



Pembroke Hopkins Park Construction Outreach Program

13355 E. 3000 S. Rd., Pembroke Township, IL 60958

Tel: (815) 944-8897 Fax: (815) 944-5675

Level One

Module Overview

This module explains the role of safety in the construction crafts. Trainees will learn how to identify and follow safe work practices and procedures as well as how to properly inspect and use safety equipment. Trainees will be able to describe safe work procedures for lifting heavy objects, fighting fires, and working around electrical hazards.

Prerequisites

There are no prerequisites for this module.

Objectives

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

1. Explain the idea of a safety culture and its importance in the construction crafts.
2. Identify causes of accidents and the impact of accident costs.
3. Explain the role of OSHA in job-site safety.
4. Explain OSHA's *General Duty Clause* and *1926 CFR Subpart C*.
5. Recognize hazard recognition and risk assessment techniques.
6. Explain fall protection, ladder, stair, and scaffold procedures and requirements.
7. Identify struck-by hazards and demonstrate safe working procedures and requirements.
8. Identify caught-in-between hazards and demonstrate safe working procedures and requirements.
9. Define safe work procedures to use around electrical hazards.
10. Demonstrate the use and care of appropriate personal protective equipment (PPE).
11. Explain the importance of hazard communications (HazCom) and material safety data sheets (MSDSs).
12. Identify other construction hazards on your job site, including hazardous material exposures, environmental elements, welding and cutting hazards, confined spaces, and fires.



Performance Tasks

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

1. Inspect PPE to determine if it is safe to use (PPE should include safety goggles, hard hat, gloves, safety harness, and safety shoes).
2. Properly don and remove PPE (safety goggles, hard hat, and personal fall protection).
3. Demonstrate safe lifting procedures.
4. Set up an extension ladder properly.
5. Demonstrate three-point contact on a ladder.

Materials and Equipment List

Multimedia projector and screen
Core Curriculum PowerPoint® Presentation Slides
Desktop or laptop computer
Whiteboard/chalkboard
Markers/chalk
Pencils and scratch paper
Copies of your local code
Variety of personal protective equipment, including:
Hard hats
Safety glasses, goggles, and face shields
Safety harness
Gloves
Safety shoes
Hearing protection
Respiratory protection
Variety of fire extinguishers
Variety of communication tags and signs
Materials to create hypothetical fire hazards
Variety of safety tags, including:
Scaffold tags
Lockout/tagout tag
Fire extinguisher tag
Copies of your company's fall protection plan
Variety of ladders, including:
Straight ladder
Extension ladder
Stepladder
Trade Terms Quiz*
Module Examination**



Performance Profile Sheets**

* Located in the back of the Trainee Guide module

**Available only through the Instructor Resource Center using the access code bound with this book.

Safety Considerations

Ensure that the trainees are equipped with appropriate personal protective equipment. Always work in a clean, well-lit, appropriate work area.

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.

Construction Back Safety. Videocassette. 10 minutes. Coastal Training Technologies Corp. Virginia Beach, VA.

Construction Confined Space Entry. Videocassette. 10 minutes. Coastal Training Technologies Corp. Virginia

Beach, VA. *Construction Electrical Safety*. Videocassette. 10 minutes. Coastal Training Technologies Corp. Virginia Beach, VA.

Construction Fall Protection: Get Arrested! Videocassette. 11 minutes. Coastal Training Technologies Corp. Virginia Beach, VA.

Construction Lockout/Tagout. Videocassette. 10 minutes. Coastal Training Technologies Corp. Virginia Beach, VA.

Construction Safety. Jimmie Hinze. Englewood Cliffs, NJ: Prentice Hall.

Construction Safety Council Home Page, <http://buildsafe.org>.

Construction Stairways and Ladders. Videocassette. 10 minutes. Coastal Training Technologies Corp. Virginia Beach, VA.

Construction Welding Safety. Videocassette. 10 minutes. Coastal Training Technologies Corp. Virginia Beach, VA.

Field Safety, 2003. NCCER. Upper Saddle River, NJ: Prentice Hall.

Handbook of OSHA Construction Safety and Health. James V. Eidson, et al. Boca Raton, FL: Lewis Publishers, Inc.

HazCom for Construction. Videocassette. 11 minutes. Coastal Training Technologies Corp. Virginia Beach, VA.

NAHB-OSHA Jobsite Safety Handbook. Washington, DC: Home Builder Press.

Available online at www.osha.gov.

Occupational Safety and Health Standards for the Construction Industry, latest edition. Washington, DC: Occupational Safety and Health Administration, U.S. Department of Labor, U.S. Government Printing



Office.

Safety Orientation, 2003. NCCER. Upper Saddle River, NJ: Prentice Hall.

Safety Technology, 2003. NCCER. Upper Saddle River, NJ: Prentice Hall.

United States Department of Labor, Occupational Safety and Health Administration
Home Page, www.osha.gov.

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 12½ hours are suggested to cover *Basic Safety*. You will need to adjust the time required for hands-on activity and testing based on your class size and resources. Because laboratories often correspond to Performance Tasks, the proficiency of the trainees may be noted during these exercises for Performance Testing purposes.

