

PE Civil Construction Practice Exam (Sample)

Study Guide



Everything you need from our exam experts!

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Introduction

Preparing for a certification exam can feel overwhelming, but with the right tools, it becomes an opportunity to build confidence, sharpen your skills, and move one step closer to your goals. At Examzify, we believe that effective exam preparation isn't just about memorization, it's about understanding the material, identifying knowledge gaps, and building the test-taking strategies that lead to success.

This guide was designed to help you do exactly that.

Whether you're preparing for a licensing exam, professional certification, or entry-level qualification, this book offers structured practice to reinforce key concepts. You'll find a wide range of multiple-choice questions, each followed by clear explanations to help you understand not just the right answer, but why it's correct.

The content in this guide is based on real-world exam objectives and aligned with the types of questions and topics commonly found on official tests. It's ideal for learners who want to:

- Practice answering questions under realistic conditions,
- Improve accuracy and speed,
- Review explanations to strengthen weak areas, and
- Approach the exam with greater confidence.

We recommend using this book not as a stand-alone study tool, but alongside other resources like flashcards, textbooks, or hands-on training. For best results, we recommend working through each question, reflecting on the explanation provided, and revisiting the topics that challenge you most.

Remember: successful test preparation isn't about getting every question right the first time, it's about learning from your mistakes and improving over time. Stay focused, trust the process, and know that every page you turn brings you closer to success.

Let's begin.

How to Use This Guide

This guide is designed to help you study more effectively and approach your exam with confidence. Whether you're reviewing for the first time or doing a final refresh, here's how to get the most out of your Examzify study guide:

1. Start with a Diagnostic Review

Skim through the questions to get a sense of what you know and what you need to focus on. Your goal is to identify knowledge gaps early.

2. Study in Short, Focused Sessions

Break your study time into manageable blocks (e.g. 30 - 45 minutes). Review a handful of questions, reflect on the explanations.

3. Learn from the Explanations

After answering a question, always read the explanation, even if you got it right. It reinforces key points, corrects misunderstandings, and teaches subtle distinctions between similar answers.

4. Track Your Progress

Use bookmarks or notes (if reading digitally) to mark difficult questions. Revisit these regularly and track improvements over time.

5. Simulate the Real Exam

Once you're comfortable, try taking a full set of questions without pausing. Set a timer and simulate test-day conditions to build confidence and time management skills.

6. Repeat and Review

Don't just study once, repetition builds retention. Re-attempt questions after a few days and revisit explanations to reinforce learning. Pair this guide with other Examzify tools like flashcards, and digital practice tests to strengthen your preparation across formats.

There's no single right way to study, but consistent, thoughtful effort always wins. Use this guide flexibly, adapt the tips above to fit your pace and learning style. You've got this!

Questions

- 1. What is headwater in relation to a culvert?**
 - A. The height of water during a flood event**
 - B. The depth at the beginning (upstream) of the culvert**
 - C. The total flow capacity of the culvert**
 - D. The volume of water managed by the culvert**
- 2. What is meant by dead storage in the context of a detention pond?**
 - A. Water stored above the outlet level**
 - B. The area below the outlet structure**
 - C. The capacity of the pond**
 - D. Drainage area of the pond**
- 3. How should 1 kN be interpreted when making calculations?**
 - A. 10 N**
 - B. 100 N**
 - C. 1000 N**
 - D. 10000 N**
- 4. Which of the following is a characteristic of a pile cap?**
 - A. It is always made of wood**
 - B. It is a thin layer of concrete**
 - C. It connects multiple columns directly**
 - D. It acts as a unit in supporting structural loads**
- 5. The area of a trapezoid can be calculated using which formula?**
 - A. $A = (b_1 + b_2) / 2 * h$**
 - B. $A = b * h$**
 - C. $A = (b_1 + b_2) * h$**
 - D. $A = \pi * r^2$**
- 6. How many pounds are in one sack of cement?**
 - A. 50 lbs**
 - B. 74 lbs**
 - C. 94 lbs**
 - D. 100 lbs**

- 7. What is form shoring used for in construction?**
- A. To provide insulation for foundations**
 - B. To support a building or structure temporarily**
 - C. To waterproof basements during construction**
 - D. To reinforce soil stability**
- 8. What characterizes a Unit Price contract?**
- A. Fixed pricing with no repeatable items**
 - B. Set pricing for known quantities of repeatable work**
 - C. Cost transparency with no maximum limit**
 - D. Payment based solely on time wages**
- 9. What is the primary purpose of a detention pond's dead storage?**
- A. To capture and store excess sediment**
 - B. To manage and control stormwater runoff**
 - C. To provide aquatic habitat**
 - D. To reduce evaporation rates**
- 10. Which manual addresses load combinations including environmental loads in construction?**
- A. ACI 318-14 Design of Structural Concrete**
 - B. ASCE 37-14 Design Loads on Structures During Construction**
 - C. ACI 347-07 Guide to Formwork for Concrete**
 - D. ASCE 7-10 Minimum Design Loads**

Answers

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- 1. B**
- 2. B**
- 3. C**
- 4. D**
- 5. A**
- 6. C**
- 7. B**
- 8. B**
- 9. B**
- 10. B**

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Explanations

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1. What is headwater in relation to a culvert?

