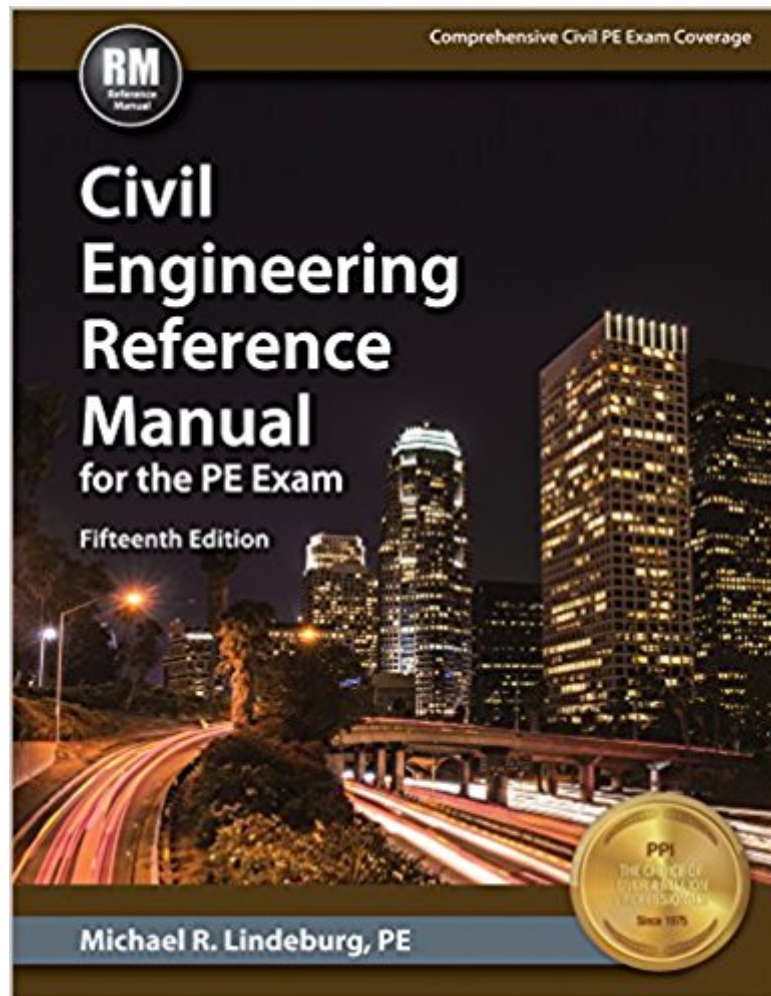




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# Civil Engineering Reference Manual For The PE Exam, 15th Ed



## Synopsis

Upgrade your review with PPI's Civil PE prep course and a passing guarantee. This prep course provides expert instruction, a structured syllabus, PPI's #1 selling review materials, and convenient online viewing from the comfort of home or on the go. Visit [ppi2pass.com](http://ppi2pass.com) to learn more and enroll.

**Comprehensive Civil PE Exam Coverage** The Civil Engineering Reference Manual is the most comprehensive textbook for the NCEES Civil PE exam. This book's time-tested organization and clear explanations start with the basics to help you quickly get up to speed with common civil engineering concepts. Together, the 90 chapters provide an in-depth review of all of the topics, codes, and standards listed in the NCEES Civil PE specifications. The extensive index contains thousands of entries, with multiple entries included for each topic, so you can find the topics referenced no matter how you search.

**This book features:** over 100 appendices containing essential support material; over 500 clarifying examples; over 550 common civil engineering terms defined in an easy-to-use glossary; thousands of equations, figures, and tables; industry-standard terminology and nomenclature; equal support of U.S. customary and SI units. After you pass your exam, the Civil Engineering Reference Manual will continue to serve as an invaluable reference throughout your civil engineering career.

