CONCRETE NEWS

Volume 4 - No. 1 - March 2001

aci *Kuwait Chapter*

from PRESIDENT

LEAPING TO A NEW DIMENSION

With a new millennium, we feel that the ACI Kuwait Chapter (ACI-KC) should leap to a new dimension. The ACI-KC Board of Directors and I look forward to lead this chapter to additional achievements. During the past few years, we have become a well-recognized chapter worldwide. The ACI Executive Vice President, Mr. James G. Toscus, informed me at the International Chapters roundtable discussions in Seoul, South Korea in Sept. 2000, that ACI-KC is the only international chapter that has published technical documents based on local experience. Mr. William R. Tolley, Senior Managing Director of ACI International, believes that we are one of the most active and well-organized international chapters. These testimonies prove that the hard work that we put into our chapter activities really pays off. With your help we want to make this year another building block in our wall of success.

The ACI-KC has the responsibility to improve the local concrete practices and spread awareness of the best techniques that suit our local environment and quality of workforce. We should encourage technical forums that serve as a platform to exchange experiences and find sound engineering solutions to our specific local problems. It is our duty to spread knowledge to improve concrete practice and serve our community. Therefore, I urge all members to participate in our activities and be generous with your contributions to help us to improve our chapter.

This year's plans start with the new and improved **CONCRETE NEWS**, which is the result of the considerable efforts of the Publication Committee who were determined to present to you the best possible document. We look forward to good participation from our members in the different sections of the newsletter. **CONCRETE NEWS** will be printed quarterly.

We are also developing an ACI-KC web page that will include our by-laws and activities. There will be a section on who-is-who in ACI-KC for our members, with a link to their C.V. It will also include our technical publications and newsletter, among other things.

We are planning to conduct two technical training courses on "Maintenance, Repair and Replacement" and "Construction Management". The cost to our members will be only 20% of the market cost of similar training courses.

Our third exhibition will take place on April 9-13, 2001, titled "Concrete, Construction & Design". Participants are suppliers, manufacturers, contractors and consultant firms from local, regional and international organizations.

A very good selection of technical publications is available to all members at our ACI-KC library (a list of available documents is available at the ACI-KC administration office at KSE). If any of our members have specific suggested technical documents titles, please forward it to me to look into obtaining it to meet your needs.

A few other interesting activities coming up include:

- Two technical documents to be finalized on "Guide to Implementation of Concrete Repair" and "Guide to Proper Concreting Practices, Part II, Placement, Compaction and Finishing".

- Three seminars will be conducted.

- Social activities include three social dinners and three site visits.

All of these plans are not possible without your active participation. Our productivity depends on the determination and dedication of our members. Don't forget that your constructive comments and feedback to improve our chapter are always welcome.

Dr. Naji Al-Mutairi

CONTENT

ACI INTERNATIONAL

The American Concrete Institute, (ACI), is a nonprofit international organization that promotes improved technology, technical competence, design, and construction related to concrete for the benefit of society

ACI Kuwait CHAPTER

The purpose of the Chapter is to further the charter objective for which the American Concrete Institute was organized, i.e., to further education and technical practices, scientific investigation and research by organizing the efforts of its members for a nonprofit, public service in gathering, correlating, and disseminating information for the improvement of the design, construction, manufacture, use and maintenance of concrete products and structures.

How the chapter FUNCTION

The ACI Kuwait Chapter is approved and authorized by the Board of Directors of ACI International to provide the means of furthering the charted objectives of the Institute in the State of Kuwait. The Chapter is managed by a local Board of Directors whose members constitute the Chapter officers. Chapter membership is open to all individuals and organizations with an interest in any aspect of concrete technology. The Chapter is operated through its committees, which are made up of volunteers from the membership. Programs are developed by the committees to meet the needs of the Chapter members. The Chapter may hold several meetings each year and engage in activities that may include:

* Sponsoring educational seminars, short courses or workshops.
* Holding or sponsoring certification training courses and examination.
* Publishing technical information and newsletters.
* Conducting awards programs for local concrete structures.

