



Columbus Engineer

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PRESIDENT'S MESSAGE

By Paul F. Junk, PE, PS, FCC President



It is a pleasure to be part of another issue of the Columbus Engineer. Although there is no program in December, we are wishing you "Happy Holidays".

You may be surprised to know this chapter covers more than just Franklin County. We have 12 counties which

also include Delaware, Fairfield, Licking, Union, Knox, Muskingum, Madison, Perry, Marion, Morrow, and Hocking. The counties are listed in order of professional engineers' population. There are 12,767 professional engineers in Ohio and FCC represents 26% of the registered engineers. We are the largest chapter in Ohio and have a lot of area to cover and work to do. We need volunteers to cover all this area for projects like MATHCOUNTS and Imagine Engineering second grade coloring contest. Your help is much needed.

It is time to renew your professional license again for another two years. I marvel at the ease to go online and register. Part of the registration process is to certify that you have your 30 hours of continuing education credits. By attending your chapter meetings and going to OSPE seminars you can meet that requirement easily. Franklin County Chapter works hard to provide programs which are informative and satisfy the State Board requirements.

In this issue is the more detailed write up of the October program "The Burning Bridge".

A few members are very hard workers and they need to be noticed. Members who have been recognized for their efforts are called "Fellow". Ohio has 1,098 Fellows and we are looking for 3 more state wide for 2016. If you know of a person who should join this select group, please let me know.

Obituary – Jim Abraham

Brig. Gen. (Ret) James M. Abraham, PhD, PE passed away on November 8. He was a long time active member of OSPE. He was president of the Franklin County Chapter in 1979-1980.

Imagine Engineering Coloring

We are kicking off our annual Imagine Engineering Second Grade Coloring Contest and we need your help to get the next generation excited about engineering. Join us this year and visit your local second grade class to help them imagine themselves as Professional Engineers. Most second graders have no idea what a Professional Engineer does or what Engineering even means.

This program is a great opportunity to educate students about future career opportunities, get them excited about engineering, increase awareness about our profession, and elevate the perception of professional engineering in our community.

Volunteering only takes a few hours of your time and it is easy and fun. We have experienced presenters that would be happy to co-present with rookie volunteers and share some tricks of the trade.

We have a list of schools that have already signed up to participate in the program, or if you are interested in presenting at your local school or to your child's second grade class we can get your school signed up for the program and provide you with materials for your presentation. Please contact me if you are interested at devon_seal@gspnet.com or 614-208-6986.

FCC Auxiliary Dec. Meeting

The Auxiliary to the Franklin County Chapter of OSPE is having their December 8th meeting will be at Scioto Country Club, 2196 Riverside Dr.(note change to 2nd Tuesday). Agnes Benedict will give the invocation and lead pledge of allegiance. Nancy Roehrs is to be hostess. Charter members and past presidents will be honored. Entertainment will be a return performance by the Grandview Singers under Director of Choral Music for the Grandview High School Andrew Krega. These young people put on a delightful program. Guests are welcome at this luncheon. Make a reservation by calling Jean Mitchell at 262-7071. **The auxiliary is not meeting in January or February. Our next meeting will be in March, 2016.**

ODOT's BURNING BRIDGE

by Ron Eifert

The principal East – West highway corridor through Franklin County was confronted with a severe restriction at 6:00 AM on July 1, 2015 when an Eastbound vehicle transporting 8000 gal of Ethanol apparently struck the barrier parapet on the four span bridge carrying (a) I-270 SB and (B) the WB I-70 to SB I-270 Ramp over the mainline EB I-70 roadway. The resulting 16000 degree firestorm essentially shut down the Eastbound Interstate segment.

It was soon apparent that span 3 of the 4 span 40'-55'-55'-40' concrete (25") slab structure was no longer to be functional. (The adjacent spans were later determined to be satisfactory to remain.) ODOT District 6 personnel were in quick command of the scene. The initial maintenance of traffic plan involved rerouting EB I-70 by way of the Roberts Rd interchange to the north until a crossover carrying the EB I-70 traffic to a two way (widened) WB pavement through the project area was provided.

The implemented maintenance of traffic plan was in place by 11 am July 3, day 3 of the burning bridge challenge, sufficiently in advance of the opening of "Red White and Boom" activities (of principal importance to City of Columbus officials.)

Bridge repair activities had commenced concurrently with traffic planning. ODOT District and Central office personnel had met on the site on July 1 with 4 contractors, scope of work defined and delivered e-mail by 7 pm. Bids were received Thursday July 2 (noon) and opened 2 pm. Shelley and Sands were awarded the contract Friday 7/3. Amount \$1,186,129. Completion was 30 days. Day 1 was July 3. Incentive / Disincentive was \$20,000 per day.

Initial thought included consideration of full replacement of the bridge but the planned replacement of the bridge on an elevated profile will be required within two years, dictating the partial replacement option.

The 55' deck slab span was replaced with fast set concrete and uncoated reinforcing steel. Required strength was attained in three days. The pier columns were repaired, encapsulated, and carbon fibers applied. A support beam was added along the column line.

The project was completed in 19 days – on July 21, 2015. (12 days ahead of schedule).

Ferzan Ahmed, Deputy Director District 6, (The "face of the project") has received plaudits for his role in the successful execution of the project. Director Wray expressed his appreciation at the OTEC opening session on October 27. The substantial contributions of Tim Keller PE, Administrator of the office of Structural Engineering, to the project success and his input to the above account is acknowledged.



