Introduction

ABOUT THIS BOOK

The Construction Depth Reference Manual covers the construction depth section of the civil PE exam administered by the National Council of Examiners for Engineering and Surveying (NCEES). This section of the exam is intended to assess your knowledge of construction engineering principles and practice.

This book is written with the exam in mind. National codes are referenced, and the appropriate sections are explained and analyzed in a concise and simple manner. Example problems further expand upon major topics in each chapter and can be used to improve problem-solving techniques.

This book’s seven chapters cover the following exam specifications.

1. Earthwork Construction and Layout (15%)
   Excavation and embankment (e.g., cut and fill), borrow pit volumes, site layout and control, earthwork mass diagrams and haul distance, site and subsurface investigations

2. Estimating Quantities and Costs (15%)
   Quantity take-off methods, cost estimating, cost analysis for resource selection, work measurement and productivity

3. Construction Operations and Methods (17.5%)
   Lifting and rigging, crane stability, dewatering and pumping, equipment operations (e.g., selection, production, economics), deep foundation installation

4. Scheduling (12.5%)
   Construction sequencing, activity time analysis, CPM network analysis, resource scheduling and leveling, time-cost trade-off

5. Material Quality Control and Production (15%)
   Material properties and testing (e.g., concrete, soil, asphalt), weld and bolt installation, quality control process (QA/QC), concrete proportioning and placement, concrete maturity and early strength evaluation

6. Temporary Structures (17.5%)
   Construction loads, codes, and standards; formwork; falsework and scaffolding; shoring and reshoring; bracing and anchorage for stability; temporary support of excavation

7. Health and Safety (7.5%)
   OSHA regulations and hazard identification/abatement, safety management and statistics, work zone and public safety

HOW TO USE THIS BOOK

The Construction Depth Reference Manual provides a comprehensive, targeted review and reference for the material found on the construction depth section of the civil PE exam, and is designed to be used in conjunction with the Civil Engineering Reference Manual as your primary breadth exam resource. Start by reviewing the exam topics (listed in this introduction) and familiarizing yourself with the contents and format of this book by looking at the table of contents, the index, and scanning the chapters and appendices. Each chapter begins with a nomenclature list of the chapter’s variables and units for easy reference. Example problems are provided throughout each chapter. Significant terms and concepts have been indexed to provide a method of quickly finding information and data.

Decide on a study schedule, assess your strengths and weaknesses, and determine how much time to spend reviewing each chapter. As you read each chapter, review or work the example problems. Compare your problem-solving approach against that provided in the example’s solution. With practice, you will be able to quickly decide which codes and information are applicable to the problem at hand.