



Division newsletter

American Society for Engineering Education

DIVISION: Civil Engineering
EDITOR: Ron W. Eck
West Virginia University

DATE: April 1988

CHAIRMAN'S REMARKS

The theme for this year's Annual Conference to be held in Portland, Oregon, is "Beginning a New Era in Engineering Education." This theme suggests a look to what the future may be holding. The brochure, "Inside ASEE", provides some interesting information about the history of the membership of ASEE. Beginning in 1893 with 70 individual memberships, the Society grew at a slow but steady rate reaching a plateau in the 1960's. For the last 20 years, the membership has held relatively constant at around 10,000 members. According to the information on the engineering profession provided by the Information Center of NSPE, when we compare 10,000 members to the number of engineers in the United States (2,214,000) the membership seems very small. However, if we compare the number to the engineers who list teaching at an educational institution as their occupation (34,500), the membership is fairly representative.

What do these numbers mean with respect to a new era in engineering education? Most of us are aware of the

declining enrollments, especially at the doctoral level, either from recent reports or from observing personally the decline in the number of students pursuing graduate degrees. In addition, many of those receiving the doctorate degree are hired by industry. Since the education of the engineers in the future will depend on the availability and the quality of the engineering faculty, this trend must affect the new era. Are we, through our educational process, inspiring our students to consider a career in education? Are we inspiring them to want to learn new ideas and approaches or are we teaching them to apply "cookbook" techniques to learning? Are we encouraging the under-represented in our society, the women and minority students? Are our lectures alive with enthusiasm for the teaching process and the new discoveries we are making in our research, or does our attitude in the classroom convey our time constraints and a sense of frustration for the interruption from the time we need to spend obtaining and directing our research projects?

As the educators of today training the future engineers and educators of tomorrow, are we providing the type of

training and leadership to help the engineer and his firm remain competitive in the world markets? Are we stimulating creativity in the young engineers or are we forcing them into a common mold? Are we developing a spirit of professionalism which recognizes the need for continuing education and growth of the engineer, or are we graduating engineers to be used as expendable products to be replaced or phased out when obsolete due to changing technology?

These are some of the questions I have been asking myself as I consider our theme, Beginning a New Era... Sessions at the Annual Conference will be directed to this theme and will explore the role of education and our role as educators. I hope you will all take the opportunity to become more active in ASEE. The Civil Engineering Division has over 800 members. I would like to encourage all of you to voice your viewpoints on education and the direction of ASEE. Our journal and newsletter are ideal for exchanging information and several of the informal sessions at the conference are devoted to interchange of ideas between members. How do you see the Beginning of a New Era?

Mardy Thomas
Iowa State University

University of
PORTLAND
'88



Beginning a new era in
Engineering Education

PORTLAND - HERE WE COME!

The program for the 1988 ASEE Annual Conference has been finalized and should be mailed to members in early April. We have a fine program planned for the Civil Engineering Division with sessions scheduled to address timely issues in civil engineering education.

The conference theme for the Portland meeting is "Beginning a New Era in Engineering Education". We addressed this theme with a group of sessions as follows: "Civil Engineers and Lifelong Learning: Current Practice", moderated by William Highter and co-sponsored by the Construction Engineering Committee, the Graduate Studies Division and the Continuing Professional Development Division, will focus on the roles of universities, professional societies, and industry in continuing education and professional development. Next, "Who is to Teach Design", moderated by David Morris, addresses concerns related to the design education component of civil engineering programs. Along these same lines, Dean Parsons will moderate a session titled "Professional Practice - ABET Requirements and Methods of Implementation" which will also address the issue of design education in the undergraduate curriculum as well as other evolving ABET requirements.

Prahlad Pant and Magdy Roufaiel are moderators for two sessions on computer activities in civil engineering. The first by Prahlad titled "Expert Systems in Civil Engineering Education and Practice" and co-sponsored by Construction Engineering will present recent developments on knowledge-based systems used in both the design and construction aspects of civil engineering projects.

Magdy's session is a demonstration and software exchange for microcomputer programs. A broad group of presenters is scheduled to demonstrate programs related to road design and construction,

construction management, concrete design, computer graphics, and traffic signal timing.

The Chi Epsilon Luncheon will be special this year with the former long-time Chi Epsilon Executive Secretary, Dexter Jameson, speaking on "The Missing Ingredient".

