence of a technically competent engineering voice in safety critical decisions.

#### ICE launches Project 13: a new way to deliver infrastructure

[Project 13](#), the industry-led initiative to improve the way high performance infrastructure is delivered, has been officially launched by ICE.

Project 13 will be a step change for the future of the industry – based on an enterprise relationship that maximises performance rather than a transactional one which transfers risk.

Currently in development, Project 13 will move to the implementation phase in March 2018, supporting clients and suppliers to adopt this new delivery model. This will include advisory support, tools, guidance and peer review.

There is wide-ranging support across the civil engineering profession and a diversity of voices from business backing the initiative.

## News from ECCE Partners

### 12th General Assembly of the World Council of Civil Engineers (WCCE)



WCCE's 12th General Assembly of the World Council of Civil Engineers was held in Antalya, Turkey from 18 to 20 October 2017, organized by the Turkish Chamber of Civil Engineers - TCCE. The Assembly was welcome by TCCE's President Cemal Gökçe. Attendance at WCCE activities by WCCE delegates was enriched by the attendance of FAEO's Past President Mustafa Shehu as well as delegations of three new countries: China, Georgia and Montenegro.

ECCE is a member of WCCE and was represented in the 12th WCCE GA by Mr. Gorazd Humar, ECCE Past President and permanent ECCE representative to WCCE.

Regarding the General Assembly, various issues were addressed being the major achievements of the meeting as follows:

- Several initiatives are to be developed jointly with UNESCO in the coming months through the signing of a UNESCO – WCCE partnership agreement being among them:
  - Publication of monographs on the topic addressed by the International Year of Water initiative for the period 2016-2019.
  - Contributions to UNESCO's SAGA report relative to assess the current situation of Women Civil Engineers and how to enhance their participation in the profession.
  - Contributions to UNESCO's II Engineering Report titled 'Engineering UN's Standing Development Goals - SDGs' together with some other partners.
- Also in the field of partnerships with other organizations they presented the following activities.
  - Participation in MENBO's General Assembly through the formerly signed partnership agreement with INBO - International Network of Basin Organizations.
  - Joint activity to be delivered with EAMC, Engineering Association for Mediterranean Countries.



- Regarding membership, both Engineering Chamber from Montenegro and Georgian Society of Civil Engineers have joined WCCE in this General Assembly.

Last but not least, the presentation from WFEO candidates to the office of President for the period 2020-22 enriched the Assembly by identifying potential lines of collaboration with WFEO both short term and long term.

This Assembly has focused on consolidating WCCE as a global partner with the UN system on the principles presented in the Madrid Declaration signed last March which stated the commitment of civil engineering towards the achievement of UN's Sustainable Development Goals and our profession's role in such achievement.

Proposals to host the WCCE General Assembly in September 2018 have been presented by Bolivia and Argentina.

## European Council of Engineers Chambers (ECEC) 14th General Assembly 2017 in Skopje



European Council of Engineers Chambers

On Saturday, 21 October 2017, the 14th General Assembly Meeting of the European Council of Engineers' Chambers took place at the Marriot Hotel in Skopje, Macedonia, hosted by the Chamber of certified architects and engineers of Republic of Macedonia and its President Prof. d-r Mile Dimitrovski.

ECCE participated in the ECEC GA represented by its Vice President / Treasurer Dimitar Natchev who delivered a short speech on behalf of ECCE highlighting the need to achieve mobility and acceptable regulation in favor of society and practicing engineer with adequate clear rules at European and national level.

Main topics of this event were the enforcement of regional, European and international cooperation, EU developments such as the EC Services Package, the Procurement of Engineering Services and the principle question of the future ECEC Strategy. Training Principles for Engineers, which is, on behalf of the European Commission, currently conducted by the ECEC. The ECEC has finalized



the procedure of establishing as legal personality and the GAM adopted the formal accession of the current members to the "new" organization. The ECEC GAM also welcomed a new associate member, the Portuguese Ordem dos Engenheiros. Additionally the ECEC decided on a change of statutes that will allow a broader range of organizations – not only those from EU countries / candidates countries but also from other European countries – to become associate members of the ECEC.

