

Meetings with CIA and ISO/TC71

By
Prof. Tamon Ueda
ACF President
Hokkaido University



Mr. Doug Jenkins
President
Concrete Institute of Australia



Mr. David Millar
Chief Executive Officer
Concrete Institute of Australia

The year 2014 has started and one month has already gone. My first trip as ACF President was the trip to Sydney. Since I am currently chairing ISO/TC71/SC7 "Maintenance and Repair of Concrete Structures", I participated in TC71 Plenary meeting and SC7 meeting from 28th to 31st January 2014. On this occasion we had a chance to meet the delegates from the Concrete Institute of Australia (CIA): Mr Doug Jenkins, President and Mr David Millar, Chief Executive Officer.

ISO/TC71 is a Technical Committee on concrete, reinforced concrete and prestressed concrete. Since International Committee on Concrete Model Code (ICCMC) has been developing Asian Concrete Model Code, the ACF community (including the former ICCMC community) has closely worked with TC71 in various ways. Major achievement in TC71 by ACF community is the establishment of SC7, which was a joint proposal of Korea and Japan based on the discussion in ACF. ACMC was then the only international code that covered maintenance besides design and construction. Because of this fact, Korea and Japan, who are active members of TC71, made the proposal. Since the establishment of SC7 in 2004, Chair and Secretary have been from Korea and Japan. I will have another report on the cooperation between ACF and TC71.

Some national delegates to TC71 are also the Executive Council members of ACF. They include Prof Uomoto, JCI President and ACF TB Chair, Prof Sim, ACF Immediate-past President, Mr Jose Kurian, Immediate-past ICI President and ACF EC member, and myself. Four of them could introduce themselves to Mr Jenkins during TC71 Plenary meeting. Separately Prof Sim and I had a meeting with Mr Jenkins and Mr Millar for the cooperation between CIA and ACF. CIA is the only concrete-related organization in the national level in Australia. Membership is over 2,000 including individuals from industry and university and companies/academic institutions. CIA organizes biannual conference like ACF. CIA does not produce standards/guidelines by themselves, but has a strong connection with Australian Standards. "Australian Standards Online" is a comprehensive standard reference service to the subscriber, who can enjoy the instant access to all Australian Standards through Internet and the discount rate for purchasing the Standards. This is in fact an interesting service, which ACF and its member institutions may consider to introduce. You can get more information at the website of CIA (<http://www.concreteinstitute.com.au/Australian-Standards-Online.aspx>). In the constitution of ACF one of the objectives reads, "promotion of up-to-date concrete codes/standards related to structural designs, materials, constructions, maintenance, sustainable development and other relevant areas". We can learn how we work out for the codes/standards related issues from CIA.

[from President Report, January 2014]

ACF Member Institute “Mongolian Concrete Association (MCA)”



By
Prof. Duinkherjav Yagaanbuyant
Mongolian University of Science and Technology

Mongolian Concrete Association (MCA) was established on 17 May 2002 as Mongolian Chapter of American Concrete Institute with a mission to advance in concrete technology and on collaboration of concrete practitioners of the country.



Student Competition Winner

It has become a tradition to organize annual concrete conference for members and for the industry people who are interested in the latest concrete engineering advances and technology.

The 12th International Concrete Conference was held on 21 June 2013 in Ulaanbaatar. The theme of the conference was 'Eco Concrete'. MCA highly values our guests for the presentation of valuable information of their latest research advances taking long journey and their precious time to join the conference. Our gratitude goes to one of the founders of MCA, Dr.M.R.Hansen, South Dakota School of Mines and Technology, USA, Dr. Choi, D.-U., Hankyong National University, Dr. Dunil Pushpalal, Tohoku University, Japan, Dr. Byun, K.J, Yonsei University, Korea.



Participants of the Annual Conference (21 June 2013)

Within annual meeting of MCA, research student competition on the theme of Eco Concrete was also organized and winners were awarded by MCA.

The current President of MCA is Mr. A. Khashchuluu, President of Beton Armatur, Co., Ltd and Vice President is Mr. O. Batmunkh, Executive Director of Premium Concrete, Co., Ltd.

World's Largest Asymmetrical Building Opened in Seoul



An overview of Seoul's new Dongdaemun Design Plaza

The seven-story Dongdaemun Design Plaza is the world's largest asymmetrical free form building, according to its operator Seoul Design Foundation. It is designed by Pritzker-winning Iraqi-British architect Zaha Hadid. With a floor area of 86,574 square meters (931,875 square feet), the structure spans three underground levels and four above ground, and occupies a site of more than 25,000 square meters - equivalent to 3.5 soccer fields.

The building's exterior is noted for its grass-covered tops and its 45,133 aluminum panels, each individually shaped.

