



NCCER

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REINFORCING IRONWORK

Competencies / Objectives

Reinforcing Ironwork Level One

MODULE 39101-05 – CONCRETE REINFORCEMENT

1. Describe the applications of reinforcing bars, the uses of reinforced structural concrete, and the basic processes involved in placing reinforcing bars.
2. Recognize and identify the bar bends standardized by the American Concrete Institute (ACI).
3. Read and interpret bar lists and describe the information found on a bar list and bar tag.
4. List the types of ties used in securing reinforcing bars.
5. Perform bar layout and mark bar crossings.
6. Demonstrate the proper use of common ties for reinforcing bars.
7. Describe methods by which reinforcing bars may be cut and bent in the field.
8. Use the tools and equipment needed for installing reinforcing bars.
9. Demonstrate the ability to safely use selected tools and equipment to cut, bend, and install reinforcing materials.
10. Explain the necessity of concrete cover in placing reinforcing bars.
11. Explain and demonstrate how to place bars in walls, columns, beams, girders, joists, and slabs.

MODULE 39102-05 – CONCRETE REINFORCEMENT SAFETY

1. Identify hazards associated with working with concrete reinforcing bar.
2. Identify signs and barricades that will help you perform your job safely.
3. Identify safety hazards associated with concrete construction work.
4. Demonstrate and explain proper on-site safety, including the use of appropriate personal protective equipment (PPE).
5. Describe how to safely use ladders and scaffolding.
6. Explain and identify safety hazards associated with excavations.
7. Demonstrate proper lifting and carrying techniques for reinforcing bar.
8. Demonstrate the proper technique for using a positioning device.

MODULE 39103-05 – RIGGING EQUIPMENT

1. Identify and describe the uses of common rigging hardware and equipment.
2. Perform a safety inspection on hooks, slings, and other rigging equipment.
3. Describe common slings and determine sling capacities and angles.
4. Select, inspect, use, and maintain special rigging equipment, including:
 - Block and tackle
 - Chain hoists
 - Come-alongs
 - Jacks
 - Tuggers
5. Inspect heavy rigging hardware.
6. Tie knots used in rigging.

MODULE 39104-05 – RIGGING PRACTICES

1. Identify and use the correct hand signals to guide a crane operator.
2. Identify basic rigging and crane safety procedures and determine the center of gravity of a load.
3. Identify the pinch points of a crane and explain how to avoid them.
4. Identify site and environmental hazards associated with rigging.
5. Properly attach rigging hardware for routine lifts and pipe lifts.
6. Identify the components of a lift plan.
7. Perform sling tension calculations.

MODULE 39105-05 – COMMERCIAL BLUEPRINTS

1. Recognize the difference between commercial and residential construction drawings.
2. Identify the basic keys, abbreviations, and other references contained in a set of commercial drawings.
3. Accurately read a set of commercial drawings.
4. Explain basic construction details and concepts employed in commercial construction.
5. Read and interpret the information on a set of commercial drawings.

MODULE 39106-05 – OXYFUEL CUTTING

1. Identify and explain the use of oxyfuel cutting equipment.
2. Set up oxyfuel equipment.
3. Light and adjust an oxyfuel torch.
4. Shut down oxyfuel cutting equipment.
5. Disassemble oxyfuel equipment.
6. Change empty cylinders.
7. Perform oxyfuel cutting:
 - Straight line and square shapes
 - Piercing and slot cutting
 - Bevels
 - Washing
 - Gouging
8. Operate a motorized, portable oxyfuel gas cutting machine.

Reinforcing Ironwork Level Two

MODULE 27204-01 – FOUNDATIONS AND FLATWORK

1. Identify various kinds of footings, including:
 - Continuous or spread
 - Stepped
 - Pier
 - Grade beam
2. Identify the parts of footing forms and explain their purpose.
3. Identify the parts of pier forms and explain their purpose.
4. Demonstrate the ability to lay out and construct selected footing forms, including:
 - Continuous footing
 - Pier footing
 - Pile cap
 - Grade beam
5. Strip a pier footing form and prepare it for erection at another location.
6. Identify types of concrete structures that require the construction of edge forms:
 - Slabs with or without a foundation
 - Parking lots
 - Driveways and streets
 - Sidewalks
 - Approaches
7. Identify the parts of edge forms and explain their purpose.
8. Demonstrate the ability to construct and disassemble edge forms for:
 - A slab-on-grade with an existing foundation
 - A slab-on-grade with an integral foundation
9. Explain the purpose of a screed and identify the different types of screeds.
10. Demonstrate the ability to set screeds on grade.

MODULE 27205-01 – CONCRETE FORMS

1. Identify the various types of concrete forms.
2. Identify the components of each type of form.
3. Explain the safety procedures associated with using concrete forms.
4. Erect, plumb, and brace selected concrete forms, including:
 - Basic wall form
 - Ganged wall form
 - Radius wall form
 - Column form
 - Beam form and shoring
 - Stair form

MODULE 27207-01 – HANDLING AND PLACING CONCRETE

1. Identify and state the purpose of different types of concrete joints.
2. Recognize the various equipment used to transport and place concrete.
3. Describe the factors that contribute to the quality of concrete placement.
4. Demonstrate and/or describe the correct methods for placing and consolidating concrete into forms.
5. Demonstrate and/or describe how to use a screed to strike off and level concrete to the proper grade in a form.
6. Demonstrate and/or describe how to use a bullfloat and/or darby to level and smooth concrete.
7. Determine when conditions permit the concrete finishing operation to start.
8. Demonstrate and/or describe how to use a hand float and finishing trowel.
9. Demonstrate and/or describe how to use an edger.
10. Demonstrate and/or describe how to use a jointer.
11. Name the factors that affect the curing of concrete and describe the methods used to achieve proper curing.
12. Properly care for and safely use hand and power tools used when working with concrete.

MODULE 27208-01 – MANUFACTURED FORMS

1. Recognize various types of manufactured forms.
2. Identify the components of manufactured wall-forming systems.
3. State the differences in construction and use among different types of forms.
4. Describe how a flying form system is moved.
5. Erect, plumb, and brace a manufactured wall form.
6. Use a manufactured hardware system to erect forms of lumber and sheathing.
7. Erect, plumb, and brace a manufactured column form.

MODULE 30116 – METAL DECKING

1. Identify and explain types of decking and deck profiles.
2. Describe how decking is packaged, shipped, and stored.
3. Erect decking and observe job site safety.
4. Explain the effects of deck penetrations and damage.
5. Demonstrate how to place concrete.

MODULE MT101 – INTRODUCTORY SKILLS FOR THE CREW LEADER

1. Discuss current issues and organizational structure in the construction industry today.
2. Understand and incorporate leadership skills into work habits, including communication, motivation, team building, problem solving, and decision-making skills.
3. Demonstrate an awareness of safety issues, including the cost of accidents and safety regulations.
4. Identify a supervisor's typical safety responsibilities.
5. Show a basic understanding of the planning process, scheduling, and cost and resource control.