Again this year, we have scheduled the Civil Engineering social and dinner away from the convention center. We will be leaving Portland in the late afternoon for a scenic bus ride, compliments of CH2M Hill, up the slopes of Mt. Hood to the historic Timberline Lodge. Since space is limited, be sure to pre-register for this event. It should be a fun and relaxing evening. PORTLAND - Here We Come!

Noel Tolbert
Program Chairman

THE CANDIDATES

The report of the Nominating Committee was published in the Fall issue of the CE Division Newsletter. The ballot for voting is found on the last page of this issue. You are urged to cast your vote and return your ballot today. It is important that you vote since there are two candidates for Vice Chair, Secretary/Treasurer/Newsletter Editor, and Director. Short biographical sketches of each of the candidates follow.

Noel Tolbert -- Professor of Civil Engineering at Tennessee Technological University. Prior to Tennessee Tech, Noel taught at Arkansas State University and the University of Arkansas at Little Rock. His industry experience included employment with Dow Chemical in Freeport and Houston, Texas and the former Nuclear Division of Union Carbide in Paducah, Kentucky. He is a registered Professional Engineer

in Tennessee and previously in Arkansas and Kentucky.

Noel has been a Faculty Research Fellow for NASA, Marshall Space Flight Center, in Huntsville, Alabama. His primary areas of publication and research have been in structural composites, finite elements and microcomputer applications. He has been a consultant to several industries and is currently under contract with Martin Marietta at the Oak Ridge National Laboratories. He is a member of the following organizations: Tau Beta Pi; Chi Epsilon; ASCE, Past Director of Arkansas Section, Corresponding Member - Committee on Curriculum and Accreditation; ASEE, current vice chairman of CE Division, former chairman of CE Division Committee on Teaching Methodology. Noel has also organized and moderated CE Division sessions at several ASEE Annual Conferences.

Anis Farah -- Dr. Farah is a member of the Board of Directors of the C.E. Division and an Associate Editor of the Civil Engineering Education journal. He was chairman of the Committee on Computer Applications of the CE Division from 1983-1987, and is chairman of the Computer Advisory Committee at Laurentian University. He is currently editing a special volume for ACI on long-term serviceability of concrete structures. He is a registered professional engineer and is a member of ASEE, ASCE, ACI, CSCE, EIC, and Sigma Xi. Additionally, he is a member of two technical committees, safety and deflection, of ACI and Chairman of two subcommittees. From 1979 to 1982 he acted as a consultant to the Royal Commission On The Northern Environment set up by the Ontario Government.

Dr. Farah is Professor of Engineering at Laurentian University, Sudbury, Ontario, Canada which he joined in 1968. He graduated with a B.Sc (first

class honors) degree from Queen's University of Belfast, N. Ireland, U.K.; M.A.Sc. degree from the University of Toronto, and a Ph.D. degree from the University of Waterloo. All three degrees are in civil engineering with a specialization in structures. Dr. Farah's research spans several areas which include structural vibrations, serviceability under dynamic loading, the analysis and design of columns and shear walls, and numerical methods.

William H. Highter -- Dr. Highter joined the faculty of the University of Massachusetts in September 1985 as Professor and Head of the Department of Civil Engineering. Prior to that date he was Professor of Civil Engineering at the University of Tennessee at Knoxville (1981-1985) and Assistant and Associate Professor of Civil and Environmental Engineering at Clarkson University (1972-1981). Dr. Highter received Bachelor of Science Degrees in Geology and Civil Engineering from Notre Dame, and the M.S. and Ph.D. from Purdue. He is a Registered Professional Engineer.

Dr. Highter's research interests are in the areas of geotechnical engineering and pavement design and evaluation. He has been active in ASCE technical and professional activities. He is currently chairman of the ASEE CE Division's Committee on Educational Policy and will moderate the session "*Civil Engineers and Lifelong Learning: Current Practice*" at the Portland meeting in June.

Thomas E. Mulinazzi -- Tom is the Associate Dean of Engineering at the University of Kansas and a member of the Civil Engineering Department. He received his BSCE from Notre Dame and his M.S. and Ph.D. from Purdue. He is currently the past chairman of the Midwest Section of ASEE and the Section Campus Representative Coordinator.