During the event that was also attended by the Macedonian President H.E. d-r Gjorge Ivanov, the 4th ECEC award was given to past WFEO President Marwan Abdelhamid. Additionally the Chamber of certified architects and engineers of Republic of Macedonia received an honorary mention of the ECEC.



### ECEC Medal 2017



From left to right: Remec, Abdelhamid, Ivanov, Oreskovic

The ECEC medal is regularly awarded for outstanding achievements in regard to the values of ECEC. At the General Assembly Meeting in Skopje it was awarded for the fourth time: On 21 October 2017 it was presented to WFEO Past President Eng. Marwan Abdelhamid. The decision was based on the fact that Eng. Marwan Abdelhamid played a major role in supporting the ECEC to gain recognition and positive acceptance in the engineering world on international level. Due to his efforts, the ECEC has now a respected position within the WFEO. This broader scope of thinking had and continuously has a positive effect on the development of the ECEC.

The medal was presented to Mr Abdelhamid by ECEC President Remec and the former award winner Mirko Oreskovic together with the President of the Former

Yugoslav Republic of Macedonia H.E. d-r Gjorge Ivanov.

## European Construction Forum (ECF)



The ECF is a platform for cooperation on issues of common interest between independent organizations representing key players in the construction sector and participating on a voluntary basis.

Following a time of "ECF hibernation", ECF is revitalized again and ready to work in favor of the entire construction sector.

In quite some publications, the EU institutions have been considering the construction sector a priority for growth and jobs, so that there should be better opportunities for having ECF's ideas and proposals included in their work programmes.

For this reason, ECF is joining forces again with a kick-off meeting that will be organized in the beginning of January 2018, to discuss possible collaboration and joint actions on the digital transformation of the construction sector and the umbrella topic of "Construction 4.0".

As the FIEC Director General Ulrich Paetzold mentioned "At FIEC, we have been discussing how to best support our member federations and their construction companies through the anticipated period of extensive change that is already having an impact in some countries and is likely to have a massive impact on the entire value chain of the industry in the medium to long-term. You may be aware that we produced a manifesto "[Making BIM a global success](#)" earlier in 2017. This was only the start.

Amongst the challenges that we face as a federation are:

- the response of the European Union policy makers and their current perceptions of the industry and how it can be improved
- the response of other sectors, notably the IT industry but also the consultants - that see the digitalization of construction as a huge opportunity to develop new business models, products and systems that could eventually corner the market and force construction companies to "buy or die"; and to sell their expertise
- the response of the industry itself, in particular the SMEs, in a rapidly changing environment that requires considerable investment and is fraught with risk.

We think that other industry federations in the construction value chain are facing similar challenges.

The digital transformation of construction requires collaboration, not only in the sharing of information and access to the necessary portals, but in the entire way of working. Fragmentation – for which we are often criticized – will slow down the pace of change and leave wide open the space for new (financially strong) companies to enter the market and change it beyond recognition. As an example from a different sector of industry, I would look at what is happening in the car industry, with new mobility players from hitherto totally different sectors.

We believe that the construction industry should lead the change and support the many companies, both large and small, that risk being overwhelmed by the speed of change and the associated costs and risks. That said, FIEC, representing only one of the components of the construction value chain, does not have all the answers and we want to join forces with others, to work on solutions together."

With this in mind, a meeting will be hosted on 16 January 2018, at FIEC offices, in Brussels to start talking about all of this and see what could be done jointly.

ECCE as a member of ECF will be represented in this meeting by the ECCE Vice President / President Elect Aris Chatzidakis and by the UK National Delegate from the Institution of Civil Engineers Paul Coughlan.