Bridge Fire



Think Like an Engineer

How do we better prepare engineers of the future? How do we build more interest in engineering as a career path? One approach is to determine how engineers think and act, and then teach young students how to be engineer-learners.

If young people, namely students, are exposed to styles of teaching and learning that are more closely related to the real world of engineering, they are more likely to view engineering as a subject worth pursuing as a career. Current engineering education is not prominent at the primary school levels, and teaching methods give an impression that engineering is not an attractive profession to students.

One study on this conundrum outlines the following six attributes of the “engineering habits of mind” that describe how engineers think and act:

1. **Systems thinking** - Seeing whole systems and parts and how they connect, pattern-sniffing, recognizing interdependencies, and synthesizing.
2. **Adapting** - Testing, analyzing, reflecting, rethinking, changing both in a physical sense and mentally.
3. **Problem-finding** - Clarifying needs, checking existing solutions, investigating contexts, and verifying.
4. **Creative problem-solving**—Applying techniques from different traditions, generating ideas and

solutions with others, generous but rigorous critiquing, and seeing engineering as a team sport.

5. **Visualizing**—Being able to move from abstract to concrete, manipulating materials, mental rehearsal of physical space and of practical design solutions.

6. **Improving**—Relentlessly trying to make things better by experimenting, designing, sketching, guessing, conjecturing, thought-experimenting, and prototyping.

(The preceding attributes, are direct quotes from the PE July 2014 issue, article by the same name.)

A better understanding of how engineers think, presented to the k-12 education profession, could help teachers’ better design curricula and provide input on how to more effectively present engineering as a career to students of both sexes.

FCC has four programs that interact with the k-12 students: Imagine Engineering, MATHCOUNTS, judges to the regional Science Fair and scholarships for seniors selecting an engineering curriculum. We need more engineers to implement these programs. Please contact the Chair of the program that you would like to support. The Chairs are listed in this Issue of the Columbus Engineer. (Also Available on the Ohioengineer.com website, under Chapters.)

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The OSPE-FCC November Luncheon Presentation

Once again, our 2015-2016 November luncheon program, I-270/US 33 Interchange, was outstanding. The presenters were Andy Wolpert, a senior technologist in CH2M'S Columbus office and Drew Griesdorn, the ODOT project engineer for the 270/33 Interchange project.

Our next luncheon speaker is Mr. William Lohta, next January. His ethics presentations are very constructive. Starting next year, all PEs will need a CPD hour of ethics and a CPD hour on legislation, every biennium.

The November luncheon presentation was on the reconstruction of the I-270/US 33 interchange. The project was identified as an intermediate project in the Northwest Freeway Study (NFS). Several conceptual alternatives were developed, to improve traffic operations, promote economic growth and eliminate hazardous crash areas while minimizing environmental and right-of-way impacts.

The interchange improvements will be constructed in phases, with Phase 1 now construction under way and Phase

2 construction in approximately 15 years. The presentation highlights included:

- Accelerated design schedule
- First project to use the Highway Safety Manual's Freeway and Interchange crash prediction methodologies to evaluate safety performance
- Phased construction approach
- Widening US 33 from two lanes to four lanes in each direction for approximately two miles
- Realignment and reconstruction of seven ramps
- Eight new bridges and three widened bridges
- Eight new retaining walls
- Aesthetic enhancements

The speakers presented the latest construction details within one week of the luncheon, with actual pictures of the ongoing construction. For those members, who could not make the luncheon, a more complete description of the presentation will be presented in a later article in the Columbus Engineer. The interchange before and after the new construction:

Before



After



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FIRST CLASS

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2015-16 CALENDAR

Dec. 8	5:30 p.m.	FCC Board Meeting @ Korda Nemeth
Dec. 17	5:00 p.m.	Deadline for January Columbus Engineer
Jan. 12	5:30 p.m.	FCC Board Meeting @ Korda Nemeth
Jan. 15	5:00 p.m.	Deadline for February Columbus Engineer
Jan. 21	11:30a.m.	Program: Ethics - Bill Lhota
Feb. 9	5:30 p.m.	FCC Board Meeting @ Korda Nemeth
Feb. 13	8:00 a.m.	Local Mathcounts Competition @ Columbus State Community College
Feb. 15	5:00 p.m.	Deadline for March Columbus Engineer
Feb. 21-27		National Engineers Week (see www.eweek.org)
Feb. 24	8:00 – 3:00 p.m.	Engineer for a Day Program
Feb. 25	11:30 a.m.	Program: E-Week Luncheon
Mar. 8	5:30 p.m.	FCC Board Meeting @ Korda Nemeth
Mar. 12	8:30 a.m. – 3:00 p.m.	State Mathcounts Competition (FCC Volunteers)
Mar. 14		District Science Day
Mar. 15	5:00 p.m.	Deadline for April Columbus Engineer
Mar. 17	11:30a.m.	Program: Roundabouts versus Circles
Mar. 21		Spring Certificate Ceremony (OSPE)
Apr. 12	5:30 p.m.	FCC Board Meeting @ Korda Nemeth
Apr. 15	5:00 p.m.	Deadline for May Columbus Engineer
Apr. 21	11:30a.m.	Program: Oil & Gas Pipeline Corrosion - Srdjan Nestic, Chemical Eng., OU
May 10	5:30 p.m.	FCC Board Meeting @ Korda Nemeth
May 16	5:00 p.m.	Deadline for June Columbus Engineer