MODULE OVERVIEW
This module covers tasks involved in the construction of foundations and flatwork.

PREREQUISITES
Please refer to the Course Map in the Trainee Module. Prior to training with this module, it is recommended that the trainee shall have successfully completed the following modules:

Core Curriculum; Carpentry Level One; Carpentry Level Two, Modules 27201 through 27203

LEARNING OBJECTIVES
Upon completion of this module, the trainee will be able to:

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.

PERFORMANCE OBJECTIVES
Under supervision of the instructor, the trainee should be able to:

1. Lay out and construct one or more form(s):
   - Continuous footing form
   - Pier footing form
   - Pile cap form
   - Grade beam form
2. Lay out, construct, and disassemble one or more edge form(s):
   - A slab-on-grade with an existing foundation
   - A slab-on-grade with an integral foundation
3. Set screeds (screed guides) on grade.
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If you see the Teaching Tip icon, that means there is a teaching tip associated with this section. Also refer to any suggested teaching tips at the end of the module.

SAFETY CONSIDERATIONS

Ensure that the trainees are equipped with appropriate personal protective equipment.

PREPARATION

Before teaching this module, you should review the Module Outline, Learning and Performance Objectives, and the Materials and Equipment List. Be sure to allow ample time to prepare your own training or lesson plan and gather all required equipment and materials.

MATERIALS AND EQUIPMENT LIST

<table>
<thead>
<tr>
<th>Materials:</th>
<th>Equipment:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transparencies</td>
<td>Overhead projector and screen</td>
</tr>
<tr>
<td>Markers/chalk</td>
<td>Whiteboard/chalkboard</td>
</tr>
<tr>
<td>8d and 16d duplex nails</td>
<td>Appropriate personal protective equipment</td>
</tr>
<tr>
<td>6d, 8d, and 16d common nails</td>
<td>Videocassette recorder (VCR)/TV set (optional)</td>
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<tr>
<td>Form oil</td>
<td>Videotape (optional), Foundation and Curb Forms</td>
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<td>Plans</td>
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<td>Form ties</td>
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<td>Column clamps</td>
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<tr>
<td>No. 9 annealed wire</td>
<td>Sledgehammer</td>
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<td>Compressible fiber board</td>
<td>100’ tape</td>
</tr>
<tr>
<td>%” plywood sheathing</td>
<td>Folding rule or steel tape</td>
</tr>
<tr>
<td>Assortment of lumber, including:</td>
<td>Hand level</td>
</tr>
<tr>
<td>1 x 4s</td>
<td>String line</td>
</tr>
<tr>
<td>2 x 2s</td>
<td>Builder’s level and rod</td>
</tr>
<tr>
<td>2 x 4s</td>
<td>Plumb bob</td>
</tr>
<tr>
<td>2 x 6s</td>
<td>Large brush, spray can, roller, or mop for applying form oil</td>
</tr>
<tr>
<td>2 x 8s</td>
<td>Electric drill and bits</td>
</tr>
<tr>
<td>2 x 12s</td>
<td>Chalkline</td>
</tr>
<tr>
<td>1½” diameter pipe</td>
<td>Ten-inch adjustable wrench</td>
</tr>
<tr>
<td>½” x 3” x 15” stakes</td>
<td>Framing square</td>
</tr>
<tr>
<td>Copies of Job Sheets 1 through 8*</td>
<td>Wrecking bar</td>
</tr>
<tr>
<td>Module Examinations*</td>
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<tr>
<td>Performance Profile Sheets*</td>
<td></td>
</tr>
</tbody>
</table>

*Packaged with this Annotated Instructor’s Guide.
ADDITIONAL RESOURCES
This module is intended to present thorough resources for task training. The following reference works are suggested for both instructors and motivated trainees interested in further study. These are optional materials for continued education rather than for task training.


TEACHING TIME FOR THIS MODULE
An outline for use in developing your lesson plan is presented below. Note that each Roman numeral in the outline equates to one session of instruction. Each session has a suggested time period of 2½ hours. This includes 10 minutes at the beginning of each session for administrative tasks and one 10-minute break during the session. Approximately 15 hours are suggested to cover _Foundations and Flatwork_. You will need to adjust the time required for hands-on activity and testing based on your class size and resources.

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<td>1. Factors That Determine the Size and Shape of Footings</td>
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<tr>
<td>2. Types of Footings</td>
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<tr>
<td>a. Continuous and Stepped Continuous Footings</td>
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<td>b. Piers</td>
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<td>c. Grade Beams</td>
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<td>3. Components of Footing and Pier Forms</td>
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<tr>
<td>a. Footing Forms</td>
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<tr>
<td>b. Pier Forms</td>
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<tr>
<td>4. Laying Out and Constructing Forms for a Continuous Footing</td>
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<td>a. Establishing the Location of the Building on Site</td>
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<td>b. Establishing Building Lines</td>
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<tr>
<td>c. Excavation and Trenching</td>
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<tr>
<td>d. Laying Out and Constructing Footing Forms</td>
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</tr>
</tbody>
</table>

| Session II. Laboratory | |
| A. Laboratory | |
| Hand out Job Sheet 27204-1. Under your supervision, have the trainees lay out and construct a form for a continuous footing. Note the proficiency of each trainee. (Job Sheets 27204-2 through 27204-5 may be used in addition to or in lieu of Job Sheet 27204-1, as local conditions warrant.) | |

| Session III. Laboratory | |
| A. Laboratory | |
| Under your supervision, have the trainees continue the construction tasks begun in the previous session. | |
Session IV. Edge Forms; Removing Forms

A. Edge Forms
   1. General Requirements for On-Grade Slabs
   2. Types of Slabs
   3. Parts of Edge Forms
   4. Laying Out and Constructing Edge Forms for Flatwork
      a. Ground Preparation
      b. Reinforcing Concrete Slabs
      c. Isolation Joints
      d. Forming Curves
      e. Forms for Sidewalks and Driveways
      f. Form Evaluation

B. Removing Forms

Session V. Laboratory

A. Laboratory
   Hand out Job Sheets 27204-6 through 27204-8. Under your supervision, have the trainees construct one or more edge form(s), demonstrate how the concrete would be screeded, and then disassemble the form. Note the proficiency of each trainee.

