

FINAL INVITATION

TOWARDS A RESILIENT BUILT ENVIRONMENT

RISK AND ASSET MANAGEMENT

Organised by



In co-operation with





MESSAGE FROM THE PRESIDENT OF IABSE

It is with great pleasure that IABSE received the invitation from the Portuguese Group of IABSE (APEE), the Institute for Sustainability and Innovation in Structural Engineering (ISISE) and the University of Minho to be in Guimarães in March 2019 and be part of IABSE's Calendar of International Symposia.



Fernando Branco
President of IABSF

This internationally renowned technical meeting joins members, colleagues and friends, during a few intense days of learning and discussing the new themes of Structural Engineering, arising from around the world.

With the theme 'Towards a Resilient Built Environment - Risk and Asset Management' the Symposium presents the discussion of the existing solutions as well as the evolution of our built environment to achieve a good performance during its service life, always trying to increase the wellbeing of our society.

This theme is especially important to our young colleagues, who are invited to join the Symposium and our famous Association, to take advantage of the 'IABSE Young Engineers Programme'. It is with them that the performance of our built environment must be discussed, as they will be the builders of the future.

The Organising Committee, with Paulo Lourenço as honorary chair, José Matos as executive chair and a Scientific Committee chaired by Luís Oliveira Santos, has prepared a very attractive and innovative Symposium with renowned keynote speakers and with sessions presented in tracks of specialised themes, allowing you to spend a few days to update your knowledge with the experience of colleagues from all over the world.

Besides the Symposium activities, interesting technical visits, tours and a pleasant social programme have also been arranged to enjoy the historical city of Guimarães. The importance of its historical monuments was recognised by UNESCO who declared the city a World Heritage site in 2001.

Leave your office for a few days, and come to Guimarães in March 2019 to meet your friends again, to make new contacts, to learn more about the future of our profession and simultaneously walk among the main tourist attractions of the city or enjoy day tours to Braga, Porto or the Douro river valley.

MESSAGE FROM THE ORGANISING COMMITTEE



Paulo B. Lourenço
Honorary Chair, Organising Committee



José Campos e Matos Executive Chair, Organising Committee

The IABSE Symposium Guimarães 2019 'Towards a Resilient Built Environment - Risk and Asset Management' will be held on March 27-29, 2019, at Vila Flor Cultural Centre.

The Symposium aims at providing an international forum for the debate on, among others, issues such as the sustainability of the built environment, risk assessment and asset management in infrastructures. In addition to Future Trends, the conference shall be focusing on cutting-edge issues, such as Novel Management Tools for the Built Environment, Lifecycle Quality Control of Infrastructures, Advanced Frameworks for a Sustainable Built Environment and Risk Analysis Procedures. The Symposium is thus targeted at attendees from different stakeholders, respectively, from academia to industry.

Guimarães is a cosy and lively UNESCO city, considered as the cradle of Portugal. Attendees will have the opportunity to increase their network through a set of social events, such as the welcome reception and the gala dinner. Young attendees will also have the opportunity to enjoy the Symposium through a tailor-made young engineers programme, including a happy hour. Finally, 'IABSE Tank' is a new initiative where young engineers will have the opportunity to show their ideas to investors in a purely entrepreneural environment.

Preceding this Symposium is the final conference of COST Action TU 1406 on 'Quality specifications for roadway bridges, standardisation at a European level' (www.tu1406.eu), to be held on March 25-26 2019. We believe that such an event will also attract a large number of leading participants who may take advantage of both events being in the same location.

On behalf of IABSE, we are looking forward to welcoming you to Guimarães for this promising event.

FAST FACTS

Venue Vila Flor Cultural Centre, Guimarães

Date March 27-29, 2019

Participants Approx. 500

Demographics Practicing Engineers and Architects, Researchers, Consultants, Design

Software Engineers, Contractors, Designers, Students, Educators, Owners,

Suppliers, Governmental Agencies, Regulators.

Registration <u>www.iabse.org/guimaraes2019</u>

SYMPOSIUM FORMAT

Topics are related, but not restricted, to important issues as the sustainability of the built environment, risk assessment and asset management in infrastructures.

Focus will be given to cutting-edge issues, such as Novel Management Tools for the Built Environment, Lifecycle Quality Control of New and Existing Infrastructures, and Advanced Frameworks for a Sustainable Built Environment and Risk Analysis Procedures.

Keynote Sessions will be given by renowned experts of each theme of the Symposium and will address the most innovative findings of their ongoing work.

