Asian Concrete Federation E-Newsletter

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This edition of ACF E-Newsletter contains general news and current issues about concrete field in Asia.

An article contributed by Prof. Jang-Ho Jay Kim titled "Advanced Concrete Technologies in Korea" starts off the E-Newsletter and followed by the 6th ACF President and Vice-Presidents Meeting Contents, ACF-JCI-VCA Joint Seminar Contents, ACF Corporate Member (CM) Advertisement, ACF Environmental Declaration of Concrete, and the 4th ACF Conference Advertisement.

Prof. JHJ Kim is an associate professor in the School of Civil and Environmental Engineering at Yonsei Univ. in Korea. He is an active member of ACF, ICCMC, and KCI who specializes in the area of concrete structural and material mechanics.

Advanced Concrete Technologies in Korea

Prof. Jang-Ho Jay Kim
Executive Member of ICCMC and Professor at Yonsei University

1. New Concrete Construction Projects in Korea

Recent advancements in concrete technology have been applied to construction projects in Korea. Applications of state of the art concrete technologies are applied to two major civil-engineering projects in Korea: Inchon International Airport (IIA) and Korean High Speed Railway (KHSR) projects.

Fig. 1 Inchon International Airport Layout

1.1 Inchon International Airport

Inchon International Airport (IIA) was built to meet future air travel demand of 21st century. The new airport is located 52km from the center of Seoul and 15km from Inchon City. It has 40 minute travel time from downtown Seoul and is considered as an ideal location for an air transportation hub of the Far East Asia region. Since new airport is located on tidal land between 2 nearby islands, it is free from noise and space availability problems for a large airport development project. Also, the future expansion of the airport is possible due to low land reclamation cost from the shallow sea level depth around the islands. When fully developed, the new airport and its support facilities will cover 5,617 ha of reclaimed land between two islands, which are connected by a 17.3km long dike. The site covers 8 km from north to south, and 10 km from east to west.

Inchon International Airport is served by an intermodal transportation system composed of the airport expressway, airport railway, subway, underwater tunnel and seaport. With these access transportations in place, it is easily accessible from the main metropolitan cities in Korea.

Fig. 2 Passenger Terminal Complex and International Business Center

To connect the airport to the main land, a double-deck suspension bridge was constructed. This bridge has a 6-lane roadway on the upper level, and 4-lane roadway and a double-track railway on the lower level.

The distance between the two main bridge towers is 300 m. The bridge has a clearance of 35 m that allows 10,000 ton cargo ships to pass by.

1.1.1 Chloride Resistant Concrete

IIA has been constructed on the reclaimed island between Yongjong and Yongyu Islands, exposing it to continuous chloride and sulphate attacks in its soil and underground water. This saline environment has initiated extreme protection issues for concrete used in construction for potential degradation by salt damages. IIA survey has shown that its soil and under ground water, surrounding concrete structures has maximum 1.8% of chloride and 0.31% of sulphate contents. The concentration of the ground surface was measured to be in less than that in the underground due to dilution from storm water. This site has higher concentration of sulphate contents, requiring proper countermeasures. The results of the survey are as shown in Table 1.

To improve durability of concrete structures exposed to saline environment, IIA has set up a standard specification for salt resistance concrete as shown in Table 2. Moderate-heat cement (Type II) was used, but a lack of Type II OPC production in Korea could not meet the volume of cement required at IIA. Therefore, instead of using unfavorable and uneconomical Type II cement, IIA decided to use a pozzolan (slag powder) mixed with sulphate resistant cement (Type V). Epoxy painted reinforcement has excellent salt resistance, but when its coating comes off, its maintenance is not so easy. Thus, IIA decided to use corrosion inhibitor for the epoxy painted rebar. A standard specification against salt damage has been developed into two categories for a separate application for underground structures having great potential for salt damage and for above ground structures having less potential for against salt damage. Determined specification requirements were as follows:

Table 1 Concentration of Chloride and Sulphate(Unit:%)

Content	Soils		Underground Water
	Surface	Underground	
Chloride	0.04~0.08	0.4~0.5	1.7~1.8
Sulphate	0.01~0.02	0.08~0.09	0.27~0.31

Table 2 Standard Specification of Manufacturing Salt Resistance Concrete

Classification	Salt Resistance Measures		Material Employment Plan					Adequate Cover of Re-bars
	Measures against chloride	Measure against sulphate	Cement	Admixtures	W/C	Chemical Admixtures	Washed Sea-sand	
Above ground strurture	-Reduce W/C -Increase water tightness -Use chlorine resistant admixture	-	Type I	Slag Powder (13%)	W/C: 45%	-Super-plasticizer -Air-entrainers -Corrosion inhibitor	Enhance standard chloride content: less than 0.02% (KS standard; less than 0.04%)	5~10cm
Under ground structure	-Reduce W/C -Increase water tightness -Use chlorine resistant admixture -Add anti-corrosive admixture	Limit of C_3A content: 4~5%	Type V	Slag powder (25%)	W/C: 43%	-Super-plasticizer -Air-entrainers -Corrosion inhibitor		8~10cm

