



CONCRETE NEWS

ACI-Kuwait Chapter
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EDITORIALS

Dear Colleagues,

It is the pleasure of the publicity committee to present and welcome all readers to this first issue of Concrete News, the newsletter of the Kuwait Chapter of ACI. It is addressed to members of the Chapter, civil engineers and all individuals / organizations who entertain an interest in the world of concrete. ACI chapters are formed to further the objective of ACI by bringing together the various individuals and groups in the local area who are interested in concrete, for the purpose of discussing and disseminating technical information. The main purpose of Concrete News is to create a platform for scientific, technical and social communication and interaction among the various members of the Chapter. We apologize for not being able to present to you all the news that we originally thought of because of the lack of available data. This was due to the very tight deadline we had to meet so that we didn't delay the "premiere" of Concrete News for too long. Considerable effort, hard work and long meetings were necessary to lay this first issue between your hands. Since many decisions had to be taken in the creation of Concrete News, we do not expect it to be perfect. However, we trust it will approach perfection in time with your constructive feedback and comments to the editors, since it is designed with all of you in mind. We encourage strongly all readers to participate in this newsletter by sending written comments and suggestions, (to the email above) scientific and technical news of interest, technical articles concerning concrete construction (100-300 words), news of local or international events related to the world of concrete, commercials and job vacancies, social news from member (individuals/ organizations), jokes and puzzles, in addition to any contribution that you find fit to include in Concrete News. Finally, we also encourage all our readers to join the Chapter and benefit from the many privileges, explained in this issue, which are offered to our members.



ACI

(KUWAIT)

WANTS

YOU

You already know the benefits of the American Concrete Institute national membership. But have you considered the benefits of belonging to your local ACI chapter? The local KUWAIT CHAPTER functions as a distribution center for the latest information and ideas. And you'll find a group of colleagues with ready answers for local concrete problems you encounter every day.

Fill in the coupon below and fax it to 4841603; we'll rush you complete information on ACI KUWAIT Chapter affiliation.

Send me all the facts on ACI KUWAIT CHAPTER membership.

Name _____

Company _____

Fax or Address _____



ACI Kuwait Chapter Introduced

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.

PURPOSE OF THE ACI KUWAIT CHAPTER

The ACI Kuwait Chapter was established in 1997 as an authorized local representative for the American Concrete Institute which is a renowned non-profit international organization. The purpose of the Chapter is to further the chartered objectives for which the American Concrete Institute was organized; i.e., to further education and technical practice, scientific investigation, and research by organizing the efforts of its members for a non-profit, public service in gathering, correlating, and disseminating information for the improvement of the design, construction, manufacture, use, and maintenance of concrete products and structures.

A major objective of the Chapter is to provide forum for members to interact with colleagues and identify potential sources for cooperation in addressing specific technical problems.

HOW THE CHAPTER FUNCTIONS

ACI Kuwait Chapter is approved and authorized by the Board of Direction of ACI International to provide the means of furthering the chartered objectives of the Institute in the State of Kuwait. The Chapter is managed by a local Board of Direction whose members constitute the Chapter officers. The chapter membership is open to all individuals and organizations with 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 examinations. Publishing technical information and newsletters.
- Conducting awards programs for local concrete structures.
- Special social events.

BENEFITS TO CHAPTER MEMBERS

- Attend seminars, short courses and workshops organized by the Chapter at reduced fees.
- Free use of ACI publications which are supplied to the Chapter by ACI International and are kept in the Chapter library.
- The Chapter provides a forum for members to interact with colleagues and identify potential sources for cooperation in addressing specific technical problems.

Introduction to Gulf Consult

November, 1997 saw the 30th anniversary of the establishment of Gulf Consult by its Principal and Chief Executive, Mr. Hamad T. Alghanim. Since its formation, the company has steadily grown in size and reputation to the point where today it is one of the largest and most reputable consulting companies in Kuwait, with approximately 250 staff. Of these, some 90 are graduate architects and engineers who are either members of Kuwait Society of Engineers (KSE) or who are eligible to join it.

Gulf Consult is a corporate member of the ACI Kuwait Chapter, and 14 of its engineers are individual members.

