



# Asian Concrete Federation E-Newsletter

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## Foreword

### Taketo Uomoto

President of ACF

The Asian Concrete Federation (ACF) was founded in 2004 after three years of discussions and efforts among institution members in the Asian countries and regions. In the year 2004, thirteen member institutions, including one international organization ICCMC, gathered together in the First ACF International Conference held in Chiang Mai, Thailand. Ten executive members (EC), including one President and two Vice Presidents were elected in the meeting, and the works of ACF have started since January 2005.

#### 1. Introduction

Asian countries, especially East and South-East Asian countries, have been increasing their economic strength since 1990. Although there were some recessions, these countries have overcome the problems and increased gross national production drastically. The statistics show that in the year 2001, about two thirds of the total amount of world cement was produced in Asia. These cements were used for construction works in the region. As a result, many new construction works were made and important infrastructures, such as roads, railways, buildings, bridges, etc. supported the growth of these countries. Such growth was not observed in other parts of the world.

As a result, many famous structures were built in this area, such as the Akashi-Kaikyu bridge (suspension steel bridge, constructed in 1998, mid

span: 1991m) in Japan, and the Petronas Towers (steel concrete composite high-rise building, constructed in 1998, height: 452m) in Malaysia, which are the longest bridge and the highest building constructed during the 20<sup>th</sup> century. Even in the 21<sup>st</sup> century, new structures are being made in this region, such as Lupu bridge (steel arch bridge, constructed in 2003, span: 550m) in China, Taipei International Financial Center (steel concrete composite high-rise building, constructed in 2004, height: 508m) in Chinese Taipei, etc. which became the longest arch bridge and the highest building in the world after their constructions. These evidences show that Asia is now the most active region in the field of construction throughout the world.

When we look at the details of the region, many problems exist in the field of concrete. The problems may be summarized as follows:

- 1) Although many structures have been made, the concept of design, construction and maintenance for different structures in this region is not the same. Some countries have their own specifications, but some countries do not possess their own and rely on consultants who use different specifications from one to another. This causes problems for the people who take care on the structures after they are constructed.



- 2) The education of concrete engineers may not be sufficient to realize the importance of technologies related to the design and construction of concrete structures.
- 3) Information transfer among the Asian concrete engineers has not been done fluently, and this may cause misunderstandings of the problems they have to solve.

To deal with these problems, the Asian Concrete Federation was formed, and this paper briefly explains the present situation of concrete in Asia and the works started in ACF.

#### 2. Brief history of Asian Concrete Federation

Considering the above, the first Asian Concrete Forum was held in Sapporo, Japan, in the year 2001. The delegates attended from AIT (Thailand), ICI (India), JCI (Japan) and KCI (Korea).

The following declaration was made by the delegates from these organizations:

“We, the delegates to the Asian Concrete Forum (ACF), recognize our

common problems and interests in concrete engineering in the Asian region and the necessity for more exchange of information and collaboration among countries/ regions in Asia. Considering this fact, we agreed to the following two points:

- 1) To set up a committee to draw up a long-term strategy for information exchange and international collaboration on concrete in Asia. The committee will submit a proposal at the next meeting of ACF for approval.
- 2) To have the next meeting of ACF before the end of 2002."

As a result, the second and the third forum were opened in 2002 and 2003, in Korea and India, respectively (see Table 1).

Table 1. Meetings for the set up of Asian Concrete Federation

Year	Meeting	Place
2001	The 1 <sup>st</sup> Asian Concrete Forum	Japan
2002	The 2 <sup>nd</sup> Asian Concrete Forum	Korea
2003	The 3 <sup>rd</sup> Asian Concrete Forum	India
2004	The 1 <sup>st</sup> International Conference of ACF	Thailand

### 3. The First ACF Conference in Chiang Mai, Thailand

In the year 2004, the setting up of a permanent body was agreed, the Asian Concrete Federation (ACF), and the First ACF Conference was held in Chiang Mai, Thailand. In the first conference, members from more than 12 countries and regions attended, and the ACF Constitution was approved. The important items of the constitution were as follows:

The objectives of the Federation shall be to promote understanding of concrete structures and services to the society through concrete structures in countries in the Asia and neighboring region through:

- initiation and support of international collaborative activities for development of research and technology relating to various aspects of concrete and concrete structures;
- dissemination of useful information on concrete and concrete structures by way of publications, conferences, symposia, workshops and seminars;

- promotion of updating and revising concrete codes/standards on structural design, materials, construction and maintenance through development of new knowledge to meet the needs of changing time;
- interaction with the members and keeping them aware of the activities of the Federation.