00101-09 Basic Safety (12.5 Hours)

Session I. Introduction to Safety and Accidents

- A. Importance of Safety _____
- B. Accidents: Causes and Results _____
- C. Company Safety Policies and OSHA Regulations _____
- D. Hazard Recognition, Evaluation, and Control _____

Session II. Working from Elevations

- A. Elevated Work and Fall Protection _____
- B. Ladders and Stairs _____
- C. Laboratory _____

Trainees practice setting up and using ladders. This laboratory corresponds to Performance Tasks 4 and 5.

- D. Scaffolds _____

Session III. Job-Site Hazards

- A. Struck-by Hazards _____
- B. Caught-in-Between Hazards _____
- C. Electrical Hazards _____



Session IV. Safety Precautions and Job-Site Hazards

A. Personal Protective Equipment _____

B. Laboratory _____

Trainees practice inspecting and donning PPE. This laboratory corresponds to Performance Tasks 1 and 2.

C. Hazard Communication Standard _____

D. Other Job-Site Hazards _____

E. Laboratory _____

Trainees practice safe lifting techniques. This laboratory corresponds to Performance Task 3.

Session V. Review and Testing

A. Review _____

B. Module Examination _____

1. Trainees must score 70 percent 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.

C. Performance Testing _____

1. Trainees must perform each task to the satisfaction of the instructor to receive recognition from NCCER. If applicable, proficiency noted during laboratory exercises can be used to satisfy the Performance Testing requirements.

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 mathematical operations commonly used in construction, and explains how the metric system and geometry are used in the trade. Trainees will learn how to add, subtract, multiply, and divide whole numbers, fractions, and decimals, as well as how to convert decimals, fractions, and percentages.

Prerequisites

Prior to training with this module, it is recommended that the trainee shall have successfully completed the following: *Core Curriculum: Introductory Craft Skills*, Module 93600-01.



Objectives

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

1. Add, subtract, multiply, and divide whole numbers, with and without a calculator.
2. Use a standard ruler, a metric ruler, and a measuring tape to measure.
3. Add, subtract, multiply, and divide fractions.

4. Add, subtract, multiply, and divide decimals, with and without a calculator.
5. Convert decimals to percentages and percentages to decimals.
6. Convert fractions to decimals and decimals to fractions.
7. Explain what the metric system is and how it is important in the construction trade.
8. Recognize and use metric units of length, weight, volume, and temperature.
9. Recognize some of the basic shapes used in the construction industry and apply basic geometry to measure them.

Performance Tasks

This is a knowledge-based module. There are no performance tasks.

Materials and Equipment List

Multimedia projector and screen
Core Curriculum PowerPoint® Presentation Slides
Desktop or laptop computer
Whiteboard/chalkboard
Markers/chalk
Pencils and paper
Copies of your local code
Sample work orders that require mathematical functions
Calculator
Standard ruler (with 1/16-inch markings)
Metric ruler (with centimeters [cm] and millimeters [mm])
Tape measure
Architect's scale
Metric scale
Engineer's scale
Set of construction drawings
Protractors
Trade Terms Quiz*
Module Examinations**

* Located in the back of the Trainee Guide module

**Available only through the Instructor Resource Center using the access code bound with this book.



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. *All the Math You'll Ever Need*, 1999. Stephen Slavin. New York, NY: John Wiley & Sons.

Applied Construction Math: A Novel Approach, 2006. National Center for Construction Education and Research. Upper Saddle River, NJ: Prentice Hall.

Basic Construction Math Review: A Manual of Basic Construction Mathematics for Contractor and Tradesman License Exams. Printcorp Business Printing. Construction Books Express.

Math for the Building Trades. Homewood, IL: American Technical Publishers (ATP).

Math to Build On: A Book for Those Who Build, 1997. Johnny and Margaret Hamilton. Clinton, NC: Construction Trades Press.

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 10 hours are suggested to cover *Introduction to Construction Math*. You will need to adjust the time required for hands-on activity and testing based on your class size and resources. Because laboratories often correspond to Performance Tasks, the proficiency of the trainees may be noted during these exercises for Performance Testing purposes.

00102-09 Introduction to Construction Math (10 Hours)

Session I. Whole Numbers and Measurements

- A. Whole Numbers _____
- B. Working with Length Measurements _____
- C. Other Types of Scales _____
- D. Laboratory _____

Have trainees practice taking measurements using scales.

Session II. Fractions and Decimals



- A. Reducing and Comparing Fractions _____
- B. Adding and Subtracting Fractions _____
- C. Multiplying and Dividing Fractions _____
- D. Comparing Decimals _____
- E. Adding and Subtracting Decimals _____
- F. Multiplying and Dividing Decimals _____

Session III. Conversion and Geometry

- A. Converting Fractions and Decimals _____
- B. Converting Inches and Decimals _____
- C. Introduction to Construction Geometry _____
- D. Area of Shapes _____
- E. Volume of Shapes _____

Session IV. Review and Testing

- A. Review _____
- B. Module Examination _____
 1. Trainees must score 70 percent 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.