Gulf Consult offers a full range of consulting services and has specialised departments for planning architecture and interior design, landscaping, structural engineering, electrical and mechanical engineering, civil engineering and utility engineering. In addition, Gulf Consult has its own quantity surveying and contract documentation department and a separate division responsible for the supervision of construction projects. Gulf Consult also has considerable experience in undertaking master planning and urban / economic studies, in addition to design and construction work.

Gulf Consult is fully computerised in all departments, with 87 professional work stations networked in the Head Office.

The company has extensive experience of working for government ministries, public authorities and for private clients. While most of its work is centred in Kuwait, Gulf Consult does regularly undertake work elsewhere. The most recent instance has been the structural design review of the proposed Intercontinental Hotel in Tirana, Albania.

A selection of Gulf Consult's current projects for major clients include:

- * The Scientific Center, Salmiya for KFAS, valued at KD 28.00 million. This is a design / supervision project currently under construction.
- * The New Police Academy for the MPW, Kuwait, valued at KD 35.00 million. This is a design / supervision project currently under design.

* The Marine Sciences Center, Kuwait University for MPW valued at KD 12.00 million. This is a design / supervision project currently under design.

* Kuwait Sewer Renovation (Phase V - Jahra and Sulaibikhat) valued at KD.45.00 million. This is a design/supervision project currently under construction.

* New Designated Garden at Riggae, for PAAT and valued at KD 2.0 million. This is a design supervision project. Design has just been completed and construction is about to commence.

* Reconstruction and Expansion of the Mowasat Hospital, for the AlWazzan Group, valued at KD 7.00 million.

Gulf Consult has just been commissioned to undertake the design/supervision contract on a fast track-multiple bid pack basis.

* New 120-bed General Hospital at Sabah Al Salem for Kuwait Medical Center, Valued at KD 7.5 million.

Gulf consult has been commissioned for the design and supervision of this project, which is just about ready to go to tender.

* NBK Hospital for Children, at Sabah Hospital valued at KD 2.75 million.

This is a design/supervision project now under construction.

* Adult Psychiatric Hospital for MPW valued at KD 18.5 million.

Gulf Consult has recently been asked to take over supervision halfway through construction.

Some of these jobs Gulf Consult has been commissioned on its own, for others Gulf Consult is working in Joint Venture or in association with large, international design firms. Gulf Consult is currently working with the engineering firms of Ove Arup, L.G. Mouchel, Halcrow, Montgomery, Watson and Parsons Engineering Science in addition to such architectural firms as Skidmore, Owings and Merrill and Cambridge Seven Associates.

1998 Calendar*

March 15, 1998 11:00 a.m.	Site visit to Scientific Center-KFAS Project at Ras Salmiyah
March 24, 1998 6:00 p.m.	Workshop: "Site Supervision and Inspection of Concrete Structures" at Kuwait Engineering Society
April 29, 1998 7:30 p.m.	Social gathering for members: Dinner Banquet to be held in one of the main hotels
May 12, 1998 6:00 p.m.	Workshop: "Improving Concrete Durability in Kuwait" at Kuwait Engineering Society
October 5, 1998	Chapter to contact ACI international for a list of members residing in Kuwait (eligible for office nominations).
October 20, 1998 6:00 p.m.	Workshop: "Review of Concrete Guidelines" at Kuwait Engineering Society
October 24, 1998	Deadline for receiving nominations for Board of Directors.
December 14, 1998	Annual General Meeting and elections. followed by Social gathering for members: Dinner Banquet

* For further information on a specific event contact ACI Kuwait Chapter office or concerned committee. Specific announcements will be made for each event.

ACI Kuwait Chapter Committees

BOARD OF DIRECTORS - 1998

President	Dr. Hussain Alkhaiat
Vice President	Ms. Hayfaa Almudhaf
Director	Mr. Ubaidur Arain
Director	Dr. Yousef Shuhaibar

MEMBERSHIP COMMITTEE

Coordinator	Ms. Suad Al-Bahar
Member	Ms. Hayfaa Almudhaf
Member	Mr. Abdulwahab Rumani
Member	Dr. Khaldoun Rahal
Member	Mr. Ebrahim Al-Ansari
Member	Ms. Malakah Nour
Member	Ms. Ibtissam Al-Kazemi
Member	Mr. Adel Abdel Twab

