



# Programme

*77<sup>th</sup> RILEM Annual Week and the 1<sup>st</sup>  
Interdisciplinary Symposium on Smart &  
Sustainable Infrastructures (ISSSI 2023)*

*September 4-8, 2023  
Vancouver, Canada*





*77<sup>th</sup> RILEM Annual Week  
&  
the 1<sup>st</sup> Interdisciplinary Symposium on Smart &  
Sustainable Infrastructures (ISSSI 2023)*

# FINAL PROGRAMME

*September 4-8, 2023*

*Vancouver, BC*

*Canada*

# Message from the Chairs

On behalf of the RILEM Standing Committees and RILEM technical committees, and our various institutional and corporate sponsors, it gives us great pleasure to welcome you to Vancouver, BC, Canada.

We are excited that the **77<sup>th</sup> RILEM Annual Week and the 1<sup>st</sup> Interdisciplinary Symposium on Smart & Sustainable Infrastructures (ISSSI 2023)** brings together academics, industry personnel and practitioners from around the world to explore the latest international research in the field. RILEM Week includes meetings of RILEM Standing Committees (TAC, DAC, DEV, Bureau) and RILEM technical committees (TCs). Our programme includes an industrial session; the prestigious Robert L’Hermitte Lecture and an Award Ceremony is also held during the week.

ISSSI 2023 will coincide with RILEM Week 2023. The primary objective of ISSSI is to create an environment of mutual cooperation between experts in Materials and Structures and to provide a forum for active dialogue. We believe that it is only through such a multi-disciplinary approach that cross-fertilization of ideas occur and innovative solutions to our infrastructural inadequacies are found.

We are indebted to the many people who made this conference possible: the members of the Organizing, Technical, and International Advisory Committees; the reviewers who volunteered their expertise to safeguard the high quality and integrity of the papers presented; and our sponsors who generously funded this spectacular event.

We would like to extend our gratitude and admiration to our honorees, including Dr. Ravindra Gettu, Dr. Surendra Manjrekar, Dr. Changwen Miao, Dr. Takafumi Noguchi and Dr. Karen Scrivener, and congratulate them for their lifetime achievements. We look forward to a productive week of collaboration. Thank you for your participation and welcome to the 77<sup>th</sup> RILEM Week.



**Prof. Sidney Mindess**

Chair, RILEM Week 2023  
Professor Emeritus  
The University of British Columbia



**Prof. Nemy Banthia**

Co-Chair, RILEM Week 2023  
University Killam Professor  
The University of British Columbia

## Message from the Chair of the Organizing Committee

I would like to express a warm welcome to all of our colleagues attending the **77<sup>th</sup> RILEM Annual Week & the 1<sup>st</sup> Interdisciplinary Symposium on Smart & Sustainable Infrastructures (ISSSI 2023)**.

Most importantly, I would like to express my sincere appreciation and my heartfelt gratitude to the conference Co-Chairs, Prof. Sidney Mindess and Prof. Nemy Banthia, and to my fellow members of the Organizing Committee without whom hosting this conference would have not been possible. The members of the Organizing Committee have worked tirelessly over the past year to ensure this event becomes a great success.

The 77<sup>th</sup> RILEM Week is built upon the successes of its preceding annual meetings, and hereby, I would like to thank RILEM as well as all the previous Organizing Committees who helped shape this event to be what it is today.

A strong international interest in this meeting is clearly apparent from the 417 abstracts we received from 55 countries. After a rigorous review, these resulted in nearly 250 actual presentations. We are now hosting close to 300 delegates from 39 countries.

I would like to also thank all the authors who have submitted their research communications to us and waited patiently as we completed the rigorous review process, with the support of the top world experts in the field. This fruitful technical program and its *Proceedings* are the result of a collective effort. I hope you will find the discussions at the sessions useful and of an equally high quality.

I would like to sincerely thank the RILEM Bureau Officers, all Committee Members, my colleagues at the SIERA Group at The University of British Columbia, staff at IC-IMPACTS headquarters, and many others who provided unstinting help when needed. We welcome you all to Vancouver, Canada, and wish you an enjoyable stay in the world's most beautiful city.



**Dr. Salman Soleimani-Dashtaki**

Secretary, RILEM Week 2023  
Research Associate, SIERA Group  
The University of British Columbia

# Table of Contents

Message from the Chairs .....	1
Message from the Chair of the Organizing Committee.....	2
Organizing Committee .....	4
Technical Committee .....	5
International Advisory Board.....	9
Conference Sponsors .....	11
Conference at a Glance.....	12
Conference Honorees .....	17
Keynote Speaker .....	20
RILEM L’Hermitte Medalist .....	21
Conference Venue .....	22
Technical Programme .....	22
About the Sponsors.....	49
Map of Conference Venue .....	52
Sheraton Vancouver Wall Center Floor Plans.....	53
Map of Sheraton Vancouver Wall Center 3 <sup>rd</sup> Floor .....	54



## Organizing Committee

<b>Sidney Mindess (Chair)</b>	University of BC
<b>Nemkumar Banthia (Co-Chair)</b>	University of BC
<b>Salman Soleimani-Dashtaki (Secretary)</b>	University of BC
<b>Rishi Gupta</b>	University of Victoria
<b>Obinna Onuaguluchi</b>	University of BC
<b>Negar Roghanian</b>	University of BC
<b>Caijun Shi</b>	Hunan University
<b>Doo-Yeol Yoo</b>	Yonsei University
<b>Yamei Zhang</b>	Southeast University



# Technical Committee

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<b>Zhang, Min Hong</b>	Singapore
<b>Zhang, Yamei</b>	China
<b>Zunini, Franco</b>	Switzerland



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<b>Basheer, Mohammed</b>	UK

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**Department of Civil Engineering**  
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RILEM



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# Conference at a Glance

<b>Monday, Sep 4, 2023</b>				
<b>08:00 am</b> <b>04:30 pm</b>	<b>Information Desk &amp; Conference Registration @ Pavilion Foyer</b>			
<b>08:30 am</b> <b>10:00 am</b>	<b>I-A-1: RILEM TAC Meeting</b> <i>Burrard</i>	<b>I-A-2: RILEM DAC Meeting</b> <i>Vancouver</i>	<b>I-A-3: RILEM TC ACP Meeting</b> <i>Orca</i>	<b>I-A-4: Course D Session 1</b> <i>Finback</i>
<b>10:00 am</b> <b>10:30 am</b>	<b>Morning Coffee Break</b>			
<b>10:30 am</b> <b>12:00 pm</b>	<b>I-B-1: RILEM TAC Meeting</b> <i>Burrard</i>	<b>I-B-2: RILEM DAC Meeting</b> <i>Vancouver</i>	<b>I-B-3: RILEM TC FEE</b> <i>Orca</i>	<b>I-B-4: Course D Session 2</b> <i>Finback</i>
<b>12:00 pm</b> <b>01:00 pm</b>	<b>Lunch @ Port McNeil (North Tower – 4<sup>th</sup> Floor)</b>			
<b>01:00 pm</b> <b>02:30 pm</b>	<b>I-C-1: RILEM TAC Meeting</b> <i>Burrard</i>	<b>I-C-2: RILEM DAC Meeting</b> <i>Vancouver</i>	<b>I-C-3: Course D Session 3</b> <i>Finback</i>	
<b>02:30 pm</b> <b>03:00 pm</b>	<b>Afternoon Coffee Break</b>			
<b>03:00 pm</b> <b>04:30 pm</b>	<b>I-D-1: RILEM TAC Meeting</b> <i>Burrard</i>	<b>I-D-2: RILEM DAC Meeting</b> <i>Vancouver</i>	<b>I-D-3: Course D Session 4</b> <i>Finback</i>	
<b>05:00 pm</b> <b>07:00 pm</b>	<b>Young Delegates Meet &amp; Greet by RILEM Week 2023 Sponsors @ Port McNeil</b>			

# Tuesday, Sep 5, 2023

08:00 am 04:30 pm	<b>Information Desk &amp; Conference Registration @ Pavilion Foyer</b>		
08:30 am 10:00 am	II-A-1: RILEM TAC Meeting <i>Burrard</i>	II-A-2: RILEM TC 284-CEC (7:00am-9:00am) <i>Vancouver</i>	II-A-3: RILEM TC 297-DOC <i>Beluga</i>
	II-A-4: Course A Session 1 <i>Orca</i>	II-A-5: Course B Session 1 <i>Finback</i>	II-A-6: Manjrekar Honoree Session <i>Pavilion A</i>
10:00 am 10:30 am	<b>Morning Coffee Break</b>		
10:30 am 12:00 pm	II-B-1: RILEM BoE MS Meeting <i>Vancouver</i>	II-B-2: RILEM TC 305-PCC <i>Beluga</i>	II-B-3: Course A Session 2 <i>Orca</i>
	II-B-4: Course B Session 2 <i>Finback</i>		II-B-5: Manjrekar Honoree Session <i>Pavilion A</i>
12:00 pm 01:00 pm	<b>Lunch @ Pavilion Ballroom CD</b>		
01:00 am 02:30 pm	II-C-1: RILEM BoE MS Meeting <i>Vancouver</i>	II-C-2: RILEM TC 285-TMS <i>Beluga</i>	II-C-3: Course A Session 3 <i>Orca</i>
	II-C-4: Course B Session 3 <i>Finback</i>		II-C-5: Manjrekar Honoree Session <i>Pavilion A</i>
02:30 pm 03:00 pm	<b>Afternoon Coffee Break</b>		
03:00 pm 04:30 pm	II-D-1: RILEM DEV Meeting <i>Burrard</i>	II-D-2: Course A Session 4 <i>Orca</i>	II-D-3: Course B Session 4 <i>Finback</i>
06:00 pm 09:00 pm	<b>Conference Opening Reception @ Pavilion Foyer</b>		



## Wednesday, Sep 6, 2023

08:30 am 10:00 am	<b>III-A-1: Conference Plenary Session @ Pavilion CD</b>		
10:00 am 10:30 am	<b>Morning Coffee Break</b>		
10:30 am 12:00 pm	<b>III-B-1: RILEM Bureau Meeting</b> <i>Vancouver</i>	<b>III-B-2: Gettu Honoree Session</b> <i>Finback</i>	<b>Session III-B-3 Carbon Reduction</b> <i>Pavilion CD</i>
	<b>Session III-B-4 Sustainable UHPC</b> <i>Pavilion A</i>	<b>Session III-B-5 Advanced Materials &amp; Methods</b> <i>Pavilion B</i>	<b>Session III-B-6 Durability</b> <i>Orca</i>
12:00 pm 01:00 pm	<b>Lunch @ Pavilion Ballroom CD</b>		
01:00 pm 02:30 pm	<b>III-C-1: RILEM Bureau Meeting</b> <i>Vancouver</i>	<b>III-C-2: Gettu Honoree Session</b> <i>Finback</i>	<b>Session III-C-3 Carbon Reduction</b> <i>Pavilion CD</i>
	<b>Session III-C-4 Sustainable UHPC</b> <i>Pavilion A</i>	<b>Session III-C-5 Advanced Materials &amp; Methods</b> <i>Pavilion B</i>	<b>Session III-C-6 Durability</b> <i>Orca</i>
02:30 pm 03:00 pm	<b>Afternoon Coffee Break</b>		
03:00 pm 04:30 pm	<b>III-D-1: RILEM Bureau Meeting</b> <i>Vancouver</i>	<b>III-D-2: Gettu Honoree Session</b> <i>Finback</i>	<b>Session III-D-3 Smart Technology</b> <i>Pavilion CD</i>
	<b>Session III-D-4 Sustainable UHPC</b> <i>Pavilion A</i>	<b>Session III-D-5 Resilience</b> <i>Pavilion B</i>	<b>Session III-D-6 Durability</b> <i>Orca</i>
06:30 pm 10:00 pm	<b>*RILEM Banquet Dinner – Odyssey to India</b> Venue: South Hall Banquet Palace (Address: 8273 Ross Street, Vancouver, BC)		

