Professional Registration:
Advice for Aspiring Army Engineers

By Major Richard J. Gash

Author's Note: I originally wrote this article in 2002, after my peers and I had struggled through the process of preparing to take the National Council of Examiners for Engineers and Surveyor's Practices and Principles of Engineering Examination.[1] Its goal was to provide a roadmap to success for Army engineer officers seeking licensure as professional engineers. I offer both that the advice that follows is still valid and that the need for licensed engineers in our Regiment has never been greater. Current events in Iraq and Afghanistan demonstrate how today's operational environment demands great engineers. Professional registration is one way we can help ensure that we will have them in our ranks.

Several years ago, a group of Engineer Captain's Career Course (ECCC) classmates and I struggled through the professional engineer (PE) application process. After hours of toiling over experience forms, making innumerable telephone calls to the Missouri Board for Professional Engineers, and spending a small fortune on express mail, some of us met the application deadline. Many did not.

The purpose of this article is to capture the lessons we learned while applying and share them with engineer officers aspiring to do the same. In keeping with the finest of military operations, I have broken the process into four phases. The first phase involves becoming an engineer-in-training and laying a foundation for future success. The second phase is filling out the application. The third phase, which is generally everyone's favorite, is studying and preparing for the exam. The final phase is taking (and passing!) the exam itself.

Phase I: Engineer in Training

This phase begins before commissioning and continues through the Engineer Basic Officer Leader Course (BOLC) and assignments leading up to the ECCC. The first step is to become an engineer-in-training by graduating from an engineering program approved by the Accreditation Board for Engineering and Technology and passing the Fundamentals of Engineering Examination administered by the National Council of Examiners for Engineers and Surveyors. These requirements are nonnegotiable because they are written into the state laws governing registration boards. The second step is BOLC. My advice for the course is threefold. First, pay attention. Second, keep the construction handouts. Third, start a professional journal. While it may be possible to succeed without the first two pieces of advice, the journal is essential.

Your professional journal should include a record of all the engineering-related projects you work on. The BOLC practical exercises are a great place to start. This record will make filling out the experience portion of the PE application much easier. Another important aspect of the journal is contact information. The application requires the officer who was your supervisor at the time to verify your engineering work experience. While at BOLC, get a good permanent standard or e-mail address from your platoon trainer and company commander. You will have to mail one of them part of your application for signature four years later. Your journal should also include contact information for PEs you work under. You will need recommendations from three of them for the application. If anyone in your

BOLC chain of command—from platoon trainer to brigade commander to course director—is a PE, introduce yourself, state your intentions, and get good contact information.

Phase I continues with the jobs you hold as a lieutenant. Keep updating your journal with contact information for PEs and supervisors. Continue to record engineering projects you work on. While some of us are lucky enough to work in construction units or even for the United States Army Corps of Engineers, most of us are more familiar with concertina wire and C-4 than construction. *This is not a problem*. Believe it or not, much of the work done by mechanized and light engineers *is* engineering related. Route, bridge, and ford reconnaissance; bridge classification and demolition; terrain and trafficability analysis; and even combat obstacle and fighting position construction all require engineering and project-management skills. Record them in your journal. Always fight to get projects that will add to your experience. A combat engineer platoon can easily clear and construct a live-fire range or even a playground!

Phase I culminates with the transition to ECCC and the start of the Principles and Practice of Engineering Examination application process. Fortunately for most engineer officers, the engineer-in-training experience required to apply generally coincides with the move to Fort Leonard Wood, Missouri. The end state for this phase is four years of experience and good contact information for supervisors and PEs. If your experience doesn't quite add up to four years, don't panic; ECCC and postgraduate education (quite possibly at the Missouri University of Science and Technology [Missouri S&T]) will add to your time.

Phase II: Application

The application to take the Principles and Practice of Engineering examination is probably the biggest obstacle separating Army engineers from professional registration. Timing, perceived lack of engineering experience, and the inability to obtain signatures combine to discourage many officers from applying. Selecting the proper exam date and completing the application early will give you the best chance for success.

The Missouri Board for Architects, Professional Engineers, and Professional Land Surveyors and Landscape Architects administers the examination semiannually in April and October. I recommend taking it right after graduation from ECCC. Although it is tough to juggle course requirements, studying, and trips to the Lake of the Ozarks, staying on for the Missouri University of Science and Technology degree will give you a chance to take the exam a second time in Missouri if you fail. Get an application from the Missouri Board as soon as you begin ECCC. You can request one through the board's Web site at <*http://pr.mo.gov/apelsla.asp*>. Even though applications are generally due three months before each examination, complete yours as soon as possible and turn it in early. If the board finds any problems with it, you will have time to correct it. I found the board very willing to help.

