aci
Kuwait Chapter

Concrete News

Volume 27 / January 2023

Cover : College of Engineering and Petroleum, New University City, Kuwait University, Kuwait.

Kuwait Chapter

Local Connection with International Links

Concrete News

Concrete News is published by ACI-Kuwait Chapter for sharing information, promoting exchange of technical knowledge amongst its membership, and enhancing the Chapter's position within Kuwait's engineering fraternity.

Volume 27 / January 2023

Kuwait Chapter

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President's Message

ACI-KC President, Azizz Mamuuji

ACI-Kuwait Chapter sincerely hopes that you will find this 27th issue of Concrete News, and its coverage of our activities over the past 18 months, to be informative and interesting.

The Chapter has indeed been busy. Meetings of the Board of Directors transitioned from online to in-person; technical webinars and seminars continued throughout at regular intervals; members enjoyed an exciting tour of the construction site of Kuwait's new Justice Palace; and the Student's Committee surprised us with their enthusiasm.

And, finally after a two year Covid-19 induced postponement, two of the Chapter's important annual events were held this year - the prestigious Annual Awards Function; and the Annual General Meeting during which our new Board of Directors was confirmed. The Annual Awards Banquet was a particularly poignant affair, as it was held after a two-year hiatus and combined the awards for Year 2019 and 2020. Nominations received for both years were judged together. The function and the award are extensively covered in this issue.

As we all gradually return to the normal times, ACI-Kuwait Chapter hopes to more actively pursue its mandated programme of technical activities and professional support to our members. Our effectiveness, however, is very much dependent on active participation by all members, consulting firms and construction companies. I urge you to become more involved, and to take more advantage of the Chapter's services.

And as I leave you to enjoy reading this issue of our Newsletter let me, on behalf of the Board of Directors, wish all our members continued professional and personal success.

Annual Awards 2020-2021

Every year ACI Kuwait Chapter recognizes and presents two awards, one to an outstanding project and the other to a deserving individual. The Award of Excellence, which is for a project, and the Award of Achievement are presented during the Chapter's highly anticipated grand Awards Banquet.

The Chapter has presented these awards every year since 2001, except in 2019 and 2020 as our functions had to be cancelled due to Covid-related restrictions.

This year's well attended awards ceremony was held at Radisson Blue Hotel in Abdul Hussain Marafie Ballroom on 31st May, 2022, under the patronage of His Excellency, Mr. Ali Hussain Ali Mousa, Minister of Public Works and Minister of Electricity, Water and Renewable Energy.

ACI KC Annual Awards Function, May 2022

His Excellency, Mr. Ali Hussain Ali Mousa, Minister of Public Works and Minister of Electricity, Water and Renewable Energy

Azizz Mamuuji, ACI-KC Vice President, Master of Ceremonies

Dr. Moetaz El Hawary, ACI-KC President

Award of Excellence 2021

The Award of Excellence is bestowed on a local project of outstanding merit. The award itself, comprising a trophy, plaque and certificate, is given to the owners or developers of the project. Certificates of Excellence and plaques are also presented to the general or main contractor; the design and supervision consultants; and the main concrete supplier.

This year ACI-KC honoured Kuwait University's College of Engineering and Petroleum, located in its New University City in Shadadiya. The project was appreciated as a "sustainably designed higher education facility that seamlessly combines functional

His Excellency, Mr. Ali Hussain Ali Mousa, Minister of Public Works and Minister of Electricity, Water and Renewable Energy, the Guest of Honor and elegant architecture with contemporary engineering and smart systems". The award was presented to Kuwait University Construction Program (KUCP), which manages the new campus and all its buildings on behalf of Kuwait University.

Award of Achievement

ACI - Kuwait Chapter's Award of Achievement is presented to an individual to recognize his or her long-standing and commendable contribution to Kuwait's development, or for significantly helping promote concrete technology and engineering education in the country. The award this year was given to Mr. Mohammed Al Nassar for his 'lifetime involvement in formulating Kuwait Municipality policies influencing urban development in the State of Kuwait'.

Presentation of Award of Achievement
to Mr. Mohammed Al Nassar

Presentation of Award of Excellence to Dr. Qutaiba Razouqi, Director of KUCP

His Excellency the Minister and ACI KC Board Members with Award Recipients

Award of Excellence 2021

ACI-Kuwait Chapter bestows the Award of Excellence on a project in recognition of, amongst other aspects, outstanding use of concrete, innovative architectural and structural design, iconic landmarks and high standards of construction.

Recognition

ACI-KC's respected Award of Excellence is given to a significant and deserving project that has been substantially completed in the preceding two years.

The award acknowledges and appreciates various aspects of substantially completed projects :

- Outstanding work in concrete construction and practices
- Innovative architectural and structural design
- Response to cultural considerations and traditions
- Architectural landmarks and iconic structures
- High standards of construction
- Imaginative Renewal and renovation
- Creative use of concrete
- Public appreciation of a project

The award is presented to the developer of the project, but it also acknowledges the design and supervision consultants, general contractor and the main concrete supplier.

Kuwait University - College of Engineering and Petroleum, Shadadiya Campus

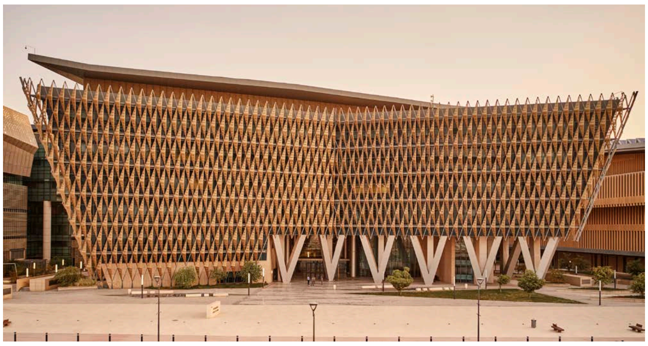
The Chapter has bestowed this award every year since 2001, except for 2019 and 2020 as our activities were curtailed due to covid restrictions.

The Award of Excellence for the Year 2021 was presented to Kuwait University's new College of Engineering and Petroleum, which was honoured as 'a sustainably designed high education facility that seamlessly combines functional and elegant architecture with contemporary engineering and smart systems'. The grand award ceremony was conducted on 31st May, 2022 in Hashemi Ballroom of Radisson Blue Hotel.

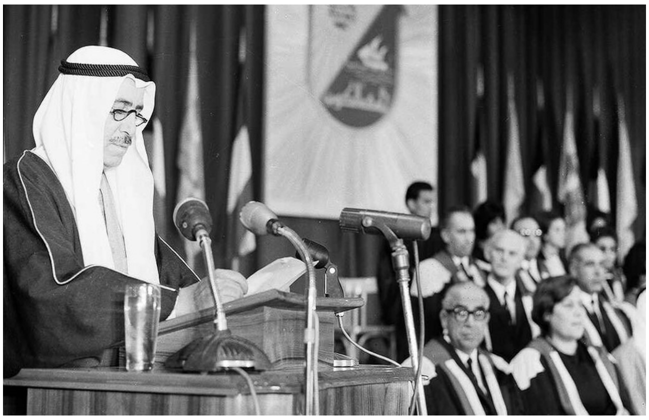
History

Kuwait University was established in 1966 by an Amiri Decree, and its first campus was in Khaldiya. Every few years thereafter, new decrees were issued and more colleges were added, and the university ultimately expanded to six campuses.
The College of Engineering was established by a decree issued in 1974. With the growth in student numbers, the College's first building needed expansion and KH 14, pictured here, was completed in the mid-90's. Decree N30/2004, issued on 6th May 2004, authorized the establishment of a new university in Shadadiya; and on 19th February 2005, almost 50 years after the establishment of Kuwait University, the foundation stone for the new Sabah Al Salem University City was laid. The new city, conceived and planned on a 6.0 million m^2 site, comprises two main parts : the large sciences, humanities and administration campus; and the health sciences campus.

It will ultimately accommodate almost 40,000 students. Implementation of the new campus has begun and a number of its iconic buildings, some pictured here, are already in use.



KU - College of Life Sciences

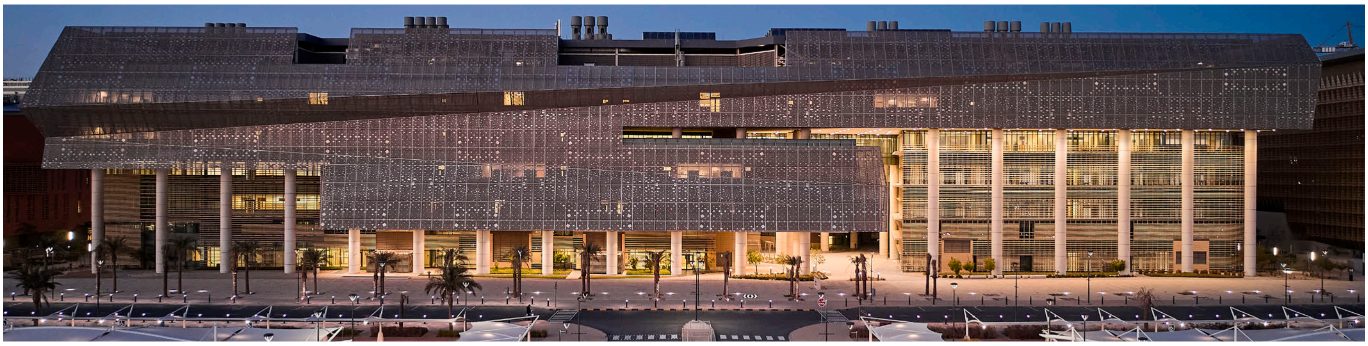


Establishment of Kuwait University by Amiri Decree

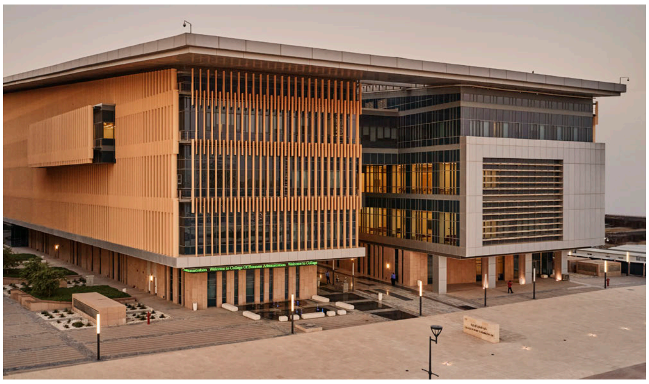
KU - College of Social Science, Shari'a and Law