\*Transportation will be provided to/from the venue. Busses will be loading from 5:00 to 6:00 pm (every 10 min), in front of the hotel lobby; return from 9:00 pm

# Thursday, Sep 7, 2023

09:00 am 03:00 pm	Information Desk & Conference Registration @ Pavilion Foyer		
08:00 am 10:00 am	IV-A-1: Plenary Honoree Keynotes @ Pavilion CD		
10:00 am 10:30 am	Morning Coffee Break		
10:30 am 12:00 pm	IV-B-1: RILEM TC Presentations <i>Pavilion CD</i>		IV-B-2: Gettu Honoree Session <i>Finback</i>
	IV-B-3: Noguchi Honoree Session <i>Pavilion A</i>	IV-B-4: Miao Honoree Session <i>Orca</i>	IV-B-5: Scrivener Honoree Session <i>Pavilion B</i>
12:00 pm 01:00 pm	Lunch @ Pavilion Ballroom CD		
01:00 am 02:30 pm	IV-C-1: RILEM General Council Meeting <i>Pavilion CD</i>		IV-C-2: Noguchi Honoree Session <i>Pavilion A</i>
	IV-C-3: Miao Honoree Session <i>Orca</i>	Session IV-C-4 Durability <i>Pavilion B</i>	Session IV-C-5 Sustainable UHPC <i>Finback</i>
02:30 pm 03:00 pm	Afternoon Coffee Break		
03:00 pm 04:30 pm	Session IV-D-1 Carbon Reduction <i>Pavilion CD</i>		IV-D-2: Gettu Honoree Session <i>Finback</i>
	Session IV-D-3 Advanced Materials & Methods <i>Pavilion A</i>		Session IV-D-4 Durability <i>Pavilion B</i>

## Friday, Sep 8, 2023

08:30 am 12:00 pm	<b>Information Desk &amp; Conference Registration @ Pavilion Foyer</b>		
08:30 am 10:00 am	<b>V-A-1: Gettu Honoree Session</b>  <i>Finback</i>	<b>Session V-A-2</b> Advanced Materials & Methods  <i>Orca</i>	<b>Session V-A-3</b> Smart Technologies  <i>Parksville</i>
10:00 am 10:30 am	<b>Morning Coffee Break</b>		
10:30 am 12:00 pm	<b>V-B-1: Gettu Honoree Session</b>  <i>Finback</i>	<b>Session V-B-2</b> Smart Technologies  <i>Orca</i>	<b>Session V-B-3</b> Carbon Reduction  <i>Parksville</i>
12:00 pm 01:00 pm	<b>Lunch @ Junior Ballroom</b>		
01:00 am 02:30 pm	<b>V-C-1: Gettu Honoree Session</b>  <i>Finback</i>		
05:00 pm 06:00 pm	<b>*Cruise Boarding for the Gala Dinner</b> <i>Coal Harbour Dock @ 1601 Bayshore Drive, Vancouver, BC</i>		
06:00 pm 09:00 pm	<b>**Cruise Gala Dinner</b>		

\* Transportation will be provided to/from the dock. Busses will be loading from 4:00 pm to 5:30 pm (every 15 min), in front of the hotel lobby

\*\* Tickets needed for this function, purchasable from the registration desk

<b>Registration</b>
<b>Plenary Sessions</b>
<b>Social Events</b>

## Conference Honorees

There will be five special honoree sessions during RILEM Week 2023, honoring the lifetime research and work of our highly distinguished colleagues from around the world. The sessions will be run parallel to the general sessions.

### **Professor Ravindra Gettu**



Prof. Ravindra Gettu is currently V.S. Raju Chair Professor, in the Department of Civil Engineering, at the Indian Institute of Technology Madras, Chennai. He obtained his Ph.D. degree in Structural Engineering from Northwestern University.

He was honoured for outstanding contributions at the Gettu-Kodur Symposium on Advances in Science & Technology of Concrete, organized by the India Chapter of the American Concrete Institute, Mumbai, in 2018.

He was elected as a Fellow of the Indian National Academy of Engineering in 2018. He is the Immediate Past President and Fellow of RILEM, the International Union of Laboratories and Experts in Construction Materials, Structures and Systems, based in France. He was elected as a Foreign Member of the Russian Academy of Engineering in 2019.

The areas of research of Dr. Gettu have been fracture mechanics of concrete and rock; nonlinear behaviour of cement-based materials; high strength, fibre reinforced and self compacting concretes; sustainability and the effective use of chemical admixtures.

**Dr. Surendra Manjrekar**



Dr. Surendra Manjrekar is CMD of Sunanda Specialty Coatings Pvt. Ltd. Surendra is the “Honorary Member” of American Concrete Institute (2018) and “Honorary Fellow” of Institute of Concrete Technology (ICT), UK (2022). Construction Industry Development Council (CIDC) India honored him with “Industry Doyen Award” (2017). He was three times “President of India Chapter of ACI” and “Principal Convener of ACI Certification in India” (2008 – present).

Surendra is Vice Chancellor appointee on “Internal Quality Assurance Cell” of Dr. Homi Bhabha State University, Mumbai as an Industry representative. He is Special Signatory to MOU for technical co-operation between India, Singapore, Vietnam and Malaysia organized by ACI in Singapore (2019).

**Professor Changwen Miao**



Prof. Changwen Miao, academician of Chinese Academy of Engineering, professor of Southeast University and President of Jiangsu Research Institute of Building Science Co., Ltd. Prof. Miao has been making great contribution to the improvement of the durability of concrete, developing key technologies of anti-cracking for concrete, and R&D on multifunctional materials for civil engineering.

Prof. Miao also serves as a member of Administrative Decision Committee of RILEM, Associate editor of the journal of Cement and Concrete Composites, Vice director of China Building Material Federation, Executive director of China Civil Engineering Society, Executive Director of The Chinese Ceramic Society, Vice director of China Concrete and Cement-based Products Association and etc.

### **Professor Takafumi Noguchi**



Prof. Noguchi is a professor at the University of Tokyo. He obtained Ph.D. degree in Mechanical Properties of High Strength Concrete from the University of Tokyo. His research fields are wide-ranging, and he has authored numerous papers on high-strength concrete, self-compacting concrete, completely-recyclable concrete, carbon neutral concrete, optimization of maintenance of concrete structures, fire-resistance of concrete, etc.

Prof. Noguchi is Vice-president of Architectural Institute of Japan, President of Japan Society for Finishings Technology, Chief Director of Ready-mixed & Returned Concrete Solution Association, Chair of ISO/TC71/SC8 (Environmental management for concrete and concrete structures), Deputy-chair of fib Commission 7 (Sustainability), Member of ACI 130 Committee (Sustainability of Concrete), Fellow of RILEM, and Fellow of Japan Concrete Institute.

### **Professor Karen Scrivener**

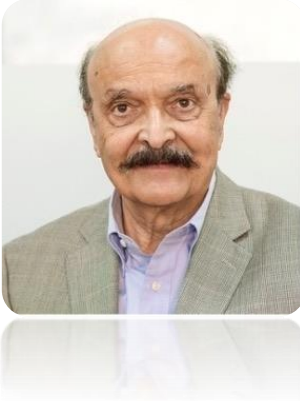


Prof. Karen Scrivener is a material chemist known for her pioneering works in cementitious materials. She is the head of Laboratory of Construction Materials at Ecole Polytechnique Fédérale de Lausanne and served as the editor-in-chief of the Cement and Concrete Research journal for 15 years.

Dr. Karen Scrivener works at the interface between academic research and industrial applications in the cement industry. Her academic studies of microscopic structure have considerably advanced the understanding of the behavior of cementitious materials, in particular with regard to the deterioration of concrete. She is a founder of the Nanocem network, which in ten years has grown to include 11 industrial partners and 22 academic partners.

## Keynote Speaker

### **Professor Surendra P. Shah**



Prof. Shah has been actively involved in concrete technology research for several decades. He has made pioneering and groundbreaking contributions to understanding fiber-reinforced concrete, damage, and fracture and developing innovative experimental techniques. He is the Director of the Center of Advanced Construction Materials, Civil engineering department at the University of Texas.

He served as a Professor of Civil Engineering, at Northwestern University and founded NSF-funded Center for Advanced Cement Based Materials (ACBM) including the academic partner universities of Illinois, Michigan, Purdue, and NIST.

## RILEM L’Hermite Medalist



### **Professor Gaurav Sant**

The 2023 RILEM Robert L’Hermite Medal was awarded to Prof. Sant, who is Full Professor in Sustainability at the University of California, Los Angeles (UCLA), where he is Director of UCLA’s Institute for Carbon Management. The Robert L’Hermite medal was awarded to Prof. Sant in recognition of his activity aimed at developing new technologies for carbon dioxide management and improving the service life of modern construction materials.

In particular, he has played a significant role in development of carbonate-cemented composites and data-driven concrete optimization by application of machine learning. His remarkable research activity, testified by numerous indicators such as highly cited publications and patents, has reached beyond the borders of the academic community, leading to the creation of award-winning companies and industrial consortia.

Moreover, he has also been active in communicating research results to legislators, to illustrate pathways for technological carbon management. In 2017, Prof. Sant received one of the Gustavo Colonnetti medals for his previous work on silicate dissolution in cementitious environments. Since then, his research activity has diversified and accelerated, bringing him to the leadership position in CO<sub>2</sub> management that is today acknowledged by the Robert L’Hermite Medal 2023.



