

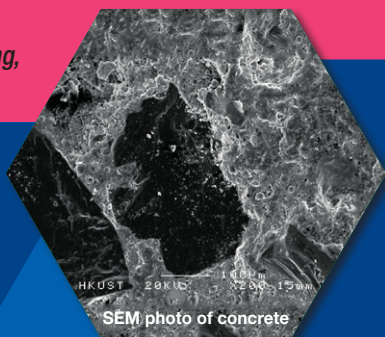
# MaSTEC 2019

## Materials Science and Technology in Engineering Conference

# Innovative Materials Science and Technology in the Greater Bay Area Construction

### 5-6 March 2020

Multi-Purpose Hall & Exhibition Area A, Zero Carbon Building,  
8 Sheung Yuet Road, Kowloon Bay, Kowloon, Hong Kong



## Registration Brochure

Cover photos: Courtesy by TS Cheng and TY Fan

Organizer

**HK I E** THE HONG KONG  
INSTITUTION OF ENGINEERS  
香港工程師學會

Materials Division  
材料分部

Supporting Organization



Co-sponsorship





## Background

Following the Framework Agreement on Deepening Guangdong-Hong Kong-Macao Cooperation in the Development of the Greater Bay Area on 1 July 2017, an outline development plan signifying the development of the Area was promulgated on 18 February 2019. The plan supports the development of the five Hong Kong R&D Centers in selected focus areas including Nano and Advanced Materials.

With the total area of 56,000 km<sup>2</sup>, a population of around 70 million and a GDP of HKD12.7 trillion as at end 2017, a number of mega construction projects like Hong Kong-Zhuhai-Macao Bridge have just been successfully completed, and some are under construction such as the Third Runway System project at a construction cost of HKD141.5 billion in Hong Kong, the Shenzhen-Zhongshan Bridge valued at HKD59 billion and the Zhujiang Delta Water Resources Allocation project costing nearly HKD40 billion. More are under planning. The estimated construction expenses on public works alone in the Greater Bay Area are more than HKD750 billion in 2019, and expected to keep increasing in the coming years. Material costs normally account for more than 50% of the overall construction cost in typical building project, but less in infrastructure projects, i.e. 30%. Hence, the market demand for various construction materials in the Greater Bay Area will be at least HKD250 billion per annum in the coming years.

At the same time, innovation and technology are designated by the Government of Hong Kong as major contributing factors to boost sustainable development, enhance competitiveness and provide new momentum for economic development. Mega construction projects provide not only challenges to materials scientists, engineers, technologists and other professionals working or planning to work in the Area, but also unprecedented opportunities for the application of leading edge innovative materials and technologies towards more sustainable built environments.

MaSTEC is a classic event hosted by the HKIE Materials Division, but as distinct from previous conferences, MaSTEC 2019 aims to provide a platform for engineers, researchers, business leaders, industry experts and government officials working or planning to work in the Greater Bay Area, to promulgate their latest innovations or pioneering applications of construction related materials, share information and experiences, and explore collaboration opportunities.

## Theme

Innovative Materials Science and Technology in the Greater Bay Area Construction

## Discussion Topics

MaSTEC 2019 will include plenary keynote lectures and topics that cover all kinds of construction related materials such as:

- Materials science such as materials genome and alkali-aggregate reaction
- Steel and other metallic materials such as coupler
- Cement-based materials such as 3D printing materials and their additives like fiber and admixtures
- Glass, ceramic and other nonmetallic materials
- Coating materials such as paints
- Functional materials having construction related applications but not listed above
- Materials testing, quality control and big data in manufacturing or construction applications



## Guest of Honour

**Ms Connie Yeung, JP**

Deputy Director (Development and Construction), Hong Kong Housing Authority

## Keynote Speaker

**Professor Jin-Guang TENG**

President, The Hong Kong Polytechnic University

## Conference Organizing Committee

*Chairman* **Ir Dr ZHENG, Herbert**

*Members* **Ir Raymond WAN Wai Man**  
CHKIE (Chairman, The HKIE Materials Division)

**Ir Prof Joseph MAK Yiu Wing**  
CHKIE (Immediate Past Chairman, The HKIE Materials Division)

**Ir Dr FUNG Wing Kun**  
CHKIE (Chairman of Immediate Past Conference)

**Ir CHAN, William**

**Ir CHOY, Sam**

**Ir HO, Corey**

**Ir KWOK, Andy**

**Ir LAM, Chi Sing**

**Dr LAM, Christina**

**Ir Pak, Kenneth**

**TAM, Chi Lam, Anlam**

**Ir YIP, Sam**

## Who Should Attend

Engineers and professionals from Government, public authorities, consultants, contractors and materials suppliers as well as academics, scientists and students from tertiary and research institutions.