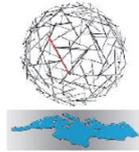
## FIEC takes over presidency of ECCREDI



The European Council for Construction Research, Development and Innovation (ECCREDI ) has a new President. FIEC's Director of Technical and Environmental Affairs, Sue Arundale, has already been involved with ECCREDI for several years and has recently served as a Vice-President. The Council brings together colleagues from other construction federations, including those focused in particular on research (the European Network of Building Research Institutes, ENBRI, European Large Geotechnical Institutes Platform, ELGIP and the European Network of Construction Companies for Research and Development, ENCORD).

[Read more...](#)

## Engineering Association of the Mediterranean Countries (EAMC) Executive Board meeting



### Engineering Association of Mediterranean Countries

On 28 November the meeting of the EAMC ExBo was held in Rome besides the General Assembly of WFEO. ECCE participated to this meeting represented by its Vice President / President Elect Aris Chatzidakis who is also a member of the EAMC ExBo.

The meeting has approved the minutes of its previous meeting, has approved also the financial matters on the agenda and discussed the report by the General Secretary Nicola Monda.

The main topic was the report and planning of Technical Committees. The accent was given to the collaboration with students and women engineers in Arabic countries.

The next General assembly will be in Beirut, Lebanon in the beginning of May.

## EU News

### A European Strategy for the Digitisation of Industry



The 4<sup>th</sup> industrial revolution is unfolding worldwide, opening up new horizons driven by new-generation digital technologies such as the Internet of Things, High Performance Computing, cloud computing, big data, robotics, artificial intelligence and 3D printing. This change of paradigm has a profound impact on products, processes and business models in every industry, from construction, health and agri-food to the tourism and audiovisual sector. The European manufacturing industry alone accounts for 2 million enterprises, 33 million jobs and 60% of productivity growth. Digitisation of products and services can add more than €110 billion of annual revenue for industry in Europe until 2020.

However, in order to unlock this potential, Europe needs to join forces under a common strategy that takes digitisation of the EU's economy forward. With this objective, the European Commission launched the Digitising European Industry strategy (DEI) in April 2016. The initiative aims to reinforce the EU's competitiveness in digital technologies and ensure that every business in Europe - whichever the sector, wherever the location, whatever the size – can draw the full benefits from digital innovation.

The Digitising European Industry Initiative is a key element of the Digital Single Market strategy, which aims to make the EU's single market fit for the digital age. This need was also recognised at the Digital Summit in Tallinn in September 2017, where European leaders aspired to make the EU the ideal home for enterprises and innovators in the digital age and to accelerate the digital transformation of industries.

Building on and complementing the various national initiatives for digitizing industry, the DEI strategy is structured around five main pillars:

- European Platform of National Initiatives on Digitising Industry
- Digital Innovations for all: Digital Innovation Hubs
- Strengthening Leadership through Partnerships and Digital Industrial Platforms
- A regulatory framework fit for the digital age
- Preparing Europeans for the Digital Future

The whole report on the progress achieved so far, by the European Commission's Digitising European Industry initiative can be found at the FIEC website [here](#).

## Next steps of the Digitising European Industry strategy are discussed at European Commission hosted high-level governance meeting



The European Platform of National Initiatives on Digitising Industry hosted a high-level meeting with representatives of Member States, national initiatives for digitising industry, European Public Private Partnerships and relevant European Associations in order to discuss the next steps on the digitisation of European industry.

The [Digitizing European Industry \(DEI\) Strategy](#) aims to reinforce EU's competitiveness in digital technologies and ensure that any industry in Europe, big or small, wherever situated and in any sector can fully benefit from digital innovations. This requires not only a dynamic digital sector in Europe but also the full integration of digital innovations across all sectors of the economy.

In order to meet these challenges, a European governance framework is essential to facilitate coordination and cooperation of European, national and regional initiatives on digitising industry, as well as to mobilise stakeholders across value chains.