Calender of EVENTS

YEAR 2001

Date	***Event***
9 - 13 April	***Exhibition*** "Concrete & Construction Exhibition"
May	***Technical, Training Course*** "Maintenance, Repair and Replacement of Concrete Structures"
8 May	***Social*** Field Visit: "Ghassan Al-Khalid Factory for Blocks"
May	***Technical*** Seminar: "Advancement in Building Materials"
5 June	***Social*** Dinner: Location to be announced
October	***Technical*** Seminar: "Arbitration & New Trends in Contracts"
October	***Social*** Field Visit:"Kuwait Cement Company"
October	***Technical*** Training Course: "Construction Management"
November	***Annual Meeting*** Election & Dinner at KSE

Who's WHO

BOARD OF DIRECTORS

ACI-KC

1. Dr. Naji Al-Mutairi	President
2. Eng. Anas Al-Kassem	Vice President
3. Dr. Bader Al-Hoti	Past President
4. Dr. Khaldoun Rahal	Director
5. Mr. Ubedur Rahman Arain	Director
6. Eng. Malakah Noor	Director
7. Mr. Abdulwahab Rumani	Director & Treasurer
8. Mr. Gaby Khalaf	Director
9. Mr. Mohammed Harb	Chairperson, Publication Committee
10. Eng. Ibtisam Al-Kazemi	Chairperson, Social Committee
11. Dr. Moetaz El-Hawary	Chairperson, Technical Committee

C. N. MISSION

Concrete News is published periodically by ACI-Kuwait Chapter to share information between members, exchange technical knowledge and enhance the Chapter's position within the engineering community.

CONCRETE NEWS

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Chapter NEWS

Field Visit to Coast Guard Headquarters

A group of ACI Kuwait Chapter members visited the Coast Guard Headquarters project located in Fintas. Dr. Alexander Babovic, the project consultant fro Dar Al-Handasah and Eng. Nabil Hamad, the resident engineer welcomed the visitors and gave them a brief review of the project. This was followed by a visit to the various sections of the project including marine and civil works. The 33 million KD project is expected to be completed next September.

An Official Website for the Chapter

Work is underway in developing a special website for the ACI Kuwait Chapter. The website, expected to be launched in June, will be the core platform for communication among the Chapter members. ACI - KC currently is registered with the domaon name of (www.acikuwait.com). This website will provide the Chapter with more visibility and means to broadcast news to a wider audience. Concrete News will be posted on the site and available for downloading.

Dinner Banquet at the Holiday inn

The social committee organized a dinner banquet for the Chapter members on the 20th. of February at the Holiday inn Crown Plaza hotel. The event was attended by Dr. Naji Al-Mutari, the Chapter President and the Board Directors. A special social and entertaining program was set for the events and winners were rewarded. The gathering was definitely an opportunity for exchange of ideas in a friendly atmosphere.

Technical Committee

The Board of Direction of ACI-KC is pleased to announce that our technical documents, KC 01-98 "Guide to Assessment and Repair of Concrete Works" and KC 02-98 "Guide to Proper Concreting Practices Part - 1 Mixing and Curing", are the only technical documents produced by an international chapter. The documents are currently under review by the ACI International Technical Activities Committee during the 2001 ACI Spring Convention in Philadelphia, Pennsylvania. This outstanding achievement is due to the dedication and hard work of our members.

Two additional documents, KC 03 "Guide to Implementation of Concrete Repair" and KC 04 "Guide to Proper Concreting Practices Part - II, Placement, Compaction and Finishing", have been completed as draft copies and will be circulated among members for feedback.

Concrete & Construction Exhibition

Work is underway in the preparation for the Chapter annual exhibition. The Concrete and Construction exhibition is to be held on 9 to 13 April at the international fair ground in Mishref. The event is expected to attract several exhibitions covering all specialties related to concrete from materials, testing, manufacturing and contracting companies. A special technical program will be held in parallel to the exhibition including presentations and demonstrations.

PERFORMANCE OF GROUND GRANULATED BLASTFURANCE SLAG CONCRETE IN KUWAIT

Reinforced concrete is a complex and most widely accepted materials of construction in the Middle East and particularly in Kuwait and the Arabian Gulf region. However, the damage of concrete structures caused by corrosion of the reinforcing steel rebar is becoming of increasing importance in the Gulf region. In that difficult region the environmental conditions off shore and the adjacent to the shore are considered to be one of the most severe corrosive environment in the world. Surveys of concrete structure have shown an alarming degree of corrosion deterioration within 10 to 15 years of construction.

Concrete provides passivation to the steel reinforcements due to its alkaline nature, however, this passivation may be disrupted when chloride contamination reaches the steel rebars. On the other hand, many investigators have reported that the blended cements containing admixtures or ground granulated blastfurnace slag (GGBS) are superior to ordinary Portland cement in cases of attack by chloride, which is the most aggressive agent in the marine environment. It is suggested that the positive effect of these admixtures is based mainly on their influence on the permeability of the concrete and on their capacity to bind chloride to their hydration products. The result is reduced chloride content in the pore solution in the concrete.