Module Overview

This module explains how to inspect and properly use hand tools. Trainees will learn how to identify and take care of basic hand tools.

Prerequisites

Prior to training with this module, it is recommended that the trainee shall have successfully completed the following: *Core Curriculum: Introductory Craft Skills*, Modules 93600-01

Objectives

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

1. Recognize and identify some of the basic hand tools and their proper uses in the construction trade.
2. Visually inspect hand tools to determine if they are safe to use.
3. Safely use hand tools.



Performance Tasks

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

1. Visually inspect the following tools to determine if they are safe to use:

- Hammer
- Screwdriver
- Saw

2. Make a straight square cut using a crosscut saw.

3. Safely and properly use a minimum of three of the following tools:

- Hammer and cat's paw (to drive and pull nails)
- Screwdriver (slotted or Phillips)
- Adjustable wrench
- CHANNELLOCK® pliers
- Spirit level
- Carpenter's square and steel tape
- Saw

Materials and Equipment List

Multimedia projector and screen

Core Curriculum PowerPoint® Presentation Slides

Desktop or laptop computer

Whiteboard/chalkboard

Markers/chalk

Pencils and scratch paper

Copies of your local code

Appropriate personal protective equipment

Claw hammer

Wood board with nails to practice using hammers

Ball peen hammer

Screwdrivers, including:

Slotted

Phillips

Wood board with screws to practice using screwdrivers

Sledgehammer

Stake

Ripping bar

Nail pullers, including:

Cat's paw

Chisel bar

Flat bar

Wood boards with nails to practice using nail pullers

Pliers, including:



Slip-joint
Long-nose
Lineman
Tongue-and-groove
CHANNELLOCK® pliers
Boards with wire and soft metals to practice using pliers
Measuring tools, including:
Steel rule
Measuring tape
Wooden folding rule
Laser measuring tool
Spirit level
Squares, including:
Carpenter's square
Combination square
Try square
Square wood frames to practice using the
measuring tools
Plumb bob
Self-chalker
Clamps, including:
C-clamp
Locking C-clamp
Spring clamp
Bar clamp
Pipe clamp
Hand-screw clamp
Quick Grip®
Web clamp
Crosscut saw
Sections of wood suitable for sawing
Files and rasps, including:
Veneer knife file
Square file
Triangle file
Flat file
Rat-tail file
Rasp
File card
Materials to be filed
Wood chisel
Cold chisel
Wood and metal to practice using chisels
Punches



Wrenches, including:
Nonadjustable wrench
Adjustable wrench
Torque wrench
Sockets and ratchets
Utility knife
Cardboard box to practice cutting with a utility knife
Shovels
Pick
Trade Terms Quiz*
Module Examinations**
Performance Profile Sheets**

* Located in the back of the Trainee Guide module

** Available only through the Instructor Resource Center using the access code bound with this book.

Safety Considerations

Ensure that the trainees are equipped with appropriate personal protective equipment. Always work in a clean, well-lit, appropriate work area.

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. *Field Safety*, 2003. NCCER. Upper Saddle River, NJ: Prentice Hall.

Hand Tools & Techniques, 1999. Minneapolis, MN: Handyman Club of America.

The Long and Short of It: How to Take Measurements. Video. Charleston, WV: Cambridge Vocational & Technical, 800-468-4227.

National Institute for Occupational Safety and Health (NIOSH), DHHS Publication No. 2004-164,

“Easy Ergonomics: A Guide to Selecting Non-Powered Hand Tools.”

<http://www.cdc.gov/niosh/docs/2004-164/pdfs/2004-164.pdf>

Reader's Digest Book of Skills and Tools, 1993. Pleasantville, NY: Reader's Digest.

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 10 hours are suggested to



cover *Introduction to Hand Tools*. You will need to adjust the time required for hands-on activity and testing based on your class size and resources. Because laboratories often correspond to Performance Tasks, the proficiency of the trainees may be noted during these exercises for Performance Testing purposes.

00103-09 Introduction to Hand Tools (10 Hours)

Session I. Hand Tools, Part One

A. Hammers _____

B. Laboratory _____

Trainees practice inspecting and using a hammer. This laboratory corresponds to Performance Tasks 1 and 3.

C. Ripping Bars and Nail Pullers _____

D. Laboratory _____

Trainees practice using nail pullers. This laboratory corresponds to Performance Task 3.

E. Chisels and Punches _____

F. Laboratory _____

Trainees practice using chisels and punches.

G. Screwdrivers _____

H. Laboratory _____

Trainees practice inspecting and using screwdrivers. This laboratory corresponds to Performance Tasks 1 and 3.

Session II. Hand Tools, Part Two

A. Pliers and Wire Cutters _____

B. Laboratory _____

Trainees practice using CHANNELLOCK® and other pliers. This laboratory corresponds to Performance Task 3.

C. Wrenches _____

D. Laboratory _____

Trainees practice using adjustable wrenches. This laboratory corresponds to Performance Task 3.