College of Engineering, Khaldiya Campus

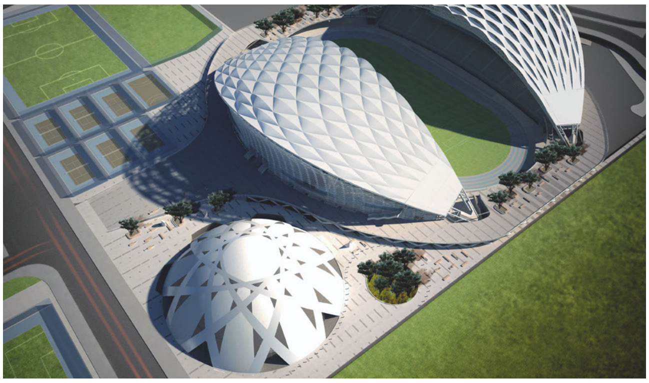
KU - College of Art and College of Education



KU - College of Science and Faculty Club



KU - College of Business



KU - Students Activities and Athletics Facilities

Functional Requirements

Within the new campus, College of Engineering and Petroleum (COEP) occupies a site of 73,500 m^2. It brings together the University's engineering and allied technical disciplines into one massive facility that accommodates six colleges :

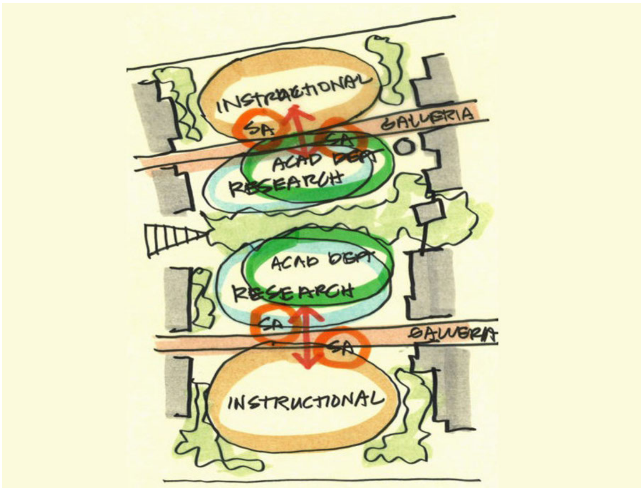
- Civil Engineering
- Chemical Engineering
- Electrical Engineering
- Industrial Engineering
- Petroleum Engineering
- Architecture

These departments are now together in a well developed and dynamic facility that incorporates smart technologies, and invokes a lively and great collegial environment. The School of Architecture, however, will ultimately have its own building.The design brief called for a development with separate facilities for male and female students, numbering over 5500 in total, and served by more than 1400 facility members.

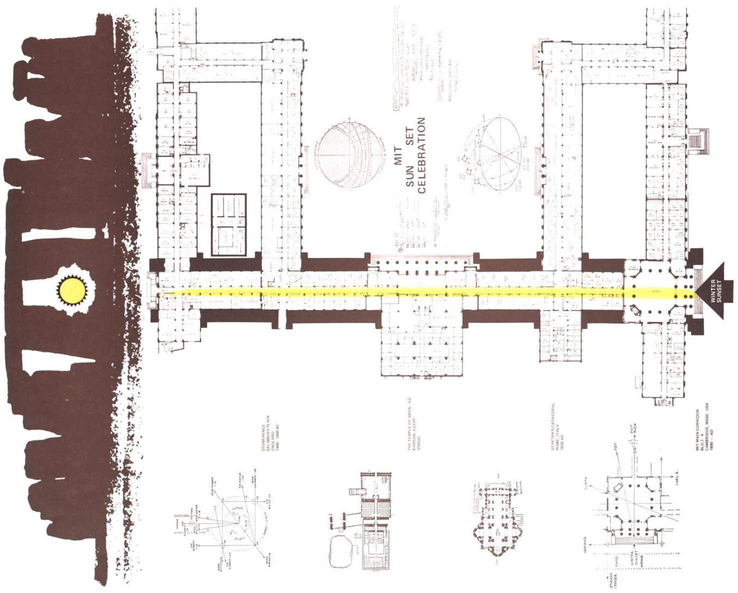
- Site : 73,500 m^2
- Gross Area : 290,000 m^2
- Students : 5500
- Faculty : 1410

- Laboratories : 533
- Classrooms : 115
- Auditoria (500 seats) : 2
- Student Services
- Separate Facilities for Male / Female Students

The academic and research programme, requiring about 530 general and special laboratories, 115 classrooms, two 500 seat auditoria and a host of other support provisions, added up to almost 290,000 m^2 of built-up area. Given the relatively small site, a clever



design approach had to be conceived for this massive facility.



MIT Infinite Corridor

MIT Infinite Corridor

The planning and design inspiration came from the 'Infinite Corridor' at the world renowned Massachusetts Institute of Technology, more commonly known as MIT.

MIT's Infinite Corridor is a 251 m long hallway that connects and runs through all its major buildings. The design solution for COEP was the re imagining of this linear layout by folding it back on itself several times. The critical design challenge was to create a unique form that not only satisfied functional and programme requirements, but also permits exterior views, brings in daylight along the perimeter, and ultimately fosters a healthier, more conducive learning environment. The zig-zagging masses also gave the opportunity to create shaded courtyards and breakout spaces along what ultimately became a 6.2 km multilevel walkway.

COEP: Over 6.0 km of Internal Walkways

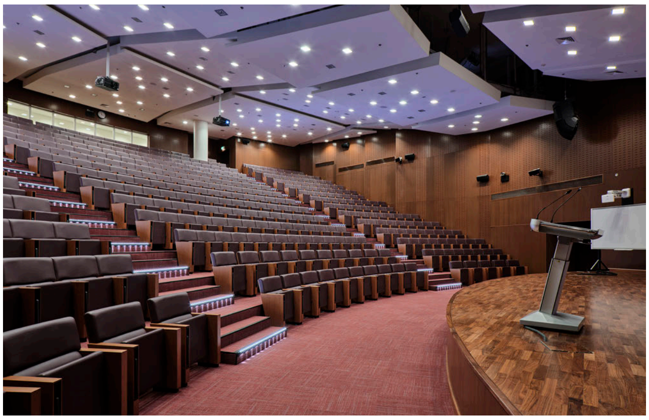
Planning and Architectural Form

The building's conception ultimately led to a dynamic new facility that, from ground up, projects a unified whole, while celebrating the unique design expression of each college. As the Design Consultants said, rather than a disjointed architectural showcase, each college individually interprets the overall campus guidelines, and boldly expresses its own specific programmes.

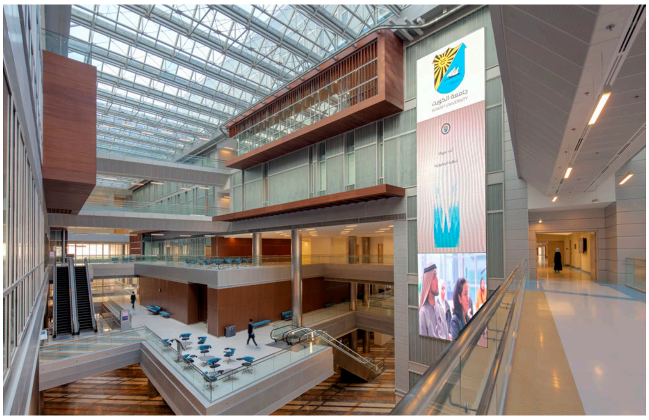
Originally planned to accommodate separate male and female facilities, the directive was modified mid-way to enable many of the sophisticated laboratories and workshops to be shared. The College's programmatic components have been manifested into the zig-zag plan form referred to above, and the footprints of the female and male buildings are separated by the landscaped Oasis that traverses the entire University campus. The ground floor plan shows how classrooms, laboratories, offices, and shared and external spaces are organized. The building configuration comprises bold architectural forms that vary in height from 3-7 floors.

Architecturally, as these masses and volumes wrap around themselves, they create constantly changing shadows and textures.

Elevations are clad with terracotta rain-screens, which in addition to their sustainable properties and resilience to extreme and harsh climate, are notable for their elegance and colour.