Becoming a Professional Engineer

The licensure of professional engineers (PEs) is important to the public because of the significant role engineering plays in society. The profession regulates itself by setting high standards to help protect the public safety and welfare. Becoming registered as a PE increases your opportunity for promotions, pay raises, credibility, respect, and security.

The registration process involves the following steps:

- Graduating from an Accreditation Board for Engineering and Technology accredited program.
- Passing the Fundamentals of Engineering Examination.
- Gaining a minimum of four years (three years with a master's) of verified practical engineering experience.
- Passing the Principles and Practice of Engineering Examination.

Examinations are typically administered twice a year, once in April and once in October. Applications must be completed 45 to 120 days before the examination date, depending on the individual state regulations.

The Engineer School point of contact for questions pertaining to the PE registration process is Mr. Chad Morris, PE, at <*chad.alan.morris@us.army.mil*>.

The two sections of the application that cause the most headaches are Section V, *References*, and Section VI, *Engineering Experience*. Section V requires applicants to obtain character recommendations from five individuals, three of whom must be PEs. I strongly advise sending out additional recommendation requests. Since military life is transient by nature, at least one of the officers on whom you were banking will be deployed or in the middle of a PCS, or will simply not receive your request. The recommendation form is easy to fill out. A couple of completed extras will ensure that you do not get caught short. It is also very likely that you have been out of contact with many of your potential references for some time. Your BOLC brigade commander or former college professor may not remember who you are. If you fear this may be the case, include a copy of Section VI from your application and the telephone number of your last battalion commander for them to contact.

An early start should allow you plenty of time to get the recommendations you need. However, if you find yourself closing in on the application deadline and still in need of recommendations, there is one last course of action available. Start knocking on doors at the United States Army Maneuver Support Center at Fort Leonard Wood. Because it is the home of the United States Army Engineer School, it has one of the highest concentrations of PEs in the Army. With a proper introduction and the right testimonials, you should find the

recommendations you need. *(Note: The Engineer School point of contact shown in the figure maintains a list of PEs on post.)*

Section VI is the meat of the application. In it, you must account for four years of engineering experience—all accrued subsequent to baccalaureate graduation. Here is where the experience part of your professional journal will come in handy. The application requires a brief synopsis of the work you have done in each job you have held. A supervisor who oversaw your work must verify each synopsis with his or her signature. Although the application appears to imply that this supervisor must be a PE, this is not the case. Keep in mind that you cannot use the same person as a supervisor and as a reference. Remember to include BOLC and ECCC as part of your experience. *(Note: The Engineer School point of contact has examples that might be helpful.)*

If you have any questions while working on your application, the best thing to do is contact the board or the Engineer School point of contact. The end state for this phase is an accepted application and a letter back from the Missouri Board authorizing you a seat at the examination. Once you have this letter in hand, it is time to focus all your energy on studying and Phase III.

Phase III: Preparation

The question of how much effort to put into studying for the Principles and Practice of Engineering Examination is foremost on every applicant's mind. The best answer—although probably not the one you want to hear—is (of course): Enough to ensure that you pass! This can range anywhere from a few weeks to a few years. Each applicant should conduct an introspective assessment to determine how long and how hard he needs to study. I recommend erring toward longer and harder. It is important to note that for many, this period of preparation may need to start well before Phase II is completed.

The next questions most applicants have are what and how to study. Fortunately, I can offer much more explicit advice in this area. Concerning what to study, I strongly recommend that applicants purchase Michael R. Lindeburg's *Civil Engineering Reference Manual, Practice Problems for the Civil Engineering PE Examination, and Civil Engineering Sample Examination*. Used together, these three books will serve as excellent study guides. They will also function as invaluable resources during the examination. The reference manual contains detailed information about the examination, step-by-step sample problems, and a wealth of up-to-date reference material. The practice problems book includes sample problems covering engineering fundamentals and all disciplines of civil engineering. The sample examination offers a great way to gauge the progress of your preparation. All three books are well worth the cost.

How to study is a little more complicated. It is best to develop a solid plan of action that will streamline your preparation process. A good place to start is by researching the examination, which recently underwent significant revision. The new exam format has two sessions. The morning session includes 40 multiple-choice questions that encompass all disciplines of civil engineering. The afternoon session also has 40 multiple-choice questions focused on one of five disciplines. Applicants must choose from water resource, transportation, geotechnical, environmental, and structural engineering. Decide on a discipline early in your preparation, and focus your studying on that field.