1.1.2 Heat of Hydration in Mass Concrete

Major infra structures in IIA including ATC, underground tunnel, elevated bridge, IAT tunnel, utility tun nel, etc. have been constructed using mass concrete of 1.0 ~ 2.8m cover thickness for the remedies to the potential cracking problems induced by temperature stress from heat of hydration. All structure have been reviewed based on the estimated stress from the heat of hydration, and then determined the concrete mix and construction conditions through site mock-up testing to avoid cracking of the structures. Elevated bridges were designed with larger cover thickness and higher strength when high heat of hydration in expected. Therefore, both pipe cooling and pre-cooling methods were applied on these structures while for underground tunnel and IAT tunnel, etc. only pre-cooling method were applied.

1.1.3 Precast Drainage Structure

IIA has a total of about 100km underground storm-water drainage channels under the airfield area. To construct high quality concrete structures, IIA built a large-scaled on-site plant with the state-of-the-art concrete technology to manufacture high-strength and precast concrete drainage structures such as pre-cast culvert, drain pipes and ditch box elements. This plant is equipped with steam curing frameworks, overhead cranes, concrete batch plant, and automatic concrete pouring facilities. Its productivity is approximately 320,000 cubic meters of precast concrete culvert and slab elements in two years or about 600 cubic meters per day. The elements weigh between 30 and 70 tons.

1.1.4 Long-Term Salt Damage Inspection

In order to evaluate and improve the quality of concrete used at IIA project, 380 samples have been exposed to splash zone of seaside of north dike for 5 years and are being tested annually.

1.2 Korean High Speed Railway

The expressway linking the two major cities (Seoul-Pusan) of the Korean peninsula is currently the main project of Korean High Speed Railway (KHSR) Corporation. Four intermediate stations are located along the 412 km between Seoul and Pusan at the cities of Chonan, Taejon, Taegu and Kyungju. Taejon and Taegu are the third and fourth largest cities of Korea, repectively, and Kyungju is a city of historic importance. The high-speed railway will link the major economic and cultural centers of the Korea as shown in Fig.3 The project includes 84 tunnels (191km) and 143 brigdes (109km).

Fig. 3 Route of Korean High Speed Railway

The feasibility of the project was studied in the 1980's, which the study led to the initiation of a government policy on the Seoul-Pusan High-Speed Railway construction. In March 1992, the Korean High Speed Railway Construction Authority, the public authority in charge of the project, was created. In June of the same year, the start of the construction on a 57.2km long test section located between Chonan and Taejon began. In June 1994, the French TGV technology was selected and a consortium led by Alstom was awarded the Core System contract including the procurement of system management, catenary, and signaling and train control. Among a total of 46 high-speed trains, 12 trains are to be manufactured in France while the remaining 34 trains are to be manufactured in Korea.

1.2.1 Precast Span Method

One of the significant bridge design and construction innovations on this project was the introduction of 25m long precast PC Box Girders. The girders are cast in temporary casting yards and transported on a special trailer and installed with a launching girder. The Precast Span Method (PSM) was adopted for the bridge deck construction of several long bridges. The PSM method involves the prefabrication, transport and installation of 25m long Precast Prestressed Box Girders. The 600-ton girders are cast in a temporary casting yard located near one end of the bridge, and transported by specially designed carriers to the point of installation. The concrete box girders are lifted from the carrier and moved along a launching beam. The launching beam is supported at the front end on the pier head, on which the girder is to be installed, and at the rear end on the previously installed girder. As the construction progresses, the installed girders serve as the access route for the special carrier. This method, of course, is particularly advantageous for long bridge structures (Fig. 4).

Fig. 4 Installation of 25m long precast prestressed box girder

2. Concrete Design Codes and Standards in Korea

2.1 Working Stress Design Method

Two main societies related to building and civil engineering exists in Korea: ACI (Korea Concrete Institute) and KSCE (Korean Society of Civil Engineers) which provide Construction Code for Concrete Structure and Standard Specification for Concrete Civil Works based on working stress design methods since 1993 and 1962, respectively. KSCE revised the specification so that both the working stress method and ultimate strength design method be applicable in 1968. Then, KSCE emphasized the ultimate strength design in the 2nd revision and treated the working stress design method as an alternative design method. Two more revisions were made in 1983 and 1988 by KSCE. Meanwhile KCI supplemented the building code in 1993 and two more revisions were made until now on the basis of the working stress design method. Standard Specification for Roads and Bridges on the basis of working stress design method was made in 1962 and revised in 1972 and 1983. The 3rd revision of specification began to adopt the concept of ultimate strength design method in 1993.