B. Summary
   1. Summarize module.
   2. Answer questions.

Session VI. Module Examination and Performance Testing

A. Module Examination
   1. Trainees must score 70% or higher to receive recognition from the NCCER.
   2. Record the testing results on Craft Training Report Form 200 and submit the results to the Training Program Sponsor.

B. Performance Testing
   1. Trainees must perform each task to the satisfaction of the instructor to receive recognition from the NCCER.
   2. Record the testing results on Craft Training Report Form 200 and submit the results to the Training Program Sponsor.
MODULE OVERVIEW
This module introduces the carpentry trainee to the methods and procedures used in constructing job-built concrete forms.

PREREQUISITES
Please refer to the Course Map in the Trainee Module. Prior to training with this module, it is recommended that the trainee shall have successfully completed the following modules:
Core Curriculum; Carpentry Level One; Carpentry Level Two, Modules 27201 through 27204

LEARNING OBJECTIVES
Upon completion of this module, the trainee will be able to:
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

PERFORMANCE OBJECTIVES
Under supervision of the instructor, the trainee should be able to:
1. Erect, plumb, and brace a basic wall form.
2. Erect, plumb, and brace a ganged wall form.
3. Erect, plumb, and brace a radius wall form.
4. Erect, plumb, and brace a column form.
5. Erect, plumb, and shore a beam form.
6. Erect, plumb, and brace a stair form.

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If you see the Teaching Tip icon, that means there is a teaching tip associated with this section. Also refer to the suggested teaching tips at the end of the module.

SAFETY CONSIDERATIONS

Ensure that the trainees are equipped with appropriate personal protective equipment.

PREPARATION

Before teaching this module, you should review the Module Outline, Learning and Performance Objectives, and the Materials and Equipment List. Be sure to allow ample time to prepare your own training or lesson plan and gather all required equipment and materials.

MATERIALS AND EQUIPMENT LIST

Materials:  
Transparencies  
Markers/chalk  
Sheathing plywood  
¾" conduit for spreaders  
Assortment of lumber, including:  
1 × 4s  
2 × 2s  
2 × 4s  
2 × 6s  
2 × 8s  
2 × 10s  
2 × 12s  
4 × 4s  
4 × 6s  
Stakes  
Duplex nails  
Common nails  
Form ties, washers, and nuts  
Threaded or smooth rods for ties  
Waler support brackets  
Column clamps  
Wire  
¾" plywood  
Form oil  
Mop, brush, or sprayer for applying form oil  
Copies of Job Sheets 1 through 8*  
Module Examinations*  
Performance Profile Sheets*  

Equipment:  
Overhead projector and screen  
Whiteboard/chalkboard  
Appropriate personal protective equipment  
Videocassette recorder (VCR)/TV set (optional)  
Videotape (optional), Job-Built Wall Forms  
Videotape (optional), Job-Built Forms for Heavy Construction  
Videotape (optional), Job-Built Stair Forms  
Chalkline  
String line  
100' steel tape  
Sledgehammer  
Claw hammer  
Hand level  
Builder’s level  
Framing square  
Sawhorses  
Circular saw  
Extension cord  
Powder-actuated fastener and pins  
Power drill and bits  
Handsaw  
Plumb bob and line  
Stair gauges

*Packaged with this Annotated Instructor’s Guide.

ADDITIONAL RESOURCES

This module is intended to present thorough resources for task training. The following reference works are suggested for both instructors and motivated trainees interested in further study. These are optional materials for continued education rather than for task training.

TEACHING TIME FOR THIS MODULE

An outline for use in developing your lesson plan is presented below. Note that each Roman numeral in the outline equates to one session of instruction. Each session has a suggested time period of 2½ hours. This includes 10 minutes at the beginning of each session for administrative tasks and one 10-minute break during the session. Approximately 32½ hours are suggested to cover Concrete Forms. You will need to adjust the time required for hands-on activity and testing based on your class size and resources.