**Exam Topics Covered**

**Civil Breadth:** Project Planning; Means and Methods; Soil Mechanics; Structural Mechanics; Hydraulics and Hydrology; Geometrics; Materials; Site Development

**Construction:** Earthwork Construction and Layout; Estimating Quantities and Costs; Construction Operations and Methods; Scheduling; Material Quality Control and Production; Temporary Structures; Health and Safety. For additional Construction Depth coverage, check out the **Construction Depth Reference Manual**.

**Geotechnical:** Site Characterization; Soil Mechanics, Laboratory Testing, and Analysis; Field Materials Testing, Methods, and Safety; Earthquake Engineering and Dynamic Loads; Earth Structures; Groundwater and Seepage; Problematic Soil and Rock Conditions; Earth Retaining Structures; Shallow Foundations; Deep Foundations

**Structural:** Analysis of Structures; Design and Details of Structures; Codes and Construction. For additional Structural coverage, check out the **Structural Engineering Reference Manual**.

**Transportation:** Traffic Engineering; Horizontal Design; Vertical Design; Intersection Geometry; Roadside and Cross-Section Design; Signal Design; Traffic Control Design; Geotechnical and Pavement; Drainage; Alternatives Analysis. For additional Transportation Depth coverage, check out the **Transportation Depth Reference Manual**.

**Water Resources and Environmental:** Analysis and Design; Hydraulics

- Closed Conduit;
- Open Channel;

Hydrology; Groundwater and Wells; Wastewater Collection and Treatment; Water Quality; Drinking Water Distribution and Treatment; Engineering Economic

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## Customer Reviews

Michael R. Lindeburg, PE, is one of the best-known authors of engineering textbooks and references. His books and courses have influenced millions of engineers around the world. Since 1975, he has authored more than 35 [engineering reference and exam preparation books](#). He has spent thousands of hours teaching engineering to students and practicing engineers. He holds bachelor of science and master of science degrees in industrial engineering from Stanford University.

Most chapters in this book are independent. Start with any one and look through it. Use the index extensively. Decide if you are going to work problems in that topic. If so, solve as many problems in that topic as time allows. Do not stop studying until the exam. Start right now! Quickly! Goodluck. If you are preparing for the PE exam in civil engineering, the following suggestions may help. Find out the current edition of this book. You might be reading this book long after it was published. Newer editions mean that the codes, standards, and regulations on which the exam is based are not represented in the older edition, that the exam body of knowledge has changed, and/or the exam format and policies have changed. Older editions are no longer appropriate for the current exam, and it is not reasonable for you to expect an older edition to serve your needs when it is out of date. Become intimately familiar with this book. This means knowing the order of the chapters, the

approximate locations of important figures and tables, what appendices are available, and so on.

If you're reading these reviews undoubtedly you know what this is and why you need this for the Civil PE exam. That said, as far as I can tell this is pretty much the only comprehensive reference available for the exam so rather than talk more about the CERM itself I wanted to break down some things that helped me use the manual to study and pass the PE exam the first time:

- 1) Download and print out a copy of the index for the CERM from the PPI website, bind it separately, and use that to look stuff up while studying and taking the exam to avoid constantly flipping around in the manual between the index and the chapters. Saves lots of time and aggravation working from multiple places in the CERM. I learned this from people in my review class and never would've thought of this on my own which is why I wanted to share it here.
- 2) For the most used equations, write the constants and such in the margins next to the equations. Highlight the equations to make them pop from the columns of text in the book. This did a few things for me: familiarize me again with the equations and constants, help me remember how to use the equations, and also save me time looking for constants in the back or whatever. I did this the month before my review class started, helped me find what's in the manual too before I got into the heavy duty working of problems during my review class for hours on end.
- 3) Tab everything possible. The exam is all about speed (~5 min/question...) so make sure you can find what you need real fast. I used a combination of heavy duty tabs with paper inserts and the sticky flags. I color coded the tabs by topic and tabbed my manual as follows: tabs across the top for tables of data (e.g. water demands per capita per day, wastewater production per capita per day, etc), tabs down the sides for specific topics/equations (e.g. shallow foundations, water hammer, that CM workflow diagram whose name escapes me right now, etc), tabs across the bottom for the reference tables in the back (e.g. head losses for specific fittings, moments of inertia for generic shapes, the Ten State's regs, etc). Seemed to work real well, I probably had a few too many flags/tabs but I only needed to use the index to find something a few times during the exam so I guess I did okay there. I left all my tabs and flags in the CERM after finding out I passed since it makes the book look real salty and reminds me of the pain I went through studying and taking the exam.