E. Sockets and Ratchets _____

F. Torque Wrenches _____

G. Rules and Other Measuring Tools _____

H. Laboratory _____

Trainees practice using rules and other measuring tools. This laboratory corresponds to Performance Task 3.

I. Levels _____

J. Laboratory _____

Trainees practice using spirit levels. This laboratory corresponds to Performance Task



Session III. Hand Tools, Part Three

A. Squares _____

B. Laboratory _____

Trainees practice using a carpenter's square. This laboratory corresponds to Performance Task 3.

C. Plumb Bob _____

D. Chalk Lines _____

E. Utility Knives _____

F. Saws _____

G. Laboratory _____

Trainees practice inspecting saws and using a crosscut saw to make cuts. This laboratory corresponds to Performance Tasks 1, 2, and 3.

H. Files and Rasps _____

I. Laboratory _____

Trainees practice using files and file cards.

J. Clamps _____

K. Performance Testing _____

Trainees practice working with various hand tools necessary to complete the requirements for Performance Task 3.

Session IV. Hand Tools, Part Four; Review and Testing

A. Chain Falls and Come-Alongs _____

B. Shovels _____

C. Picks _____

D. Review _____

E. Module Examination _____

1. Trainees must score 70 percent 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.

F. Performance Testing _____

1. Trainees must perform each task to the satisfaction of the instructor to receive recognition from NCCER. If applicable, proficiency noted during laboratory exercises can be used to satisfy the Performance Testing requirements.

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 power tools commonly used in the construction trade. Trainees will learn how to safely use and properly maintain a variety of power tools.

Prerequisites

Prior to training with this module, it is recommended that the trainee shall have successfully completed the following: *Core Curriculum: Introductory Craft Skills*, Modules 93600-01 through 93600-04

Objectives

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

1. Identify power tools commonly used in the construction trades.
2. Use power tools safely.
3. Explain how to maintain power tools properly.

Performance Tasks

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

1. Safely and properly use three of the following tools:
 - Safely and properly operate an electric drill.
 - Safely and properly operate a circular saw.
 - Safely and properly operate a SawZall®.
 - Safely and properly operate a pneumatic power nailer.

Materials and Equipment List

Multimedia projector and screen
Core Curriculum PowerPoint® Presentation Slides
Desktop or laptop computer
Whiteboard/chalkboard
Markers/chalk
Pencils and scratch paper
Copies of your local codes
Appropriate personal protective equipment
Power drills, including:
Electric drill
Cordless drill



Hammer drill
Electromagnetic drill
Pneumatic drill (air hammer)
Electric screwdriver
Variety of drill bits
Saws, including:
Circular saw (Skillsaw®)
Saber saw
Reciprocating saw (SawZall®)
Portable handheld bandsaw
Power miter saw
Variety of saw blades
Changeable blades for saber saws
Boards to practice cutting
Handheld grinders, including:
Angle grinder
End grinder
Detail grinder
Miscellaneous power tools, including:
Pneumatically powered nailer (nail gun)
Powder-actuated fastening system
Air impact wrench
Pavement breaker
Hydraulic jack
Porta-Power®
Nails
Air compressor
Nuts and bolts to practice using an air impact wrench
Trade Terms Quiz*
Module Examinations**
Performance Profile Sheets**
* Located in the back of the Trainee Guide module
** Available only through the Instructor Resource Center using the access code bound with this book.

Safety Considerations

Ensure that the trainees are equipped with appropriate personal protective equipment. Always work in a clean, well-lit, appropriate work area.

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.

29 CFR 1926, OSHA Construction Industry Regulations, latest edition. Washington, DC: Occupational Safety and Health Administration, U.S. Department of Labor, U.S. Government Printing Office.

All About Power Tools, 2002. Des Moines, IA: Meredith Books.

Hand and Power Tool Training. Video. All About OSHA. Surprise, AZ.

Power Tools, 1997. Minnetonka, MN: Handyman Club of America.

Powered Hand Tool Safety: Handle with Care. Video. 20 minutes. Coastal Training Technologies Corp. Virginia Beach, VA.

Reader's Digest Book of Skills and Tools, 1993. Pleasantville, NY: Reader's Digest.

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 10 hours are suggested to cover *Introduction to Power Tools*. You will need to adjust the time required for hands-on activity and testing based on your class size and resources. Because laboratories often correspond to Performance Tasks, the proficiency of the trainees may be noted during these exercises for Performance Testing purposes.

00104-09 Introduction to Power Tools (10 Hours)

Session I. Power Tools, Part One

A. Electric, Pneumatic, and Hydraulic Tools _____

B. Power Drill _____

C. Laboratory _____

Trainees practice using power drills. This laboratory corresponds to Performance Task 1.

D. Cordless Drills _____

E. Hammer Drills _____

F. Electromagnetic Drills _____

G. Pneumatic Drills _____

Session II. Power Tools, Part Two

A. Circular Saws _____

B. Laboratory _____



Trainees practice using circular saws. This laboratory corresponds to Performance Task 2.