TECHNICAL COMMITTEE

Coordinator	Dr. Ahmed Essawy
Member	Mr. Saed Hares
Member	Dr. Naji Al-Mutairi
Member	Mr. Abdulhamid Darwish
Member	Mr. Abdulwahab Rumani
Member	Dr. Hisham Abdelfattah

PUBLICITY COMMITTEE

Coordinator	Dr. Mohamad Terro
Member	Mr. Mohamad Iqbal
Member	Dr. Humayun Kabir
Member	Mr. Hussain Al-Najadah
Member	Mr. Essam Al-Shami
Member	Mr. Mohamad Harb Sayed

SOCIAL COMMITTEE

Coordinator	Ms. Shaikhah Al-Arfaj
Member	Mr. Hussain Al-Najadah
Member	Mr. Mohammed Al-Shareef
Member	Mr. Khaled Ahmad
Member	Mr. Fouad Meerza

Achievements

The Chapter Achievements

Given the short period, the elected interim board of direction has successfully run the affairs of the chapter, the following are the chapter achievements during that period.

Technical Activities

1. Concrete Technology Seminar

A concrete technology seminar was held on 27th September 1997 in Holiday Inn.

The lecturers were:

- Mr. Richard White - President ACI
- Mr. Richard Stehly - Chairman, Chapter Activities Committee, ACI

This lecture was attended by over 40 attendees and was partly funded by Kuwaiti Tech and Gulf Consult.

2. High Performance Concrete

A seminar was held on 26th November, 1997 at Le Meridien. The lecture was delivered by Prof. Paul Zia, Past President ACI. About 60 ACI members attended this lecture.

3. Conferences

Considering the wider perspective, Kuwait Chapter of ACI has agreed to co-sponsor the International Conference: High Performance Concrete Design and Materials 7, 2 - 5 December 1997 Kuala Lumpur, Malaysia.

Social Activities

1. Dinner at Kuwait Towers

A dinner was arranged at Kuwait Towers for ACI President Mr. Richard White, Mr. Richard Stehly - Chairman and Mr. William Tolley - Senior Managing Director who visited Kuwait in connection with Concrete Technology Seminar. All members of the Task Force Committee and Board of Directors were invited. This dinner was hosted by Al-Bahar and Bardawil Specialties Company.

2. Inauguration of ACI - Kuwait Chapter

In the evening of 26th September, 1997 an inauguration ceremony by ACI chapter was held at the Kuwait Society of Engineers. This meeting was chaired by ACI President Dr. Husain Al-Khaiat, Dr. Hasan Al-Sanad, Dean of the College of Engineering, Kuwait University and Mr. Yousef AbdulRaheem, Head of Technical Committee of Kuwait Society of Engineers. Mr. Faisal Al-Khalaf, President of KSE was also present, who was kind enough to receive the guests on behalf of KSE.

At the end of the meeting buffet dinner was served to all participants courtesy of KSE. It was highly praised by the attendees.

Chapter Library

ACI Chapter maintains a library at its main office in the Civil Engineering Department of Kuwait University Building 5, Khaldiah Campus.



Glimpse on the Construction Business in Kuwait

* Tender No. MEW/22/4/26/97-98: Construct drinking water line (1000 mm) from Mulaa' round about up to AlRawdatain reservoirs in north area, Awarded to M/S Mushref trading, and contracting Co. (lowest price) at KD. 999,980/- (agreed).

* **Public Authority of Youth and Sport.**
Tender No. DAYS 15/97-98: Construct and maintain Arabic Sport Club track awarded to M/S 26 February - for constructions (lowest price) at KD. 158,490/- (agreed).

* **Kuwait Municipality**
Agreement settled with Al-Din United Co to maintain the instruments and its accessories for the period time of 1.1.98 up to 30/6/98 at a total KD. 15,106/-

* **Ministry of Transportation**
Practicing No. 39/97-98 of supplying special electronic panels size (AXE) awarded at M/S Arecson Construction (Single source) at a total KD. 45,762/- (agreed).

* **Public Department of Civil Aviation**
Buying passenger waiting chairs for departure gates in Kuwait airport from the German company M/S KUSCH at a total KD. 141,823/- (agreed).

