How to Use This Book

This book is primarily a companion to the *PE Civil Reference Manual*. As a tool for preparing for an engineering licensing exam, there are a few, but not very many, ways to use it.

Before it grew to behemoth size, I envisioned this book being taken to work, on the bus or train, on business trips, and on weekend pleasure getaways to the beach. I figured that it would “carry” a lot easier than the big *Reference Manual*. Though I do not think you will be taking this book on any backpacking trips, you might still find yourself working problems in the cafeteria during your lunch break.

The big issue is whether you really work the practice problems or not. Some people think they can read a problem statement, think about it for about ten seconds, read the solution, and then say “Yes, that is what I was thinking of, and that is what I would have done.” Sadly, these people find out too late that the human brain does not learn very efficiently in that manner. Under pressure, they find they know and remember too little. For real learning, you have to spend some time with a stubby pencil.

There are so many places where you can get messed up solving a problem. Maybe it is in the use of your calculator, like pushing log instead of ln, or forgetting to set the angle to radians instead of degrees, and so on. Maybe it is rusty math. What is \( \ln(e^x) \), anyway? How do you factor a polynomial? Maybe it is in finding the data needed or the proper unit conversion. Maybe it is just trying to find out if that proprietary building code equation expects \( L \) to be in feet or inches. Conquering these things takes time—more time than you may want to spend when time is at a premium. And unfortunately, most people have to make a mistake once so that they do not make it again.

Even if you do decide to get your hands dirty and actually work the problems (as opposed to skimming through them), you will have to decide how much reliance you place on the published solutions. It is tempting to turn to a solution when you get slowed down by details or stumped by the subject material. You will probably want to maximize the number of problems you solve by spending as little time as you can on each problem. After all, optimization is the engineering way. However, I want you to struggle a little bit more than that—not because I want to see you suffer, but because the optimization is in getting you through your licensing exam. We are not trying to find the optimally minimum study time.

Studying a new subject is analogous to using a machete to cut a path through a dense jungle. By doing the work, you develop pathways that were not there before. It is a lot different than just looking at the route on a map. You actually get nowhere by looking at a map. But cut that path once, and you are in business until the jungle overgrowth closes in again.

So, do the problems. All of them. Do them twice, once in customary U.S. units, and then again in SI units. Do not look at the answers until you have sweated a little. And, let us not have any whining. Please.