- C. Saber Saws _____
- D. Reciprocating Saws (SawZalls®) _____
- E. Laboratory _____

Trainees practice using SawZalls®. This laboratory corresponds to Performance Task 3.

- F. Portable Handheld Bandsaw _____
- G. Power Miter Saw _____
- H. Abrasive Cutoff Saw _____

Session III. Power Tools, Part Three

- A. Grinders and Sanders _____
- B. Laboratory _____

Trainees practice using handheld grinders.

- C. Pneumatically Powered Nailers _____
- D. Laboratory _____

Trainees practice using a pneumatic power nailer. This laboratory corresponds to Performance Task 4.

- E. Powder-Actuated Fastening Systems _____
- F. Air Impact Wrench _____
- G. Laboratory _____

Trainees practice using an air impact wrench.

- H. Pavement Breaker _____
- I. Hydraulic Jack _____
- J. Laboratory _____

Trainees practice using hydraulic jacks and Porta-Powers®.

Session IV. Review and Testing

- A. Review _____
- B. Module Examination _____

1. Trainees must score 70 percent 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.

- C. Performance Testing _____

1. Trainees must perform each task to the satisfaction of the instructor to receive recognition from NCCER. If applicable, proficiency noted during laboratory exercises can be used to satisfy the Performance Testing requirements.
2. Record the testing results on Craft Training Report Form 200, and submit the results to the Training Program Sponsor.



Module Overview

This module discusses construction drawing terms, components, and symbols. Trainees will learn how to interpret construction drawings, recognize classifications of drawings, and use drawing dimensions.

Prerequisites

Prior to training with this module, it is recommended that the trainee shall have successfully completed the following: *Core Curriculum: Introductory Craft Skills*, Modules 93600-01 through 93600-04.

Module 93600-01 is an elective and is not a requirement for completion of this course.

Objectives

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

1. Recognize and identify basic construction drawing terms, components, and symbols.
2. Relate information on construction drawings to actual locations on the print.
3. Recognize different classifications of construction drawings.
4. Interpret and use drawing dimensions.

Performance Tasks

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

1. Using the floor plan supplied with this module:
 - Locate the wall common to both interview rooms.
 - Determine the overall width of the structure studio.
 - Find the distance from the outside east wall to the center of the beam in the structure studio.
 - Find the elevation of the slab.

Materials and Equipment List

Multimedia projector and screen
Core Curriculum PowerPoint® Presentation Slides
Desktop or laptop computer
Whiteboard/chalkboard
Markers/chalk
Pencils and scratch paper
Copies of your local code
Door, window, and hardware schedules
A complete set of plans, including:
Civil
Architectural



Fire Protection
Structural
Mechanical
Plumbing
Electrical
Specifications
Construction drawings with title block
Construction drawings with a legend
Construction drawings with a gridline system
Construction drawings with interior and exterior measurements
Trade Terms Quiz*
Module Examinations**
Performance Profile Sheets**

* Located in the back of the Trainee Guide module

** Available only through the Instructor Resource Center using the access code bound with this book.

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.

Blueprint Reading for the Building Trades, 1989. John Traister. Carlsbad, CA: Craftsman Book Co.

Blueprint Reading for Construction, Second Edition. 2003. James Fatzinger. Upper Saddle River, NJ: Prentice Hall.

Blueprint Reading for the Construction Trades, Second Edition. 2005. Peter A. Mann. Micro-press.com. *Construction Blueprint Reading*, 1985. Robert Putnam. Englewood Cliffs, NJ: Prentice Hall. *Reading Architectural Plans for Residential and Commercial Construction*, 2001. Ernest R. Weidhaas. Upper Saddle River, NJ: Prentice Hall.

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 10 hours are suggested to cover *Introduction to Construction Drawings*. You will need to adjust the time required for hands-on activity and testing based on your class size and resources. Because laboratories often correspond to Performance Tasks, the proficiency of the trainees may be noted during these exercises for Performance Testing purposes.



00105-09 Introduction to Construction Drawings (10 Hours)

Session I. The Drawing Set and Types of Construction Drawings, Part One

- A. Basic Components of Construction Drawings _____
- B. Civil Plans _____
- C. Architectural Plans _____
- D. Laboratory _____

Trainees practice using a floor plan. This laboratory corresponds to Performance Tasks 1 and 4.

Session II. Types of Construction Drawings, Part Two

- A. Structural Plans _____
- B. Mechanical Plans _____
- C. Plumbing/Piping Plans _____
- D. Electrical Plans _____
- E. Fire Protection Plans _____
- F. Specifications _____
- G. Request for Information _____

Session III. Construction Drawings

- A. Scale _____
- B. Lines of Construction _____
- C. Abbreviations, Symbols, and Keynotes _____
- D. Using Gridlines to Identify Plan Locations _____
- E. Dimensions _____
- F. Laboratory _____

Trainees practice using a floor plan. This laboratory corresponds to Performance Tasks 2 and 3.

