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AAAEA NEWSLETTER

Volume 7, Issue 2
May 2006

In This Issue ...

President's Message

Abder R. Ghouleh, PE

Greetings members,

In this edition, I am writing my last column as President of this great organization. Though some dips along the way, the AAAEA is on a steady climb to more effectiveness, expansion and professional stature. It was amazing to see so many good people help in the success of the Association. My heartfelt thanks to everyone who contributed.

A look back on the past and then a quick look to the future:

Education: After participating in the 2005 PE/EIT review classes under PESO, we decided to undertake in again running our own EIT Review program in 2006. Interest in these classes by our membership exceeded our original expectations. Held at UIC from January to April, we had 16 students participate in the 13 week long session. It should be noted that many non-Arabs attended these classes.

A Technical Seminar by Dr. Maher Abu-Mallouh was held in February 2005 and a Field Trip to Argonne National Lab was done in April 2005. A Technical Seminar Day was held at UIC in November 2005, with Dr. Abu-Mallouh, Dr. Soliman Khudeira and Shaker Asfour making presentations.

A Seminar on Renewable Energy by Dr. Said Al-Hallaj and a tour of the IIT Energy Lab was held in April 2006. The 2006 Technical Conference with expert presentations in different fields of engineering was held in May 2006 at the IIT Rice Campus in Wheaton. I am pleased to say that all the conferences/seminars were well received and well attended.

Giving back to the community and helping out the next generation was shown in the Math Tutoring for our grade school and high school students. A great thanks to our Math tutoring volunteers for their commitment to the children of our community. Also, AAAEA volunteers were mentors in the WYSE programs and we again ran an ACT Review Program for high school juniors. I cannot say enough about all the volunteers' dedicated service to the AAAEA and the kids of the community.

Activities: After having the esteemed Illinois Secretary of Transportation Timothy Martin as our Keynote Speaker at the 2004 Semi-Annual Meeting, we were fortunate to have Motorola Vice-President Amer Husaini as our 2005 Keynote Speaker. He gave a great speech on challenging oneself in their engineering career, and discussed some of the latest technology breakthroughs in communication and the business at Motorola.

The Family Bowling event held this January was very successful with its biggest attendance ever, and even with reserving additional lanes, it was still sold out early. Its good to have an indoor social activity during the winter months for the

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UPCOMING EVENT

Elections

Date: May 20, 2006

Time: 11:00AM – 2:20PM

Place: UIC, ERF Room 1047
842 W. Taylor Street • Chicago, Illinois

Cost: None

Notes: The election committee strongly recommends that those members who did not renew their membership to please do so. Membership needs to be renewed in order to participate in the elections.

For more information please visit *www.aaaea.org*

EDITOR'S NOTE

I would like to thank all members for their contributions to the Newsletter, especially Dr. Soliman Kuhdeira, Dr. Ihab Darwish, and Dr. Hiba Abdalla for their technical articles.

We are always in need of articles for the Newsletter, so we strongly encourage you to send in material to us.

Thank you,

Ibrahim Shillo
Publication Comitee
aaaea@aaaea.org

COMING THIS SUMMER!

CAUCUS GOLF OUTING

CALENDAR OF EVENTS

May 2006

May 20
Elections

June 2006

June 18
AAAEA Picnic #1
Labaugh Woods, Chicago

June 28
Technical Seminar on
"Movable Bridges" at UIC

July 2006

Date TBA
AAAEA Picnic #2

Date TBA
Career Workshop

August 2006

August 20
AAAEA Picnic #3
Centennial Park, Tinley Park

whole family to enjoy. And with this family activity getting more popular every year, we may have to reserve the whole alley next year!

During the summer months, we held family picnics at various locations. With picnics held north, west and south in different months, it made it very convenient for all members to attend at least one picnic. They were all very well attended, with great food and fun activities for young and old.

An Engineers Networking Evening was held last year, which gave new members a chance to interact. The Women Engineers Group, headed by Dr. Hiba Abdalla, has had two networking meetings so far.

The Annual Dinner Social, or "Hafleh", was held in the spring at the Oak Brook Drury Lane. Enjoyed by all who attended, this year's event was sold out. It included some different activities, such as cultural information and a debke troupe.

We hope all had the opportunity to enjoy these activities.

Membership: With the membership closing in on 300, there was a 40% increase in the last year. We have over 30 new members in 2006 alone. Another positive is that we now have over 40 student members. A new members directory was published and sent to all active members.

Publication: Four newsletters in the past year, each one having more material and a better, more modern layout than the one before. A new brochure is a work currently in progress.

Website: Every month, the website has improved under the guidance of IT Officer Mohammad Kleit, and has many new features. One of which is that members can now post their resumes on the website at no cost. There is now a History page, links to the other engineering groups, a Business Directory and the AAAEA Forum. The Forum is another way to increase communication between members. I encourage everyone to register as a Forum member and to visit and participate as needed. The website has brought us many members, and interest from Arab engineers throughout the world.

Communication: There has been an increase in communication between the AAAEA and its membership. In addition to the newsletter, mailings and the website, the amount of emails generated and sent to members has dramatically increased, so that you will always have the latest in engineering & community news and current job announcements.

Career Enhancement: Every few months, career workshops were held at GM Sadat's office. Those looking for employment, were helped with resumes, cover letters, job search and interview advice. Resume editing was done throughout the year.

Financial: With the increase in membership and the generosity of our sponsors, the AAAEA continues to be in its best financial shape ever.

Scholarship: Two $1,000 scholarships were awarded to student members in 2005.

