

**SCI**



# CONCRETUS

NOVEMBER 09 • MICA (P) No. 186/09/2009

**INAUGURAL ISSUE**



**SINGAPORE  
CONCRETE  
INSTITUTE**



# MC Solutions for Protection of Concrete in Waste and Drinking Water Industry



## High Performance Concrete

- High strength
- High durability
- Integral Waterproof
- High flowability
- Chemical resistant
- Low permeability



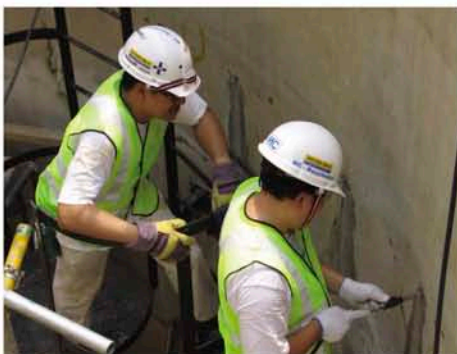
## Concrete Protection System

- Open to water vapour diffusion
- No risk of osmosis
- Mechanical / chemical resistant
- Moisture insensitive



## CIPP Lining System

- High strength
- High flexibility
- High mechanical / chemical resistant
- Tested and approved by WRc / DIBt / IKT
- Minimum shrinkage
- Physiologically harmless



## Injection System

- Suitable for potable water application
- High chemical resistant
- Solvent free
- Low viscosity
- High strengths
- Highly durable



MC-Bauchemie Müller  
GmbH & Co. KG

## WAK Technologies Pte Ltd

12A Sixth Avenue  
Singapore 276475

Tel : 6462 0362 / Fax : 6466 0505  
www.wakmc.com



WAK Technologies Pte Ltd

## Editorial Board

Whew, what a month. As we worked on launch of “SCI Concretus”, we were planning for a big start to a new successful series in SCI history. A bi-annual magazine to cover the new challenges, technologies, regulations and concerns in concrete society of Singapore. Editors of this series are determined to deliver good quality articles to address various interests in the market. Technical contents were classified as Sustainable Development & Green Technologies, Concrete Technologies & Standards, Structural Health Monitoring, Testing & Repair, Ready Mix & Concrete Admixtures and Construction Technologies. Thanks to our chief editor Dr Tam Chat Tim for his invaluable time and efforts and other editorial board members who contributed to the success of this issue. The following people have been selected to form strong Editorial Board for this inaugural issue.

**Dr. Tam Chat Tim**

Associate Professorial Fellow  
National University of Singapore  
2nd president of SCI, 1984-1986.

**Prof. Zhang Min Hong**

Associate Professor  
National University of Singapore  
Director of SCI

**Er Oh Lock Soon**

General Manager of QINGJIAN  
GROUP CO., LTD Singapore Branch  
Current President of SCI, 2009-2010

**Prof. Susanto Teng**

Associate Professor  
Nanyang Technological University of  
Singapore

**Prof. Gary Ong**

Associate Professor  
National University of Singapore  
9th President of SCI, 2001-2003

**Mr. Fong Weng Khiong**

Director of Ascent Facilities  
Engineering Pte Ltd  
Asst Hon Secretary of SCI

**Mr. Willie Kay**

Managing Director of  
WAK Technologies Pte Ltd  
Immediate Past President of SCI

**Mr. Bahador Sabet Divsholi**

PhD student, Nanyang Technological  
University of Singapore  
Director of SCI

**Mr. Tan Yew Meng**

Deputy Director of  
School of Architecture & The Built  
Environment, Singapore Polytechnic  
Honorary Treasurer of SCI



**SINGAPORE CONCRETE INSTITUTE**  
Blk 342 Ang Mo Kio Ave 1  
#03-1563 Singapore 560342  
Telephone : (65)-65520674  
Fax: (65)-65520674  
www.scinst.org.sg

**President**  
Oh Lock Soon

**1st Vice President**  
Koh Beng Thong

**2nd Vice President**  
Loh Kah Soon

**Honorary Secretary**  
Arnold De Silva

**Honorary Treasurer**  
Tan Yew Meng

**Asst Honorary Secretary**  
Fong Weng Khiong

**Immediate Past President**  
Willie Kay

**Directors**  
Zhang Min Hong  
Johnny Wong  
Lim Tee Yoke  
Neo Bian Hong  
Chen Hong Fan  
Sabet D. Bahador

**SCI Concretus Magazine**

Published by :



