

Newsletter

Message from ACF President

Prof. Tamon Ueda ACF President Hokkaido University



Information dissemination is quite important for professional organization like ACF. The website is to provide the information whenever the side receiving the information need the information to be obtained, while the newsletter is to provide the information whenever the side sending the information need the information to be sent. President Report, which I started in January 2013, is with a similar objective.

New ACF Secretary General

Our new Secretary General, Ms Krittiya Kaewmanee took her office in the early August 2013. Many of ACF members might have noticed that ACF has been reactivated in some extent, meaning that Secretary General is quite important for the ACF community.

Ms Krittiya is a researcher in the field of construction materials. She also serves as a member of technical committee of Thailand Concrete Association (TCA). She worked in collaboration with TCA to organize the 1st ACF International Conference in Chiang Mai, 28-29 October 2004. She has interpersonal skills and experiences working in the international level.

It was unfortunate that ACF could not publish the newsletter for a quite some time. The last issue was in December 2012. Now the latest newsletter is sent to you. One of the articles in this issue is to announce the new newsletter with new style, new title and new editorial concept. This is the sign for ACF to consider the information dissemination through the newsletter as a key issue.



Ms. Krittiya Kaewmanee ACF Secretary General

Ms Krittiya's responsibility ranges widely from the secretariat of ACF's important meetings, such as Executive Council meeting and Technical Board meeting, the management of membership, bank account and website, a member of newsletter editorial team and any other businesses relating to President, Vice-Presidents, Treasurer, Technical Board Chair and Technical Committee Chairs. She is very quick and efficient.

Your contribution to ACF is very welcome. Our new Secretary General would provide assistance to you whenever you need for your contribution.

The 9th ACF Executive Council Meeting

by Prof. Somnuk Tangtermsirikul ACF Vice President (Technical) Sirindhorn International Institute of Technology Thammasat University



On 10th September 2013, the 9th ACF Executive Council Meeting was held at the Building of Faculty of Engineering, Hokkaido University, Japan, attended by 6 EC members, the Secretary General and 2 other participants. Some important results of the discussion are summarized below:

- Ms Krittiya Kaewmanee, who replaced Ms Naoko Masaki as the Secretary General of ACF since August 2013, was introduced to the EC meeting members.

- The committee was informed of the new ACF Secretariat Office which is located at the Office of Construction and Maintenance Technology Research Center, Sirindhorn International Institute of Technology, Thammasat University, Thailand. This is the first permanent office of ACF.

- It was reported that the Concrete Institute of Australia (CIA) had joined as a new Representative Member (RM) of ACF since January 2013. The CIA is the 10th RM of ACF.

- ACF had decided to publish its own international journal. The first volume of the ACF International Journal is expected to appear after the 6th ACF International Conference.

- Prof Han, the Vice President for Policy and the Chairman of the local organizing committee of the 6th ACF International Conference, reported the progress of 6th ACF International Conference preparation. The period of the conference will be September 17th-19th, 2014. The venue will be the K Seoul Hotel, Kangnam, Seoul, Korea.

- Also reported was that ACF would support four speakers for the 2013 ACF-VCA Joint Workshop on Advanced Concrete Technology, which would be held on November 21st, 2013 at the Institute for Building Science and Technology (IBST), Hanoi, Vietnam.



Executive Council Meeting members, 10 Sep 2013, Sapporo

The 2nd ACF Technical Board Meeting



Technical Board Meeting members, 11 Sep 2013, Sapporo

The 2nd TB meeting was held on September 11th, 2013 at the Building of the Faculty of Engineering, Hokkaido university. Some interesting topics of discussion are concluded as follows:

- Examples of Complete set of Level 3 Documents for Asia Concrete Model Code (ACMC) will be soon available. The following documents were proposed as the examples of the Complete Set of Level 3 Documents for ACMC.

• For Part 1 : Design, the English version of JSCE Design Guideline will be used.

• For Part 2 : Materials and Construction, two examples i.e. the Guidelines for materials and construction based on Japanese Standard Specifications and the Thai Standard for Materials and Construction will be used.

• For Part 3 : Maintenance, two examples i.e. the Vietnam National Standard TCXDVN 318:2004 - "Concrete and Concrete Reinforced Structures - Guide to Maintenance" and the English version of JSCE Standard will be used.