The works agreed were as follows:

- 1) Promotion of international standardization relating to test methods, properties of material, and guidelines for design, construction and maintenance
- 2) Hold international conferences
- 3) Dissemination of information through Internet (e-newsletter and homepage)
- 4) International collaboration on advanced technology and/or hot topics
- 5) Offer international engineering license
- 6) Publication of international journal.

After the general meeting among the delegates of the national and regional institutions, ten executive members were elected to run the ACF for two years till the end of the year 2006. The elected first EC members including one President and two Vice Presidents are as follows:

- President: Prof. Taketo Uomoto (JCI)
- Vice Presidents: Prof. Keun Joo Byun (KSCE) and Dr. Pichai Nimityongskul (TCA)
- Treasurer: Prof. Tamon Ueda (ICCMC)
- EC Members: Prof. Mahesh Tandon (ICI), Dr. FX Supartono (HAKI), Dr. Mohan Prasad Aryal (NCI), Peter N. Aventajado (PICE), Prof. Jenn-Chuan Chern (CICHE), Prof. Nguyen Tien Dich (VCA).

### 4. Activities of ACF from 2004 to 2006

Since 2004, Presidents and EC members gathered several times to finalize by-laws of the federation, and start the works of the federation. Due to a lack of member fees, the works of the ACF was limited. JCI kindly donated the amount of ¥1,000,000 to ACF and we could start our activities. The homepage of ACF was opened and information on ACF activities was introduced

to the public. The homepage address is <http://www.acf-org.com/>.

Working groups were set up to start the collaborative works among member countries and regions. The second ACF conference was planned by Prof. FX Supartono to be held in Indonesia in the year 2006. Also the third ACF conference was decided to be held in Vietnam in the year 2008.

The Presidents and EC members attended several International Symposiums and conferences to advertise the activities of ACF to the world, such as JCI 40<sup>th</sup> Anniversary in Tokyo, The 4<sup>th</sup> CECAR in Taipei, ACECON2005: ICI-Asian Conference in Mumbai, and EASEC10 in Bangkok. An agreement of collaboration was signed between ACF and ACECC in Taipei, 2004.

### 5. The Second Conference of ACF in Bali, Indonesia

In the year 2006, the Second ACF Conference was held in Bali, Indonesia. More than 200 peoples from 19 countries and regions attended the conference. After the conference, "Excellent papers awards" were given to four distinguished papers.

The by-laws, budgets for the year 2007 and 2008 were approved in the General Assembly. Three working groups were formed: one WG to publish e-newsletter and two WGs in ICCMC to write up the drafts of concrete test methods and guidelines with the support of ACF. Further, the time and venue of the third conference and EC meetings were decided.

Eight executive members were elected to run the ACF for two years till the end of the year 2008. The elected EC members including one President and two Vice Presidents are as follows:

- President: Prof. Taketo Uomoto (JCI)
- Vice Presidents: Prof. Jenn-Chuan Chern (TCI) and Prof. FX Supartono (HAKI)
- Treasurer: Prof. Ha Won Song (ICCMC)
- EC Members: Dr. Biswadip Sen (ICI), Dr. Pichai Nimityongskul (TCA), Jongsung Sim (KCI), Dr. Le Quang Hung (VCA)

## 6. Looking at the future of ACF

ACF has started the works as planned by the EC members. The results of the works will come out by the end of the year 2008, possibly by the next ACF Conference in Ho Chi Minh City, Vietnam. Although the number of individual members, cooperative members and representative members are still limited, I hope the success of the ACF works in the future involves not only symposiums but also e-newsletters and standardizations.

