

ACI Concrete Field Testing Technician - Grade I Practice Exam (Sample)

Study Guide



Everything you need from our exam experts!

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Table of Contents

Copyright	1
Table of Contents	2
Introduction	3
How to Use This Guide	4
Questions	5
Answers	8
Explanations	10
Next Steps	16

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 weight must the mallet be when tapping the sides of the bowl after rodding each layer?**
 - A. 0.75 lb. (340 g)**
 - B. 2.00 lb. (900 g)**
 - C. 1.25 lb. (600 g)**
 - D. 1.50 lb. (680 g)**
- 2. The container for obtaining the concrete sample can be any of the following except?**
 - A. Plastic bucket**
 - B. Metal pan**
 - C. Wheelbarrow**
 - D. Flat, clean nonabsorbent mixing board**
- 3. Field Curing is utilized for assessing which of the following?**
 - A. Determination of mix proportions**
 - B. Acceptance of structural testing**
 - C. Strength of shapes and weaknesses**
 - D. Capability of the structure to be put into service**
- 4. Is it acceptable to measure the temperature of concrete in a wall form?**
 - A. True**
 - B. False**
 - C. Only if there is sufficient space**
 - D. Only if the form is made of metal**
- 5. If the air content exceeds the meter's 9% range, what should be done?**
 - A. Calibrated cups of water are added to adjust the liquid level**
 - B. Reduce the water content**
 - C. Increase the alcohol content**
 - D. The test should be restarted**

- 6. 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**
- 7. How often should the temperature measuring device be calibrated?**
- A. Every six months**
 - B. Annually**
 - C. Every two years**
 - D. Only when damaged**
- 8. What is the minimum number of cylinders that should be cast for strength testing on a batch of concrete?**
- A. 1**
 - B. 2**
 - C. 3**
 - D. 4**
- 9. From what portion of the batch must composite samples from a truck mixer be obtained?**
- A. Top**
 - B. Middle**
 - C. Bottom**
 - D. Randomly**
- 10. 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]**

Answers

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

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Explanations

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1. What weight must the mallet be when tapping the sides of the bowl after rodding each layer?

- A. 0.75 lb. (340 g)**
- B. 2.00 lb. (900 g)**
- C. 1.25 lb. (600 g)**
- D. 1.50 lb. (680 g)**

When compacting concrete in a cylindrical mold using a mallet, the specified weight of the mallet is critical to ensure consistent and effective compaction without damaging the sample. In this case, the standard weight for the mallet used when tapping the sides of the bowl after rodding each layer of concrete is 1.25 lb. (600 g). This specific weight is established in testing protocols to provide sufficient energy to displace air bubbles and consolidate the concrete effectively. Using a mallet of this weight helps achieve uniform consistency in the compaction process across different tests, which is vital for obtaining reliable compressive strength results. Variations in mallet weight can lead to inconsistent compaction, which may affect the density and overall performance characteristics of the concrete mix under evaluation. Thus, adherence to this requirement is essential for compliance with established testing standards.

2. The container for obtaining the concrete sample can be any of the following except?

- A. Plastic bucket**
- B. Metal pan**
- C. Wheelbarrow**
- D. Flat, clean nonabsorbent mixing board**

When obtaining a concrete sample, the selected container for collection should be clean and nonabsorbent to prevent contamination and ensure the integrity of the sample. A wheelbarrow, while practical for transporting concrete, is not suitable for sampling because it may not provide a stable or sufficiently clean environment for capturing an accurate representation of the concrete's properties. On the other hand, a plastic bucket, metal pan, and a flat, clean nonabsorbent mixing board are all appropriate choices since they can be easily cleaned, are stable for holding the concrete, and do not introduce substances that could alter the composition of the sample. Each of these options allows for a clear and uncontaminated collection process, essential for ensuring accurate testing results. Using a wheelbarrow as a collection tool can lead to inconsistent sampling and diminish the reliability of test outcomes.

3. Field Curing is utilized for assessing which of the following?

- A. Determination of mix proportions**
- B. Acceptance of structural testing**
- C. Strength of shapes and weaknesses**
- D. Capability of the structure to be put into service**

Field curing is an essential practice used to evaluate how concrete behaves under real-world conditions. The purpose of field curing is to create a controlled environment that reflects the actual conditions the concrete will face in service. By observing the performance of field-cured specimens, one can gain insight into the strength and durability of the concrete. In the context of determining whether a structure can be safely put into service after concrete placement, field curing provides practical evidence of how that concrete will perform over time. It helps in assessing whether the concrete has developed the necessary strength to support the intended loads, ensuring that it is safe for use. This direct relation between field curing and the readiness of the structure underscores why this option is the most relevant. Other choices would not be applicable because mix proportions relate to design specifications rather than structural readiness, acceptance of structural testing pertains to compliance with codes rather than real-time performance, and while assessing the strength of shapes and weaknesses could theoretically connect to various aspects of concrete performance, it doesn't specifically measure the readiness for service which is ultimately the focus of field curing.