Gerard H. Schlimm -- Dr. Schlimm joined the Civil Engineering Department at The Johns Hopkins University in 1986, having spent the preceding 20 years as Director of Part-time Graduate and Undergraduate programs and teaching both day and evening courses. He had been an Assistant Professor of Mechanical Engineering at the U.S. Naval Academy and Instructor in the Civil Engineering Department at the University of Maryland before coming to Hopkins. His industrial experience includes Esso Research and Engineering Company, Trident Engineers, the Maryland State Highway Administration and as a partner in a consulting firm. He received the B.S.-Civil Engineering and Ph.D. at the University of Maryland and an M.S.-Engineering Management at New Jersey Institute of Technology; he is a registered Professional Engineer.

He is a member of ASEE, ASCE, NSPE and the Engineering Society of Baltimore, having been President of Maryland Section-ASCE and the Engineering Society of Baltimore. He has also been active in ASEE, first as an officer of the now Continuing Professional Development Division in the late 1960's and early 70's and as a member of the Engineering Manpower Committee from the mid-70's through the Cincinnati Conference, serving as Program Chairman for two years. His current public service activities include the Maryland Governor's Science Advisory Council (1975 to present) and Chairman, Governor's Hart-Miller Island (dredge disposal facility) Advisory Board. He is a member of Tau Beta Pi (Executive Council, 1982-86), Chi Epsilon, Sigma Xi, and Omicron Delta Kappa.

Robert M. Henry -- Robert M. Henry is an Associate Professor in Civil Engineering at the University of New Hampshire. He joined the department after receiving his Ph.D. from the University of Pennsylvania in structural mechanics in 1980. His major areas of

teaching are structural analysis, numerical techniques, CAD and computer graphics applications in Civil Engineering. Current areas of research focus on finite element analysis on parallel computers, incorporation of cladding panels as structural components and computerization of pavement management of rural roads.

On the University level, he is chairman of an advisory committee for the use of microcomputers and computer-assisted instruction and is a member of a committee which oversees the operations of the Computer-Aided Design, Analysis and Graphics (CADAG) Center. On the national level, he is a member of the Education Committee of the Technical Council on Computer Practices (TCCP) of ASCE. His involvement with ASEE began in 1984. He received the Dow Outstanding Young Faculty Award in 1986 and chaired a session at the 1987 Reno Annual Conference.

Edward H. Kalajian -- Dr. Ed Kalajian is a Professor of Civil Engineering and Head of Department of Civil Engineering at Florida Institute of Technology. Ed earned his B.S. degree in Civil Engineering from the University of Maryland and his M.S. and Ph.D. from the University of Massachusetts. He has five years of industrial experience with the US Naval Facilities Engineers Command and has been involved in engineering education for sixteen years.

He has been a member of ASEE for twelve years and was the FIT ASEE campus representative. Ed is also a member of ASCE and served on the Florida Section Education Committee. He is a registered Professional Engineer. His current research efforts are in the area of stabilization and reuse of waste materials.

GUEST EDITORIAL

Editor's Note: Since my term as Secretary-Treasurer of the Civil Engineering Division expires in June 1988, this will be the last issue of the Newsletter for which I have editorial responsibility. My three years in this position have been interesting and enjoyable. I hope you will support my successor in the same manner you have supported my efforts over the last three years. I want to express special thanks to my assistant, Toni Jones, for her efforts in helping to get the Newsletter prepared and mailed in a timely fashion.

Over the years, a number of prominent educators and practitioners have shared, through this column, their ideas and opinions on engineering education. Since ASEE is a professional society concerned with engineering education and since education involves students, it occurred to me that the student perspective might make an interesting and thought-provoking "Guest Editorial" for my last issue. The idea developed from a series of continuing informal discussions on the state of civil engineering education with two concerned and articulate civil engineering graduate students at West Virginia University (WVU). One of the graduate students has an engineering technology degree, the other a B.S.C.E. Each had been a "practitioner" for at least six years before returning to school. Both had definite thoughts on what they found when they returned to academia. Because I thought these similar, yet different, perspectives would be of interest to readers of this Newsletter, I invited them to prepare guest editorial articles. Both graciously accepted. Their background and experience are summarized below.

Terry R. Irwin is completing the requirements for a Masters degree at WVU, specializing in geotechnical engineering. He has a B.S. in

engineering technology and spent six years in engineering practice before returning to school full-time to pursue a graduate degree.

Kevin T. Beachy is completing the requirements for a Masters degree at WVU, specializing in transportation engineering. He has a B.S. degree in civil engineering and practiced for nine years as a public works engineer. He is a registered professional engineer. In 1987, he returned to school full-time to pursue a graduate degree.