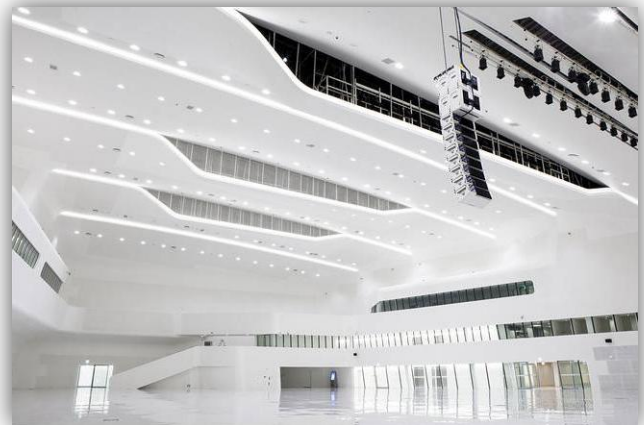
Built on a historic site adjacent to the ancient capital's east gate, the structure contains exhibition spaces and conference centers as well as workshops and boutiques. The shows for the 2014 Fall/Winter Seoul Fashion Week were taken place at its opening on March 21, 2014.

Seoul spent 484 billion won (\$454.6 million) on the project.

Source: The article and photos from The Wall Street Journal, Korea Realtime on 11 March 2014 (<http://blogs.wsj.com/korearealtime/2014/03/11/worlds-largest-asymmetrical-building-to-open-in-seoul/>)



Seoul's Dongdaemun Design Plaza opened on March 21, 2014



The art hall where conferences, fashion shows, concerts and film previews take place



The 6th Asia and Pacific Young Researchers and Graduates Symposium (YRGS 2014) – The Structural Engineering for Sustainable Development –

Hosted by

Construction and Maintenance Technology Research Center (CONTEC), Sirindhorn International Institute of Technology (SIIT, Thammasat University)

Organizing Partners & Sponsors

Asian Concrete Federation (ACF)

Young Engineer Chapter, Engineering Institute of Thailand (EIT)

Chulalongkorn University

Thailand Concrete Association (TCA)

Background and Objectives

The Asia-Pacific Young Researchers and Graduates Symposium (YRGS) series is primarily a platform for early-stage structural engineering professors, research scientists, professional engineers, postdoctoral fellows and PhD students to present their latest findings within the context of the wide structural engineering discipline. The series was initiated to promote collaboration and knowledge sharing among the young professionals.

The symposium features not only oral presentations from early-career structural engineers but also includes talks from leading figures in the field. It provides an opportunity for learning about future career paths and networking with fellow researchers. One of the valuable merits of attending YRGS is the opportunity to network with a wide range of structural engineering researchers from the Asia-Pacific regions to develop collaboration and friendship.

The first YRGS was held at Kunsan National University, Korea in 2009. The second was in 2010 at Zhejiang University, China; the third was in 2011 at National Taiwan University, Taiwan; the fourth was in 2012 at Hong Kong Polytechnic University, Hong Kong; and the fifth was in 2013 at Malaviya National Institute of Technology Jaipur, India.

Scope of YRGS 2014

The YRGS 2014 focuses on the new knowledge, emerging techniques, advanced engineering practices which contribute to the sustainable structural development. The official language of the symposium is English. Technical articles addressing the following topics are invited for submission:

- ❖ Computational techniques in structural engineering
- ❖ Durability of structures
- ❖ Performance-based design of structures
- ❖ Life-cycle performance assessment and management
- ❖ Structural health monitoring and control
- ❖ Smart materials and advanced material for construction
- ❖ Recycle and utilization of wastes in construction
- ❖ Performance of structures against disasters
- ❖ Management and policies for sustainable structural engineering

Important Dates

Abstract submission:	March 15 th , 2014
Abstract Acceptance:	March 31 st , 2014
Paper Submission:	May 15 th , 2014
Paper Acceptance:	May 30 th , 2014
Camera-Ready Article:	June 15 th , 2014

Conference Dates

31st July (Thu) – 1st August 2014 (Fri)

Conference Venue

Sirindhorn International Institute of Technology (Rangsit Campus), Thammasat University, Pathum Thani, Thailand

Best Paper Awards

Technical papers of remarkable research value and outstanding technical quality will be selected for the best paper awards sponsored by Asian Concrete Federation.

**Registration**

Early-Bird Registration (by 15 June 2014): 3,500 Baht
 Late Registration: 4,500 Baht
 Only online payment is accepted (no on-site registration).

Website

<http://saki.siit.tu.ac.th/YRGS2014>

Secretariat

Secretariat of YRGS2014: yrgs2014@siit.tu.ac.th

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PhD Abstract on High Pressure Synchrotron X-ray Diffraction Study of Calcium Silicate Hydrates and Alkali-activated Inorganic Binders



Dr. Jae-Eun Oh
Ulsan National Institute of Science and Technology
Korea

Dr. Oh is an assistant professor of Ulsan National Institute of Science and Technology (UNIST), Korea. He got his B.S. from Materials Science and Engineering at Seoul National University (SNU) and received his M.S. for Architectural Structural Engineering from SNU. He earned his Ph.D. from University of California, Berkeley at 2009 for Construction Materials. His Ph.D. topic was "High Pressure Synchrotron X-ray Diffraction Study of Calcium Silicate Hydrates and Alkali-activated Inorganic Binders".