Outreach: I established this new committee to deal with the increased interest in the AAAEA from Arab American engineers in other states and to assist them in forming their own similar engineering association. There were 2 trips each to Texas, Michigan and Wisconsin. With our assistance in the last year, Arab American engineering associations have been established in these three states. There is future interest in other states, such as Ohio, Florida and Louisiana. It should be noted that on February 4, 2006, we had different AAAEA representatives meeting with Arab engineer groups in Houston, Milwaukee and Boston.

Business: A Business Owner's Networking Meeting was held in January 2006 with 20 of our 30 Business members in attendance. Another Networking Meeting is planned for later this year.

Professional Caucus: The Professional Networking Reception was held in March at the Chicago Athletic Club. In addition to this annual spring reception, we continue to work with our caucus partners: the doctors, lawyers, businessmen and other professionals, to establish more shared events similar to the joint picnic last summer. In the works are a Caucus Golf Outing, another joint picnic, and possibly a huge dinner reception for all professionals in the fall.

Office: We completed the transition to a new mailing address and phone number, have established a shared working office and shared office assistant with Professional Caucus partners NAAMA and ABAR.

Professional engineering societies: Our participation has increased in the Illinois Engineering Council and Chicago Engineers Week. We have two AAAEA members on the IEC board, Dr. Soliman Khudeira and Moosa Matariyeh.

The upcoming year and the board will continue all the standard activities and I'm sure will think of some new ones. It should be noted that there will be new younger engineers in the future leadership of the AAAEA. A good mix of experience and young energy should make for a good year. My recommendations are to continue working with the university engineering students and continue the progress of establishing student chapters. Also to keep up the momentum on all committees and their activities.

In closing, my sincere thanks to all my Committee Chairpersons and Board Officers for their service and dedication to the Association, and to our Board of Trustees for their guidance and advisement. I will remain involved and participate on different committees. So good luck to the incoming board and I hope all members join me in offering them a helping hand whenever needed. Volunteering to further the Association will result in a stronger AAAEA, which will heighten the profile of all of us as Arab American engineers.

AAAEA Outreach to Wisconsin

On Saturday, February 4, 2006, President Abder R. Ghouleh, Outreach Chairman Mustafa Mahamid and Trustees John Dasoqi & Bilal Almasri were invited to attend the WAAEA's First General Meeting held in Milwaukee, Wisconsin. After WAAEA Steering Committee Chairman Aziz Aleiow gave an introduction of the new organization for the benefit of the new people in attendance, the AAAEA "Outreach" powerpoint presentation followed, with Abder and team stressing the successes and challenges that the AAAEA has had the last 9 years. A question & answer and open discussion session followed, with the meeting concluding with a social hour.

The meeting was well attended, with over 25 engineers, and the presentation was well received and stimulated much interest in the potential for the new organization in Wisconsin. The AAAEA thanks Aziz Aleiow and the Wisconsin AAEA Steering Committee for the invitation and the opportunity to make the presentation and to meet its members. We congratulate them on the work that has been done up to this point: registering the organization, establishing a PO Box, and creating a website: **www.waaea.org**. Also, thanks to Dr. Wessam Daoud, WAAEA Secretary, for his coordinating and communicating efforts between our two groups.

Announcing AAEAA (Texas) Logo Design Competition

You are invited to participate in this competition for the design of a new Logo for the Association. This logo is envisioned to encompass the following guidelines & criteria, and is one that:

- Embraces the true meaning/spirit/mission of the engineering profession
- Fosters the integrity of its fellowship
- Symbolizes the importance of education; and Promotes public safety/welfare
- Portrays timelessness (not bounded by time or era); and Exhibits simplicity and uniqueness
- Does not portray or foster a religious, national, sectarian or cultural affiliation or inclination
- Reflects our Arab heritage, American nationality and Texas residency.

All received designs will be submitted to the board members for their vote. Designs must be submitted in electronic format (JPEG, GIF, Image) for ease of distribution. The winner(s) will be awarded a $25 gift certificate each, and will receive mention on our Association's web page.

Submit your logo design as soon as possible.
Design away and have fun doing it!
Good luck to all.

Hosam Salman, P.E. • AAEAA-TX, President
www.AAEAA-tx.org • Email: info@aaeaa-tx.org

Roadway Planning and Design Topics – Part IV:
Environmental Assessment and Project Scope

by Dr. Soliman Khudeira, SE, PE

This is the fourth article in a series of articles to follow that discuss various roadway planning and design topics. Each topic is discussed in limited detail and illustrated, as applicable, by citing a typical roadway project. Part I of this series discussed roadway classifications, Part II discussed Needs Analysis, and Part III discussed Value Engineering. Part IV discusses Environmental Assessment Methodology and Project Scope. Other topics that will be discussed in future issues include: Project Phases and Durations, Context Sensitive Design, Stakeholders Participation, Project Funding Sources, Right-Of-Way (ROW) Acquisition Process, Cost Methodologies, and Maintenance of Roadway Elements.

ENVIRONMENTAL ASSESSMENT METHODOLOGY

The type of environmental assessment document varies depending on the project. In order to incorporate environmental considerations into decision making process, it is necessary to develop a complete understanding of the consequences of a proposed action. This section defines the terminology used for environmental assessment of roadway projects. **Exhibit 1** outlines the required environmental process for a typical roadway project.