Kuwait Institute for Scientific Research (KISR) has carried out an investigation to evaluate the performance of GGBS, in order to support its large scale use in a major project (The Scientific Center). The main aim of the study was to evaluate the effect of GGBS on concrete performance and its composition to provide corrosion protection to the steel reinforcement under the prevalent severe local environment condition of Kuwait.

The results showed significant improvement in the corrosion risk assessment of concrete when 50% cement replacement by slag is employed. Results of time-to-corrosion and corrosion rate testing indicated that slag concrete can provide requirements for a high level of corrosion protection in coastal areas and marine facilities under the local environment of Kuwait. On the other hand, poorly placed, un-compacted and inadequately cured slag concrete showed unfavorable characteristic; as poor as any ordinary prepared concrete.

PROFILE

UBAID ARAIN

Profile article is intended to introduce members of ACI-Kuwait Chapter and individuals who made a significant contribution to advance the goals of ACI.

(By A. Kassem)

Ubedur Rahman Arain -who prefers to call himself "Ubed Arain"- is a familiar face in Kuwaiti Engineering circles as he has been in Kuwait for the last 25 years. He came to Kuwait as a Structural Engineer to work for Gulf Consult, then known as Gulf Engineering Office, and has been with the same organization ever since. He became Chief Engineer in 1980 and Manager of the firm in 1987. He is proud of having worked on major projects in Kuwait such as, the Scientific Center in Salmiya, the Marine Science Faculty Building in Fintas, the New Police Academy, Sulaibiya Treatment Plant and two 20 meters deep major Sewage Pumping Stations in Jahra and Sulaibikhat.

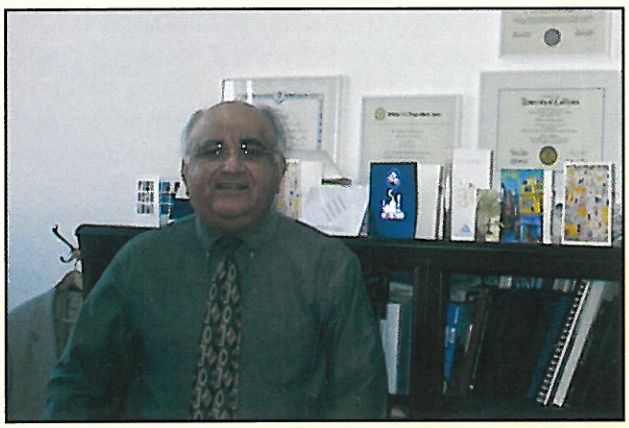
Being a Structural Engineer and a user of concrete as a construction material, he has been involved with ACI for the last 30 years with a short interruption because of the Gulf War. Ubed feels that ACI has contributed a lot to his profession by providing up-to-date information on concrete technology for better and more durable concrete. He strives to use state of the art specifications to improve the quality of the concrete in all projects that he designs.

Ubed believes that the ACI Chapter in Kuwait is great. He has been actively involved in its establishment since the idea was first floated by one of his colleagues in 1995. He remembers the dedication and efforts by many including Dr. Hussain Al Khaiat, Dr. Naji Al Mutairi, Eng. Hayfaa Al Mudhaf, Eng. Suad Al Bahar who helped establish ACI- Kuwait's chapter.

He has high hopes for the ACI Kuwait Chapter in promoting good concrete practice and engineering. ACI Kuwait Chapter publications on durability of concrete, ACI sponsored exhibitions and seminars are all contributing towards the success of the Chapter. Ubed wishes that he had more time to spend promoting the profession. Kuwait has very capable and highly professional engineering community, but due to lack of proper legislation and a uniform standards for professional qualifications, one can see a lot of substandard construction. He hopes that Kuwait will improve its regulatory procedures where its citizens can be given a better choice with high engineering standards.

Ubed is a key player in Gulf Consult which is one of the leading firms of architects, engineers and planners in Kuwait. Gulf Consult was ranked 6th in the Middle East by World Architecture in January, 2001 issue and No. 252 in the World.

Ubed recalls, as one of his most interesting project, the design for an expansion of a villa. The owner, after completing the design and construction of grand villa in Dahiya Abdul Salem, decided to add a basement to the three floors already built. The client approached GC and asked whether he could make a basement in an existing house? Ubed told the client that if there is a will, there is a way. Now, the client is happily enjoying a billiard room, a kitchen, store room, sports area, servant's room, and plenty of space in his basement - during the whole period of construction, the client kept on living on the second floor of the house and never moved out.