<table>
<thead>
<tr>
<th>Topic</th>
<th>Planned Time</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Session I. Introduction; Form Safety; Wall Forms</strong></td>
<td></td>
</tr>
<tr>
<td>A. Introduction</td>
<td></td>
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<tr>
<td>B. Form Safety</td>
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<tr>
<td>C. Wall Forms</td>
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<tr>
<td>1. Components of a Wall Form</td>
<td></td>
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<tr>
<td>a. Sheathing</td>
<td></td>
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<tr>
<td>b. Form Ties and Spreaders</td>
<td></td>
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<tr>
<td><strong>Session II. Foundation Walls; Laboratory</strong></td>
<td></td>
</tr>
<tr>
<td>A. Foundation Walls</td>
<td></td>
</tr>
<tr>
<td>B. Laboratory</td>
<td>Under your supervision, have the trainees erect, plumb, and brace a basic wall form.</td>
</tr>
<tr>
<td><strong>Session III. Ganged Form Construction; Laboratory</strong></td>
<td></td>
</tr>
<tr>
<td>A. Ganged Form Construction</td>
<td></td>
</tr>
<tr>
<td>B. Laboratory</td>
<td>Hand out Job Sheet 27205-1. Under your supervision, have the trainees erect, plumb, and brace a ganged wall form.</td>
</tr>
<tr>
<td><strong>Session IV. Curved Wall Forms; Laboratory</strong></td>
<td></td>
</tr>
<tr>
<td>A. Curved Wall Forms</td>
<td></td>
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<tr>
<td>B. Laboratory</td>
<td>Hand out Job Sheet 27205-2. Under your supervision, have the trainees erect, plumb, and brace a radius wall form.</td>
</tr>
<tr>
<td><strong>Session V. Framing Wall Openings; Laboratory</strong></td>
<td></td>
</tr>
<tr>
<td>A. Framing Wall Openings</td>
<td></td>
</tr>
<tr>
<td>B. Laboratory</td>
<td>Under your supervision, have the trainees continue the construction tasks begun in the previous session.</td>
</tr>
<tr>
<td><strong>Session VI. Column Forms; Laboratory</strong></td>
<td></td>
</tr>
<tr>
<td>A. Column Forms</td>
<td></td>
</tr>
<tr>
<td>B. Laboratory</td>
<td>Hand out Job Sheet 27205-3. Under your supervision, have the trainees erect, plumb, and brace a column form.</td>
</tr>
</tbody>
</table>
Session VII. Laboratory
   A. Laboratory
      Under your supervision, have the trainees continue the construction tasks begun in the previous session.

Session VIII. Slab-and-Beam Forms
   A. Slab-and-Beam Forms
      1. Beams and Girders
      2. Shoring

Session IX. Laboratory
   A. Laboratory
      Hand out Job Sheets 27205-4 and 27205-5. Under your supervision, have the trainees erect, plumb, and shore either a spandrel or an interior beam form.

Session X. Laboratory
   A. Laboratory
      Under your supervision, have the trainees continue the construction projects begun in the previous session.

Session XI. Stair Forms; Laboratory
   A. Stair Forms
   B. Laboratory
      Hand out Job Sheets 27205-6, 27205-7, and 27205-8. Under your supervision, have the trainees erect, plumb, and brace one or more concrete stair forms.

Session XII. Laboratory
   A. Laboratory
      Under your supervision, have the trainees continue the construction projects begun in the previous session.
   B. Summary
      1. Summarize module.
      2. Answer questions.

Session XIII. Module Examination and Performance Testing
   A. Module Examination
      1. Trainees must score 70% or higher to receive recognition from the NCCER.
      2. Record the testing results on Craft Training Report Form 200 and submit the results to the Training Program Sponsor.
   B. Performance Testing
      1. Trainees must perform each task to the satisfaction of the instructor to receive recognition from the NCCER.
      2. Record the testing results on Craft Training Report Form 200 and submit the results to the Training Program Sponsor.
MODULE OVERVIEW
This module covers the tools, equipment, and procedures involved in the safe handling, placement, and finishing of concrete.

PREREQUISITES
Please refer to the Course Map in the Trainee Module. Prior to training with this module, it is recommended that the trainee shall have successfully completed the following modules:

Core Curriculum; Carpentry Level One; Carpentry Level Two, Modules 27201 through 27206

LEARNING OBJECTIVES
Upon completion of this module, the trainee will be able to:

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.

PERFORMANCE OBJECTIVES
Under supervision of the instructor, the trainee should be able to:

1. Properly handle, place, and consolidate concrete in selected concrete forms.
2. Use a screed to strike off and level a concrete surface.
3. Use a bullfloat and/or darby to level and smooth a concrete surface.
4. Use an edger to form a radius at the edges of a concrete pad, slab, etc.
5. Use a jointer to make control joints in a concrete surface.
6. Use a hand float and finishing trowel to level high spots, remove imperfections, and smooth a concrete surface.

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If you see the Teaching Tip icon, that means there is a teaching tip associated with this section. Also refer to any suggested teaching tips at the end of the module.

SAFETY CONSIDERATIONS

Ensure that the trainees are equipped with appropriate personal protective equipment.

PREPARATION

Before teaching this module, you should review the Module Outline, Learning and Performance Objectives, and the Materials and Equipment List. Be sure to allow ample time to prepare your own training or lesson plan and gather all required equipment and materials.

MATERIALS AND EQUIPMENT LIST

Materials:
Transparencies
Markers/chalk
Supply of plastic concrete
Samples of joint sealants
Module Examinations*
Performance Profile Sheets*

Equipment:
Overhead projector and screen
Whiteboard/chalkboard
Appropriate personal protective equipment
Videocassette recorder (VCR)/TV set (optional)
Videotape (optional), On Your Guard, Power Tool Safety (or equivalent)
Equipment for moving, placing, and consolidating concrete, including:
   Movable chutes (such as used with mixer trucks)
   Drop chutes
   Elephant trunk
   Wheelbarrow
   Power buggy and/or carts
   Crane and bucket
   Belt conveyor
   Concrete pump
   Pneumatic gun
   Internal vibrator
   Rollerbug tamper

Equipment for screeding, leveling, and finishing concrete, including:
   Manual/powered screeds
   Knee boards
   Darby floats/bullfloats
   Pointed trowels
   Edgers
   Jointers (groovers)
   Power saws
   Hand floats
   Hand trowels
   Finishing machine
   Brooms
   Assortment of combination tools
   Pointing and margin trowels
   Cement hammers
   Carborundum rubbing stones
   Sprayers
   Power grinders
   Properly-constructed concrete formworks

*Packaged with this Annotated Instructor’s Guide.
ADDITIONAL RESOURCES

This module is intended to present thorough resources for task training. The following reference works are suggested for both instructors and motivated trainees interested in further study. These are optional materials for continued education rather than for task training.


