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You are cordially invited to the seminar organised by Japan Concrete Institute (JCI), American Concrete Institute (Singapore Chapter) and PTRC.

One Day Seminar on Assessment of Thermal Cracking in Mass-Concrete

Date: 6 March 2020 (Friday)

Time: 9:00am to 5:40pm

- 09:00-09:10 Opening Address
- 09:10-10:10 Issues of Massive Concrete in Singapore
(Mr. Jinping LU, President of American Concrete Institute-Singapore Chapter)
- 10:10-10:30 Tea Break
- 10:30-11:20 Overview of JCI (Japan Concrete Institute) "Guidelines for Control of Cracking of Mass Concrete 2016"
(Professor T. MIZOBUCHI, Hosei University, Japan, Chairperson of Japan Concrete Institute Revision Committee of Guidelines for Control of Cracking of Mass Concrete)
- 11:20-12:00 Assessment of DEF Cracking in Japan
(Dr. M. TANIMURA, Taiheyo Cement Corporation, Japan)
- 12:00-13:00 Lunch Break
- 13:00-14:00 Characteristics of Autogenous Shrinkage depending on Binder and Temperature
(Professor S. MIYAZAWA, Ashikaga University, Japan)
- 14:00-15:00 Numerical Simulation for Thermal Cracking Assessment in Japan
(Professor M. ISHIKAWA, Tohoku Gakuin University, Japan)
- 15:00-15:30 Tea Break
- 15:30-16:30 Initial Cracking Assessment of Architecture and Building
(Dr. D. QIAO, Takenaka Corporation, Japan)
- 16:30-17:00 Demonstration of Japan Concrete Institute Simulation Software
(Professor M. ISHIKAWA, Tohoku Gakuin University, Japan)
- 17:00-17:30 Questions and Discussion
- 17:30-17:40 Closing

Venue: Lecture Theatre 7 (LT 7), Block NS1, NS1-02-03 (Second Level)

Nanyang Technological University | Singapore, 50 Nanyang Avenue, Singapore 639798

Abstract:

The first "Guidelines for Control of Cracking of Mass Concrete" were published in 1986 by the Technical Committee of Japan Concrete Institute (JCI) on Cracks of Concrete Structures (Chairperson: Shigeyoshi NAGATAKI, Professor of Tokyo Institute of Technology). Since its publication, various measures for design and construction have been adopted and their effectiveness has been demonstrated in many Japan structures. As a consequence, planning, design, material selection and construction technologies pertaining to control of thermal cracking have been greatly improved. Thus, the "Guidelines for Control of Cracking of Mass Concrete" were updated in 2008 incorporating the latest technologies for thermal crack control. Owing to the great development in computational engineering, a full-3D FEM simulation that assesses the causes of thermal cracking by coupling heat transfer analysis and thermal stress analysis, was implemented in the guideline. The thermal cracking probability can be obtained based on the calculated thermal cracking index in simulation to assess the controlling variables under various conditions such as change of mix proportion, application of pre- or post-cooling methods. The English version of these Guidelines was published in July 2011 owing to appreciation by ACI, RILEM, IFSTTAR and others. The guidelines were revised again in 2016 to improve the accuracy and application range of design values. This revision also modified with simple equations for predicting thermal crack index and thermal crack width, as well as incorporating with DEF cracking prevention, etc. In the seminar, members of JCI revision committee will introduce the Guidelines for Control of Cracking of Mass Concrete for 2024 revision.

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Speaker 1: Mr. Jinping LU, MD, Admaterials Technologies Pte Ltd, Singapore

Mr. Jinping LU has more than 30 years of experience working in areas of research & development, testing and technical consultancy for construction materials. He was a Lecturer in the Department of Construction Materials at the Tongji University, China from 1988 to 1994. Mr. Lu is currently the President of American Concrete Institute – Singapore Chapter. Mr. Lu serves as Advisory Committee member of Temasek Polytechnic, School of Applied Science (May 2017 – Apr 2020), SAC Council Committee member for Management System and Product (CCMP), Spring Singapore (Jul 2015 – Jun 2018), Member of SAC Technical Committee for Laboratory Accreditation (SINGLAS) (Jul 2015 – Jun 2018); Member of SAC Technical Committee for Proficiency Test (Jul 2015 – Jun 2018) and Member of Board of Directors, International Congress on Polymers in Concrete (ICPIC). Mr. Lu has also presented more than 50 papers at various international conferences in the region and has published articles on testing, performance and research on construction materials. He is the lead auditor for certification of Ready-Mix Concrete Products by Singapore Accreditation Council. He received five years' service award of dedicated voluntary service to the community from People's Association and Merit Award from Spring Singapore for Meritorious service and contribution to the Singapore National Standardisation Programme.

Speaker 2: Dr. Toshiaki MIZOBUCHI, D. Eng., Professor, Hosei University, Japan

Dr. Toshiaki MIZOBUCHI obtained his bachelor, master and doctor degrees of engineering at The Nagoya University, 1982, 1984 and 2001, respectively. His research interests are resistant properties for cracking caused by shrinkage with volume change of concrete in early age, development of diagnostic technology for deterioration of concrete structures using non-destructive testing method, development of infrastructure diagnostic robot system by concrete structures moving mechanism and bridge observation maintenance based on distribution investigation method of deterioration factors and the probabilistic method for evaluating the variation of the structural performance from investigation results. He is also currently the Chairperson of Committee for Investigation on Cracking in Mass Concrete (JCI) and Chairman of the editorial board of Journal of Japan Society of Dam Engineers (JSDE).

Speaker 3: Dr. Makoto TANIMURA, D. Eng., Taiheyo Cement Corporation, Japan

Dr. Makoto TANIMURA obtained his bachelor, master and doctor degrees of engineering at Hiroshima University, 1989, 1991 and 2005, respectively. His research interests include concrete materials, durability, and crack reduction technology. He was the secretary of the Technical Committee on English Version / Revised Version of JCI Guidelines for Control of Cracking of Mass Concrete.

Speaker 4: Dr. Shingo MIYAZAWA, D. Eng., Professor, Ashikaga University, Japan

Dr. Shingo MIYAZAWA obtained his bachelor degree of engineering at Tokyo Institute of Technology in 1982 and doctor degree of engineering at Hiroshima University in 1992. His research interests are shrinkage of concrete, crack control of mass concrete structures and utilization of mineral admixtures.

Speaker 5: Dr. Masami ISHIKAWA, D. Eng., Professor, Tohoku Gakuin University, Japan

Dr. Masami ISHIKAWA obtained his bachelor, master and doctor degrees of engineering at Hosei University in 1981, 1984 and 1996, respectively. His research interests are mainly thermal stress analysis by FEM. For the last couple of years, he has developed new drying shrinkage model based on micro structures of concrete, and it was adopted to JCMAC3 by which is the calculation program for initial cracks of concrete structures.

Speaker 6: Dr. Di QIAO, Dr. Eng., Researcher, Construction Material Engineering Department, Takenaka Research & Development Institute, Takenaka Corporation, Japan

Dr. Di QIAO currently works as a research engineer at the Department of Construction Material Engineering of Takenaka Research & Development Institute, Japan. He obtained his PhD degree from Nagoya University, Japan. His research interests include durability of reinforced concrete structures associated with steel corrosion, numerical analysis, and development of fiber reinforced high performance concrete.