2.2 Ultimate Strength Design Method

When the construction market of the middle-east area was expanded by huge amount of oil money inflow from western countries in 1970, many construction companies of Korea were involved in their projects mostly designed by western country engineering firms. To meet the design requirements mainly following the specifications of U.S. and European countries, Korean construction engineers involved in the projects had to rely on the ultimate design method and limit design method. It was natural for them to apply such foreign design codes to domestic projects. Thereafter the ultimate strength design method has been more widely used as method for the structural calculation of reinforced concrete structures in Korea than the

limit state design methods because many new young engineers in Korea were trained in U.S. as students or practicing engineers. Such engineering environment led to the smooth transition of the working stress design method to the ultimate strength design method as standards of structural concrete for both buildings and bridges in 1988. After these revisions, both groups made efforts to supplement and revise their code and specification in 1994 and 1990, respectively. Finally, Korea Concrete Institute (KCI) combined two different standards with two corresponding specifications for structural concrete in Korea to make a unified concrete code on the basis of ultimate strength design method and a unified specification for construction in 1999. The unified design code and specification can be considered as a giant progress for rationality of understanding of concrete technology in Korea

2.3 Performance Based Design Concepts

In recent years there has been a substantial research and design concept development directed toward "Performance-based Design (hereinafter abbreviated as PBD)" since General Standard for Earthquake Resistant Design by Earthquake Engineering Society of Korea was made on the basis of PBD in 1997. Since the ultimate strength design method involves the design for serviceability in terms of deflection, vibration, and cracking, the PBD, that is a new label for Limit State Design, is nothing new if engineers add another limit state between serviceability and ultimate limit states. Although the PBD is interpreted as a refined version of limit state design, the traditional force-based design is needed to shift to deformation-based design philosophy. The agenda of the proposed Asian Concrete Model Code on the based on PBD and/or Limit state design concept is to determine load factors for corresponding performance levels and load combinations. Now it is just conceptual stage to set forth qualitative description of performance states. Maybe a concept similar to the capacity spectrum method to search the performance point is necessary to devise for design for other actions. In other word the magnitudes of design actions for target performances and load combination formats are proposed, otherwise at least some methodology must be describe in the next version such as reliability-based- approach.

2.4 Korean Standards for Materials and Testing

Korean Standards (KS) has described material specifications and testing methods necessary for Concrete codes since 1960's. Over forty articles related to concrete are currently provided in KS. Now the compatibility of the requirements and contents of KS between those of ISO are reviewed and revised by a special committee of KCI. It is observed that some articles for the maintenance of concrete in KS are necessary to meet ACMC.

What's ACF objective ?

- 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/or seminars.
- Promotion of updating and revising concrete codes/standards on structural design, materials, construction and maintenance through development of new knowledge to meet the latest needs.
- Interaction with the members and keeping them aware of the activities of the Federation.

6th ACF President and Vice-Presidents Meeting

5 July, 2010
Hosted by ACF and Hokkaido University

The 6th ACF President and Vice President Meeting was held at Sappro, Japan at Hokkaido Univ. on July 5, 2010. The meeting was hosted by ACF and Hokkaido Univ. and attendees express sincere appreciation for their hospitality. The meeting details are as follows.

1. Introduction

On 5th July 2010, the 6th ACF President and Vice President Meeting was at Hokkaido University, Sapporo, Japan.

2. Attendees

The attendees of the meeting are as follows.
J.Sim (ACF President)
T.Ueda (ACF Vice President)
L.Q.Hung (ACF Vice President)
C.Park (ACF Secretary)
H.Noguchi (ACF EC)
N.Masaki (ICCMC Secretary)

3. Agenda

1. Opening Remarks by Prof. Sim, President of ACF

The President of ACF, Jongsung Sim opened the 6th ACF President and Vice Presidents Meeting. He addressed his appreciation to Prof. Ueda for hosting this meeting.

2. Presentation of the Handouts and Approval of Meeting Agenda

Secretary Cheolwoo Park, the Secretary of ACF, distributed handouts and gave brief explanations and also the meeting agenda was approved per President's request.

3. Review of the last 5th EC Meeting Minutes

Secretary Cheolwoo Park explained the main issues that was discusses at the last EC meeting

4. President and Vice President (Policy) Reports: Expansion of Membership

- Understanding the actual problems in expanding the RM countries: financial problems and others.
- Need to consider the benefit to participating RM countries
- China: Dr. Hung will contact delegates from China at the 4th ACF Conference.
- Laos and Cambodia: Dr. Hung will send an invitation letter.
- Financial support to some countries: For the 1st time attendee from new RM country, ACF can consider to support some travel cost.
- Financial support for ACF Environmental Declaration: For current RM countries, ACF may consider to support the delegates from some countries for the attendance at ACF Environment Declaration.
- RM membership fee: Some of current RM countries did not pay RM fee yet.
- Hong Kong Concrete Institue: HKCI is a potential ACF RM member so that Prof. Ueda will have a chance to contact HKCI.
- CM member of ICCMC: The current ICCMC CM members can be a CM of ACF. (Currently 6 of ICCMC CM members)
- CM from Vietnam: Dr. Hung will contact a corporate in Vietnam. (maybe 1-2 CMs in the near future)
- Policy for membership: ACF may need to develop a policy to "keep" and "extend" the membership.
- Profit from seminar: Holding a technical seminar or lecture can be a good way to make a profit (eg. JCI-VCA_ACF Joint seminar) which can be used to support any ACF member country.