Special Sessions will grant the opportunity to present developments related to a specific topic proposed by highly respected individuals on that field of research or technical practice. Each contribution to these sessions consists of a paper of six to eight pages and an oral presentation followed by an open floor discussion for the audience to participate in.

Scientific and Technical Sessions will consist of the presentation of cutting-edge research results, technical developments on innovative and traditional methods, project and case studies presentations, as well as lessons learned and future prospects. Each contribution to these sessions consists of a paper of six to eight pages and a presentation.



'Aqui Nasceu Portugal' Wall

THEMES AND TOPICS

OBJECTIVES

- Place the topic of Sustainability of the Built Environment in an International Discussion Forum
- Offer a worldwide discussion in risk assessment and infrastructure asset management with an exchange of knowledge from different stakeholders
- Discuss Performance and Costs of built environment assets, with a focus on "Zero Maintenance"
- Provide the adaptation of Young Engineers to the topics of Risk, Construction, Quality, Resilience and Management.

1. NOVEL MANAGEMENT TOOLS FOR THE BUILT ENVIRONMENT

- · Infrastructure asset management
- · Bridge management systems
- Management and conservation strategies of historical structures
- · Maintenance, repair and retrofitting strategies

2. LIFECYCLE QUALITY CONTROL OF NEW AND EXISTING INFRASTRUCTURES

- Lifecycle performance-based design
- Lifecycle assessment of civil infrastructures
- · Load carrying capacity and remaining lifetime
- · Performance indicators
- · Structural health monitoring
- · Evaluation and assessment techniques
- · Innovative inspection techniques

3. ADVANCED FRAMEWORKS FOR A SUSTAINABLE BUILT ENVIRONMENT

- Performance-based framework for structural resilience
- Adaptation to climate change and societal challenges
- · Expanding structures service life
- · Future structural and functional demands
- New design methods for sustainable infrastructures
- · Aesthetics in structural design
- · Wind and extreme load design
- Codes of practice for existing and new structures
- · Strengthening and repurposing of structures
- · Geotechnical design challenges
- · Deterioration modelling
- · Deconstruction and recycling
- · Case studies

4. RISK ANALYSIS PROCEDURES, FROM THEORY TO PRACTICE

- · Environmental risk assessment
- · Insurance, reinsurance and management of risk
- Learning from previous errors: Forensic engineering
- Model updating, safety evaluation and reliability forecast
- Reducing risks of earthquakes and other natural hazards
- Reducing risks of fire and other man-made hazards
- · Resilience of civil engineering structures
- · Resilience of critical infrastructures
- Risk analysis and risk-informed decision making
- Risk perception and communication

5. FUTURE TRENDS IN STRUCTURAL FNGINFFRING

- · Advanced experimental testing and techniques
- · Advanced numerical models and simulations
- · Building Information Modelling tools
- Construction 4.0
- Information technology in structural engineering
- · Innovative construction methods
- · Innovative structural devices
- · New materials and products
- · Offshore and marine structures
- · Passive and active control systems

KEYNOTE SPEAKERS



HOW WILL 'DIGITAL **TECHNOLOGY' CHANGE** ASSET MANAGEMENT IN THE **RAILWAYS?**

Andy Doherty Chief Technology Officer for Network Rail. UK



WE NEED MORE ACCURATE AND MORE USEFUL ENVIRONMENTAL ASSESSMENT OF INFRASTRUCTURE

Arpad Horvath Professor of Civil and Environmental Engineering at the University of California, USA



RISK AND RESILIENCE OF CIVIL INFRASTRUCTURE SYSTEMS UNDER EXTREME EVENTS

Mitsuvoshi Akivama Professor of Civil Engineering at Waseda University, Japan

co-author: Dan M. Frangopol Professor of Civil Engineering at Lehigh University, USA



BRIDGES AND STRUCTURES: DESIGN PRACTICE AND NEW **TRENDS**

António Reis Professor of Bridges and Structural Engineering at University of Lisbon Technical Director of GRID International Consulting Engineers S.A.