* **P.I.C. Company**
Awarded practicing No. PS/6/98 for buying spare parts to pump 602 C/D from M/S. URACA Germany (single source) at a total KD. 10,000/

TECHNICAL ARTICLES

MICROSILICA FOR SUPERIOR CONCRETE

Eng. Moh'd Harb Sayed
Alghanim Specialties Co. W.L.L.

Microsilica is a superior pozzolanic material which dramatically improves the properties of both fresh and hardened concrete. The deterioration of concrete structures is a problem in hot and humid areas. Tests and experiences show that Microsilica provides a highly durable concrete. It also increases the resistance against both sulphates and chlorides attack, giving the ultimate protection for sub-structures as well as super-structures in harsh environments.

All tests done in Norway, USA, UK and Saudi Arabia confirmed that Ordinary Portland cement in combination with Microsilica resists sulphates even better than sulphate resistant cement (S.R.C).

The physical and chemical reactions of Microsilica contribute to increase compressive, flexural and tensile strengths, higher than that can be attained by any other means. The maximum concrete strength obtained for Microsilica concrete is reported as high as 112 MPa.

Concrete with low permeability provides protection to the embedded steel. Microsilica eliminates the chloride penetration in concrete as shown in the rapid chloride permeability test (AASHTO-T-277-g3) when Microsilica is mixed at 8% with PBFS cement for restoration of Shuaiba Oil Pier (Kuwait). The total charge Coulombs was found to decrease

from 2397 Coulombs (when PPFS only used) to 323 Coulombs providing a better protection of reinforcement steels from corrosion.

PERFORMANCE OF EPOXY REPAIRED CONCRETE IN THE KUWAITI ENVIRONMENT

Moetaz El-Hawary, Husain Al-Khaiat and Sami Fereig
Department of Civil Engineering, Kuwait University
P.O. Box 5969, Safat 13060, Kuwait

Due to the recent Gulf War exposure, and the usual harsh environment in Kuwait, many concrete structures were damaged and consequently repaired using epoxy resins. Some of these repaired buildings are close to the Gulf waterfront, and were exposed to sea water. The effect of sea water, at different temperatures, on the epoxyrepaired concrete has been investigated. Two different types of cement, ordinary and sulphate resistant, three different types of epoxy resins, and different time durations of exposure to sea water at different temperature stations have been investigated. The effect of weather was taken into account by keeping the specimens immersed in tanks full of sea water in the open air for different time durations. Some specimens were immersed in the Arabian Gulf in the tidal zone to capture the actual effect of sea water including biodeterioration and effect of wetting and drying cycles. Controlled speci-

mens were kept in sea water tanks which were put in an oven for different time durations and temperatures.

The split tensile strength, compressive strength, flexural strength and bond strength were determined for different time durations and temperatures. The investigation showed that:

- Failure of specimens in split or flexure is governed by the strength of concrete for low exposure durations. For longer durations (more than six months) the failure occurs in epoxy, which means that the deterioration of epoxy is faster than concrete. For bond test, however, failure occurs in epoxy at all durations studied.
- Large variations in strength of specimens repaired using different types of epoxy are observed. However, no single epoxy type provided better results in all tests, suggesting that larger factors of safety should be utilized with all types of epoxy.
- A drop in strength followed by an increase is the general trend of behavior of specimens with time. A reduction in strength is also observed for some specimens after a year of sea water exposure.
- Ordinary Portland cement specimens are, in general, superior to those cast using sulphate resistant cement.
- The increase in temperature reduces the strength of specimens, which means that sea water exposure is more detrimental in hot weather.
- Specimens suspended in sea water in tidal zone, experienced an increase in strength compared to all other groups, due to build up of sea shells.