5. Vice President Report (Technical): Working Group's reports

- Copyright: For any publications from ACF and ICCMC, Prof. Ueda will propose a draft copyright agreement.
- TG4: TG4 asked if any additional fund but currently no fund is available for TG activity.
- TG 5: For the TG5 activity, Prof. Noguchi would ask RMs in each member country for their help for the data survey.
- TG 6: Per TG 6's ask, the working period of TG6 will be extended for an additional one year.
- TG7: For the Environment Declaration, Prof. Sim suggested to invite the Presidents of each member institutes.
- TG7: The Environment Declaration at the ACF Conference would contain very conceptual ideas. Prof. Choi together with Green Committee for Concrete of KCI will prepare the 1st draft by early September and distribute the draft to all RMs for their review. Prof. Noguchi would distribute the draft around Sep 13 to the Japan side for pre-discussion.
- Special session of TG activities at ACF Conference: Prof. Ueda proposed to hold a special session of TG activities at the 4th ACF Conference.
- Merger between ICCMC and ACF: The framework had already been approved at the last 5th EC meeting. The details in the merger (Financial matter, newsletter, membership, homepage etc) will be discussed after the EC meeting.

6. ACF Conference updates

- LOC: Continuous efforts may be needed by LOC.
- ACF membership fee: Registration fee should include two year membership fee of ACF.

7. Other Business

- Concrete Research Letter: ACF EC meeting will discuss this issue later.
-Promotional Session at ICI-ACECON: ACF President, Prof. Sim will attend ICI-ACECON and give a promotional session. (Maybe Prof. Ueda and Choi will join the conference)
- ACF-JCI-VCA joint seminar: The seminar was successfully completed but no financial profit was made.
- ACI Concrete International: An letter to the ACI CI was already sent for the publication.
- ACF homepage: There are still some past events on the first page of the site.

8. Next Meeting

- EC Meeting: 10AM Nov. 28
- Election of EC: during EC meeting
- GA Meeting: 4PM Nov. 28

9. Adjournment

President Sim closed the meeting officially. Drafted by Prof. Cheolwoo Park, Secretary of ACF, on 10 July 2010.

ACF-JCI-VCA Joint Seminar on "Practical Guideline for Investigation, Repair and Strengthening of Cracked Concrete Structures"

Phan Huu Duy Quoc, Ph. D.
Committee on ACF Affairs in JCI
Shimizu Corporation,
Civil Engineering Technology Division

Organization of the ACF-JCI-VCA Joint Seminar on "Practical Guideline for Investigation, Repair and Strengthening of Cracked Concrete Structures" in Vietnam.

31 May, 2010 ~ 1 June, 2010 (Hanoi)
3 June, 2010 ~ 4 June, 2010 (Hochiminh)

1. General introduction

This is a brief report on the organization of the above joint seminar, with the hope that it will serve as a typical example for similar activities in the future.

This seminar was jointly organized by Asian Concrete Federation (ACF), Japan Concrete Institute (JCI) and Vietnam Concrete Association (VCA), with the cooperation of the following two divisions in Vietnam Ministry of construction: State Authority for Construction Quality Inspection and Department of Science and Technology.

The purposes of the seminar were to enrich the mutual relation between JCI and VCA, members of ACF, and to cope with the concrete cracking problem, one of the currently most concerned issues in concrete technology not only in Vietnam, but also in other Asian countries.

From the initial idea of the Committee on ACF affairs in JCI (chaired by Prof. Takafumi Noguchi, the University of Tokyo), a steering committee was set up between JCI and VCA, and preparation work started in November, 2009. Within a half year since the initiation, with the strong support from the Committee on ACF affairs in JCI, VCA has successfully hosted the seminar at two locations in Hanoi and Hochiminh city.

Date	Location	Venue	Number of Participants
May 31st & June 1st	Hanoi	Institute of Building Science and Technology (Ministry of Construction)	194
June 3rd & 4th,	Hochiminh	Hochiminh city University of Technology	182

The seminar can be considered as the first of this kind since the establishment of ACF. It is surely a proof for the role of ACF in bridging individuals and organizations together, for sharing information and working together for the sake of concrete community in Asia.

2. Preparing the basement for cooperation and financing the seminar

To facilitate the organization of the seminar, the following agreements were signed by representatives of involved organization:

a) Agreement on the organization of the seminar, signed by leaders of ACF, JCI and VCA
b) Agreement on publication of the JCI's Guideline, signed by representatives of JCI and VCA.

It can be said that these agreements are very important to clarify the role, responsibility, right, etc. of each organization in this activity. Nevertheless, the most important thing was turned out not to be the rule, but the willing to cooperate between involved people in ACF, JCI and VCA.

Budget for organizing the seminar was thought to be a big problem at the beginning. However, VCA and JCI have found a solution for co-funding this event. Besides, the local organizing committee also issued a Call for Sponsorship and obtained about 20 percent of the necessary budget from the sponsors. The remaining required budget was collected from the participation fee.