Terry's comments are presented first, followed by Kevin's remarks. It is my hope that the articles will generate a good deal of discussion. Responses in the form of letters to the editor are invited. I encourage you to put your thoughts on paper and share them with your colleagues. I will forward all responses received to my successor for publication in the next issue.

"PRACTICAL ALTERNATIVES FOR ENGINEERING EDUCATION"

Following our series of "after hours" discussions on engineering education, I felt compelled to document some thoughts concerning my own educational experience, its impact on my professional career, and some observations of engineering education in general. Although my experiences are from a civil engineering perspective, similar trends may exist in other disciplines as well. I chose to use this publication because it reaches those persons most responsible for affecting the quality of education - the professors who teach and the administrators who set policy and guidelines. It is my hope that after reading this article, these people will take some time to critique their own teaching and/or managerial methodologies as well as assess engineering education in the broader sense.

My B.S. degree is in Civil Engineering Technology (1980). Upon graduation, I spent three years in construction management, both in the U.S. and abroad, with a large international engineering company. It would have been easy to become intimidated by engineers from larger, more prestigious, university engineering programs. However, it became evident rather quickly that the skills I obtained from a small state school's engineering technology program allowed me to perform my tasks as a site engineer on par with, and in many cases exceeding, those of my fellow engineers. I couldn't help but question why this was so, and over time, to ask questions about their engineering curricula. Then, to satisfy a desire to work for a smaller company and to do more design work, I spent three years at a site engineering and surveying firm and at the same time attended two different universities for evening courses in engineering. Once again, I matched my skills against other engineers, only this time in a design environment. I found my educational background to be more than adequate, if not superior. In 1986, I decided to continue my formal education full-time, and will graduate this spring with an M.S. degree specializing in geotechnical engineering.

The main advantage I had over fellow engineers was the more practical nature of the engineering technology education I received. Theory was taught only as an introduction and brief explanation to a topic, followed by an abundance of practical application work. The engineers with whom I worked, and the undergraduate and graduate students I've observed these last two years, have only been exposed to theoretical manipulations in many cases. On top of making it difficult to assess the problem at hand, such training normally breeds tunnel vision when it comes to arriving at a solution, i.e. such engineers have a hard time accepting that there may be more than one correct approach to the solution and

often more than one correct answer!

Possibly, this stems from the fact that my technology professors had many years of work experience before beginning their teaching careers and could draw upon their practical experiences. Most of my professors had education Ph.D.'s rather than engineering doctorates. I don't know if this is a trend among technology educators, but it certainly seems to be a good combination. The professors I've observed in classical engineering programs are, for the most part, so concerned with theories and derivations, and research to support these concepts (both old and new) that they never get off first base. Imagine how much money and time could be saved in industry if graduating engineers could be more productive very early on instead of the months it takes to bring a new engineer up to speed.

The range of practical experience that a professor has is plainly evident in the classroom and is reflected in work produced by the student. It must be noted that a professor has many responsibilities, having to combine classroom teaching and service as well as research. In many cases, the research helps to support the professor or the department financially. However, time and again I have seen professors who are not willing to put forth extra time and effort either in the classroom or in research while expecting such extra effort of their students. Homework and term papers must be assigned, and lots of them. Practice, as in any of the arts and the sciences, makes perfect. A professor's enthusiasm toward teaching can have a profound positive effect upon his students.

The engineering curriculum as governed by ABET may be the cause of gaps that exist in education versus practice. The assortment of college catalogs I perused while writing this article showed that

many engineering schools today are top-heavy with theory and analysis courses. Whatever happened to courses like contracts and specifications, codes and practices, scheduling and management? Most students that I asked what they knew about these subjects didn't have a clue!

Have we (speaking for civil engineers) forgotten that the end product of most of our efforts is a constructed project carried out "in the field"? When was the last time you saw a drafting class in engineering? I don't know how many students, and engineers, I've met who have a hard time conceptualizing ideas in three-dimensions, either in their mind, in conversation, or on paper. One of the reasons engineering technology evolved was to bridge the gap that exists between engineers and designers on one hand and constructors and manufacturers on the other. Does anyone have to wonder why? The sad fact is that many companies and corporations fail to recognize both the gap that often impedes their productivity and profits, and the engineering technologist who is trained to overcome that deficiency. Engineering curricula and their professors should take a look at approaching some courses from more of a "project" direction where knowledge from rudimentary courses in different areas (e.g. structural, environmental, transportation, and geotechnical for civil majors) can be called upon to solve the problem at hand. Senior projects, which seem to have gone the way of the slide rule, should be reinstated into engineering programs.