## Conference Venue

Function	Location
<b>Accommodation</b>	Sheraton Vancouver Wall Center
<b>Conference Sessions &amp; Registration</b> <i>Sep 4-8, 2023</i>	Sheraton Vancouver Wall Center <i>Registration: Pavilion Foyer</i>
<b>Opening Reception</b> <i>Tuesday Sep 5, 2023</i>	Sheraton Vancouver Wall Center <i>Pavilion CD</i>
<b>Banquet Dinner</b> <i>Wednesday Sep 6, 2023</i>	South Hall Banquet Palace <i>Address: 8273 Ross St, Vancouver, BC</i>
<b>Cruise Gala Dinner</b> <i>Friday Sep 8, 2023</i>	Coal Harbour at 1601 Bayshore Drive

## Technical Programme

### Monday, September 4<sup>th</sup>, 2023

#### Conference Registration Desk

08:00 AM 04:30 PM	Conference Registration & Information	<i>Pavilion Foyer</i>
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#### RILEM Meetings

*Monday, September 4<sup>th</sup>, 2023*

08:30 AM 10:00 AM	I-A-1: RILEM TAC Meeting	<i>Burrard</i>
08:30 AM 10:00 AM	I-A-2: RILEM DAC Meeting	<i>Vancouver</i>
08:30 AM 10:00 AM	I-A-3: RILEM TC ACP Meeting	<i>Orca</i>

#### Conference Courses

*Monday, September 4<sup>th</sup>, 2023*

08:30 AM 10:00 AM	I-A-4: Additive Manufacturing and 3D Concrete Printing <i>Course D Session 1</i>	<i>Finback</i>
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10:00 AM 10:30 AM	<b>Coffee Break</b>	<b>Foyer</b>
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<b>RILEM Meetings</b>		<i>Monday, September 4<sup>th</sup>, 2023</i>
10:30 AM 12:00 PM	I-B-1: RILEM TAC Meeting	<i>Burrard</i>
10:30 AM 12:00 PM	I-B-2: RILEM DAC Meeting	<i>Vancouver</i>
10:30 AM 12:00 PM	I-B-3: RILEM TC FEE Meeting	<i>Orca</i>

<b>Conference Courses</b>		<i>Monday, September 4<sup>th</sup>, 2023</i>
10:30 AM 12:00 PM	I-B-4: Additive Manufacturing and 3D Concrete Printing <i>Course D Session 2</i>	<i>Finback</i>

12:00 PM 01:00 PM	<b>Lunch Break</b>	<b>Port McNeil</b>
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<b>RILEM Meetings</b>		<i>Monday, September 4<sup>th</sup>, 2023</i>
01:00 PM 02:30 PM	I-C-1: RILEM TAC Meeting	<i>Burrard</i>
01:00 PM 02:30 PM	I-C-2: RILEM DAC Meeting	<i>Vancouver</i>

<b>Conference Courses</b>		<i>Monday, September 4<sup>th</sup>, 2023</i>
01:00 PM 02:30 PM	I-C-3: Additive Manufacturing and 3D Concrete Printing <i>Course D Session 3</i>	<i>Finback</i>

02:30 PM 03:00 PM	<b>Coffee Break</b>	<b>Foyer</b>
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<b>RILEM Meetings</b>		<i>Monday, September 4<sup>th</sup>, 2023</i>
03:00 PM 04:30 PM	I-D-1: RILEM TAC Meeting	<i>Burrard</i>
03:00 PM 04:30 PM	I-D-2: RILEM DAC Meeting	<i>Vancouver</i>

<b>Conference Courses</b>		<i>Monday, September 4<sup>th</sup>, 2023</i>
03:00 PM 04:30 PM	I-D-3: Additive Manufacturing and 3D Concrete Printing <i>Course D Session 4</i>	<i>Finback</i>

<b>Evening Program</b>		<i>Monday, September 4<sup>th</sup>, 2023</i>
05:00 PM 07:00 PM	Young Delegates Meet & Greet by RILEM Week 2023 Sponsors	<i>Port McNeil</i>

**Tuesday, September 5<sup>th</sup>, 2023**

<b>Conference Registration Desk</b>		
08:00 AM 04:30 PM	Conference Registration & Information	<i>Pavilion Foyer</i>

<b>RILEM Meetings</b>		<i>Tuesday, September 5<sup>th</sup>, 2023</i>
08:30 AM 10:00 AM	II-A-1: RILEM TAC Meeting	<i>Burrard</i>
07:00 AM 09:00 AM	II-A-2: RILEM TC 284-CEC Meeting	<i>Vancouver</i>
08:30 AM 10:00 AM	II-A-3: RILEM TC 297-DOC Meeting	<i>Beluga</i>

<b>Conference Courses</b>		<i>Tuesday, September 5<sup>th</sup>, 2023</i>
08:30 AM 10:00 AM	II-A-4: High Performance Supplementary Cementitious Materials <i>Course A, Session 1</i>	<i>Orca</i>
08:30 AM 10:00 AM	II-A-5: Ultra High-Performance Concrete (UHPC) <i>Course B, Session 1</i>	<i>Finback</i>

<b>II-A-6: Durability</b> <b>Dr. Manjrekar Special Session [8:30 AM – 10:00 AM]</b> <i>Session Co-Chairs: Prof. Basheer, Prof. Durán-Herrera</i>		<b>Pavilion A</b>
<i>Timing for each paper: 12 min presentation + 3 min for Q&amp;A</i>		
8:30 AM	Evaluation of Tensile Behaviour of 3D Printed Concrete Assemblies with Reinforcement <b>Tippabhotla, A.</b>	
8:45 AM	Autogenous and Stimulated Healing of UHPC Under Torsion Induced Cracking <b>Ferrara, L.</b>	
9:00 AM	Use of Pull-Out Strength to Determine the Equivalent $f'_c$ of Concrete from Core Strengths and the Criterias Stablished in ACI 214.4-21 and ACI 562-19 <b>Durán-Herrera, A.</b>	
9:15 AM	Concrete Cracking and Corrosion in Front of the Gulf of México. Long Term Empirical Correlation <b>Castro Borges, P.</b>	
9:30 AM	Specifications and Acceptance Criterias for Corrosion Inhibiting Admixtures in Concrete Systems Exposed to Chlorides <b>Kamde, D.</b>	
9:45 AM	Marine Corrosion and its Mitigation <b>Jadhav, B.</b>	

10:00 AM 10:30 AM	<b>Coffee Break</b>	<b>Pavilion Foyer</b>
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<b>RILEM Meetings</b>		<i>Tuesday, September 5<sup>th</sup>, 2023</i>
10:30 AM 12:00 PM	II-B-1: RILEM BoE MS Meeting	<i>Vancouver</i>
10:30 AM 12:00 PM	II-B-2: RILEM TC 305-PCC Meeting	<i>Beluga</i>

<b>Conference Courses</b>		<i>Tuesday, September 5<sup>th</sup>, 2023</i>
10:30 AM 12:00 PM	II-B-3: High Performance Supplementary Cementitious Materials <i>Course A, Session 2</i>	<i>Orca</i>
10:30 AM 12:00 PM	II-B-4: Ultra High-Performance Concrete (UHPC) <i>Course B, Session 2</i>	<i>Finback</i>

<b>II-B-5: Carbon Reduction</b>		<b>Pavilion A</b>
<b>Dr. Manjrekar Special Session [10:30 AM–12:00 PM]</b> <i>Session Co-Chairs: Prof. Basheer, Prof. Durán-Herrera</i>		
<i>Timing for each paper: 12 min presentation + 3 min for Q&amp;A</i>		
10:30 AM	Influence of Dry-Ice Based CO <sub>2</sub> Sequestration in Concrete on its Microstructure, Mechanical and Durability Properties <b>Basheer, M.</b>	
10:45 AM	The Repairs, Renovation, Waterproofing of 50 Years Old “Wankhede Cricket Stadium” with Reduction of Carbon Foot Print of Over 10,00,000 Kgs of CO <sub>2</sub> <b>Manjrekar, R.</b>	
11:00 AM	Galvanized Bars: Understanding its Coating <b>Thalakkal, K.</b>	
11:15 AM	Case Study - State of the Art Repairs and Restoration of 200 Years Old Low-Rise Heritage Structure – Anand Ashram in Mumbai Metropolis, Thane City <b>Nakhawa, A.</b>	
11:30 AM	Environmental Assessment of Asphaltic Wearing Course Containing Mixed Plastic Waste in Singapore <b>Lee, K.</b>	

12:00 PM 01:00 PM	<b>Lunch Break</b>	<b>Pavilion Ballroom</b>
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<b>RILEM Meetings</b>		<i>Tuesday, September 5<sup>th</sup>, 2023</i>
01:00 PM 02:30 PM	II-C-1: RILEM BoE MS Meeting (Optional)	<i>Vancouver</i>
01:00 PM 02:30 PM	II-C-2: RILEM TC 285-TMS Meeting	<i>Beluga</i>

<b>Conference Courses</b>		<i>Tuesday, September 5<sup>th</sup>, 2023</i>
01:00 PM 02:30 PM	II-C-3: High Performance Supplementary Cementitious Materials <i>Course A, Session 3</i>	<i>Orca</i>
01:00 PM 02:30 PM	II-C-4: Ultra High-Performance Concrete (UHPC) <i>Course B, Session 3</i>	<i>Finback</i>

<b>II-C-5: Durability</b> <b>Dr. Manjrekar Special Session [1:00 PM–2:30 PM]</b> <i>Session Co-Chairs: Prof. Basheer, Prof. Durán-Herrera</i>		<b>Pavilion A</b>
<i>Timing for each paper: 12 min presentation + 3 min for Q&amp;A</i>		
01:00 PM	Decarbonizing cement and concrete-based construction: Myth, reality and the journey ahead (“Opportunities, Challenges, and Sectoral Considerations”) <b>Sant, G.</b>	
01:15 PM	A Refined Modeling Scheme for Transport of Multiple Ionic Species Through Concrete <b>Neithalath, N.</b>	
01:30 PM	The Mechanisms Behind the Detrimental Effect of Pumping on the Freeze-Thaw Durability of Concrete <b>Feys, D.</b>	
01:45 PM	Design and Construction of Merdeka 118 Tower Using High Performance Concrete: Pushing the Boundaries of Concrete Technology for Mega tall Tower <b>Abdelrazaq, A.</b>	
02:00 PM	Influence of Cold Joint on Fracture Behavior of 3D Printed Concrete <b>Kamakshi, T.</b>	
02:15 PM	The Connection Between Design and Construction Non-Performance and Sustainability in Concrete Construction <b>Stivaros, P.</b>	

02:30 PM 03:00 PM	<b>Coffee Break</b>	<b>Pavilion Foyer</b>
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<b>RILEM Meetings</b>		<i>Tuesday, September 5<sup>th</sup>, 2023</i>
03:00 PM 04:30 PM	II-D-1: RILEM DEV Meeting	<b>Burrard</b>

<b>Conference Courses</b>		<i>Tuesday, September 5<sup>th</sup>, 2023</i>
03:00 PM 04:30 PM	II-D-2: High Performance Supplementary Cementitious Materials <i>Course A, Session 4</i>	<b>Orca</b>
03:00 PM 04:30 PM	II-D-3: Ultra High-Performance Concrete (UHPC) <i>Course B, Session 4</i>	<b>Finback</b>

<b>Evening Program</b>		<i>Tuesday, September 5<sup>th</sup>, 2023</i>
06:00 PM 09:00 PM	Welcome Reception	<i>Pavilion Ballroom</i>

**Wednesday, September 6<sup>th</sup>, 2023**

<b>Plenary Session [8:30 AM – 10:00 AM]</b>		<i>Pavilion CD</i>
Opening Remarks and Plenary Speeches		
08:30 AM	Welcome notes by Nemy Banthia, Conference Chair	
08:35 AM	Welcome notes by Nicolas Roussel, RILEM President	
08:40 AM	Welcome notes by Salman Soleimani-Dashtaki, Conference Secretary	
08:45 AM	Keynote by Surendra Shah	
09:15 AM	L’Hermite Medalist Lecture by Gaurav Sant	
10:15 AM	Group Photo – In front of the Sheraton Hotel	

10:00 AM 10:30 AM	<b>Coffee Break</b>	<i>Pavilion Foyer</i>
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<b>RILEM Meetings</b>		<i>Wednesday, September 6<sup>th</sup>, 2023</i>
10:30 AM 12:00 PM	III-B-1: RILEM Bureau Meeting	<i>Vancouver</i>

