



National Craft Assessment and Certification Program  
S P E C I F I C A T I O N S

**Industrial Ironworker V3**  
**Iron30\_03**

Released June 2013

**Focus Statement**

An ironworker works comfortably at heights that often reach 2000 feet or higher, recognizes safety-related issues and equipment; masters proper and safe use of a variety of hand and hydraulic, pneumatic, and electrical power tools; recognizes various structural shapes, such as wide-flange beam sections and a variety of fastening materials and their proper uses; directs and assembles different types of mobile and tower construction cranes, creates and develops complex rigging plans for heavy structural steel lifts; effectively communicates hoisting operations using verbal and hand signals; plumbs and aligns steel structures to tolerances set by AISC Code of Standard Practices; fits, bolts, and welds structural members; identifies and interprets a wide variety of blueprint components; calculates weights of a variety of structural shapes, and recognizes the functions and limitations of a wide variety of hoisting equipment and welding processes.

**Overview**

- Two-hour closed-book examination
- May use a basic function, non-printing calculator
- No extra papers, books, notes, or study materials are allowed

- The minimum passing score is 75
- A Performance Verification is available

**Study Materials**

All NCCER written assessments are referenced to NCCER's curriculum listed in the content. You may order modules from Pearson (1.800.922.0579) or from NCCER's Online Catalog at [www.nccer.org](http://www.nccer.org)

**Assessment Development**

All questions are developed and approved by subject matter experts under the direction of NCCER and Prov™, NCCER's testing partner.

**Credentials**

NCCER will send appropriate credentials to the assessment center for successful completions.

**Training Prescription Reports**

Each candidate will have access to individual results of the written assessment from Prov's website at [www.provexam.com](http://www.provexam.com).

**Registry**

Assessment results will be maintained in NCCER's Registry and become a portable record of the candidate's training and assessment achievements.

**Written Assessment Contents:**

Content Domain	Number of Questions
<b>Cutting &amp; Welding</b> [29102-09, 29106-09, 30112-11]	10
<b>Rigging</b> [30106-11, 30107-11, 38201-11, 38301-11]	24
<b>Cranes and Forklifts</b> [30105-11, 30203-11, 30207-11]	10
<b>Structural Ironworking</b> [30109-11, 30205-11, 30312-12]	10
<b>Tools and Equipment of the Trade</b> [30103-11, 30316-12]	5
<b>Fastening</b> [30104-11]	5
<b>Plumbing, Aligning, and Guying</b> [30110-11, 30208-11]	7
<b>Trade Drawings</b> [30108-11, 30204-11]	5
<b>Joists and Girders</b> [30113-11, 30206-11]	5
<b>Trade Math and Field Fabrication</b> [30115-11, 30201-11]	7
<b>Trade Safety</b> [30102-11]	5
<b>Metal Decking and Stud Welding</b> [30114-11, 30304-12]	7
<b>Total Number of Questions</b>	<b>100</b>



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Learning Objectives related to Assessment:

<b>Cutting and Welding</b>	
<b>Registry ID Number:</b>	<b>Module Title and Objectives:</b>
<b>29102-09</b>	<b>Oxyfuel Cutting</b>
	Identify and explain the use of oxyfuel cutting equipment.
	Set up oxyfuel equipment.
	Light and adjust an oxyfuel torch.
<b>29106-09</b>	<b>Weld Quality</b>
	Identify and explain weld imperfections and their causes.
	Perform a visual inspection of fillet welds.
<b>30112-11</b>	<b>Introduction to Arc Welding</b>
	Identify different welding processes and welding equipment.
	State safety precautions associated with arc welding.
	Identify weld joints, their dimensions, and their applications from weld symbols and drawings.
<b>Rigging</b>	
<b>Registry ID Number:</b>	<b>Module Title and Objectives:</b>
<b>30106-11</b>	<b>Rigging Equipment</b>
	Identify and describe the uses of common rigging hardware and equipment.
	Perform a safety inspection on hooks, slings, and other rigging equipment.
<b>30107-11</b>	<b>Rigging Practices</b>
	Properly attach rigging hardware for routine lifts.
	Identify the components of a lift plan.
	Perform sling tension calculations.
	Determine the weight of beams and basic weight estimation
	Explain D/d.
<b>38201-11</b>	<b>Intermediate Rigging</b>
	Describe the basic requirements to lift personnel.
	Given a particular load, select the appropriate sling(s) for a lift.
	Describe the basic elements of a lift plan
<b>38301-11</b>	<b>Advanced Rigging</b>
	Explain how the center of gravity of the load affects the rigging.
	Explain how the weight of the load and the position of the crane boom affect the capacity of the crane.
	Explain how cribbing is used to support loads.
<b>Cranes and Forklifts</b>	
<b>Registry ID Number:</b>	<b>Module Title and Objectives:</b>
<b>30105-11</b>	<b>Mobile Construction Cranes</b>
	Identify and describe common lifting equipment.
	Identify and explain commonly used construction cranes
	Identify and use the correct hand signals to guide a crane operator.

