



EXAMINATION PREPARATION

IASHEP – CMCRS

Certified Mobile Construction Crane & Rigging Specialist

Overview

This guide outlines the examination structure and core knowledge areas required to achieve certification as a Certified construction Crane & Rigging Specialist. The exam is based on OSHA 1910.179, OSHA 29 CFR 1926 Subpart CC, and ANSI B30.5 standards.

Core Exam Structure

Site Knowledge (Approximately 20% of the Test)

Focus on the following elements:

- **Ground Stability:** Identifying factors affecting ground stability, including soil composition and proper compaction.
 - **Supporting Material:** Proper use of mats, cribbing, and outrigger pads to stabilize cranes.
 - **Electrical Hazards:** Awareness of proximity to power lines, required clearances, and protective measures.
 - **Travel Without Load:** Safe travel practices and risk mitigation while moving cranes without a load.
 - **Hazard Evaluation:** Recognizing site-specific hazards and implementing control measures.
 - **Controlling Entity Responsibilities:** Understanding roles and responsibilities in site coordination and hazard mitigation.
 - **Lift Requirements:** Identifying and adhering to pre-lift and lifting protocols.
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Operations Knowledge (Approximately 26% of the Test)

Key areas include:

- **Crane Safety Inspection:** Pre-operational and post-operational checks.
- **Crane Leveling and Setup:** Proper setup and alignment of cranes.
- **Operational Hazards:** Identifying and mitigating risks during operations.
- **Wire Rope Knowledge:** Types, uses, and inspection of wire ropes.
- **Crane Signals:** Mastery of hand and audible signals per industry standards.
- **Lift Types and Requirements:** Procedures for blind lifts, tandem lifts, and other specialized lifts.
- **Taglines:** Proper usage and safety considerations.
- **Operator Aids:** Understanding the functions of aids such as load moment indicators and anti-two block devices, and protocols for their malfunction.
- **Safety Devices:** Use and functionality of safety mechanisms.
- **Emergency Procedures:** Actions during equipment failure or adverse conditions.
- **Dynamic Loading and Side Loading:** Awareness of forces and their effects on crane stability.
- **Weather Conditions:** Operating under various weather conditions, including wind and visibility limitations.

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- **Attachments and Stability:** Effects of attachments and backward stability limitations.
 - **Stop Operation Authority:** Criteria for stopping operations and ensuring safety.
 - **Shutdown Procedures:** Steps to properly shut down and secure the crane.
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Technical Knowledge (Approximately 28% of the Test)

Standards and Terminology:

- Understanding definitions and terms from ASME B30.5, B30.10, OSHA 1910.180, and 1926 Subpart CC.
- Crane functions and limitations.

Inspection Requirements:

- Criteria for rigging devices, wire ropes, hook blocks, and overhaul balls.
- Replacement standards for rigging components.

Rigging Procedures:

- Safe rigging practices and device usage.
- Relationship between line pull and safe working load of running ropes.

Fall Protection and Access:

- Requirements for fall protection systems.
- Safe access and egress practices.

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Load Charts (Approximately 26% of the Test)

Key Skills:

- Understanding load chart terminology.
 - Reading and interpreting range diagrams, work area diagrams, and rated capacity charts.
 - Basic math for calculating gross and net capacities.
 - Applying manufacturer's notes and specifications.
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Specialty Exam Structure

Site Knowledge (Approximately 23% of the Test)

- **Crane Setup:** Factors influencing proper crane setup.
 - **Supporting Materials:** Use of mats, stabilizers, and outriggers.
 - **Boom Assembly/Disassembly:** Procedures for safe assembly and disassembly.
 - **Outriggers and Stabilizers:** Proper deployment and adjustment.
 - **Position Indicators and Sensors:** Understanding their use and maintenance.
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Operations Knowledge (Approximately 23% of the Test)

- **Crane Operations:** Safe pick-and-carry procedures.

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- **Operator Aides and Safety Devices:** Their functions and limitations.
 - **Power Flow Systems:** Handling and approaching two-blocking scenarios.
 - **Shutdown Procedures:** Steps to ensure safety during and after operations.
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Technical Knowledge (Approximately 19% of the Test)

- **Crane-Specific Terminology:** Knowledge unique to specific crane types.
 - **Wire Rope Inspection:** Replacement criteria and inspection processes.
 - **Function and Limitations:** Understanding how different crane types operate and their restrictions.
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Manufacturer Load Charts (Approximately 35% of the Test)

- **Terminology:** Comprehensive knowledge of load chart terms.
 - **Application:** Reading and applying notes, specifications, range diagrams, and rated capacity charts.
 - **Problem Solving:** Determining maximum radius, gross capacity, and net capacity under various configurations.
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Recommended Preparation

- Thoroughly review OSHA 1910.179, OSHA 1926 Subpart CC, and ANSI B30.5.

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- Practice interpreting load charts and solving related problems.
 - Familiarize yourself with crane operation manuals and safety protocols.
 - Gain hands-on experience or attend training sessions to reinforce theoretical knowledge.
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Additional Resources

- **OSHA Website:** Access the full standards and guidelines.
- **ANSI Standards:** Review ANSI B30.5 and other applicable documents.
- **Crane Operation Manuals:** Study specific manufacturer guidelines.

By mastering the above topics, candidates will be well-prepared to excel in both the core and specialty exams.