**INFRASTRUCTURE ASIA Pte Ltd.**  
Co.No. 200809527H  
1091 Lower Delta Rd #05-08,  
Mapletree Industrial  
Singapore 169202  
Tel : 6382 3881; Fax : 6382 1920  
Website : www.ica.roofandfacade.com

**Editorial Advisor**  
Raj Lawrence

**Consulting Editor**  
Steven Wemple

**Content Manager**  
Dr Parvathy Subhadra (Paru)

**Design & Creative Services**  
Zpydr  
Priyanka Menon  
Florence Tan

**Production Services**  
Pamela De Silva

**For Advertising enquiries, contact -  
Business Development Representatives**  
Devan Arumugam  
devan@roofandfacade.com  
9181 1301

Rosalind Tang  
rosalind@roofandfacade.com  
8200 4963

**Media Representatives**  
Infrastructure Asia Pte Ltd;  
Roof & Façade Pte Ltd.

**Printed by**  
EZRA Print & Pack Pte Ltd, 107 Neythal Rd,  
Singapore 628595

**NOTE :** SCI Concretus welcomes articles relating to use of Concrete in its various forms. Publication is at the discretion of the Editorial Board. The views expressed are not necessarily those of Singapore Concrete Institute or the Publisher. While care has been taken to ensure that the information contained in this magazine is accurate, SCI or the Publisher assume no responsibility for any errors in or misrepresentation of such information, neither for any loss or damage arising from or related to its use.

No part of this publication can be reproduced without the express written permission of the Publisher.



**PRESIDENT'S MESSAGE 4**

**BOARD OF DIRECTORS 2009/2010 5**

**PAST PRESIDENTS' MESSAGE 6**

**ARCHIVES 8**

**CATEGORY 1: SUSTAINABLE DEVELOPMENT & GREEN TECHNOLOGIES**

- BCA's Role in Shaping Singapore's Built Environment **10**
- Enhancing Environmental Sustainability Through the Innovative Application of Prefabrication Technology **12**
- Singapore Polytechnic Role as a Tertiary Institution Towards Environmental Sustainability **14**

**CATEGORY 2: CONCRETE TECHNOLOGIES AND STANDARDS**

- 'If Concrete can Speak' by Professor Tam **16**
- Standardisation in the Building and Construction Industry. **17**
- Singapore Standards for Concrete and Constituent Materials **18**
- Flowchart of Singapore Standards **20**





**CATEGORY 3: STRUCTURAL HEALTH MONITORING, TESTING AND REPAIR**

- Prediction of Service Life and Durability Analysis of Pier Structure. **21**
- Detecting Rebar with Proceq **23**
- Application of Piezoelectric Materials for Health Monitoring of Concrete Structures **24**
- Rehabilitation System for Manholes and Non-Accessible Sewers **26**
- Restoration of the Guggenheim Museum **28**

**CATEGORY 4: READY MIX AND CONCRETE ADMIXTURES**

- Green Sense Concrete **31**
- MC Ensures Clean Water in Singapore – Dam Projects **34**

**CATEGORY 5: CONSTRUCTION TECHNOLOGIES**

- Green Waterproofing System – CONIPUR **37**
- Post-Tensioned Slab-Column Connections Subjected to Cyclic Bi-directional Lateral Loading **39**
- Pre-stressed Structural Concrete: Trends in Selected Construction Methods **41**
- Innovative Technology in Final Lining Permanent Shotcrete **45**
- The low-cost Alternative for any Type of Infrastructural Foundation **46**
- Recycled Concrete Aggregates and Waste Materials for Sustainable Green Products **48**

**SCI ACTIVITIES 2009 50**

**SCI ACCREDITATIONS AND MEMBERS' LISTING 53**

**SCI – CI PREMIER AGREEMENT, UPCOMING CONFERENCES 55**

**SCI MEMBERSHIP 56**

**SCI MEMBERSHIP APPLICATION FORM 57**

**DIRECTORY LISTINGS**

- Construction Chemicals **60**
- Reinforced Concrete Materials **60**
- Concrete Services **61**
- Ready Mixed Concrete **61**
- Precast and Pre-Stressed Concrete **61**
- Concrete Products **62**
- Contractors **62**
- Consultants **63**
- Concrete Specialists **63**
- Others **64**