On Reinforced Concrete Slabs and Cylindrical Panels
H.R.H. Kabir, and Husain Al-Khaiat
Department of Civil Engineering
Kuwait University

Abstract

Inherent material properties and long term behavior of reinforced concrete play a major role in the concept, and consideration of design criteria and philosophy. Introduction of reduction of flexural stiffness to an effective one possesses a difficult situation to engineers in analyzing and designing reinforced concrete slabs and panels, as they do not behave in an isotropic nature, even in low strain domains. They can be viewed as at least an orthotropic manner due to their shapes, reinforcement placements, and cracked phenomena. An analytical solution is developed to include such complex behavior within a linear model concept following the cracked assumptions, in the average sense, as stipulated in the code of American Concrete Institute. The numerical results for various parametric effects are presented in a tabular form, and should help structural engineers analyzing and designing slabs and panels efficiently in rational manners. A comparison is given with the finite element results, showing around 20% lower values than the analytical one for maximum edge moments, and a very good agreement with central moments in both cases. An isoparametric formulation based on four-node shear-flexible, and shear locking free finite element is selected for such comparisons.

This research project was sponsored by the Kuwait University, under Grant No. EV092.

INVESTIGATION AND REPAIR OF CORROSION DAMAGE OF CONCRETE STRUCTURES IN KUWAIT

S. Al-Bahar and E.K. Attiogbe

Corrosion of steel reinforcement is a major cause of concrete deterioration in Kuwait and other Arabian Gulf countries. The selection of effective repair schemes for corroding structures requires that the corrosion damage be assessed and quantified.

The symptoms of corrosion-induced deterioration in two reinforced concrete structures in Kuwait are documented and discussed. The investigative techniques employed identified the nature of the service environment and its role in promoting corrosion of steel reinforcement in the concrete structures. The failure to account for the service environment of the structures through implementation of corrosion preventive measures contributed to the deterioration of the structures. Both ingress of chloride ions and carbonation of the concrete were the causes of the corrosion-induced deterioration.

Chloride-induced corrosion caused primarily by ingress of chloride ions aided by sulfate attack. Cracking of concrete caused by sulfate attack can facilitate the ingress of chloride ions, which promote corrosion of steel reinforcement. The groundwater in the coastal zone generally contains high levels of chlorides and sulfates, and would be expected to induce corrosion when in contact with unprotected reinforced concrete elements.

Carbonation-induced corrosion is usually due to insufficient concrete cover on the steel reinforcement. The insufficient cover thickness seem, to be the result of a lack of an adequate specified minimum cover and poor control during construction. Studies in Kuwait have shown that carbonation due to poor construction practices was the cause of corrosion of non-marine concrete structures.

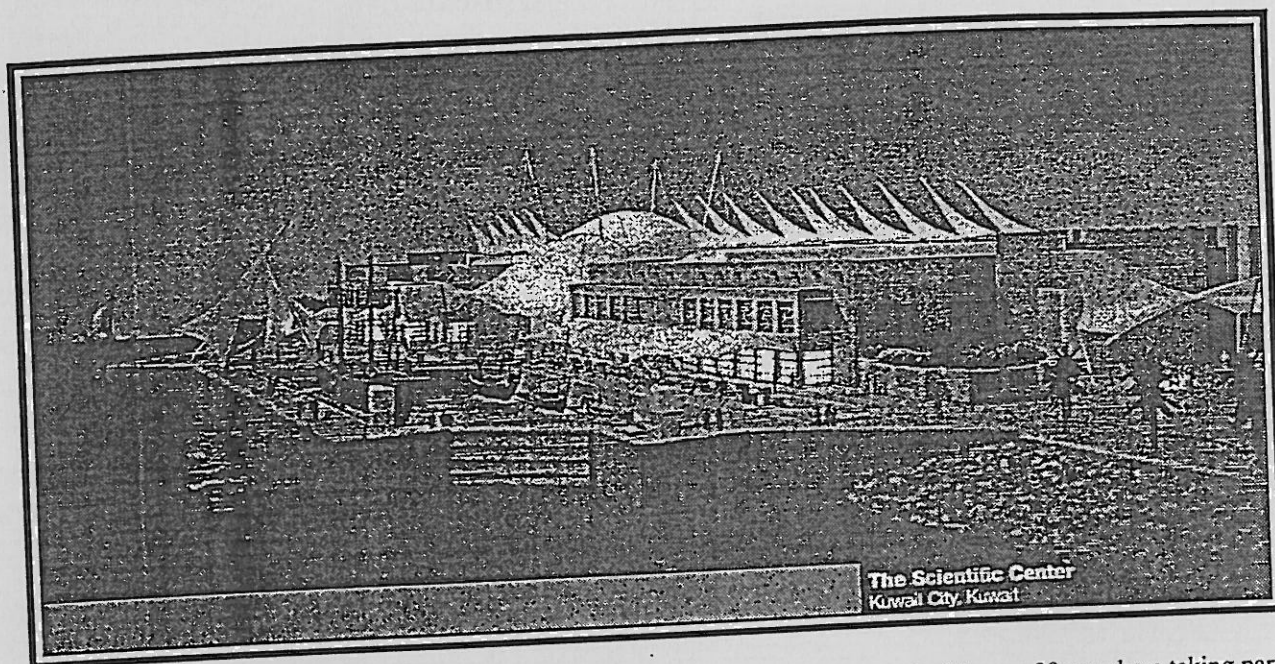
The following general guidelines are appropriate when repairing corrosion-induced damage in reinforced concrete structures:

- Cracked concrete should be repaired after an adequate preparation of the concrete surface to ensure a good bond between the repair and the base concrete,
- Whenever possible, cracked concrete cover should be removed to at least 2 cm beyond corroded steel bars,
- During repair of cracked concrete cover, all exposed, severely corroded reinforcement (i.e. > 25% section loss) should be repaired by providing new reinforcement,
- After concrete repair, protective coating may be applied to the surfaces of the structure to protect against the ingress of moisture, chlorides and gases, and
- Periodic monitoring of the structure may be undertaken, following completion of the repair work, to assess the extent of any further corrosion activity.

ACI MEMBERS

VISIT TO

SCIENTIFIC CENTER PROJECT



The Scientific Center
Kuwait City, Kuwait

The ACI's visit to the Scientific Center site on 15th March 1998 was well attended with over 20 members taking part, and our thanks and appreciation go to KFAS and the organisers for such an enlightened and interesting tour of the site.

The Kuwait Foundation for the Advancement of Science (KFAS) was established upon the initiative of H. H. The Amir of Kuwait, who is the Chairman of the KFAS board of directors. KFAS is dedicated to the development and modernisation of science and technology within the State of Kuwait.

The Scientific Center, KFAS's pearl from the deep and vast ocean of science is an unmatched and valueless present to the people of Kuwait. The center's unique and diverse features will have a life long impression on the visitors and impart knowledge to all categories and all age groups.

The project is located just West of Ras Al Ard harbour along the seacoast at Salmiya. The site is 1 km long and approximately 300m wide. The estimated cost of the project is KD 25 million.

The project comprises of protecting the reclaimed land from the sea by rock armour weighing between 0.5 to 3 tons, placed on suitable under layers of stone and core material protected by geotextile fabric filter. Over 160,000 tons of various sizes of metamorphic lime stone rocks were imported from Ras Al Khaima.

For the reinforced and precast concrete works on the project, a mixture of ground granulated blast furnace slag (GGBS) and ordinary portland cement were used for prolonged overall durability of the concrete. This is particularly useful in the marine environment where harmful chlorides and sulphates are present in seawater. This is the first project in Kuwait promoting the use of GGBS cement.

A 73 x 28m harbour formed by tied steel sheet pile walls will display a number of historic dhows to their fullest advantage.

The harbour is impounded by a steel fabricated lock gate, designed and manufactured in the U.K.

Two fishing piers, each 60m long are constructed over 813mm diameter, 16mm thick, inclined tubular steel piles,

penetrating a depth of over 15m into the sea.

The main Scientific Center building has a gross area of 18,000sq.m formed on over 2,000 precast reinforced concrete piles 10 - 14m long and 40x40cm in section. The main building will house

(1) An open Ocean tank aquarium of 500sq.m, 8.3m high and holding more than 550,000 gallons of filtered, treated sea water.

(2) The discovery place which will stimulate the curiosity, creative thinking and experimental action of young learners.

(3) A 250 seat IMAX theatre which will show films on a screen, 10 fold larger than in normal cinemas to reveal the secret of the deep ocean, the abundance of the sky or the breaking of an atom.

The Planned Aquarium, Discovery Place, IMAX Theatre and Dhow harbour will create the focus while the central court, restaurants, gift shop and green areas provide the amenities.

