

ACI Concrete Field Testing Technician - Grade I 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

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- 1. Which ASTM Standard governs the sampling of concrete for the slump test?**
 - A. C150, Standard Specification for Portland Cement**
 - B. C172, Standard Practice for Sampling Freshly Mixed Concrete**
 - C. C31, Standard Practice for Making and Curing Concrete Test Specimens**
 - D. C39, Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens**

- 2. A 6 by 12 in [150 mm by 300 mm] cylinder mold can be used for concrete containing aggregate with particles not exceeding what size?**
 - A. 1 in. [25 mm]**
 - B. 1.5 in. [37.5 mm]**
 - C. 2 in. [50 mm]**
 - D. 2.5 in. [62.5 mm]**

- 3. If the concrete has a slump of less than 1 in. [25 mm], how must the test specimens be consolidated?**
 - A. Rodding**
 - B. Vibration**
 - C. Pressing**
 - D. Mixing**

- 4. What is the required number of strokes of the tamping rod for consolidating each layer in a 0.5 ft³ measure?**
 - A. 10**
 - B. 15**
 - C. 25**
 - D. 30**

- 5. What action is recommended if there is uncertainty about the accuracy of the temperature measuring device?**
 - A. Replace the device**
 - B. Calibrate the device**
 - C. Use another method of measurement**
 - D. Ignore the uncertainty**

- 6. What is the minimum thickness for a glass or acrylic strike-off plate in the slump test?**
- A. 1/4 in. [6 mm]**
 - B. 1/2 in. [12 mm]**
 - C. 3/4 in. [19 mm]**
 - D. 1 in. [25 mm]**
- 7. When rodding the bottom layer, how should the tamping rod be positioned?**
- A. Vertical**
 - B. Slightly inclined**
 - C. Horizontal**
 - D. Perpendicular**
- 8. Which of the following describes the procedure for handling the temperature measuring device after placement?**
- A. It should be left alone**
 - B. It should be jiggled to ensure contact**
 - C. Gently pressed at the surface**
 - D. Immediately removed for readings**
- 9. What is the minimum allowable capacity of the measuring bowl used in the related testing method?**
- A. 3 L (0.10 ft³)**
 - B. 6 L (0.20 ft³)**
 - C. 12 L (0.40 ft³)**
 - D. 15 L (0.50 ft³)**
- 10. How is the top of the concrete specimen identified for slump measurement?**
- A. By the top edge of the mold**
 - B. By the displaced original center of the top surface**
 - C. By the lowest point of the specimen**
 - D. By the color change of the concrete**

Answers

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

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Explanations

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1. Which ASTM Standard governs the sampling of concrete for the slump test?

- A. C150, Standard Specification for Portland Cement**
- B. C172, Standard Practice for Sampling Freshly Mixed Concrete**
- C. C31, Standard Practice for Making and Curing Concrete Test Specimens**
- D. C39, Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens**

The correct answer is governed by ASTM C172, which is the Standard Practice for Sampling Freshly Mixed Concrete. This standard specifically outlines the procedures and precautions necessary for sampling concrete to ensure that the sample is representative of the batch. Sampling is a critical step before conducting tests such as the slump test because it directly affects the reliability and accuracy of the test results. The standard includes important guidelines on how to collect and handle samples, including the quantity of concrete needed, methods to prevent contamination, and the timing of the sample collection in relation to the placement of concrete. Understanding ASTM C172 is essential for any technician performing field tests on concrete, as it ensures adherence to best practices and compliance with industry standards. The other options, while related to concrete testing and specifications, focus on different aspects: C150 pertains to cement specifications, C31 deals with making and curing specimens for strength tests, and C39 describes the testing of the compressive strength of concrete cylinders. Therefore, none of those standards provide the specific guidance on sampling needed for conducting a slump test.

2. A 6 by 12 in [150 mm by 300 mm] cylinder mold can be used for concrete containing aggregate with particles not exceeding what size?