The major objectives of the thesis are as follows: (1) to explore the possible identity of reaction products of alkali-activated inorganic binders; and (2) to obtain the bulk moduli of those products by means of synchrotron X-ray diffraction using diamond anvil cells to generate high-pressure.

The extensive literature survey suggests that the identity of the geopolymer reaction product may be in a form of disordered single layers consisting of six-membered rings, which is a typical building unit of the ABC-6 family of zeolites framework. Based on the results, alkali-activated fly ashes and slag were selected to be examined by synchrotron X-ray diffraction.

The similarities and differences between various binders formed in the samples were investigated particularly for those binders activated by Na-based activators, such as NaOH, sodium silicate or a mixture of these two components at 80°C. The results confirm that the C-S-H (I) phase is a major phase in the alkali-activated slag system and also give support to the suggested identity of Na-based geopolymer (i.e., a disordered form of the ABC-6 family type of zeolite), demonstrated by the detection of a large presence of the hydroxycancrinite phase, one of the ABC-6 family of framework type zeolites, in the samples.

The second objective of the thesis was to determine experimentally the bulk moduli of the selected representatives of reaction products of alkali-activated inorganic binders [tobermorites (14Å, 11Å, and 9Å types), synthetic C-S-H (I), alkali-activated slag C-S-H (I) and hydroxycancrinite] using high pressure synchrotron X-ray diffraction.

Measurements of the bulk moduli of the materials are as follows:

- (1) 14Å tobermorite: 84 ± 3 GPa with $K'_{\text{0}} = 4 \pm 2$;
- (2) 11 Å tobermorite: 118 ± 4 GPa with $K'_{\text{0}} = 4 \pm 2$;
- (3) 9 Å tobermorite: 88 ± 6 GPa with $K'_{\text{0}} = 5 \pm 3$;
- (4) Synthetic C-S-H (I): 35 ± 5 GPa ($K'_{\text{0}} = 4.00$, assumed);
- (5) Alkali-activated slag C-S-H (I): 33 ± 3 GPa ($K'_{\text{0}} = 7 \pm 3$, calculated); 35 ± 1 GPa ($K'_{\text{0}} = 4.00$, assumed);
- (6) Hydroxycancrinite: 45 ± 2 GPa with $K'_{\text{0}} = 4 \pm 1$



The abstract submission deadline has been extended until **31 March 2014**. All abstracts must be submitted electronically via the Conference Official Homepage. For more detail, please visit <http://acf2014.kr/acf2014/10abstract.html>

Important Dates

Abstract Submission:	March 31, 2014
Full Paper Submission:	May 31, 2014
Final submission & pre-registration:	July 31, 2014
The 6th international Conference of ACF:	September 21-24, 2014

PhD Abstract on Experimental Analysis for Steel Congestion Relief in Concrete Structures under Monotonic and Seismic Loads



Dr. Woosuk Kim
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Korea

Dr. Woosuk Kim is an assistant professor of Kumoh National Institute of Technology since he got the PhD in University of Oklahoma, USA. He received his Bachelor of Engineering degree from Kumoh National Institute of Technology, South Korea and his Master of Science degree from State University of New York at Buffalo, USA. His research interest covers large-scale tests of fiber-reinforced and recycled concrete structures. His PhD topic was “Experimental Analysis for Steel Congestion Relief in Concrete Structures under Monotonic and Seismic Loads”.

Since the beginning of the PhD research, the author has endeavored to determine how to resolve the issues involving steel congestion in reinforced concrete (RC) structures. Three potential solutions to this problem were researched in detail. In the first method, reinforced concrete (RC) was mixed with steel fibers. The use of steel fibers instead of shear reinforcement stirrups resulted in the reduction of steel congestion in a manner which was both effective in reducing the effects of congestion and which was practical to implement. In the second method, steel congestion in reinforced concrete (RC) was effectively reduced by the use of self-consolidating concrete (SCC), which does not require the use of vibrators in its casting.

In the final method, steel congestion was effectively reduced by the use of headed bars instead of traditional hooked bars. This first and third approach is emerging as a research topic of special interest in the American Concrete Institute (ACI). In evaluating these three approaches, and in combining them in this study, varied types of concrete were used. Shear testing was conducted using a lightweight concrete mix. Flexural testing of lightweight prestressed concrete (PC) beams was conducted using self-consolidating concrete (SCC). Seismic testing of headed bars in RC beam-column connections was conducted using a normal weight concrete mix. These three experiments were the subject matter of this study. In these studies the experimental results were compared with the ACI 318-08 provisions and with existing modeling equations proposed by many researchers. New models were proposed which better correlated with the test results were proposed. Therefore, although other studies in the world may have dealt with the relief of steel congestion in RC and/or PC structures, in researching these three unique methods for the relief of steel congestion it was discovered that several variations and combinations of such methods can provide effective solutions for diverse conditions. Most of all, the study should prove important in providing the basis for additional research since the guidelines and codes regarding the relief of steel congestion are shown to be based upon previously limited data.

Membership fee

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