Session IV. Review and Testing

- A. Review _____
- B. Module Examination _____

1. Trainees must score 70 percent 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.

- C. Performance Testing _____



1. Trainees must perform each task to the satisfaction of the instructor to receive recognition from NCCER. If applicable, proficiency noted during laboratory exercises can be used to satisfy the Performance Testing requirements.
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 uses of slings and common rigging hardware. Trainees will learn basic inspection techniques, hitch configurations, and load-handling safety practices, as well as how to use American National Standards Institute hand signals.

Prerequisites

Prior to training with this module, it is recommended that the trainee shall have successfully completed the following: *Core Curriculum: Introductory Craft Skills*, Modules 93600-01 through 93600-05. This module is an elective and is not a requirement for completion of this course. Trainees can obtain further training and a rigging completion certificate from the Contren® Learning Series *Rigging* curriculum.

Objectives

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

1. Identify and describe the use of slings and common rigging hardware.
2. Describe basic inspection techniques and rejection criteria used for slings and hardware.
3. Describe basic hitch configurations and their proper connections.
4. Describe basic load-handling safety practices.
5. Demonstrate proper use of American National Standards Institute (ANSI) hand signals.

Performance Tasks

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

1. Select and inspect appropriate slings for a lift.
2. Given various loads, determine the proper hitch to be used.
3. Select and inspect appropriate hardware and/or lifting equipment.
4. Demonstrate and/or simulate the proper techniques for connecting hitches.
5. Demonstrate the proper use of all hand signals according to *ANSI B30.2* and *B30.5*.
6. Describe or demonstrate pre-lift safety checks.
7. Demonstrate and/or simulate how to lift the load level.



8. Describe and/or demonstrate safety precautions for attaching and disconnecting a load.

Materials and Equipment List

Multimedia projector and screen
Core Curriculum PowerPoint® Presentation Slides
Desktop or laptop computer
Whiteboard/chalkboard
Markers/chalk
Pencils and scratch paper
Copies of your local code
Appropriate personal protective equipment
Identification tags for slings
Copies of *Figure 16* with labels covered
Damaged slings or photos of damaged slings
Anchor shackles and chain shackles
Various types of pins, including:
Screw pin shackle
Round pin or straight pin shackle
Safety shackle
Damaged shackles and pins
Damaged and undamaged eyebolts
Undamaged lifting clamps
Rusty or corroded lifting clamps
Damaged and undamaged rigging hooks
Trade Terms Quiz*
Module Examinations**
Performance Profile Sheets**

* Located in the back of the Trainee Guide module

** Available only through the Instructor Resource Center using the access code bound with this book.

Safety Considerations

Ensure that the trainees are equipped with appropriate personal protective equipment. Always work in a clean, well-lit, and appropriate work area.



Note

Due to liability issues, trainees under the age of 18 should not perform hoisting maneuvers; therefore, trainees under 18 should not perform the demonstration aspect of Performance Task numbers 4, 7, and 8. The instructor may choose to have trainees simulate the concepts underlying the tasks by using alternative methods.

If you do not have access to rigging hardware or equipment, there are many resources available to you including local contractors, rigging equipment manufacturers, or even your local Training Program.

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.

Bob's Rigging and Crane Handbook, Latest Edition. Bob DeBenedictis. Leawood, KS: Pellow Engineering Services, Inc.

High Performance Slings and Fittings for the New Millennium, 1999 Edition. Dennis St. Germain. Aston,

PA: I & I Sling, Inc. *Mobile Crane Manual*, 1999. Donald E. Dickie, D. H. Campbell.

Toronto, Ontario, Canada: Construction Safety Association of Ontario. *Rigging Manual*, 1997. Toronto, Ontario, Canada: Construction Safety Association of Ontario.

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 *Basic Rigging*. You will need to adjust the time required for hands-on activity and testing based on your class size and resources. Because laboratories often correspond to Performance Tasks, the proficiency of the trainees may be noted during these exercises for Performance Testing purposes.

00106-09 Basic Rigging (15 Elective Hours)

Session I. Introduction and Slings



- A. Introduction _____
- B. Tagging Requirements _____
- C. Synthetic Slings _____
- D. Alloy Steel Chain Slings _____
- E. Wire Rope Slings _____
- F. Laboratory _____

Have trainees practice selecting and inspecting slings for a lift. This laboratory corresponds to Performance Task 1.

Session II. Hitches

- A. Vertical Hitch _____
- B. Choker Hitch _____
- C. Basket Hitch _____
- D. Laboratory _____

Have trainees practice selecting appropriate hitches for loads. This laboratory corresponds to Performance Task 2.

Session III. Rigging Hardware

- A. Shackles _____
- B. Eyebolts _____
- C. Lifting Clamps _____
- D. Rigging Hooks _____
- E. Laboratory _____

Have trainees practice selecting and inspecting appropriate hardware and/or lifting equipment. This laboratory corresponds to Performance Task 3.

Session IV. Sling Stress and Hoists

- A. Sling Stress _____
- B. Operation of Chain Hoists _____
- C. Hoist Safety and Maintenance _____

Session V. Rigging Operations and Practices

- A. Rated Capacity _____
- B. Sling Attachment _____
- C. Hardware Attachment _____
- D. Load Control _____
- E. Laboratory _____



Have trainees practice demonstrating proper use of all hand signals and completing pre-lift safety checks. These laboratories correspond to Performance Tasks 5 and 6.