Mariya Gabriel, the Commissioner for Digital Economy and Society, highlighted the importance of the Digitising European Industry strategy. She states that:

*"the DEI strategy has to continue to ensure reinforcing the EU's competitiveness in digital technologies so that any industry in Europe, big or small, wherever situated and in any sector can fully benefit from digital innovations to upgrade its products, improve its processes and adapt its business models to the digital change."*

[Read more...](#)

## CEF "blending call": €1 billion for 39 "clean" transport projects

On 30th November, the European Commission published the results of the 2017 "blending call" from the Connecting Europe Facility (CEF). The proposed projects aim to upgrade the rail network, develop alternative fuels infrastructure and clean waterway transport in the Trans-European Transport Network (TEN-T).

The 39 selected projects of the call have an investment volume of €4.5 billion, with co-funding of about €1 billion. Project promoters were attracted by the proposed mix of EU grants with financing from other public and private investors achieved within this first-ever blending call.

Selected projects include, for instance, the upgrade of the Divača-Koper rail line in Slovenia, the construction of 340 charging stations for electric cars in 13 EU countries and the upgrading of the Albert Canal, Belgium's main inland waterway.

A second round of the call is open until 12<sup>th</sup> April 2018.

[Read more...](#)

## The State of the Union 2017: Catching the wind in our sails



European Commission President Jean-Claude Juncker delivered on 13 September his 2017 State of the Union Address, before the Members of the European Parliament in Strasbourg, presenting his priorities for the year ahead and outlining his vision for how the European Union could evolve by 2025.

President Juncker said: "The wind is back in Europe's sails. But we will go nowhere unless we catch that wind. (...) We should chart the direction for the future. As Mark Twain wrote, years from now we will be more disappointed by the things we did not do, than by the ones we did. Now is the time to build a more united, stronger and more democratic Europe for 2025."

To steer the reform agenda set out in his speech, President Juncker proposed a Roadmap for a More United, Stronger and More Democratic Union. A series of concrete initiatives were immediately adopted by the Commission - on trade, investment screening, cybersecurity, industry, data and democracy.

You can watch President Juncker's full speech [here](#).

## Ministerial Declaration on eGovernment - the Tallinn Declaration

All the European Union Member States and EFTA countries signed the 'eGovernment Declaration' in Tallinn on 6 October 2017. The declaration was signed during the Ministerial Meeting which took place in the framework of the eGovernment Ministerial Conference. This was chaired by Minister Urve Palo, representing the Estonian Presidency of the Council of the EU and in the presence of Andrus Ansip, European Commission Vice-President for the Digital Single Market.

Read more [here](#).

## Public consultation on a European Labour Authority and on a European Social Security Number



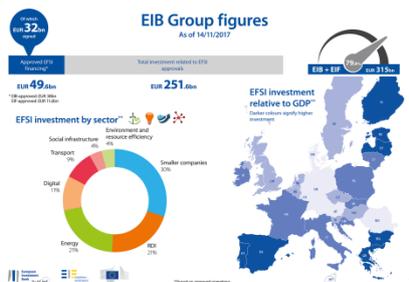
The European Commission has launched a public consultation to gather views of the broader public on setting up a European Labour Authority and the introduction of a European Social Security Number. The deadline for taking part in this consultation is 7/1/2018.

The European Labour Authority should ensure that EU rules on labour mobility are enforced in a fair, simple and effective way. The Authority would support national administrations, businesses, and mobile workers by strengthening cooperation at EU level on matters such as cross-border mobility and social security coordination. It would also improve access to information for public authorities and mobile workers and enhance transparency regarding their rights and obligations.

The European Social Security Number (ESSN) aims at simplifying and modernising citizens' interaction with administrations in a range of policy areas. An EU Social Security Number would facilitate the identification of individuals across borders for the purposes of social security coordination and allow the quick and accurate verification of their social security insurance status. It would facilitate administrative procedures for citizens by optimising the use of digital tools. Both legislative proposals are planned to be tabled by spring 2018.

Read more...