Auditorium



Galleria

Design Features

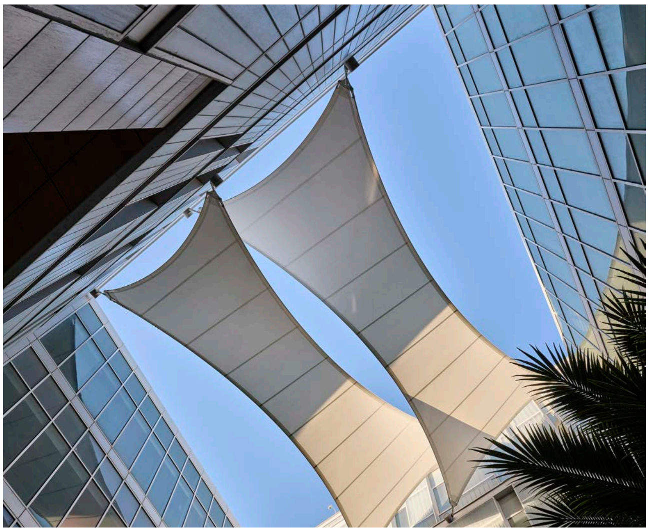
A grand multi-storey multi-use galleria is an all weather focal space which houses students' services, and is a place where they gather for breaks, meals, study and informal congregations.

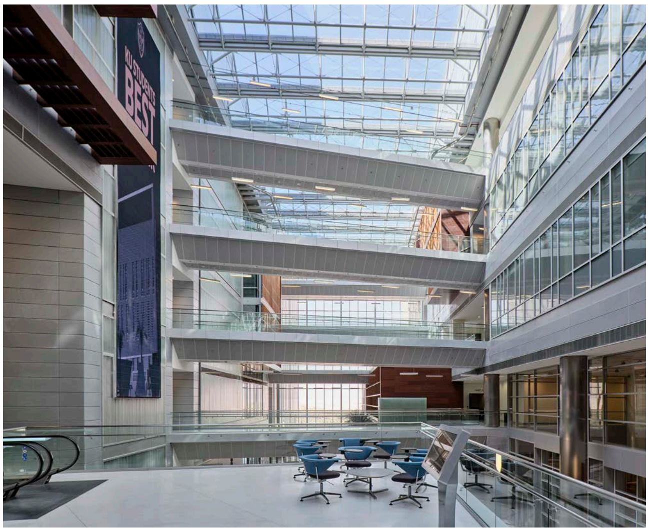
Faculty offices overlook this soaring glass topped space that is serviced by an integrated cleaning and maintenance gantry that virtually disappears when not in use.

The buildings' interiors reflect a comfortable atmosphere and ambience, well suited to an academic facility. Interiors are characterized by carefully selected materials and colours with controlled natural, general and special area lighting. The courtyards between the folding blocks become well shaded external breakout areas that are also used for outdoor experimentation.

The high walls and tent structures provide deep shading and protect the perimeter.

There are two specialized non-duplicated laboratories that serve both the men's and women's campuses: a 3,500 m^2 ocean engineering laboratory features a giant tank holding 1.4 million litres of water to facilitate modeling of coastal structures; and a state-of-the-art seismic engineering laboratory is of a scale previously unavailable to the university's students.

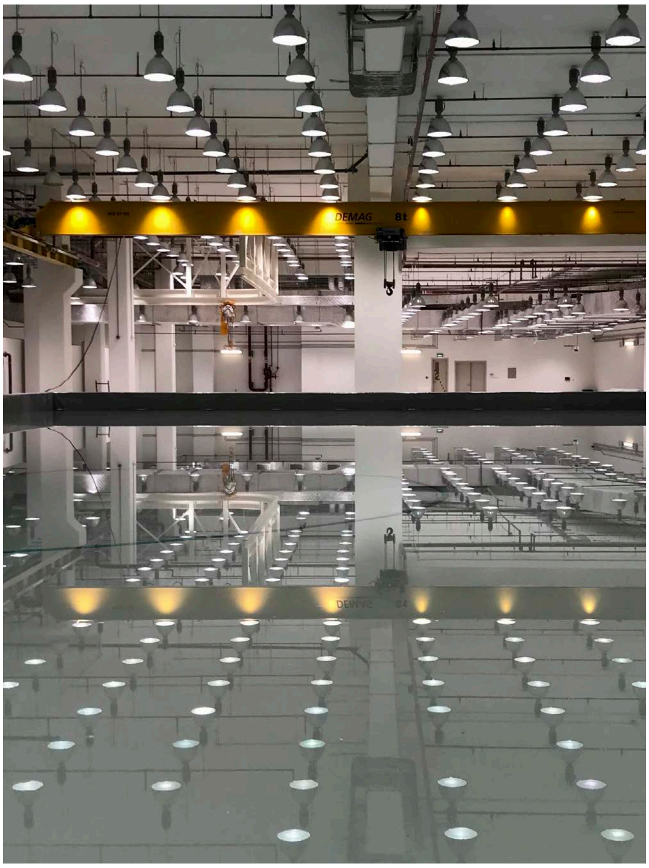




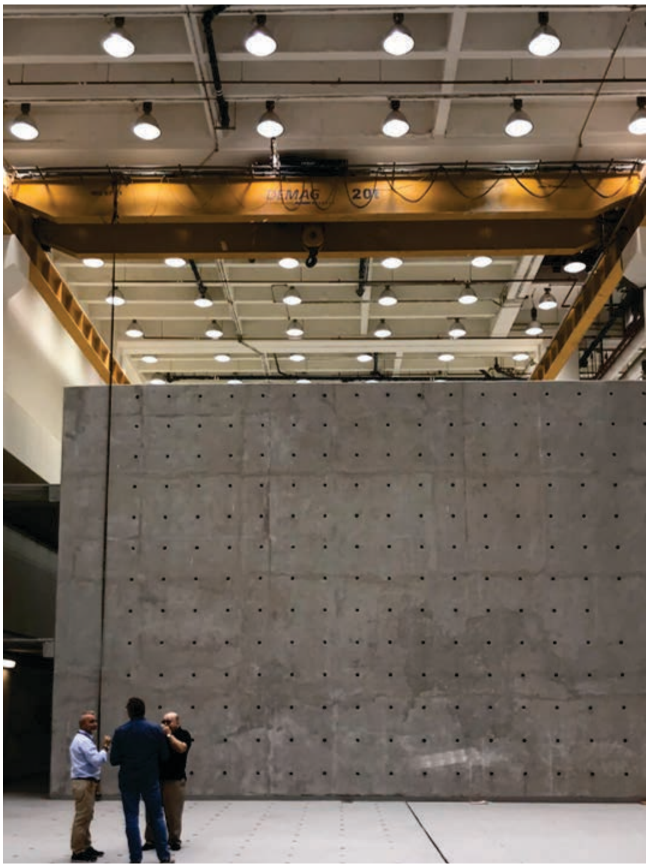
Engineering Systems

The structural system is generally reinforced concrete, with framing done with a combination of ribbed and flat floor slabs. Connecting bridges are either steel with concrete decking or pre-stressed beams with concrete slabs. The foundation is a 750 mm thick raft, and basement walls are 600 mm thick reinforced concrete. As would be expected, the complex is designed to satisfy rigorous sustainability and engineering standards.

Building services are designed to comply with LEED silver rating, and are carefully designed to include an efficient chilled water system producing 12,000 tonnes of refrigeration; automated energy and water conservation; as well as special ventilation, exhaust, waste, safety and control systems for the laboratories.



Coastal Engineering Tank



Seismic Engineering Lab

Mr. Jay Stoughtenger receiving the award for International Consultant, C7A

Mr. Ubed Arain receiving the award for Local Consultant, Gulf Consult

Mr. Fahad Al Kharafi receiving the award for Joint Venture Contractor

Mr. Lutfi Hakim receiving the award for Main Concrete Supplier

Awardees

Developer:
Kuwait University Construction Program (KUCP)

General Contractor:
Metallurgical Corporation of China (MCC)

Joint Venture Contractor:
Khalid Ali Al-Kharafi Bros. and Co. (KAK)

Design and Supervision Consultants:
Cambridge Seven of Cambridge, Massachusetts, USA and Dar Gulf Consult of Kuwait

Main Concrete Supplier:
Messilla International Ready Mix Concrete.

Award of Achievement 2021

At its Annual Awards Banquet held on 31st May, 2022 at the Hashemi Ballroom in Radisson Blue Hotel, ACI-Kuwait Chapter proudly presented its Award of Achievement for the Year 2021 to a distinguished state official who, with considerable foresight and over many years, influenced urban development in the State of Kuwait.

Mr. Mohammed Al Nassar

The Awardee and Citation

ACI-Kuwait Chapter was pleased to present its Award of Achievement 2021 to Mr. Mohammed Al Nassar for his 'lifetime involvement in formulating Kuwait Municipality policies influencing urban development in the State of Kuwait'. Eng. Al Nassar, better addressed as Abu Eid, was born in Kuwait. His early schooling started with the well-known Al Nile School, and continued through Al Ghazalli and Al Shamiya schools.

After finishing from Shuwaikh High School, he travelled to Egypt for higher studies, and in 1980 he graduated with a Bachelor's degree in Civil Engineering from Alexandra University. It is during his It is during his time at the university that he developed an interest in urban development.

Alexandria University

Career

On his return to Kuwait he joined Kuwait Municipality, where for the first ten years, he worked in the Building Department's Branch in Salmiya.

The key focus of his work was municipal issues pertaining to the large and heavily populated neighborhoods in Salmiya, Hawalli and Fahaheel. Ten years later, in 1990, he moved to Kuwait Municipality's iconic main building in Kuwait

A few years later, he was promoted to become the Deputy General Manager, and this was followed by his appointment in 2000, as the General Manager of Kuwait Municipality.