Categorical exclusion

Categorical Exclusion (CE) is an action that does not individually or cumulatively have a significant impact on the human environment. This Categorical Exclusion does not require an Environmental Assessment or an Environmental Impact Statement. A project is classified "Categorical Exclusion" if the project elements do not individually or cumulatively have significant effect on the environment and for which, therefore, neither an Environmental Assessment (EA) nor an Environmental Impact Statement (EIS) is required. For a project to qualify as Categorical Exclusion, the project should not include the following: 1) significant impacts on the environment, 2) substantial controversy on environmental grounds, 3) significant impacts on properties protected by section 4(f), and 4) Inconsistencies with any federal, state or local law or administrative determination relating to the environment. Section 4(f) is applicable to the following lands: 1) publicly owned parks, 2) recreational areas, 3) wildlife and waterfowl, or 4) any historic site in or eligible for the National Register Historic Places.

Environmental assessment (EA)

An interim decision document prepared for an action where the significance of social, economic, or environmental impact is not clearly established. If the action is determined to have significant impact, an Environmental Impact Statement is then prepared. If no significant impact, a finding of no significant impact (FONSI) is prepared.

Environmental impact statement (EIS)

EIS is a document, required under the National Environmental Policy Act, prepared for an action that is likely to have significant impact. This document summarizes the major environmental impacts, outlines issues, examines reasonable alternatives, and arrives at a record of decision (ROD), identifying the selected alternatives for the project. The ROD also documents the method of mitigation adapted for the selected alternative choice.

PROJECT SCOPE OF WORK

The project scope of work will reflect the basic intent of the project and will determine the overall level of roadway improvement. This decision, in combination with the highway functional classification, will determine the project scope of work.

Types of roadway improvement

The type of roadway improvement is determined based on the available budget, the condition of the roadway, and current & future traffic demands. The current and future average daily traffic (ADT) normally plays a major role in defining the project scope. The ADT is defined as the total traffic volume during a given period (in whole days), greater then one day and less than one year, divided by the number of days in that time period. The ADT volume is important as justification for the proposed

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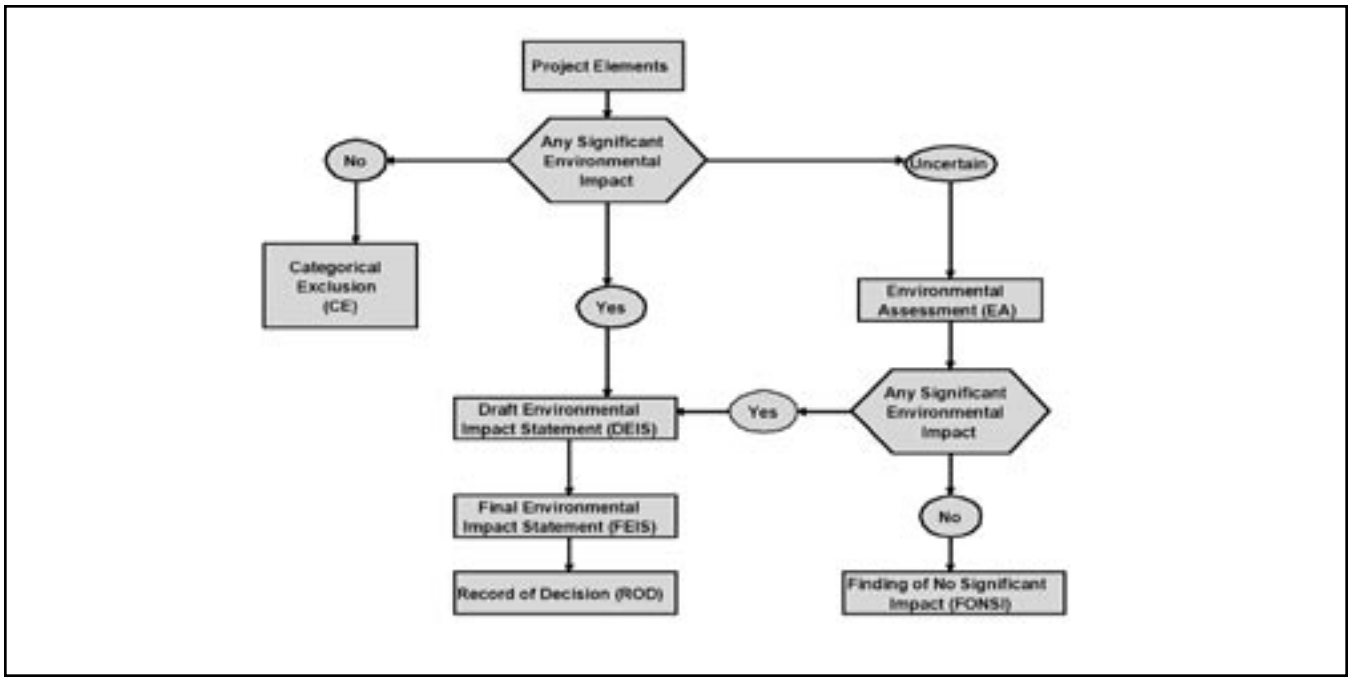


Exhibit 1. Project Environmental Process

expenditure and deciding on the type of the project. This section outlines the three types of roadway improvements: 1) new construction, 2) reconstruction, or 3) rehabilitation, restoration, and resurfacing (3R) projects.

1. New construction

Generally, new construction is defined as horizontal and vertical alignment on new location. The development is based on at least 20-year design period. Typically, the project will have a significant length and will connect major roadways. The common pavement materials used in the US is concrete and/or asphalt. The usage of either material is dependant on various factors including: budget, climate, desired noise levels, sub-grade conditions, etc.