3. Introduction of the Guideline

The newest Japanese version of JCI's Practical Guideline for Investigation, Repair and Strengthening of Cracked Concrete Structures was published in 2009 by JCI Committee on Cracked Concrete. This Guideline covers important issues related to cracking problems of concrete, including investigation, cause estimation, evaluation, judgment and treatment of cracked concrete structures.

The initial edition of this guideline was published as early as 1980 and lately revised 3 times in 1987, 2003 and 2009. Therefore, it can be said that this Guideline is the crystallization of comprehensive study and experiences on this topic in Japan for more than 30 years.

The English version of the 2009 Guideline was completed in March, 2010 and was used as the textbook for this joint seminar as well as in other bilateral seminars between JCI and its counterparts.

In the ACF-JCI-VCA seminar, the Vietnamese version of the JCI's Guideline was published as the seminar textbook for users who are not so familiar with English documents.

4. Seminar program

Each seminar was held in two days and the same program was applied for both seminars. Four Japanese lecturers from JCI gave lectures on the main contents of the Guideline, including investigation, cause estimation, evaluation, judgment, and repair and strengthening method. In addition, two Vietnamese lecturers from VCA provided typical examples and related technical standards in Vietnam. Bellow tables show the list of lecturers and the seminar program.

5. The seminar outcome and future expectation

In total, nearly 400 people have participated in the two seminars, including 10 international engineers working in Vietnam and surrounding countries. Most of the participants were engineers working at construction companies and researchers at research institutes. It was observed that most of the participants remained till the end of the seminar with a very high concentration.

After each seminar, there were almost non-ending comprehensive discussions between lecturers and participants about not only the contents covered in the seminar but also actual cracking problems that participants are facing in their works.

At the end of each seminar, a Certificate of Completion was issued to each participant as recognition of their participation, which guarantees that each participant has gained basis knowledge about cracking and how to deal with it.

The success of this seminar is the outcome of tremendous efforts of all involved people, including leaders, researchers and staffs of ACF, JCI and VCA.

Overall, this joint seminar is an evidence for the important role of ACF in creating a platform for country members like JCI and VCA, to exchange information and cooperate with each other. It is also expected that similar activities will be held more and more under the leadership and coordination of ACF.

Table 1 Lecturers at the seminar

Lecturer	Association	Affiliated organization
Prof. Dr. Hiroshi Yokota	JCI	Hokkaido University, Japan
Prof. Dr. Toshiro Kamada		Osaka University, Japan
Dr. Takeshi Yamamoto		Central Research Institute of Electric Power Industry, Japan
Dr. Koji Osada		Central Nippon Expressway Co. Ltd., Japan
Dr. Bui Duc Chinh	VCA	Institute of Science and Technology Ministry of Transportation, Vietnam
Dr. Tran Ba Viet		Institute of Building Science and Technology, Ministry of Construction, Vietnam

Table 2 Seminar program

Date	Time	Content	Lecturer
First day	7 h 15 – 8 h 20	Registration	
	8 h 20 – 8 h 30	Opening section	
	8 h 30 – 9 h 10	General introduction	Prof. Dr. H. Yokota
	9 h 10 – 10 h 30	Investigation on cracked concrete structures	Dr. T. Yamamoto
	10 h 30 – 10 h 40	Break	
	10 h 40 – 12 h 00	Presentation regarding crack problems in Vietnam (Transportation facilities)	Dr. Bui Duc Chinh
	12 h 00 – 13 h 30	Lunch break	
	13 h 30 – 14 h 50	Cause Estimation	Dr. T. Yamamoto
	14 h 50 – 15 h 30	Evaluation of cracks	Prof. Dr. T. Kamada
	15 h 30 – 15 h 40	Break	
	15 h 40 – 16 h 30	Evaluation of cracks (Cont.)	Prof. Dr. T. Kamada
Second day	8 h 00 – 8h 40	Judgment of necessity of repairing and strengthening	Prof. Dr. T. Kamada
	8 h 40 – 9 h 30	Repair and Strengthening	Dr. K. Osada
	9 h 30 – 9 h 45	Break	
	9 h 45 – 11 h 35	Repair and Strengthening (Cont.)	Dr. K. Osada
	11 h 35 – 13 h 00	Lunch break	
	13 h 00 – 14 h 30	Presentation regarding crack problems in Vietnam (Civil facilities)	Dr. Tran Ba Viet
	14 h 30 – 14 h 45	Break	
	14 h 45 – 15 h 45	Open discussion	
	15 h 45 – 16 h 30	Closing section, Certification Issuance	