- A. 1 in. [25 mm]**
- B. 1.5 in. [37.5 mm]**
- C. 2 in. [50 mm]**
- D. 2.5 in. [62.5 mm]**

The correct choice regarding the maximum particle size of aggregate that can be used in a 6 by 12 inch (150 mm by 300 mm) cylinder mold is based on the principle that the largest aggregate particle should not exceed one-third of the diameter of the cylinder. In this case, the diameter of the cylinder mold is 6 inches (or 150 mm), and one-third of this dimension is 2 inches (50 mm). This means that aggregates must be smaller than or equal to this size to ensure proper concrete compaction and consistent testing results. Larger aggregate sizes could hinder proper filling of the mold, result in voids, or affect the structural properties of the concrete. Therefore, using aggregates larger than 2 inches could compromise the integrity of the testing process and the accuracy of the strength results derived from the cylinders. The other options suggest particle sizes greater than this threshold, which would not comply with the best practices outlined in concrete testing procedures.

3. If the concrete has a slump of less than 1 in. [25 mm], how must the test specimens be consolidated?

- A. Rodding**
- B. Vibration**
- C. Pressing**
- D. Mixing**

When concrete has a slump of less than 1 inch (25 mm), it indicates a very stiff mix. In such cases, adequate consolidation of the test specimens is crucial to ensure that the concrete is uniformly compacted, which affects its overall properties and allows for accurate testing results. Vibration is the preferred method for consolidating stiff concrete, as it effectively eliminates air pockets and achieves a dense mix without damaging the concrete's structure. Vibration ensures that the concrete flows into corners and around reinforcement, which is especially important for achieving a proper sample that accurately reflects the characteristics of the mix. This method introduces energy into the mix through mechanical means, thereby loosening it enough to settle conveniently into the mold while maintaining the integrity of the specimen. In contrast, rodding may be less effective for stiff mixes since it relies on manual manipulation to push the concrete down and might not adequately consolidate the material throughout, especially in denser areas. Pressing is typically not a recognized method for concrete consolidation in laboratory settings, and mixing is generally not designed for the purpose of consolidation of specimens after the initial pour. Therefore, vibration stands out as the most effective method for consolidating concrete with a low slump.

4. What is the required number of strokes of the tamping rod for consolidating each layer in a 0.5 ft³ measure?

- A. 10**
- B. 15**
- C. 25**
- D. 30**

The correct answer for the required number of strokes of the tamping rod for consolidating each layer in a 0.5 ft³ measure is based on standard procedures outlined in concrete testing guidelines. When consolidating concrete in a measure of this size, it is essential to ensure that the concrete is adequately compacted to avoid air pockets and achieve the desired density. For a 0.5 ft³ measure, the industry standard dictates using 25 strokes of the tamping rod for each layer. This number of strokes is determined through specific testing practices established by organizations such as ASTM (American Society for Testing and Materials). The strokes should be applied uniformly and at an appropriate angle to ensure that the concrete is uniformly compacted throughout the measure. This process of consolidation is crucial, as it directly impacts the accuracy of the test results and the strength characteristics of the concrete. Properly consolidating the concrete ensures that the test sample accurately represents the batch of concrete being evaluated. Therefore, 25 strokes are required to achieve the necessary consolidation for each layer in this context.

5. What action is recommended if there is uncertainty about the accuracy of the temperature measuring device?

- A. Replace the device**
- B. Calibrate the device**
- C. Use another method of measurement**
- D. Ignore the uncertainty**

If there is uncertainty regarding the accuracy of a temperature measuring device, calibrating the device is the recommended action. Calibration ensures that the device provides measurements that are as accurate and reliable as possible. This process typically involves comparing the measurements from the device against a standard or reference known to be accurate and making necessary adjustments to correct any discrepancies. In the context of concrete field testing, maintaining accurate temperature readings is important for compliance with specifications and for ensuring the quality of the concrete mix. Temperature can significantly affect concrete's workability, setting time, and overall performance. Therefore, taking steps to ensure that the measuring device is accurately calibrated helps prevent potential issues that could arise from using faulty data. It's also worth noting that while replacing the device or using another method of measurement might work, these steps are not as fundamental as calibration. Replacing the device could involve unnecessary costs and may not be required if the device can be calibrated effectively. Additionally, using another measurement method could introduce variability and inconsistency in testing procedures. Ignoring the uncertainty would be counterproductive and could lead to serious consequences in construction quality.