## Juncker Plan exceeds €250 billion in investment



According to the latest available information (meeting of the European Investment Bank Board of Directors of November 2017), the European Fund for Strategic Investments (EFSI) is now expected to trigger more than €251.6 billion in investment. The deals approved under the EFSI amount to €49.6 billion in financing and are located in all 28 Member States. Around 528,000 small and medium-sized companies (SMEs) are expected to benefit from improved access to finance.

As of November, the top five countries ranked in order of investment triggered relative to GDP are Estonia, Bulgaria, Greece, Portugal and Spain.

Read more...

## Overview of the Horizon 2020 Work Programme 2018-2020 by BUILD UP



With the new [Horizon 2020 Work Programme](#), which was [announced on 27 October 2017](#), the European Commission aims for a greater impact of research funding by focusing on concrete critical topics such as climate, clean energy, digital economy, security, and migration. During its last three years, Horizon 2020 will also be more geared towards boosting breakthroughs and market-creating innovation, with an emphasis on better dis-

semination of results and a focus on open access to data. This overview article provides a brief presentation of the new work programme and its provisions on energy matters, as well as the forthcoming building-related calls.

Rear the whole article [here](#).

## EU Parliament and Commission mobilised for clean energy financing



On 7th November, the European Parliament and the European Commission organised a high-level conference on clean energy financing. The conference was attended by hundreds of participants and tackled all aspects of clean energy: energy efficiency, energy infrastructure and renewables.

One of the messages of the day was that climate action can go hand in hand with economic growth. Also, the basic EU legal framework is already in place, with the Clean Energy Package to be adopted soon. But the financial challenge is crucial. According to the Commission's estimates, €379 billion per year in investment is needed by 2030 for energy efficiency, the production of renewables and infrastructure. This requires the joint management of public and private financing, the Commission says, pointing out that there will be some critical decisions in the perspective of the EU multi-annual financial framework post-2020.

In contrast, Jerry Brown, Governor of California and guest of honour at the conference, stressed that investment is one thing, but it is more important is to have a long-term vision.

Rear more [here](#)

Source: FIEC

## Up to €800 million to roll out alternative fuel infrastructure

On 8th November, the European Commission presented its second "mobility package" of the year, focused on climate change adaptation.

As part of this package, the European Commission proposes to allocate up to €800 million to help Member States roll out alternative fuel infrastructure on their territory. The Commission points out that widescale use of clean vehicles will only become a reality in the event of a huge expansion in appropriate recharging infrastructure in the Union. Although this rollout has made significant progress over recent years, the Commission would like to speed it up as part of the Trans-European Transport Network (TEN-T) in urban and suburban areas.

The Commission has adopted an energy neutral approach. It will initially release €350 million in addition to what has already been paid out, through the Connecting Europe Facility (CEF), by spring 2018. This is expected to generate €1.9 billion in additional investment. The Commission will also provide technical expertise and logistical support to the public authorities to help make this fuel infrastructure a reality.

Reade more [here](#)

Source: FIEC

## EU-Japan: Advanced Economies Shaping the Next Stage of Inclusive Globalisation



At the 24<sup>th</sup> Summit between the European Union and Japan, held on 6<sup>th</sup> July in Brussels, leaders reached a political agreement in principle on two landmark agreements, the Economic Partnership Agreement and the Strategic Partnership Agreement, which will bring huge benefits to the populations of both the European Union and Japan and represents a significant step in our relations.

The European Union was represented at the Summit by the President of the European Commission, Jean-Claude **Juncker** and the President of the European Council, Donald Tusk, whilst Japan was represented by its Prime Minister, Shinzō Abe. The Commissioner for Trade, Cecilia **Malmström** and the Foreign Minister of Japan, Fumio Kishida, also

participated.

The European Union and Japan have issued a Joint Summit Statement, which is available [online](#). The Press Release can be found [here](#).

The timing of the conclusion of the [EU-Japan Economic Partnership Agreement](#) is not coincidental. In today's state of intense geopolitical uncertainty, the economic partnership concluded between the EU and Japan surpasses mere business interests. It is a forceful and timely joint statement of intent in favour of multilateralism and strategic cooperation at a time when isolationism and confrontation are all too prevalent.