DIGITAL CONSTRUCTION: **BUILDING THE PRESENT** CREATING THE FUTURE. **CHANGING THE WAY** WE CREATE OUR BUILT **ENVIRONMENT**

Menno de Jonge Director Digital Construction of Royal BAM Group, The Netherlands



Vila Flor Cultural Centre



Auditorium of Vila Flor Cultural Centre

PROGRAMME AT A GLANCE

Time	March 26 (Tuesday)	March 27 (Wednesday)	March 28 (Thursday)	March 29 (Friday)	March 30 (Saturday)
From 08:00		Registration	Registration	Registration	
09:00 - 10:00		Opening Ceremony	Keynote Lecture	Keynote Lecture	
10:00 - 10:30		Keynote Lecture	Keynote Lecture	Keynote Lecture	Technical
10:30 - 11:00		Coffee break	Coffee break	Coffee break	Visit A
11:00 - 12:30		Scientific / Technical Sessions	Scientific / Technical Sessions	Scientific / Technical Sessions	
12:30 - 14:00		Lunch	Lunch	Lunch	
14:00 - 16:00		Scientific / Technical Sessions	Scientific / Technical Sessions	Scientific / Technical Sessions	
16:00 - 16:30		Coffee break	Coffee break	Coffee break	Technical
16:30 - 17:30	Registration	Scientific /	Scientific /	IADOE Tools	Visit B
17:30 - 18:00		Technical Sessions	Technical Sessions	IABSE Tank	
18:00 - 18:30	Welcome			Closing Ceremony	
18:30 - 21:00	Reception	Happy Hour	Gala Dinner		
20:00 - 23:00					

Social Tours will be held every day of the event (26-29 March 18) at 14:00h (maximum of 40 participants each).

REGISTRATION

	Early Bird fee	Standard Fee	On site *
Registration Category	Until December 15, 2018	December 16, 2018 - until March 25, 2018	March 26, 2019
IABSE Member	600 €	700 €	800€
Non Member	750 €	850 €	950 €
Non-Member PLUS *	770 €	870 €	970 €
COST TU1406 & Portuguese Engineers Order members	650 €	750 €	850 €
Young Participant **	300 €	350 €	400 €
Accompanying Person ***	100 €	150 €	200 €
Gala Dinner	75 €	75 €	100 €

^{*} Includes a one year IABSE membership

Registration should be made on the following link: www.iabse.org/guimaraes2019

VAT is included in registration fee.

Payments through bank transfer will be valid after payment successfully received, participant should send bank draft in order to complete registration.

Payment by credit card (VISA, American Express or Master Card) is automatically confirmed upon authorisation by the participant. Cancellation until 15 December 2018: 75% of registration fee refunded.

Cancellation after 15 December 2018: No refund.

Registration fee includes:

- · Congress bag and programme & Book of Abstracts + Proceedings
- Access to all scientific sessions & Opening and Closing Ceremony
- · Access to exhibition
- · Lunch & coffee breaks
- · Welcome reception & Happy Hour
- Social Tours in historical city Guimarães

Accompanying person fee includes:

- · Opening and Closing Ceremony
- · Access to exhibition
- · Lunch & coffee breaks
- Welcome reception
- · Social Tours in historical city Guimarães

^{**} Born after 01/01/1985

^{***} Accompanying persons are understood to be family members only

THE YOUNG ENGINEERS PROGRAMME

IABSE YOUNG ENGINEERS AWARDS

Any Young Engineer, who personally presents his/her paper as the main author at the Symposium, will be considered for recognition. An independent jury will select the two best contributions, and each will receive a prize of 1,000 EURO. The prizes are offered by the IABSE Fellows and the Organising Committee and will be announced at the Closing Session of the Symposium.

IABSE HAPPY HOUR

An icebreaker challenging game bringing together two generations, Young and Senior Engineers, is proposed to the Symposium participants, composed of groups of six participants randomly selected at the registration stage. The event will be held at the Cloisters of the Alberto Sampaio Museum and includes a structural engineering quiz with an interactive platform, ambient music and cocktail. Awards will be granted to the best performance. The event is limited to 150 participants.

THE SOCIAL PROGRAMME

WELCOME RECEPTION

The Welcome Reception will take place on the 26th of March at the Ducal Palace, an impressive Heritage site on a medieval estate that also integrates the Guimarães Castle, the Church of São Miguel and the statue of Afonso Henriques, our founder King.

GALA DINNER

The Gala Dinner will be held on March 28th, at MITPenha, in Guimarães. This modern construction, located in the Penha hill overlooks Guimarães.

IABSE TANK

During the Symposium, a competition aimed at promoting the development of new ideas (e.g. innovative products, materials, techniques, software, services, etc.) applied to the structural engineering will take place. Symposium participants can take part in this competition according to the rules. listed on the conference website.