The overall concept of the Scientific Center is to bring together under one roof all aspects of Kuwait's intertwined environment of desert, coastal edge, and the sea, incorporating the life style of the Kuwaiti people.



Jokes

ENGINEERS EXPLAINED

People who work in the fields of science and technology are not like other people. This can be frustrating to the nontechnical people who have to deal with them. The secret to coping with technology-oriented people is to understand their motivations. This section will teach you everything you need to know.

SOCIAL SKILLS

Engineers have different objectives when it comes to social interaction.

"Normal" people expect to accomplish several unrealistic things from social interaction:

- * Stimulating and thought-provoking conversation
- * Important social contacts
- * A feeling of connectedness with other humans
- * In contrast to "normal" people, engineers have rational objectives for social interactions:
- * Get it over with as soon as possible.
- * Avoid getting invited to something unpleasant.
- * Demonstrate mental superiority and mastery of all subjects.

FASCINATION WITH GADGETS

To engineers, all matter in the universe can be placed into one of two categories:

1. Things that need to be fixed, and

2. Things that will need to be fixed after you've had a few minutes to play with them.

Engineers like to solve problems. If there are no problems handily available, they will create their own problems. Normal people don't understand this concept; they believe that if it ain't broke, don't fix it. Engineers believe that if it ain't broke, it doesn't have enough features yet.

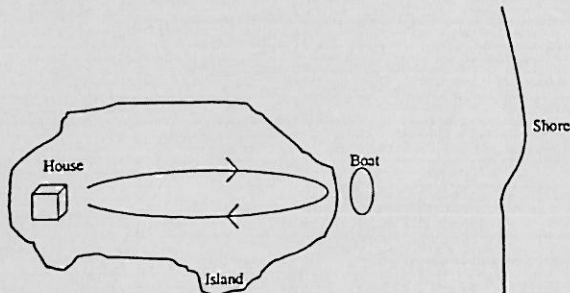
No engineer looks at a television remote control without wondering what it would take to turn it into a stungun. No engineer can take a shower without wondering if some sort of Teflon coating would make showering unnecessary. To the engineer, the world is a toy box full of optimized and feature-poor toys.

POWERS OF CONCENTRATION

If there is one trait that best defines an engineer it is the ability to concentrate on one subject to the complete exclusion of everything, else in the environment. This sometimes causes engineers to be pronounced dead prematurely. Some funeral homes in high-tech areas have started checking resumes before processing the bodies. Anybody with a degree in electrical engineering or experience in computer programming is propped up in the lounge for a few days just to see if he or she snaps out of it.

Puzzles

A man lives on an island with his carriage driver. The man makes a daily trip with his driver to the other end of the island (as shown by the arrow) and then takes the boat to the sea shore. He returns back from the sea shore arriving at the end of the island at 5:00 pm. One day he arrives at the island at 4:00pm. He decides to take a walk and meet his driver on his way. He meets him, and they arrive at the house 10 minutes earlier than usual. **How long did the man walk?**



Publications Available in ACI-Kuwait Chapter

Various publications of the international American Concrete Institute (ACI) and other institutions are currently available at the Chapter library for the use of members. The chapter library is in the office of the chapter secretary, located in the Civil Engineering Department at Kuwait University (Khalidiya Campus, building Kh. 5, second floor). For further information, please contact Dr. Khaldoun Rahal, Civil Engineering Department, Kuwait University, phone: 4811188 (ext. 5734) or 4817240, or fax: 4817524.

A closed bottle (shown) is partially filled with water. If the only instrument you're allowed to use is a ruler, **Find the volume of the bottle.**



Announcements

Will the following new members collect their membership cards from Room No. 1822 at KISR: Mohammad Al-Hassan, Yousof Abdulrahim, Mohammad Ahsan, Mohd Talaat Saleh, Ismail Ashkanani, Ihab Abdulfatah, Udaya Bhanu, Ebtahim Al-Ansari, Abdulla al-Motee', Adel AlKazemi, Tarek Anwar Awida, Essam Al-Shami, Hadi Khajah, Fahad Al-Muteri, Mohammed Naddom, Mohamad Al-Harees, Anwar Naki, Ayoub Kamal, Abdul-Hakim Al-Ramadhan, Amthal Al-Dabbous, Ammar Al-Hebshy, AbdulAziz Al-Obaidi.