He remained in this position till his retirement in 2006.

Liberation Day, 1991

- Optimism
- Change
- Opportunities
- Municipal Code
- Development Strategy
- Building Code Interpretation

Circumstances and Personal Convictions

The post-occupation liberation of Kuwait in 1991 ushered in a new municipal planning vision for the country. It was time for optimism and there was a perceiveable call for change; changes in people's aspirations and a better appreciation of their rights.

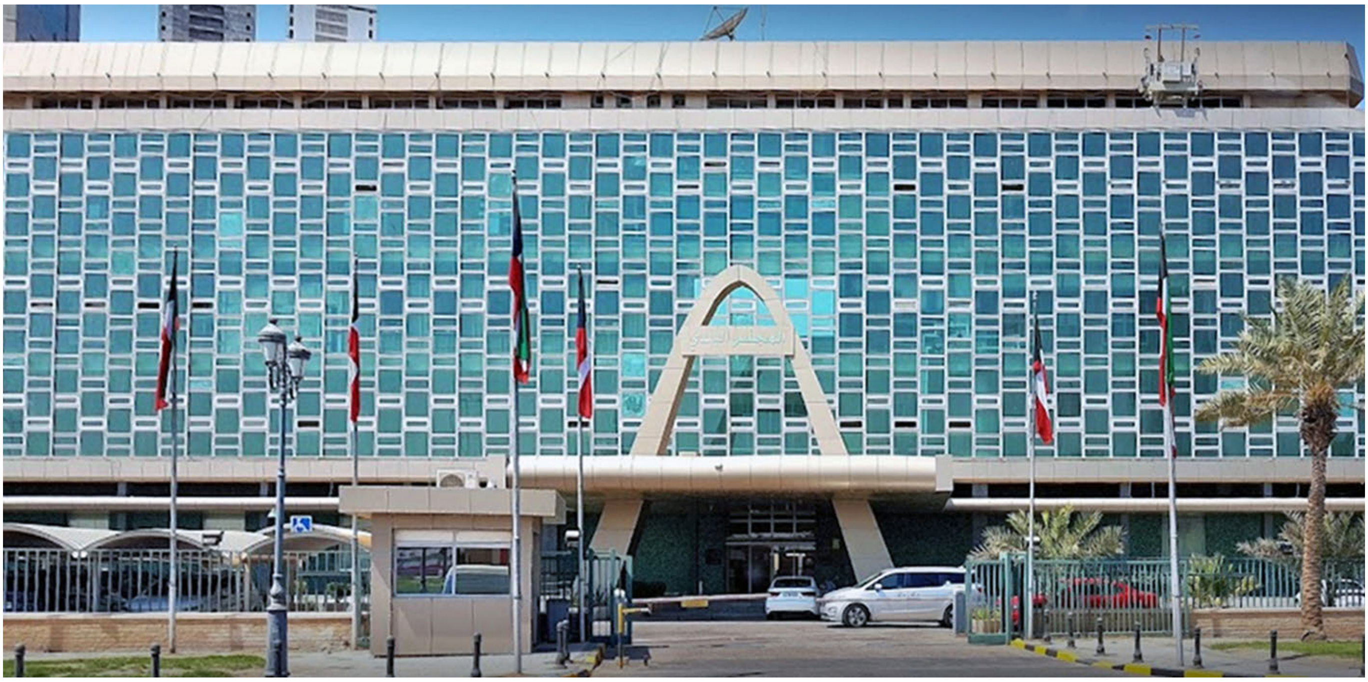
The sphere of municipal influence was becoming more pronounced and the country needed more investment and development opportunities.

As an obvious outcome, the municipal development code required clearer definition, and its utilization and implementation had to be managed more effectively. In effect, the Municipality had to better understand the desires of investors and put in place a more comprehensive urban development strategy.

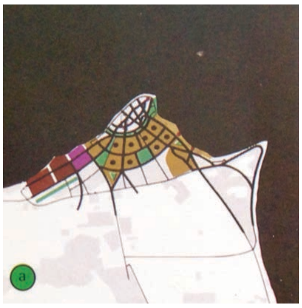
Open minded thinking was required, with flexibility in the interpretation of the building code, and a more forward looking urbanization vision. And, this became Abu Eid's vision. Important personal convictions moulded Abu Eid's work and influence. Firstly, he has a strong belief in the significance and importance of national and local master plans.

He values the extensive analysis, research and expertise involved in developing comprehensive, realistic and implementable cultural constraints.

Furthermore, he always appreciated that these have to be realized through concerted effort, with appropriate policies and regulations, and all within a firm and balanced legal framework.



Kuwait Municipality



Kuwait Master Plans

He was convinced that if pursued as intended, the country's urban development would be much better managed, organized and implemented.

New Development

In the context of master plans, in his capacity as Director, Eng. Mohammad has the drive and vision to push for the establishment of a number of new projects.

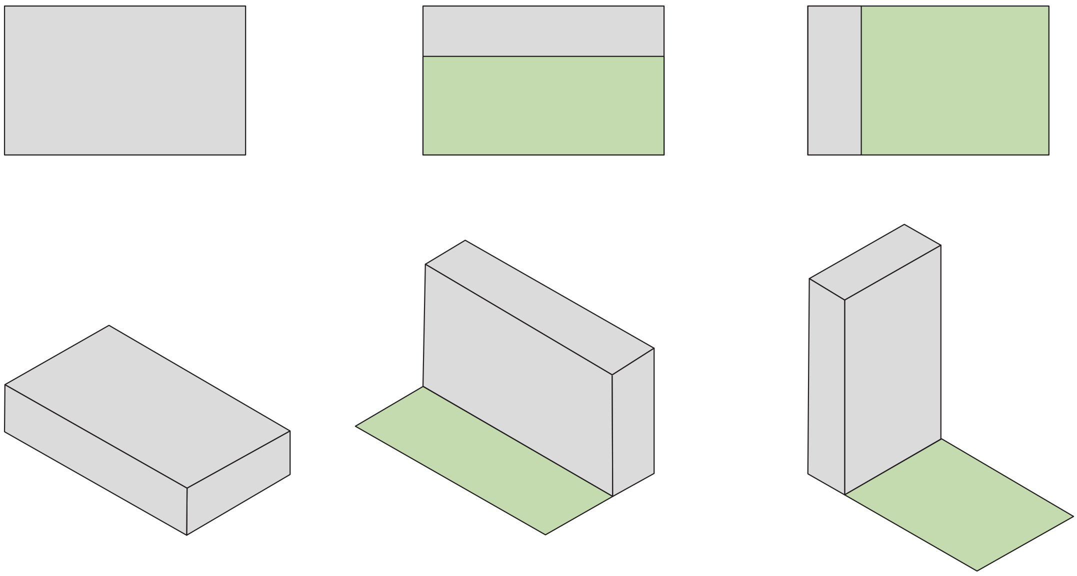
These include amongst others, Mutlaa City, Subiya, Sabahiya, Sabah Al Salem and Shadadiya.

Another aspect of urban development was the national plan for highways and roads, for the implementation of which he and his colleagues had to wrestle with complex issues pertaining to : coordination with private land owners; land acquisition and legal complications; road reserves in different and difficult locations; dealing with conflicting interests; and satisfying demands of various concerned statutory authorities.

These aspects called for tactful management, and led to many important decisions concerning highway networks, some of which have already been executed over the past few years.

Code Interpretation

Abu Eid had an open-minded approach towards the interpretation of the building code, and his developmental philosophy was aptly explained by



- Fixed FAR
- Site fully utilized
- Low-rise development
- No Open Space

- Same FAR
- Same built-up area
- Mid-rise development
- More open space
- Better site utilization

- Same FAR
- Same built-up area
- High-rise development
- Maximum open space
- Optimized open site utilization opportunities

BOT Projects

using a tissue box to illustrate the flexibility needed in formulating policies for built-up areas and allowable floor area ratios. The floor area ratio, FAR, defines the area that can be built on a given plot. It is expressed as a percentage of the size of the plot.

The tissue box aptly demonstrated how imaginative interpretation and application of the Municipality's FAR was necessary.

The diagrams alongside illustrate that while the total built-up area remains constant, code interpretation impacts massing, site utilization, open space, building height and visual quality of any development. This approach came into its own when the concept of investment through a BOT (build, operate and transfer) system was introduced in Kuwait. At the beginning of this century Kuwait Municipality oversaw implementation of various prominent BOT projects, some of which were under Abu Eid's leadership. These included amongst others, Marina Mall, Al Kout Mall and Souq Sharq.

A number of waterfront phases were also similarly implemented as BOT ventures. The Municipality also directly initiated and implemented some major waterfront projects, including Waterfront Phase 4 and Injaffa in Ras Salmiya. Changes in the code also eventually facilitated other significant mega projects, such as The Avenues, 360 Mall and Al Hamra Tower.

Life and Work Philosophy

Abu Eid has a commendable life and work philosophy that has guided him in his career. He proudly says that a sincere and serious work ethic is an essential attribute for everyone; and that particularly in public services, one's decisions must always be in the country's interest.

He humbly appreciates and accepts that his work and achievements would not have been possible without the support of his many hard working colleagues, experts and technical staff.

Importantly too, competent employees and professionals should be given the freedom to think creatively, and be empowered to take well-studied decisions. He also emphasizes and acknowledges his father's immense influence in moulding him into the person he is. He proudly, with love, respect and sincere appreciation, proclaims his father, Mr. Eid Al Abdul Mohsen Al Nassar, to be his influential guide, mentor, leader and friend.