2. Reconstruction

Reconstruction of an existing roadway will typically include the addition of travel lanes and/or reconstruction of the existing horizontal and vertical alignment, widening of the roadway, and flattening side slopes, but the roadway will remain essentially within the existing roadway corridor. These projects will require some right-of-way acquisitions. The primary reason for the reconstruction of an existing roadway is because the facility cannot accommodate its current or future traffic demands, because the existing alignment or cross section is significantly deficient, and/or because the service life of the pavement has been exceeded. In addition, any intersection which falls within the limits of a reconstruction project will be reconstructed as needed. The development is also on 20-year design period, however some existing cross section elements may be allowed to remain in place.

3. Rehabilitation, Restoration, and Resurfacing (3R) Projects

Since available funds do not always permit the total reconstruction of a roadway, the Federal-aid Highway Act of 1976 amended the term "construction" to permit Federal-aid funding of resurfacing and widening & resurfacing of existing rural and urban pavements with or without revision of horizontal or vertical alignment or other geometric features. The 1982 Surface Transportation Assistant Act stipulated that 3R projects be constructed to standards to preserve and extend the service life of the roadways and enhance safety.

Widening projects, resurfacing projects, and 3R projects are considered "simple projects". The basic purposes of 3R construction projects are to preserve and extend the service life of existing highways and streets and to enhance safety. Because of limited resources, individual rehabilitation projects may have to be limited in scope in an effort to preserve the

mobility function of the entire highway system. The scope of 3R projects varies from thin overlays and minor safety upgrading to more complete rehabilitation. 3R projects differ from reconstruction projects in that reconstruction projects substantially deviate from the existing horizontal and/or vertical alignment and/or add capacity.

a. Project evaluation – For a project to qualify as a 3R project, a detailed evaluation needs to be conducted to assess the appropriateness of the project. The evaluation should include: field review and documentation of existing geometrics, obtain accident data, assess the pavement conditions, geometric design of the adjacent roadways, physical constraints, and bridges and other structures within project limits.

b. Design guidelines – Design guidelines for 3R projects have been developed to allow greater design flexibility. The guidelines offer sufficient flexibility to ensure cost effective design and further compliance with the program goals of preserving and extending the service life and enhancing safety. While safety may not be the primary reason for initiating a 3R project, roadway safety is an essential element of all projects. The 3R projects are to be developed in a manner which identifies and incorporates appropriate safety enhancements.

Typical design guidelines for a 3R projects include criteria for: Pavement design, Geometric design, design speed, lane width, safety criteria, etc. A sample design criteria for a typical 3R project is presented in **Exhibit 2**.

SAMPLE DESIGN GUIDELINES FOR RURAL TWO-LANE ROADWAY			
Design Element	**Current Average Daily Traffic (ADT)**		
	0-400	**400-1500**	**1500 or more**
Design Speed	30 mph	30 mph	40 mph
Shoulder Width	0 ft	1 ft	3 ft
Lane Width	10 ft	11 ft	11 ft
Surfaced Roadway	20 ft	24 ft	28 ft
Turn Lane Width	10 ft	10 ft	10 ft
Horizontal Clearance	7 ft	7 ft	16 ft
Bridges: Width to be retained	20 ft	24 ft	24 ft

Exhibit 2. Sample Design Criteria for a Typical 3R Project

News From Detroit

Dear fellow professionals, members and friends,

We are very pleased to announce that last night, our Michigan association had its first official elections. We started with a short meeting where we updated everyone on the status of our communications with Chicago, Texas, Louisiana, and Wisconsin chapters. We also went over our visit to Nablus and Chicago in December.

With more than 60 professionals attending, candidates introduced themselves, ballots where collected, validated, counted and presented to the floor. We are also extremely excited to announce that 95 members had fully joined. The voting results and other info are posted on our website: http://www.aaeausa.com/

We would like to thank all of you for your support, hard work and all the nominees for participating. We are looking forward to an exciting 2006 year.

Sermed K. Saif, PE - President
Arab American Engineers & Architects Association (AAEA)
www.aaeausa.com

Michigan Election Results, January 25, 2006

Arab American Engineers and Architects Association (AAEA)

2006 Elected Executive Board
President: Sermed Saif
Vice President: John Saad
Treasurer: Mahmoud El-Gamal
Secretary: Mustapha Hamood

Board of Directors
Awni Qaqish
Ghassan Abdelnour
Khalil Atasi
Lami Taweel
Nafa Khalaf

AAAEA Outreach to Michigan

On Friday, May 6, 2006, President Abder R.Ghouleh and Trustee Bilal Almasri were invited to attend the AAEA General Meeting held in Dearborn, Michigan. The AAAEA "Outreach" powerpoint presentation was given to the Michigan engineers to give them an idea of the programs and activities that the AAAEA conducts. A question and answer/discussion period followed.

The meeting was well attended, with about 45 members. The AAAEA thanks President Sermed Saif and the AAEA Board in Michigan for the invitation and the opportunity to make the presentation and to meet its members.

May 6, 2006

News from Houston

AAAEA Outreach to Texas

On February 4, 2006, Board of Trustees Chairman Dr. Soliman Khudeira and Membership Chair Suha Saber met with the Texas Arab engineers (AAEAA) in Houston, Texas. The meeting was well attended and Dr. Khudeira made the AAAEA's "Outreach" powerpoint presentation, which describes our Association and is a primer on how to establish a similar engineering association. The discussion that followed the presentation was an important step in forming AAEAA-Texas. We thank Soliman and Suha for taking the time to meet and encourage our colleagues in Texas.

