RILEM SPRING CONVENTION 2020

GUIMARÃES, PORTUGAL
9-14 MARCH 2020

FINAL PROGRAMME

3RD RILEM SPRING CONVENTION 2020

AMBITIONING A SUSTAINABLE FUTURE FOR BUILT ENVIRONMENT: COMPREHENSIVE STRATEGIES FOR UNPRECEDENTED CHALLENGES

Under the auspice of:

RILEM · Universidade do Minho · isise · IB-S Institute of Science and Innovation for Bio-Sustainability · TecMinho · PROGEST consultoria empresarial · aci American Concrete Institute

CORONAVÍRUS (COVID-19)

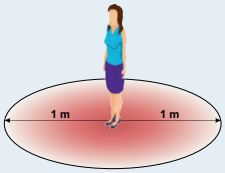
RECOMENDAÇÕES | RECOMMENDATIONS

Quando espirrar ou tossir tape o nariz e a boca com o braço ou com lenço de papel que deverá ser colocado imediatamente no lixo

When coughing or sneezing cover your mouth and nose with your forearm or with tissue paper that should be placed immediately In the trash

Lave frequentemente as mãos com água e sabão ou use solução à base de álcool

Wash your hands frequently with soap and water or an alcohol -based solution



Se regressou de uma área afetada, evite contacto próximo com outras pessoas

If you returned from an affected area, avoid contact close with people

EM CASO DE DÚVIDA LIGUE

IF IN DOUBT, CALL

SNS 24

808 24 24 24

REPÚBLICA PORTUGUESA
SAÚDE

40 ANOS SNS SERVIÇO NACIONAL DE SAÚDE 1979-2019

120 ANOS DGS desde 1899 Direção-Geral da Saúde

01. MESSAGE FROM THE PRESIDENT OF RILEM

Ravindra Gettu
President, RILEM

It is with immense pleasure to welcome you to the Third RILEM Spring Convention in Guimaraes, Portugal! After the first event in Barcelona, Spain, in 2018 and the second in Rovinj, Croatia, in 2019, it gives me great satisfaction to see this young RILEM series of events progressing well.

This edition of the Spring Convention has recently been affected by some global health issues, as you are all aware of. This may affect the turnout though we are glad that many like you chose to participate in the event. As anticipated, the high-quality scientific presentations and nourishing discussions, all accompanied by the warm and friendly touch of the local organisers, will justify the effort and commitment made to attend the conference, meetings, etc.

I would like to thank the organising committee of the University of Minho in Guimaraes for the massive effort to put together so many events under the umbrella of the RILEM Spring Convention and Conference: RILEM standing committee (TAC, DAC, EAC, DEV, Bureau) meetings, eight RILEM technical committee (TC) meetings, one PhD Workshop, one Plenary RILEM Workshop and three Advanced Short Courses. Furthermore, during the week we will have the pleasure to meet and listen to the two winners of the 2020 Gustavo Colonnetti medals!

The organisers have captured the spirit of the Spring Convention by focusing on young delegates and PhD students. The strategy to organise several technical and social activities within the week to encourage the interaction between senior and young researchers, and to stimulate the discussion on critical topics for the future well-being of our planet and our society is admirable.

I am sure that the RILEM Spring Convention 2020 will be a great success, and I am glad to be here to celebrate the RILEM family spirit with you all!

02. MESSAGE FROM THE CHAIR

Joaquim Barros
Honorary Chair

Eduardo Pereira
Executive chair

Fábio Figueiredo
Co-chair

It is our immense pleasure to welcome you all to the RILEM Spring Convention and Conference 2020! The event, which will last for 6 days, will host two hundreds of participants coming from 44 different countries in two venues. The first, in the School of Engineering, at the Azurém Campus of the University of Minho, where most of the Engineering Courses and Departments are located. The second, in the Vila Flor Palace, built by the Portuguese nobleman Tadeu Luís António Lopes de Carvalho de Fonseca and Camões in the 18th century. The city of Guimarães welcomes you to one of Portugal's UNESCO World Heritage cities, where Portugal was born nine centuries ago!

The UMinho team has worked relentlessly on a programme since 2015, with the aim of contributing to a future model for RILEM Spring Conventions. The meetings of the different RILEM TCs and SCs, the presence of prominent scientists and practitioners, the offer of advanced short courses, the activities specifically dedicated to the young scientists, namely PhD and ECI Workshop in a novel format, the Mix social events, the RILEM Workshop and the Colonetti laureates, the Plenary Lectures and finally the Special and Thematic Sessions, combine and intertwine into an extremely compact and intense event. Reminding the main aim of RILEM and his founder, Robert L'Hermite, towards the renew of international relations & cooperation between institutions for testing and research on materials and structures after the devastation of World War II.

We chose as theme 'Ambitioning a Sustainable Future for Built Environment: comprehensive strategies for unprecedented challenges'. Our world is rapidly becoming a small village where highly developed and sophisticated communities interact and interrelate. Although the benefits are clear and unimaginable, our common village is extraordinarily pushing the environment and the resources, while facing unprecedented challenges.

This may well be the first RILEM event pushing us rethink the classical mode of interaction between their members in events. In the midst of a severe outbreak of COVID-19, in this small village of ours, we are brought to the essence of our beliefs. Without knowing what the future holds, humanity has to move forward, facing all the new challenges that derive from globalization and from our will to evolve. And RILEM, as before, will be part and contribute to this evolution.

The chairs, on behalf of the Organizing Committee of RILEM Spring Convention and Conference 2020.

03. ABOUT RILEM

The International Union of Laboratories and Experts in Construction Materials, Systems and Structures (RILEM, from the name in French) was founded in June 1947, with the aim to promote scientific cooperation in the area of construction materials and structures.

Today, the new meaning of the acronym RILEM (*'Réunion Internationale des Laboratoires et Experts des Matériaux, systèmes de construction et ouvrages'*) emphasises its dominant focus on people as well as its worldwide activities, covering 70 countries.

The mission of the association is to advance scientific knowledge related to construction materials, systems and structures and to encourage transfer and application of this knowledge world-wide. This mission is achieved through collaboration of leading experts in construction practice and science including academics, researchers, testing laboratories and authorities.

The three main goals of RILEM are:

- to promote sustainable and safe construction, and improved performance and cost benefit for society,
- to stimulate new directions of research and its applications, promoting excellence in construction,
- to favour and promote cooperation at international scale by general access to advanced knowledge.

RILEM's world-wide goals are:

- To promote environmental friendly, safe and sustainable construction;
- To improve performance and cost benefit for users and general public;
- To engage top experts of construction practice and in science as well as promising young scientists and engineers;
- To involve a broad range of players including academics, researchers, testing laboratories, suppliers, contractors, owners and authorities;
- To ensure networking;
- To promote education and training;
- To encourage the formation of active regional groups;
- To provide a platform of experts in interdisciplinary terms;
- To stimulate new orientations of research and application;
- To promote and maintain excellence in research and technology;
- To prepare and widely disseminate outstanding RILEM products such as guides to good practice, recommendations (and if required also pre-standards), proceedings of symposia and workshops, state of the art reports, data basis, and International Journals.

RILEM
4 avenue du Recteur Poincaré, 75016 Paris, France
T.: +33 142 246 446
W.: www.rilem.net

04. 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 quite 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 research projects and PhD students is over 0.5 and more than 150 PhD's are awarded every year. The average yearly production of refereed papers in scientific journals is impressive: above 2/FTE/year.

Moreover, 250 R&D contracts are signed yearly with industry while, within the framework of FP7 programme, 2 ERC advanced grants have been awarded by UMinho. The 28 UMinho Research units evaluated by the FCT in 2014, one was considered Exceptional while 10 and 11 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.

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Largo do Paço, 4704-553 Braga, Portugal
T.: +351 253 601 100 | E.: gcii@reitoria.uminho.pt
W.: www.uminho.pt

Universidade do Minho

05. 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 2014-2017), ISISE was rated as Very Good.

ISISE is an example of interaction and knowledge transfer between academic institutions and industry market stakeholders both in national and international environment. The Institute has ~80 PhD members (~30 Post-Doc), ~150 PhD students, ~€5 millions of competitive funding granted per year, 4 European Master Courses while its international leadership has been already recognized.

Regarding the structural configuration of ISISE, it is organized in four Research Groups, addressing the topics of construction technologies in i) historical materials and masonry, ii) steel and mixed materials and iii) composites, and also iv) functional performance of the structures. ISISE aims to increase the structural and functional performance of Civil Engineering infrastructures and construction products, from a perspective of advanced technology and innovation, with a holistic approach of their life cycle.

Therefore, outstanding fundamental and applied research is the driving force of the Institute. The Unit possesses several numerical tools and laboratory facilities to support any kind of research work in the ISISE related areas.

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Campus de Azurém, 4800-058 Guimarães, Portugal
T.: +351 253 510 200 | F.: +351 253 510 217
W.: www.isise.net

06. ABOUT SARCOS

The search for smart self-healing materials and preventive repair methods is justified by the increasing sustainability and safety requirements of structures. The appearance of small cracks in concrete is unavoidable, not necessarily causing a risk of collapse for the structure, but certainly accelerating its degradation and diminishing the service life and sustainability of constructions. That loss of performance and functionality promote an increasing investment on maintenance and/or intensive repair/strengthening works. The critical nature of such requirements is signified by their inclusion as priority challenges in the European Research Program.

The first focus of this proposal is to compare the use of self-healing capabilities of concrete with the use of external healing methods for repairing existing concrete elements. Despite the promising potential of the developed healing technologies, they will be real competitive alternatives only when sound and comparative characterization techniques for performance verification are developed, being this SARCOS's second focus. The third focus deals with modelling the healing mechanisms taking place for the different designs and with predicting the service life increase achieved by these methods.

SARCOS COST Action is leading by research institutions searching on different self-healing technologies and repair solutions for extending service life of new and existing concrete structures, with high expertise in developing characterization techniques. Also specialists on modelling healing mechanisms and experts on numerical service life prediction models contribute for the Action's success. This composition provides a solid framework to advance in implementing innovative and sustainable solutions for extending the service life of concrete structures.

CA15202 - Self-healing As preventive Repair of COncrete Structures
www.cost.eu/actions/CA15202
www.sarcos.eng.cam.ac.uk

07. COMMITTEES

Organizing Committee
Honorary Chair: Joaquim Barros - University of Minho, Portugal
Executive chair: Eduardo Pereira - University of Minho, Portugal
Co-chair: Fábio Figueiredo - University of Minho, Portugal
Lead Technical Programme: Jose Sena-Cruz - University of Minho, Portugal
Lead Social Programme and Networking: Isabel Valente - University of Minho, Portugal
Lead PhD Workshop: Vitor Cunha - University of Minho, Portugal
Lead Sponsoring and Exhibitions: Salvador Dias - University of Minho, Portugal
Lead Advanced Short Courses: Ventura Gouveia - Polytechnic Institute of Viseu, Portugal
Lead Institutional Liaisons: Miguel Azenha - University of Minho, Portugal

Scientific Committee

Topic 1: Strategies for a resilient built environment
Scientific Lead: Daman Panesar - University of Toronto, Canada
Cise Unluer - Nanyang Technological University, Singapore
Cristina Zanotti - The University of British Columbia, Canada
Daniel Straub - Technical Univeristy of Munich, Germany
Fausto Minelli - University of Brescia, Italy
Guillaume Habert - ETH Zurich, Switzerland
Manu Santhanam - IIT Madras, Chennai-India
Miguel Ferreira - VTT Technical Research Centre of Finland, Finland
Antonio Caggiano - Darmstadt University of Technology, Germany
Carlos Bettencourt - LNEC, Portugal
Carlos Chastre Rodrigues - Universidade Nova de Lisboa, Portugal
Daniel Oliveira - University of Minho, Portugal
Jorge Branco - University of Minho, Portugal
José Matos - University of Minho, Portugal
Klaas van Breugel - Delft TU, Netherlands
Luc Tarweve - University of Ghent, Belgium
Marko Bartolac - University of Zagreb, Croacia
Mette Geiker - Norwegian University of Science and Technology, Norway
Paulo Cachim - Universidade de Aveiro, Portugal

Topic 2: New materials and structures for ultra-durability
Scientific Lead: Alexandra Bertron - University of Toulouse, France
Doug Hooton - University of Toronto, Canada
Ana Baričević - University of Zagreb, Croacia
Esperanza Menendez Mendes - Instituto Eduardo Torroja, Spain
Florian Mittermayr - TU Graz, Austria
Frank Winnefield - EMPA, Switzerland
Josée Duchesne - University of Laval, Canada
Mark Alexander - University of Cape Town, South Africa
Martin Cyr - University of Toulouse, France
Alexandra Bertron - University of Leeds, UK
Ueli Angst - ETH Zurich, Switzerland
Aires Camões - University of Minho, Portugal
Gonzalo Ruiz - University of Castilla-La Mancha, Spain
Jaime Galvez - Universidad Politécnica de Madrid, Spain
João Ramôa Correia - IST Técnico Lisboa, Portugal
Liberato Ferrara - Politecnico di Milano, Italy
Lisbeth Ottosen - Technical University of Denmark, Denmark
Petr Kabele - Czech Technical University, Prague, Czechia
Pietro Lura - EMPA, Switzerland
Sandra Nunes - University of Porto, Portugal
Thomas Keller - École polytechnique fédérale de Lausanne, Switzerland
Susan Bernal - University of Leeds, United Kingdom
João Paulo Castro Gomes - Universidade da Beira Interior, Portugal