- Five new Technical subcommittees on the following topics were proposed;

• "Effective Utilization of Concrete with High Volume Supplementary Cementitious Materials in Asian Region" proposed by Dr. Takafumi Noguchi

• "Systematization of Electrochemical Measurements Based on Physicochemical Theory" proposed by Dr. Takafumi Noguchi

• "Asian Concrete Vision 2030 Forum" proposed by Prof. Chulwoo, Park

• "Promotion of the Asian Concrete Model Code in the Asian Region" proposed by Prof. Jongsung, Sim

• "Subcommittee for Young Concrete Professionals (YCP-STC)" proposed by Dr. Jian-Guo, Dai

ACF welcomes its members to form and propose technical committees (application form is available on the ACF website).

- ACF announced its decision to publish its own international journal under the name of ACF International Journal with its 1st volume to appear in 2015 after the 6th ACF International Conference.

- The revised version of Asian Concrete Model Code is under process and is expected to be finished by the end of 2013 (The most recent version was published in 2006).

- An ACF supported YRGS 2013 conference was held on 15-16 October at Maliviya National Institute of Technology, Jaipur, India.

The Planned Change in the ACF Newsletter

by Prof. Manyop Han ACF Vice President (Technical) Ajou University



Changing or improving the ACF Newsletter has been discussed for a long time, but how to improve the style and contents is very difficult and requires a hard work and many man power and money. It will be a challenging task to change the newsletter to either ACF News or ACF Magazine. The change will eventually upgrade the dignity of ACF to its internationally recognized organization. Though the name and the style of the new form of ACF Newsletter had not been decided yet.

The title, 'News' normally implies the quick and short contents, on the other hands, the title 'Magazine' implies the detailed and long contents. An organization like ACF, an association of many countries having different cultures and languages, might publish 4-6 issues a year, which is not good for News, therefore ACF Magazine might be better name for the publication. ACF News vs. ACF Magazine will be finalized by the editorial board before the first issue.

As for the ACF Journal, the name of the Journal has not been decided yet. At first, International Journal of ACF (IJACF) was the first name that had been discussed during the presidential meeting. But during the Scientific Committee meeting, the name is quite long and the ACF is already an international organization, so further simple name without international, ACF Journal has been proposed, just like ACI Journal. International Journal of ACF (IJACF) vs. ACF Journal (ACFJ) will be finalized by the editorial board before the first issue.

In order to make the both publications successful, lots of supports from the member countries are essential. The 6th ACF Conference will also be organized to invite as many new member countries as possible from the whole Asia. The total number of countries in Asia are 46 countries in six regions, which includes East Asia, South East Asia, South Asia, South West Asia, Central Asia including North Asia, and also Oceania, Among the total number of 46 Asian countries, the target number of ACF member countries will be increased from 10 to 20-30 countries, including China, Egypt, Turkey, UAE, New Zealand, and so on.

ACF Magazine

The first ACF Magazine will be published on January 2015, then following issues will be published on April, July and October, ie. 4 times a year. The number of issue can be increased if the quantity and quality of articles supported by the member countries are increasing. The main contents of the ACF Magazine will be the translated articles from the contents of the technical magazine of the member countries. Also the national plans related to construction industry such as long-term development plan and also annual budgets and plans of member countries.

The contents will be collected in 2013 from the member countries before the ACF Conference, and also from the non-member and new member countries after the ACF Conference. Once the contents are collected, they will be edited and published in hard copy for the first issue, than electronically published thereafter.

The magazine will be a good tool for the personal members and companies of the member countries. They can exchange the information between the member countries. The information will be beneficial for all the construction companies in Asian region.

Member countries are responsible for submitting the translated articles. The submitted articles will be reviewed and edited by the editorial boards and ACF officers. The table of contents of ACF Magazine might be designed as follows;

Contents of ACF Magazine
President's Memo
News – What's happening in ASIA?
Member Countries Activities
National Construction Plan
Construction Records
Major Construction Companies
Engineers in Construction
Special Topics
Technical Articles
New Technologies
Students Sections
International Concrete Conferences Schedule
Introduction of Concrete Related Institutes in Asia

ACF Journal

The first ACF Journal will be published with the selected papers presented during the 6th ACF Conference in Seoul, Korea. The target number of paper might be approximately 30-40 papers, which will be published during the year 2015. For the first two years, 4 issues are planned to be published on March, June, September, and December. So, the 40 papers might be good enough for the period collecting additional papers for the subsequent year. If the papers are successfully collected and published for the first two years, the ACF Journal become the major concrete engineering journal not just in Asia but also in the whole world.