Houston Election

The results of the AAEAA-Texas elections held on March 18, 2006 in Houston Texas:

President: Hosam Salman
Vice President: Ahmad Boorenie
Treasurer: Ayman Shannak
Secretary: Reem Hashem
Student Rep.: Nizar Aouni
Membership Committee: Ihab El-Okda
Financial Committee: Ahmad Sayah
Education Committee: Ahmed Abu-Shaaban
Activity Committee: Rowaidah Ayoub

Letter from Texas:

Dear Dr. Khudeira,

We would like to take this opportunity to express our heartfelt thanks to you and your colleagues in Chicago office for your very active participation in our recent event on February 4, 2006, in Houston, Texas. Your presentation encourages and motivates our members to build a strong association for our Arab engineers and architects here in the state of Texas. With more than 50 participants attending this event, we all enjoyed your exceptional and inspiring presentation and your energizing personality.

We would like also to express our great thanks to Abder Rahman Ghouleh, the President of Arab American Engineers and Architects (AAAEA) in Chicago for his long time support and contribution..... We want to thank you again for your time and your presentation. Looking forward to see you again in our future events.

AAEAA-Texas website:
www.aaeaa-tx.org

February 4, 2006

Annual Hafleh – March 18, 2006

President Abder R. Ghouleh

Honoree Issam Rayyan (right)

Master of Ceremonies Moosa Matariyeh

Presentation on Khalil Jibran by Rana Kazkaz

Presentation on Turath by Dr. Aiman Tulaimat

Honoree Shaker Asfour (right)

Annual Hafleh – March 18, 2006

St. Mary's Dabkeh Squad

St. Mary's Dabkeh Squad

St. Mary's Dabkeh Squad

Thank You Concordia Wireless & Terra Engineering for sponsoring the Dabkeh entertainment

St. Mary's Dabkeh Squad

Jamal Grainawi, Abder R. Ghouleh, Ibrahim Shillo

VP Jamal Grainawi presents a raffle prize to Raghad Dahhan

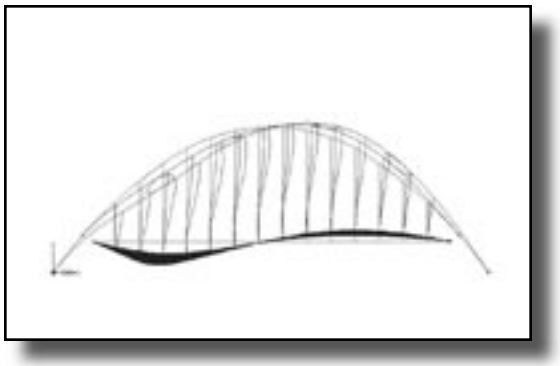
Detroit Gateway Bridges

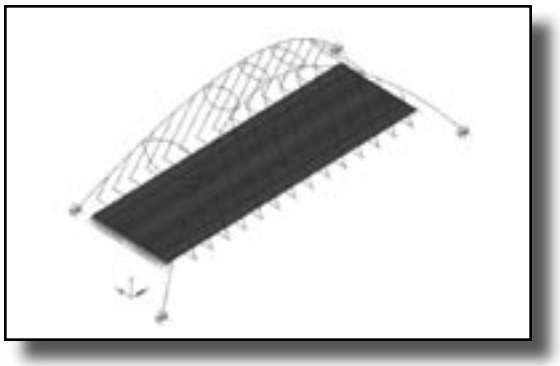
contributed by Ihab Darwish, Ph.D., P.E., S.E. & Hiba Abdalla, Ph.D.

Alfred Benesch & Co. is responsible for the design of the new Detroit Gateway Arch Bridge on Interstate 94 over Telegraph Road. The bridge welcomes visitors as they arrive at Detroit's International Airport, and its unique design is visible from the air as well as from ground as commuters travel above, through, or underneath these magnificent twin bridges.

Telegraph Road twin arch bridges are part of a $55-million project to improve I-94 between Detroit airport and downtown Detroit. The bridges carry westbound and southbound I-94 traffic over a new reconstructed interchange at Telegraph Road. The interchange is a Single Point Urban Design (SPUD) which limits the needed Right-of-Way (ROW) to minimum. The SPUD requires the bridge to be a single span. The existing bridge is a four span structure. A typical conventional single span structure (i.e. plate girder, bulb tee, etc.), requires a minimum superstructure depth of 8', which reduces the minimum underclearance required under the bridge. One of the project requirements is to maintain the 14'-9" existing clearance under the bridge. If a conventional bridge is to be designed, I-94 profile would need to be raised in order to maintain the required clearance. To avoid this raise, to maintain a clear sight distance, and to improve aesthetics at the interchange, an arch bridge is proposed. The superstructure depth of the arch is 5', which increases the vertical clearance under the bridge.