Fig. 1 Seminar in Hanoi

Fig. 2 Prof.Yokota's opening speech

Fig. 3 JCI lecturers

Fig. 4 Seminar in Hochiminh city

ACF Corporate Member Advertisement

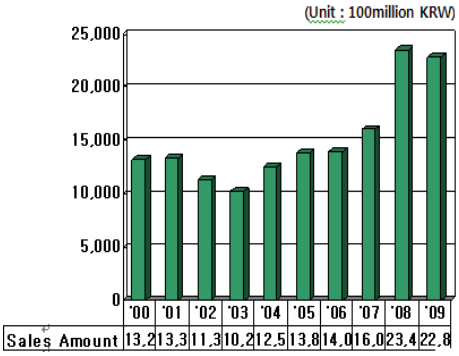
Dongbu Corporation

Dongbu Corporation traces its origin to the 1969 founding of Miryung Construction, which successfully carried out major construction contracts in Saudi Arabia *in* the early 1970s. The collective value of these early contracts, approximately US $2 billion, put in place a solid foundation for what was to become the Dongbu Group. Leveraging its core competencies in civil infrastructure, construction and plant construction, Dongbu Corporation expanded into housing and SOC (social overhead capital) projects as well as real estate development. Upon merging with Dongbu Express, Ltd. in 2000, the company expanded upon its strong position as one of Korea's leading construction and logistics businesses

Vision

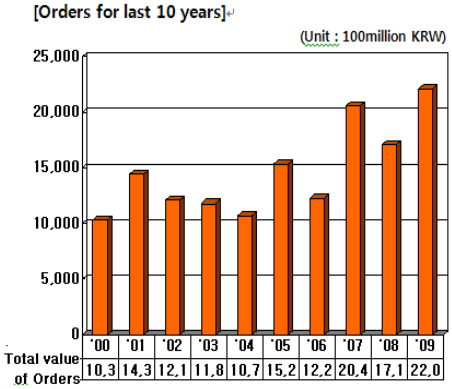
"Total Service Provider for Clients"In concert with Dongbu Group's Corporate philosophy, Dongbu Corporation is committed to a mission and vision to build an "Global Excellent Company"

[Annual Sales for past 10 years]



	'00	'01	'02	'03	'04	'05	'06	'07	'08	'09
Sales Amount	13.2	13.3	11.3	10.2	12.5	13.8	14.0	16.0	23.4	22.8

[Orders for last 10 years]



	'00	'01	'02	'03	'04	'05	'06	'07	'08	'09
Total value of Orders	10.3	14.3	12.1	11.8	10.7	15.2	12.2	20.4	17.1	22.0

Organization

Civil Works

With the advanced technology and knowhow in the field of civil engineering works, the Civil Works Division of Dongbu Corporation is successfully implementing various large scale construction projects nationwide and overseas. It builds a new world with the best quality and state-of-the-art technology.

Cheongdam Bridge
- 1993.12 ~ 2001.02
-Noyou-dong,Gwangjin-gu~Chungdam-dong, Gangam-gu, Seoul, Korea
- Total Length: 2,242 m
- The first Double deck bridge in Korea

Building Works

From the ultra-modern intelligent buildings to medical facilities, Dongbu Corporation displays the brand-new technology and excellent designs that created the legendary success in the Middle East.

Dongbu Financial Center
- 1993.01~2001.12
- 891-10 Daechidong, Gangnam-gu, Seoul Korea
- Basement 7F ~ Ground 35F
- Total building floor area :57,020㎡
- 2003 The 21st Seoul Construction Awards

Plant Works

The Environment & Industrial Plants Works Division of Dongbu Corporation successfully performs large scale projects of industrial facilities in the fields of environment, energy, chemicals, steel and T/L Every effort is made to preserve the clean environment.

Eastern Regional Resource Recovery Facility
- 2005.10 ~ 2008.08
- Incheon City, Geonggi-do, Korea
- Stoka Incinerator: 300 ton/day

Housing

Putting the quality first, Dongbu Corporation is creating a beautiful living space with rich housing experience and expertise. It makes every effort to establish a new-living culture where people can enjoy more affluent and comfortable life.

Daechi Centreville

- 2002.3 ~ 2005.1
- Daechi-dong, Gangnam, Seoul, Korea
- Y-type Tower-type Structure
- 2005 Korea Construction Culture Awards
- 2006 Good Apartment Awards
- 2007 Good Design Certification from the Ministry of Commerce, Industry & Energy (Environment Design Section)

Development

With advanced technology acknowledged worldwide, the Development Business Division of Dongbu Corporation performs large scale development projects including hotels, shopping malls, gold courses, and parking lots. It is more than ready to do its utmost to create pleasant living space.

Marrium
- Buam 1-dong, Busanjin-gu, Busan, Korea
- One-Stop furnishings w/ wedding special department
- Basement 1F ~ Ground 3F
- Total building floor area : 16,529㎡

Structural Steel Works

The Structural Steel Works Division of Dongbu Corporation provides the steel structure products of the best quality based on the top-notch equipments and system. The entire staff members do their best to develop new technology and guarantee the finest quality.