TEACHING TIME FOR THIS MODULE

An outline for use in developing your lesson plan is presented below. Note that each Roman numeral in the outline equates to one session of instruction. Each session has a suggested time period of 2½ hours. This includes 10 minutes at the beginning of each session for administrative tasks and one 10-minute break during the session. Approximately 22½ hours are suggested to cover *Handling and Placing Concrete*. You will need to adjust the time required for hands-on activity and testing based on your class size and resources.

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<td>3. Control Joints</td>
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<td>A. Moving and Handling Concrete</td>
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<td>2. On-Site Equipment for Conveying and Placing Concrete</td>
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<td>a. Chutes</td>
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<td>b. Drop Chutes and Elephant Trunks</td>
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<td>c. Wheelbarrows, Power Buggies, and Carts</td>
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<td>d. Cranes and Buckets</td>
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<tr>
<td>e. Belt Conveyors</td>
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<td>f. Concrete Pumps</td>
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<td>g. Shotcrete</td>
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<td><strong>Session III. Placing Concrete in Forms; Consolidating Concrete</strong></td>
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<tr>
<td>A. Placing Concrete in Forms</td>
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<td>2. Placing the Concrete</td>
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<td>B. Consolidating Concrete</td>
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<tr>
<td>1. Internal Vibrators</td>
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<tr>
<td>2. External Vibrators</td>
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</tbody>
</table>
Session IV. Consolidating Concrete; Laboratory
   A. Consolidating Concrete
      1. Laboratory
         Under your supervision, have the trainees properly handle, place, and consolidate concrete in selected concrete forms. Note the proficiency of each trainee.

Session V. Screeding; Leveling
   A. Screeding
      1. Laboratory
         Under your supervision, have the trainees practice using a screed to strike off and level a concrete surface. Note the proficiency of each trainee.

   B. Leveling
      1. Laboratory
         Under your supervision, have the trainees practice using a bullfloat and/or darby to level and smooth a concrete surface. Note the proficiency of each trainee.

Session VI. Edging; Jointing; Floating and Troweling; Brooming
   A. Edging
      1. Laboratory
         Under your supervision, have the trainees practice using an edger to form a radius at the edges of a concrete pad or slab. Note the proficiency of each trainee.

   B. Jointing
      1. Laboratory
         Under your supervision, have the trainees practice using a jointer to make control joints in a concrete surface. Note the proficiency of each trainee.

   C. Floating and Troweling
      1. Laboratory
         Under your supervision, have the trainees practice using a hand float and finishing trowel to level high spots, remove imperfections, and smooth a concrete surface. Note the proficiency of each trainee.

   D. Brooming

Session VII. Curing Concrete; Joint Sealants; Removing Forms
   A. Curing Concrete
   B. Joint Sealants
   C. Removing Forms

Session VIII. Other Hand and Power Tools Used When Working with Concrete; Safety Precautions
   A. Other Hand and Power Tools Used When Working with Concrete
      1. Combination Tools
      2. Pointing and Margin Trowels
      3. Hammers
      4. Carborundum Rubbing Stones
      5. Sprayers
      6. Power Grinders

   B. Safety Precautions
      1. Rules for the Care and Safe Use of Hand Tools
      2. Rules for the Care and Safe Use of Power Tools
      3. Preventing Cement Dermatitis
C. Summary
   1. Summarize module.
   2. Answer review questions.

Session IX. Module Examination and Performance Testing

A. Module Examination
   1. Trainees must score 70% or higher to receive recognition from the NCCER.
   2. Record the testing results on Craft Training Report Form 200 and submit the results to the Training Program Sponsor.

B. Performance Testing
   1. Trainees must perform each task to the satisfaction of the instructor to receive recognition from the NCCER.
   2. Record the testing results on Craft Training Report Form 200 and submit the results to the Training Program Sponsor.
MODULE OVERVIEW

This module introduces the carpentry trainee to the methods and procedures used in erecting patented concrete forms and systems.

PREREQUISITES

Please refer to the Course Map in the Trainee Module. Prior to training with this module, it is recommended that the trainee shall have successfully completed the following modules:

Core Curriculum; Carpentry Level One; Carpentry Level Two, Modules 27201 through 27207

LEARNING OBJECTIVES

Upon completion of this module, the trainee will be able to:

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.

PERFORMANCE OBJECTIVES

Under supervision of the instructor, the trainee should be able to:

1. Erect, plumb, and brace a patented wall form.
2. Erect, plumb, and brace a patented column form.
3. Use a patented hardware system to erect forms of lumber and sheathing.