07. COMMITTEES

Topic 3: Service life extension of existing structures

Scientific Lead: Nele De Belie - University of Gent, Belgium

Bahman Ghiassi - University of Nottingham, United Kingdom
Christoph Gehlen - Technische Universität München, Germany
Hans Beushausen - University of Cape Town, South Africa
Kei-Ichi Imamoto - Tokyo University of Science, Japan
Luping Tang - Chalmers University of Technology, Sweden
Markus Krüger - Technical University of Graz, Austria
Mustafa Sahmaran - Hacettepe University, Turkey
Ravi Patel - Paul Scherrer Institute PSI, Switzerland
Roberto Torrent - Materials Advanced Services Ltd, Argentina
Agnieszka Jedrzejewska - Silesian Unversity of Technology, Poland
Carlos Sousa - University of Porto, Portugal
Cristina Barris - University of Girona, Spain
Dirk Schlicke - TU Graz, Austria
Emmanuel Ferrier - LMC2 Université Lyon1, France
Fragkoulis Kanavaris - ARUP, UK
Francesco Pesavento - University of Padova, Italy
Jacob Wittrup Schmidt - Technical University of Denmark , Denmark
Jean Michel Torrenti - IFSTTAR, France
Maurizio Guadagnini - University of Sheffield, UK
Mirian Velay - Purdue University, USA
Thanongsak Imjai - Walailak Universiy, Thailand

Topic 4: Shift to a circular economy

Scientific Lead: Enzo Martinelli - Università degli Studi di Salerno, Italy

Alessandro Pasquale Fantilli - Politecnico di Torino, Italy
Belén González Fonteboa - University of A Coruña, Spain
Carlo Pellegrino - Università di Padova, Italy
Carlos Thomas - Universidad de Cantabria, Spain
Eddie Koenders - Technische Universität Darmstadt, Germany
Jian-Guo Dai - The Hong Kong Polytechnic University, Hong Kong
Jorge de Brito - University of Lisbon, Portugal
Liberato Ferrara - Politecnico di Milano, Italy
Maria Antonietta Aiello - Università del Salento, Italy
Miguel José Pereira - University of Algarve, Portugal
Holmer Savastano Junior - University of São Paulo, Brazil
Asif Hussain Shah - Shaqra University, Saudi Arabia
Carlos Rebelo - University of Coimbra, Portugal
Gintaris kaklauskas - University of Vilnius, Lithuania
Jorge Brito - IST Técnico Lisboa, Portugal
Nicolas Roussel - IFSTTAR, France
Nuno Cristelo - Universidade de Trás-os-montes e Alto Douro, Portugal
Pietro Crespi - Politecnico di Milano, Italy
Ziga Turk - University of Ljubljana, Slovenia
Tiago Miranda - University of Minho, Portugal
Domenico Asprone - University of Naples “Federico II”, Italy
Mário Pimentel - University of Porto, Portugal

Technical Committee

Technical Programme: Luis Correia - University of Minho, Portugal
PhD Workshop: M. Rezazadeh - University of Minho, Portugal
Advanced Short Courses: Ali Ed.-Behbahani - University of Minho, Portugal
Logistics, Exhibitions and Sponsoring: Chandan Gowda - University of Minho, Portugal

Administrative Secretariat

Management of information flow: Juneia Kingeski - University of Minho, Portugal

08. GUIMARÃES AND NORTH OF PORTUGAL

THE HISTORY

"Aqui Nasceu Portugal" Wall

Guimarães, city of medieval origin, has its roots in remote century X. It was at this time that the Countess Mumadona Dias, widow of Hermenegildo Mendes built a monastery, which has become a centre of attraction and gave rise to the establishment of a population group. Parallel and defence cluster, Mumadona built a castle within walking distance on the hill, creating a second anchor point. Connecting the two nuclei formed the Santa Maria Street.

Later the monastery became a chapter house and acquired great importance due to the privileges and donations that kings and nobles were giving him.

It became a famous centre for pilgrimage, and everywhere flocked believers with prayers and promises. The village continued to grow and organizing, and then surrounded by a defensive wall. However the mendicant orders are installed in Guimarães and help shaping the city.

Subsequently, the two poles merge into a single, after the fifteenth century the city walls had been established. There is also be the construction of some churches, monasteries and palaces, the formation of the Misericordia Square (now Largo João Franco) in the late seventeenth century and early eighteenth centuries, but its structure not be significantly altered.

It is from the late nineteenth century, with the new urban ideas on public health that the village, a city in 1853 by Queen Maria II, undergoes major changes: the Broad do Carmo (now Largo Martins Sarmento) and Countess of Juncal were built, streets and avenues were opened and then as well as the Colina da Foundation and the Alameda. However, almost everything was done in a controlled way, thus allowing the conservation of its magnificent Historic Centre.

08. GUIMARÃES AND NORTH OF PORTUGAL

GUIMARÃES AND SURROUNDING AREAS

Park of Peneda-Gerês

Waterfall of Arado - Gerês

Old Bridge over the Waterfall of Arado - Gerês

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.

Porto - Arrabida Bridge

Porto - Dom Luis I Bridge

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.

Douro River Valley

Palace of the House of Bragança

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.

Medieval Castle of Guimarães

Penha Sanctuary

08. GUIMARÃES AND NORTH OF PORTUGAL

GUIMARÃES AND SURROUNDING AREAS

Toural Square - Historical Centre

The Guimarães municipality, with an area of 241 km2, is located in Braga district in Northern Portugal. Elevated to the category of city in 1853, it is divided in 20 parishes with a total population of 158.000 inhabitants. The population of Guimarães is one of the youngest in Europe.

Statue of Dom Afonso Henrique

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.

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.

08. GUIMARÃES AND NORTH OF PORTUGAL

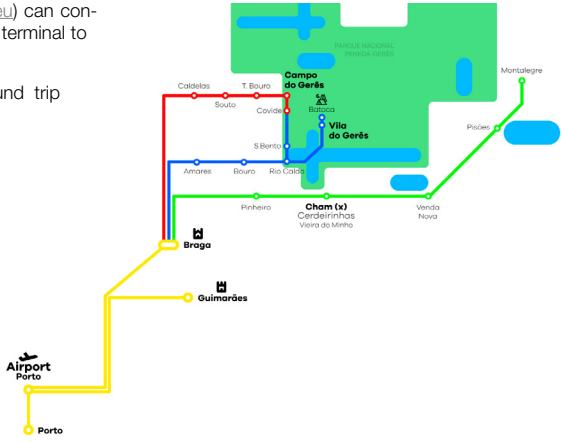
TRAVELLING TO GUIMARÃES

Toural Square - Historical Centre

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. 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).

A direct shuttle bus (www.getbus.eu) 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.



08. GUIMARÃES AND NORTH OF PORTUGAL

MAP OF THE CITY AND POINTS OF INTEREST

The conference venue is located close to the historic centre of Guimarães, which will be held both in the University of Minho and Vila Flor Cultural Centre. The social event (RILEM Welcome Reception) is located at a walking distance of 10-15 minutes from the historic centre. The Convention Dinner will be on MIT Penha, located in the Penha hill overlooks Guimarães. Gala Dinner attendees should use motorized transportation (bus/taxi/Uber).

1 Conference Venue
Centro Cultural Vila Flor CCVF
GPS 41.437378, -8.294989

2 PhD Workshop Venue // Welcome Reception // Junior - Officer RILEM Mix-event
School of Engineering - University of Minho
GPS 41.450915, -8.293477

3 Convention Dinner
MIT Penha
GPS 41.444782, -8.260376

4 RILEM Dinner
Hotel Guimarães
GPS 41.436152, -8.296969
(by invitation only)

09. HOST VENUE – 9, 10, 14 OF MARCH

UNIVERSITY OF MINHO (UMINHO)

Founded in 1973, the University of Minho welcomed its first students in the academic year of 1975/76. At present, the University is renowned for its competence and quality of teaching staff, excellence in scientific research, wide range of undergraduate and graduate courses offered and for its high level of interaction with other institutions. For these reasons, UMinho has a central role in the region and is an important reference for the country and a recognised partner in the European and global scene. Located in the north of Portugal, the University has a campus in Braga and two others in Guimarães, Azurém and Couros.

Originating from the ancient Roman town of Bracara Augusta, Braga is currently the third largest city in Portugal. Guimarães is known as the "cradle of the nation" and is classified as World Cultural Heritage by UNESCO.

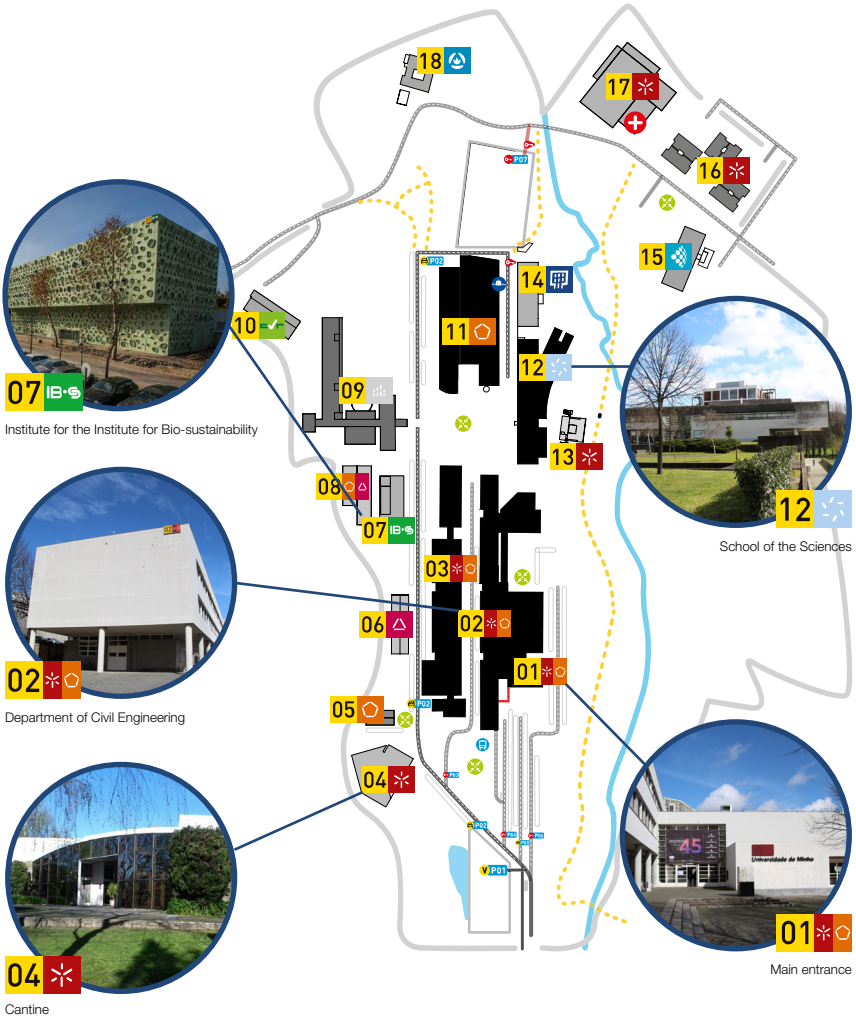
The University's organisational structure is flexible and conducive to innovation and interdisciplinary research on emerging topics. The teaching and research courses and the Schools and the Institutes are the basic structure of the University: Schools of Architecture, Sciences, Health Sciences, Law, Economics and Management, Engineering, Psychology, Nursing, and the Institutes of Social Sciences, Education and Arts and Human Sciences.

The courses and research projects have a strong international reputation. UMinho is a targeted research university, committed to the value chain of knowledge, in other words: Research, Development and Innovation. It also points to the socio-economic environment, with many successful partnerships in research, cultural and socio- economic development projects.

The three campi, one in Braga and the other two in Guimarães, have a total of 30 libraries including two general libraries (in Braga and Guimarães) with about 300.000 books and 600 seats, a Classic Library (with more than 300.000 books dating from 1450 to 1900), and several specialised libraries (over 100.000 books) and 17.000 scientific journals accessible through the Digital Library b-on. There are also three sports halls, three canteens (4.000 meals/hour), a snack bar, two grills, a restaurant and 14 cafeterias. The number of beds available in the four halls of residence is quite high (847 and 542 beds in Braga and in Guimarães, respectively), all the spaces fulfil the necessary conditions for academic success and well-being of the students, including Wi-Fi, dining rooms, cafeterias and canteens, study and recreation areas, and laundry.