The first ACF Journal might be published on September 2014, during the ACF Conference in Seoul, Korea, or on December 2014, or March 2015. The real publication may be depending on how fast the full papers are collected.

Editorial Board

In order to publish the ACF Journal and ACF Magazine, both publications need editorial board separately. The editorial boards for both ACF Journal and ACF Magazine will need following editorial members for each publication.

Editorial Board
Chief Editor
Vice Chief Editor
Regional Chief Editor (7)
East Asia (Korea, Japan, China, Taiwan, Hongkong, Mogorlia)
South East Asia (Thailand, Indonesia, Malaysia, Vietnam, Philiphine,
Singapore, Combodia, Laos,)
South Asia (India, Pakistan, Srilanka, Bangladesh, Nepal)
West Asia (Saudi Arabia, UAE, Iraque, Quaite, Egypt, Turkey)
North & Central Asia (Russia, Uzvekistan, Kazachstan)
Oceania (Australia, New Zealand)
Other Worlds (Europe(fib), America(ACI), South America, Africa)
Editors (21)
Editorial Secretary(1-2)

Ultimate Shear Behavior and Modeling of Reinforced Concrete Members Jacketed By FRP and Steel

Dr. Tidarut Jirawattanasomkul Hokkaido University, Japan



Dr. Tidarut Jirawattanasomkul is a PhD graduate of Hokkaido University, a top university recognized for Civil Engineering. She received her Bachelor of Engineering degree from Chulalongkorn University, Thailand, in 2008, and her Master of Engineering degree from Hokkaido University in 2009. She is a dedicated researcher in structural engineering with corporate, academic, and research institutions. She was instrumental in the development and implementation of a variety of concrete structures, and characterized their structural performance, and durability as well as supervising their monitoring and maintenance. Her PhD topic was "Ultimate Shear Behavior and Modeling of Reinforced Concrete Members Jacketed By FRP and Steel".

Many existing reinforced concrete (RC) members built using old design codes are susceptible to catastrophic collapse during a major earthquake due to their insufficient shear strength and member ductility. Use of fiber-reinforced polymer (FRP) composites as the external bonding/jacketing material of RC members to improve their shear strength and ductility has been a widely used because of the high strength-to-weight ratio and corrosion resistance of FRP composites. The most often used FRP composites include carbon-fiber reinforced polymer (CFRP), glass-fiber reinforced polymer (GFRP), and aramid-fiberreinforced polymer (AFRP) composites, which are termed conventional FRPs. In recent years, a new category of FRP composites, which are made of polyethylene naphthalate (PEN) or polyethylene terephthalate (PET) fibers, have emerged as an alternative to conventional FRPs as the strengthening materials of RC members. These FRPs have a much larger rupture strain (LRS) compared to conventional FRPs. Although their elastic modulus and strength are relatively low, they are much cheaper than conventional FRPs. The relatively low strength and modulus of LRS FRP can be compensated by the use of a greater amount of the fiber material, whereas the small rupture strain of conventional FRP cannot be compensated in this way. Up till now, it has remained unclear how to predict the shear strength of LRS FRP-strengthened RC members, which in turn influence their overall behaviors.

This research program aims to conduct an experimental study for the first time on the shear strength and deformation behavior of RC members strengthened with LRS FRP composites. Tests on ten RC beams strengthened in shear with fully wrapped PET FRP sheets have been conducted considering the following test parameters: the strengthening ratio, the longitudinal

reinforcement ratio and the shear-span to effective-depth ratio. The increase in the amount of PET FRP sheets led to an increase of the shear strength and shear ductility, whereas a lower longitudinal reinforcement ratio and a smaller shear-span to effective-depth ratio corresponded to improved shear ductility. PET FRP sheets developed very high strains, namely the maximum strains of 1.4-6% at the peak shear loads and as high as 14.0% at the defined ultimate state (i.e., the load dropped by 20% compared to its peak load). Consequently, PET FRP sheets can be used to enhance the shear strength of RC beams while substantially increasing the member ductility. In particular, PET FRP sheets did not rupture at the peak load, and led to a ductile shear failure of the strengthened RC members. This failure mode also enabled us to clearly observe the behavior of shear strength degradation of concrete with increase in shear deformation even before the peak strength was developed. The shear contribution of concrete was found to degrade by 0-54.6% depending on the volumetric ratio of the FRP sheets, the shear-span to effective-depth ratio and the member depth.