<b>III-B-2: Fracture of Cementitious Composites</b>		<b>Finback</b>
<b>Prof. Gettu Special Session [10:30 AM – 12:15 PM]</b>		
<i>Session Co-Chairs: Prof. Santhanam &amp; Prof. Subramaniam</i>		
<i>Timing for each paper: 12 min presentation + 3 min for Q&amp;A</i>		
10:30 AM	(Invited Talk) Looking back at the Advancement of the Fracture Mechanics of Concrete in 50 years <b>Bazant, Z.</b>	
10:45 AM	Thoughts on Hybrid Fiber Reinforced Systems for Optimal Performance <b>Gopalaratanam, V</b>	

11:00 AM	On the Relationship Between the Impact Behaviour and the Standard Toughness Parameters of Fibre Reinforced Concrete (FRC) <b>Zerbino, R.</b>
11:15 AM	Fatigue testing for the validation of fatigue models for SFRC <b>Koorikkattil, A.</b>
11:30 AM	Influence of Incorporating Short Glass Fibers on the Tensile Behavior of Textile-Reinforced Concrete <b>Paul, S.</b>
11:45 AM	Assessment of Parameters Affecting Degradation of PVC Coated Fibers <b>Paul, S.</b>
12:00 PM	Characterization of Uniaxial Tensile Response of Textile Reinforced Concrete Using Digital Image Correlation <b>Samanthula, R.</b>

<b>III-B-3: Carbon Reduction [10:30 AM – 12:00 PM]</b>		<b>Pavilion CD</b>
<i>Session Co-Chairs: Prof. Beushausen &amp; Prof. Maruyama</i>		
<i>Timing for each paper: 12 min presentation + 3 min for Q&amp;A</i>		
10:30 AM	[Invited Paper] Carbon Utilization on the Production of Alkali-Activated Materials <b>Kim, J.</b>	
10:45 AM	Paving Zero Emissions? <b>Blom, J.</b>	
11:00 AM	Thermal Energy Storage of Integrated Energy and Structural Retrofitting Systems for Masonry Walls: Cases Studies and Numerical Assessments <b>Caggiano, A.</b>	
11:15 AM	Microstructural Analysis of Ternary Hybrid Alkaline Binders Containing Slag, Fly Ash and Portland Cement <b>Etcheverry, J.</b>	
11:30 AM	The Effects of Using Recycled Sand with Customized Granulometry in Lime-Cement Masonry Mortars <b>Grogorjev, V.</b>	
11:45 AM	Decarbonization Through CO <sub>2</sub> Mineralization in the Formation of Magnesium-Silicate-Hydrate/ Magnesium Hydroxide System <b>Marsiske, M.</b>	



<b>III-B-4: Sustainable UHPC [10:30 AM – 12:00 PM]</b> <i>Session Co-Chairs: Prof. Kim &amp; Prof. Feys</i>		<b>Pavilion A</b>
<i>Timing for each paper: 12 min presentation + 3 min for Q&amp;A</i>		
10:30 AM	Mitigating Autogenous Shrinkage by Using Recycled Superabsorbent Polymers <b>Snoeck, D.</b>	
10:45 AM	Characteristics of High Calcium Fly Ash Geopolymer Mortar <b>Law, D.</b>	
11:00 AM	The Role of Reinforced Interface Adhesive Layer to Construct Resilient Pavement <b>Omranian, S.</b>	
11:15 AM	New Supplementary Cementitious Materials from the Co-Calcination of Green Liquor Dreg and Kaolinite <b>Adesanya, E.</b>	
11:30 AM	The evolution of air bubbles in 3D printed cement-based materials and its effect on mechanical properties <b>Yu, C.</b>	
11:45 AM	Final Disposal of Molecular Sieves in Cement Mortars <b>Ring, R.</b>	

<b>III-B-5: Advanced Materials &amp; Methods [10:30 AM – 12:00 PM]</b> <i>Session Co-Chairs: Prof. Kanematsu</i>		<b>Pavilion B</b>
<i>Timing for each paper: 12 min presentation + 3 min for Q&amp;A</i>		
10:30 AM	Unveiling Pore Formation and its Influence on Micromechanical Property and Failure of 3D Printed Foam Concrete Modified with Hydroxypropyl Methylcellulose and Silica Fume <b>Liu, C.</b>	
10:45 AM	Study of Hydration of Belite-Based Cement with High Gypsum Content <b>Goncharov, A.</b>	
11:00 AM	New Insights into the Role of Early C3A and C3S Hydration in the Structural Build-up Fresh Cement Paste <b>Han, K.</b>	
11:15 AM	Chloride Transport Characterisation in Self-Healing Concretes <b>Dabral, K.</b>	
11:30 AM	The Shrinkage of 3DPC, Effect of Surface to Volume Ratio, Water to Binder Ratio, and PP Fiber <b>Ma, L.</b>	
11:45 AM	The Effect of UEA on the Microstructural and Mechanical Properties of Mortar Fabricated Through Alternate 3D Printing <b>Zou, Y.</b>	

<b>III-B-6: Durability [10:30 AM – 12:00 PM]</b> <i>Session Co-Chairs: Prof. Weiss &amp; Prof. Zhutovsky</i>		<b>Orca</b>
<i>Timing for each paper: 12 min presentation + 3 min for Q&amp;A</i>		
10:30 AM	Self-Healing Performance Evaluation for Concrete Beams with Artificial Inner Tunnel and Repair Agents by Non-Destructive Testing <b>Lee, S.</b>	
10:45 AM	Effects of Natural Drying and Carbonation on a Method for Investigating Fire-Damaged Concrete Using Phenolphthalein Solutions <b>Kinose, T.</b>	
11:00 AM	Proposal for a New Maintenance and Deterioration Prediction System Using Center of Core <b>Iyoda, T.</b>	
11:15 AM	Effects on Hydration Reactions by Different Curing Temperatures for Various Types of Cement <b>Yahiro, R.</b>	
11:30 AM	Durability Survey of Reinforced Concrete Structures Exposed to Salt Damage Environment for 30 Years - Verification of The Technology for Service Life Extension <b>Kage, T.</b>	
11:45 AM	Effect of Finishing Materials on Rebar Corrosion Inhibition in Reinforced Concrete Specimens after Five Year Outdoor Exposure Test <b>Matsuzawama, K.</b>	

12:00 PM 01:00 PM	<b>Lunch Break</b>	<b>Pavilion Ballroom</b>
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<b>RILEM Meetings</b>		<i>Wednesday, September 6<sup>th</sup>, 2023</i>
01:00 PM 02:30 PM	III-C-1: RILEM Bureau Meeting	<b>Vancouver</b>

<b>III-C-2: Durability of Cementitious Systems</b> <b>Prof. Gettu Special Session [1:00 PM – 2:30 PM]</b> <i>Session Co-Chairs: Prof. Alexander &amp; Prof. Castro Borges</i>		<b>Finback</b>
<i>Timing for each paper: 12 min presentation + 3 min for Q&amp;A</i>		
01:00 PM	Enhancement of Concrete Durability with Sustainable Binder Systems <b>Santhanam, M.</b>	

01:15 PM	Electrical Resistance and Fibre Optic Sensors for Monitoring the Durability Performance of Concrete in Structures <b>Basheer, M.</b>
01:30 PM	Valorisation of Iron-Rich Non-Ferrous Metallurgy Slag in Concrete and Effects on Durability <b>De Belie, N.</b>
01:45 PM	Acid Resistance Evaluation of Expansive and Non-Expansive Calcium Sulfoaluminate Cements <b>Damion, T., Chaunsali, P.</b>
02:00 PM	Potential Strength and Durability of Blended Low-Grade Limestone and Calcined Clay Cement Concrete <b>Radheshyam Chauhan, A.</b>
02:15 PM	Valorization of Textile Waste in Laminated Fabric Reinforced-Cementitious Composite Plates: Tensile and Durability Performance <b>Sadrolodabae, P.</b>

<b>III-C-3: Carbon Reduction [1:00 PM – 2:30 PM]</b>		<b>Pavilion CD</b>
<i>Session Co-Chairs: Prof. Blom &amp; Dr. McGrath</i>		
<i>Timing for each paper: 12 min presentation + 3 min for Q&amp;A</i>		
01:00 PM	The Comparison of Waste Glass and Limestone Chip Seals Performance <b>Shamsaei, M.</b>	
01:15 PM	Glassy Pozzolanic SCM Produced by Flash In-Flight Vitrification of a Granitic Construction Aggregate <b>Lake, D.</b>	
01:30 PM	CO <sub>2</sub> Uptake Due to Natural Carbonation of Fly Ash Concrete in Canada <b>Oyinkanola, T.</b>	
01:45 PM	Environmental and Mechanical Investigation of Sustainable Lightweight Aggregate Concrete <b>Dabaghi, F.</b>	
02:00 PM	Strategic carbon sequestration to develop low-carbon sustainable concrete <b>Shah, S.</b>	
02:15 PM	A Case Study on Structural Steel Reuse: From Source Material to New Construction <b>Bannet, I.</b>	

<b>III-C-4: Sustainable UHPC [1:00 PM – 2:30 PM]</b> <i>Session Co-Chairs: Prof. Kasal &amp; Prof. Zhou</i>		<b>Pavilion A</b>
<i>Timing for each paper: 12 min presentation + 3 min for Q&amp;A</i>		
01:00 PM	Mechanical and Shrinkage Properties of High Strength Lightweight Self-Compacting Concrete Reinforced with Steel Fiber <b>Choi, J.</b>	
01:15 PM	Flexural Strength of Reinforced Lightweight Concrete Beams Containing Carbon Nanotube <b>Hong, S.</b>	
01:30 PM	Influence of Ribs on the Bonding Properties of CFRP Bar in UHPC <b>Yoo, S.</b>	
01:45 PM	Structural Behaviour of Severely Corroded RC Beam Strengthened with Ultra High-Performance Concrete (UHPC) <b>Biswas, R.</b>	
02:00 PM	Analysis of The Deterioration of Concrete Road Bridges in Bhutan Under Differing Environmental Conditions <b>Okada, M.</b>	
02:15 PM	New Systems for Sustainable Strengthening and Service Life Extension of Existing Structures <b>Feix, J.</b>	

<b>III-C-5: Advanced Materials &amp; Methods [1:00 PM – 2:15 PM]</b> <i>Session Co-Chairs: Prof. De Schutter &amp; Prof. Yoon</i>		<b>Pavilion B</b>
<i>Timing for each paper: 12 min presentation + 3 min for Q&amp;A</i>		
01:00 PM	Structural Design Approaches for 3D Concrete Printed Structures <b>Jungwirth, J.</b>	
01:15 PM	Self-Sealing Performance of Healing Agents Via a Low- and High-Pressure Water Permeability Test with Active Crack Width Control <b>Van Mullem, T.</b>	
01:30 PM	Accelerated Concrete Curing Method based on Induction Heating Technology <b>Choi, J.</b>	
01:45 PM	Investigating the Self-sealing of a Healing Agent Via a Korean Permeability Test and a Migration Test <b>De Brabandere, L.</b>	
02:00 PM	Measurement of Reinforced Concrete with New Geometry by Neutron Diffracting Method <b>Kanematsu, M.</b>	