Ubedur Rahman Arain in his office - Kuwait

Family: Wife, Sabiha. Has four daughters; Kiran - College Senior, Resham - a Medical Student, Johi - a Civil Engineering Student and Teeba - a 7th grade Student in Kuwait.

ACI-Kuwait Chapter: One of founding members; he has been elected to the Board of Directors since the inception of the Chapter. He held the post of Treasurer and Secretary of Chapter. Currently, Ubed is a Director and Secretary of Chapter

Work: Chief Engineer and Manager, Gulf Consult, Kuwait.

Education: M.S. in Structural Engineering, University of California, Berkeley, USA.

B.E. in Civil Engineering, University of Karachi, Pakistan.

Licensed Professional Engineer, California

Licensed Engineer, Pakistan

Licensed as a Structural Engineer in Kuwait

Interests: Research in Quranic subjects

State of ART

This section reviews abstracts from international journals that relate to the lates in concrete technology.
For more information please refer to the sources.

How Clean Must Rebar Be?

Form-release agents, bond breakers and cement splatter sometimes contaminate reinforcing steel before concrete is placed. However ACI 301-96, "Standard Specifications for Structural Concrete," says: "When concrete is placed, all reinforcement shall be free of materials deleterious to bond." Inspectors often cite this sentence when requiring contractors to remove form-release or bond-breaker overspray and cement splatter from contaminated rebar. But is this work really necessary?

The Aberdeen Group ran a series of bond pull-out tests to assess the effect of contaminants on bond strength. Pull-out tests measure the bond force acting parallel to the bar on the interface between the bar and concrete. Clean, black Grade-60 steel bars and bars with form-release agents, curing compound/bond breakers, cement splatter, motor oil and rust on their surfaces were tested. The form release and curing compound/bond breaker were sprayed on 100% of the rebar surface to duplicate the worst case of contaminant coverage possible during construction. The used motor oil was applied to the entire bar length with a rag, and a cement paste was mixed and applied to various areas of the rebar. To produce rusted rebar, bars were dipped in hydrochloric acid then stored in a moist curing room. The results, based on 27 tests of bars with nine different surface conditions, show that the contaminants didn't adversely affect bond.

Concrete Construction
June 1998

First-Aid Kits for Concrete

The truck mixer has moved into position on your jobsite and begins discharging concrete. With a quick field test, you determine that the concrete isn't suitable for the intended use. Fortunately, contractors may be able to fix some concrete mixes onsite by using water reducers and other admixtures available in preweighed portions. Packaged in bags, the admixtures can be conveniently tossed into the truck mixer, eliminating spillage and waste.

The manufacturer of these prepackaged products offers water reducers, superplasticizers, set retarders, and air-entraining admixtures that all conform to ASTM C 494, "Standard Specifications for Chemical Admixtures for Concrete." Some concrete producers and contractors keep a selection of these products on hand as a first-aid kit for many types of concrete emergencies.

Concrete Construction
October 2000

Bond Security

For optimum performance, repair materials or coatings must form a strong bond with the concrete substrate. But how can you accurately measure this bond strength in the field?

Contractors often rely on portable adhesion testers, which can evaluate surface preparation during preconstruction testing and measure bond strengths throughout a project. The instruments are available from several manufacturers, but they all work the same way. A flat, circular pull stub is secured to the surface of the coating or repair material with a fast-setting adhesive. After the adhesive cures, the operator attaches the testing apparatus to the pull stub and applies tension perpendicular to the test surface. The force applied to the pull stub is gradually increased until failure or, if nondestructive testing is desired, a specified value is reached. Acceptable pull-off strengths for concrete repairs and coatings depend on the application, but specifications often require minimum pull-off strengths of 100 to 250 psi.

Concrete Construction
September 1999

Trouble SHOOTING

PLASTIC SHRINKAGE CRACKING

Plastic shrinkage cracks are cracks that appear on the surface of freshly placed concrete during or soon after finishing operation.

These cracks are usually parallel to each other on the order of 300-900mm apart and 25-50mm deep and rarely do they intersect the perimeter of the structure.

Plastic shrinkage cracks should not be confused with the settlement cracks, or cracks due to movement of formwork.

Plastic shrinkage cracks occur when the rate evaporation of surface moisture exceeds the rate of rising bleeding water. And if the surface dries before sufficient tensile strength develops cracks will appear during the concrete setting process.