NCCER STANDARDIZED CRAFT TRAINING PROGRAM

The National Center for Construction Education and Research (NCCER) provides a standardized national program of accredited craft training. Key features of the program include instructor certification, competency-based training, and performance testing. The program provides trainees, instructors, and companies with a standard form of recognition through a National Craft Training Registry. The program is described in full in the Guidelines for Accreditation, published by the NCCER. For more information on standardized craft training, contact the NCCER by writing us at P.O. Box 141104, Gainesville, FL 32614-1104, calling 352-334-0911, or e-mailing info@nccer.org. More information may be found at our Web site, www.nccer.org.

HOW TO USE THIS ANNOTATED INSTRUCTOR’S GUIDE

Each page presents two sections of information. The larger section displays each page exactly as it appears in the Trainee Module. The narrow column ties suggested trainee and instructor actions to each page and provides icons to call your attention to material, safety, audiovisual, or testing requirements. The bottom of each page includes space for your notes.

If you see the Teaching Tip icon, that means there is a teaching tip associated with this section. Also refer to any suggested teaching tips at the end of the module.
SAFETY CONSIDERATIONS

Ensure that the trainees are equipped with appropriate personal protective equipment.

PREPARATION

Before teaching this module, you should review the Module Outline, Learning and Performance Objectives, and the Materials and Equipment List. Be sure to allow ample time to prepare your own training or lesson plan and gather all required equipment and materials.

MATERIALS AND EQUIPMENT LIST

<table>
<thead>
<tr>
<th>Materials</th>
<th>Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transparencies</td>
<td>Overhead projector and screen</td>
</tr>
<tr>
<td>Markers/chalk</td>
<td>Whiteboard/chalkboard</td>
</tr>
<tr>
<td>Form panels</td>
<td>Appropriate personal protective equipment</td>
</tr>
<tr>
<td>Form hardware</td>
<td>Chalkline</td>
</tr>
<tr>
<td>Plywood</td>
<td>String line</td>
</tr>
<tr>
<td>Assorted lumber, including:</td>
<td>100’ steel tape</td>
</tr>
<tr>
<td>1 × 2s</td>
<td>Sledgehammer</td>
</tr>
<tr>
<td>2 × 4s</td>
<td>Claw hammer</td>
</tr>
<tr>
<td>2 × 6s</td>
<td>Hand level</td>
</tr>
<tr>
<td>2 × 8s</td>
<td>Builder’s level</td>
</tr>
<tr>
<td>4 × 4s</td>
<td>Framing square</td>
</tr>
<tr>
<td>4 × 6s</td>
<td>Sawhorses</td>
</tr>
<tr>
<td>Duplex nails</td>
<td>Powder-actuated fastener and pins</td>
</tr>
<tr>
<td>Common nails</td>
<td>Power drill and bits</td>
</tr>
<tr>
<td>Examples of patented column form(s)</td>
<td>Circular saw</td>
</tr>
<tr>
<td>and related hardware</td>
<td>Extension cord</td>
</tr>
<tr>
<td>Insulated polystyrene wall form blocks</td>
<td>Handsaw</td>
</tr>
<tr>
<td>Adjustable shores</td>
<td>Plumb bob and line</td>
</tr>
<tr>
<td>Burlap</td>
<td>Air compressor</td>
</tr>
<tr>
<td>Dome forms</td>
<td>Air hose</td>
</tr>
<tr>
<td>Prefabricated flying truss form</td>
<td>Air gun</td>
</tr>
<tr>
<td>Shore frames (scaffold)</td>
<td>Air wrench with sockets</td>
</tr>
<tr>
<td>Truss roller assemblies</td>
<td>16” adjustable wrench</td>
</tr>
<tr>
<td>Copies of Job Sheets 1 through 4*</td>
<td>Form oil and brush</td>
</tr>
<tr>
<td>Module Examinations*</td>
<td>Screw jacks</td>
</tr>
<tr>
<td>Performance Profile Sheets*</td>
<td>Wrecking bar</td>
</tr>
</tbody>
</table>

*Packaged with this Annotated Instructor’s Guide.

ADDITIONAL RESOURCES

This module is intended to present thorough resources for task training. The following reference works are suggested for both instructors and motivated trainees interested in further study. These are optional materials for continued education rather than for task training.


TEACHING TIME FOR THIS MODULE

An outline for use in developing your lesson plan is presented below. Note that each Roman numeral in the outline equates to one session of instruction. Each session has a suggested time period of 2½ hours.
This includes 10 minutes at the beginning of each session for administrative tasks and one 10-minute break during the session. Approximately 22½ hours are suggested to cover Manufactured Forms. You will need to adjust the time required for hands-on activity and testing based on your class size and resources.