- A. The height of water during a flood event**
- B. The depth at the beginning (upstream) of the culvert**
- C. The total flow capacity of the culvert**
- D. The volume of water managed by the culvert**

The term "headwater" refers specifically to the depth of water at the upstream end of a culvert, indicating the elevation of water just before it enters the structure. This measurement is crucial for understanding how much water is backing up or pooling in front of the culvert during flow events. Headwater levels can provide insight into hydrologic conditions, assist in sizing culverts appropriately, and help ensure that they are capable of managing expected flow rates without causing flooding or excessive water buildup. Understanding headwater is essential for engineers, as it impacts the design considerations for the culvert, including its dimensions and the potential need for other water management strategies downstream. This measurement helps in assessing the performance of the culvert and evaluating hydraulic conditions, making it a key factor in drainage design and flood management.

2. What is meant by dead storage in the context of a detention pond?

- A. Water stored above the outlet level**
- B. The area below the outlet structure**
- C. The capacity of the pond**
- D. Drainage area of the pond**

Dead storage is defined as the water volume stored in a detention pond that is situated below the outlet structure. This region is significant because it allows for the retention of water during storm events and helps facilitate sedimentation and pollutant removal before the water is released. The design typically incorporates this space to manage smaller storm events effectively, ensuring that water does not immediately overflow the outlet and instead is allowed to percolate or be stored until it can be released in a controlled manner. The area below the outlet structure is crucial for the functioning of the detention pond and contributes to water quality and hydrology management. In this context, dead storage ensures that a volume of water is held within the pond over time, helping to maintain ecosystem health and water quality standards within the watershed.

3. How should 1 kN be interpreted when making calculations?

- A. 10 N
- B. 100 N
- C. 1000 N**
- D. 10000 N

The interpretation of 1 kN is based on the metric system, where the "k" denotes a prefix meaning "kilo," which represents a factor of one thousand. Therefore, when 1 kN (kilonewton) is encountered in calculations, it should be understood as 1,000 newtons (N). This unit of force is commonly used in civil engineering and construction practices because it simplifies the representation of weights and loads commonly encountered in these fields. Understanding and converting these units accurately is essential for making precise calculations regarding structural loads, material strengths, and various engineering applications. Recognizing that 1 kN equals 1,000 N ensures that calculations involving forces are conducted correctly. In contrast, the other numerical values provided do not accurately reflect the definition of a kilonewton, and thus would not be suitable interpretations for this measurement in calculations.

4. Which of the following is a characteristic of a pile cap?

- A. It is always made of wood
- B. It is a thin layer of concrete
- C. It connects multiple columns directly
- D. It acts as a unit in supporting structural loads**

A pile cap is a robust structural element that is placed on top of a group of piles. Its primary function is to distribute loads from the superstructure above into the piles below. By acting as a unit, the pile cap helps ensure that the loads are evenly distributed across the pile foundations, which contributes to the stability and integrity of the overall structure. This characteristic is crucial in situations where soil conditions may be inadequate to support the loads directly or where settlement could be a concern. Choosing this characteristic underscores the pivotal role of a pile cap in foundation design, especially in heavy load situations or in soft soil conditions. The other options do not accurately describe a pile cap's fundamental attributes—such as being made of wood, being a thin concrete layer, or merely connecting columns. Instead, the emphasis on acting as a unit in load support highlights its importance in foundation engineering.

5. The area of a trapezoid can be calculated using which formula?

A. $A = (b_1 + b_2) / 2 * h$

B. $A = b * h$

C. $A = (b_1 + b_2) * h$

D. $A = \pi * r^2$

The area of a trapezoid can be accurately calculated using the formula $A = \frac{(b_1 + b_2)}{2} \times h$. In this formula, (b_1) and (b_2) represent the lengths of the two parallel sides (bases) of the trapezoid, and (h) is the height, which is the perpendicular distance between these two bases. This formula essentially averages the lengths of the two parallel bases and then multiplies that average by the height to obtain the area. The reasoning behind this approach lies in the fact that the trapezoid can be viewed as a composite shape that can be broken down into simpler figures, such as rectangles or triangles, when determining its overall area. The other formulas provided do not apply to trapezoids: - The formula that suggests $A = b \times h$ pertains to rectangles, where (b) is the length of one side and (h) is the height. - Another option suggests $A = (b_1 + b_2) \times h$ does not consider the division by 2, which is essential for averaging the two bases in a trapezoid.