The rate of evaporation of water is higher when the wind velocity is high, the relative humidity is low and the ambient temperature is high.

Anything that delays setting tends to increase plastic shrinkage cracking when the rate of evaporation is high. That means that plastic shrinkage cracks is not only a summer phenomenon. High wind velocity could cause similar damage during winter.

Practically it is not possible to eliminate consistently plastic shrinkage cracking. To reduce plastic shrinkage cracking it is important to recognize before placement weather conditions may occur that are conductive to cracking.

The precautions to minimize plastic shrinkage cracking occurrence are:

1. Have adequate manpower, equipment and supplies on hand to finish concreting promptly. If delays occur cover the concrete with wet burlap etc.

2. Start curing as soon as possible, and keep it continuously moist. Do not wait for complete finishing of the structure. Cure as you finish. Water curing is the most effective curing. Cover concrete with wet hessian and polythene sheet between finishing operations. Ensure to avoid wind tunnel effect covering with polythene sheet.
3. Erect wind barriers.
4. Use fog sprays in summer.
5. If possible provide sun shades or schedule placement to begin in the late evening or very early morning.
6. Consider use of synthetic fibres in concrete.

PROJECTS

COASTGUARD HQ. & FACILITIES

Location: Fintas, Kuwait

Client: Ministry of Public Works, Kuwait

Consultant: Dar Al-Handasah

Main Contractor: The Arab Contractors

Total Value: 33,462,593 KD

Project Period: 1,080 Days

Date of Enterprise: 3/10/1998

Completion Date: 16/9/2001

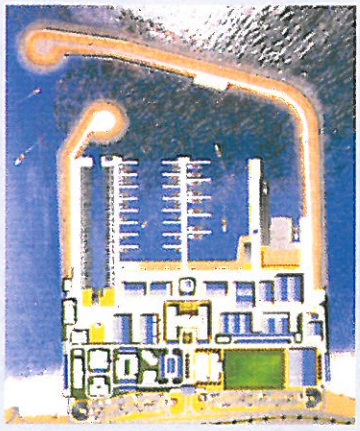
Area of site layout (land & water): 370, 000 m^2

* Area of the harbor including the two breakwaters: 230,000 m^2

* Total built-up area of the buildings and workshops: 56,630 m^2

* External basement car park area: 15,822 m^2

* Landscaping and roads: 67,548 m^2



Marine Works:

* Two breakwaters (main and lee), total length: 1,300 m^2

* Berth and pontoons: 27,300 m^2

* Dredging works: 287,000 m^3

* Reclamation, slope protection, workshops of maintenance and services of boats.

Civil Works:

* Total no. of buildings is 30 building:

* 14 concrete buildings (administration, accommodation, training center and sport facilities).

* 16 steel structural buildings (workshops and stores).

* Roads, water tanks (ground and elevated), sewage and storm water systems, landscaping and irrigation systems, fences and gates, watch towers and similar.

EVENTS

FIRST GULF CONFERENCE ON ROADS

Conference Objectives:

Large amounts of funds are spent by nations to construct, manintain, and improve its road networks. Therefore, road networks are considered to be one of the most valuable assets of the nation due to the fact that it is the most important element in its infrastructure. Road networks have become a fundamental measure of nations' progress and development. Also, new techniques in road maintenance are playing key role in maintaining the functionality of road networks.

Pavement construction and maintenance industry has gone through many stages and field experiences to reach advanced levels in answering nations' needs by overcoming topographical, environmental, and economic conditions. Such an advancement would have not been realised without continuous global communication between specialists to exchange ideas and expertise through conference and meetings.

Therefore, the Ministry of Public Works (Kuwait) decided to hold the First Gulf Conference on Roads, in cooperation with Kuwait Society of Engineers and Gulf Road Engineering Society.

The conference will consider many topics related to road industry in the Arabian Gulf Cooperation Council state members.

Conference Themes:

The conference theme is "Towards ... Safe, Comfortable and Economic Roads" Abstracts are invited for all topics related to the conference theme which may be included in the following subtitles:

1- Materials **2- Design** **3- Construction**
4- Operation **5- Maintenance** **6- Bridges**

Important Dates:

1 June 2001
Deadline for receipt of abstracts.
1 August 2001
Authors will be notified about the status of their abstracts.
1 October 2001
Deadline for receipt of full text of paper.
1 December 2001
Authors will be notified about the status of their paper.

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