<b>III-C-6: Durability [1:00 PM – 2:30 PM]</b> <i>Session Co-Chairs: Prof. De Belie &amp; Prof. Gao</i>		<b>Orca</b>
<i>Timing for each paper: 12 min presentation + 3 min for Q&amp;A</i>		
01:00 PM	Performance of a Hybrid-Type Galvanic Anode for Protecting Corroded Steel from Further Corrosion <b>Kobayashi, K.</b>	
01:15 PM	Alkali-Silica Reaction in Seawater Mixed Cement Mortar <b>Zhang, W.</b>	
01:30 PM	Effects of Hydrolytic Aging on the Long-Term Performance of Nano Silica (SiO <sub>2</sub> )-Treated Spruce Wood <b>Beuthe, C.</b>	
01:45 PM	Capturing Internal Swelling Reactions (ISR) Damage in Concrete Through the Damage Rating Index (DRI) <b>Trottier, C.</b>	
02:00 PM	Increasing the Shelf Life of Portland Cement <b>Peterson, K.</b>	
02:15 PM	Corrosion and its Control in Prestressed Concrete Structures <b>Pillai, R.</b>	

02:30 PM 03:00 PM	<b>Coffee Break</b>	<b>Pavilion Foyer</b>
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<b>RILEM Meetings</b>		<i>Wednesday, September 6<sup>th</sup>, 2023</i>
3:00 PM 4:30 PM	III-D-1: RILEM Bureau Meeting	<b>Vancouver</b>

<b>III-D-2: Carbonation and Re-carbonation</b> <b>Prof. Gettu Special Session [3:00 PM – 4:30 PM]</b> <i>Session Co-Chairs: Prof. Neithalath &amp; Prof. Rajabipour</i>		<b>Finback</b>
<i>Timing for each paper: 12 min presentation + 3 min for Q&amp;A</i>		
03:00 PM	Effect of Blending Portland Cement with Calcium Sulfoaluminate Belite Cement and Calcium Sulfate on Carbonation Resistance <b>Shaji, P.</b>	
03:15 PM	Understanding the Carbonation Performance of Cements Containing Calcined Clay <b>Dhandapani, Y.</b>	
03:30 PM	Concrete Carbonation in Ibero-American Countries. A Six-year Perspective and a Conservative Prediction Model from DURACON Project <b>Castro, P.</b>	

03:45 PM	Effect of Enhanced CO <sub>2</sub> Sequestration on Mineralogical, Mechanical and Durability Characteristics of Concrete <b>Kamde, D.</b>
04:00 PM	Characterizing pH Threshold and Estimating Service Life of Various Steel Cementitious Systems <b>Hule, U.</b>
04:15 PM	Performances of Concrete Containing Carbonated Paste Powders <b>Zhou, X.</b>

<b>III-D-3: Smart Technology [3:00 PM – 4:30 PM]</b>		<b>Pavilion CD</b>
<i>Session Co-Chairs: Prof. Sonebi &amp; Dr. Torrent</i>		
<i>Timing for each paper: 12 min presentation + 3 min for Q&amp;A</i>		
03:00 PM	Use of Non-Destructive Assessment Techniques to Evaluate Condition of Carbon Fiber-Reinforced Concrete Pavements <b>Gupta, R.</b>	
03:15 PM	Structural Digital Twin of Concrete Infrastructures Powered with Physics-Informed Neural Networks <b>Zandi, K.</b>	
03:30 PM	Electrical resistivity measurements to evaluate the segregation of fresh concrete pavement under excessive vibration <b>Bang, J.</b>	
03:45 PM	Impact of Climate Change on Building Façade Materials: Insights from Microscopy, Numerical Simulations and Machine Learning <b>Basquiroto de Souza, F.</b>	
04:00 PM	Simulation-Based Transfer Learning for Concrete Strength Prediction <b>Li, Z.</b>	
04:15 PM	Machine Learning-Based Deterioration Modeling of Highway Bridges Considering Climatic Conditions <b>Assad, A.</b>	

<b>III-D-4: Sustainable UHPC [3:00 PM – 4:30 PM]</b>		<b>Pavilion A</b>
<i>Session Co-Chairs: Prof. Sant &amp; Prof. Snoeck</i>		
<i>Timing for each paper: 12 min presentation + 3 min for Q&amp;A</i>		
03:00 PM	Optimizing Bridge Rehabilitation: A Life Cycle Assessment and Cost Analysis of Conventional and UHPC Overlays <b>Malik, M.</b>	
03:15 PM	High-Performance Concrete Cover – A Smart Way to Increase Service Life and Reduce CO <sub>2</sub> <b>McGrath, P.</b>	

03:30 PM	Development of Sustainable Concrete for Underground Construction <b>Zhang, L.</b>
03:45 PM	Optimizing the Effects of Mineral Admixtures and Curing Regimes on Sustainable Non-Proprietary UHPC <b>Zhang, Y.</b>
04:00 PM	A Performance Enhancement Technique for Recycled Concrete Aggregates <b>Rampit-Greaves, R.</b>
04:15 PM	An Investigation into The Effect of Pre-treated Milkweed Fibers on Hydration of Portland Cement <b>Sabziparvar, A.</b>

<b>III-D-5: Resilience [3:00 PM – 4:30 PM]</b>		<b>Pavilion B</b>
<i>Session Co-Chairs: Prof. Isgor &amp; Prof. Plizzari</i>		
<i>Timing for each paper: 12 min presentation + 3 min for Q&amp;A</i>		
03:00 PM	Modular Design of Industrial Control Room with Steel and Aluminum Foam Materials Under Internal or External Blast Loads <b>Sharma, H.</b>	
03:15 PM	Structural Performance and Sustainability of an Existing RC Bridge Reinforced with HPFRC <b>Plizzari, G.</b>	
03:30 PM	Comparative Analysis of a Base-Isolated LNG Storage Tank Using Friction Pendulum Bearings and U-Shaped Dampers <b>Wu, J.</b>	
03:45 PM	Enhancing Shielding Effectiveness and Impact Resistance of Concrete wall Using Metal Grid and High Strength High Ductility Concrete <b>Lee, H.</b>	
04:00 PM	Floor Impact Sound Tests of Slabs Using Steel Fiber Reinforced Concrete <b>Hong, G.</b>	
04:15 PM	Cost Implications of Natural Disasters on Road and Bridges Infrastructure in the Philippines <b>Adarne, M.</b>	

<b>III-D-6: Durability [3:00 PM – 4:30 PM]</b>		<b>Orca</b>
<i>Session Co-Chairs: Prof. Schlangen &amp; Prof. Sukontasukkul</i>		
<i>Timing for each paper: 12 min presentation + 3 min for Q&amp;A</i>		
03:00 PM	Effect of Graphene Oxide on Chloride Ion Penetration in Standard Canadian Mixes <b>Ouellet-Plamondon, C.</b>	

03:15 PM	Transport Properties and Pore Structure Improvement of High-Volume Blast Furnace Slag Cement-Based Materials by Incorporating Nano Silica <b>Guo, Z.</b>
03:30 PM	Determining Factors Affecting Pitting Corrosion of Stainless-Steel Reinforcing Bars <b>Abdolhosseini, M.</b>
03:45 PM	Fire Spalling Behavior of RC Beams Repaired Using Polymer Cement Mortar <b>Ozawa, M.</b>
04:00 PM	Improved Porosity Characterization of Cementitious Materials Containing Water-Soluble Organic Admixtures Using Low-Field NMR <b>Zhao, L.</b>
04:15 PM	Flexural Performance of Basalt Fiber Mini Bars in Reinforced Concrete Beams <b>Olafsson, B.</b>

## Evening Program

*Wednesday, September 6<sup>th</sup>, 2023*

06:00 PM 09:00 PM	RILEM Banquet Dinner - Odyssey to India  <i>Please consider wearing a traditional Indian attire or your own national dress</i>  Address: 8273 Ross Street, Vancouver, BC	<i>Off-Site: South Hall Banquet Palace</i>
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## Thursday, September 7<sup>th</sup>, 2023

### Plenary Session [8:00 AM – 10:00 AM]

Opening Remarks and Plenary Speeches

*Timing for each keynote: 20 min talk + 4 min for Q&A*

**Pavilion CD**

08:00 AM	Honorary Keynote by Ravindra Gettu
08:25 AM	Honorary Keynote by Surendra Manjrekar
08:50 AM	Honorary Keynote by Changwen Miao
09:15 AM	Honorary Keynote by Takafumi Noguchi
09:40 AM	Honorary Keynote by Karen Scrivener

10:00 AM  
10:30 AM

**Coffee Break**

**Pavilion  
Foyer**



**RILEM TC Presentation***Thursday, September 7<sup>th</sup>, 2023*

10:30 AM 12:00 AM	IV-B-1: RILEM TC Presentations	<i>Pavilion CD</i>
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**IV-B-2: Corrosion and Its Control****Prof. Gettu Special Session [10:30 AM – 12:00 PM]***Session Co-Chairs: Prof. Trejo & Prof. Mukherjee****Finback****Timing for each paper: 12 min presentation + 3 min for Q&A*

10:30 AM	Assessing Passivation and Corrosion of Post-Tensioned Tendons in Various Grouts under Chloride Salt Exposure <b><i>Shakouri, M.</i></b>
10:45 AM	Assessment of Galvanic Corrosion of Prestressed Strands in Re-grouted, Post-tensioned Concrete Systems <b><i>Manickam, K.</i></b>
11:00 AM	Service Life of Prestressed Steel in Slag-Based Cementitious System <b><i>Srinivasan, S.</i></b>
11:15 AM	20-year Monitored Performance of Distributed Galvanic Anodes <b><i>Haixue, L.</i></b>
11:30 AM	Long-Term Performance of Galvanic Anodes in Reinforced Concrete Systems <b><i>Pillai, R.</i></b>
11:45 AM	Electrical/Electrochemical Modelling and Experimentation for the Performance Assessment of Concrete-Steel-Anode (C-S-A) Systems <b><i>Thalakkal, K.</i></b>

**IV-B-3: Carbon Reduction****Prof. Noguchi Special Session [10:30 AM – 11:45 PM]***Session Co-Chairs: Prof. Maruyama & Prof. Kanematsu****Pavilion A****Timing for each paper: 12 min presentation + 3 min for Q&A*

10:30 AM	Prediction of the Resource Amount of Calcium Carbonate Concrete Materials Generated from Concrete Stocks in the Past and Future <b><i>Tamura, M.</i></b>
10:45 AM	Global Carbon Reduction Analysis and Modelling of Recycled Concrete Considering Accelerated Carbonation <b><i>Xiao, J.</i></b>

11:00 AM	Practical Use of CO <sub>2</sub> -Fixed Concrete with $\gamma$ -2CaO-SiO <sub>2</sub> Produced from By-Product <b>Ushiro, M.</b>
11:15 AM	CO <sub>2</sub> Sequestration by Wet Carbonation Treatment of Recycled Fine Aggregate and Recycled Fine Powder and Application to Concrete <b>Nishioka, Y.</b>
11:30 AM	Investigation of Accelerated Carbonation and CO <sub>2</sub> Sequestration of Cement-Based Materials Under High Temperatures <b>Wang, D.</b>