The structure is a single span inclined through arch. The interior and exterior arch ribs are inclined 25 degrees towards each other. The inclination is limited to 25 degrees in order to maintain the desirable vertical clearance. The ribs are braced together using five football shape braces. The bases of the exterior arch ribs are located at Telegraph Road, while the bases of the interior arch ribs are located at I-94 level. This caused the length of the exterior rib and the interior rib to be different. The length of the exterior and interior arch ribs is 296' and 257', respectively. The span length measured between the east and west abutments are 246'. In order to restrain the bases of the arch ribs, several options were investigated. The options investigated included tied arch bridge, and true arch bridge with hinged base, and a true arch bridge with fixed base. Since the two bridges will carry traffic over a major roadway, a non-redundant tied arch option was excluded for safety concerns. Also, a true arch bridge with a hinged base was then excluded to avoid maintenance of the arch base hinges and to reduce the size of the arch ribs. A true arch with a fixed base was then selected as the preferred option. For a true arch bridge, the arch foundation and the soil would have to resist a large permanent longitudinal thrust force. The soil profile at the bridge site consists of medium to soft clay. This type of soil will creep under the arch longitudinal thrust force, and considerable time-dependant foundation movement is expected. Considerable foundation movement will affect the bridge profile, and may cause cracks in the bridge deck. Therefore, it was decided to design a foundation system that is independent of the soil. The arch ribs are restrained longitudinally by a reinforced concrete foundation ties that are located 4 feet below Telegraph Road roadway. The interior arch ribs for both eastbound and westbound bridges share the same interior longitudinal foundation tie. The interior longitudinal foundation tie measured 14'-10" by 3'-2" and reinforced with 102 # 9 bars. The tie is 232 feet long. The exterior arch ribs are restrained longitudinally by a 7'-4" by 3'-2' foundation tie which is reinforced with 52 # 9 bars, and transversely by 8'-6" by 1'-4" foundation tie which is reinforced with 24 # 9 bars. The exterior longitudinal tie is 289' long. The transverse foundation tie is 11'-6" long and ties the exterior arch rib foundations to the abutment foundation. For redundancy, several piles under the arch rib foundations are battered to resist a portion of the arch thrust. The ties are designed to resist the total arch thrust force, ignoring the contribution of the batter piles, while maintaining tensile stresses below the concrete cracking stress. Also, the steel reinforcement in the ties are designed to resist the total arch thrust force, while maintaining a maximum tensile stresses in the reinforcement of 24 ksi. The frictional resistance to the arch thrust between





the foundation tie and the soil is also ignored in the design, which increases the redundancy of the foundation system.

In order to reduce the size of the arch ribs, the shape of the arch is optimized to produce axial stresses in the rib with a minimum moment for dead load. The dead load produces mainly axial stress and most of the bending stress comes from live load acting over a part of the span.

An arch has a tendency to buckle in the plane of the arch due to the axial compression. This in-plane buckling is usually greater than lateral buckling since the arch is braced. This effect is more common on long span arches. For this arch, there was no buckling issue due to the short span of the arch. The arch ribs are 3' x 4' box-section. The webs are ¾" thick. The flanges for the exterior ribs are 2 ½" thick, while the flanges for the interior arch ribs are 2 ¼" thick. Due to the small size of the arch ribs, future inspection and maintenance of the inside portion of the box will be difficult. Therefore, the arch ribs are pressurized with air to prevent any moisture inside the arch ribs, and therefore, prevent corrosion.

The framing of the bridge deck is a series of floor beams, stingers and stiffening girders. The transverse floor beams support a 9" thick concrete deck, which in turn is supported by hangers. The longitudinal stringers and stiffening girders reduce the deck deflection due to live load. The stiffening girders also distribute the live load between the adjacent hangers. This resulted in lighter hangers. The hanger assembly has two strands per assembly. Each strand is 2 1/8" diameter, ASTM 586 structural strand. The inner wire is galvanized with Class A coating, while the outer wires are galvanized with class C coating. In the event of loosing one strand per assembly, each strand within the assembly is designed to carry the total load of the adjacent failed strand with an impact factor of 2. To reduce the possibility of wake galloping for the hangers, one separator, which connects the two strands together, is added. The transverse beams are haunched I-beams with portions of the beam extend outside the deck. These portions are boxed using two additional outer webs and then pressurized with air. The boxed-sections of the beams improve aesthetics and increase the torsional resistance of the beams in case one strand within the hanger assembly is lost or replaced.

The geometry of the two bridges necessitated a detailed structural analyses scheme to investigate their behavior under different loading conditions.

continued on next page

LUSAS software was employed for this task and was vital in determining the final profile of the arch ribs. Thick beam elements were used for meshing the ribs, top bracing, hangers, and floor framing system, while thin shell elements were used for discretizing the concrete deck slab. This three-dimensional model enabled the observation of the global behavior of the bridge as well as the behavior of its structural components.

The arch ribs were optimized for minimum bending stresses under dead loads. Starting from a basic circular profile with constant radius, the bridge was analyzed under dead loads, and the profile radius was varied and re-analyzed until bending stresses were observed to attain a practical minimum. The resulting profile is an arch with a higher rise and two different radii, one for the crown segment and the other for the two landing segments. The optimization phase was greatly enhanced by the software's graphic capabilities for result processing and the ease of manipulating the geometrical outline of the structure.

When the final geometry was decided, extensive analyses were performed to examine the performance under live, wind, and temperature loads, and all combinations thereof. Due to the unusual geometry of these bridges, live load effects at numerous locations along the arch ribs, transverse girders and longitudinal girders, had to be determined. Graphic animation of the bridge displacements under moving live loads gave a better understanding how the different components work integrally to sustain traffic loads. Buckling analyses were also performed to determine load factors.

Since structural strands are used for hangers, it was crucial to determine with great accuracy the force levels within each hanger during and after construction. Analyses were performed to examine hanger forces under dead loads, and to finally determine the necessary stressing forces to be applied in order to maintain the bridge at its proposed profile grade. This technique has proven to be useful in predicting and accounting for displacements occurring during construction.