Read the EPSC brief [here](#).

## Miscellaneous

### 10 Trends Transforming Education as We Know It



What are the sweeping changes that are already – or should be – reshaping the way Europeans teach and learn throughout their lives in an increasingly digital society?

In today's fast-paced, changing world, the ability of individuals to adapt, learn and re-skill will matter more than ever. Education systems must reinvent themselves to keep up with these new realities. Read the report [here](#).

### People Centric Buildings



Buildings 2030 has released a white paper that describes a “state of the art” for the debate about healthy, comfortable and productive buildings by looking at both policy and market dimensions. Buildings 2030 believes that a strong focus on people will contribute to increasing the rate of renovation in Europe and bringing concrete benefits to all Europeans. [Read more...](#)

### Getting the measure of fuel poverty - Final Report of the Fuel Poverty Review



This report, commissioned by the UK's Department for Energy and Climate Change (DECC), presents the final conclusions of the and the main part of this analysis examines “The implications of measurement for the way we understand the effectiveness of the range of policy approaches to reducing fuel poverty.”

The central task for this review was to examine the way in which trends in fuel poverty and identification of those at risk from it have been measured and to suggest whether there might be a better alternative.

The conclusions are crystal clear; underlining that fuel poverty is a major social problem, causing considerable hardship and negative health impacts.

To download and read the full report, please visit the relevant webpage at the link <https://www.gov.uk/government/publications/final-report-of-the-fuel-poverty-review>.

Source: BUILD UP Europe

### MAchUP project transforming urban areas: co-designing future smart cities



*MAchUP will deploy large scale demonstration projects in three Lighthouse cities namely, Valencia (Spain), Dresden (Germany) and Antalya (Turkey), and support the development of replication and upscaling plans in four Follower cities namely, Ostend (Belgium), Herzliya (Israel), Skopje (Macedonia) and Kerava (Finland). Led by the City of Valencia, the consortium is composed of 28 partners across 8 different countries, each one contributing through their specific knowledge and expertise to meet the said MAchUP objectives.*

MAchUP - Maximizing the Upscaling and replication potential of high level urban transformation strategies - is a 60 months long project funded under the European Union's Horizon 2020 Smart Cities and Communities programme. It addresses the issues that constrains a better and wider development of the urban transformation of the cities through the use of innovative technologies in the energy, mobility and ICT areas and through the direct engagement of citizens in the co-design of their future smart

cities.

### New Smart City Project MAtchUP at the forefront of the European sustainable urban transformation process

Rear the whole article [here](#).

## EU Research and Innovation for and with Cities



### Yearly mapping report, September 2017

This report provides an overview of the main EU Research and Innovation (R&I) actions for and with cities, promoted both at the European and international level to foster sustainable urban development. In addition it presents a detailed overview of budget of Horizon 2020 and the past three research Framework Programmes (FP7, FP6 and FP5) committed to city-related projects. The added value of this publication is to provide a comprehensive overview of actions and initiatives which have been promoted by the EU R&I and present the contribution to other EU policies on sustainable urban development. This document is a first attempt to provide a more systemic overview of all the different EU R&I action on smart and sustainable cities. The intention is to update this report on a yearly basis and create a series.

[Read more here...](#)

## Overview document of the Horizon 2020 Work programme of Research and Innovation funding for 2018-2020, of all calls related to cities and urban development



### HORIZON 2020 - Work Programme 2018-2020

Topics related to Cities and Urban Development  
(last update 06/12/2017)

DG Research and Innovation recently published an overview document of the Horizon 2020 Work programme of Research and Innovation funding for 2018-2020, of all calls related to cities and urban development. The document can be downloaded [here](#).

In particular, you are encouraged to have a closer look at the calls mentioned below, for innovation actions (demonstration projects) in which cities are a crucial part of the consortium applying for EU funding.