MITPenha



THE TECHNICAL VISITS

TECHNICAL VISIT A

Date: March 30 Hours: 09.00-12.30h

The Municipal Stadium of Braga is an all-seater football stadium located in Braga, at a distance of just 20 km from Guimarães. Also known as "A Pedreira" (The Quarry), since it was carved from the face of Monte do Castro, it was built in 2003 as a venue for the 2004 UEFA European Championship. In 2006, the stadium won the Chicago Athenaeum International Architecture Award for the best new global design.

Price: 50€

Registration: www.iabse.org/guimaraes2019

Its designer, Architect Eduardo Souto Moura, received the Pritzker Prize in 2011. The visit will be accompanied by the leader of the Engineering team, Rui Furtado.

After the technical visit, the participants will have the possibility to participate in football activities in the Braga Training Centre and Young Academy.



Municipal Stadium of Braga

TECHNICAL VISIT B

Date: March 30 Hours: 14.00-17.30h

The Porto Cruise Terminal is the largest project for the consolidation of the Port of Leixões as an important gateway of the region. It is located just 3 km from the city of Porto. Since April 2011, the new pier with a length of 340 metres has received the biggest and the most glamorous cruise ships from the worldwide cruise fleet, boosting the cruise tourism in the North of Portugal region.

Price: 75€

Registration: www.iabse.org/guimaraes2019

The visit will be done accompanied by the architect, Luis Pedro Silva, and the leader of the Engineering team, Jose Carlos Lino. This technical visit will be followed by a cruise trip to the bridges of Porto. The cruise will go up river beginning on the margins of Porto and following the Douro river within the so-called Porto Six Bridges Cruise. During this cruise, Prof. Adão da Fonseca will give a lecture about those magnificent bridges structures.



Porto Cruise Terminal



Municipal Stadium of Braga



Sanctuary of Bom Jesus do Monte



Braga Training Centre and Young Academy

Douro river



National Monument of Arco da Porta Nova





Dom Luís I Bridge





Vila Flor Cultural Centre Gardens of Vila Flor Cultural Centre



Vila Flor Cultural Centre

Palace of Vila Flor Cultural Centre

THE VENUE

VILA FLOR CULTURAL CENTRE

Avenida D. Afonso Henriques, 701 4810-431 Guimarães

View on Map - goo.gl/maps/dAJUDDYuzFH2

The Vila Flor Cultural Centre is a respected and distinguished establishment on the Portuguese national cultural scene. The Cultural Centre, inaugurated on 17th September 2005, is the main cultural facility of Guimarães and it was born from the renovation of the Vila Flor Palace (18th century), and involving spaces. This space brings together the rich history of a manor house, its magnificent gardens and lovely architecture.

The recovered Gardens received the Honors distinction in the category Exterior Spaces of Public Use of the National Prize for Landscape Architecture 2006.

The building was designed to hold all types of cultural events, namely, all resources are optimised in order to provide the highest quality facilities and spaces which guarantee that a wide range of events can be successfully hosted. With this objective, the Cultural Centre was equipped with two auditoriums, four meeting rooms, an exhibition area of 1000 m2, a restaurant, a parking place and several gardens.

At this moment, the auditoriums of Cultural Centre are just right for accommodating a wide variety of needs, such as Conferences, Seminars, Summits and Colloquiums.



Inside of Vila Flor Cultural Centre

SPONSORSHIP AND EXHIBITION

SPONSORSHIP PROGRAMME

Sponsoring the IABSE Symposium Guimarães 2019 provides an excellent opportunity for your organisation to gain face-to-face exposure to national and international delegates from academia and industry, in addition to networking with an audience of engineers and architects, researchers, consultants, constructors, students and people engaged in the design, construction and maintenance of bridges and structures.

Sponsors can expect branding, various forms of acknowledgement and special benefits depending on the type and level of sponsorship, from Tiered Sponsorship to Item Sponsorship Opportunities.

The brochure with detailed information is available at: www.iabse.org/guimaraes2019.

EXHIBITION

This is an excellent opportunity to present your company, products and services and to interact with key decision makers and potential new clients.

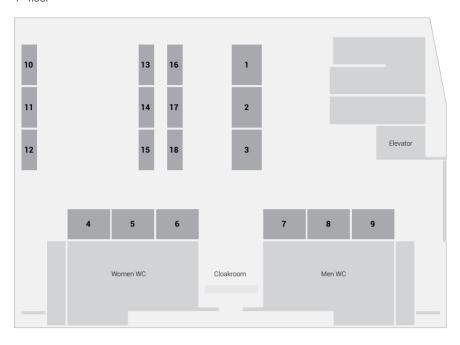
The exhibition area, located in upper and lower foyers of the Grand Auditorium of Vila Flor Cultural Centre, will be combined with the coffee break stations, an area with high traffic of delegates.