Bottom line here: Know what's in the book and where to find it. The morning exam was pretty much straight out of the CERM and my review class, quite literally 95% of the questions were pure muscle memory from using the CERM to study. The PM exam was the similar but about 25% of the questions couldn't be answered out of the CERM and needed an outside reference (master's level stuff in my opinion and I don't have an MSCE so I just did what I could and guessed the rest).

- 4) Use the CERM as much as possible while studying. I know this

sounds obvious but I first attempted studying with stacks of textbooks from engineering school in addition to my CERM and quickly realized it would never work. You need to become as familiar as possible with the CERM if you want a ghost of a chance of passing, and you'll be amazed what's in there if you look. Also, you will not have time to flip around between 20 books during the exam so just get used to using the CERM as much as possible while studying. Heck, sleep with your CERM if you have to and take it with you to lunch. Remember, there are many CERMs but this one is mine, without my CERM I am nothing, without me my CERM is a monitor stand. For the exam, I only brought in my trusty marked up and tabbed CERM, my open channel hydraulics book, and my (undergrad) geotech book along with my notes and sample problems from my review class. I spent probably 80% of my time in the exam using the CERM, my other references were nearly useless save for some rando oddball questions I was able to find during my spare time to get some extra points. The CERM and a few other things were enough to get me through the WR exam and I am neither a water resources engineer by practice nor the kid from Good Will Hunting.<sup>5</sup>) Take a review class if at all possible. I was fortunate to find one an hour away on Saturdays. It helped me get into the mode of studying a lot (I kept records and including 56 hours of class I spent about 250 hours preparing for the exam over about 3.5 months, did nothing the two weeks before the test due to burnout and a work trip during which I was not going to study in the hotel at night), helped me realize I wasn't the only one fighting my way through the pain and misery, and helped me learn enough to get by in areas that I had little to no college coursework on (e.g. transpo, econ, etc). The review was kinda costly but I figure I got off cheap passing the PE the first time.

This manual served as my primary resource for the April 2016 PE Exam, which I passed on the first try. I highly recommend using this manual as your main source, along with highlighter markers, post-it notes/tabs, and a binder in which to place photocopies of key tables. The test will indeed require additional sources (hydraulic design, hydrology, water and wastewater, soils, and concrete design for me), but the manual is still pretty comprehensive. As I worked through the manual, I tabbed important pages and highlighted key equations. The test through its fair share of curve balls, but I was prepared. I was even able to answer several questions by using the index. My advice is to buy this book (I am keeping mine as a reference forever), work out a loose study schedule based on the number of weeks you have, work as many problems as you can, write out outlines of concepts that you have studied, and take practice exams if you have access. I also recommend YouTube. Civil Engineering Academy was a great supplement to my studying. Good luck to everyone!

I gave it three stars because I took the Construction Depth exam, and this reference has very little construction information. I highly recommend buying a separate construction study guide. However, this reference was quite useful to me during the morning exam for the non-construction problems. HUGE reference, and it has way more information than you would need for any PE exam. I do not recommend using this as a study guide (except for the example problems), just a pure reference like the design standards. Once you narrow down the sections specific to your exam, the material is very useful. Some of the problems were representative of the exam, and others were so complex, they could never be solved in the average 6 minutes per problem (at least not by me). It is good to work those more complex problems for your depth area, so you have a better understanding of the topic. For the exam though, you might have to do two or three steps of those really complex problems.

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