<b>IV-B-4: Advanced Materials &amp; Methods</b> <b>Prof. Miao Special Session [10:30 AM – 12:00 PM]</b> <i>Session Co-Chairs: Dr. Yu</i>		<b>Orca</b>
<i>Timing for each paper: 12 min presentation + 3 min for Q&amp;A</i>		
10:30 AM	Responsive Superplasticizers for Active Rheology Control of Cementitious Materials <b>De Schutter, G.</b>	
10:45 AM	Assessment of Percolation Effects of Cementitious Suspensions Through Viscosity Transition from Dilute Regime to Concentrated Regime <b>Zuo, W.</b>	
11:00 AM	The Non-classical Nucleation of the Calcium Silicate Hydrate (C-S-H) <b>Shen, X.</b>	
11:15 AM	Hydrated lime-enriched CO <sub>2</sub> Sequestration Binders modified by nanoparticles <b>Gu, Y.</b>	
11:30 AM	Hydration Characteristics of Low-carbon Cementitious Material Containing Multiple Solid Waste <b>Zhao, Y.</b>	
11:45 AM	Advancements in Assessing the Performance of Concrete Exposed to Microbial Attack <b>Weiss, J.</b>	

<b>IV-B-5: Carbon Reduction</b> <b>Prof. Scrivener Special Session [10:30 AM – 11:45 PM]</b> <i>Session Co-Chairs: Prof. Bishnoi &amp; Dr. Zunino</i>		<b>Pavilion B</b>
<i>Timing for each paper: 12 min presentation + 3 min for Q&amp;A</i>		
10:30 AM	Study on Shrinkage and Elastic Modulus of LC3 Concrete with Selected African Raw Materials <b>Beushausen, H.</b>	

10:45 AM	Limestone Calcined Clay Cements with Less than 50% Clinker: Opening New Avenues for Ultra-Green Concrete Formulations <b>Zunino, F.</b>
11:00 AM	Fresh and Hardened Properties of Low Clinker Cementitious Systems with Low CO2 Footprint Produced with Carbonated Recycled Fine Aggregates <b>Latifi, M.</b>
11:15 AM	R3 Revealed – Inside Views from Calcined Clay Calorimetry Brews <b>Zhao, P.</b>
11:30 AM	Current Understanding of the Structure of Calcium Silicate Hydrates <b>Kunhi Mohamed, A.</b>

12:00 PM 01:00 PM	<b>Lunch Break</b>	<b>Pavilion Ballroom</b>
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<b>RILEM General Council</b>	<i>Thursday, September 7<sup>th</sup>, 2023</i>
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01:00 AM 02:30 AM	IV-C-1: RILEM General Council	<i>Pavilion CD</i>
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<b>IV-C-2: Carbon Reduction</b> <b>Prof. Noguchi Special Session [1:00 PM – 2:00 PM]</b> <i>Session Co-Chairs: Prof. Maruyama &amp; Prof. Kanematsu</i>	<b>Pavilion A</b>
<i>Timing for each paper: 12 min presentation + 3 min for Q&amp;A</i>	

01:00 PM	Applications of Recycled Sand and Bottom Ash for Reactive Powder Concrete and Ultra-Light Foamed Concrete <b>Choi, D.</b>
01:15 PM	Development of Carbon Negative Concrete by Green Innovation Fund Project in Japan <b>Mori, K.</b>
01:30 PM	Development and Implementation of Carbon Pool Concrete for Both Resource Recycling and Carbon Neutral <b>Suzuki, Y.</b>
01:45 PM	Calcium Carbonate Concrete Inspired by Natural Concretion Formation <b>Maruyama, I.</b>

<b>IV-C-3: Advanced Materials &amp; Methods</b> <b>Prof. Miao Special Session [1:00 PM – 2:00 PM]</b> <i>Session Co-Chairs: Dr. Yu</i>		<b>Orca</b>
<i>Timing for each paper: 12 min presentation + 3 min for Q&amp;A</i>		
01:00 PM	Advancements in Assessing the Performance of Concrete Exposed to Microbial Attack <b>Sahan, F.</b>	
01:15 PM	Research on Underwater Anti-Dispersion Ultra-Thin Annular Retaining Wall Material <b>Chen, W.</b>	
01:30 PM	Exploring Hydration Regulation Effects of Nano silica for Super Sulfated Cement Preparation <b>Zhou, X.</b>	
01:45 PM	Imputed Data Driven Prediction of Concrete Autogenous Shrinkage Based on Machine Learning Algorithms <b>Xu, X.</b>	

<b>IV-C-4: Durability [1:00 PM – 2:30 PM]</b> <i>Session Co-Chairs: Prof. Pourghaz &amp; Prof. Bindiganavile</i>		<b>Pavilion B</b>
<i>Timing for each paper: 12 min presentation + 3 min for Q&amp;A</i>		
01:00 PM	Thermal and Alkaline Aging of Wood as a Construction Material Measured by Atomic Force Microscopy <b>Li, J.</b>	
01:15 PM	Use of Novel Reference Material and X-ray Fluorescence to Quantify Sulfur Species in Aggregates and Concrete to Assess Pyrrhotite <b>Watson, S.</b>	
01:30 PM	Improving the Bond Strength Between Flexible Plastic Packaging and Cementitious Mortar Matrix by the Intervention of Surface Treatments <b>Gupta, R.</b>	
01:45 PM	Durability of Concrete According to Performance-Concept – Inspection of Bridges <b>Kubens, S.</b>	
02:00 PM	Raman Imaging of Cementitious Systems <b>Polavaram, K. Garg, N.</b>	
02:15 PM	Optimizing Mixture Components, Shiv Size and Content in Hempcrete for Thermal Capacitance <b>Bindiganavile, V.</b>	

<b>IV-C-5: Carbon Reduction [1:00 PM – 2:30 PM]</b> <i>Session Co-Chairs: Prof. Panesar &amp; Prof. Law</i>		<b>Finback</b>
<i>Timing for each paper: 12 min presentation + 3 min for Q&amp;A</i>		
01:00 PM	Clinkering Over Molten Steel Using Recovered Cement Paste <b>Dunant, C.</b>	
01:15 PM	Carbonation and shrinkage behavior of alkali-activated GGBS mortar incorporated with supplementary precursors <b>Tavasoli, S.</b>	
01:30 PM	Improvement of Recycled Cement Powder Characteristics from C&D Wastes by Combined Accelerated CO <sub>2</sub> Curing and Heating Treatment <b>Khalid Al- Janabi, A.</b>	
01:45 PM	Enhancement of Early Age Strength of Activated Steel By-Products <b>Bondar, D.</b>	
02:00 PM	Use of Recycled Aggregate Originating from Plumbum and Zinc Mine Site for Concrete Production <b>Turk, T.</b>	
02:15 PM	Integrated Structural and Energy Retrofitting Based on Cementitious Composites and Phase Change Materials <b>Zanjani, M.</b>	

02:30 PM 03:00 PM	<b>Coffee Break</b>	<b>Pavilion Foyer</b>
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<b>IV-D-1: Carbon Reduction [3:00 PM – 4:30 PM]</b> <i>Session Co-Chairs: Prof. Peterson &amp; Dr. Zhang</i>		<b>Pavilion CD</b>
<i>Timing for each paper: 12 min presentation + 3 min for Q&amp;A</i>		
03:00 PM	Frost Testing Non-Air Entrained SCM HPC: Salt-Scaling and Internal Damage <b>Jacobsen, S.</b>	
03:15 PM	Optimizing Flue Gas CO <sub>2</sub> for Accelerating the Carbonation Curing Efficiency of Cement Compacts <b>Yu, H.</b>	
03:30 PM	Optimized Mix Design Regarding Cost and Sustainability <b>Torrent, R.</b>	
03:45 PM	Reuse of Waste Plastic as an Alternative of Concrete Used in Blocks <b>Khan, S.</b>	
04:00 PM	Fabric-Reinforced Lime Composite as a Strengthening System for Masonry Materials: A Study of Adhesion Using Flexural and Tensile Testing <b>Rakshmehpour, A.</b>	

04:15 PM	Value-Added Utilization of Electrical Ferronickel Slag as an Active Powder in Magnesium Potassium Phosphate Cement <i>Lu, J.</i>
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<b>IV-D-2: Engineering the Microstructure for Macro-Performance</b> <b>Prof. Gettu Special Session [3:00 PM – 4:45 PM]</b> <i>Session Co-Chairs: Prof. Ferrara &amp; Dr. Mohamed</i>  <i>Timing for each paper: 12 min presentation + 3 min for Q&amp;A</i>	<b>Finback</b>
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03:00 PM	Optimizing Performance-Engineered Concrete Mixtures Using Linear Programming <i>Weiss, J., Isgor, B.</i>
03:15 PM	Limestone Calcined Clay Binder Prepared from Malawi Raw Materials: A Preliminary Characterization <i>Patel, A.</i>
03:30 PM	Predicting the Alkali Contribution of SCMs to Concrete Pore Solution <i>Rajabipour, F.</i>
03:45 PM	Nanoscale Layer Thinning in Metakaolin Upon Dissolution <i>Garg, N.</i>
04:00 PM	Role of Phosphorous on Clinkering and Reactivity of Belitic Calcium Sulfoaluminate Cement <i>Kumar, V.</i>
04:15 PM	Performance of Bio-Cementitious Grout Prepared Using Fly Ash Based Inoculum for Repair of Cracks in Real Concrete Structures <i>Goyal, S.</i>
04:30 PM	Engineering of Low-Carbon Binders for Glass Reinforced Cement Composites <i>Kusumanchi, S.</i>

<b>IV-D-3: Advanced Materials &amp; Methods [3:00 PM – 4:30 PM]</b> <i>Session Co-Chairs: Prof. Choi &amp; Prof. Yoo</i>  <i>Timing for each paper: 12 min presentation + 3 min for Q&amp;A</i>	<b>Pavilion A</b>
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03:00 PM	Printability and Shape Stability of Cement Mortar Incorporating Low Volume of Micro-Polypropylene Fiber for 3D Printing Application <i>Sukontasukkul, P.</i>
03:15 PM	Self-Sensing Performance of Cementitious Composites with Carbon and Recycled Carbon Fibres <i>Niki, T.</i>

03:30 PM	Investigation and Visualisation of Microcapsules Incorporated into a Cementitious Matrix to Assess Distribution and Triggering Over Time <b>Riordon, C.</b>
03:45 PM	A Bio-inspired Solution to Alleviate Anisotropy of 3D Printed Engineered Cementitious Composites (3DP-ECC): Knitting/Tilting Filaments <b>Zhou, W.</b>
04:00 PM	Evaluation of Crack-Healing Performance of Bio-Inspired Multi-Functional Polymeric Fibers (Biofibers) for Concrete Self-Healing Applications <b>Farnam, Y.</b>
04:15 PM	Bioreceptive Concrete: Greening Facades on the Microscale <b>Stohl, L.</b>