Welcome New AAAEA Members

Amal Elatia	**Mahmoud Hasan**	**Dania Shaar**
Hayat Chaouki	**Amer Mustafa**	**Hussien Albakhit**
Hassenin Raafat	**Mohammed Khattab**	**Rami Sabbah**
Feras Abunamous	**Reza Faramarzi**	**Ghaith Assaf**
Jamal Ismail	**Tariq Sinokrot**	**Rachid Amine**
Hatem Sahouri	**Jafar Ahmad**	**Aiman Shibli**
Mohammad Hamoudeh	**Mustafa Alshaikh**	**Ahmad Arshan Khan**
Hussain Mesyef	**Samir Maaninou**	**Muhammad Siddiqui**
Said Al-Hallaj	**Jafar Al-Shraideh**	**Nabeel Aldrees**
Iyad Khanji	**Abed Hamdan**	**Muna Adhamy**

AAAEA Forum Users Guidelines

Contributed by Mohammad Kleit, IT Officer

Participation in the AAAEA Forums constitutes agreement to the following guidelines, which apply to posts, private messages, profile information, avatars, signatures and any other content on this site. These guidelines are subject to change at any time.

If you believe that someone has violated our User Guidelines, please send a private message to me or a staff member with a link to the post and a brief description of what you believe is wrong. Notification is voluntary and anonymous, but in no case should a user respond to a situation personally, thereby aggravating the situation further. Responding to a violation in an inflammatory manner is a violation in itself and will result in you being in as much trouble as the original violator.

Any post that violates our User Guidelines will be removed.

1. Political and religious posts and/or discussions are not allowed on this website. If it is believed that the end result of a discussion will be political or religious, the post may be removed. Likewise, strong political and religious sentiments should be kept out of profiles, signatures and other content. This will be at the discretion of the AAAEA Executive Board.

2. Vulgar language and inappropriate material is not allowed and will be removed. Abbreviations and attempts to circumvent the word censoring feature of the forum software also violate this guideline. If your post contains a word that is censored by the software, you must remove that word or the post will be removed. If you feel that the censor is acting in error, please contact us.

3. Cross posting is not allowed and will result in the removal of one or more posts. Cross posting is defined as posting the same information in two or more forums.

4. Advertisements are not allowed. Advertisements are posts made specifically for the promotion of a website, product or service. You may only post a link to your site/a site that you are in some way affiliated with if the link specifically answers the question that is being asked and the answer cannot be simply posted without the link or is not greatly enhanced by the link.

5. You are not allowed to post an affiliate URL that leads to you earning cash, banner impressions, click-thrus, etc.

6. When linking to other websites, you must ensure that the content of the link is appropriate for our community and in line with the guidelines laid out here. If you post a link and that link is automatically censored, it is considered to be an inappropriate link and you should remove it from your post immediately. If left, all posts that feature inappropriate links will be removed.

7. Do not post copyrighted materials that you do not have permission to reproduce. For text articles, most of the time you may quote small bits and pieces of the article and link to or provide the source. Posting the entire article, even with the source, constitutes copyright infringement.

8. You must respect your fellow members. Please refrain from inflammatory/unnecessary comments as well as flaming, taunting and general disrespect. Do not simply put down the opinion or advice given by others. If you don't agree with it, say why - respectfully. Don't just tell them they're wrong. Do not make uninvited remarks about typos, duplicate posts, posting styles, etc.

9. Signatures are limited to 5 lines of text. This includes blank lines. No images. The text in the signature may be customized by the BBCode in use on the forums. It is recommended that you stick with readable fonts and colors and that the size is not too large.

10. Each user is allowed to create posts and send private messages from one username. Doing so from more than one username is not allowed.

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11. You may request an item to be removed at any time, but we will decide when and if to remove content from our community. If you wish to no longer be identified with our community, let us know and we will close your account and alter your account information to remove all identifying characteristics, including your profile, signature and username.

12. Moderators and the administrator have the final say on anything. If you have a problem, you may send a complaint to them directly and not publicly on the forum. Creating threads to question administrative decisions, such as thread removals and closures, is not permitted.

If a user continually breaks the guidelines, they run the risk of losing their account at the AAAEA Forums. We reserve the right to deactivate any account and to edit or remove any content without warning.

If you ever need clarification on any part of our User Guidelines or have a question, suggestion, a bit of feedback or a problem with the site, please feel free to contact me aaaea@aaaea.org. Please do not post it in the forums.

AAAEA Sponsored Junior High and High School Educational Programs

ACT Review Class

This year the ACT review class started on March 18, 2006 and will continue on until May 27, 2006. Classes were held at Universal School which is located at 7350 W 93rd St., Bridgeview, Illinois. The four ACT topics, Mathematics, Science, English and Reading, were reviewed and studied. Also included were sample tests.

This year, we had 31 students that enrolled in the review class. We would like to wish our students the best of luck and thank our volunteers for all of their help.

The program was organized by AAAEA Membership Chair Suha Saber. Volunteers included Ms. Abdullah of the Universal School, Dr. Saber, Peggy Kazkaz, Rana Saber, and AAAEA members Ghaffar Kazkaz, Bilal Almasri and Abder R. Ghouleh.

WYSE Competition

This email from the Universal School:

"...our WYSE team scored very good in the regional competition. Without your effort we wouldn't be able to make it. We hope that we will score better in the sectional in order to make it to state finals."

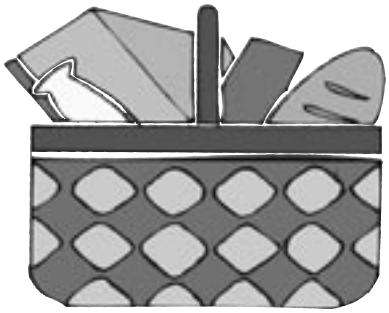
Thanks to AAAEA members Soliman Khudeira, Maher Abu-Mallouh, Ghaffar Kazkaz, Mohammed Rashed, Bilal Almasri and Ahmad Hammad for mentoring the student team.