6. How many pounds are in one sack of cement?

A. 50 lbs

B. 74 lbs

C. 94 lbs

D. 100 lbs

The standard weight of a sack of cement commonly used in the construction industry is 94 pounds. This weight has been established for many types of Portland cement and is widely accepted in building specifications and practices. Cement is typically sold in this standard size because it simplifies the calculations for mixing concrete and ensures consistency across various projects. This 94-pound sack size allows for easier handling and transportation while maintaining an efficient balance between material quantity and labor requirements. Other weights, such as 50 pounds or 100 pounds, may exist for specific applications or types of materials but are not the standard weight for Portland cement sacks. Therefore, choosing 94 pounds reflects the most commonly used measurement in the construction sector.

7. What is form shoring used for in construction?

- A. To provide insulation for foundations
- B. To support a building or structure temporarily**
- C. To waterproof basements during construction
- D. To reinforce soil stability

Form shoring is a temporary support system used in construction to support structures, particularly during the process of concrete placement and curing. When concrete is poured, it needs adequate support to maintain its shape until it has cured sufficiently to bear its own weight and the loads it will encounter later. Form shoring helps ensure that the concrete remains in the desired position and does not sag or collapse before it has achieved the necessary strength. In this context, the role of form shoring is crucial during the construction of floors, walls, and other structural components. The temporary nature of the support is essential, as once the concrete has hardened, the form shoring can be removed safely without compromising the integrity of the structure. While the other options present valuable aspects of construction, they do not relate directly to the primary function of form shoring. Insulation, waterproofing, and soil stabilization involve different techniques and materials that serve specific purposes unrelated to the temporary structural support provided by form shoring.

8. What characterizes a Unit Price contract?

- A. Fixed pricing with no repeatable items
- B. Set pricing for known quantities of repeatable work**
- C. Cost transparency with no maximum limit
- D. Payment based solely on time wages

A Unit Price contract is characterized by its structure allowing for set pricing based on known quantities of work that are repeatable. This type of contract is commonly used in construction projects where certain tasks can be quantified in units, such as cubic yards of excavation, linear feet of piping, or tonnage of materials. In the context of this contract, the contractor provides a unit price for specific items of work. As the project progresses, the quantities of each item are measured, and the contractor is paid based on the actual quantities completed times the agreed-upon unit price. This approach provides flexibility to account for variations in the project scope while ensuring that the contractor is compensated fairly for the work completed. Therefore, the essence of a Unit Price contract lies in its allowance for price adjustments based on fluctuating quantities of work, making it particularly useful for projects involving specific and repetitive tasks. This ensures cost control and accountability, reflecting the actual work performed.

9. What is the primary purpose of a detention pond's dead storage?

- A. To capture and store excess sediment**
- B. To manage and control stormwater runoff**
- C. To provide aquatic habitat**
- D. To reduce evaporation rates**

The primary purpose of a detention pond's dead storage is to manage and control stormwater runoff. Dead storage refers to the portion of the pond that holds water permanently, regardless of rainfall events. This storage area provides crucial capacity for managing runoff by allowing for the gradual release of stormwater. During a storm, excess water flows into the pond and is temporarily stored, reducing the peak flow rate that would otherwise enter downstream watercourses. This controlled release helps prevent flooding and minimizes erosion in the surrounding areas. While other functions, such as sediment capture, providing aquatic habitats, and reducing evaporation, may also be attributes of a detention pond to varying degrees, these are not the primary intended functions of the dead storage aspect. The central aim is stormwater management, which underpins the design and operation of detention facilities within urban planning and environmental engineering practices.

10. Which manual addresses load combinations including environmental loads in construction?

- A. ACI 318-14 Design of Structural Concrete**
- B. ASCE 37-14 Design Loads on Structures During Construction**
- C. ACI 347-07 Guide to Formwork for Concrete**
- D. ASCE 7-10 Minimum Design Loads**

The correct choice focuses on ASCE 7-10, which is the standard widely recognized for establishing minimum design loads for buildings and other structures. This manual provides detailed guidelines on various load combinations, including factors for dead loads, live loads, and environmental loads, such as wind and snow. ASCE 7-10 explicitly addresses the need to consider these environmental loads during the design phase to ensure structures can withstand the conditions they will face over their lifespans. It is essential for engineers to integrate these variables into their calculations to guarantee safety and structural integrity. While the other options discuss relevant aspects of structural design and construction, they do not specifically focus on load combinations that include environmental factors. ACI 318-14 deals primarily with the design of structural concrete without explicitly addressing load combinations, and ACI 347-07 is more about formwork practices rather than load considerations. ASCE 37-14 focuses on loads during the construction phase, but it does not comprehensively cover environmental load combinations as ASCE 7-10 does.

Next Steps

Congratulations on reaching the final section of this guide. You've taken a meaningful step toward passing your certification exam and advancing your career.

As you continue preparing, remember that consistent practice, review, and self-reflection are key to success. Make time to revisit difficult topics, simulate exam conditions, and track your progress along the way.

If you need help, have suggestions, or want to share feedback, we'd love to hear from you. Reach out to our team at hello@examzify.com.

Or visit your dedicated course page for more study tools and resources:

<https://pecivilconstruction.examzify.com>

We wish you the very best on your exam journey. You've got this!