Session VI. Review and Testing

A. Review _____

B. Module Examination _____

1. Trainees must score 70 percent 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.

C. Performance Testing _____

1. Trainees must perform each task to the satisfaction of the instructor to receive recognition from NCCER. If applicable, proficiency noted during laboratory exercises can be used to satisfy the Performance Testing requirements.
2. Record the testing results on Craft Training Report Form 200, and submit the results to the Training Program Sponsor.

Module Overview

This module reviews basic communication skills. Trainees will learn how to interpret information in written and verbal form and how to communicate effectively using written and verbal skills, as well as using electronic communication devices.

Prerequisites

Prior to training with this module, it is recommended that the trainee shall have successfully completed the following: *Core Curriculum: Introductory Craft Skills*, Modules 93600-01 through 93600-04. Module 93600-05 is an elective and is not a requirement for completion of this course.

Objectives

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

1. Interpret information and instructions presented in both verbal and written form.
2. Communicate effectively in on-the-job situations using verbal and written skills.
3. Communicate effectively on the job using electronic communication devices.

Performance Tasks

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

1. Fill out a work-related form supplied by your instructor.
2. Read instructions for how to properly don a safety harness, and orally instruct another person to don the apparatus.



3. Perform a given task after listening to oral instructions.

Materials and Equipment List

Multimedia projector and screen
Core Curriculum PowerPoint® Presentation Slides
Desktop or laptop computer
Whiteboard/markers
Copies of your local code
Fall protection harness
Instructions for donning a safety harness
Examples of written materials commonly used on the job, including:
Safety procedures
Construction drawings
Manufacturer's manuals
Materials lists
Punch lists
Work orders and schedules
Specifications
Change orders
Company memos and newsletters
Trade manuals
Work-related forms, including:
Accident reports
Time and materials reports
Training reports
Time sheets
RFIs
Copies of the Teaching Tips handouts*
Module Examinations**
Performance Profile Sheets**
* Located in the back of the Trainee Guide module
** Available only through the Instructor Resource Center using the access code bound with this book.

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.

Communication at Work. Tony Alessandra and Phil Hunsaker. New York, NY: Simon and Schuster. *Communicating in the Real World: Developing Communication Skills for Business and the Professions*. Terrence G. Wiley and Heide Spruck Wrigley.



Englewood Cliffs, NJ: Pearson. *Communication Skills for Business and Professions*. Paul R. Timm and James A. Atead. Upper Saddle River, NJ: Pearson. *Elements of Business Writing*. Gary Blake and Robert W. Bly. New York, NY: Collier. *Improving Business Communication Skills*. Deborah Britt Roebuck. Upper Saddle River, NJ: Pearson.

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 7½ hours are suggested to cover *Basic Communication Skills*. You will need to adjust the time required for hands-on activity and testing based on your class size and resources. Because laboratories often correspond to Performance Tasks, the proficiency of the trainees may be noted during these exercises for Performance Testing purposes.

00107-09 Basic Communication Skills (7.5 Hours)

Session I. The Communication Process; Listening and Speaking Skills

- A. The Communication Process _____
- B. Active Listening on the Job _____
- C. Laboratory _____

Trainees practice following verbal instructions, including those for donning a safety harness. This laboratory corresponds to Performance Tasks 2 and 3.

- D. Speaking on the Job _____

Session II. Reading and Writing Skills

- A. Reading on the Job _____
- B. Writing on the Job _____
- C. Laboratory _____

Trainees practice accurately completing work-related forms. This laboratory corresponds to Performance Task 1.

Session III. Review and Testing

- A. Review _____
- B. Module Examination _____

1. Trainees must score 70 percent 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.

C. Performance Testing _____

1. Trainees must perform each task to the satisfaction of the instructor to receive recognition from NCCER. If applicable, proficiency noted during laboratory exercises can be used to satisfy the Performance Testing requirements.

2. Record the testing results on Craft Training Report Form 200, and submit the results to the Training Program Sponsor.

Module Overview

This module discusses basic employability skills. Trainees will learn how to effectively use critical thinking, computer, and relationship skills in the construction industry. This module will also include trainee awareness of such workplace issues as sexual harassment, stress, and substance abuse.

Prerequisites

Prior to training with this module, it is recommended that the trainee shall have successfully completed the following: *Core Curriculum: Introductory Craft Skills*, Modules 93600-01 through 93600-07. Module 93600-06 is an elective and is not a requirement for completion of this course.

Objectives

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

1. Explain your role as an employee in the construction industry.
2. Demonstrate critical thinking skills and the ability to solve problems using those skills.
3. Demonstrate knowledge of computer systems and explain common uses for computers in the construction industry.
4. Define effective relationship skills.
5. Recognize workplace issues such as sexual harassment, stress, and substance abuse.