<table>
<thead>
<tr>
<th>Topic</th>
<th>Planned Time</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Session I. Introduction; Types of Manufactured Forms; Wall Forms; Patented Wall-Forming Systems</strong></td>
<td></td>
</tr>
<tr>
<td>A. Introduction</td>
<td></td>
</tr>
<tr>
<td>B. Types of Manufactured Forms</td>
<td></td>
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<tr>
<td>1. Formwork Economics</td>
<td></td>
</tr>
<tr>
<td>C. Wall Forms</td>
<td></td>
</tr>
<tr>
<td>1. Parts and Accessories</td>
<td></td>
</tr>
<tr>
<td>2. Panel-Forming Systems</td>
<td></td>
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<tr>
<td>3. Ganged Forms</td>
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<tr>
<td>D. Patented Wall-Forming Systems</td>
<td></td>
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<tr>
<td>1. Curved Forms</td>
<td></td>
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<tr>
<td><strong>Session II. Patented Forms; Laboratory</strong></td>
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<tr>
<td>A. Patented Forms</td>
<td></td>
</tr>
<tr>
<td>1. Laboratory</td>
<td></td>
</tr>
<tr>
<td>Hand out Job Sheet 27208-1. Under your supervision, have the trainees erect, plumb, and brace a patented wall form. Note the proficiency of each trainee.</td>
<td></td>
</tr>
<tr>
<td><strong>Session III. Laboratory, continued</strong></td>
<td></td>
</tr>
<tr>
<td>A. Laboratory</td>
<td></td>
</tr>
<tr>
<td>Under your supervision, have the trainees continue the construction project from the previous session.</td>
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<tr>
<td><strong>Session IV. Column Forms</strong></td>
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<tr>
<td>A. Column Forms</td>
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<tr>
<td>1. Fiber Column Forms</td>
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<tr>
<td>2. Steel Column Forms</td>
<td></td>
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<tr>
<td><strong>Session V. Patented Column Form Laboratory</strong></td>
<td></td>
</tr>
<tr>
<td>A. Laboratory</td>
<td></td>
</tr>
<tr>
<td>Under your supervision, have the trainees erect, plumb, and brace a patented column form.</td>
<td></td>
</tr>
<tr>
<td><strong>Session VI. Patented Column Form Laboratory, continued</strong></td>
<td></td>
</tr>
<tr>
<td>A. Laboratory</td>
<td></td>
</tr>
<tr>
<td>Under your supervision, have the trainees continue the construction project from the previous session.</td>
<td></td>
</tr>
<tr>
<td><strong>Session VII. Floor-Forming Systems; Laboratory</strong></td>
<td></td>
</tr>
<tr>
<td>A. Floor-Forming Systems</td>
<td></td>
</tr>
<tr>
<td>1. Pan Forms</td>
<td></td>
</tr>
<tr>
<td>2. Corrugated Steel Deck Forms</td>
<td></td>
</tr>
<tr>
<td>3. Flying Deck Forms</td>
<td></td>
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<tr>
<td>a. Flying Deck Form Safety</td>
<td></td>
</tr>
<tr>
<td>B. Laboratory</td>
<td></td>
</tr>
<tr>
<td>Hand out Job Sheets 27208-2, 27208-3, and 27208-4. Under your supervision, have the trainees complete the tasks outlined in the job sheets. Note the proficiency of each trainee.</td>
<td></td>
</tr>
</tbody>
</table>
Session VIII. Laboratory, continued

A. Laboratory
   Under your supervision, have the trainees continue the construction project from the previous session.

Session IX. EFCO Culvert-Forming Systems; Slipforming; Forms for Paving; Architectural Forms; Polystyrene Forms; Module Examination and Performance Testing

A. EFCO Culvert-Forming Systems

B. Slipforming
   1. Vertical Slipforming
   2. Slipform Construction

C. Forms for Paving

D. Architectural Forms
   1. Smooth Finishes
   2. Textured Surfaces

E. Polystyrene Forms

F. Summary
   1. Summarize module.
   2. Answer review questions.

G. Module Examination
   1. Trainees must score 70% or higher to receive recognition from the NCCER.
   2. Record the testing results on Craft Training Report Form 200 and submit the results to the Training Program Sponsor.

H. Performance Testing
   1. Trainees must perform each task to the satisfaction of the instructor to receive recognition from the NCCER.
   2. Record the testing results on Craft Training Report Form 200 and submit the results to the Training Program Sponsor.
OBJECTIVES

Upon completion of this module, the trainee will be able to:

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.

Note to the Instructor

Before teaching this module, you should review the details in this Instructor’s Guide for Equipment and Materials, Testing, and the suggested Teaching Sequence. Be sure to allow ample time to prepare your own training plan or lesson plan and to gather all required equipment and materials.

Required Equipment and Materials

The following are required for instruction using this module:

**Equipment**
- Overhead projector and screen
- Whiteboard/chalkboard
- Appropriate Personal Protective Equipment
- Metal decking
- Fasteners
- Welding equipment

**Materials**
- Trainee Task Module
- Transparencies
- Markers/chalk
- Module Examination
- Performance Profile Sheets
HOW TO USE THIS INSTRUCTOR’S GUIDE

For each 2½-hour class session in this Instructor’s Guide, the basic Presentation Sequence is as follows:

- Introduction/Overview
- Classroom, and/or Demonstration, and/or Laboratory
- Class Break
- Classroom, and/or Demonstration, and/or Laboratory
- Summary

Suggested time periods for classroom sessions are included throughout this Instructor’s Guide. These time periods should be adapted to meet local conditions and training requirements.

Each class session is presented with two columns of information. On the left side of the page, a narrow column provides suggested trainee and instructor actions, icons to call your attention to material, safety, audiovisual, or testing requirements, and space for your notes. The right-hand column provides the outline of the suggested presentation for each class session.

In this Instructor’s Guide, the terms classroom, demonstration, and laboratory are defined and used as follows:

**Classroom**: Sessions are designed for lectures, group discussions, coaching, and additional activities. Trainees should be encouraged to actively participate.

**Demonstration**: Instructors will demonstrate all procedures before trainees attempt them. Instructors should make sure that trainees can point out all safety procedures during demonstrations to be assured of the proper use of equipment by trainees.

**Laboratory**: Instructors will facilitate all laboratory activities, coach trainees as they practice the procedures, monitor trainee progress, and provide feedback. The instructor will make sure that safety rules are followed at all times and that protective equipment is worn.

