HOW TO USE THIS BOOK

If you are the type who never reads instructions, here are my "Quickstart" theorems on how to get the most from *Seismic Design of Building Structures* during your exam preparation.

1. Get a copy of the IBC-06 and its 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 all of the example and practice problems.

If you are taking an open-book exam, here are my "Quickstart" corollaries on how to get the most from this book during the exam.

1. Don't forget to take it with you.
2. Put lots of tabs on the building code tables.
3. Use the indexes extensively.

Now, beyond that, how you will use this book depends on why you obtained it. *Seismic Design* was originally written specifically for 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. By my own pronouncement, it is now one of the best quick-primers on seismic design in print, and certainly, it's one of the most up-to-date primers. However, even though its scope and depth have increased by several orders of magnitude, I suspect this book will remain typecast in its leading role—that of an exam review book. Therefore, I am writing this section assuming that you are using *Seismic Design* book for exam review.

Although it develops subjects gradually, gently, and linearly, this book crams 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.

The California seismic exams (special civil and structural) and the national ARE are now based on the IBC-06. For the closed-book ARE exams, the concepts and theories are more important than actual equations and numbers. For example, you might need to know that a particular design category is used when the soil structure is unknown, but you won't be expected to know the nature of soil in a particular location. For the ARE, you should pay particular attention to past history (seismic events and building innovations), the people mentioned in the footnotes, the processes, the generalities, and the exceptions. You will want to know how to read the tables and figures so that you can use any abridged versions provided during the examination. You will want to understand units and recognize variable names and symbols. You will want to remember and understand the code sections.

On the other hand, for the open-book engineering exams, you are much more likely to need to pull a number out of the CBC or IBC 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 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 look-up in "the code." So, as the first suggestions at the top of this section say, if you are taking an open-book engineering exam, buy the IBC.

All of the exams place a lot of emphasis on detailing connections. What is a good connection? What used to be considered to be 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 examinations.

I know that some engineering examinees will buy this book just to take it into the open-book exam. 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 the California 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 hot-shot engineer who can get by on good looks and this book's good index.

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, *345 Solved Seismic Design Problems* and *Seismic Principles Practice Exams for the California Special Civil Engineer Examination*, 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 SPECIAL CIVIL ENGINEER SEISMIC EXAM FORMAT

In California, examinees take the NCEES Civil Engineering PE Exam, a national exam, on a Friday. Then, they come back the next day, on Saturday, for the California Special Civil Engineer Seismic Exam. (They may also take the California Special Surveying Exam on the same day.)

The format of this exam has evolved considerably. The current California Special Civil Engineer Seismic Exam is 2½ hours in length, which you take in one single sitting. The exam consists of 50 questions, all of which are multiple-choice, each with four options. Some of the questions are conceptual, some are theoretical, some are practical, some are straight look-up, and some require simple calculations. By now, you have probably figured out that the average time allowed per question is about 3 minutes. So you can see the level of difficulty cannot be insurmountable. You just have to go, go, go. For most people, it's pretty easy to know when you have to guess at a question and then move on.

Each question is worth from 2 to 8 points, with an average value of 6 points, making a total score of 300 points possible. The minimum passing score (i.e., the "cut score") varies somewhat, but seems to hover around 60%. The percentage of people who pass varies considerably: 40% to 50% passing is typical. There is only moderate correlation between the people who pass the NCEES eight-hour exam, the people who pass the special civil seismic exam, and those who pass the special surveying exam. The percentage of people who pass all three exams at the same time is not high.

The exam "test plan" that 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 you have to know in order to pass, you can print out the test plan from the web site of the California Board for Professional Engineers and Land Surveyors. A link to the test plan is provided at **www.ppi2pass.com/CAspecial**. What you will find out is that you need to know everything in this book and then some. I didn't include the actual test plan in this book because it's too scary-looking. You cannot learn anything from it, other than that the scope of the exam is huge. Besides, the test plan is vulnerable to the "change without notice" syndrome, anyway. You just have to take whatever they throw at you when you show up for your exam.

ABOUT THE CALIFORNIA STRUCTURAL ENGINEER SEISMIC EXAM FORMAT

In California, engineers wanting to use the title structural engineer are required to pass the NCEES PE Structural II exam, as well as the California Structural Engineer Seismic Exam (CSESE or CSE2). The NCEES Structural II Exam is administered in April and October, on a Friday. The CSESE is administered only in October on a Saturday. You can take the exams in parts, but both must be passed in order to become a structural engineer in California.

The CSESE is a one-day, eight-hour exam. It consists of approximately 40 multiple-choice and 60 design/essay-type questions, worth a total of 400 points. Four hours are allotted to complete the A.M. multiple-choice section and four hours to complete the P.M. design section. The entire exam is open book.

CSESE tests on the seismic principles and practices of structural engineering, and on elements of current practice in structural engineering. Your knowledge of structural engineering principles, design criteria, analysis of new and existing structures, and reasoning ability as

demonstrated in the solutions for design problems will be tested. Problems cover all common construction materials, such as steel, concrete, wood, and masonry. The design/essay portion of the exam tests on one of each of the following: multi-story buildings, schools/hospitals, and existing structures. Note that all concrete and steel problems must be solved using the LRFD method, while wood problems must be solved using ASD. Masonry problems will designate whether ASD or LRFD methods should be used. No credit will be given for problems solved using the incorrect method. The specific content of the examination is supplied by the California board, and given in the California Structural Engineer Seismic Examination Test Plan. You can find a link to the California Board for Professional Engineers and Land Surveyors test plan at **www.ppi2pass.com /CAstructural**.

ABOUT THE ARCHITECT REGISTRATION EXAM FORMAT

The ARE is composed of seven divisions that test various areas of architectural knowledge and problem-solving ability: programming, planning and practice; site planning and design; schematic design; structural systems; building systems; building design and construction systems; and construction documents and services. Most divisions include both multiple choice and graphic/design-type problems. Seismic force problems are part 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 exams, you have to take what they throw at you, and run with it.

You may schedule any division of the ARE at any time and may take the divisions in any order. Divisions can be taken one at a time, to spread out preparation time and exam costs, or can be taken together in any combination. However, all seven divisions of the ARE must be passed within a single five-year period. If you have not completed the ARE within five years, the divisions you passed more than five years ago are no longer credited, and the content must be retaken. For more information about the ARE, see **www.ppi2pass.com/areinfo**.