09. HOST VENUE – 9, 10, 14 OF MARCH

VENUE MAP (UMINHO)



1 - Main entrance (Building **01**)
2 - School of Engineering - Room 0.22 (Building **01**)
3 - Grand Auditorium - Room 0.31 (Building **01**)
4 - Registration desk/coffee breaks @ Hall of Grand Auditorium
5 - Department of Civil Engineering - Room 2.09 (Building **02**)
6 - Department of Civil Engineering - Room 2.60 (Building **02**)
7 - Institute for the Institute for Bio-sustainability - Room 3.06 (Building **07**)
8 - School of the Sciences - Room 2.13 (Building **12**)
9 - Cantine (Building 04)

09. HOST VENUE – 9, 10, 14 OF MARCH

VENUE PHOTO GALLERY (UMINHO)

Main entrance (Building 01)

Department of Civil Engineering (Building 02)

Cantine (Building 04)

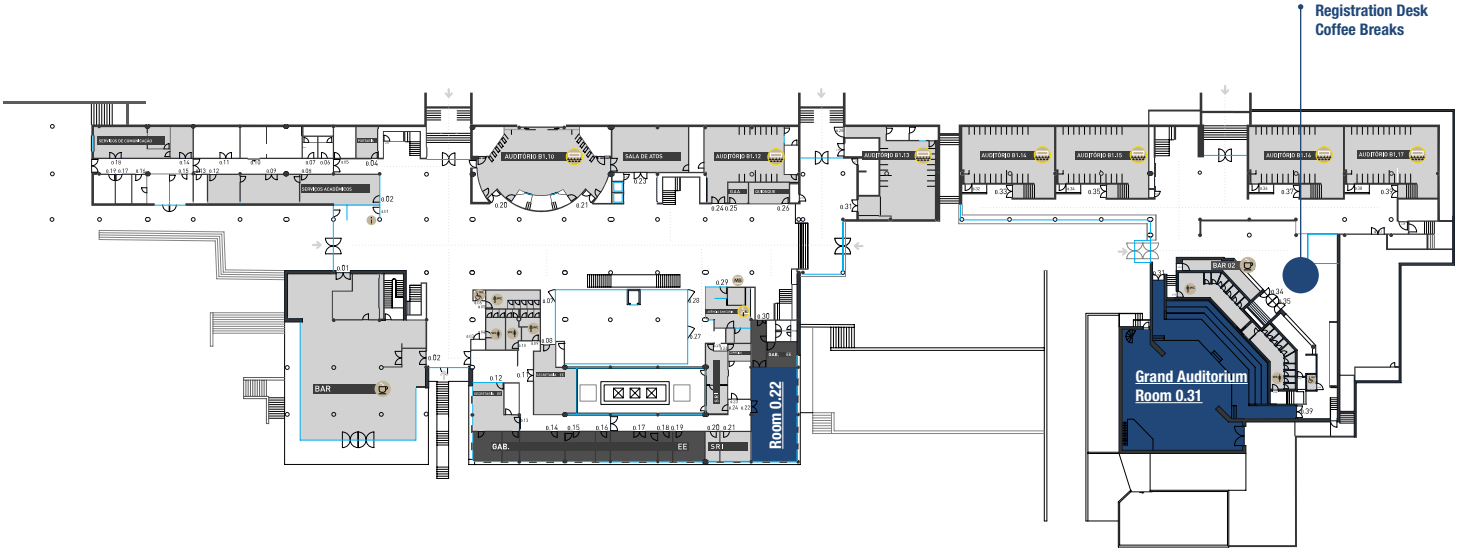
Institute for the Institute for Bio-sustainability (Building 07)

School of the Sciences (Building 12)

Grand Auditorium (Building 02)

09. HOST VENUE – 9, 10, 14 OF MARCH

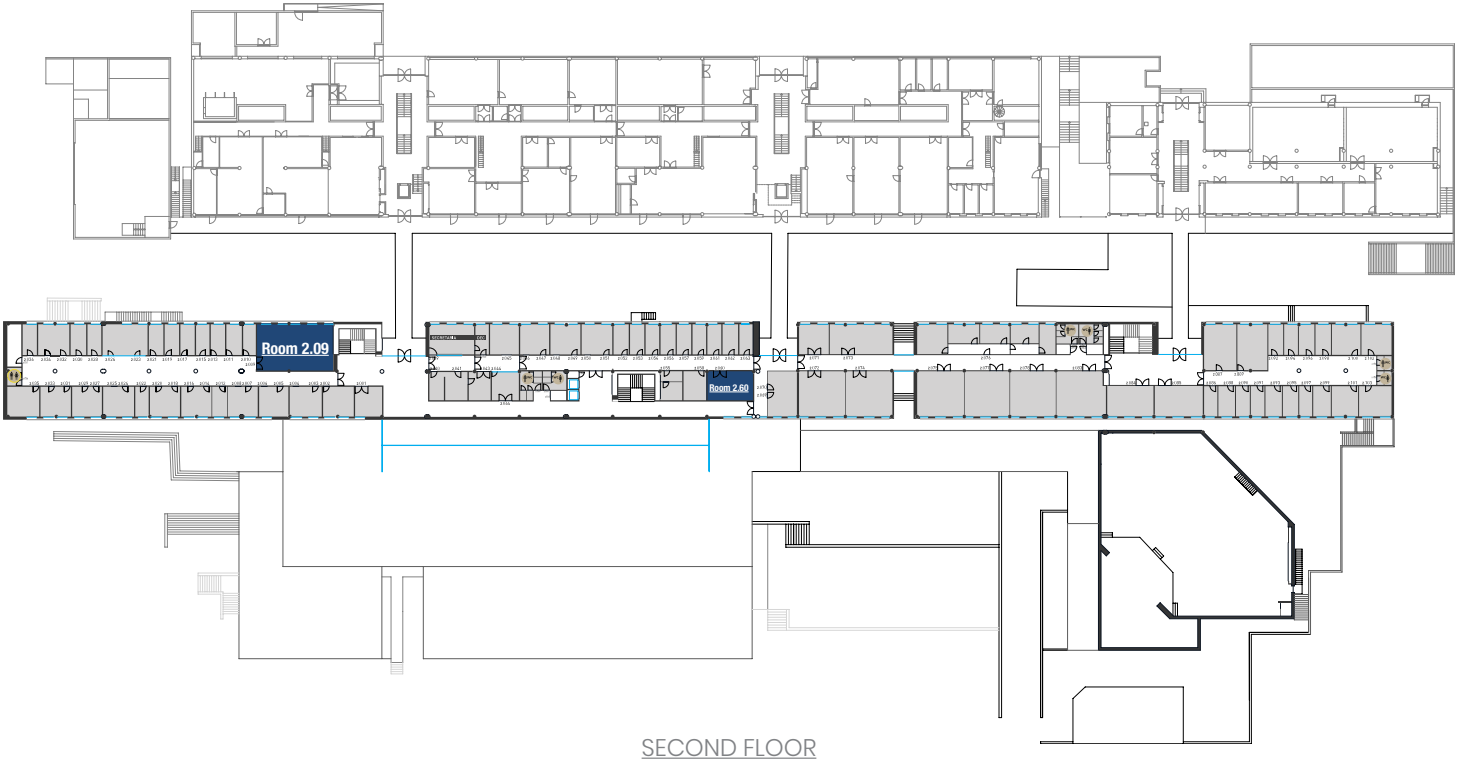
MAP OF THE BUILDING 01 - MAIN ENTRANCE // SCHOOL OF ENGINEERING // GRAND AUDITORIUM



GROUND FLOOR

09. HOST VENUE – 9, 10, 14 OF MARCH

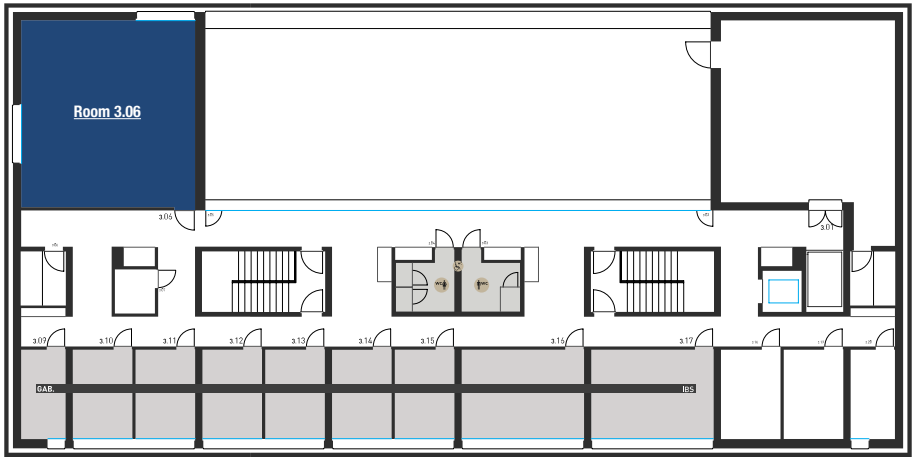
MAP OF THE BUILDING 02 – DEPARTMENT OF CIVIL ENGINEERING – ROOM 2.09 & ROOM 2.60



SECOND FLOOR

09. HOST VENUE – 9, 10, 14 OF MARCH

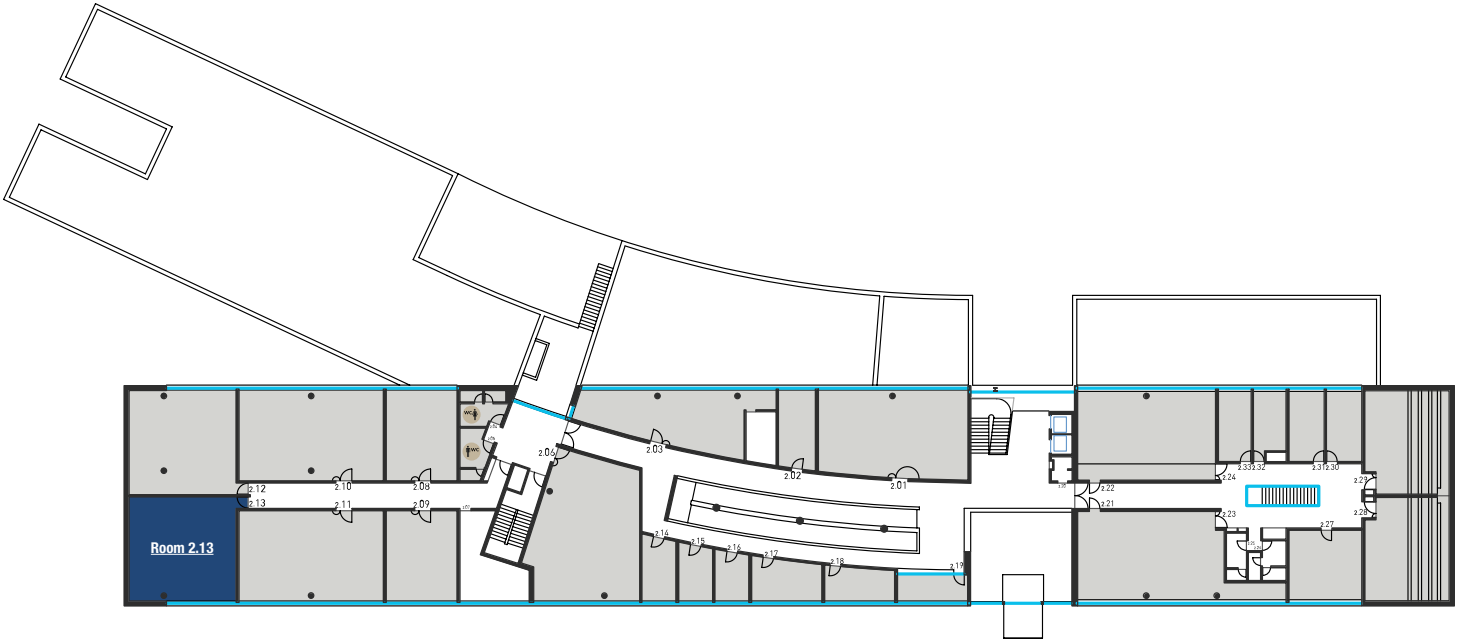
MAP OF THE BUILDING 07 – INSTITUTE FOR THE INSTITUTE FOR BIO-SUSTAINABILITY (IB·S)



THIRD FLOOR

09. HOST VENUE – 9, 10, 14 OF MARCH

MAP OF THE BUILDING 12 – SCHOOL OF THE SCIENCES – ROOM 2.13



SECOND FLOOR

10. HOST VENUE – 11 TO 13 OF MARCH

VILA FLOR CULTURAL CENTRE (CCFV)

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.

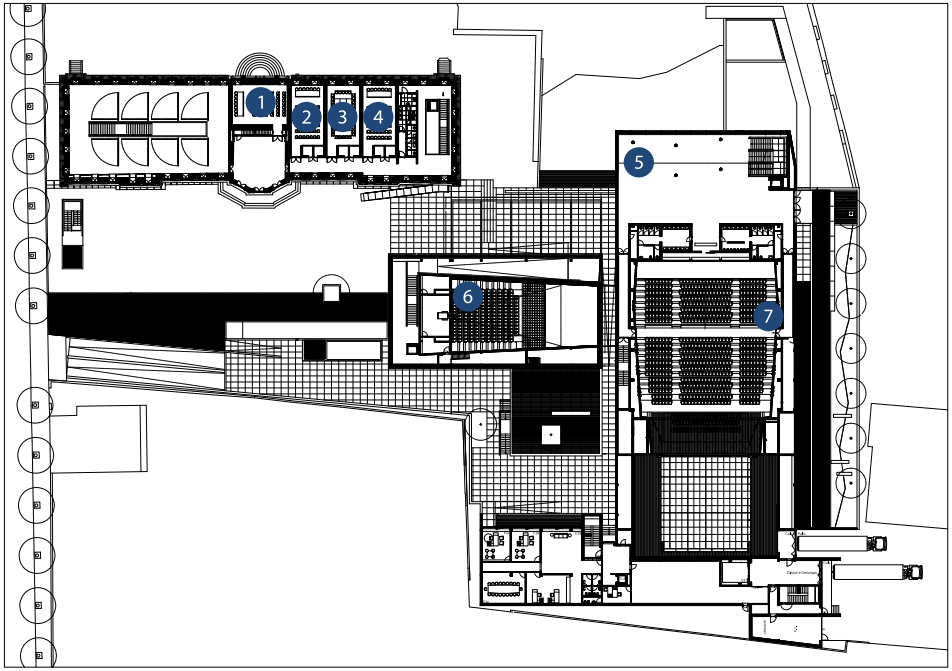
This space brings together the rich history of a manor house, its magnificent gardens and lovely architecture. The recovered Gardens received the Honors distinction in the category Exterior Spaces of Public Use of the National Prize for Landscape Architecture 2006.

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 m^2, a restaurant, a parking place and several gardens.