**NCCER Standardized Craft Training Programs**

The National Center for Construction Education and Research (NCCER) provides a standardized national program of accredited craft training. Key features of the program include instructor certification, competency-based training, and performance testing. The program provides trainees, instructors, and companies with a standard form of recognition through a National Craft Training Registry. The program is described in full in the *Guidelines for Accreditation*, published by the NCCER. For more information on standardized craft training, contact the NCCER at P.O. Box 141104, Gainesville, FL 32614-1104; or call 352-334-0911.
**MODULE OVERVIEW**

This course introduces the Ironworking trainee to the methods and procedures used in installing metal decking.

**Prerequisites**

Please see the Course Map. Prior to training with this module, it is recommended that the trainee shall have successfully completed the following modules:

Core Curricula; Ironworking Level 1, Modules 30101 through 30113

**Safety Considerations**

Ensure that the trainees are equipped with appropriate personal protective equipment.

**Teaching Time for This Module**

Approximately 10 hours or 4 sessions of training time are suggested to cover *Metal Decking*. The training class session is a suggested 2½-hour time period, which includes at least one break. **You will need to adjust the time required for hands-on activities and testing based on your class size and resources.** All time periods for this module are suggested and you will need to adapt the suggested lesson plan to meet your local conditions.

**Suggested Teaching Sequence — Four 2½-Hour Sessions**

Adjust your class times based on class size and resources.

<table>
<thead>
<tr>
<th>Session</th>
<th>Topic</th>
<th>Trainee Module Section(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction – Storage And Protection</td>
<td>1.0.0 – 2.4.0</td>
</tr>
<tr>
<td>2</td>
<td>Erecting Decking And Observing Job Site Safety – Housekeeping</td>
<td>3.0.0 – 3.6.5</td>
</tr>
<tr>
<td>3</td>
<td>Deck Damage And Penetrations – Placing Concrete</td>
<td>4.0.0 – 5.0.0</td>
</tr>
<tr>
<td>4</td>
<td>Module Examination</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Performance Profile Examination</td>
<td></td>
</tr>
</tbody>
</table>
PERFORMANCE PROFILE TASKS

1. Demonstrate safe lifting methods.
2. Properly place decking.
3. Attach decking with fasteners.
4. Attach decking by welding.
5. Demonstrate how to check weld quality.
COURSE OVERVIEW

This course introduces the basic leadership skills a crew leader needs in order to supervise a crew. Trainees will learn about:

- The construction industry today
- Construction organization
- Team building
- Gender and minority issues
- Communication
- Motivation
- Problem solving
- Decision making
- Safety
- Project control

PREREQUISITES

There are no prerequisites for this course.

LEARNING OBJECTIVES

Upon completion of this course, the trainee will be able to:

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.

PERFORMANCE OBJECTIVES

This is a knowledge-based module—there is no performance profile examination.

NCCER STANDARDIZED CRAFT TRAINING PROGRAM

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NOTE TO INSTRUCTORS

If you are training under an Accredited NCCER Sponsor, note that you may be eligible for dual credentials for successful completion of Introductory Skills for the Crew Leader. When submitting the Form 200, indicate completion of the two module numbers that apply to Introductory Skills for the Crew Leader – MT101 (from NCCER’s Contren® Management Series) and 28307-05 (from NCCER’s Masonry Level Three) and transcripts will be issued to you accordingly.
HOW TO USE THIS ANNOTATED INSTRUCTOR’S GUIDE

Each page presents two sections of information. The larger section displays each page exactly as it appears in the Trainee Guide. The narrow column ties suggested trainee and instructor actions to each page and provides icons to call your attention to material, safety, audiovisual, or testing requirements. The bottom of each page includes space for your notes.

Review questions and participant exercises are found periodically throughout the Trainee Guide in order for the trainees to test their knowledge. An answer key to these review questions and suggested answers for the participant exercises are located at the back of this Annotated Instructor’s Guide. After trainees complete thereview questions, go over the correct answers with them to be sure they understand all concepts.

PREPARATION

Before teaching this course, you should review the Course Outline, Learning Objectives, and the Materials and Equipment List. Be sure to allow ample time to prepare your own training or lesson plan and gather all required equipment and materials.

MATERIALS AND EQUIPMENT LIST

<table>
<thead>
<tr>
<th>Materials</th>
<th>Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transparencies</td>
<td>Overhead projector</td>
</tr>
<tr>
<td>Markers/chalk</td>
<td>Screen (or large blank wall)</td>
</tr>
<tr>
<td>Calculator</td>
<td>Whiteboard/chalkboard</td>
</tr>
<tr>
<td>Pencils/scratch paper</td>
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<tr>
<td>Example of OSHA Log Books</td>
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<tr>
<td>Examples of MSDS Sheets</td>
<td></td>
</tr>
<tr>
<td>Copies of Module Examinations*</td>
<td></td>
</tr>
</tbody>
</table>

*Located in the Test Booklet packaged with this Annotated Instructor’s Guide.

ADDITIONAL RESOURCES

This module is intended to present thorough resources for task training. The following reference works are suggested for both instructors and motivated trainees interested in further study. These are optional materials for continued education rather than for task training.


TEACHING TIME FOR THIS COURSE

An outline for use in developing your lesson plan is presented below. This course is designed to be taught in one of two formats: two 8-hour sessions (such as all-day workshops) or eight 2-hour sessions (such as after-work training seminars). Because of this, each session below has a suggested time period of two hours. If leading 8-hour sessions, simply teach four of these 2-hour sessions both times your class meets. All instructors will need to adjust the time required for participant activities and testing based on class size and resources.