6. What is the minimum thickness for a glass or acrylic strike-off plate in the slump test?

- A. 1/4 in. [6 mm]**
- B. 1/2 in. [12 mm]**
- C. 3/4 in. [19 mm]**
- D. 1 in. [25 mm]**

The minimum thickness for a glass or acrylic strike-off plate in the slump test is specified to be 1/4 inch (6 mm). This thickness is essential to ensure the plate is sturdy enough to provide a flat, smooth surface for leveling the fresh concrete sample without the risk of bending or breaking during use. A thicker plate may add unnecessary weight and difficulty in handling, while a thinner plate could compromise the integrity and accuracy of the test, potentially leading to inconsistent results. Having the appropriate thickness helps maintain the smoothness and stability of the strike-off process, ensuring that the concrete is struck off accurately at the right elevation, which is critical for obtaining reliable slump measurements.

7. When rodding the bottom layer, how should the tamping rod be positioned?

- A. Vertical
- B. Slightly inclined**
- C. Horizontal
- D. Perpendicular

When rodding the bottom layer, the tamping rod should be positioned slightly inclined. This angle allows for the most effective compaction of the concrete mix without causing segregation of the aggregates. When the rod is inclined, it creates an effective motion that helps in displacing the air pockets trapped in the concrete, ensuring a denser and more homogenous sample. Using a perfectly vertical or horizontal position might not achieve the same level of effectiveness in compaction. A vertical rod could lead to ineffective penetration into the mix, while a horizontal rod would not allow for the necessary movement to consolidate the concrete properly. The slight inclination strikes a balance, enabling better interaction with the concrete and achieving the desired density.

8. Which of the following describes the procedure for handling the temperature measuring device after placement?

- A. It should be left alone
- B. It should be jiggled to ensure contact
- C. Gently pressed at the surface**
- D. Immediately removed for readings

After placing the temperature measuring device in the concrete, it is crucial to ensure that it makes adequate contact with the concrete surface to obtain an accurate reading. Gently pressing the device at the surface helps establish this contact, allowing the sensor to effectively measure the temperature of the concrete. Accurate temperature readings are essential for assessing the curing conditions and overall quality of the concrete. Leaving the device alone would not provide an accurate representation of the concrete's temperature since it may not be properly seated. Jiggling the device could risk damaging the sensor or compromising the readout, while immediately removing the device would prevent gathering accurate temperature data, leading to unreliable results. Therefore, gently pressing the device ensures it is correctly positioned for an accurate temperature measurement.

9. What is the minimum allowable capacity of the measuring bowl used in the related testing method?

- A. 3 L (0.10 ft³)
- B. 6 L (0.20 ft³)**
- C. 12 L (0.40 ft³)
- D. 15 L (0.50 ft³)

The minimum allowable capacity of the measuring bowl used in the related testing method is critical for ensuring accuracy and consistency in concrete testing procedures. In this context, a measuring bowl with a capacity of 6 liters (0.20 cubic feet) is typically appropriate for achieving the required test standards. This size allows for the necessary volume of concrete to be tested for various properties, such as slump and density, while accommodating enough material to provide a reliable sample. Using a bowl that meets or exceeds this minimum capacity ensures that the sample represents the batch being tested accurately. It also enables effective mixing and prevents issues that could arise from insufficient material volume, such as variations in test results. Testing methods often have specific requirements that dictate the minimum sizes needed to maintain test integrity and allow for proper handling during the testing process. When using a 6-liter measuring bowl, technicians can perform their evaluations with confidence in adhering to industry standards, ensuring that all measurements are taken from an adequately sized sample that reflects the concrete's characteristics.

10. How is the top of the concrete specimen identified for slump measurement?

- A. By the top edge of the mold
- B. By the displaced original center of the top surface**
- C. By the lowest point of the specimen
- D. By the color change of the concrete

The correct method to identify the top of the concrete specimen for slump measurement is by the displaced original center of the top surface. This approach ensures that the slump is measured accurately and consistently. When a concrete sample is formed in a cone mold, the top surface becomes displaced during the removal of the mold. The true top of the sample is assessed based on this displacement, which represents the highest point of the concrete after the mold has been removed. This is critical because the slump test measures the vertical deformation of the concrete when the mold is removed, reflecting its workability. By identifying the top surface correctly, any potential inaccuracies that could arise from using the mold's edge or other references are minimized, ensuring that the slump value obtained indicates the actual flow characteristics of the concrete.

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://aci-i.examzify.com>

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

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