<b>30207-11</b>	<b>Tower Cranes</b>
	Describe the different types of tower cranes and their accessories and how each is used.
<b>30203-11</b>	<b>Forklifts</b>
	Describe the uses of a forklift.
	Describe the attachments used on forklifts.
	Explain safety rules and qualifications for operating a forklift.
	<b>Structural Ironworking</b>
<b>30109-11</b>	<b>Structural Ironworking One</b>
	Identify the types of construction that use structural steel.
	Identify the components of common steel structures
<b>30205-11</b>	<b>Structural Ironworking Two</b>
	Explain and demonstrate pre-erection activities for structural steel.
	Explain and demonstrate erecting columns.
	Explain and demonstrate erecting horizontal members.
<b>30312-12</b>	<b>Structural Ironworking Three</b>
	Explain how to identify unusual hazards associated with structural steel activities and the precautions associated with each.
	Describe the assembly and erection of trusses.
	<b>Tools and Equipment of the Trade</b>
<b>30103-11</b>	<b>Tools and Equipment of the Trade</b>
	Identify and explain commonly used safety tools and equipment.
	Identify and describe the proper use of common ironworking hand tools.
<b>30316-12</b>	<b>Grating and Checkered Plate</b>
	Explain how to properly rig grating and checkered plate.
	<b>Fastening</b>
<b>30104-11</b>	<b>Fastening</b>
	Recognize and identify A-325 and A-490 bolts, washers, and nuts by their identifying marks.
	Identify the four common methods of correctly tensioning bolts.
	Describe how to use the tension control, calibrated wrench, turn-of-nut, and load-indicating washer methods of tightening high-strength bolts.
	<b>Plumbing, Aligning, and Guying</b>
<b>30110-11</b>	<b>Plumbing, Aligning, and Guying</b>
	Describe the purpose and function of aligning and plumbing steel structures.
	Identify the tools and equipment used for aligning and plumbing steel structures.
	Identify the components of column bases, base plate, and foundation failures.
<b>30208-11</b>	<b>Survey Equipment Use and Care One</b>
	Identify, safely use, and properly maintain the tools and instruments commonly used for site layout tasks.
	Describe the purpose and use of survey equipment, including: builder's level, transit, theodolite, and total station.
	<b>Trade Drawings</b>
<b>30108-11</b>	<b>Trade Drawings One</b>
	Interpret symbols used on plans and drawings, including symbols for: structural steel, ornamental ironwork, and welding.
<b>30204-11</b>	<b>Trade Drawings Two</b>
	Name the types of structural plans, and identify the information included on each.
	Describe the purpose and relationship of the different types of drawings.
	Read and interpret the symbols and abbreviations on erection plans and drawings.

	<b>Joists and Girders</b>
<b>30113-11</b>	<b>Bar Joists &amp; Girders</b>
	Describe the proper procedures for rigging and storing steel joists.
	Describe the proper erection procedures for bar joists.
<b>30206-11</b>	<b>Steel Joists and Joist Girders</b>
	Locate and describe the information on a framing plan used by ironworkers.
	Describe steel joist installation procedures.
	<b>Trade Math and Field Fabrication</b>
<b>30115-11</b>	<b>Field Fabrication</b>
	Identify safety hazards associated with ironworking fabrication.
	Use common layout tools.
	Fabricate angle iron to given dimensions.
<b>30201-11</b>	<b>Trade Math</b>
	Perform calculations using fractions.
	Calculate the areas of selected items.
	Solve problems for right triangles.
	Calculate the weight of selected items.
	<b>Trade Safety</b>
<b>30102-11</b>	<b>Trade Safety</b>
	List potential hazards for ironworkers.
	Identify and explain the safe operation of various pieces of light equipment, including: aerial lifts, generators, compressors, and forklifts.
	<b>Metal Decking and Stud Welding</b>
<b>30114-11</b>	<b>Metal Decking</b>
	Identify and explain types of decking and deck profiles.
	Erect decking and observe job-site safety.
	Describe how decking is packaged, shipped, and stored.
<b>30304-12</b>	<b>Stud Welding</b>
	Identify safety precautions associated with stud welding.
	Recognize and identify the equipment associated with stud welding.
	Explain testing of stud welds.