## Privacy Statement

We are committed to protecting the privacy, confidentiality and security of the personal information we may hold by complying with the requirements of Personal Data (Privacy) Ordinance and the Institution's relevant policy with respect to the management of personal information.

We are equally committed to ensuring that all our committee members and agents uphold these obligations.

# Conference Programme

## Day 1 – Frontiers of Research and Engineering in the Greater Bay Area (09:00-17:30, 5 March 2020, Thursday)

### Welcome Speech

**Ir Prof Joseph YW MAK**

*MaSTEC 2019 Organizing Committee; Immediate Past Chairman, Materials Division, The Hong Kong Institution of Engineers, Hong Kong, China*

**Chaired by Ir Professor Joseph YM MAK**

### Opening Speech

**Ms Connie Yeung, JP**

*Deputy Director (Development and Construction), Hong Kong Housing Authority*

### Keynote Speech

**Research on Seawater Sea-sand Concrete (To be finalized)**

**Prof Jin-Guang TENG**

*President, The Hong Kong Polytechnic University, Hong Kong, China*

**Study on Use of Secondary Cementitious Materials to Mitigate Alkali-Silica Reaction in Concrete Made with Volcanic Aggregates**

**Ir Hiu Dan WONG and Ir Wallace SM TAM**

*Civil Engineering and Development Department, The Government of the HKSAR, Hong Kong, China*

**Measures for Prevention of Alkali-aggregate Reactions in Concrete**

**Prof Min DENG, Prof Liwu MO and Academician Mingshu TANG**

*College of Materials Science and Engineering, Nanjing Tech University, Nanjing, China*

**RILEM Technical Committee 258-AAA: Development of a Performance-based Testing Concept**

**Prof Borge Johannes WIGUM**

*HeidelbergCement Northern Europe, Oslo; University of Science and Technology, Trondheim, Norway*

**Enhancement of Properties of Recycled Aggregate Concrete by Accelerated CO<sub>2</sub> Curing**

**Ir Prof Chi Sun POON**

*Department of Civil and Environmental Engineering, Hong Kong Polytechnic University, Hong Kong, China*

**Chaired by Ir Dr Herbert ZHENG**

**Materials Data Science and Shenzhen Materials Genome Initiative Scientific Infrastructure**

**Prof Xiaodong XIANG**

*Department of Materials Science and Engineering; Material Genome Institute, Southern University of Science and Technology, Shenzhen, China*

**Multi-principal Element Alloys – Why Do We Bother?**

**Prof Chan Hung SHEK**

*Department of Materials Science and Engineering, City University of Hong Kong, Hong Kong, China*

**Development of Nano-driven Waterproof System for Buildings and Infrastructure**

**Dr Sherry BAO, Dr Xinkun LU, Dr Richie CHEN and Dr Ivan SHAM**

*Nano and Advanced Materials Institute, Hong Kong, China*

**New Developments in Construction Chemicals for Precast Concrete**

**Ir Kiat Huat SEOW**

*BASF South East Asia Pte Ltd, Singapore*

**Experimental and Numerical Research on Cementitious Materials Degradation Caused by External Sulfate Attack**

**Dr Xu MA, Prof Xinxiang WANG and Prof Jianxin LI**

*Guangdong Provincial Academy of Building Research Group Co Ltd, Guangzhou, China*

**Chaired by Ir Daniel BROWN**

### Dinner Reception

**Dinner Talk cum Best Paper Awards Presentation Ceremony**

*Royal One, 1/F, Tower 1 Enterprise Square, 9 Sheung Yuet Road, Kowloon Bay, Kowloon*

**Adapting the New Building Design Approach by Using Low Carbon Material in Building Eco-Friendly Skyscrapers**

**Ir Dr Julian LEE**

*Cinnotek International Group, Auckland, New Zealand*

## Day 2 – Smart Materials, Digital Quality Management and High Tech Startups (9:00-17:30, 6 March 2020, Friday)

**Chaired by Ir Dr WK FUNG**

**Progress of Chinese Cement Industry - Departing from Hong Kong**

**Prof Tongbo SUI**

*Sinoma International, China National Building Materials Group Co, Beijing, China*

**Mitigation on the Shrinkage of Concrete via the Use of MgO Expansive Additives**

**Prof Liwu MO, Prof Min DENG and Prof Lingling XU**

*State Key Laboratory of Materials-oriented Chemical Engineering; College of Materials Science and Engineering, Nanjing Tech University, Nanjing, China*

**Use of Silica Fume, Today and Tomorrow**

**Ben SEALEY, MICT**

*Elkem Silicon Materials, UK*

**Sustainability of Concrete Structures through Durability Enhancing Technologies**

**Mr Kevin YUERS**

*Kryton International Inc, Vancouver, Canada*

**CO<sub>2</sub>-Reduced Calcium Aluminate Cement (CAC) Based Coatings and Concretes for Corrosion Resistant Sewer Applications**

