



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 corresponding hands-on Performance Verification is available

Knowledge Assessment Contents:

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

NCCER Curriculum

All NCCER knowledge assessments are referenced to NCCER's curriculum modules as listed on this specification sheet. You may order modules from Pearson (800.922.0579) or from NCCER's Online Catalog at www.nccer.org.

Assessment Development

All questions are developed and approved by subject matter experts under the direction of NCCER.

Credentials

Upon successful completion of the knowledge assessment, NCCER will send applicable credentials to the assessment center.

Score Report and Training Prescription

Each candidate will have access to their assessment results including their overall score and recommended training.

NCCER Registry

Knowledge assessment results are recorded in NCCER's Registry and become a part of the portable record of an individual's NCCER credentials.



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

Learning Objectives related to Assessment:

Cutting and Welding	
Registry ID Number:	Module Title and Objectives:
29102-09	Oxyfuel Cutting
	Identify and explain the use of oxyfuel cutting equipment.
	Set up oxyfuel equipment.
	Light and adjust an oxyfuel torch.
29106-09	Weld Quality
	Identify and explain weld imperfections and their causes.
	Perform a visual inspection of fillet welds.
30112-11	Introduction to Arc Welding
	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.
Rigging	
Registry ID Number:	Module Title and Objectives:
30106-11	Rigging Equipment
	Identify and describe the uses of common rigging hardware and equipment.
	Perform a safety inspection on hooks, slings, and other rigging equipment.
30107-11	Rigging Practices
	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.
38201-11	Intermediate Rigging
	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
38301-11	Advanced Rigging
	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.
Cranes and Forklifts	
Registry ID Number:	Module Title and Objectives:
30105-11	Mobile Construction Cranes
	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.

30207-11	Tower Cranes
	Describe the different types of tower cranes and their accessories and how each is used.
30203-11	Forklifts
	Describe the uses of a forklift.
	Describe the attachments used on forklifts.
	Explain safety rules and qualifications for operating a forklift.
	Structural Ironworking
30109-11	Structural Ironworking One
	Identify the types of construction that use structural steel.
	Identify the components of common steel structures
30205-11	Structural Ironworking Two
	Explain and demonstrate pre-erection activities for structural steel.
	Explain and demonstrate erecting columns.
	Explain and demonstrate erecting horizontal members.
30312-12	Structural Ironworking Three
	Explain how to identify unusual hazards associated with structural steel activities and the precautions associated with each.
	Describe the assembly and erection of trusses.
	Tools and Equipment of the Trade
30103-11	Tools and Equipment of the Trade
	Identify and explain commonly used safety tools and equipment.
	Identify and describe the proper use of common ironworking hand tools.
30316-12	Grating and Checkered Plate
	Explain how to properly rig grating and checkered plate.
	Fastening
30104-11	Fastening
	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.
	Plumbing, Aligning, and Guying
30110-11	Plumbing, Aligning, and Guying
	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.
30208-11	Survey Equipment Use and Care One
	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.
	Trade Drawings
30108-11	Trade Drawings One
	Interpret symbols used on plans and drawings, including symbols for: structural steel, ornamental ironwork, and welding.
30204-11	Trade Drawings Two
	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.

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