It is not surprising, therefore, that he nurtures his own family and four wonderful grandchildren with the same compassion and reverence.

And his most enjoyable hobby? Taking long walks, which he says give him peace of mind and become for him his daily opportunity for quiet contemplation.

Mr. Mohammed Al Nassar with His Highness, the Amir of Kuwait

Mr. Mohammed Al Nassar receiving the Award of Achievement from His Excellency, the Minister

ACI-KC Technical Activities

A number of technical activities were carried out during 2019. These included collaboration in certification programs and courses; seminars and project presentations; and participation in conferences.

Webinars

Under the auspices of ACI Kuwait Chapter's Past President and Chairperson of the Technical Committee. Dr. Moetaz El Hawary, a series of interesting webinars were organized over the period January 2021 to February 2022. These constituted a part of ACI-KC's Talks Webinars Program.

Durability: How We Measure It?

Date
Tuesday, 19th January, 2021

Presenter
Ms. Katie Amelio, PE
Professional Development Program Engineer,
American Concrete Institute.

Moderator
Dr. Moetaz El-Hawary
ACI-KC Vice President (2020 - 2021),
Chairperson of Technical Committee.

This well attended webinar was graced by the President of ACI, Mr. Jeffrey Coleman, who commenced the proceedings with a brief welcome address. In summary, Ms. Amelio's presentation covered the following key aspects:

- How to define durability?
- Where to find durability requirements and guidance?
- Commonly used durability tests for freeze-thaw and alkali-aggregate reactivity.

In addition to about 30 attendees in Kuwait, the webinar also attracted an audience from other countries. This was a very informative session that provided valuable knowledge about concrete durability, which is a major problem in Kuwait's hot weather. The interesting presentation ended with a random raffle draw in which one of ACI-KC's attendees was given the opportunity to win one of three prizes worth about $800.

Assessment of Concrete Structures Using Infrared Thermography

Date
Tuesday, 23rd February, 2021

Presenter
Dr. Zafer Sakka, Ph.D.
Scientific Researcher,
Kuwait Institute of Scientific Research (KISR),
Board Member of ACI-Kuwait Chapter.

Dr. Sakka is a researcher in KISR's Sustainability and Reliability of Infrastructure, Energy and Building Research Center.

The webinar was arranged with the collaboration of KISR. Over 45 people attended his lecture on using infrared thermography for assessing concrete structures. Restoring damaged reinforced concrete structures is often more economical than building new ones.

Accordingly, many reinforced concrete structures, such as bridges, buildings and tunnels, require periodic assessment through some nondestructive testing (NDT) methods. Infrared thermography, IRT, is a modern non-contact NDT method with wide applications in many fields. In his presentation, Dr.

Sakka demonstrated various opportunities for using this technology in the construction industry, and its use in detecting subsurface anomalies that may exist in concrete structures.

Introduction to the Main Updates to ACI 318 – 2019

Date
Tuesday, 30th March, 2021

Presenter
Dr. Khaldoun N. Rahal, Ph.D.,
Professor, Civil Engineering Department,
Kuwait University.
President of ACI-Kuwait Chapter.

The 2019 edition of the ACI 318 Building Code introduced numerous changes to the provisions on various subjects pertaining to high-strength reinforcement.

These include: shear design of slabs and beams; strength reduction factors; hanger reinforcement for beams; structural integrity reinforcement for one-way slabs; analysis and reinforcement of two-way slabs; in-plane shear strength of walls; deep foundations; anchorage to concrete; strut and tie models; materials and durability; and other subjects related to earthquake-resistant design.

There was also a significant effort to improve the format and readability of the document. In this initial webinar, attended by many engineers and students of Kuwait University, Dr. Rahal discussed the background and effects of changes related to high-strength reinforcement, shear design of slabs and beams, strength reduction factors and hanger reinforcement for beams. Other subjects shall be addressed in future seminars.

Concrete Composites with Graphene and Nanomaterials

Date
Tuesday, 9th November, 2021.

Presenter
Dr. Moetaz El-Hawary,
Professor, Civil Engineering Department,
Kuwait University.
Vice-President of ACI-Kuwait Chapter,
Chairperson of ACI-KC Technical Committee.

Graphene is a nanomaterial that is 200 times stronger than steel. The use of graphene concrete composite is obviously an excellent concept, as it increases the strength of concrete and allows the building of taller structures, and consequently in reducing the land-take for development. Dr. El-Hawary's informative presentation covered the following topics:

- Introduction to nanomaterials
- Nanomaterials in concrete
- Graphene as a nanomaterial
- Mix design and mixing of graphene concrete composite
- Testing and properties of graphene concrete
- Sustainability and durability of graphene concrete
- Conclusions

Presenters

Ms. Katie Amelio

Dr. Zafer Sakka

Dr. Khaldoun Rahal

Low Compressive Strength Test Results? What They Mean and Next Steps

Date

Tuesday, 25th January, 2022

Presenter

Dr. Sureka Sumanasooriya, Ph.D.

Engineer - American Concrete Institute.

ACI-KC's Vice President and Chairperson of its Technical Committee, Dr. Moetaz El Hawary, moderated this technical webinar that focused on the interpretation of low compressive strength results, and the next steps.

Dr. Sumanasooriya's wide ranging presentation, which was appreciated by the many attendees, commenced with an explanation of compressive strength tests which are used for concrete acceptance, based on criteria defined in ACI 318 and ACI 301.

Tests results not meeting these criteria are referred to as low strengths. She covered the topic of low strengths in detail, and provided answers to questions such as: what is considered a strength test and what is not; what the minimum frequency of testing is; what the acceptance criteria for strength tests are; and how to investigate strength tests not meeting the acceptance requirements?

The steps needed to be taken by a concrete supplier, in case acceptance criteria are not met, were also discussed. Statistical concepts and numerical examples were shown and a list of reading resources was provided for those interested to study it in more detail. Her presentation addressed:

- Definitions related to strength testing
- Methods of sampling, fabrication, handling and curing strength test specimens
- Acceptance criteria for strength tests
- Interpretation of strength test results not meeting acceptance requirements
- Investigation of non-compliant concrete
- Dealing with low strength concrete issues in production

Presenters

Dr. Moetaz El-Hawary

Dr. Sureka Sumanasooriya

Technical Article | Fiber-Reinforced Concrete

A brief review of advantages and opportunities

As a construction technology, fiber reinforcement is almost as old as civilization itself. It has evolved many times over its long history, with some notable evolutions including:

- In ancient Mesopotamia, straw fibers were used in clay and mud bricks[1];
- Near the beginning of the twentieth century, asbestos fibers were introduced to produce artificial stone plates from hydraulic cements[2]; and
- In the mid-1960's, steel fibers were investigated for their effects in concrete mixtures.[3]

Given the ongoing innovations in fiber reinforcement, ACI Committee 544, Fiber Reinforced Concrete, was formed in 1965. Since its formation, ACI Committee 544 and others have published several documents pertaining to the topic. This article summarizes key aspects of some of the documents.

Sources

Fibers are now well established in the concrete industry. ASTM CI I I 6/CII 6M, for example, classifies fiber-reinforced concrete (FRC) by the material type of the incorporated fibers: steel, glass, synthetic, or natural,[4] and AC] Concrete Terminology (ACI CT) includes fibers in its definition of reinforcement, along with bars, wires, strands, and "other slender elements that are embedded in a matrix such that they act together to resist forces."[5]

ACI CT currently classifies fibers by equivalent diameter-the diameter of a circle with an equal aggregate sectional area as the fiber. Fibers with equivalent diameters less than 0.012 in. (0.3 mm) are classified as micro fibers, and fibers with larger equivalent diameters are classified as macro fibers. Examples are shown in Fig. 1. Micro fibers are typically

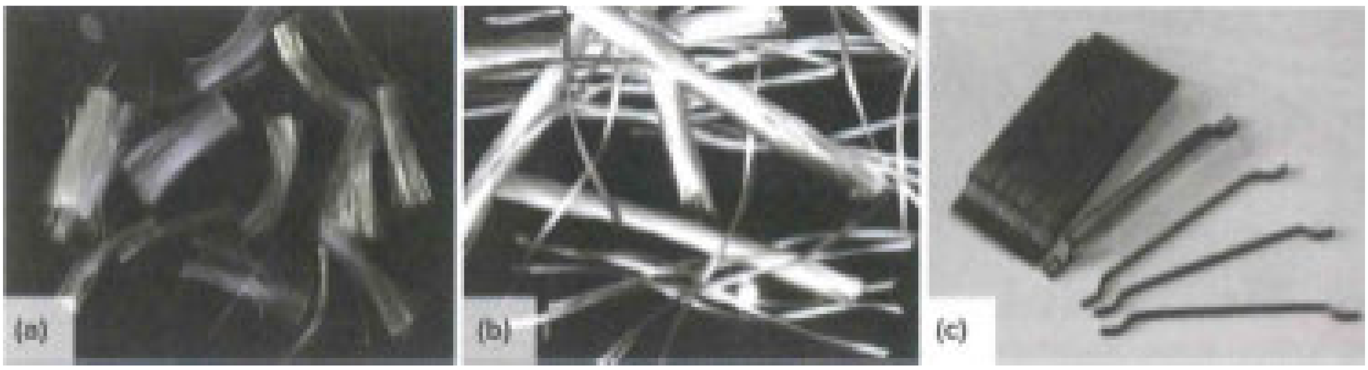


Fig. 1: Examples of fiber types, including: (a) synthetic micro fibers; (b) synthetic macro fibers; and (c) steel macro fibers

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used for mitigating plastic shrinkage cracks. Macro fibers are typically used to limit the widths of cracks resulting from shrinkage and thermal stresses and provide post-cracking tensile reinforcement. They are commonly made from steel or synthetic (polymeric) materials, and they generally have a length of 1.0 to 2.5 in. (25 to 63 mm). This article is focused on macro fibers only. Fibers provide three-dimensional (3-D) reinforcement and can enhance the ductile behavior of concrete. The level of tensile reinforcement provided by fibers depends on many factors, including fiber type, material, geometry, and bond strength.