Policy is set at the top, and both ABET and engineering administrators need to continue their responsiveness to current trends in engineering while not sacrificing sound engineering judgment based on practical applications. There is no doubt in anyone's mind that research and theoretical analysis are necessary to further man's understanding of natural and engineering

processes. Nor is there any doubt that there is a real need for "research universities." But perhaps engineering educators should be concerned by the apparent trend where virtually all major institutions seem intent on making their mark as "research universities." Some sort of balance seems to be needed. Some engineering programs should decide on their own, or collectively, to become known as "teaching institutions" or "high application institutions" where education for the practice of engineering and concern for students' professional development are accorded the same prestige as a successful research program. Were this to occur, then students could choose more easily where they wished to study, professors could choose where they would rather teach and/or do research and administrators could choose the right professors for the particular job.

Terry R. Irwin

"SYSTEM FAILURE IN ENGINEERING EDUCATION?"

In January 1987, after nine years experience in local government as a public works engineer, I returned to college to pursue a masters degree in civil engineering. I was somewhat skeptical about returning to the college scene but never anticipated being shocked and dismayed by my findings. What changes!!

First of all, it seems that the basics of grade school and high school are deficient relative to doing college-level work. Students lack reading, writing and communication skills to complete everyday tasks. Oftentimes, term papers, reports and assignments are repetitions of classroom notes. Self-motivation and the desire to learn and broaden one's knowledge without being "spoon fed" are in short supply. Notoriously, engineers have always been

considered as "number crunchers" confined to a tiny, dark room where massive sheets of paper with funny lines and symbols are produced while simultaneously pressing little buttons on an electronic gadget. This concept is obviously archaic. Today's professional is required to exhibit a high degree of technical know-how and still be able to explain it to a layman.

My second observation involves curriculum and workload. Curricula tend to be very theory-oriented with few assignments based on the practical problems an engineer will face. It almost appears as if our education system is producing engineering "scientists" versus hard-core engineers. Industry is spending millions of dollars annually in an attempt to retrain college-educated professionals in the basics of civil engineering such as reading blueprints, preparing contract specifications or drawing a simple sketch. The irony of the situation is evident when instructors are required to split a class into sections so that laboratory benches can be used as drafting tables. Engineering students carrying design drawings, T-squares and other drafting instruments are gone! Granted, the demand and need for our country's resurgence in technology requires a higher degree of problem-solving through computer-based applications. But, is it fair to eliminate completely the hands-on experience of being able to take a two-dimensional concept, produce a three-dimensional sketch through imagination and creativity, and build a scale model? A variety of computer software is available presently to solve almost any problem or the expertise exists to develop other software. However, a major problem is evident when students look for a software program to solve assignments not realizing the need to be able to perform the decision-making steps of an engineering question.

As a practicing engineer, the importance of relying on field technicians, draftpersons, clerical help and other engineers' assistance in completing a project in a timely and correct fashion is vital. Jobs can be won or lost; errors cost money when poor communications and inefficient teamwork are prevalent. One of the most memorable parts of my undergraduate education was being able to serve as project coordinator for the senior design project. The competitive spirit and tenacity needed to produce a reputable product remains fresh. Today, many programs have eliminated senior design projects, thus decreasing the esprit de corps between students and between students and faculty that is such an important part of the professional development that takes place during the senior year.

Professionalism, ethics and pride in a job well done appear to be slowly diminishing on the college campus. It seems safe to say that most times when students register, they are more concerned with who has taken the course before them and what notes and papers can be obtained. It also appears that students are not only naive to the requirements of their undergraduate degree, but are oblivious to the long-term demands for continuing education after graduation. Can you believe that there are junior- and senior-level students who do not know the meanings of the acronyms EIT and P.E.?

Some instructors lack practical experience in the workplace that they can relate to assignments and research. Instructor's notes and assignments often do not reflect current trends in the engineering field and are used ad infinitum without revisions to incorporate current innovation. Professors who fail to include current topics in their courses tend to produce apathy among the students. This is particularly true at the graduate level where graduate students seek a level of

knowledge and expertise commensurate with the responsibility they will assume in practice upon graduation. Where does the line of demarcation lie between the responsibilities and expectations of professors and graduate students?

The above are generalized statements from my own observations; in no way do they reflect any malice or antagonism to any particular institution or the field of civil engineering. I am proud of my profession as a civil engineer but saddened by the fact that many are not. For as many that do not care, just as many will make a positive impact on the future of civil engineering.