Table 2. Attended Institutions in the 1<sup>st</sup> ACF International Conference

No.	Country/Region	National Institution
1	Australia	Australian Concrete Institute
2	India	Indian Concrete Institute
3	Indonesia	Indonesian Society of Civil and Structural Engineers
4	Japan	Japan Concrete Institute
5	Korea	Korean Concrete Institute
6	Malaysia	Institute of Engineers of Malaysia
7	Nepal	Nepal Concrete Institute
8	Philippines	Philippines Institute of Civil Engineers
9	Singapore	Singapore Concrete Institute
10	Taiwan	China Institute of Civil and Hydraulics Engineering
11	Thailand	Thai Concrete Association
12	Vietnam	Vietnam Concrete Association
13	ICCMC	International Committee on Concrete Model Code

## Next Coming Concrete Events

### 1. 3<sup>rd</sup> ACF International Conference [Ho Chi Minh City, 12 – 14 November 2008]

Vietnam Concrete Association would like to inform that The 3<sup>rd</sup> ACF International Conference, which is organized by Vietnam Concrete Association under the auspice of Asian Concrete Federation, will be held in Ho Chi Minh City of Vietnam from 12<sup>th</sup> to 14<sup>th</sup> of November, 2008. Through this Conference, Asian Concrete Federation intends to create a chance for all of concrete researchers and practitioners to exchange their knowledge and experiences in the field of concrete technology and structures, and for promoting the rapid development of Asia as well as the whole world.

The conference will highlight the most recent research results and findings of the leading researchers as well as the young authors from all countries of Asia and

neighboring regions. The first call for paper and conference website will come soon. Please, joint to the conference and visit Vietnam, the hiding charm.



### 2. 8<sup>th</sup> International Symposium on Utilization of High Strength and High Performance Concrete [Tokyo, 27 - 28 October 2008]

We would like to inform you of the First Announcement of 8<sup>th</sup> International Symposium on Utilization of High Strength and High Perform-

ance Concrete to be held in Tokyo, Japan, on 27 - 28 October 2008.

Organized by Japan Concrete Institute, Japan Prestressed Concrete Engineering Association, and

Fédération Internationale du Béton, the symposium will move to Asia for the first time in 20 years history of the symposium initiated in Stavanger, Norway in 1987.

For more detailed information, please visit the following website:

[\(http://www.jci-web.jp/8HSC-HPC/\)](http://www.jci-web.jp/8HSC-HPC/)

# Report on 2<sup>nd</sup> EC Meeting and 1<sup>st</sup> General Assembly

**Nobuyuki Matsumoto**

Secretary General of ACF

## 1. Introduction

On 22 November 2006, the 2<sup>nd</sup> ACF Executive Council Meeting and the 1<sup>st</sup> General Assembly were held in Batur Conference Room in Melia Bali Hotel at Nusa Dua, Bali, Indonesia.

## 2. Attendees on EC Meeting

The Executive Council members who attended to the meeting were Prof. Taketo Uomoto (President), Prof. Tamon Ueda (Treasurer), Dr. FX. Supartono (Indonesia), Prof. JC. Chern (Taiwan), Prof. Jongsung Sim (Korea), Dr. Le Quang.Hung (Vietnam), Prof. Somnuk Tangtersirikul (Thailand), Dr. N. Matsumoto (Secretary).

The meeting had also the following guests and observer: Dr. B. Stitman-naitham (Thailand), Dr. D. Hoedajanto (Indonesia), Dr. HS. Chung (Korea), Prof. HW. Song (Korea), Prof. K. Maruyama (Japan), Prof. OC. Choi (Korea), Prof. S. Nagataki (Japan), Prof. T. Tomozawa (Japan), Dr. W. Omar (Malaysia), Prof. YW. Chan (Taiwan).

## 3. Discussion in EC Meeting

Discussions conducted in the 2<sup>nd</sup> EC meeting consist of several topics, i.e. change on the EC members, status of RP membership and individual membership, EC members for the next term, plans on Task Group activities, budget, election of new President and Vice Presidents, new Treasurer, and venues of future meetings and international conferences.

Eight new EC members were approved in this EC meeting, i.e. Biswadip Sen (India), Franciscus Supartono (Indonesia), Ha Won Song (ICCMC), Jenn-Chuan Chern (Taiwan), Jongsung Sim (Korea), Le Quang Hung (Vietnam), Pichai Nimitiyongskul (Thailand), and Taketo Uomoto (Japan).