These three calls are part of Societal Challenge 5 on 'Climate action, environment, resource efficiency and raw materials'

- [CE-SC5-03-2018](#): Demonstrating systemic urban development for circular and regenerative cities
- [SC5-14-2019](#): Visionary and integrated solutions to improve well-being and health in cities
- [SC5-20-2019](#): Transforming historic urban areas and/or cultural landscapes into hubs of entrepreneurship and social and cultural integration

## 67th ECCE General Meeting 4 and 6 October, Vienna, Austria



### SAVE THE DATE!



The 67th ECCE General Meeting will take place on Thursday 31 May 2018 and on Saturday 2 June 2018, in Tallinn, Estonia hosted by the Estonian Association of Civil Engineers. The ECCE Spring General Meeting in 2018 will be combined with the International Conference on "Civil Engineering and Cultural Heritage" which is going to be held on Friday 1 June 2018 and it will be organized under the umbrella of the ECCE initiative 2018 European Year of Civil Engineers.

Stay updated through our website [here](#).

## Upcoming events

### Annual Conference on EU Trade and Investment Law 2018 - Current Developments and Potential Consequences 5-6 February 2018, Brussels, Belgium



Key topics:

- EU trade policy
- EU antidumping law reform
- Future trade and investment agreements after Opinion 2/15
- EU-related investment proceedings
- Brexit and trade policy

Speakers include:

- **Maria Åsenius**, Head of Cabinet of Commissioner Cecilia Malmström, European Commission, Brussels
- **Philippe De Baere**, Co-Managing Partner, Van Bael & Bellis, Brussels
- **Christoph Herrmann**, Chair for Public Law, European Law, European and International Economic Law, University of Passau
- **Sabine Weyand**, Task Force for the Preparation and Conduct of the Negotiations with the United Kingdom under Article 50 TEU, European Commission, Brussels

Please click here for the detailed programme and speakers list: [www.era.int/?127531&en](http://www.era.int/?127531&en).

### ICSA2019 – 4<sup>TH</sup> International Conference on Structures and Architecture 24-26 July 2019, Lisbon, Portugal



The **ICSA2019 - The 4<sup>th</sup> International Conference on Structures and Architecture** will be held in Lisbon, Portugal, July 24-26, 2019 ([www.icsa2019.com](http://www.icsa2019.com)).

This is **the world's leading and largest global conference bridging the gap between Structures and Architecture**. The contributions on creative and scientific aspects in the conception and construction of structures, on advanced technologies and on complex architectural and structural applications represent a fine **blend of scientific, technical and practical novelties** in both fields.

The conference is organized under the auspices of the **International Association of Structures and Architecture** ([www.structures-architecture.org](http://www.structures-architecture.org)). The association aims to explore and to promote the merging of Structures and Architecture, encompassing all the aspects related with the recent advances in the art, practice and theory of teaching, as well as with researching, designing and building structures.

The time lag since ICSA2016 has been decisive to build up solid basis for ICSA2019. Some relevant milestones were achieved which have provided this new edition with undeniably extra added values:

- Co-sponsored and endorsed by **highly prestigious institutions**
- **Extended World-wide Scientific Committee** integrated by researchers and practitioners with a significant background in architecture and in structural engineering;
- Stimulating **keynote lectures** by prominent experts;
- **Mini-Symposia** and **Special Sessions**.

Please find below information on the **CALL FOR ABSTRACTS**:

1) Abstracts should be submitted by using in the restricted area of ICSA2019 webpage, in electronic form, before **March, 15<sup>th</sup>, 2018**. Abstracts will be subjected to a review process by at least two members of the scientific committee.

2) Authors will be notified about the preliminary acceptance of abstracts until May, 15<sup>th</sup>, 2018.

The proceedings will be published by Balkema (Taylor & Francis Group), including a book of extended

two-page abstracts and a CD-ROM containing the full eight-page papers. These documents are due on November, 15<sup>th</sup>, 2018. Acceptance will be notified before February, 15<sup>th</sup>, 2019. Proceedings will be sent for indexation by both Thomson Reuters (Conference Proceedings Citation Index – ISI Proceedings) and Elsevier (Scopus and EI).

