How to Use This Book

If you are the type of person who never reads instructions, here are my “Quickstart” suggestions on how to get the most from California Civil Seismic Building Design during your exam preparation.

1. Get copies of the IBC and ASCE/SEI7 and their errata.
2. Start reading this book from the first chapter. Don’t skip around, because the book builds on concepts.
3. Read slowly; a page or two a day is plenty. Look up every code section in the referenced sources.
4. Work through all of the example and practice problems.
5. Put lots of tabs on the building code tables.
6. Use the indexes extensively.
7. Don’t forget to take it with you to your exam.

Now, beyond those suggestions, how you will use this book depends on why you obtained it. California Civil Seismic Building Design was specifically written for engineering exam review. As the exams vacillated each year between areas of emphasis, the scope and depth of this book also increased. And so, this book now covers a lot of bases, and it can be used for other exams (e.g., SE and ARE) and general familiarity. However, even though its scope and depth have increased enormously over the years, I suspect this book will remain typecast in its leading role—that of an engineering exam review book. Therefore, I am writing this section assuming that you are using California Civil Seismic Building Design for that purpose.

Although this book develops subjects gradually, gently, and linearly, it cram innumerable concepts onto every page. If you don’t have a seismic background, you’ll pretty much have to start at page one and work your way through the book, page by page. I don’t assume that you know anything. I’ve skipped almost all of the higher-order mathematics. And I’ve tried to write and edit the material to provide instruction that is intuitive. However, you’ll still need to go slowly.

I know that some engineering examinees will buy this book just to take it into the open-book exam, rather than reading and working through it. During the exam, they plan to use the index a lot, hoping to hit the jackpot. If that describes you, I predict you won’t pass your exam using that plan. The subject of seismic design is different from most everything else civil engineers do. Even the language is different. What’s the difference between a “drag strut” and a “collector”? (Answer: There is no difference.) What’s the difference between a “space frame” and a “ductile moment-resisting space frame”? (Answer: There can be plenty of difference.) You can read the words, but without having studied the material in this book, they won’t mean anything to you. You’ll just be wasting your time if you think you’re a hotshot engineer who can get by on good looks and this book’s good index.

The California Civil: Seismic Principles Exam is based on the California Building Code (CBC). The seismic design principles in the CBC are essentially those of the IBC and ASCE/SEI7. Due to the cost of the CBC, its two-book format, and its references to the IBC and ASCE/SEI7, few examinees purchase it. The IBC and ASCE/SEI7 are suitable substitutes.

For the open-book engineering exams, you are much more likely to need to pull a number out of the IBC or ASCE/SEI7 than to read a code section. Not surprisingly, the only place where a complete compilation of all of the constants and other numerical values can be found is in the building codes themselves. The numerous tables and figures in this book give a false impression of completeness. True, every detail needed to solve an example or practice problem is probably contained somewhere in this book. However, the actual exam will not be so kind. It’s always a shame to lose points simply because you couldn’t perform a simple table lookup in “the code.” So, as the suggestions at the top of this section say, if you are taking an open-book engineering exam, buy the IBC and ASCE/SEI7.

The California seismic exam places a lot of emphasis on design and detailing of connections. What is a good connection? What used to be considered a good connection? What are the modes of failure of connections? And, what can be done to strengthen a connection? Learning to recognize adequacy in a variety of concrete, steel, masonry, and timber (including structural panel) connections is an important part of the exam. The example and practice problems in this book have been selected to make, or emphasize, certain points. But these problems do not try to mimic exam complexity. PPI has produced two other seismic problem-oriented books, California Civil Seismic Principles Solved Problems and California Civil Seismic Principles Practice Exams, by Majid Baradar, to provide hundreds of
additional practice problems in exam format. You can get extensive practice by working problems in these two well-organized books.

ABOUT THE CALIFORNIA CIVIL SEISMIC PRINCIPLES EXAM

The California Civil: Seismic Principles Exam is a computer-based test (CBT) administered at a Prometric testing center. There are Prometric testing centers throughout the United States. The exam is offered twice a year, around the dates of the NCEES professional engineering exams, during a relatively short (e.g., three-week) period defined by the California Board for Professional Engineers, Land Surveyors, and Geologists.

The exam is 2.5 hours in length and is taken in one single sitting. The exam consists of 55 questions, all of which are multiple-choice, each with four options. The average time allowed per question is about three minutes, but you can spend as much or as little time as you want on any problem. “Too little time,” is a common comment from examinees. Some of the questions are conceptual, some are theoretical, some are practical, some are straight lookup, and some require simple calculations.