. Annual production: Over 4 million tons of various steel products annually

· Production : Rolled Steel Sheet, Cold Rolled Steel Sheet, Galvanized Steel Sheet, EGI, Pre-coated Metal, Tin Plate, medium and large-sized Pipe, light weight welded H-Beam, PEB, Cold Heading Quality Wire, and Cold Drawn Bar

· Production bases: Asan Bay Works, Incheon Works and Pohang

Engineering

Dongbu Engineering Corporation is a total engineering company which aims to develop high added value technology and reach the global standard. Being a total consultant in technical field such as construction engineering, environment and information industry, it realizes human dream through technology. It plays a crucial role as an all-around consultant in the fields of the construction engineering, environment and information industry, making dreams come true.

Gyeongbu high speed railway
- 1998.11 ~ 1999.10
- Sin-dong, Yuseong-gu, Daejeon, Korea
- Earth works : 1,147,695㎡
- Length: 8,070m

Logistics

The Logistics Division of Dongbu Corporation is the third largest total logistics company in Korea. It connects the world's networks from transporting to stevedoring and storing, establishing the state-of-the art logistics system and thus providing high quality service.

ACF Environmental Declaration of Concrete

In the past year, ACF has planned for Environmental Declaration. In the EC meeting at Bankok, Thailand and the ACF general assembly meeting at Ho Choi Minh City, Vietnam and Seoul, Korea, the details of the ACF environmental Declaration have been discussed. In the upcoming ACF Conference at Taipei, Taiwan, ACF EC is planning to propose a draft version of ACF Environmental Declaration. Two examples of Environmental Declaration published by FIB and KCI are shown below. The following is the past activities involved with Environmental Declaration.

1. At 5th ACF EC meeting in Dec. 2009, the formation of TG7 on the "ACF Environmental Declaration of Concrete" was approved.

2. TCI already welcomed the concept of "ACF Environmental Declaration of Concrete" and will support related activities at the 4th ACF International Conference.

3. TG7 would like to invite all RM members to participate in the group and ask all RMs to provide specific ideas with regard to process and methods for the successful declaration: for example, all RMs may present and sign a declaration during the conference.

4. Exact title for the declaration is to be determined after discussion and following examples from ACI, FIB, etc.

5. Declaration will be initially prepared by KCI and circulated for review by all RMs.

6. ACF may use ACI Concrete Joint Sustainability Initiative, FIB Sustainability Initiative, KCI's Declaration for Green Concrete, and AIJ Architectural Charter for Global Environment as reference.

The FIB version is as follows.
Special Activity Group 8
fib Sustainability Initiative

Deputy-Convener:
Sakai (Kagawa University)

Provisional Members:
Bastien (Univ. of Laval, Canada), Clark (Gifford, United Kingdom), Dehn (MFPA Leipzig, Germany), Denton (Parsons Brinckerhoff Ltd, United Kingdom), Foster (Univ. of New South Wales, Australia), Gravind (Danish Technological Institute, Denmark), Hájek (Czech Technical Univ. in Prague, Czech Republic), Kawai (Univ. of Hiroshima), Matthew (Building research Establishment Ltd, United Kingdom), Menegotto (Univ. La Sapienza, Roma, Italy), Noguchi (The Univ. of Tokyo, Japan), Olsen (Olav Olsen A/S, Norway), Pinto (Univ. di Roma La Sapienza, Italy), Piscaer (UNIVERDE/SUSCON), Taerwe (Ghent Univ., Belgium), van Breugel (Delft Univ. of Technology, The Netherlands), van der Horst (BAM Infraconsult bv., The Netherlands),

Recent meeting:
Washington, D.C., USA, May 28

Terms of Reference

Scope
The reduction of greenhouse gases has become an issue of global importance. A red flag is now raised against the socioeconomic activities which have consumed resources and energy on a massive scale, and the market principles of mass production and mass consumption that have prevailed since the Industrial Revolution are now approaching an end. Human socioeconomic activities are meaningful only when the globe is in a sound condition, and human survival itself is vulnerable if the global climate drastically changes and loses its rhythm.

The Intergovernmental Panel on Climate Change (IPCC) explicitly underlined in its Fourth Assessment Report the critical situation of and responses to global warming. It is necessary for humankind to halve anthropogenic greenhouse gas emissions by the year 2050, thereby keeping the global temperature increase to 2°C.

Taking future economic growth by the developing countries into consideration, developed countries must reduce their emissions by 80% or more.

The above is what was agreed upon during the 2009 G8 Summit held in L'Aquila. Although severe negotiations are expected in the future between developed and developing countries concerning the greenhouse gas emissions reduction quotas, the objective of humankind as a whole is clear and it is the duty of the present generation to achieve such quotas for future generations.

As reduction of greenhouse gases is a task for all sectors of all nations, the concrete sector is no exception. Amongst all industries, the construction industry which includes the concrete sector uses an enormous amount of resources and energy due to the nature of its activities in constructing the infrastructure of human socioeconomic activities. The concrete sector is probably emitting CO_2 at a level of 5 billion tons per year globally today. Considering that the total amount of CO_2 emission originating from fossil fuels is about 29 billion tons, this value is extremely large. The concrete sector, based on such estimation, must meet its social accountability through the advancement of innovative technological development for the reduction of CO_2 emissions. If it fails to do so, the sector may face a drastic decrease in the scope of its application. The concrete sector must therefore make further efforts to realize its sustainability by adopting a more global viewpoint.