Today, fibers are used as reinforcement in slabs-on ground, topping slabs, pile-supported slabs, crane track slabs, pavements, shotcrete, precast concrete pipes, precast tunnel segments, structural connections, and walls (ACI 544.4R-18).[6]

Benefits during construction

In contrast to conventional steel reinforcing wires or bars, fibers require no storage at the job site, labor for installation, supports or spacers, or personnel for inspection.

So whether used in a slab, wall, or precast component, the appropriate use of fibers in place of wire or bar reinforcement can significantly reduce the time and cost associated with delivering, installing, and inspecting the reinforcement. Using fibers for slabs can also eliminate the potential tripping hazard created by wire fabric and reinforcing bars, and it makes it feasible to discharge concrete directly from the mixer truck and avoid the need for a pump or conveyor.

Using fiber reinforcement may also result in reductions in greenhouse gas emissions due to using less steel in concrete.[7] Figure 2 shows a concrete slab on a metal deck under construction. The slab has been designed to incorporate fiber reinforcement in lieu of welded wire reinforcement.

Fig. 2: A concrete placement on an elevated floor in a hospital in Ridgewood, NJ, USA. The concrete slab on a metal deck was reinforced using only synthetic macro fiber reinforcement

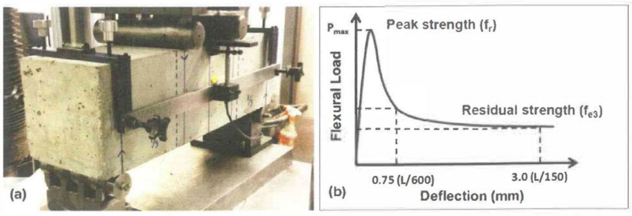

Fig. 3: FRC can be characterized using beam tests per ASTM C1609/C1609M: (a) A typical test assembly; and (b) a schematic representation of a flexural test result with post-crack residual strength (after Reference 6)

While no bars are included in this slab, some designers require conventional bars placed transversely over beams and girders to minimize cracking in the negative moment regions in the slab.

During service

In contrast to the two-dimensional (2-D) reinforcement provided by steel wires and bars, fibers provide 3-D reinforcement throughout a member. Uniformly and randomly distributed fibers can arrest incipient cracking at any point in concrete, resulting in shorter and thinner cracks and enhancing long-term durability. The 3-D nature of reinforcement by fibers also reduces the potential for spalling or chipping caused by overloading, impact, or explosion. For flatwork applications such as slabs-on-ground, elevated slabs, and pavements, traffic and vehicular loads create a fatigue-type loading; using fibers in concrete increases the toughness and fatigue resistance of concrete, resulting in a longer service life and reduced maintenance costs. Because fibers help to limit crack widths, FRC has been shown to improve the liquid tightness and service behavior of environmental concrete structures by reducing permeability and leakage. Fibers have also been shown to significantly enhance the ductility and ability of concrete to absorb energy under earthquake, impact, or blast loadings.[8]

Execution - Design

Like reinforcing bars, fiber reinforcement bridges cracks and transfers tensile loads through anchorage and bond action. However, fiber reinforcement works at a different scale, acting as hundreds of mini

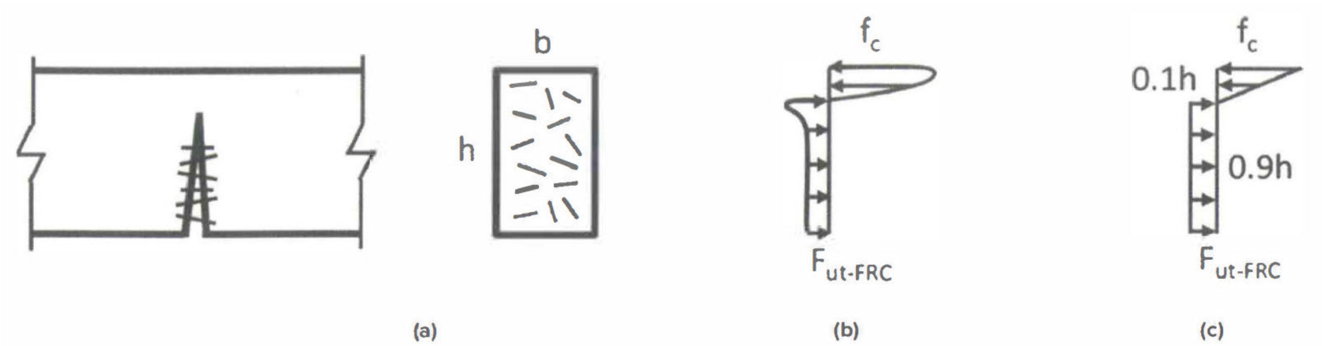

Fig. 4: Schematics of stresses in a cracked FRC section loaded in flexure: (a) FRC beam and section; (b) idealized distribution of normal stresses; and (c) simplified distribution of normal stresses (after Reference 6)

bars providing tensile strength to concrete. Fiber reinforcement can change the post-crack response of concrete from brittle to ductile under compression, tension, flexure, and impact loads.[9] For design, the tensile properties of FRC can be back-calculated from the results of flexural tests per ASTM C1609/CI609M or BS EN 14651. [10] [11]

Both test methods use beams loaded under four-point or three-point bending configurations until reaching a specific deflection or crack opening. The results include full load-deflection or load-crack opening curves and parameters regarding the post-crack flexural residual strength.

Figure 3 shows a test of an FRC beam and schematics of a typical flexural test result with post-crack residual strength measured per ASTM CI609/CI609M. Fibers can do more than control cracking due to temperature changes and shrinkage.

An FRC section can be designed to have a specific tensile and moment capacity. Similarly to a conventionally reinforced concrete section, reduction factors may be used to account for uncertainties with the material properties and the construction processes. Reference 6 provides guidance and summarizes the derivation of formulas for post-crack tensile and moment capacities using residual strength parameters obtained from beam tests. For example, that document recommends that the residual tensile strength of FRC, $F_{ut\text{-}FRC}$, can be estimated as

$$F_{ut\text{-}FRC} = 0.37\, f_{150}^{D}$$

where f_{150}^{D} is the flexural residual strength at a deflection of L/150 for beams with span *L* tested per ASTM CI609/CI609M. Similarly, Reference 6 recommends that the nominal moment capacity, $M_{n\text{-}FRC}$, of an FRC section of width *b* and height *h* can be estimated as

$$M_{n\text{-}FRC} = f_{150}^{D}\, bh^2/6$$

The selection of design parameters and their limits will depend on the specific application and design limit states. For example, where small crack widths are required under the serviceability limit state, the residual flexural strength at a deflection of L/600, f_{600}^{D} may be used in calculations. Under the ultimate limit state, however, f_{150}^{D} may be more appropriate than f_{600}^{D}. In applications such as slabs-on-ground, the equivalent flexural residual strength $f_{e,150}^{D}$ (also known as $f_{e,3}$) which accounts for the flexural toughness (energy absorption) of FRC, is often used for design. Schematic stress distributions and the corresponding design parameters for an FRC section are provided in Fig. 4. Other design aspects, including determining shear strength, controlling crack width, and designing using hybrid reinforcement comprising reinforcing bars plus fibers are also discussed in Reference 6.

A detailed discussion of the stress strain analysis of FRC, including softening and hardening behaviors, can be found in Reference 12, and information on the design for specific applications for FRC, such as precast tunnel segments, [13] shotcrete, [14] and slabs-on-ground.[15] Lastly, proposals for parametric models for determining the tensile stress-strain response of FRC for use in finite element models can be found in References 16 to 18.

Specification

Because residual strength values vary with fiber type, using a performance-based specification can ensure proper performance. The specification can dictate parameters per ASTM C1609/CI609M or per BS EN 14651.

For example, f^{D}_{150} or $f_{e,3}$ values can be specified for FRC, along with some main physical parameters such as fiber length or aspect ratio. Additionally, it is important to include fiber dosage and properties in the general structural notes and specification as well as to indicate locations on the plans that require FRC.

To ensure proper mixing, placing, and finishing of FRC, we recommend that the specification requires that a representative of the mend that the specification requires that a representative of the fiber manufacturer attend relevant preconstruction meetings.

Applications

Over the last four decades, fibers have been used to replace conventional reinforcement, fully or partially, in hundreds of successful projects, including:

- Slabs-on-ground with conventional or extended joint spacing;
- Pavements;
- Overlats and topping courses;
- Shotcrete for tunnel linings, slope stabilization or swimming pools;

Fig. 5: Examples of projects constructed using FRC: (a) the slab-on ground floors in this food processing facility in Troy, OH, USA, were designed and constructed using FRC reinforced with steel fibers only; and (b) the retaining walls for a flood control project in Tucson, AZ, USA, were constructed with synthetic macro fibers designed to replace 40% of the steel bar reinforcement determined during preliminary design

- Precast concrete for tunnel segments, septic tanks sound walls or decorative panels and
- Structural elements with hybrid reinforcement

While fibers cannot fully replace reinforcing bars where continuous reinforcement is needed for structural integrity, systems with hybrid reinforcement may provide viable alternatives that allow for accelerated construction. Recent examples include slabs-on-piles, coupling beams, shear walls, footings, foundation walls, precast walls, and tilt-up concrete panels in which the designer has used fibers to replace a portion of the reinforcing bars that would normally be used. Figure 5 shows two exemplary projects.