Navigation through the exam using the CBT interface is fairly standard. There is a list of all questions indicating which have been answered, marked for review, or skipped. You can skip a question or mark it for later review. You can navigate to a specific question. You don’t have to move sequentially through the exam, although you can if you wish to. You can return to any question and change your answer.

A timer is shown on the screen indicating how much time remains. There is no significant lag time between the problems. In some cases, you may have to toggle back and forth between a question and an on-screen illustration if the illustration takes up too much screen space.

Creature comforts are typical of CBT testing centers. Procedures used to ensure security may be objectionable and/or silly to some examinees. Desktop space is small, sufficient for only one book at a time. You can take a restroom break, but the clock doesn’t stop running. You simply raise your hand and wait for a proctor to come and release you. You can have a bottle of water. The chair will be adjustable and comfortable. Noise-reducing earplugs are allowed.

The total number of points on the exam and the minimum passing score are not public knowledge. The percentage of people who pass varies considerably: between 30% and 40%, typically. Many examinees receive specialized instruction in seismic design (i.e., they take a specialized course), and the reported passing percentage factors in those “knowledgeable” examinees. There is only a moderate correlation between the people who pass the NCEES eight-hour exam, and the people who pass the California seismic exam.

The Seismic Principles Test Plan, which defines the fundamental principles, tasks, and elements of knowledge that you need to know, has been made public by the California board. If you want to know what is needed in order to pass, you can print out the test plan from the website of the California Board for Professional Engineers, Land Surveyors, and Geologists. A link to the test plan is provided at ppi2pass.com/CAspecial. What you will find out is that you need to know everything in this book and then some. You cannot learn much from the test plan other than that the scope of the exam is huge. The areas of emphasis may change from exam to exam. You just have to take whatever they throw at you when you show up for your exam.

Your results are mailed to you; grading is not instantaneous. You will never learn your actual score. The only result reported is “Pass” or “Fail.” If you fail, you will receive a Diagnostic Report that indicates your performance level (i.e., Proficient, Marginal, or Deficient) in each of the five content areas of the test plan.

ABOUT THE NCEES STRUCTURAL ENGINEERING (SE) EXAM

The NCEES Structural Engineering (SE) Examination is offered in two parts. The first part—vertical forces (gravity/other) and incidental lateral—takes place on a Friday. The second part—lateral forces (wind/earthquakes)—takes place on a Saturday. Each part comprises a breadth section and a depth section. The breadth sections in the morning are each 4 hours and contain 40 multiple-choice problems that cover a range of structural engineering topics specific to vertical and lateral forces. The depth sections in the afternoon are also each 4 hours, but instead of multiple-choice problems, they contain essay (design) problems. You may choose either the bridges or the buildings depth section, but you must work the same depth section across both parts of the exam. That is, if you choose to work buildings for the lateral forces part, you must also work buildings for the vertical forces part. Both breadth and depth sections use customary U.S. units.

According to NCEES, the vertical forces (gravity/other) and incidental lateral depth section in buildings covers loads, lateral earth pressures, analysis methods, general structural considerations (e.g., element design), structural systems integration (e.g., connections), and foundations and retaining structures. The depth section in bridges covers gravity loads, superstructures, substructures, and lateral loads other than wind and seismic. It may also require pedestrian bridge and/or vehicular bridge knowledge.

The lateral forces (wind/earthquake) depth section in buildings covers lateral forces, lateral force distribution, analysis methods, general structural considerations (e.g., element design), structural systems integration (e.g., connections), and foundations and retaining structures. The depth section in bridges covers gravity loads, superstructures,
substructures, and lateral forces. It may also require pedestrian bridge and/or vehicular bridge knowledge. For more information regarding the NCEES SE exam, go to the NCEES website, ncees.org.

ABOUT THE ARCHITECT REGISTRATION EXAM

The Architect Registration Examination (ARE) is composed of six divisions that test various areas of architectural knowledge and problem-solving ability: practice management, project management, programming and analysis, project planning and design, project development and documentation, construction and evaluation. Most divisions include both multiple-choice and graphic/design-type problems. Seismic force problems are part of the structural systems division, but experienced test-takers will tell you that there is quite a bit of overlap among the divisions so it’s best to be prepared for seismic problems in any division. Like with the California seismic exam, you have to take what they throw at you, and run with it. For more information about the ARE, see ppi2pass.com/are-resource-hub.