The development of a comprehensive shear strength model is proposed to precisely predict not only the concrete shear deterioration but also the overall loaddeformation responses of RC members. A flexure-shear interaction (FSI) analytical method is presented which allows a more precise prediction of the load-deformation responses of RC columns with or without FRP jacketing. In this FSI analytical method, conventional section analysis is applied by including a parameter for the confinement ratio as a function of the secant stiffness of the transverse steel and fiber reinforcements. By including the effects of shear, the truss mechanism proposed by previous researchers is combined with the section analysis. After the onset of shear cracks, the additional flexural deformation due to the tension shift phenomenon is included for a more precise prediction of the flexural deformation. Use of a shear deformation model based on the truss mechanism accounts for the effects of tension stiffening, fiber confinement and proposed strut angle. The shear and flexural deformations are combined with the pull out deformations to obtain an accurate prediction of the total deformations of the columns. Using these concepts, the FSI analytical method can successfully predict the loaddeformation envelope responses of RC columns jacketed with both low and high fracture strain fiber materials, including CFRP, AFRP, PEN and PET FRP, as well as steel. It can be concluded that the FSI analytical method is expeditious and efficient for use in predicting structural response of RC members with and without various types of seismic jacketing, while maintaining a high degree of accuracy.

Development of Multi Binder Systems with Fly Ash and Limestone Powder

Ms. Krittiya Kaewmanee Sirindhorn International Institute of Technology, Thammasat University Thailand



Ms. Krittiya Kaewmanee is a PhD candidate of Sirindhorn International Institute of Technology, Thailand. She received her Bachelor of Engineering degree from Sirindhorn International Institute of Technology, Thailand, and her Master of Engineering degree from Kochi University of Technology, Japan. She has been working as a researcher in the field of construction materials with corporate, academic, and research institutions. Her PhD topic was "Development of Multi Binder Systems with Fly Ash and Limestone Powder".

Fly ash and limestone powder are two major widely available cement replacing materials in Thailand. However, the current utilization of these materials is still not optimized due to limited information on properties of binary system with limestone powder and ternary binder system. Initially, study on properties of various types of limestone powder and properties of mortars incorporating the limestone powders were performed. The concerned properties were compressive strength and consistency. Secondly, the research aimed at studying basic, fresh, mechanical and durability properties of mixtures containing cement, fly ash and limestone powder as single, binary and ternary binder systems. The main parameters considered were the average particle size, the particle size distribution and the proportion of each binder in the multibinder system. Thirdly, the research focused on the effect of free lime content of fly ash in binary and ternary binder systems. The free lime addition method was selected and the maximum free lime content in the study was 4.51%.

The results in the first part showed that clay content affected properties of concrete containing limestone powder. High clay content of limestone powder led to higher dosage of superplasticizers in order to attain the same consistency. Due to the increase of superplasticizer dosage, setting times were delayed. The secondary effect of clay content was induced on compressive strength at early age. The 1-day compressive strength declined as the clay content increased. The effect was more noticeable in case of naphthalene-based superplasticizer. It was found from the second part that single binder system consisting of only cement gave the best carbonation resistance. Binary system with fly ash exhibited superior binder performances on long-term compressive strength and many durability properties except carbonation and magnesium sulfate resistances while early compressive strength of binary binder system with limestone powder was excellent. The ternary binder system, taking the most benefit of selective cement replacing materials, yielded satisfactory performances in almost all properties. Thus, the optimization of binders can be achieved through the multi-binder system. Microscopic study in the third part revealed that free lime particles are mostly distributed outside the fly ash particles and that insignificant amount of free lime may be encapsulated inside the fly ash particles during the fly ash formation process. These ensure that the naturally high free lime and added free lime similarly affects properties of fly ash paste and mortar. Moreover, it was found that higher free lime tended to cause slightly earlier setting resulting in faster gain of compressive strength at early age. The autoclave expansion seemed to increase with the increase of free lime content. However, the expansions were still within the limit of ASTM C618 (less than 0.8%). Expansion due to alkali-aggregate reaction was slightly larger by increased free lime but was still lower than that of cement type Ionly mixture. Insignificant effect of free lime on shrinkage, carbonation depth, chloride permissibility and sulfate resistances were observed.

Lastly, prediction models for predicting compressive strength and slump of multi-binder system with cement, fly ash and limestone powder were also proposed. The accuracies of the models were found satisfactory.