Prof. Uomoto, the President of ACF, opened the 2<sup>nd</sup> Executive Council Meeting by welcoming all EC members to Bali. He especially thanked Dr. Supartono who has organized the 2<sup>nd</sup> ACF International Conference and EC meeting.

Prof. Supartono welcomed the participants of the Executive Council meeting. He also mentioned that this EC meeting should make a realistic discussion on its activities because ACF has already collected individual members with membership fee.

Dr. Matsumoto, Secretary of ACF, roll-called the EC members and confirmed 7 members including 2 substitutes attended the meeting so that the meeting was valid. He also roll-called the National Delegates who were attending the meeting as observers.

Prof. Uomoto presented the draft agenda for that meeting according to the meeting document distributed to the attendees. The draft was approved without dissent.

Prof. Uomoto asked if there are any amendments on the minutes. Prof. Somnuk asked to modify the sentence in 7b "Description Items of bylaws" in page 5 of ECM2/N4. The sentence was decided to be corrected as "JCI was asked to make ACF to be a registered corporate in Japan".



Attendees of 2<sup>nd</sup> ACF EC Meeting



2<sup>nd</sup> ACF EC Meeting

Table 3. New ACF President, Vice President and EC members (Term of office: January 2007 – December 2008)

Name	Position	Background RP member organization
Taketo Uomoto	President	Japan Concrete Institute (JCI)
Jenn-Chuan Chern	Vice President (Policy)	Taiwan Concrete Institute (TCI)
Franciscus Supartono	Vice President (Technical)	Indonesian Society of Civil and Structural Engineers (HAKI)
Ha Won Song	Treasurer	International Committee on Concrete Model Code (ICCMC)
Jongsung Sim	Policy	Korean Concrete Institute (KCI)
Pichai Nimityongskul	Technical	Thai Concrete Association (TCA)
Le Quang Hung	Technical	Vietnam Concrete Association (VCA)
Biswadip Sen	-	Indian Concrete Institute (ICI)

For the time being, because of financial difficulty, ACF has not been obtained the status as a registered corporate in Japan. If ACF obtained enough fund to be a registered corporate, it will make a process to be a registered corporate in a suitable country. Prof. Ueda pointed out some merit to be a registered corporate. With the above-mentioned amendment, the minutes were approved.

Prof. Uomoto briefly reported the activity up to now. Prof. Somnuk has briefly reported on the 1<sup>st</sup> International Conference, and Prof. Supartono has briefly reported on the 2<sup>nd</sup> International Conference.

Dr. Matsumoto explained the approval process of the bylaws by EC members. Prof. Uomoto explained the amended sentences that had been changed from the approved bylaws. He also told on the sub-categories of each country/economy. The membership fees that have been remitted from countries are confirmed as those for the term from 1<sup>st</sup> of January 2007. Prof. Uomoto also explained the necessity to amend the ACF Constitution because of the formulation of bylaws.

Prof. Uomoto reported the status of the representative member application. He also reported the numbers

of individual members as 61 at that time.

Prof. Ueda, Chairman of ICCMC, explained the collaborative task group activities by ICCMC for ACF. He proposed two topics: "Maintenance for Leakage due to Concrete Cracking" and "Assessment and Intervention for Seismic Damage." The former topic is related to ISO TC71 activity. The coordinators of the TGs were decided to be Prof. Oh (Korea) and Dr. Dradjad Hoedajanto (Indonesia), respectively.

Dr. Supartono proposed to set up a new TG to deal with periodicals (newsletters and/or international journal). Extensive discussion was conducted to make a full technical journal or not. Prof. Somnuk made an affirmative comment to make a real combined international journal. Prof. Song made a comment to promote together some good conference papers to be included in the journal. Set up of the three Task Groups was approved by the EC members unanimously. Prof. Uomoto asked Dr. Supartono to be the person in charge of TG for newsletter.

Coordinators of the three TGs were requested to report their plans of activities including financial plans to be approved by the EC members.

Several members suggested to use e-mail effectively and collect e-mail addresses who may be interested in the ACF activities.