4. Is it acceptable to measure the temperature of concrete in a wall form?

- A. True**
- B. False**
- C. Only if there is sufficient space**
- D. Only if the form is made of metal**

Measuring the temperature of concrete in a wall form is indeed acceptable because it provides valuable information about the curing process and helps ensure that the concrete achieves its intended strength and durability. Temperature affects the hydration process of cement, and maintaining the concrete within specified temperature limits is crucial for optimal curing. Conducting temperature measurements within the wall form helps identify potential issues, such as thermal cracking or insufficient curing, allowing for timely corrective actions. It is important to note that measuring the temperature in this location must be done carefully to ensure accurate readings and avoid any damage to the forms or the concrete itself. The other options highlight different conditions or restrictions that do not apply universally, as temperature measurements can be taken effectively regardless of those factors. For instance, whether there is sufficient space or whether the form is made of metal may influence the ease of measurement, but they do not restrict it fundamentally.

5. If the air content exceeds the meter's 9% range, what should be done?

- A. Calibrated cups of water are added to adjust the liquid level**
- B. Reduce the water content**
- C. Increase the alcohol content**
- D. The test should be restarted**

When dealing with an air content measurement that exceeds the meter's range, the appropriate action is to adjust the liquid level within the measuring device. This involves adding calibrated cups of water to the meter, which helps bring the liquid level down into the operational range of the meter. This adjustment is vital because if the air content readings are too high for the meter to accurately measure, it can lead to erroneous conclusions about the air entrainment in the concrete mix. Maintaining the meter's operational threshold ensures that readings can be taken within a valid range, allowing for accurate testing and subsequent adjustments to the mix design if necessary. In this context, reducing water content or increasing alcohol content would not appropriately address the issue of the air content measurement being too high. Similarly, restarting the test may lead to the same issues if the liquid level is not adjusted, as it does not rectify the original problem with the measurement range. Therefore, the best practice is to modify the conditions within the meter itself by adjusting the fluid level to ensure accurate air content measurements.

6. 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.

7. How often should the temperature measuring device be calibrated?

- A. Every six months**
- B. Annually**
- C. Every two years**
- D. Only when damaged**

The recommended frequency for calibrating the temperature measuring device is annually. This regular calibration ensures that the device remains accurate and reliable in measuring the temperature of concrete. Accurate temperature measurement is crucial because it can significantly affect the properties of the concrete mix, including workability, strength development, and curing efficiency. By calibrating annually, users can maintain confidence in the measurements taken during concrete testing, which is vital for quality control and compliance with industry standards. While other intervals may seem reasonable, they could allow the device to drift out of calibration, leading to potential errors in temperature readings. This can impact the overall integrity of the concrete work, making annual calibration the best practice in maintaining measurement accuracy.

8. What is the minimum number of cylinders that should be cast for strength testing on a batch of concrete?

- A. 1**
- B. 2**
- C. 3**
- D. 4**

Casting a minimum of three cylinders for strength testing is standard practice in concrete testing. This approach is essential for obtaining a statistically meaningful average compressive strength result. Having three cylinders allows for the detection of variability in the concrete mix and provides a more reliable assessment of its overall performance. If one cylinder fails to meet the required strength, the results from the other two can still produce a valid average, which is crucial for quality control and assurance processes in construction projects. Moreover, this practice adheres to established testing standards, such as those set forth by ASTM C39, which recommends having at least three specimens to account for discrepancies that may arise due to factors like mixing, curing conditions, or other influences on the strength of the concrete. While casting only one or two cylinders may seem sufficient, it limits the ability to accurately assess the strength and increases vulnerability to random variations within a single sample, which can lead to erroneous conclusions regarding the quality of the concrete batch.

9. From what portion of the batch must composite samples from a truck mixer be obtained?

- A. Top**
- B. Middle**
- C. Bottom**
- D. Randomly**

Composite samples from a truck mixer are obtained from the middle portion of the batch. This practice ensures that the sample represents the entire load of concrete as uniformly as possible. The rationale behind this approach is that the concrete can segregate during transport; materials may settle, and variations in composition could occur throughout the load. By collecting samples from the middle, testers minimize the risk of obtaining a sample that is either overly rich or too lean in certain materials, which could lead to inaccurate assessments of the concrete's quality and characteristics. Taking samples from the top could result in a mixture that is not representative, as it may contain more cement or water that has not mixed thoroughly with the aggregates. Similarly, sampling from the bottom could yield a portion that contains excess aggregates or settled materials, which again would not accurately reflect the true characteristics of the entire batch. Random sampling could lead to inconsistency and may not adhere to standards for representative sampling. Consequently, obtaining samples from the middle helps ensure compliance with testing standards and ultimately leads to more reliable quality control in the concrete mix.

10. 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.

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!