10. HOST VENUE – 11 TO 13 OF MARCH

VENUE MAP

CENTRO CULTURAL VILA FLOR
GUIMARÃES

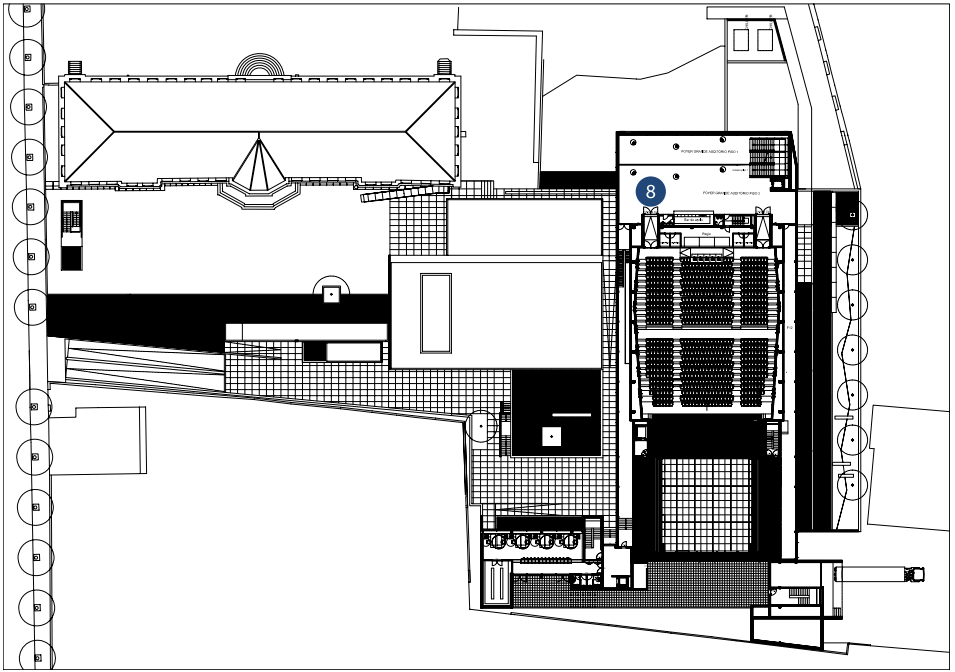


- 1>4 Meeting Rooms
- 5 Exhibition Hall / Registration Desk
- 6 Small Auditorium
- 7 Grand Auditorium

10. HOST VENUE - 11 TO 13 OF MARCH

VENUE MAP

CENTRO CULTURAL VILA FLOR
GUIMARÃES



8 Slide Desk

11. RILEM 2020 SPRING CONVENTION FORMAT

The RILEM 2020 Spring Convention include the PhD Workshop, the RILEM Workshop and Conference, the RILEM meetings and Advanced Short Courses.

PHD WORKSHOP

The second day of the RILEM spring convention will be dedicated to the PhD workshop. This international challenge is an excellent opportunity for talented students to show their research activities and skills in a challenging new format. PhD students and ECi-s will present their papers adopting the pitch format, on Tuesday. PhD students will be able to meet top leaders and researchers in their areas of expertise. The winners of the challenge will be awarded and invited to present their work again to the scientific community at the RILEM workshop, making their work more visible. This presentation will occur on Thursday morning, during the plenary session.

The PhD Workshop consists of the Group Activity and icebreaker, and Pitch Sessions. During the Group Activity, first the participants will be welcomed by the President of RILEM, Ravindra Gettu. Then a presentation by Dr. Daniela Ciancio, as Implementation Manager of RILEM, will follow. Dr. Daniela will deliver an interactive presentation to the participants, and challenge them to better understand RILEM and its mission.

The best pitches will be selected for presentation during the RILEM Workshop plenary session. The best pitches will be voted by the entire audience during the plenary session. The five most voted will be awarded by RILEM and invited to submit a revised version of their manuscript to the RILEM Technical Letters. They will also be invited to participate as guests in some RILEM standing committees.

RILEM WORKSHOP AND CONFERENCE

Plenary sessions including 'Gustavo Collonetty' lectures, PhD workshop winners, and invited keynote lectures for 'position paper' type presentations will develop throughout the entire day, with a very enriching and inspiring technical programme.

Wednesday is fully dedicated to the RILEM Spring Convention Official Opening Workshop. This day is the highest moment of the entire event, with the full scientific and technical celebration of the objectives and aims of the RILEM Spring Convention series.

Thursday and Friday will be dedicated to the continuation of the Wednesday Workshop, with time for delegates to present relevant and carefully revised communications by peers. Sessions will preferably be plenary, in order to stimulate the interaction between the different participants and maximize communications quality.

RILEM MEETINGS

The meetings of the several Standing Committees of RILEM will develop simultaneously to the RILEM Spring Convention Conference, in the same location. Like this, the exchange of ideas is favoured and the fruitful interaction between RILEM and the young generations of researchers and practitioners is stimulated. The same event will combine the RILEM standing committee meetings (TAC, DAC, DEV, Bureau), and several RILEM technical committee meetings (TC).

11. RILEM 2020 SPRING CONVENTION FORMAT

ADVANCED SHORT COURSES

Within the context of the RILEM Spring Convention and Conference, Advanced Short Courses were organized together with reference scientists in specialized fields, namely:

- ASC1: Lowering CO2 emissions from cement and concrete through increasing the use of supplementary materials | Monday, 9 March - Karen Scrivener
- ASC2: Durability based design of advanced cement-based materials in aggressive environments: a holistic approach | Saturday, 14 March - Liberato Ferrara
- ASC3: Computational methods for building physics and construction materials | Saturday, 14 March - Eduardus A.B. Koenders, Neven Ukrainczyk & Antonio Caggiano

GUIDELINES FOR PRESENTING AUTHORS

Uploading of presentations

- Please note that speakers will not be allowed to use their own laptops, tablets or other devices for the presentations.
- Presentations must be uploaded at the Slide Desk (Meeting room 4) on the day before the start of the Session. For presentation on the afternoon of the March 11th, upload must until the 12:30 of the March 11th.
- Speakers will not be allowed to upload the Presentation by using the computers installed in the symposium rooms. Presentations must be submitted in advance by e-mail (RILEMSCC2020@civil.uminho.pt) or uploaded at the Slide Desk. Acceptable presentation file formats: MS PowerPoint (ppt or pptx); Adobe Acrobat (pdf).
  - **Submission by email**: Speakers are encouraged to submit their presentation in advance by e-mail at RILEMSCC2020@civil.uminho.pt. The email message should include day and time of the session, title of presentation and name of the speaker. In addition, speakers are advised to save a copy of the presentation on an USB memory pen and bring it to the conference room.
  - **Uploading at the Slide Desk**: Onsite uploading will be made available during the symposium. Presentations saved on an USB memory pen can be brought to the Slide Desk to be uploaded by the staff.
- Regardless of the uploading procedure, speakers are required to carefully check their presentation at the Slide Desk before the session begins. Staff will assist speakers to preview their presentation to ensure a correct display.

BEFORE YOUR SESSION TAKES PLACE

- Visit the symposium venue. Check the room where your session has been scheduled to and get familiarised with the space and A/V equipment.
- Meet the Session Chairs at the session room at least 10 minutes prior to the start of the session.
- Provide the Session Chairs with any last minute information regarding your name, title, affiliation and how you would like to be introduced.
- The Session Chairs will inform you about the time of your presentation. The total time allocated for your presentation is 15 minutes: a 12 minute presentation followed by 3 minutes for questions and discussion.

DURING YOUR SESSION

- Please deliver your presentation strictly within the allotted time, leaving time for questions and discussion.
- As your presentation time nears the end, you will be alerted by the Session Chairs of the time left. Session Chairs are instructed to stop any presentation that runs over the allotted time.
- At the end of the presentations, the Session Chairs will invite for further discussion from the audience (time permitting), therefore we encourage to remain on the room until the end of the session.

12. 2ND SARCOS PHD AND ECI MEETING

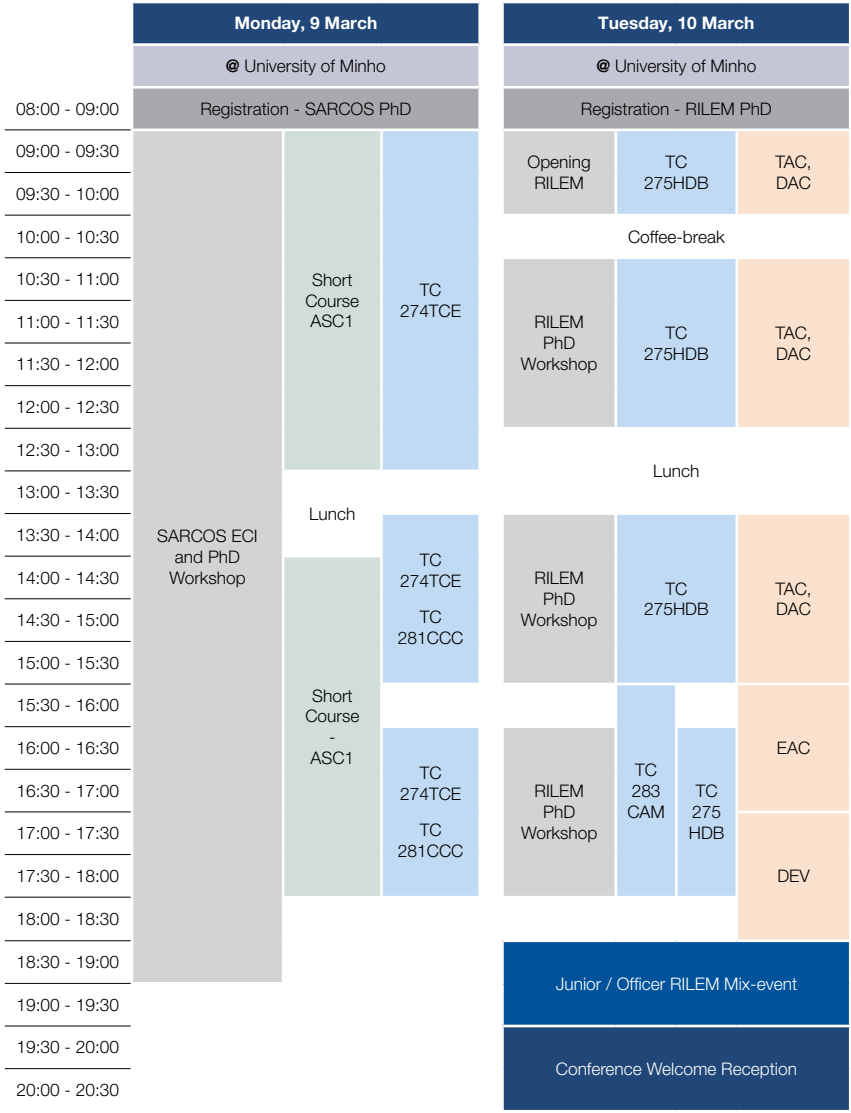
Young researchers were cordially invited to the 2nd SARCOS PhD and ECI Meeting on durability challenges in concrete with self-healing/repair technology. Organized in conjunction with the RILEM Spring Convention and Conference 2020, this event takes place on the 9th and 10th of March 2020, Guimarães, Portugal.

The SARCOS 2nd PhD Meeting is organized after the success of the 1st PhD meeting held in Novi Sad. The aim of this series of events is to connect Early Career Investigators, either PhD students or young doctors (<8 years from the thesis defence) working on self-healing/repair concrete.

For this second edition the organizing committee is preparing a dynamic and scientifically enriching programme. During the first day, the attendants are participating in a series of practical activities related with real structure durability problems, and while they apply their knowledge to real case studies they will train their team-building skills.

In the second day, the attendants learn about RILEM, discuss on current world and societal changes involving the construction field and how self-healing can help in overcoming the forthcoming challenges, while delivering small pitch presentations on their current projects.