More information: www.iabse.org/quimaraes2019

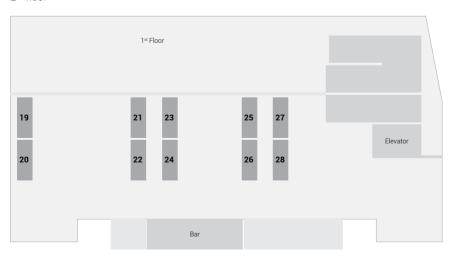


Vila Flor Cultural Centre

Foyer grand auditorium 1st floor



Foyer grand auditorium 2nd floor



GUIMARÃES AND SURROUNDING AREAS

The province of Minho, in the Northwest of Portugal, is full of scenic and historical sites, being particularly famous for the production of wine. To the North of the region, you will find the National Park of Peneda-Gerês with its rock-mountains, cascades. lakes and abundant wildlife

To the East, you have the famous Douro river valley, where the Port wine grapes are grown. To the South. you will find the city of Porto, with its international airport, featuring an impressive architecture in the banks of the Douro River, the famous bridges and the Port wine cellars





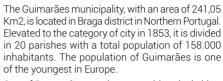
The city is famous for its architectural heritage, including worthwhile visits to: the historical centre. where its unique atmosphere of narrow streets and squares provides a meaning to the cultural heritage, which is the everyday reality for the local population; the palace of the House of Bragança, with its rare roofs and 39 large brick chimneys, that once was one of the most sumptuous residences in the Iberian Peninsula: the medieval castle, where the Portuguese history began; the Monastery of Santa Maria da Costa and the Penha Sanctuary, with a beautiful landscape.







Statue of D. Afonso Henriques



One of Portugal's most important historical cities, Guimarães is considered the "Cradle of Portuguese nationality", where the country was founded in the 9th century by King D. Afonso I (1109-1185), Portugal's first ruler. The value of the historic heritage of Guimarães has been potentiated over the years.



Statue of D. Afonso Henriques



Statue of D. Afonso Henriques

The conference facilities in Guimarães are excellent and private accommodation for the participants can be found in the city, at very reasonable prices. Participants can easily walk from the conference venue to the city centre and hotels.



Oliveira Square

HOTELS II GUIMARÃES

In Guimarães it is possible to find accommodation at very competitive prices. In this segment, we can find hotels, hostels, rural tourism and local accommodation.

The prices (all with breakfast included) are around:

- * 3 stars Single (30-40 euro); Double (45-45 euro) * 4 stars - Single (50-65 euro); Double (60-80 euro)
- * 5 stars equiv. historic hotels Single (120-155 euro); Double (130-165 euro)

Where & How to book - on conference website www.iabse.org/guimaraes2019

Suggestions and reservation available on website: www.iabse.org/quimaraes2019



TRAVELLIN O GUIMARÃES



Francisco Sá Carneiro Airport

The nearest airport to Guimarães is the Francisco Sá Carneiro Airport in Porto, which is about 50 km from Guimarães - around 30 min by car or 50 min by bus.

A direct shuttle bus can conveniently be taken from the arrivals terminal to Guimarães. A one way ride is 8,00€, the round trip 14,00€ and can be booked online.

For more information, please visit the following site: www.getbus.eu/en/guimaraes-airport-guimaraes/

The Francisco Sá Carneiro Airport operates with 73 destinations and 20 airlines, fly directly to Porto, like TAP Portugal, Lufthansa, Iberia, Air France, Transavia, Air Berlin, Luxair, as well as the ever-growing low cost airlines, such as Ryanair and Easyjet. The Francisco Sá Carneiro Airport was awarded the Best European Airport, by Airports Council International (ACI).

VISA

International delegates are encouraged to review the specific requirements for visas and other requirements to enter Portugal. For more information about entering Portugal, please visit:

www.portugal.com/portugal/travel-tips/ entering-portugal

Delegates from some countries may require a Letter of Invitation when applying for a visa. If you require a Letter of Invitation, please contact the symposium secretariat:

quimaraes@iabse2019.org

COMMITTEES

Organising Committee

Paulo B. Lourenço, University of Minho, Honorary Chair
José Campos e Matos, University of Minho, Executive Chair
Joana Oliveira, University of Minho, Lead Secretariat and Communications,
Joaquim Barros, University of Minho, Lead International Liaisons
Jorge Branco, University of Minho, Lead Social Programme and Technical Visits
José Sena-Cruz, University of Minho, Lead Programme and Young Engineering Programme
Rita Bento, Instituto Superior Técnico - Lisbon, Lead Sponsoring and Exhibition
Rita Moura, Teixeira Duarte, Lead National Liaisons
Rui Coutinho, Infraestruturas de Portugal, Lead Industrial Liaisons