<table>
<thead>
<tr>
<th>Topic</th>
<th>Planned Time</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Session I. Orientation to the Job</strong></td>
<td></td>
</tr>
<tr>
<td>A. Overview of the Construction Industry</td>
<td></td>
</tr>
<tr>
<td>1. Historical Importance of the Construction Industry</td>
<td></td>
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<tr>
<td>2. Growth and Economics of the Construction Industry</td>
<td></td>
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<tr>
<td>3. Changing Values of Workers</td>
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<tr>
<td>B. The Construction Industry Today</td>
<td></td>
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<tr>
<td>1. Training</td>
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<tr>
<td>2. New Technology</td>
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<tr>
<td>C. Gender and Minority Issues</td>
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<tr>
<td>1. Communication Styles of Men and Women</td>
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<tr>
<td>2. Language Barriers</td>
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<td>3. Cultural Differences</td>
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<td>4. Sexual Harassment</td>
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<tr>
<td>5. Gender and Minority Discrimination</td>
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<tr>
<td>D. Construction Projects</td>
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<tr>
<td>E. The Construction Organization</td>
<td></td>
</tr>
<tr>
<td>1. Division of Responsibility</td>
<td></td>
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<tr>
<td>2. Authority and Responsibility</td>
<td></td>
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<tr>
<td>3. Job Descriptions</td>
<td></td>
</tr>
<tr>
<td>4. Policies and Procedures</td>
<td></td>
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<tr>
<td><strong>Session II. Leadership Skills, Part One</strong></td>
<td></td>
</tr>
<tr>
<td>A. Introduction to Supervision</td>
<td></td>
</tr>
<tr>
<td>B. The Shift in Work Activities</td>
<td></td>
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<tr>
<td>C. Becoming a Leader</td>
<td></td>
</tr>
<tr>
<td>1. Characteristics of Leaders</td>
<td></td>
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<tr>
<td>2. Functions of a Leader</td>
<td></td>
</tr>
<tr>
<td>3. Leadership Styles</td>
<td></td>
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<tr>
<td>4. Ethics in Leadership</td>
<td></td>
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<tr>
<td>D. Communication</td>
<td></td>
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<tr>
<td>1. Verbal Communication</td>
<td></td>
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<tr>
<td>2. Non-Verbal Communication</td>
<td></td>
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<tr>
<td>3. Written or Visual Communication</td>
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<tr>
<td>4. Communication Issues</td>
<td></td>
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<tr>
<td>E. Motivation</td>
<td></td>
</tr>
<tr>
<td>1. Employee Motivators</td>
<td></td>
</tr>
<tr>
<td>2. Motivating Employees</td>
<td></td>
</tr>
</tbody>
</table>
Session III. Leadership Skills, Part Two
A. Team Building
  1. Successful Teams
  2. Building Successful Teams
B. Getting the Job Done
  1. Delegating Responsibilities
  2. Implementing Policies and Procedures
C. Problem Solving and Decision Making
  1. Problem Solving vs. Decision Making
  2. Types of Decisions
  3. Formal Problem-Solving Techniques
  4. Special Leadership Problems

Session IV. Safety, Part One
A. Safety Overview
B. Costs of Accidents
  1. Insured Costs
  2. Uninsured Costs
C. Safety Regulations
  1. Workplace Inspections
  2. Penalties for Violations

Session V. Safety, Part Two
A. Safety Responsibilities
  1. Safety Program
  2. Safety Policies and Procedures
  3. Hazard Identification and Assessment
  4. Safety Information and Training
  5. Safety Record Systems
  6. Accident Investigation Procedures
B. Supervisor Involvement in Safety
  1. Safety Meetings
  2. Inspections
  3. First Aid
  4. Fire Protection and Prevention
  5. Substance Abuse
  6. Accident Investigations
C. Promoting Safety
  1. Meetings
  2. Contests
  3. Recognition and Awards
  4. Publicity

Session VI. Project Control, Part One
A. Project Control Overview
B. Project Delivery Systems
  1. General Contracting
  2. Design-Build
  3. Construction Management
C. An Overview of Planning
   1. What is Planning?
   2. Why Plan?
D. Stages of Planning
   1. Pre-Construction Planning
   2. Construction Planning
E. The Planning Process
   1. Establishing a Goal
   2. Identifying the Work to be Done
   3. Determining Tasks
   4. Communicate Responsibilities
   5. Follow-Up
F. Planning Resources
   1. Planning Materials
   2. Planning Equipment
   3. Planning Tools
   4. Planning Labor
G. Ways to Plan
Session VII. Project Control, Part Two
   A. Estimating
   B. Scheduling
      1. The Scheduling Process
      2. Bar Charts
      3. Network Schedule
      4. Short-Interval Production Scheduling
      5. Updating a Schedule
Session VIII. Project Control, Part Three
   A. Cost Awareness And Control
      1. Categories of Costs
      2. Field Reporting System
      3. Supervisor’s Role in Cost Control
   B. Resource Control
      1. Control
      2. Materials Control
      3. Equipment Control
      4. Tools Control
      5. Labor Control
   C. Production and Productivity
   D. Summary
      1. Summarize Course
      2. Answer Questions
   E. Module Examination
      1. Trainee must score 70% or higher to receive recognition from the NCCER.
      2. Record testing results on Craft Training Report Form 200 and submit the results to the Training Program Sponsor.