13. PROGRAMME OVERVIEW



13. PROGRAMME OVERVIEW

	Wednesday, 11 March			Thrusday, 12 March		
	@ Vila Flor Cultural Centre			@ Vila Flor Cultural Centre		
08:00 - 09:00	Registration - Conference			Registration - Conference		
09:00 - 09:30	Opening & Gustavo Colonetti Cerimonies			PhD Workshop – Best Presentations Session		
09:30 - 10:00						
10:00 - 10:30						
10:30 - 11:00	Coffee-break			Coffee-break		
11:00 - 11:30	Plenary Session 1			Plenary Session 2		
11:30 - 12:00						
12:00 - 12:30						
12:30 - 13:00	Lunch			Lunch		
13:00 - 13:30						
13:30 - 14:00	Thematic Sessions 1	TC MPA	BUR	Thematic Sessions 3	TC CCH	BUR
14:00 - 14:30						
14:30 - 15:00						
15:00 - 15:30						
15:30 - 16:00	Coffee-break			Coffee-break		
16:00 - 16:30	Thematic Sessions 2	TC MPA	BUR	Thematic Sessions 4	TC CCH	BUR
16:30 - 17:00						
17:00 - 17:30						
17:30 - 18:00						
18:00 - 18:30						
18:30 - 19:00						
19:00 - 19:30						
19:30 - 20:00						
20:00 - 20:30	RILEM Dinner (by invitation only)			Convention Banquet		

13. PROGRAMME OVERVIEW

	Friday, 13 March					Saturday, 14 March
	@ Vila Flor Cultural Centre					@ University of Minho
08:00 - 09:00	Registration - Conference					
09:00 - 09:30	Plenary Session 3					Short Course - ASC2
09:30 - 10:00						
10:00 - 10:30	Coffee-break					
10:30 - 11:00	Special Session - Service life of cement-based materials and structures					
11:00 - 11:30	Thematic Sessions 5					
11:30 - 12:00						
12:00 - 12:30						
12:30 - 13:00	Lunch					
13:00 - 13:30						Lunch
13:30 - 14:00	Thematic Sessions 6	TC 270 CIM	TC CCS	TC IMC	Special Session Self-healing as preventive repair of concrete structures	
14:00 - 14:30						
14:30 - 15:00						
15:00 - 15:30						
15:30 - 16:00						Short Courses - ASC2 and ASC3
16:00 - 16:30	Closing Ceremony		TC 270 CIM	TC CCS	TC IMC	
16:30 - 17:00						
17:00 - 17:30						
17:30 - 18:00						

13. PROGRAMME OVERVIEW

MONDAY, 9 MARCH @UMINHO

- SARCOS / PhD Workshop: Department of Civil Engineering - Room 2.09
- Short Course ASC1: Department of Civil Engineering - Room 2.60
- TC 274TCE: School of the Sciences - Room 2.13
- TC 281CCC: Institute for Bio-sustainability - Room 3.06

TUESDAY, 10 MARCH @UMINHO

- Opening RILEM: Grand Auditorium - Room 0.31
- RILEM PhD Workshop: Grand Auditorium - Room 0.31
- TAC: Department of Civil Engineering - Room 2.09
- DAC: School of Engineering - Room 0.22
- EAC: School of Engineering - Room 0.22
- DEV: School of Engineering - Room 0.22
- TC 275HDB: Institute for the Institute for Bio-sustainability - Room 3.06
- TC 283CAM: Department of Civil Engineering - Room 2.60

WEDNESDAY, 11 MARCH @VILA FLOR CULTURAL CENTRE

- Opening & Gustavo Colonetti Cerimonies: Grand Auditorium
- Plenary Session: Grand Auditorium
- Thematic Sessions: Grand / Small Auditoriums
- BUR: Room 3
- TC MPA: Room 4

THURSDAY, 12 MARCH @VILA FLOR CULTURAL CENTRE

- PhD Workshop – Best Presentations: Grand Auditorium
- Plenary Session: Grand Auditorium
- Thematic Sessions: Grand / Small Auditoriums
- BUR: Room 3
- TC CCH: Room 4

FRIDAY, 13 MARCH @VILA FLOR CULTURAL CENTRE

- Plenary Session: Grand Auditorium
- Thematic Sessions: Grand / Small Auditoriums
- Special sessions: Room 1
- TC 270 CIM: Room 2
- TC CCS: Room 3
- TC IMC: Room 4
- Closing Ceremony: Grand Auditorium

SATURDAY, 14 MARCH @UMINHO

- Short Course ASC2: Department of Civil Engineering - Room 2.09
- Short Course ASC3: Institute for the Institute for Bio-sustainability - Room 3.06

14. TOPICS

The challenges posed by Global civilizations regarding the built environment are extremely demanding. The individuals of a growing global population are demanding resources at increasing paces, with irrecoverable damage on planet systems and raising questions about the sustainability of current development models. Extreme events are also more frequent and leading to unprecedented devastation.

To address the challenges posed to the future global civilization, research driven directives should be promoted, involving the new generation of scientists and the experienced ones on the development of initiatives with relevant impact. It is unquestionable the urgent need to intensify this debate, fostering a comprehensive roadmap of actions that lead to sustainable development paths.

In this context, the main objective of RSCC2020 is to contribute to the preparing of the new generation of materials and structures for future environmental requirements and societal challenges. Additionally, RSCC2020 also aims at:

- Discussing sustainability of global societies and contribute to define new trajectories for their enduring development, in the frame of the topics that are more relevant to RILEM, and in particular the ones related to the built environment;
- Identify and disseminate innovative technologies for more efficient and less resource-intensive construction and maintenance;
- Establish a closer dialogue and stimulate the exchange of knowledge between the diverse disciplines (new materials, structural modelling and design, durability, monitoring and maintenance, among others), in order to stimulate sound innovations based on multidisciplinary knowledge;
- Stimulate the discussion around disruptive strategies and new concepts to address current and future challenges for the built environment;
- Discuss and pursue alternative ways to relate the activity of RILEM TCs, between each other, between these and other experts associations, the industry and the society, in order to accelerate the uptake of new technologies by the community;
- Promote a novel and fresh organizational structure for attracting proactive and enthusiastic younger researchers and practitioners for the technical and scientific initiatives of RILEM, by promoting a PhD Workshop and opening opportunities for young researchers to communicate their ideas and integrate RILEM Standing committees.

The theme is closely related to the most critical challenges that humanity currently faces, which relate to RILEM activity: “Ambitioning a sustainable future for built environment: comprehensive strategies for unprecedented challenges”. Under this theme, four main topics are proposed:

14. TOPICS

TOPIC 1: STRATEGIES FOR A RESILIENT BUILT ENVIRONMENT

This topic will coverall the aspects related to current and emerging approaches that lead to an optimized design and maintenance of constructions and systems. It includes the development of service life models and life cycle design, in order to maximise longevity and level of service while minimising the environmental impact of constructions and systems.

It may include also the analysis and design of larger systems, such as communities, cities or regions, aiming at reducing risk and increasing resilience. The following subtopics are included:

- Resilience and robustness of the built environment and communities at local and global scales;
- Risk based inspection and maintenance;
- Life cycle analysis and service models;
- Performance based design;
- Improved design strategies by integrating materials and structures.

TOPIC 2: NEW MATERIALS AND STRUCTURES FOR ULTRA-DURABILITY

This topic will cover the current scientific and technological developments aimed at improving knowledge about degradation mechanisms in construction materials, as well as to the development of new materials with extreme durability.

Novel special materials for extreme environments or extreme loading conditions are also included, as well as novel approaches to improve the performance and durability of currently common construction materials.

Contributions to this topic are expected to focus primarily at the scale of the materials and their micro-meso-properties. The following subtopics are included:

- General purpose, constructions, infrastructures and facilities;
- Extreme environments and extreme events;
- Transport and deterioration mechanisms, characterization and mitigation;
- Supplementary Cementitious Materials, admixtures, additions and other emerging material optimization strategies;
- Smart materials for durable structures.

14. TOPICS

TOPIC 3: SERVICE LIFE EXTENSION OF EXISTING STRUCTURES

This topic will cover the most recent scientific and technological developments in the understanding of the evolution and degradation of construction materials and structural systems. Analytical and numerical, as well as experimental approaches, aimed at characterizing, modelling and predicting the evolution of the physical, chemical and mechanical properties of construction materials and structural systems are regarded.

Multiphysics models are also considered, as well as other strategies that contribute for an accurate characterization and prediction the service life and the evolution of existing and novel construction materials under normal or extreme environmental exposure or loading conditions.

New strategies to promote the smart repairing or the recovery of material properties, as well as the service life extension, are also considered. The following subtopics are included:

- Service life models and multiphysics approaches;
- Smart structures: innovative monitoring and intervention strategies;
- Management and optimized maintenance strategies;
- Integrated rehabilitation and strengthening approaches.

TOPIC 4: SHIFT TO A CIRCULAR ECONOMY

This topic is focussed on sustainability and will cover the research and technology on the use and development of sustainable materials and structural systems, as well as on recycling and reusing. It will also cover the implementation of industrial processes leading to minimized waste, including digital fabrication and deconstruction, as well as integrative approaches that lead to the achievement of the concept of circular economy.

Additionally, this topic will cover research on novel or existing construction materials and systems based on local resources and regional practices. The following subtopics are included:

- Industrialized construction systems minimizing waste;
- Recycling and reuse of materials and components;
- 4Ls: local constructions with local materials through local approaches for local development;
- Digital Manufacturing;
- Design for deconstruction;
- Smart demolition techniques;
- Timber structures;
- Life-Cycle Assessment of construction materials and technologies;
- Recycling of pavements and materials in roads;
- Resilience and robustness of the built environment and communities at local and global scales;
- Risk based inspection and maintenance;
- Life cycle analysis and service models;
- Performance based design.

15. KEYNOTE SPEAKERS

WEDNESDAY, 11 MARCH

Paulo Lourenço
University of Minho
Portugal

"Rediscovering earth as a building material: old and new construction"

Full Professor at the Department of Civil Engineering, University of Minho and Co-Head of the Institute for Sustainability and Innovation in Structural Engineering (200 researchers and 20 M€ of contracted funding). Project team leader for the revision of the European Masonry code (EC6, Part 1-1). Experienced in NDT, advanced experimental and numerical techniques, innovative strengthening techniques, novel masonry products and earthquake engineering. Specialist in structural repair, conservation and strengthening, with works in more than 100 monuments worldwide. Worked as consultant on innovative masonry structures using confined and reinforced masonry. Editor of the "International Journal of Architectural Heritage" and Coordinator of the European Master on "Structural Analysis of Monuments and Historical Constructions" (www.msc-sahc.org), awarded an European Heritage Award in 2017. Supervised 50+ PhD students and has an h-index of 50, authoring 1400+ publications. Recipient of an ERC Advanced Grant of 3M€ on seismic assessment of the built cultural heritage (2019-23).

Arpad Horvath
UC Berkeley
USA

"Environmental Assessment: From Incremental to Radical Decision Making"

Arpad Horvath is a Professor in the Engineering and Project Management Program and in the Energy, Civil Infrastructure and Climate Program in the Department of Civil and Environmental Engineering at UC Berkeley. His research interests are in developing methods and tools for life-cycle assessment of civil infrastructure systems and other industries. His research has focused on the environmental implications of transportation systems, buildings, construction, water and wastewater systems, and various service industries, and life-cycle assessment modeling using hybrid methods, environmentally augmented economic input-output analysis, and environmental performance measurement. Arpad Horvath is the director of the Consortium on Green Design and Manufacturing (CGDM), and Associate Editor of the ASCE's Journal of Infrastructure Systems.

Karen Scrivener
EPFL
Switzerland

"Practical solutions for CO2 reduction from cement and ongoing research needs"

Karen Scrivener is a Professor and the Head of the Laboratory of Construction Materials, at EPFL, Switzerland. She obtained her PhD at Imperial College and worked for Lafarge in France for 6 years. Her research focus on the understanding of the chemistry and microstructure of cement based materials and improving their sustainability. She is the editor in Chief of the leading academic journal Cement and Concrete Research and the Fellow of the Royal Academy of Engineering in 2014. Her research has already been recognized with several prizes including the prize and the Della Roy Lecture Award from the American Ceramic Society.

15. KEYNOTE SPEAKERS

THURSDAY, 12 MARCH

Nele de Belie
Ghent University
Belgium

"Self-healing concrete research in the European projects SARCOS and SMARTINCS"

Director of the Magnel Laboratory for Concrete Research of Ghent University and head of the "Concrete and Environment" group. Her research focuses on sustainable concrete with supplementary cementitious materials, acid/salt degradation, concrete/stone-microorganism interactions (biodeterioration/bioconsolidation), self-healing, self-cleaning, circular economy and life cycle assessment. She has supervised more than 50 (inter)national projects, is vice chair of COST CA15202 SARCOS and coordinator of European ITN SMARTINCS. She is a RILEM fellow and chairs the RILEM Technical Activities Committee and TC 281-CCC. She is author of over 300 scientific publications, editor of 10 books and editorial board member of 4 scientific journals.

Nicolas Roussel
IFSTTAR
France

"Rheology and processing of cement-based materials"

Nicolas Roussel graduated from Ecole Normale Supérieure in 1998 and is now in charge of the research activities dealing with rheology and processing of construction materials at IFSTTAR (ex LCPC), Paris, FRANCE. He is the founding editor of RILEM technical letters and RILEM Vice president since 2018. He has received in 2007 the Robert L'Hermite award for his work on rheology of fresh concrete. With an H-index of 37, he is the author or co-author of more than 100 papers in scientific journals such as Cement and Concrete Research, Physical Review letters or Journal of Non-Newtonian Fluid Mechanics. His research focus shifted in the last decade from concrete rheology to the understanding and analysis of existing construction processes or the development of innovative processing technologies. His materials of interest include both market-dominant products and alternative materials with low environmental impacts allowing for waste recycling along with lowered energy consumption and global warming contribution. The processing technologies under the scope cover various technology readiness levels and include mixing and dispersion, centrifugation and granulation, vibration and compaction, spraying and coating and automation in construction.

Wolfram Schmidt
BAM
Germany

"Challenges, opportunities and potential solution strategies for environmentally and socially responsible urban development of megacities in Africa"

Wolfram Schmidt is a materials researcher at the Federal Institute for Materials Research and Testing (Bundesanstalt für Materialforschung und -prüfung, short BAM). He aims to make concrete a more sustainable building material. Together with African partners, he has developed a bio-concrete based on manioc shells and other agricultural residues. In Africa, he was consistently supported by Professor Herbert Uzoegbo of the University of the Witwatersrand in Johannesburg. Together with Kolawole Olonade from the University of Lagos, Schmidt was recently awarded the German-African Innovation Prize by Federal Research Minister Anja Karliczek for his work.

15. KEYNOTE SPEAKERS

FRIDAY, 13 MARCH

Enzo Martinelli
University of Salerno
Italy

"Greening the gray: recent advances on sustainable cementitious composites"

Enzo Martinelli is Associate Professor of Structural Analysis and Design at the Department of Civil Engineering of the University of Salerno, Italy. He got the qualification to the role of Full Professor both in France (in 2013) and in Italy (in 2017). In the last twenty years he has been working on various subjects, among which the experimental characterisation and theoretical modelling of concrete structures, the seismic response of structure, the mechanics of fiber-reinforced composite materials. More recently, he has been the Principal Coordinator Contact in the EU-funded projects "Environmentally-friendly solutions for Concrete with Recycled and natural components" (EnCoRe, FP7-PEOPLE-2011-IRSES, n. 295283) and "SUstainability-driven international/intersectoral Partnership for Education and Research on modelling next generation CONCRETE" (SUPERCONCRETE, H2020-MSCA-RISE-2014, n. 645704). Co-author of almost 300 papers published in published both in international journals and conferences, he has supervised and co-supervised a total of 12 PhD Theses. Dr. Enzo Martinelli is currently Associate Editor of the European Journal of Civil and Environmental Engineering.