<b>IV-D-4: Durability [3:00 PM – 4:30 PM]</b>		<b>Pavilion B</b>
<i>Session Co-Chairs: Prof. Filho &amp; Prof. Amziane</i>		
<i>Timing for each paper: 12 min presentation + 3 min for Q&amp;A</i>		
03:00 PM	Durability Problems of Reinforced Concrete Structures on the Lagos Lagoon in Nigeria <b>Akinyele, J.</b>	
03:15 PM	Effects of Steel Slag on Cement: Retardation Mechanisms and Volume Stability <b>Zhuang, S.</b>	
03:30 PM	Corrosion-Induced Cracks in Reinforced Concrete Slabs Incorporating Multi-Peak Nonuniform Rust Layer <b>Bui, T.</b>	
03:45 PM	Engineering and Durability Performance of Composite Portland Cement- Blast Furnace Slag-Limestone Concretes <b>Sabtiwu, M.</b>	
04:00 PM	Durability of Waste Glass Fine Aggregates in Cement Composites <b>Kandra, D.</b>	
04:15 PM	Simulation of Chloride Transport in Alkali-activated Concrete <b>Xu, Z.</b>	

**Friday, September 8<sup>th</sup>, 2023**

<b>V-A-1: Novel and Advanced Materials</b> <b>Prof. Gettu Special Session [8:30 AM – 10:00 AM]</b> <i>Session Co-Chairs: Prof. De Belie and Prof. Zerbino</i>  <i>Timing for each paper: 12 min presentation + 3 min for Q&amp;A</i>		<b>Finback</b>
08:30 AM	Materials and Structural Design Considerations for Ultra High-Performance Fiber Reinforced Concretes <b>Neithalath, N.</b>	
08:45 AM	Engineered Cellular Geopolymer for Efficient Building Envelope <b>Subramaniam, K.</b>	
09:00 AM	Evaluation of Concrete-Steel Friction for Automated Tunnel Segment Extrusion <b>Ferrara, L.</b>	
09:15 AM	Improving the Setting, Retention and Rheology of Alkali Activated Concrete <b>Salman, M.</b>	
09:30 AM	Thermoplastic Impregnated Textile Reinforcement for the Industrial Realisation of Complex Shaped Concrete Elements <b>Heins, K.</b>	
09:45 AM	Mechanical Performance of 100% Recycled Aggregate Based Geopolymer Concrete at Various Concentrations of NaOH <b>Gopalakrishna, B.</b>	

<b>V-A-2: Advanced Materials &amp; Methods [8:30 AM – 9:45 AM]</b> <i>Session Co-Chairs: Prof. Bosiljkov &amp; Prof. Caggiano</i>  <i>Timing for each paper: 12 min presentation + 3 min for Q&amp;A</i>		<b>Orca</b>
08:30 AM	Experimental Study on Shear Behavior of PVA Cementitious Composites Beams with CNTs <b>Lee, S.</b>	
08:45 AM	Optimizing Digital 3D Printing of Concrete Structures <b>Jendele, L.</b>	
09:00 AM	Electrostatic Separation of Cementitious Binder and Sand <b>Ekenstein, A.</b>	
09:15 AM	Effect of Novel Smart Antimicrobial Admixtures on the Properties of Cement Paste <b>Ying, W.</b>	
09:30 AM	Study on the Self-Healing Performance of Strain-Hardening Cement Composites with Superabsorbent Polymer and the Influence of Sustained Load <b>Luan, Y.</b>	



<b>V-A-3: Smart Technologies [8:30 AM – 10:00 AM]</b> <i>Session Co-Chairs: Prof. Zandi &amp; Prof. Gupta</i>		<i>Parksville</i>
<i>Timing for each paper: 12 min presentation + 3 min for Q&amp;A</i>		
08:30 AM	Comparative Evaluation of Sensor Designs for Electrochemical Measurement of Cement Mortar <b>Fujimoto, S.</b>	
08:45 AM	Statistical Analysis of Asphalt Pavement Distress Occurrence for Project-Level Maintenance Management of Provincial Highways <b>Amir, A.</b>	
09:00 AM	Comparison of Decision Maker' Perspectives and Data-driven Factors Affecting Pavement Condition in Khyber Pakhtunkhwa, Pakistan <b>Dartey, S.</b>	
09:15 AM	Influence of Environmental Changes in Signal Energy Based Damage Identification of Bridges <b>George, R.</b>	
09:30 AM	ISAFEGUARD: A Proactive Solution for Construction Job Site Safety Monitoring <b>Soltani, M.</b>	
09:45 AM	System for Monitoring the Health of Structures Using Narrowband IoT and MEMS Sensors <b>Sikandar, S.</b>	

10:00 AM 10:30 AM	<b>Coffee Break</b>	<i>Pavilion Foyer</i>
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<b>V-B-1: Recycling of Waste in Concrete</b> <b>Prof. Gettu Special Session [10:30 AM – 12:00 PM]</b> <i>Session Co-Chairs: Dr. Vyncke &amp; Prof. Chaunsali</i>		<i>Finback</i>
<i>Timing for each paper: 12 min presentation + 3 min for Q&amp;A</i>		
10:30 AM	Recycled Concrete Aggregates – State of Play in South Africa and Collaborations with IITM <b>Alexander, M.</b>	
10:45 AM	Recycling Concrete Fines as Granulated Aggregate in Light Weight Concrete <b>Perumal, P.</b>	
11:00 AM	CO2 Capture of Concrete Waste Fines Through Wet Carbonation Under Seawater <b>Bui, K.</b>	

11:15 AM	Assessment of Intermolecular Interaction of Rap-Aggregates with Varied Cement-Mortar Phases <b>Singh, S.</b>
11:30 AM	Scaled Production of Recovered Cement from Construction Waste <b>Parajapati, R.</b>
11:45 AM	A New Technology for Full Replacement of Natural Aggregates with Bioremediated Recycled Aggregates and its Lifecycle Assessment <b>Mukherjee, A.</b>

<b>V-B-2: Smart Technologies [10:30 AM – 12:00 PM]</b> <i>Session Co-Chairs: Prof. Trejo &amp; Prof. Garg</i>		<b>Orca</b>
<i>Timing for each paper: 12 min presentation + 3 min for Q&amp;A</i>		
10:30 AM	Real-Time Monitoring of Concrete Properties Using an Embedded Smart Piezoelectric Sensor with Active and Passive Sensing Abilities <b>Duddi, M.</b>	
10:45 AM	Carbon Fibre Based Strain and Leakage Sensors for Sustainable TRC Infrastructures <b>Dittel, G.</b>	
11:00 AM	Corrosion Level Prediction with Acoustic Emission Sensing and Crack Measurements <b>Vandecruys, E.</b>	
11:15 AM	Rebar Corrosion Monitoring in Concrete Using Piezoelectric Cement Sensors <b>Pan, H.</b>	
11:30 AM	Corrosion Rate of Steel in Carbonated Cementitious Mortars Predicted by Machine Learning <b>Ji, H.</b>	
11:45 AM	Self-Sensing Cementitious Composites for Monitoring Concrete Beams Under Bending <b>Toledo, R.</b>	

<b>V-B-3: Carbon Reduction [10:30 AM – 12:00 PM]</b> <i>Session Co-Chairs: Prof. Ouellet-Plamondon &amp; Prof. Zuo</i>		<b>Parksville</b>
<i>Timing for each paper: 12 min presentation + 3 min for Q&amp;A</i>		
10:30 AM	Study on the Causes that Effect of Carbonation on the Elastic Modulus of Different Cured Concrete and Mortar Containing High GGBS Content <b>Noguchi, Y.</b>	

10:45 AM	Fundamental Study on Carbonation Boosting Method of Hardened Cement Paste <b>Oh, D.</b>
11:00 AM	Integration of Concrete Sustainability Information as Part of the BIM Process <b>Shilstone, J.</b>
11:15 AM	Hydration and Strength Development in Limestone Calcined Clay Cements with Low-grade Limestone <b>Asha, B.</b>
11:30 AM	Carbon Reduction in Concrete Design and Construction <b>Minson, A.</b>
11:45 AM	Investigation of Carbonation Shrinkage Behavior of Carbon Consuming Concrete (CCC) <b>Choi, H.</b>

12:00 PM 01:00 PM	<b>Lunch Break</b>	<b>Pavilion Ballroom</b>
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<b>V-C-1: Sustainability and Circular Economy</b> <b>Prof. Gettu Special Session [1:00 PM – 2:30 PM]</b> <i>Session Co-Chairs: Prof. Gopalaratnam &amp; Prof. Kobayashi</i>		<b>Finback</b>
<i>Timing for each paper: 12 min presentation + 3 min for Q&amp;A</i>		
01:00 PM	Circular Construction and European Taxonomy regulation - Opportunities & Challenges. <b>Vyncke, J.</b>	
01:15 PM	Assessing the Trade-off Between Sustainability and Resiliency of Reinforced Concrete in Corrosive Conditions: An LCA-System Dynamics Approach <b>Rangel, E., Trejo, D.</b>	
01:30 PM	Transition Towards Low Carbon Concrete: Persuading Parameters <b>Basavaraj, A.</b>	
01:45 PM	Recycling of Concrete Aggregates - Assessing the Environmental Impacts <b>Hrihar, M.</b>	
02:00 PM	Critical Parameters Affecting the Carbon Footprint of Asphalt Mixtures <b>Gettu, N.</b>	
2:15 PM	(Invited Talk) Future of Science and Technology of Construction Materials <b>Shah, S.</b>	

# About the Sponsors



## IC-IMPACTS Activities in Canada & India

### INNOVATION

We work hand in hand with scientists, community residents, industry leaders and government offices in **Canada** and **India** to systematically identify critical challenges and develop cutting-edge technologies to address those challenges.

### DEMONSTRATION

We then deploy our wide variety of technologies through demonstration projects, such as digitally monitored pavements, low-cost water treatment plants, and early diagnostic tools for viral and infectious diseases, including HIV and tuberculosis.

### COMMERCIALIZATION

Our technologies are then rolled-out with our industry partners offering real solutions to challenges faced by highly vulnerable communities, maximizing social impact to improve the lives of Canadians.



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Advanced Pavement Project  
 Chawathil First Nation Community, Hope, BC

## OVER 80 CANADIAN COMPANIES CONTRIBUTE TO PROJECTS

66 Through a dynamic collaboration with industry, SME's, academia, government and the not-for-profit sectors in Canada & India, a number of demonstration projects have been successfully completed in communities.



Prof. Nemkumar Banthia  
 CEO & Scientific Director



WITH 90% HQP  
**EMPLOYMENT RATE**

## CONNECTING FORCES

✓ We utilize our extensive network to acts as a connection point between different forces, pairing more than 1,059 graduates with our current 350 partners.

✓ We also provide substantial support to the Canadian startup community. Our entrepreneurial students have already created 7 startups, employing hundreds of Canadians and secured 30 patents and technology disclosures.



- ✓ Innovation
- ✓ Entrepreneurship
- ✓ Employment
- ✓ Training
- ✓ Commercialization
- ✓ Trade

### THEMES

- PUBLIC HEALTH
- INTEGRATED WATER MANAGEMENT
- SAFE & SUSTAINABLE INFRASTRUCTURE
- FOOD SECURITY
- HOUSING

Projects	HQP Trained	Publications
76	1,434	1,561
Partnership	Patents	Start-ups
383	34	8

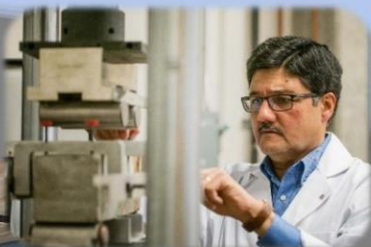


THE UNIVERSITY OF BRITISH COLUMBIA

Department of Civil Engineering

SIERA: Sustainable Infrastructure Research Group

UBC SIERA





# Certificate in Structural Engineering



The Certificate in Structural Engineering program is intended to enhance the knowledge base of structural engineers by offering courses that fill the needs of the industry. The goal of the program is to provide additional knowledge and skills in structural engineering to permit the candidate to be more effective in an engineering firm.