On the other hand, concrete has the great benefits, such as safety, security, longevity, thermal mass and storage, aesthetics, use of byproducts etc. That's a reason why concrete is the world's most used construction material, after water. Therefore, the concrete sector has to make a great effort to facilitate the understanding of the public regarding the sustainability of concrete structures. At the time of commencement of its activities in 1998, the International Federation for Structural Concrete (fib) established the Commission 3: Environmental aspects of design and construction. Although at that time the environmental issues in concrete sector was not so "trendy," fib was already aware more than ten years ago of the necessity for a commission which handles environmental issues concerning the con-

crete sector, demonstrating that in this respect, fib had foresight. The environment aspect is the most important element concerning sustainability. Commission 3 has published six bulletins in the past 12 years.

This shows that Commission 3 has yielded a steady flow of results so far. These activities have contributed to disseminating the knowledge on the environmental aspects of concrete and concrete structures. However, it is now necessary for fib to reestablish a common recognition of placing 'sustainability' which is becoming increasingly important, as a core of its activities, and to explicitly inform the society to this effect. In the near future, fib may need to change the current name; Commission 3 to include 'sustainability.' Given the fact that a large number of corporations and academic societies have clarified and are actively conveying to society their commitment to sustainability, it is imperative for fib to take prompt action also. Based on that background, fib has decided to launch a new special activity group (SAG 8) for taking forward-looking sustainability actions in collaboration with fib's all commission at the 2009 Oslo fib Technical Council.

Based on the background, SAG 8 firstly makes the fib sustainability initiative to indicate fib's missions to the society regarding sustainability, secondly develops the fib guideline on sustainability for concrete industry, and thirdly plans a fib future commission strategy on sustainability which will be discussed within fib.

Working programme

(1) Drafting of fib sustainability initiative
- backgrounds
- fib's missions to the society regarding sustainability

(2) Publication of fib guideline on sustainability for industry
- project planning
- design
- execution
- use
- maintenance and remedial activities
- demolition, reuse, and recycling

(3) Planning of fib future commission strategy on sustainability
- Analyses of sustainability trends in concrete societies
- Role of commission 3
- Proposal of framework in commission activities.

The KCI Declaration for Green Concrete is as follows.

As we recognize the effects of concrete industry on the global environmental issues including climate change in the 21st century, we, representing seven concrete-related organizations in Korea, hereby declare as follows for realizing the society of sustainable development.

May 6th, 2010

Korea concrete Institute

Korean Recycled Construction Resources Institute

Korea Institute of Construction Materials

Korea Ready Mixed Concrete Industry Association

Korea Federation of Ready Mixed Concrete Industry Cooperatives

Korea Cement Industry Association

Korea Reinforced Concrete Construction Industry Association

1. We shall promote concrete industry and its technological development only to the extent that we meet the needs of the present without compromising the ability of future generations to meet their own needs.

2. We shall admit that both the growth of concrete industry and the preservation of the Earth's environment are of equal importance.

3. We shall make a full effort to maximize environmental benefits at the same time minimizing environmental burdens by closely evaluating the whole process covering production, delivery, placement, maintenance, demolition and recycling of concrete.

4. We shall recognize that the Earth's environment is significantly affected by the establishment and implementation of concrete technology policies and the development and selective use of concrete technologies.

5. We shall make an effort to turn the environmental crisis of the Earth into an opportunity for the development of innovative concrete technologies.

6. We shall keep it in mind that our strong demands for the society of sustainable development require us to keep improving concrete industry, not just as a construction technology but as a part of an act to help and preserve the society of health and welfare.

Advertisement of the 4th ACF Conference

Conference Information

Date
November 28 ~ December 01, 2010

Venue
Taipei International Convention Center (TICC)
No.1, XinYi Road, Sec. 5, Taipei, Taiwan

Organized by
Taiwan Concrete Institute (TCI)
National Taiwan University (NTU)
National Taiwan University of Science and Technology (NTUST)
National Taiwan Ocean University (NTOU)

Hosted by
Asian Concrete Federation (ACF)

Official Language
The official language of the Conference is English.

Conference Secretariat
If you would like to be on our mailing list to receive the further information on the Conference, please email the Conference Secretariat with your contact information (Name, Affiliation, Mailing Address and E-mail)!

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Main Theme

- Ecology, Environment and Engineering
- Sustainable Construction
- Design and e –Concrete
- Code and Standards
- Life Cycle Management
- Repair, Maintenance and Rehabilitation
- Innovative Technology and Modern Management
- Mega Project and International Cooperation

Program Topics

- Engineering for Ecology and Environment
- Eco-cement, Eco-concrete, and Green Concrete
- Durability
- Supplementary Cementitious Materials
- RPC, ECC, and other Special Concrete
- Architectural Concrete and Esthetics

Taiwan, Taipei, Nov.28-Dec.01, 2010
http://www.acf2010.tw