Prof. Ueda explained the budget plan and expenditure items. Prof. Chern made a comment that ACF needs to expect more financial donation from International Conferences. Prof. Ueda made a comment that it is very important to give budget to promote TG's activities. Prof. Uomoto suggested making some ceiling if there are many TG activities. But for the time being, TG activities that have been approved will be sufficiently supported.

Dr. Matsumoto explained the method and the process of the presidential election. Prof. Uomoto was re-elected unanimously as the ACF President for the next term. Prof. JC. Chern and Dr. Supartono were recommended and nominated as Vice Presidents. They were elected unanimously as the Vice Presidents for the next term. Prof. Chern was assigned as the Vice President for Policy and Dr. Supartono was assigned as the Vice President for Technical. Besides, Prof. Ha Won Song was assigned to be the Treasurer.

## 2<sup>nd</sup> ACF International Conference

### FX. Supartono

Vice President of ACF (Technical)

Within the objective to exchange the latest information on concrete technology and concrete engineering, as well as to enlarge the international collaboration in concrete research and practices, the 2<sup>nd</sup> ACF International Conference was held in the Melia Bali Hotel at Nusa Dua, Bali, Indonesia, on 20 – 21 November 2006.

Since the 1<sup>st</sup> Announcement of the Conference, the Organizing Committee has received enormous response from the concrete researchers and practitioners from Asian countries and the neighboring regions. On the closing date of the abstract submission, 144 abstracts were accepted by the Committee, on which 117 papers were submitted to the Conference Committee, and 115 papers were presented, including 5 key-note papers.

During the 2 day Conference, 212 participants have attended the Conference. They came from 19 countries: Australia, Belgium, Canada, China, Hungary, India, Indonesia, Japan, Korea, Malaysia, Netherlands, Norway, Pakistan, Singapore, Sri Lanka, Taiwan, Thailand, UK, and Vietnam.

Topics of the presented papers were:

- Concrete material technology (36 papers)
- High strength and high performance concrete (8 papers)
- Reinforced, prestressed and precast concrete structure (27 papers)
- Maintenance and repair of concrete structure (19 papers)
- Durability of concrete structure (16 papers)
- Construction management and engineering (9 papers).



Beside of the Conference, an Exhibition in concrete materials and concrete structural components was also organized by the Conference Committee at the Puri Bali Hall of Melia Hotel, in the same days of the Conference.

At the end of the Conference, after reviewed and nominated by an International Scientific Panel, 4 papers were selected to receive the “ACF Best Paper Awards”.



Attendees of 2<sup>nd</sup> ACF International Conference, Bali, Indonesia, 20 – 21 November 2006

## ACF Best Paper Awards on the 2<sup>nd</sup> ACF Conference [Bali]

### A. Best Concrete Technology Award

#### **Study on the Application of Low-Quality Recycled Coarse Aggregate to Concrete Structures by Surface Modification Treatment**

*Masato Tsujino, Takafumi Noguchi, Masaki Tamura, Manabu Kanematsu, Ippei Maruyama and Hironori Nagai*

##### **Summary**

This paper aims to establish a technique for recycling concrete easily in view of the essential solution toward establishing closed-loop recycling society. In establishing recycle-oriented concrete industry, the current recycle process, requiring a high-level modification technique such as heating and rubbing, still includes many problems, e.g., energy-reduction cost-saving and fine powder treatment. The recycling system of concrete structure is being significantly improved under the emphasis on more enhanced environmental consciousness. Japanese Industrial Standards (JIS) have been developed to put recycled concrete aggregate into practical use. The technique introduced in this study enables the improvement of recovery rate of original aggregate by enhancing a peeling-off effect of aggregate without damaging any mechanical properties. The enhanced peeling-off effect is re-

alized by applying a surface improving agent to aggregate. In addition, high water absorption of recycled aggregate is also reduced. In this paper, material tests were conducted on recycled aggregates with low quality and middle quality. In the test, two types of surface improving agent, oil-type and silane-type, were used. The test results have shown that the recycled aggregate finished with silane-type improving agent was greatly improved in recovery rate but showed lowered strength. Reinforced concrete beams were made using the oil-finished aggregate, while the aggregate finished with silane-type improving agent was excluded because it was considered difficult to be used for structure. The reinforced concrete beams were subjected to the bending test.