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Timerman, Julio, Brazil Valenzuela Saavedra, Matias, Chile Vergoossen, Rob, The Netherlands Wagemans, Leo, The Netherlands

Wisniewski, David, Poland Wu, Zhishen, China Zingoni, Alphose, South Africa Zmigrodzki, Stefan, Canada

ABOUT UMINHO

The University of Minho (UMinho) aims to be a university without walls, focusing on the regional, national and international socio-economic environment. International activities are guite intense with a range of countries from all continents, including the Portuguese-speaking ones. UMinho is a research university engaged in the establishment of the chain Knowledge-Research, Development and Innovation - as evidenced by a series of indicators. The ratio between PhD students and academic staff is over the unity while the fraction of postgraduate students in the total student population is over 20%. Furthermore, the ratio between research projects and PhD students is over 0.5 and more than 150 PhD's are awarded every year. It is also important to highlight that the average yearly production of refereed papers in scientific journals is impressive: above 2/FTE/year and the citations are also strongly increasing every year. Moreover, 250 R&D contracts are signed yearly with industry while, within the framework of FP7 programme, two FRC advanced grants have been awarded by UMinho. It is interesting to see that amongst the 28 UMinho Research units evaluated by the Portuguese Foundation for Science and Technology (FCT) in 2014, one was considered Exceptional while ten and eleven of them were ranked as Excellent and Very Good respectively. In terms of the Times Higher Education (THE) 100 under 50 ranking for 2014, UMinho was on the 75th position and according to the 2014 THE World University Rankings, UMinho was ranked in the range 350-400. Finally, based on the CWTS Leiden Ranking for 2014, UMinho is the best Portuguese university.

ABOUT ISISE

UMinho co-hosts (with the University of Coimbra) the Institute for Sustainability and Innovation in Structural Engineering (ISISE), which is a multidisciplinary research unit funded by the Portuguese Foundation for Science and Technology (FCT). In the last Research Assessment Exercise (RAE 2008-2013), ISISE was rated as Excellent, ISISE is an example of interaction and knowledge transfer between academic institutions and industry market stakeholders both in national and international environment. This institute has 47 PhD members. 102 PhD students, €8.5 millions of competitive funding granted, two European Master Courses while its international leadership has been already recognized. Regarding the structural configuration of ISISE, it is organized in three Research Groups, addressing the topics of construction technologies in historical materials and masonry, steel and mixed materials, and concrete. Presently, ISISE has employed several researchers with background on inspection and monitoring of existing structures with special emphasis to historical heritage buildings and sites. Along these lines, the research conducted by the institute aims mainly to develop an integrated life-time structural approach and tools for monitoring of existing structures and infrastructures, and assess and manage new and existing building stock, on both micro and macro scale in order to propose innovative methods and create useful guidelines.





ABOUT IABSE

The International Association for Bridge and Structural Engineering (IABSE) was founded in 1929 and has its seat in Zurich, Switzerland. Today, IABSE has members in over 100 countries and 50 National Groups around the world. IABSE's aim as a scientific and technical society is to promote the advancement of structural engineering practice while taking into account technical, economic, environment, aesthetic and social aspects. IABSE deals with all structures and with all materials

To fulfil its mission IABSE organises conferences and publishes the quarterly journal Structural Engineering International (SEI), conference reports, as well as books reflecting the work of its technical groups. It creates technical groups as required by needs and technological progress, offers activities within National Groups of IABSE, supports Young Engineers with a programme and presents annual awards for outstanding achievements in research and practice that advance the profession of structural engineering.



IABSE SECRETARIAT

c/o ETH Zurich, Hoenggerberg HIL E21.3 8049 Zurich - SWITZERLAND Phone: +41-44-633 2647 Fax: +41-44-633 1241 Email: secretariat@iabse.org

SYMPOSIUM SECRETARIAT

Ms Joana Oliveira University of Minho Campus de Azurém 4800-058 Guimarães PORTUGAL

Phone: +351-253 510 748 Fax: +351-253 510 217

Email: <u>guimaraes@iabse2019.org</u> Web: <u>www.iabse.org/guimaraes2019</u>