Liberato Ferrara
Politecnico di Milano
Italy

"Ultra High Durability Concrete: upgrading the concept and durability-based design of reinforced concrete structures exposed to extremely aggressive environments"

Liberato Ferrara is associate professor of Structural Analysis and Design and holds the Italian National qualification to full professor. He has been Fulbright visiting scholar at the Center for Advanced Cement Based Materials, Northwestern University, IL, USA. He is the coordinator of H2020 project ReSHEALience (GA 760824), deputy-coordinator of ITN initiative SMARTINCS (GA 860006) and WP leader in COST Action 15202 SARCOS- Self healing as preventive repair in concrete structures. He is currently chair of the American Concrete Institute (ACI) TC 544-Fiber Reinforced Concrete and member of RILEM TC SHE-Self healing evaluation in cement based materials; DFC-Digital fabrication with cement based materials and MRP-Measuring rheological properties of cement based materials. He has served in international scientific conference committees, as editorial consultant for Springer and reviewer for international journals and different research foundations worldwide. Author of more than 50 peer-reviewed journal papers, 3 book chapters and more than 200 conference papers and co-editor of 1 book on sustainable cement based materials (Springer, June 2017), he has given seminar talks in about 50 universities worldwide, has (co)supervised 6 PhD students and has served in several PhD defence committees in Italy and abroad.

16. REGISTRATION

Authors are invited to participate in the RILEM Spring Convention and Conference, which includes the PhD Workshop, and submit full papers for peer reviewing by the Scientific Committee of the event.

Participation in the RILEM Meetings is exclusive to the official members of the different Standing Committees or Technical Committees, or by invitation.

All accepted papers will be published by Springer in RILEM Bookseries, which is indexed in SCOPUS, Google Scholar and SpringerLink. Selected papers will also be invited for publication in "Developments in the Built Environment", a golden Open Access Journal by Elsevier, exempted of publication fees. Non-selected papers may be also submitted for a special issue on the RILEM event at discounted rates.

Authors of the best presentations selected during the PhD Workshop will also be invited to submit extended versions for publication in RILEM Technical Letters, the newest Open Access Journal by RILEM, in a special issue.

Registration Type	Early Bird	Standard Price
General	625€	750€
RILEM Member	575€	650€
Student	275€	350€
Accompanying Person	150€	200€

Registration Type	Fee Per Course
Participants of the Conference	100€
Non-participants of the Conference	200€

[1] GENERAL and RILEM MEMBER registration types entitle the participants to participate in the entire event and to submit for possible publication up to two full papers. Each author can present up to two papers during the RILEM Spring Convention and Conference, which will occur on Wednesday, Thursday and Friday.

[2] STUDENT registration type entitles the participants to submit up to one full paper. Each author can present during the PhD Workshop, on Tuesday. Presentations will adopt the pitch format. The 10 best presentations will be selected by the peers on Tuesday for a special session during Wednesday, in the RILEM Convention Official Opening Workshop. The best presentations will be selected by the audience, during the plenary session, and invited to submit for publication by RILEM Technical Letters.

[3] Authors who wish to submit a paper for review and possible publication but are not able to attend the event, can submit up to two papers. The paper publication fee is 150 € per paper.

[4] RILEM Officers and TC members participating exclusively in the Standing Committee Meetings or TC meetings, who do not wish to participate in the RILEM Spring Convention and Conference, are entitled to the event meals and coffee breaks during the course of the RILEM Meetings. They are also invited to the RILEM dinner.

17. CERTIFICATE OF ATTENDANCE

Certificate of attendance will be sent by email after the Event.

18. WI-FI ACCESS

Complimentary Wi-Fi is being provided to all participants.

@University of Minho (UMINHO): the Wi-Fi (*eduroam*) access is free with the following credentials:
Username: *rilem@guest*
Password: *2020!!rilem*

@Vila Flor Cultural Centre (CCVF): the Wi-Fi (*RILEM2020GUIM*) access is free and no credentials are needed.

19. FOOD SERVICE

@ University of Minho (UMINHO): Coffee breaks will be served at the hall of the Grand Auditorium. Lunch will be served at the canteen.

@ Vila Flor Cultural Centre (CCVF): Coffee breaks will be served in the Exhibition Hall. Drinks (water, coffee and tea) will be continually available in the Exhibition Hall. Lunch will be served in the Restaurant Café Concerto, located in the floor -1.

Note: food restrains should be mentioned at the registration.

20. THE SOCIAL PROGRAMME

JUNIOR / OFFICER RILEM MIX-EVENT & CONFERENCE WELCOME RECEPTION

An icebreaker challenging game bringing together two generations, Young and Senior Engineers, is proposed to the Event participants, composed of groups of six to eight participants randomly selected at the registration stage. The event includes a structural engineering quiz with an interactive platform, ambient music and cocktail. It will take place on the March 10th at the Main Entrance of School of Engineering of the University of Minho.

RILEM DINNER (BY INVITATION ONLY)

The RILEM dinner will take place on the 11 March at the Guimarães Hotel.

CONVENTION BANQUET

The Convention Banquet will be held on 12 March, at MITPenha, in Guimarães. This modern construction, located in the Penha hill overlooks Guimarães.

21. ACCOMMODATION

HOTEL FUNDADOR

Hotel Fundador is set on a hill overlooking the UNESCO-protected center of Guimarães. It offers modern rooms with direct access to the garage and free Wi-Fi, next to the city's train station.

www.hotelfundador.com

STAY HOTEL

Located just outside the historical centre of Guimarães, Stay Hotel Guimarães Centro is a 5-minute walk from Guimarães train station, and offers free WiFi. The 47 rooms at the Stay Hotel Guimarães Centro are modern and include a work desk, cable and satellite TV. Some rooms have a relaxing seating area.

www.stayhotels.pt

HOTEL DA OLIVEIRA

Hotel da Oliveira is located in the historical area of Guimarães, considered a UNESCO World Heritage Site. Guimarães Castle, the most emblematic place of interest in the city, is 150 meters away. All rooms at Hotel da Oliveira are equipped with air conditioning, a private bathroom with free toiletries and a hairdryer, as well as a flat-screen cable TV and a tablet. The accommodation also has a minibar, and some include a balcony. All rooms are individually decorated with themes inspired by historical personalities of Guimarães.

www.hoteldaoliveira.com

21. ACCOMMODATION

POSH RESIDENCES

Posh Residences offers accommodation within the city walls of Guimarães, just a 15-minute walk from Guimarães Train Station. The Salado Standard is 100 meters from the property. Free Wi-Fi is available throughout the property. It has a dining area and a seating area with a flat-screen cable TV. An oven and a coffee machine are also provided. Some units also have a kitchen equipped with a microwave, a toaster and a fridge. Each unit includes a private bathroom with bathrobes and free toiletries and towels are provided.

www.posh-residences.com

HOTEL TOURAL

Hotel Toural is located in the historic city center of Guimarães and offers spacious rooms with satellite TV and air conditioning, just a 10-minute walk from Guimarães Castle. Free parking is available. Rooms at the Toural Hotel are decorated with wooden furniture. All rooms have a telephone, a minibar and a private bathroom. Some rooms have a spacious seating area and 2 TVs.

www.hoteltoural.com

22. SPONSORSHIPS

Gold Sponsorship

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Structural reinforcement using CFRP

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Core reinforcement using CFRP

Oranienburger Chaussee - Berlin
Road reinforcement using Carbophalt® G

Paseo Marítimo – Castro Urdiales, Spain
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S&P is a leading company in the field of building reinforcement and offers system solutions for retrofitting existing structures made of reinforced concrete, steel, masonry, wood and asphalt surfaces such as roads and airport taxi-ways.

For more information, visit sp-reinforcement.eu

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S&P Reinforcement

Part of Simpson Strong-Tie, S&P is a leading company in the field of building reinforcement and offers system solutions for retrofitting existing structures made of reinforced concrete, steel, masonry, wood and asphalt surfaces such as roads and airport taxi-ways.

For 25 years and counting we have been a trusted source for construction solutions on projects world-wide, including the Vasco da Gama bridge, Lisbon, the Maracanã Stadium - Rio de Janeiro, the Deutsche Bank Headquarters, Frankfurt-am-Main and Copenhagen International Airport - to name just some.

Today our range of solutions includes CFRP, asphalt reinforcement, tunnel rehabilitation, bridge pile repair and specialist concrete repair and reinforcement.

We are as proud of our people as we are our products, with over 140 team members dedicated to providing expert technical advice and installation support throughout Europe.

SIMPSON Strong-Tie®

23. PhD WORKSHOP

SESSION 10:30 – 12:30

Bond behaviour between concrete and NSM-CFRP strips at elevated temperatures: single-lap shear tests and definition of local bond vs. slip laws

Adriana Azevedo

Chloride ingress and corrosion of steel in Alka-li-Activate Concrete (AAC)

Antonino Runci

Towards a proposal to model the autogenous healing-induced regain in strength for Ultra High-Performance Fibre-Reinforced Cementitious Composites (UHPFRCCs)

Antonio Cibelli

Assessment of different coastal defence structures to promote wave energy dissipation and sediments retention

Bárbara Vieira

Enhanced fatigue life of old metallic bridges – application of preloaded injection bolts

Bruno Pedrosa

CarboDB – Open access database for concrete carbonation

Charlotte Thiel

Geopolymer Cements: A novel disposal method for radioactive waste

Daniel Geddes

The Influence of Polymers Impregnation on Bending Behaviour of Phyllostachys pubescens (Mosso) Bamboo

Fabrício Vitorino

Development and characterization of autonomous self-healing cement-based materials using cementitious capsules

Giovanni Anglani

In-plane behavior of clay brick masonry wallet strengthened by TRM system

Ali Dalalbashi

An analytical approach for pull-out behavior of TRM-strengthened rammed earth elements

Antonio Romanazzi

Interfacial performance of coating polymer on calcium-silicate-hydrates during different stages of cement hydration

Ashwin KN

Meso-scale study of plain concrete beam under both ambient and high temperature

Biswajit Pal

Potential of fungi to produce bioconcrete

Carolina Martuscelli

Assessing the alkali-sensitivity of the mechanical behavior of jute fibers to evaluate their durability in cementitious composites applications

Claudia Brito de Carvalho Bello

Characterization of the air void system in hardened concrete using a neural network approach

Fabian Diewald

Deployment of a High Sensor-Count SHM of a Prestressed Concrete Bridge Using Fibre Optic Sensors

Felipe Sakiyama

Evaluation of the self-healing capability of Ultra-High-Performance Fiber-Reinforced Concrete with Nano-particles and crystalline admixtures by means of permeability

Hesam Doostkami

23. PhD WORKSHOP

SESSION 10:30 – 12:30

Long-term performance of cement composites with wood biomass ash
Ivana Carevic

Classification of recycled aggregates using deep learning
Jean David Lau Hiu Hoong

Impact of super absorbent polymers on early age behavior of high performance concrete walls
Judy Kheir

Effect of relative humidity on cement paste: Experimental assessment and numerical modelling
Kinda Justin

Bond behaviour of NSM FRP strengthening systems on concrete elements under sustained load
Javier Gómez Colom

Towards the understanding the role of the mix design method in the mechanical behaviour of recycled aggregate concrete at early ages
Jeonghyun Kim

The effect of recycled fine aggregate sourced from construction and demolition waste on the properties of epoxy resin coatings
Kamil Krzywiński

Influence of nanofibrillated cellulose (NFC) on the mechanics of cement pastes
Letícia de Souza

SESSION 13:30 – 15:30

A Short Review of Researches on Mechanical Properties of Traditional Chinese Timber Joints: From Experimental Aspect
Lipeng Zhang

Microstructural evaluation of fibre-reinforced slag-based foams
Mark Češnovar

Critical overview and application of integrated approaches for seismic loss estimation and environmental impact assessment
Martina Caruso

Magnesium-phosphate cement pastes to encapsulate industrial waste powders
Matthieu De Campos

Experimental analysis of the bending behavior of structural metal joints based on the use of girder clamps to service life extension of existing structures
Manuel Cabaleiro

Effect of Recycled Tyre Polymer Fibres on Autogenous Deformation of Self-Compacting Concrete
Martina Pezer

Screening regionally available natural resources and waste streams as potential supplementary ce-mentitious material
Matea Flegar

Strength and microstructure development of fly ash geopolymer binders using waste glass powder
Md Nabi Newaz Khan

23. PhD WORKSHOP

SESSION 13:30 – 15:30

Early age temperature control in mass concrete through incorporation of dispersed Phase Change Materials (PCMs)

Mohamamd Kheradmand

Thermal energy storage characterization of environmental-friendly bio-based PCMs as an alternative to petroleum-based paraffin waxes

Mona Nazari Sam

Durability under thermal actions of concrete elements confined with an inorganic matrix fiber-reinforced composites

Pietro Mazzuca

Polymer Flexible Joints as an Alternative External Repair Method in RC Structures

Tuğrul Akyıldız Ahmet

Resistivity sensors for monitoring water exchange in hardened cementitious materials

Ruben Beltran Cobos

Preventive repair of concrete substrates using epoxy resin coatings modified with waste mineral additives

Chowaniec Agnieszka

Bacteria-Based Self-Healing in Cementitious Materials

Justo Reinoso Ismael

Self-Healing capacity of concrete composites due to combination of different exposure conditions – freeze/thaw cycles under chloride penetrations combined with mechanical

Visar Krelani

An analytical approach for evaluating the impact response of steel fiber reinforced concrete beam