The bending test results have revealed that the flexural capacity of reinforced concrete beam with aggregate



finished with oil-type improving agent was approximately equal to that of conventional reinforced concrete beam with non-finished crushed stone. Consequently the possible applicability of recycled aggregate finished with oil-type surface improving agent was verified.

### B. Best Concrete Practice Award

#### **Grand Wisata Cable Stayed Bridge**

*FX. Supartono*

##### **Summary**

The Grand Wisata bridge is located in Eastern Bekasi, around 25 km from Jakarta. The bridge has 81 meters span length, having single pylon that consists of two inclined concrete columns being interconnected by an arch at the top, and precast prestressed concrete girders over-crossing an express way. Due to 3-D inclination and non-prism shape of 40 meters high pylon, fully supported scaffolding system was used for concrete pouring. Due to heavy reinforcement in the pylon's sections, particularly on the proximity of the stay cable's anchors, a special care is given on the effectiveness of concrete compaction. In this respect, a high

performance and self compacting concrete having 60 MPa cylindrical strength and a minimum flow of 650 mm, is designed for the pylon. This kind of concrete represents the highest grade of self compacting concrete having been realized in Indonesia, particularly for the cast-in-place concrete practice. Due to limited space in the express way to construct a temporary support for erection of the precast girders, a multistage stressing sequence was designed for the stay cables to adapt the maximum allowable reaction force on the temporary supports.



A special design was also applied to the fabrication of precast concrete girders that should have a slightly parabolic precamber.

## C. Best Concrete Research Award

### 1. Radiography of Reinforced Concrete Structures using Compton Backscattered Laser Photons Beam

*Hisashi Kanada, Hirayuki Toyokawa, Taketo Uomoto*

#### Summary

There is strong demand for non-destructive inspection of reinforcement in concrete structures. It is an emerging issue in Japan because many buildings were built using false earthquake-resistance data. Detection of bar arrangement after completion of construction is attempted in order to verify whether amount of reinforcement was reduced compared to the design criteria.

Non-destructive inspection methods are often used to detect bar arrangement for core boring in order to avoid reinforcement. Radar or electromagnetic methods are often used, and X-ray radiography may be applied if necessary. Radar and electromagnetic methods can also be applied, but only if the cover depth is small. Detection is very difficult when the bar arrangement is complex. X-ray CT scanner

using bremsstrahlung X-ray are commonly used for non-destructive inspection of industrial products such as automobile or aircraft components. However, if the X-ray absorption coefficient of a sample object is large, metal artifact presents due to spectrum hardening effect.

High permeability quasi-monochromatic photon beam allows acquisition of accurate information about the density distribution of the sample objects. The quasimonochromatic photon beam is produced by the laser-Compton backscattering from relativistic electrons. National Institute of Advanced Industrial Science and Technology (AIST) have developed a high-energy and quasi-monochromatic photon transmission radiography and CT systems.



The authors used the radiography system to inspect reinforced concrete structures with deformed bars of different diameters and cracks with precisely controlled width. The applicability of the method was examined, and the quality of the information obtained from the experiment was discussed.

### 2. Effect of Mix Proportion and Cover Thickness on Electromagnetic Properties of Concrete Measured by Radar Method

*Raktipong Sahamitmongkol, Yoshitaka Kato, Taketo Uomoto*

#### Summary

The effect of mix proportion (w/b, s/a, and total aggregate content) on dielectric property of concrete was investigated. The multi-component model is applied to calculate dielectric constant of aggregates and pastes. The effect of chloride ion and fly ash on the dielectric constant is then studied.

The effect of cover thickness is also discussed. The technique explained in this study can be applied to improve the detection of reinforcing bar in RC structure as well as to evaluate the condition of concrete.



<b>President</b>	: Taketo Uomoto (Japan, JCI)
<b>Vice President (Policy)</b>	: Jenn-Chuan Chern (Taiwan, TCI)
<b>Vice President (Technical)</b>	: FX. Supartono (Indonesia, HAKI)
<b>Treasurer</b>	: Ha Won Song (Korea, ICCMC)
<b>Secretary General</b>	: Nobuyuki Matsumoto (Japan, JCI)