After selecting an area of emphasis, the best way I found to study was to work through the practice problems in Michael Lindeburg's books. The first section in the reference manual is devoted to engineering fundamentals. Although these may seem rudimentary at first, I found them invaluable as a review of complex unit conversions and how to use my calculator. Mastering these two areas alone will greatly enhance your chances for success on the examination. The next sections are each devoted to one of the five afternoon disciplines. Don't be disheartened by the difficulty of the sample problems. With practice, answers will begin to come easily.

While you work through sample problems, take time to become familiar with your reference materials. Chances are that you have the information needed to answer all of the examination questions somewhere in your references. The trick is being able to find the right information quickly. Try to avoid always looking for answers in Michael Lindeburg's books. One slight flaw with using them as study guides is that by design, almost all the information needed to solve his sample problems can be found somewhere in his reference manual. Some of the actual exam questions may require you to dig through other references. You need to become familiar with your other manuals as well.

As examination time draws near, I recommend taking a break from studying. Take some time to relax and mentally recharge. You definitely do not want to be burned out before starting the eight-hour exam. Take the last few days to finish organizing your references and supplies and make the transition from Phase III to Phase IV. The end state for this phase is the confidence that you are ready to pass the examination.

Phase IV: Examination

Taking the Principles and Practice of Engineering Examination is the last step in the process of becoming a registered PE. This phase involves actions on the objective. I can offer advice on what to bring with you, along with some final hints. Taking the examination is up to you!

Applicants often lose sleep while trying to determine which reference books to take to the exam and which to leave behind. I can clear up any confusion. If in doubt, take it. Take every book you own that remotely relates to engineering. Go to the Maneuver Support Center library and check out any additional books you think you might need. Take a good dictionary, the thicker the better. Inevitably, questions will include obscure

words you have never seen before. Take your Engineer School handouts. They present a surprising amount of pertinent information in an easy-to-follow format. Don't worry about being overloaded. No matter how many books you take, you will see people at the exam with more. It is easy to tell the first-timers from the veterans of several examinations. The novices all struggle from their cars to the exam room, dropping books out of overflowing cardboard boxes. The veterans all have bookshelves on wheels they can push along with them. I recommend the middle ground—a collapsible luggage dolly.

In addition to your reference materials, make sure you think through the logistics involved in taking the exam. You will need a good transportation plan. This is partly to accommodate your reference materials, but mostly because of the road network in central Missouri. The board makes every effort to centralize the exam location for applicants from across the state. Unfortunately, this ensures that a direct land route will not exist between the exam site and Fort Leonard Wood. Take the time to conduct a good route recon before the examination. Struggling down unfamiliar Ozark roads in the predawn darkness will only add unneeded stress to your day. A better plan would be to spend the night before the examination in a local hotel so you won't have to worry about getting to the examination site on time.

Having the proper amount of supplies is also essential to success. Determine how many pencils, erasers, batteries, and even calculators you think you will need—and double that amount. Halfway through the afternoon session is not the best time to realize that the 7 key on your calculator has stopped working.

My final piece of advice is to stay relaxed. Don't panic or get frustrated. Stick to your plan of action. Don't try to switch afternoon disciplines at the last minute just because you overheard someone during lunch saying that transportation was easier than water resources. Trust your preparation. Keep a positive attitude. The end state for this phase is walking out of the exam site with full confidence that you passed!

Major Gash is currently a student at the United States Army Command and General Staff College at Fort Leavenworth, Kansas. His previous assignments include service as an assistant professor in the Department of Civil and Mechanical Engineering at the United States Military Academy; as a company commander in the 864th Engineer Battalion at Fort Lewis, Washington; and as a mechanized engineer platoon leader and company executive officer in the 70th Engineer Battalion at Fort Riley, Kansas. He has served in combat in both Iraq and Afghanistan. Major Gash is a graduate of the United States Military Academy and holds master's degrees in geology and geophysics from the University of Missouri-Rolla (now Missouri S&T) and civil engineering from the University of California, Los Angeles. He is a registered professional engineer in the State of Missouri.

Endnote

[1] "Professional Registration: Advice for Aspiring Army Engineers" by Captain Richard J. Gash, *Engineer*, October-December 2002, pages 48-50.

Editor's Note: On 6 November 2008, the American Society of Civil Engineers (ASCE) honored Major Gash at the 138th Annual Civil Engineering Conference in Pittsburgh, Pennsylvania, with its 2008 Young Government Civil Engineer Award. The society presents the award annually to a distinguished civil engineer under the age of thirty-five who has demonstrated significant contributions to civil engineering in the public sector.