Mohammad Bakhshi

Influence of specific SCM on microstructure and early strength of sustainable cement blends

Ognjen Rudic

A Simplified Two-Step Approach for the Seismic Retrofitting Design of Existing Structures Towards a Resiliency Enhancement

Rafael Shehu

Morphological and chemical characterization of self-healing products in MgO concrete

Amenta Maria

Durability of cement-based overlays modified with selected waste mineral powders

Chajec Adrian

Evaluation of the self-healing capability of Ultra-High-Performance Fiber-Reinforced Concrete with Nano-particles and crystalline admixtures by means of permeability

Doostkami Hesam

Self-healing of Engineered Cementitious Composites at Two Different Maturity Levels

Keskin Süleyman Bahadır

Crack self-healing ability of bio-mortar

Bojan Miljevic

23. PhD WORKSHOP

SESSION 16:00 – 18:00

Interface Evaluation of Carbon Textile Reinforced Composites
Rebecca Mansur de Castro Silva

Durability Assessment Based Design of Ultra High Durability Concrete Structures
Salam Alobaidi

Analysis of the bonding behaviour of sand treated CFRP laminates with cement-based adhesive in NSM systems using Digital Image Correlation technique
Reza Mohammadi

Influence of crack geometry and crack width on carbonation of High-Volume fly Ash (HVFA) mortar
Tim Van Mullem

Modelling the three-stages of creep
Vitor Dacol

The effect of mechanical load on carbonation of concrete: discussion on test methods and results
Zhiyuan Liu

Recycling of slightly contaminated demolition waste - Part 1: inorganic constituents
Lia Weiler

Use of Biopolymers In Recycled Aggregates
Merino Daniel

Monitoring and Identifications of Early Cracking in the Cement Road Pavements; Lab, Field and numerical study
Rasol Mezgeen

Bacteria-based self-healing concrete in cold climates
Skevi Lorena

Self-Healing in Cementitious Materials
Tsampali Evangelia

Salt-scaling resistance of SAP-modified concrete under freeze-thaw cycles
Roberto Tenorio

The Response of Synthetic Alkali-Silica Reaction Products to Carbonation
Satyanarayana Narneni

Behaviour of poorly indurated clay/concrete interface due to lateral stress: application for the disposal of radioactive waste
Takoua Lamouchi

Sustainable polyurethane plasterboard for construction
Víctor Miguel Bernabé

Cracking Potential of Alkali-activated Concrete Induced by Autogenous Shrinkage
Zhenming Li

A New Dilation Model for FRP Fully/partially Confined Concrete Column under Axial Loading
Javad Shayanfar

Self-healing capacities of mortars with crystalline admixtures
Lina Ammar

Synthesis and characterisation of core/shell particles for developing self-healing mortars
Stamatoula Papaioannou

Self-healing processes using biopolymers in recycled concrete and mortars
Serrano Lorena

Sprayed Self-healing Engineered Cementitious Composites for Concrete Repair
Tamilarasan Meenakshi

Construction and Demolition Waste-based Engineered Geopolymer Composites (EGC) with Self-healing Capability
Yıldırım Gürkan

24. TECHNICAL PROGRAMME

11-13 MARCH, 2020

	Wednesday, 11 March	Thursday, 12 March	Friday, 13 March	
08:00 - 09:00	Registration	Registration	Registration	
09:00 - 09:30	Opening & Gustavo Colonetti Ceremonies	PhD Workshop Best Presentations Session	Plenary Session 3 Enzo Martinelli; Liberato Ferrara	
09:30 - 10:00				
10:00 - 10:30			Coffee-break	
10:30 - 11:00	Coffee-break	Coffee-break	Thematic Sessions 5	Special Session Service life of cement-based materials and structures
11:00 - 11:30	Plenary Session 1 Paulo Lourenço; Árpád Horvath; Karen Scrivener	Plenary Session 2 Nele De Belie; Nicolas Roussel; Wolfram Schmidt		
11:30 - 12:00				
12:00 - 12:30				
12:30 – 13:30	Lunch	Lunch	Lunch	
13:30 - 15:30	Thematic Sessions 1	Thematic Sessions 3	Thematic Sessions 6	Special Session Self-healing as preventive repair of concrete structures
15:30 - 16:00	Coffee-break	Coffee-break	Coffee-break	
16:00 - 17:00	Thematic Sessions 2	Thematic Sessions 4	Closing Ceremony	
17:00 - 18:00				

STREAMING SESSIONS

DAY	GRAND AUDITORIUM	SMALL AUDITORIUM	ROOM 1
11 March	Streaming 1	Streaming 4	Streaming 7
12 March	Streaming 2	Streaming 5	Streaming 8
13 March	Streaming 3	Streaming 6	Streaming 9

24. TECHNICAL PROGRAMME

WEDNESDAY, 11 MARCH | THEMATIC SESSIONS 1

13:30 - 15:30	**Topic 1: Strategies for a resilient built environment** Small Auditorium	**Topic 2: New materials and structures for ultra-durability** Grand Auditorium
13:30 - 13:45	High-resolution luminescent pH analyses for cement based construction materials – applications, limitations and future prospects *Cyrill Grengg, Bernhard Mueller, Florian Mittermayr, Sergey M. Borisov, Martin Dietzel, Torsten Mayr*	Determination of Autogenous Self-healing Capability of Cementitious Composites through Non-destructive Testing *Gürkan Yıldırım, Oğuzhan Öztürk, Hüseyin Ulugöl, Muhammed Hatem, Mustafa Şahmaran*
13:45 - 14:00	Electromagnetic properties of concrete *Tulio Honorio, Farid Benboudjema, Thierry Bore, Helena Carasek, Oswaldo Cascudo, Mehdi Ferhat, Eric Vourc'h*	Autogenous Self-healing Assessment of 1-year-old Cementitious Composites *Gürkan Yıldırım, Hüseyin Ulugöl, Oğuzhan Öztürk, Mustafa Şahmaran*
14:00 - 14:15	Design for disassembly of Super-Light concrete structures *Philip S. Halding, Kristian D. Hertz*	Self-healing of Engineered Cementitious Composites at Two Different Maturity Levels *Özlem Kasap Keskin, Kamil Tekin, Süleyman Bahadır Keskin*
14:15 - 14:30	Design for Deconstruction: the potential for reducing demolition waste in the design stage and a BIM application *George Yun, Patricia R. B. Lima, Conrado S. Rodrigues*	Geopolymer Leaching in Water and Acetic Acid: SEM-EDS Study *Neven Ukrainczyk, Oliver Vogt,Eddie Koenders*
14:30 - 14:45	Towards the understanding the role of the mix design method in the mechanical behaviour of recycled aggregate concrete at early ages *Jeonghyun Kim, Miguel Azenha, Łukasz Sadowski*	Material Characterization of Geopolymer Concrete for its beneficial use in Composite Construction *J. Juhart, C. Gößler, C. Grengg, F. Mittermayr, A. McIntosh, B. Freytag*
14:45 - 15:00	Architectural Concrete versus White Stone: a New Approach to Restoring Historical Heritage *Vyacheslav R. Falikman, Vyacheslav V. Deniskin*	Correlating multi-scale pore structure and fluid transport through geopolymer cements: effect of formulation parameters *Catherine A. Dav, M. Bertin, B. Planel, P. Adler, G. Hauss, V. Cantarel, D. Lambertin*
15:00 - 15:15	Earth, gypsum and cement-based plasters contribution to indoor comfort and health *T. Santos, P. Faria, M. I. Gomes*	A correlation between sorptivity coefficients of concrete as calculated from relationships of water uptake with t^0.5 or t^0.25 *Yury A. Villagrán-Zaccardi, Natalia M. Alderete, Alejandra Benítez, María F. Carrasco, Patricio Corallo, Raúl López, Alejo Musante, Cristian Rios*
15:15 - 15:30	Green cementitious composites made with PCM-Recycled Brick Aggregates: Thermal Energy Storage characterization and modelling *Christoph Mankel, Antonio Caggiano, Andreas Koenig, Diego Said Schicchi, Mona Nazari Sam, Eddie A.B. Koenders*	10 years of research on sugar cane bagasse ash as supplementary cementitious material *Guilherme C. Cordeiro, Romildo D. Toledo-Filho, Eduardo M. R. Fairbairn, Luis M. Tavares*

24. TECHNICAL PROGRAMME

WEDNESDAY, 11 MARCH | THEMATIC SESSIONS 2

16:00 - 18:00	**Topic 3: Service life extension of existing structures** Grand Auditorium	**Topic 4: Shift to a circular economy** Small Auditorium
16:00 - 16:15	Nonlinear Analysis of offshore Wind Towers in prefabricated segments of prestressed Fibre Reinforced Concrete *Fabio P. Figueiredo, Joaquim A. O. Barros, A. Ventura-Gouveia*	Treated Municipal Solid Waste (Biomass) based Concrete Properties – Part I: State of the Art *Massoud Sofi, Lino Maia, Junli Liu, Ylias Sabri, Annie Zhou, Tawab Frah-mand, Priyan Mendis*
16:15 - 16:30	Numerical analyses of the connections between representative SFRC prestressed segments of off-shore wind towers *Chandan C Gowda, Fabio P Figueiredo, Joaquim A O Barros, A. Ventura-Gouveia*	Treated Municipal Solid Waste (Biomass) based Concrete Properties – Part II: Experimental Program *Massoud Sofi, Lino Maia, Junli Liu, Ylias Sabri, Annie Zhou, Tawab Frah-mand, Priyan Mendis*
16:30 - 16:45	Micro-to-meso scale mechanisms for modelling the fatigue response of cohesive frictional materials *Antonio Caggiano, Diego Said Schicchi, Swati Maitra, Sha Yang, Eddie A.B. Koenders*	Thermal Performance Assessment of Compressed Blocks made of C&D and Polyurethane Foam Wastes *A. Briga-Sá, V. Neiva, D. Leitão, T. Miranda, N. Cristelo*
16:45 - 17:00	Activated ductile CFRP NSMR strengthening *Jacob Wittrup Schmidt, Christian Overgaard Christensen, Per Goltermann, José Sena-Cruz*	Recycling of slightly contaminated demolition waste - Part 1: inorganic constituents *Anya Vollpracht, Lia Weiler*
17:00 - 17:15	Contribution of thermodynamic modeling to the understanding of interactions between hydrated cement pastes and organic acids *Cédric Roosz, Marie Giroudon, Laurie Lacarrière, Matthieu Peyre-Lavigne, Alexandra Bertron*	Use of waste calcium carbonate in sustainable cement *Luca Valentini, Ludovico Mascarin, Hassan Ez-zaki, Mark Bediako, Joseph Mwiti Marangu, Maurizio Bellotto*
17:15 - 17:30	Electrochemical realkalisation of carbonated “Dalle de Verre” windows *Shishir Mundra, Götz Hüsken, Hans-Carsten Küh-ne*	Causal Factors for Rehabilitating Water Distribution Networks *Rahimi A. Rahman, Noor Suraya Romali, Siti Sarah Sufian, Mazlan Abu Seman*
17:30 - 17:45	The chloride transport behaviour in carbonated concrete *Raphaele Malheiro, Aires Camões, Gibson Meira, Maria Teresa Amorim, João Castro-Gomes*	
17:45 - 18:00	Corrosion of Carbonated Structures. Real Cases of Structures in Spain *Nuria Rebolledo, Julio E. Torres, Javier Sánchez*	

24. TECHNICAL PROGRAMME

THURSDAY, 12 MARCH | THEMATIC SESSIONS 3

13:30 - 15:30	**Topic 1: Strategies for a resilient built environment** Small Auditorium	**Topic 2: New materials and structures for ultra-durability** Grand Auditorium
13:30 - 13:45	Integrated model for predicting the flexural capacity of concrete elements reinforced with non-corrodible discrete reinforcements *Tiago Valente, Christoph de Sousa, Inês Costa, Felipe Melo, Joaquim Barros*	Internal hydrophobization of cementitious materials by using of organosilicon compounds *Marcin Koniorczyk, Kalina Grabowska*
13:45 - 14:00	The Response Surface Methodology Applied to Study the Relationship Between Flexural Residual Strength and Compression Strength in Steel Fiber-Reinforced Concrete *G. Ruiz, Á. de la Rosa, E. Poveda*	Use of Microwave-Accelerated Curing under Low-Pressure in The Production of Ultra-Durability Portland Type I-Portland Cement Pastes *Natt Makul*
14:00 - 14:15	A Simplified Two-Step Approach for the Seismic Retrofitting Design of Existing Structures Towards a Resiliency Enhancement *Rafael Shehu*	Microencapsulation of Isophorone Diisocyanate with Silica Shell *Ahsanollah Beglarigale, Doğa Eyice, Yoldaş Seki and Halit Yazıcı*
14:15 - 14:30	Crack Analysis of Tensile and Bending RC Members *Gintaris Kaklauskas, Aleksandr Sokolov*	Pore-scale numerical modeling tools for improving efficiency of direct carbon capture in compacts *Ravi A. Patel, Nikolaos I. Prasianakis*
14:30 - 14:45	Experimental Study for Making Easily to Recovery of RC Piers Damaged by Earthquakes *Hisako Kobayashi, Kaoru Kobayashi, Takeshi Yamamoto*	Long term capillary imbibition of mortars with slag and fly ash *Natalia Alderete, Yury A. Villagrán-Zaccardi, Nele De Belie*
14:45 - 15:00	Resilience strategy after 2016 central Italy earthquake in historical centres: seismic vulnerability assessment method of traditional masonry buildings *L. Bernabei, R. Gulli, G. Mochi, G. Predari*	Pore size distribution of cement based materials determined by dynamic water vapour sorption and low temperature calorimetry *Tian Wang, Min Wu*
15:00 - 15:15	Durability of slag-blended cementitious materials interacts with high concentration of sodium sulphate *Chuang Li, Yogarajah Elakneswaran, Tomohiro Kajio, Eiji Owaki, Masataka Ogino, Toyoharu Nawa*	Usefulness of mercury porosimetry to assess the porosity of cement composites with the addition of aerogel particles *Jarosław Strzałkowski, Halina Garbalińska*
15:15 - 15:30	Using data analysis to extract structural deterioration information from the US National Bridge Inventory database *Filippos Alogdianakis, Dimos C. Charmpis, Ioannis Balafas*	Calcined clay-to-limestone ratio on durability properties of concrete with low clinker CEM II/B-M(Q/LL) cements *S. Ferreiro, R. Sacchi, L. Frølich, D. Herfort, J. S. Damtoft*