Activities

October 2013

The Asia and Pacific Young Researchers and Graduates Symposium (YRGS) 2013 will be held on 15-16 October 2013 at Maliviya National Institute of Technology, Jaipur, India.

November 2013

Vietnam Concrete Association (VCA) and Asian Concrete Federation (ACF) will hold a Joint Seminar for practical engineers in Vietnam. The theme of the seminar includes Durability Design, Construction Quality Control and Inspection and Maintenance Technology. The seminar will be held on 21 November 2013 at IBST campus, Hanoi, Vietnam.

The 6th Asian Concrete Federation International Conference

Dates: September 21-24, 2014 Venue: The-K Seoul Hotel, Seoul, Korea Organized by: Asian Concrete Federation (ACF), Korea Concrete Institute (KCI)

Introduction

Recently, countries all over the world are focusing on the rapid development of Asian countries by the fact that Asia is the world largest continent which covers almost 30% of the world landmass and accounts for over 60% of the world population. In 2010, USGS reported that cement production of Asia was over 70% of the world production. It is obvious that the construction activities are concentrated in this region.

Asian Concrete Federation (ACF) was officially established since 2004 along with the recognition of the growth of the Asian region. It is certain that a tremendous amount of research and practical information as well as new technologies are now spreading within this region. The ACF International Conference has been held every 2 years since 2004 in various countries of Asia and has been well functioned as a regular event for information exchange as well as for many other activities such as technical meetings of related committees and social meetings of participants, etc. With increasing number of presented papers and participants, the ACF international conference has become well-known among researchers, academicians, professionals and practitioners in the field of concrete and has become one of the major conferences in this field in Asia and other regions.

The 6th International Conference of ACF (ACF 2014) is scheduled to be held in the heart of Asia, Seoul, Korea on 21 to 24 September 2014 hosted by ACF together with Korea Concrete Institute (KCI). The organizing committee, on behalf of ACF, would like to extend our invitation to all of you to participate in this meaningful conference and to welcome all of you to Korea.

Objectives

The aim of the ACF 2014 is to share the latest developments in research and application of concrete technologies in civil and architectural engineering areas. The main theme of the ACF 2014 is "Asian Concrete Vision 2030" with following research topics.

- 1. Concrete structures (ST)
- 2. Concrete materials and technologies (MT)
- 3. Maintenance, monitoring, repair and strengthening (MR)
- 4. Sustainability (SU)
- 5. Construction management and engineering (CM)
- 6. Recent research and related topics (RT)

The official language of the conference is English.

Important dates

Last date of Abstract Submission:	January 31, 2014
Notification of Abstract Acceptance:	February 28, 2014
Deadline for Full Paper Submission:	May 31, 2014
Notification of Full Paper Acceptance:	June 30, 2014
Submission of Final Camera-Ready Full Paper:	July 31, 2014
Deadline for Early Bird Registration:	July 31, 2014
Conference Dates:	September 21-24, 2014

Submission procedure

Participants wishing to present a paper are invited to submit an A4 size one page abstract in English (W/ or W/O figures). Abstracts should be submitted on-line in MS-WORD format to www.acf2014.kr. Detailed guidelines for preparing and submitting abstracts and full length papers may be found on the conference website.

Abstracts and final papers will be reviewed by the Scientific Committee. Authors of accepted papers are expected to attend and present their papers at the conference. Abstract will be published in hard copies and the full paper will be provided in USB.

Registration

With the payment of the registration fee, ACF members and non-ACF members who are qualified to join ACF will be provided with a two-year complimentary ACF membership for 2015-2016. Registration covers attendance at the conference, conference proceedings, welcome reception, and all lunches and refreshments.

Category	Before July 31,2014	After July 31,2014
General	USD 400	USD 500
Student	USD 50	USD 70

Payment method

Registration fee must be paid online by major credit cards (VISA, MasterCard and JCB) through conference website.

ACF Journal

Selected papers can be considered for publication in the inaugural issue of ACF Journal.

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For more information regarding to any announcements as well as conference venues, details schedule, paper templates, submission procedure, registration method, and other related information to this conference, please visit our website or contact the conference secretariat.

Website: http://www.acf2014.kr

Conference Secretariat: M.H. Jang E-mail: jmh@kci.or.kr

Membership fee

Members are kindly reminded to pay their membership fee.

Please contact the secretariat in case you have any query about your membership status.

Mailing address:

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