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Selected for reader interest by the editors.

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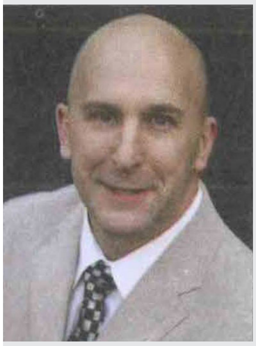
He received the 2018 ACI Young Member Award for Professional Achievement. He received his master's degree in structural engineering from the University of Tehran, Tehran, Iran, in 2006, and his PhD from Arizona State University, Tempe, AZ, USA, in 2010. A licensed professional engineer, Bonakdar has coauthored several papers on mechanical characterization of concrete and is focused on educating and promoting the use of novel and sustainable materials in concrete construction.



Michael A. Mahoney, FACI, is the Director of Marketing and Technology, Fiber-Reinforced Concrete, for The Euclid Chemical Company, Cleveland, OH, USA. He Is a Past Chair of ACI Subcommittee 544-A, FRC-Production and Applications, and is a Past President of the Fiber Reinforced Concrete Association (FRCA).

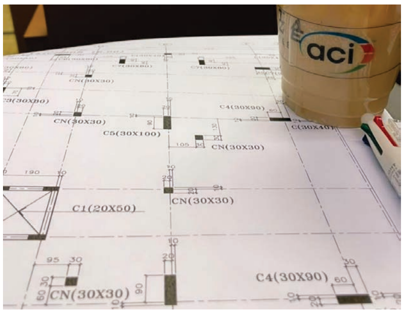
In 1997, he received his master's degree in civil engineering from the Technical University of Nova Scotia, Halifax, NS, Canada, where he helped to develop and patent an innovative synthetic fiber for concrete reinforcement. Mahoney has coauthored several papers on FRC and currently directs research and marketing projects while educating engineers and contractors on the use of FRC.

ACI-KC Students Committee Activities

The ACI Scientific Club in Kuwait University's College of Engineering finally resumed activities after it was forced to stop for two years due to the Covid-19 pandemic. The Club works under the supervision of Dr. Moetaz El-Hawary, faculty staff and Chairperson of ACI-KC Students Committee.

Board of Directors

The Club's new Board of Directors comprises Hajar Aljuberi, Sara Almashaan, Manar Alsumairi, Wsmeyah AlAjmi, Hanouf AlEssa and Mahmoud Zaidan. Recent activities included a two-day membership drive that was set-up over the period 10th - 11th March, 2022. Giveaways helped attract many new members to join the Club. Later, in March 2022, Eng. Anwar Al Suraij conducted a training course on Reading and Understanding Engineering Drawings, and the many students that participated certainly benefited from this course. In line with the charitable spirit of ACI-KC's Students Committee signed an agreement with the Kuwait Food Bank to collect donations to help needy people and distribute food for Iftar.



ACI-KC Site Visit

On Saturday, 19th March, 2022, the Chapter's Social Committee organized a visit to the construction site of the New Palace of Justice building in Kuwait City.

New Palace of Justice

The large group of our members was welcomed to the premises by Eng. Mohamad Ghaddar, Project Director, who commenced the tour with an informative technical presentation about the building's architectural and functional features.

PACE are the project's design and supervision consultants and their Lead Structural Engineer, Eng. Adly Abozid, described the structural systems, highlighting key design aspects and the challenges faced during construction.

Following the interesting presentations, attendees were given the opportunity to ask questions. The tour that followed the presentations was enjoyable, and Eng. Shaheen's explanations of various design and construction features were very helpful. A brief about the Palace of Justice project is available at http://www.pace-me.com/projects#new-palace-of-justice-kuwait

This will be largest judicial building in the Middle East. Located on a site of 34,500 m², the new complex of about 356,000 m² gross area will accommodate about 141 courtrooms, offices and services distributed over 23 above grade levels.

The building also comprises 3 basements, and is served by a combination of conventional and automated parking for 2740 cars. The project's client is Kuwait's Amiri Diwan, and construction is expected to be completed in late 2023. ACI-Kuwait Chapter wishes to thank Al Diwan Al Amiri, PACE and the Contractor, Messers. Mohammad Al Kharafi (MAK), for arranging the visit and for their hospitality.

New Palace of Justice (under construction)

Newspaper Coverage

فاز بجائزة المعهد الأمريكي للخرسانة

مبنى كلية الهندسة والبترول في «الشدادية»... الأفضل محلياً

| كتب علي العلاس |

أعلن المعهد الأمريكي للخرسانة – فرع الكويت مساء أول من أمس، عن فوز مبنى كلية الهندسة والبترول الجديد والتابع للبرنامج الإنشائي لجامعة الكويت فرع (علي صباح السالم) في منطقة الشدادية كأفضل مشروع محلي وفقاً للمعايير الخاصة بالتصميم المعماري والإنشائي.

وعرض عضو المعهد عبد العزيز ماموجي خلال الحفل الذي نظمه المعهد تحت رعاية وزير الأشغال وزير الكهرباء والماء والطاقة المتجددة علي الموسى في مركز المؤتمرات بقاعة الهاشمي، المزايا التصميمية للمشروع والمواصفات التي تم تشييده بها والتي أهلته للفوز بالجائزة.

ومنح المعهد، جائزة التصميم والإشراف إلى المكتب الاستشاري العالمي «كامبريج سيفن إنترناشيونال» وجائزة التصميم المتميز للمكتب المحلي دار (مستشارو الخليج) وجائزة المقاول الرئيسي للشركة الصينية «ميتالورجيكال كوربيرت» وجائزة المقاول العام للشركة المحلية خالد علي الخرافي وإخوانه، وأخيراً منح المعهد جائزة المورد المتميز للخرسانة الجاهزة إلى شركة المسيلة الدولية.

الوزير الموسى مُكرماً مدير بلدية الكويت السابق محمد النصار (تصوير اسعد عبدالله)

وحاز مدير بلدية الكويت السابق محمد النصار على جائزة الإنجاز لمساهمته ودوره المؤثر في تحقيق التنمية العمرانية وتطوير أسس البناء والتشييد، حيث تم عرض فيلم وثائقي عن الأعمال التي قام بها خلال فترة توليه منصبه في بلدية الكويت.

من جانبه، شكر مدير فرع المعهد بالكويت الدكتور معتز الهواري الوزير الموسى لرعايته حفل تسليم الجوائز، مبيناً أن الجوائز التي يمنحها المعهد تساهم في تشجيع التطوير التقني ونشر ثقافة المستجدات في عالم تكنولوجيا الخرسانة.

الجريدة. العدد 5045/ الخميس 2 يونيو 2022م / 3 ذو القعدة 1443هـ 5 محليات local@aljarida.com

الموسى يرعى احتفال فوز مبنى «الهندسة» بجائزة التميز

سيد القصاص

برعاية وحضور وزير الأشغال العامة وزير الكهرباء والماء والطاقة المتجددة م. علي الموسى، أعلن المعهد الأميركي للخرسانة- فرع الكويت، فوز مبنى كلية الهندسة والبترول الجديد والتابع للبرنامج الإنشائي لجامعة الكويت (صباح السالم)، بجائزة التميز للعام الحالي كأفضل مبنى.

جاء ذلك خلال حفل جوائز الإنجاز والتميز للعام الحالي، الذي أقامه المعهد، أمس الأول، بمركز مؤتمرات الهاشمي.

ومنح المركز جائزة التصميم والإشراف إلى المكتب الاستشاري العالمي «كامبريج سيفن إنترناشيونال»، وجائزة التصميم المتميز للمكتب المحلي دار مستشارو الخليج، وجائزة المقاول الرئيسي للشركة الصينية «ميتالورجيكال كوربيرت»، وجائزة المقاول العام للشركة المحلية خالد الخرافي وإخوانه، وجائزة المورد المتميز للخرسانة الجاهزة لشركة المسيلة الدولية.

الوزير الموسى يتوسط الفائزين بالجائزة

وقدم المعهد، وللمرة الثانية على التوالي، جائزة الإنجاز لشخصية كويتية يتم اختيارها لمساهمتها لدورها المؤثر في تحقيق التنمية العمرانية وتطوير أسس البناء والتشييد، حيث حصل عليها هذا العام المهندس محمد نصار المدير العام لبلدية الكويت السابق، وتم عرض فيلم وثائقي عن الأعمال التي قام بها خلال فترة توليه منصبه في بلدية الكويت.

وفي كلمته بالحفل، وجَّه مدير فرع المعهد بالكويت د. معتز الهواري، الشكر للوزير الموسى على الرعاية، مضيفا أن هذه الجوائز تمنح من المعهد بالكويت كمنظمة دولية غير ربحية تساهم في تشجيع التطوير التقني ونشر ثقافة المستجدات في عالم تكنولوجيا الخرسانة بمجال التصاميم والإنشاءات.

وأشار الهواري إلى أن فرع المعهد في الكويت يهدف إلى توسيع نطاق التعليم والمعرفة والتدريب التقني والبحوث العلمية في هذا المجال بجهود أعضائه، وتجميع وتبادل المعلومات لخدمة تطوير جودة التشييد الخرساني والتصاميم المستخدمة في المنشآت وصيانة المنتجات الخرسانية للمباني، بجميع أنواعها، في الكويت.