Some concluding remarks are offered as food for thought: Are students looking only at the monetary rewards associated with the engineering profession and not their impact on our surroundings? As a registered professional engineer, do you want to rely on your own knowledge and experience or on the microchips of a computer? And how do you convey these philosophies to your students? Should a "co-op" program be developed between industry and educational institutions in order to provide hands-on practical experience for professors prior to tenure?

Kevin T. Beachy

REMEMBER

TO

VOTE!!

BALLOT ON

LAST PAGE

ASEE ANNUAL CONFERENCE -- PORTLAND, OREGON

CIVIL ENGINEERING DIVISION PROGRAM

Monday, June 20, 1988

- 8:30 - 10:15 am Civil Engineering Executive Board Meeting
(closed business meeting)
- 10:30 - 12:00 am MINI-PLENARY -- International Perspectives
on Creativity: Engineering Education in a
New Era (co-sponsored by CE Division)
- 12:30 - 2:00 pm Civil Engineering Division Business Luncheon
(moderated by Mardith Thomas)
- 4:30 - 6:00 pm Civil Engineers and Lifelong Learning:
Current Practices
(moderated by William Highter)
- 8:00 - 10:00 pm Civil Engineering Rap Session - Bring Ideas!
(refreshments)

Tuesday, June 21, 1988

- 8:30 - 10:15 am Who is to Teach Design?
(moderated by David Morris)
- 12:30 - 2:00 pm Civil Engineering Division Planning Luncheon
(moderated by Noel Tolbert)
- 2:30 - 4:15 pm Professional Practice -- ABET Requirements
and Methods of Implementation
(moderated by Dean Parsons)
- 5:30 - 11:00 pm Civil Engineering Social and Dinner
(scenic bus ride up slopes of Mt. Hood to the
historic Timberline Lodge)

Wednesday, June 24, 1988

- 8:30 - 10:15 am Expert Systems in Civil Engineering Education
and Practice
(moderated by Prahlad Pant)
- 12:30 - 2:00 pm Chi Epsilon Luncheon
(Speaker: Dexter Jameson - "The Missing
Ingredient")
- 2:30 - 4:15 pm Computer Applications in Civil Engineering
Poster and Software Exchange
(Moderated by Magdy S. Roufaiel)

CALLS FOR PAPERS

CIVIL ENGINEERING EDUCATION

The CE Division of ASEE is soliciting papers for review for publication in Civil Engineering Education. They should be typewritten and double spaced. Five copies are required. Titles should not exceed sixty characters, including spaces. Maximum length of articles is 3,000 words. Illustrations should be submitted as black and white glossy photos or ink lined drawings. Note that illustrations may be reduced at least one-half. Footnotes and extensive bibliographies are not generally used. Papers on any and all aspects of Civil Engineering Education are welcome. Address papers and inquiries to:

Gerald R. Seeley, Editor
Department of Civil Engineering
Valparaiso University
Valparaiso, Indiana 46383
(219) 464-5135

ASCE JOURNAL OF PROFESSIONAL ISSUES IN ENGINEERING

ASCE is beginning a campaign to publish more papers, articles, notes, and discussions on civil engineering education in the Journal of Professional Issues in Engineering. You are invited to submit an article or paper. Papers on any and all aspects of Civil Engineering Education are particularly welcome. Policy and position papers on accreditation, registration, professionalism, ethics, tenure, curriculum, professional development, faculty unions, universities, etc. are ideal and are considered professional issues in engineering.

Submit four double-spaced copies. Maximum length for papers is 10,000 words; for notes, 2,500 words; and for discussions, 1,250 words. Illustrations should be submitted as black and white glossy photos or ink-lined drawings. Keep in mind that illustrations may be reduced at least one-half. Direct questions concerning this Call for Papers to Dr. Peter G. Hoadley, Department of Civil and Environmental Engineering, Vanderbilt Univ., Nashville, Tenn. 37235 or call (615) 322-3396.

Mail articles to:
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ASCE
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New York, NY 10017-2398

ASEE BALLOT - CE DIVISION
Officers for 1988-89

(biographical sketches begin on page 3)

Place an X in the appropriate ()

CHAIR: R. Noel Tolbert ()

VOTE FOR ONE

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William Highter ()

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DIRECTOR (1988-91): Robert M. Henry ()
Edward H. Kalajian ()

RETURN BALLOT BY May 15, 1988 to:

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