24. TECHNICAL PROGRAMME

THURSDAY, 12 MARCH | THEMATIC SESSIONS 4

16:00 - 18:00	**Topic 3: Service life extension of existing structures** Small Auditorium	**Topic 4: Shift to a circular economy** Grand Auditorium
16:00 - 16:15	Production of Recycled Aggregate Concrete using Construction and Demolition Waste *Oikonomopoulou K., Savva P., Ioannou S., Nicolaides D., Petrou M.F.*	Circular economic modelling - barriers and challenges throughout the value circle *Birgitte Holt Andersen, Giovanni Salvetti, Anastasija Komkova*
16:15 - 16:30	Hydric characterisation at different temperature of nuclear waste package's concrete *François Soleilhet, Patrick Sémété, Laurent Charpin, Ginger El Tabbal*	Barriers for Adopting Concrete Recycling in Construction Projects: Perspective of Project Managers *Rahimi A. Rahman, Noor Suraya Romali, Siti Sarah Sufian, Mazlan Abu Seman*
16:30 - 16:45	Tensile Characterization of Multi-Ply Fabric-Reinforced Cementitious Matrix *Giuseppe Bramato, Alessio Cascardi, Francesco Micelli, Maria Antonietta Aiello*	Screening regionally available natural resources and waste streams as potential supplementary cementitious material *Matea Flegar, Marijana Serdar, Diana Londono-Zuluaga, Karen Scrivener*
16:45 - 17:00	Pathological Manifestations of Neoprene Support Devices in Infrastructure *Fernando R. Gonçalves, Mohammad K Najjar, Ahmed W A Hammad, Assed N. Haddad, Elaine G. Vazquez*	Proposed Life Cycle Assessment Method in Building Water Heating Systems *Fernando R. Gonçalves, Mohammad K Najjar, Ahmed W A Hammad, Assed N. Haddad, Elaine G. Vazquez*
17:00 - 17:15	Effects of the thermal conditioning on the mechanical properties of an FRCM (Fiber Reinforced Cementitious Matrix) strengthening system *L. Ombres, P. Mazzuca, S. Verre*	Development of Sustainable perspective of carbon fibers recycling and reusing for construction materials *R. Napolitano, P. Vitale, C. Menna, D. Asprone*
17:15 - 17:30	Durability under thermal actions of concrete elements confined with an inorganic matrix fiber-reinforced composites *L. Ombres, P. Mazzuca, S. Verre*	Circular CO2 Utilization Strategies for More Sustainable Concrete *Sean Monkman, Mike Thomas*
17:30 - 17:45	Impact of the immersion/drying cycles of hemp concrete on durability *Kamilia Abahri, Alexandra Bourdot, Fares Bennai, Sylvain Langlois, Ghaith Alhaik*	Processed Waste Incineration Ashes as Sustainable Binder for Concrete Products *Aneeta Mary Joseph, Natalia Alderete Stijn Matthys, Nele De Belie*
17:45 - 18:00		Recycling of hydrated Portland cement paste for clinker production *Semion Zhutovsky, Andrei Shishkin*

24. TECHNICAL PROGRAMME

FRIDAY, 13 MARCH | THEMATIC SESSIONS 5

10:30 - 12:30	**Topic 1: Strategies for a resilient built environment** **Topic 4: Shift to a circular economy** Small Auditorium	**Topic 2: New materials and structures for ultra-durability** Grand Auditorium
10:30 - 10:45	Behaviour and characteristics of construction materials subjected to different environmental conditions *E. Menéndez, Y. Salem, E. Hernández Montes, M. C. Alonso, M. L. Gil*	Rheological Behaviour and Flow Properties of Alkali-Activated Materials *Mohammed Fouad Alnahhal, Taehwan Kim, Ailar Hajimohammadi*
10:45 - 11:00	Challenges and solution strategies for environmentally and socially responsible urban development of mega cities in Africa *Wolfram Schmidt, Nonkululeko Radebe, Mike Otieno, Kolawole Olonade, Shirin Fataei, Fatma Mohamed, Gesine Lenore Schiewer, Mareike Thiedeitz, Angela Tetteh Tawiah, Risikat Dauda, Ghada Bassioni, Melissa Telong, Andreas Rogge*	Assessing the alkali-sensitivity of the mechanical behaviour of jute fibres to evaluate their durability in cementitious composites applications *C. B. de Carvalho Bello, A. Cecchi, L. Ferrara*
11:00 - 11:15	Microstructural and chemical effects of accelerated carbonation of High-Volume Fly Ash binders in view of carbon sequestration *Philip Van den Heede, Nele De Belie*	Preliminary results on Life Cycle Assessment of pavements from alkali activated materials *Francesca Lolli, Kimberly E. Kurtis*
11:15 - 11:30	Optimization of alkali-activated mineral wool mixture for panels production *Majda Pavlin, Ana Frankovič, Barbara Horvat, Vilma Ducman*	Effect of Curing Temperature on the Alkali Activation of German Brown Coal Fly Ash *David W. Law, Patrick Sturm, Gregor J. G. Gluth, Chamila Gunasekara*
11:30 - 11:45	Suitability of different stabilizing agents in alkali-activated fly-ash based foams *Katja Traven, Mark Češnovar, Vilma Ducman*	The influence of municipal solid waste incinerator bottom ash on the performance of alkali-activated materials: A review *Rawz Kurda, Rui Vasco Silva, Jorge de Brito*
11:45 - 12:00	Influence of specific SCM on microstructure and early strength of sustainable concrete formulations *O. Rudic, J. Juhart, J. Tritthart, M. Krüger*	Mechanical property of cementitious materials incorporating stainless steel argon oxygen decarburization (AOD) slag according to CO2 curing *B. Park, J. H. Kim, Y. C. Choi, S. W. Yoo, T. S. Kim, S. H. Jung*
12:00 - 12:15	Performance evaluation of warm recycled surface mixtures with steel slag *P. Georgiou, A. Loizos*	Production of multifunctional cement-based composite using super-hydrophobic biochar *Muhammad Intesarul Haque, Rakibul Islam Khan, Warda Ashraf, Hemant Pendse*
12:15 - 12:30		Calorimetry study of the influence of Portland cement content, slag/fly ash ratio, and activator type on the early hydration of hybrid cements *Gregor J. G. Gluth, Solen Garel*

24. TECHNICAL PROGRAMME

FRIDAY, 13 MARCH | SPECIAL SESSION

10:30 - 12:30	**Early age and long-term crack width analysis in RC Structures** Room 1
10:30 - 10:45	Finite Element Modelling of Concentrated Anchorage Load in Early Age Concrete *Massoud Sofi, Lino Maia, Elisa Lumantarna, Aocheng Zhong, Priyan Mendis*
10:45 - 11:00	Concrete drying modelling in a variable temperature environment *Jean-Luc D. Adia, Herman Koala, Justin Kinda, Julien Sanahuja, Laurent Charpin*
11:00 - 11:15	Modelling the three-stage of creep *Vitor Dacol, Elsa Caetano*
11:15 - 11:30	A comparison between crack control reinforcement estimates from different codified approaches *Fragkoulis Kanavaris, Andy Gardner, Shintaro Ito, Fangjie Chen, Dirk Schlicke, Mariusz Zych, Agnieszka Jędrzejewska, Miguel Azenha*
11:30 - 11:45	Autogenous shrinkage in structural concrete made with Recycled Concrete Aggregates *Mayara Amario, Caroline S. Rangel, Marco Pepe, Enzo Martinelli, Romildo D. Toledo Filho*
11:45 - 12:00	3D Thermo-hygro-mechanical simulation of a RC slab under restrained shrinkage and applied loads: influence of the reinforcement ratio on service life behaviour *José Gomes, Rui Carvalho, Carlos Sousa, José Granja, Rui Faria, Dirk Schlicke, Miguel Azenha*
12:00 - 12:15	Influence of concrete mix design on the assessment of shrinkage restraint cracking *Farid Benboudjema, Céline Van Bunderen, Farah Rifai, Özlem Cizer*

24. TECHNICAL PROGRAMME

FRIDAY, 13 MARCH | THEMATIC SESSIONS 6

13:30 - 15:30	**Topic 2: New materials and structures for ultra-durability** Grand Auditorium	**Topic 4: Shift to a circular economy** Grand Auditorium
13:30 - 13:45	Using Waste Materials in Durable Environmentally Friendly Concrete *R. Morsy, S. Ghoniem*	Analysis of tensile behaviour of recycled aggregate concrete using acoustic emission technique *N. Williams Portal, M. Flansbjer, D. Carró-Lopez, I. Fernandez*
13:45 - 14:00	Urban Furniture in Fibre Reinforcement Concrete with High Durability *Felipe Melo, Inês Costa, Tiago Valente, Cristina Frazão, Christoph de Sousa, Ana Moreira, João Sá*	Mechanical and Physical Properties of Interlocking Compressed Earth Brick Units *B. H. Abu Bakar, S. Saari, Hazizan Md Akil, N. A. Surip*
14:00 - 14:15	Chloride ion penetration into cracked UHPFRC during wetting–drying cycles *Ana Mafalda Matos, Sandra Nunes, Stefan Chaves Figueiredo, Erik Schlangen, José L. Barroso Aguiar*	Performance and aging evaluation of a HMA with high RAP content *C. Santos, V. Antunes, J. Neves, A.C. Freire*
14:15 - 14:30	Steel reinforcement in slag containing binders and its susceptibility to chloride-induced corrosion *Shishir Mundra, John L. Provis*	The Influence of Polymers impregnation on Bending Behaviour of Phyllostachys Pubescens (Mosso) Bamboo *Lucas Muniz Valani, Fabrício de Campos Vitorino, Adriana Paiva de Souza Mar-tins, Romildo Dias Toledo Filho*
14:30 - 14:45	Analysis of prefabricated materials made with polyurethane roof wastes from vehicles *Javier Garabito, Verónica Calderón, Alba Rodrigo, Ángel Rodríguez, Jesús Gadea*	Strength and microstructure development of fly ash geopolymer binders using waste glass powder *Md. Nabi Newaz Khan, Jhutan Chandra Kuri, Prabir Kumar Sarker*
14:45 - 15:00	Microstructural evaluation of fibre reinforced slag based foams *M. Češnovar, K. Traven, V. Ducman*	Rheology and thixotropy of one-part fly ash/slag blended geopolymer pastes *Yazan Alrefaei*
15:00 - 15:15	Sustainable polyurethane plasterboard for construction *Víctor Miguel, Carlos Junco, Sara Gutiérrez, Lourdes Alameda , Alba Rodrigo*	Geopolymer concrete structures: bond with deformed steel bars *V.Romanazzi, M. Leone, M. A. Aiello, M. Pecce*
15:15 - 15:30	A New Dilation Model for FRP Fully/partially Confined Concrete Column under Axial Loading *Javad Shayanfar, Mohammadali Rezazadeh, Joaquim Barros, Honeyeh Ramezansefat*	

24. TECHNICAL PROGRAMME

FRIDAY, 13 MARCH | SPECIAL SESSION

13:30 - 15:30	**Self-healing as preventive repair of concrete structures** Room 1
13:30 - 13:45	Self-healing concrete research in the European projects SARCOS and SMARTINCS *Nele De Belie, Kim Van Tittelboom, Mercedes Sánchez Moreno, Liberato Ferrara, Elke Gruyaert*
13:45 - 14:00	Morphological and chemical characterization of self-healing products in MgO concrete *Maria Amenta, Stamatoula Papaioannou, Vassilis Kilikoglou, Ioannis Karatasios*
14:00 - 14:15	Impact of Super Absorbent Polymers on Early Age Behavior of Ultra-High Performance Concrete Walls *J. Kheir, L. De Meyst, J.R. Tenòrio Filho, T.A. Hammer, A. Klausen, B. Hilloulin, A. Loukili, N. De Belie*
14:15 - 14:30	Self-healing capacities of mortars with cristalline admixtures *Lina Ammar, Kinda Hannawi, Aveline Darquennes*
14:30 - 14:45	Influence of crack geometry and crack width on carbonation of High-Volume fly Ash (HVFA) mortar *Tim Van Mullem, Laurence De Meyst, Jessica P. Handoyo, Robby Caspeele, Nele De Belie, Philip Van den Heede*
14:45 - 15:00	Salt-scaling resistance of SAP-modified concrete under freeze-thaw cycles *José Roberto Tenório Filho, Els Mannekens, Didier Snoeck, Nele De Belie*
15:00 - 15:15	Self-healing of Engineered Cementitious Composites at Two Different Maturity Levels *José Roberto Tenório Filho, Els Mannekens, Didier Snoeck, Nele De Belie*

RILEM SPRING CONVENTION 2020

Under the auspice of:

Universidade do Minho

INSTITUTE OF SCIENCE AND INNOVATION FOR BIO-SUSTAINABILITY

American Concrete Institute