«الشباب» تطلق برنامجاً تأهيلياً للعمل بالصحافة الإلكترونية

يستحدث لهم مساراً وظيفياً في القطاع الإعلامي

أطلقت الهيئة العامة للشباب برنامج «تأهيل الشباب في العمل الصحافي الإلكتروني» بالشراكة مع نقابة الصحافيين الكويتية ضمن مشروع «صناع العمل» الذي يعد أحد برامج السياسة الوطنية للشباب والمدرج في الخطة الإنمائية لدولة الكويت وبرنامج عمل الحكومة.

وقالت المتحدثة الرسمية باسم الهيئة، أسرار الأنصاري، في تصريح صحافي أمس الأول، إن البرنامج يهدف إلى تمكين وتدريب الشباب في العمل الصحافي الشامل وتأهيلهم لاحتياجات سوق العمل والمشاركة الدولية.

وأوضحت أن المشاركين سيحضرون ورش عمل ولقاءات مع الخبراء وأساتذة الإعلام في الصحافة الورقية والإذاعية والتلفزيونية والإلكترونية، وذلك لتمكينهم من الارتقاء بطرح المحتوى الإعلامي الذي يخدم الخطة الوطنية للدولة.

وأضافت أن البرنامج يمثل استحداث مسار وظيفي للشباب الكويتيين في القطاع الإعلامي، ويمكنهم من امتلاك أدواتهم والاستفادة من تقنيات الذكاء الاصطناعي بوسائل الإعلام التقليدية والحديثة في شكل ومحتوى الرسالة الإعلامية المقدمة عبر مواقع الصحف. وذكرت أن البرنامج سيسهل على الشباب استثمار وسائل الإعلام الحديثة للتسويق لمشاريع الدولة التنموية ولصناعة فريق من الشباب يمتهن عمل الإعلام المهني والتفاعلي.

ولفتت الى أن المشاركين سيحصلون بعد تجاوز البرنامج على شهادات معتمدة من النقابة ومن مركز لندن للدراسات والبحوث الاجتماعية ومن جامعة إسطنبول الحكومية وشبكة محرري الشرق الأوسط والاتحاد الدولي للصحافة العربية.

LOCAL ARAB TIMES, SUNDAY, JUNE 5, 2022 5

Top & above: Photos taken during the Kuwait Chapter of American Concrete Institute grand Annual Awards Banquet.

'Opinion' sought from CPA to build new company like KNet

KUWAIT CITY, June 4: According to relevant sources, bank officials decided to refer to the Competition Protection Authority to find out its opinion on the establishment of a new company similar to the automated banking services company "KNet", before contracting with KPMG International, which was appointed as a consultant to prepare the study for the establishment of the target company, reports Al-Rai daily.

They explained that the banking orientation in this regard came after the bank officials participated in a legal executive discussion about whether it is better to refer to the Competition Protection Authority for its opinion regarding advisory expenses for a process not approved by the supervision of the Competition Protection Authority.

The company to be established is expected to include banks and finance companies themselves, in line with eight ambitious sub-projects that will be launched in two phases within the Kuwait National Payments System.

It is noteworthy that the new requirements within the Kuwait National Payments System project require the addition of new activities that are not currently available at KNet. Therefore, it is better to establish a new company, and perhaps companies capable of meeting the accelerating needs, unlike

ACI-Kuwait Chapter holds Annual Awards Banquet

The Kuwait Chapter of American Concrete Institute (ACI-KC) held its grand Annual Awards Banquet on 31st May, 2022 at the Hussain Marafie Ballroom of Radisson Blu Hotel. His Excellency the Minister of Public Works and Minster of Electricity, Water and Renewable Energy, Ali Hussain Al Mousa, attended the event as the Chief Guest.

The awards function is a prestigious annual event during which the Chapter presents two major awards. The Award of Excellence is presented to a deserving project that has been completed in the past two years; and the Award of Achievement recognizes an individual who has had a lifelong contribution towards development in Kuwait.

The evening commenced with an address by ACI-Kuwait Chapter's President, Dr. Moetaz Al Hawari, who outlined the Chapter's activities and achievements over the past 25 years of its existence.

The Chapter's Vice President, Azizz Mamuuji, who conducted the event's proceedings, then gave an interesting presentation on the project that had been selected for the Award of Excellence. The project is the College of Engineering and Petroleum which, with a total built-up area of over 290,000 m², is the largest college in Kuwait University's new Sabah Al Ahmed University City. He highlighted various design factors about this well-planned building complex that accommodates more than 530 sophisticated laboratories, and will serve almost 5500 students.

The award for the Developer of the project, Kuwait University Construction Program (KUCP), and was received by its Director, Dr. Qutaiba Razouqi. On behalf of the Main Contractor, Metallurgical Corporation of China (MCC), the award was collected by Jia Ningchuan, President of MCC Middle East. Fahad Al Kharafi, CEO of Khalid Ali Al Kharafi Co., received the award as MCC's local joint venture contracting firm.

The project's design and supervision consultants were also honoured. Jay Stoughtenger received the award on behalf of Cambridge Seven of USA, the international consultant; and Ubed Arain, CEO and Managing Director, collected it for Dar Gulf Consult, the local consultant. Lutfi Hakim received the award on behalf of Messila International Ready Mix Company, the main concrete supplier.

The Award of Achievement was given to Eng. Mohammed Al Nassar, who has had a 26 year career with Kuwait Municipality, and served as its General Director from 2000 to 2006. In his presentation, Azizz Mamuuji summarized Al Nassar's involvement in formulating Kuwait Municipality policies that influenced urban development in the State of Kuwait.

Top and above: Photos taken during the Kuwait Chapter of American Concrete Institute grand Annual Awards Banquet

About the Chapter

The Board of Directors of ACI - Kuwait Chapter is pleased that members can now look forward to the Chapter's activities and programmes being conducted without the constraint of Covid-related restrictions. While this is so, and as we look forward to new initiatives and events, the Directors want to advise members and their families to continue to be cautious and take the recommended precautions wherever necessary and advisable.

Board of Directors

As Covid-related restrictions impacted the Chapter's activities during 2020 and 2021, it had been agreed that Board Members elected in late 2019 would continue until the Chapter was able to convene its next Annual General Meeting. The Annual General Meeting was conducted on June 12, 2022, and the new Board of Directors, comprising the following elected members, was confirmed for the 2022-2023 term :

President	:	Mr. Azizz Mamuuji
Vice President	:	Mr. Ghassan Al Ghawas
Past President 1	:	Dr. Moetaz El-Hawary
Past President 2	:	Dr. Khaldoun Rahal
Past President 3	:	Dr. Saud Al Otaibi
Director/Secretary	:	Mr. Mansoor Rao
Director/Treasurer	:	Mr. Abdul Wahab Rumani
Director	:	Mr. Hasan Kamal
Director	:	Ms. Dana Drobiova

Chapter Committees

The Chapter's affairs and activities are executed through various Committees :

- Technical Committee
- Membership Committee
- Publication Committee
- Social Committee
- Nomination Committee
- ACI-KC Students ' Committee

Technical Committee

Chairperson : Dr. Moetaz El-Hawary
Roles and Responsibilities :

- Identifying technical topics of interest to Chapter Members and arranging seminars, short courses and workshops on various topics.
- Reviewing and submitting to Chapter Members, ACI International committee reports on subjects of relevance to Kuwait.
- Reviewing proposed revisions of ACI Standards and submitting comments to Chapter's Board of Directors for submission to ACI International.
- Serving objectives of the Chapter by organizing training courses and technical workshops.
- Promoting local research and testing programs to resolve technical issues of importance for durable concrete construction in Kuwait.

Students' Committee

Chairperson : Dr. Moetaz El-Hawary
Roles and Responsibilities :

- Activities are generally in line with ACI-Kuwait Chapter objectives.
- Encouraging student participation in all activities of ACI-Kuwait Chapter.
- Student participation guided and organized by an elected Board of Directors, and sub-committees appointed from within their membership.
- Activities include technical and social events, and further information can be found on www.ACIQ8.com.

Membership Committee

Chairperson : Mr. Mansoor Rao
Roles and Responsibilities :

- Recruiting new individual members and organizations.
- Issuing and renewing membership identity cards.
- Publishing and updating Chapter's membership directory.
- Facilitating interaction amongst members and communicating their concerns to the Board of Directors and other Committees.

Social Committee

Chairperson : Ms. Dana Drobiova
Roles and Responsibilities :

- Organizing major annual Chapter events and programs for members.
- Organizing field trips to major construction projects and industries.
- Arranging participation of the Chapter in selected national events.

Publication Committee

Chairperson : Mr. Azizz Mamuuji
Roles and Responsibilities :

- Publishing periodic newsletters covering the Chapter's activities and providing general information of use to Chapter members.
- Printing and distributing copies of technical reports to Chapter members, as well as to interested individuals and concerned organizations.
- Preparing reports and Chapter news for publication in ACI's Concrete International magazine.

Nomination Committee

Chairperson : Dr. Moetaz El-Hawary
Roles and Responsibilities :

- Nominating individuals who have the interest, leadership qualities and willingness to serve the Chapter, for selection to the Board of Directors.
- Submits names, prior to the Chapter's Annual General Assembly, for election by members.

Sponsors

ACI-KC appreciate the support of various Consultants and Companies in Kuwait.

Ministry of Public Works

Ministry of Defence

GULF INSPECTION INTL.

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