Vacancy for Civil Engineer

Engineering Development Company, Stone Center and Wood Center are in need of the following:

1. A licensed Bachelor of Science in Civil Engineering;
2. Must be bilingual (English/Arabic);
3. Must have 5 years experience in housing construction;
4. Must have knowledge in Kuwait market;
5. Must possess Kuwaiti driver's license; and
6. Transferrable Visa

For further information contact:

Eng. Sheikha Al-Arfaj Tel.: 482-0411/22

Announcements

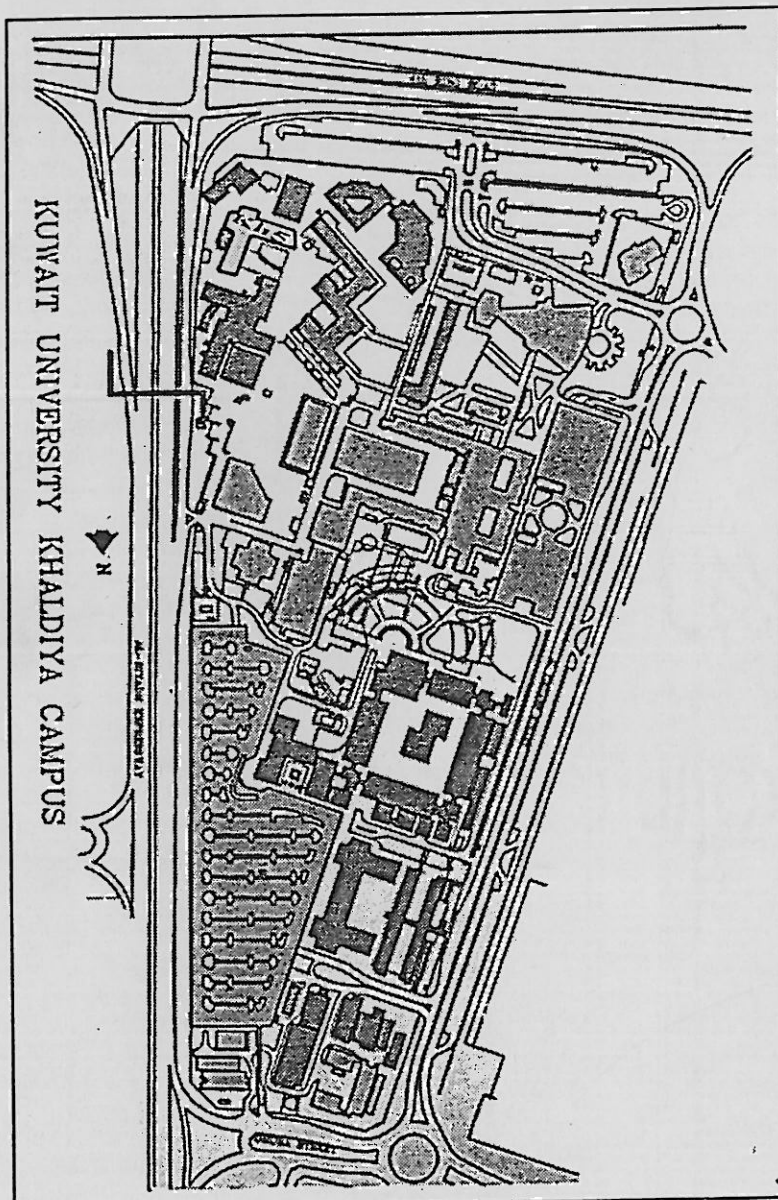
The ACI, Kuwait chapter will be publishing a directory for its members. All members are requested to supply the following:

- a) One passport size photograph, b) Address, telephone & fax numbers, c) Educational background information, and d) Job description in ten keywords.

Jobs Wanted

Quality control engineering, 18 years experience in construction industry, seeking a job. Please contact 4742871 or 5624104.

Location of ACI-Kuwait Chapter



Room 25, 2nd floor,
Bldg. 5kh.,
Civil Eng. Dept.,
Kuwait University,
Khalidya Campus
Tel. 4811188 Ext. 7021