**M SCHMID<sup>1</sup>, BK YEO<sup>2</sup> and G Walenta<sup>1</sup>**

*<sup>1</sup>CALUCEM GmbH, Mannheim, Germany; <sup>2</sup>CALUCEM Pte, Singapore*

**The Quality Control Strategy and Application of Concrete Durability in Urban Rail Transit Engineering**

**Prof Haiyong YU**

*Shanghai Research Institute of Building Sciences, Shanghai, China*

**Chaired by Ir Raymond WM WAN**

**CoDA - Concrete Damage Assessment by Coda Wave Interferometry**

**Dr Herbert WIGGENHAUSER**

*DFG Research Unit 2825, Berlin, Germany*

**Non-destructive Testing of Structural Steel Using Phased Array Ultrasonics over Conventional Ultrasonic Testing**

**Ir Dr Sajeesh Kumar BABU**

*ASTAR NDT Consultants Ltd, Hong Kong, China*

**Concrete Management System**

**Ir Gabriel WK CHAN<sup>1</sup>, Mr Vincent KH MOK<sup>1</sup> and Mr Chun Ho TSE<sup>2</sup>**

*<sup>1</sup>Gammon Construction Ltd; <sup>2</sup>MTR Corporation Ltd, Hong Kong, China*

**High Performance Concrete “Glue” for Modular Integrated Construction**

**Dr Garfield X GUAN and Dr Anderson SH CHU**

*ConHubForm Construction Technology Co Ltd, Hong Kong, China*

**Using Machine Learning to Optimise Concrete Mix Designs for Performance, Cost, and CO<sub>2</sub>**

**Issam ASHUR, Gideon FARRELL, Oliver GREET, Raphael SCHEPS and William TAI**

*Converge.io, London, UK*

### Closing Speech

**Ir Raymond WM WAN**

*Chairman, Materials Division, The Hong Kong Institution of Engineers, Hong Kong, China*

Note: (a) For paper with multiple authors, the name of the presenter is underlined. (b) Each timeslot includes 5 minutes Q&A.



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5-6 March 2020

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## Registration Form

### Personal Details

Name: (Ir/Prof/Dr/Mr/Mrs/Ms)

(First Name)

(Surname) (For printing onto the CPD Certificate)

HKIE Member: \* Yes / No. If yes, please specify the Membership no.:

(\*please delete as appropriate)

Company: \_\_\_\_\_

Position: \_\_\_\_\_

Email: \_\_\_\_\_ Tel: \_\_\_\_\_

### Enrollment Fee

		Registration Fee	Registration (please "✓" as appropriate)
Members of The HKIE / Supporting Organizations	Early-bird (before 5 Feb 2020)	HK\$2,300	
	Regular	HK\$2,600	
HKIE Graduate Members under HKIE Scheme A / Full-time Students		HK\$1,900	

#### Remarks:

- The conference is designed for 2-CPD Days (12-hour). Attendance certificate will be issued after the conference.
- The fee includes a copy of Conference Programme Book, tea breaks and dinner on 5 Mar 2020 at Royal One (皇室1號東九龍), 1/F, Tower 1 Enterprise Square, 9 Sheung Yuet Road, Kowloon Bay, Kowloon (**Lunches NOT included**)
- Cancellation will be accepted only in writing via email no later than two weeks before the commencement of the Conference and only 50% of registration fee will be refunded.

### Payment Method (Please ✓ as appropriate)

☐ Check payable to "The HKIE Materials Division".

☐ Visa / Master Card

I hereby authorize the Conference Secretariat, c/o Centre for Research & Professional Development, to debit the following credit card for registration fee payment of THE HKIE MATERIALS DIVISION - MaSTEC 2019 - to be held on 5-6 March 2020.

Credit Card Number (16-digit): \_\_\_\_\_

and Security Code (3-digit): \_\_\_\_\_

All the 19-digit card numbers must be provided.

(as shown at the back of the card)

Cardholder Name (as embossed on the card face) : \_\_\_\_\_

Expiry Date: \_\_\_\_\_

Authorized Amount: \_\_\_\_\_

Cardholder Signature: \_\_\_\_\_ Date: \_\_\_\_\_

(please sign as on the back of your credit card)

### Registration & Enquiries

For registration, please complete the registration form and have it returned to the Conference Secretariat with payment by check / credit card.

### MaSTEC 2019 Conference Secretariat

c/o Centre for Research & Professional Development  
Room 2108 Kimberland Centre, 55 Wing Hong Street, Kowloon, Hong Kong

For enquiries, please contact Ms May Ho at Tel : (852) 2796 1638; Fax : (852) 3016 8648;

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