This is a challenging program. It is primarily directed towards anyone who intends to pursue a design oriented structural engineering career. The program is suitable for students who already have a good grasp of structural engineering fundamentals such as structural mechanics, strength of materials, second or third year university level differential equations etc. In addition, students must already have some basic knowledge of structural designs using different structural materials. The basic knowledge may have been acquired through undergraduate civil engineering courses, or from a design office, or both.

The prerequisite for the program is a bachelor degree in civil engineering. However, technologists who have some years of experience in a structural engineering design office and have a strong background in strength of materials and have taken university level math courses may also be admitted into the program.

The program is also open to individuals wishing to take a few courses with the purpose of gaining or updating their knowledge in specific areas. Upon completing the course requirements, these students will receive a certificate indicating that the course was taken and the course requirements were completed.



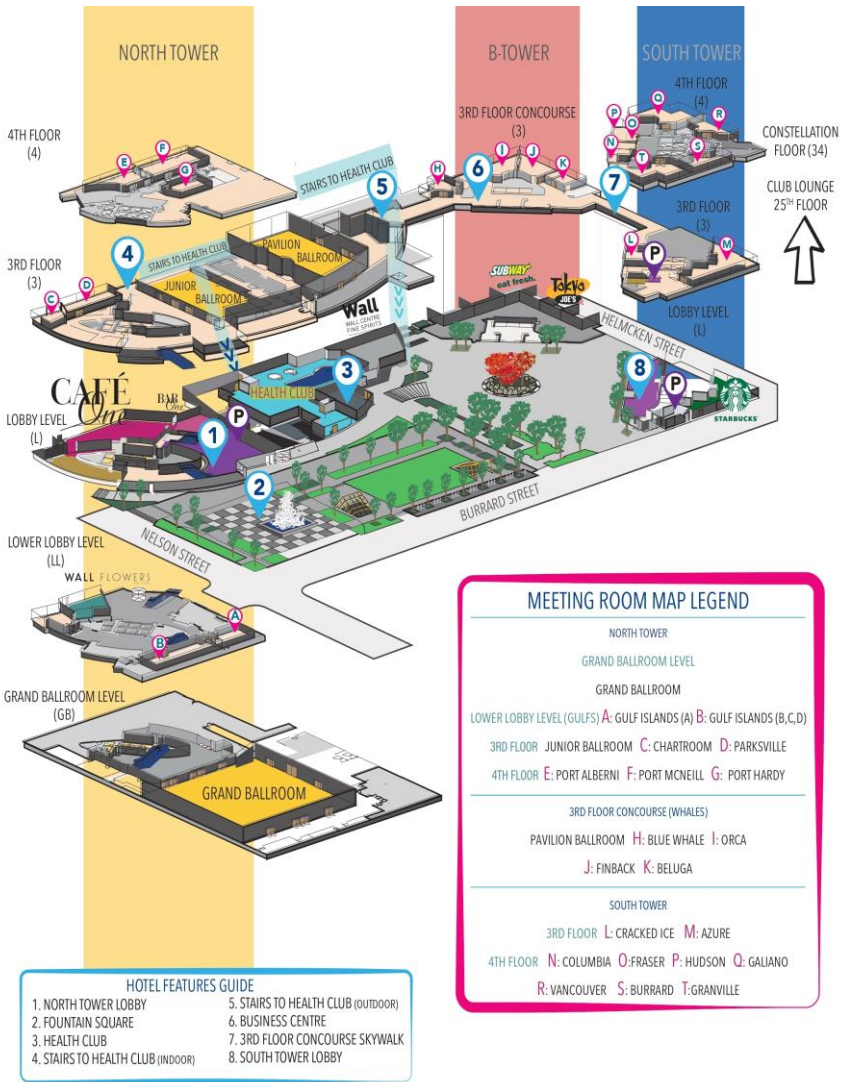
**UBC Civil Engineering Dept. is a major contributor and supporter of the certificate program with SEABC**

**Evening courses held at convenient downtown Vancouver location**



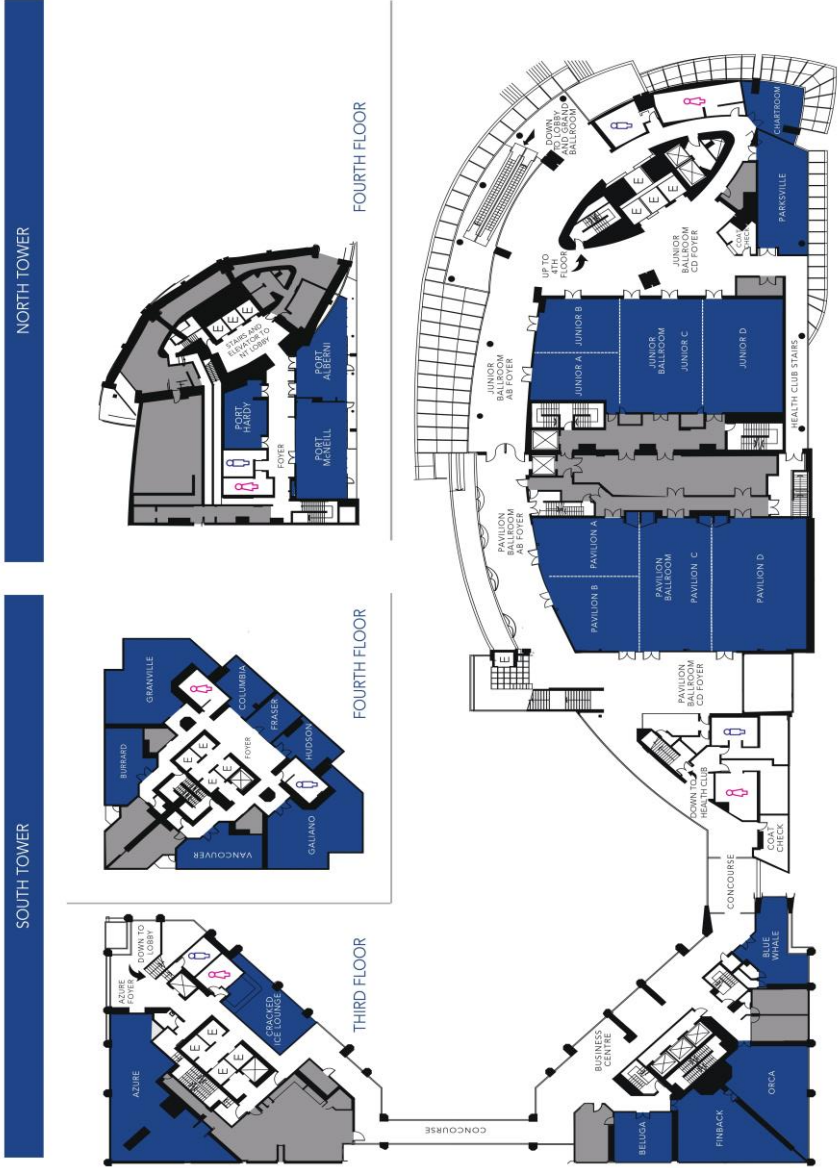
[www.seabc.ca](http://www.seabc.ca)

# Map of Conference Venue



# Sheraton Vancouver Wall Center Floor Plans

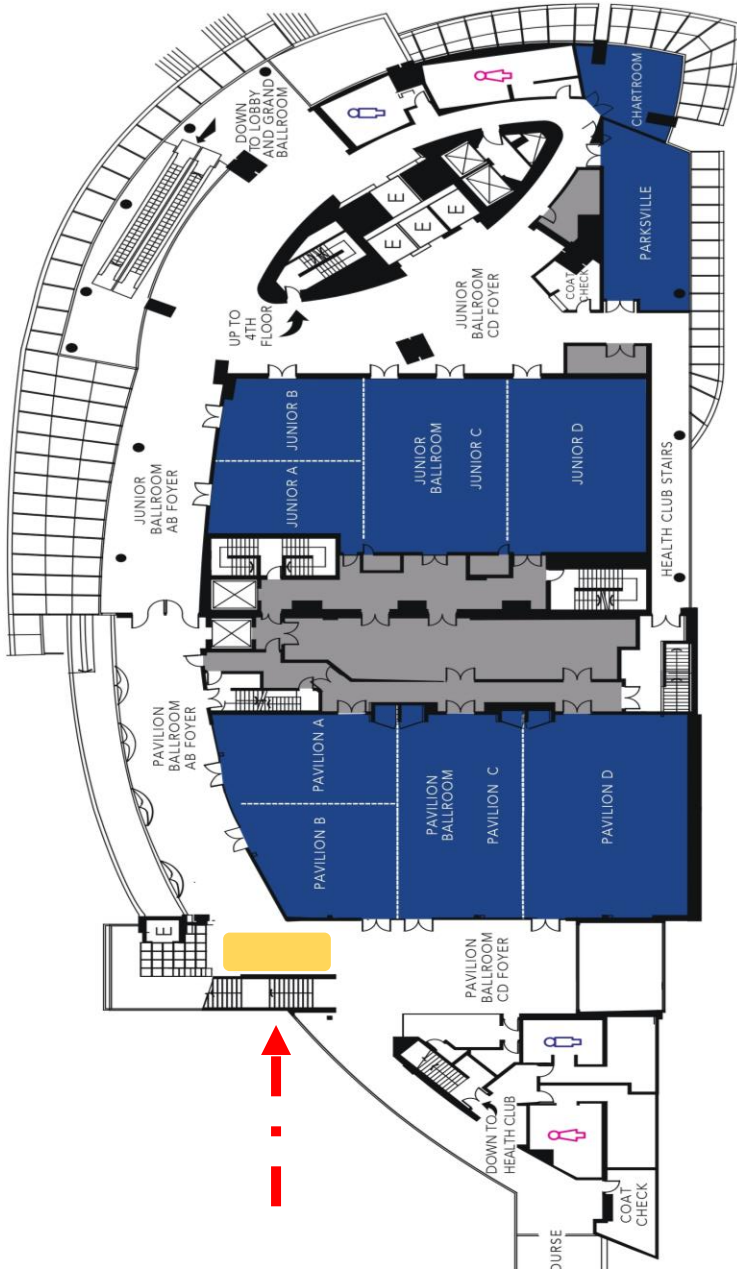
Floor plans and function spaces to Sheraton Vancouver Wall Center are provided below. Please enter the Sheraton Conference Center from the South Tower.





## Map of Sheraton Vancouver Wall Center 3<sup>rd</sup> Floor

The RILEM Week 2023 registration desk is on the third floor at the Pavilion Foyer:



# Notes





*Cover Page Photo Caption:  
A Beautiful View of Green Lake, Whistler, BC*



*Photo by: Justa Jeskova, Tourism Whistler*