Updated information on ICSA2019 can be found at [www.icsa2019.com](http://www.icsa2019.com)

## C4E FORUM 2018

**C4E FORUM**  
CENTRAL & EASTERN EUROPEAN  
ENERGY EFFICIENCY FORUM  
13 - 16 JUNE 2018  
SEROCK, POLAND

Register Now!



### WHAT IS C4E FORUM?

The aim of C4E Forum is to build and strengthen Central and Eastern Europe's energy efficiency community. There are so many interesting efficiency projects, policies and programmes happening in the region and our community can immensely benefit from sharing and learning from them. C4E Forum is a bi-annual community-building event designed to promote this objective.

- Half-week interactive programme combining **practical sessions**, creative workshops and evening plenaries with **high-level speakers** and **plenty of informal networking opportunities**
- Professionals and those interested in energy efficiency in buildings from **government, industry, NGOs, think-tanks, financial institutions**, etc. from across the CEE region all in one place

### WHAT TOPICS WILL BE DISCUSSED?

The following key topics for the energy efficiency community have been identified. You can see more detailed topics or even add your own when you [register to attend](#) the event or when you [submit your presentation outline](#).

- Capacity building
- Circular economy
- Financing the renovation of the building stock
- Governments leading by example
- Healthy buildings
- Implementation of EU policies
- Innovation in the building sector
- Leadership at local level
- Multiple benefits of energy efficiency
- Renovation programmes
- Role of buildings in the energy system

### READY TO PARTICIPATE?

The dates have been set, the venue has been selected and now an enticing programme for all participants is being prepared.

[Register as a participant](#) and enjoy all the learning and networking

[Submit a presentation outline](#) to become a speaker

For more information visit the website <http://c4eforum.net/>

## World Sustainable Energy Days



**World Sustainable Energy Days**  
28 February - 2 March 2018, Wels/Austria

The World Sustainable Energy Days (WSED) is one of Europe's largest annual conferences in this field. The 2018 conference will take place from 28 February - 2 March 2018 in Wels/Austria.

Energy efficiency and renewable energy are key to boost the economic competitiveness of the EU, its member states, regions and individual businesses. Resulting economic growth provides jobs and the

ability to invest in the further progress of the clean energy transition to the benefit of all citizens. Clean energy for economic competitiveness and how to make the clean energy transition work for business, planet and people will therefore be core themes of the World Sustainable Energy Days 2018.

The event will feature policies, technology innovation and market development. It offers a unique combination of conferences and interactive events.

The annual conference brings together more than 700 delegates from over 50 countries from business, public sector and the research community.  
Clean energy for all Europeans!

[Read more...](#)



As the holiday season is almost here, we'd like to take this opportunity to thank you for your continued support to the European Council of Civil Engineers over the past year.

We hope your Christmas Holidays and New Year is filled with happiness, health and prosperity and we look forward to cooperating and working with you in 2018 and beyond.

All the best from the Acting President, the Executive Board and Secretary of the European Council of Civil Engineers

Włodzimierz Szymczak  
ECCE Acting President

Maria Karanasiou  
ECCE General Secretary



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**“Civil Engineers at the Heart of Society  
Building Life Quality and a Sustainable  
Environment”**

The European Council of Civil Engineers (ECCE) was created in 1985 out of the common concern of the professional bodies for Civil Engineers in Europe that the Civil Engineers working together across Europe could offer much more to assist Europe advance its built Environment and protect the natural environment.

At the European Union level, ECCE aims to promote the highest technical and ethical standards, to provide a source of impartial advice, and promote co-operation with other pan-European organizations in the construction industry. ECCE also advises and influences individual governments and professional institutions, formulates standards and achieves a mutual compatibility of different regulations controlling the profession, and formulates standards for a European Code of Conduct of the Civil Engineering Profession and disciplinary procedures applicable throughout the Union.