Math Tutoring

The AAAEA conducted another year of tutoring local junior high and high school students in algebra, geometry and pre-calculus. Thanks to AAAEA volunteers Ahmad Hammad, Bilal Almasri, Ghaffar Kazkaz, Maher Abu-Mallouh, Shaker Asfour and Basman Dahleh.

AAAEA 2006 Picnic #1 – Come Rain or Shine!

Saturday, June 18, 2006 • 10:00 am–Dusk
Labagh Woods, Grove #1
Cicero Avenue just north of Foster Avenue • Chicago, Illinois



- Bring your food, drinks, and lawn chairs!
- A limited amount of grilled hamburgers and chicken will be provided by the AAAEA, and will be served between 12:30 and 1:30 pm.
- You can use the AAAEA grill to BBQ your own food.

EIT Review Classes

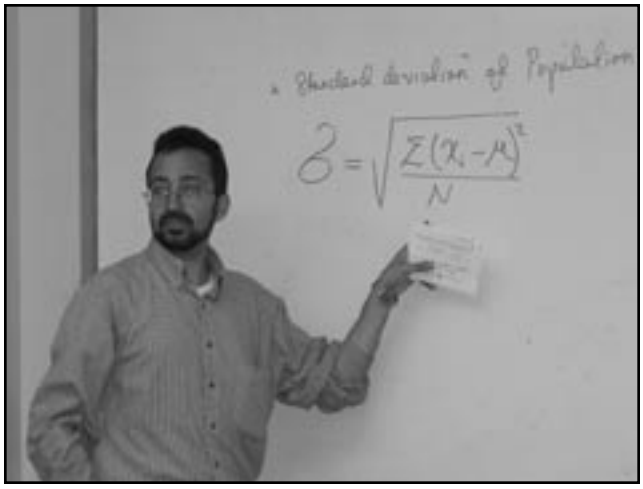
Contributed by Abder R. Ghouleh, PE

The AAAEA returned to offering its own EIT Review classes this year. Interest in these classes by our membership exceeded our original expectations and we had our highest attendance ever. The 2006 EIT Review program was very successful with 16 students participating in the 13 week long session. The AAAEA also gained new members, when three attendees became AAAEA members, so the class had a total of 11 members and 5 non-members. It should be noted that many non-Arabs attended these classes.

Feedback from the students was very good. Our classes were comparable to other programs but at a better value. The lectures were very professionally done by experts in their fields. The instructors were well prepared and made themselves available to all questions. The 13 week long session was held at the University of Illinois-Chicago campus (UIC) from January to April. Almost each week of the program featured a different subject for review.

I would like to thank the following for volunteering their time to help their fellow engineers acheive the EIT license: Dr. Soliman Khudeira (Mechanics of Materials, twice), Jamal Grainawi (Statics), Dr. Mustafa Mahamid (Dynamics, twice), Dr. Ghaffar Kazkaz (Mathematics, twice), Dr. Bassam Jody (Thermodynamics), Dr. Driss Omari (Chemistry), Dr. Mahmoud Issa (Fluid Mechanics), Dr. Eyad Elqaq (Electrical Engineering) and Jamil Bou-Saab (Engineering Economics). A special thanks to Dr. Abdallah Shuibi of DePaul University for taking the time to teach the Probability & Statistics class for us.

Good luck on the Exam to all our students!



Announcements and News

Congrats to Raed Abu Shukhaidem on his wedding. Raed married Kawther Saadeh on 03/12/06.

Congratulations to Dr. Shafic Budron for being re-elected President of the ADC.

Congratulations to Bilal Almasri for receiving the ABPA Recognition Award for Engineering Service.

Congratulations to Dr. Moussa Issa and wife for their new baby born girl Nour.

Congratulations to Issam Abozir and wife on the birth of their new baby boy Tarik.

Congratulations to Mohammad Xoubi and wife on the birth of their new baby boy Dean.

Congratulations to Hesham Mahdy on his new position

Congratulations to Mohammad Kleit on his new position.

Congratulations to Ibrahim Shillo on his new position with UL.

Congratulations to Mohammad Xoubi on his recent promotion at the MWRD.

Congratulations to Jamil Bou-Saab for being elected Vice-President of ABPA.

Congratulations to Moosa Matariyeh for being appointed Secretary of the IEC.

Congratulations to members Ayman Shannak and Ihab Elokda on being elected to the board of the Texas AAEAA.

Get well wishes and speedy recovery to Mohammad Alasfar.

Get well wishes and speedy recovery to Jamil Elian.

Get well wishes and speedy recovery to the brother of Ibrahim Shihadeh.

Get well wishes and speedy recovery to Hatem Elagha.

Condolences to Jamal Grainawi and family for the passing of their sister in Jordan.

Condolences to Ziad Baradi and family on the loss of his father.

Condolences to Issam & Nader Abozir and families on the loss of their mother.

A special thanks to the Pita Inn for sponsoring a $1000 scholarship.

If you have an annoucement on any member, please email it to us at aaaea@aaaea.org

Business Profile

ALPHA ENGINEERING, LTD.

Consulting Engineers and Designers

Alpha Engineering, Ltd. is a fully licensed, LEED accredited, Building Commissioning Association member, a professional engineering firm, with Minority/Disadvantage Business Enterprise (MBE/DBE) registration, and more than 150 years of combined hands-on experience.

They provide the design of technically practical solutions for HVAC, Electrical, Plumbing and Fire Protection systems for commercial, residential, and institutional buildings. Alpha Engineering is a corporate member of the AAAEA and utilizes the talents of three experienced AAAEA members.

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