Performance Tasks

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

1. Demonstrate the ability to access, retrieve, and print from the following basic software programs:
 - Email
 - Databases
 - Internet



Materials and Equipment List

Multimedia projector and screen
Core Curriculum PowerPoint® Presentation Slides
Desktop or laptop computer
Whiteboard/chalkboard
Markers/chalk
Pencils and scratch paper
Copies of your local code
Various mission statements
Variety of job listings
Excerpts from federal laws prohibiting job discrimination
News articles highlighting workplace incidents, including:
Harassment
Stress
Drug and alcohol abuse
Copies of the Handouts for the Teaching Tips
Trade Terms Quiz*
Module Examinations**
Performance Profile Sheets**

* Located in the back of the Trainee Guide module

** Available only through the Instructor Resource Center using the access code bound with this book.

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.

Art and Science of Leadership. Afsaneh Nahavandi. Upper Saddle River, NJ: Prentice Hall.

Computer Numerical Control. John S. Stenerson. Upper Saddle River, NJ: Prentice Hall.

Introduction to Computer Numerical Control. James Valentino. Upper Saddle River, NJ: Prentice Hall.

Tools for Teams: Building Effective Teams in the Workplace. Craig Swenson, ed. Leigh Thompson, Eileen Aranda, Stephen P. Robbins. Boston, MA: Pearson Custom Publishing.

Your Attitude Is Showing. Elwood M. Chapman. Upper Saddle River, NJ: Prentice Hall.



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 7½ hours are suggested to cover *Basic Employability Skills*. You will need to adjust the time required for hands-on activity and testing based on your class size and resources. Because laboratories often correspond to Performance Tasks, the proficiency of the trainees may be noted during these exercises for Performance Testing purposes.

00108-09 Basic Employability Skills (7.5 Hours)

Session I. Employability Skills, Part One

- A. The Construction Business _____
- B. Critical Thinking Skills _____
- C. Laboratory _____

Trainees practice solving problems. This laboratory corresponds to Performance Task

Session II. Employability Skills, Part Two

- A. Computer Skills _____
- B. Laboratory _____

Trainees practice computer skills. This laboratory corresponds to Performance Task 1.

- C. Relationship Skills _____
- D. Workplace Issues _____

Session III. Review and Testing

- A. Review _____
- B. Module Examination _____

1. Trainees must score 70 percent 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.

- C. Performance Testing _____

1. Trainees must perform each task to the satisfaction of the instructor to receive recognition from NCCER. If applicable, proficiency noted during laboratory exercises can be used to satisfy the Performance Testing requirements.



2. Record the testing results on Craft Training Report Form 200, and submit the results to the Training Program Sponsor.

Module Overview

This module will introduce the concept of materials handling. Trainees will learn how to properly handle materials and move them around the job site, as well as how to choose the appropriate materials handling equipment, recognize hazards, and follow materials-handling safety procedures.

Prerequisites

Prior to training with this module, it is recommended that the trainee shall have successfully completed the following: *Core Curriculum: Introductory Craft Skills*, Modules 93600-01 through 93600-08. Module 93600-06 is an elective and is not a requirement for completion of this course.

Objectives

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

1. Define a load.
2. Establish a pre-task plan prior to moving a load.
3. Use proper materials-handling techniques.
4. Choose appropriate materials-handling equipment for the task.
5. Recognize hazards and follow safety procedures required for materials handling.

Performance Tasks

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

1. Demonstrate proper materials-handling techniques.

Materials and Equipment List

Multimedia projector and screen
Core Curriculum PowerPoint® Presentation Slides
Desktop or laptop computer
Copies of your local code
Appropriate personal protective equipment
Materials to be moved, including:
Pipes



Pallets
Stacks of boxes
Sheets of plywood
Various objects to be lifted
Material cart
Hand truck
Roller skids
Wheelbarrow
Pipe mule
Jack
Pallet jack
Powered wheelbarrow
Concrete mule
Trade Terms Quiz*
Module Examinations**
Performance Profile Sheets**

* Located in the back of the Trainee Guide module

**Available only through the Instructor Resource Center using the access code bound with this book.

Safety Considerations

Ensure that the trainees are equipped with appropriate personal protective equipment. Always work in a clean, well-lit, appropriate work area.

Additional Resources

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

Make More Money with Construction Machine Control—A How To-Manual for Site-Prep Contractors. First Edition. 2008. TrenchSafety. Little Rock, AK: TrenchSafety.

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 5 hours are suggested to cover *Introduction to Materials Handling*.

You will need to adjust the time required for hands-on activity and testing based on your class size and resources. Because laboratories often correspond to Performance



Tasks, the proficiency of the trainees may be noted during these exercises for Performance Testing purposes.

00109-09 Introduction to Materials Handling (5 Hours)

Session I. Materials-Handling Basics, Safety, and Equipment

A. Materials-Handling Basics _____

B. Laboratory _____

Trainees practice proper lifting procedures. This laboratory corresponds to Performance Task 1.

C. Materials-Handling Safety _____

D. Non-Motorized and Motorized Equipment _____

E. Laboratory _____

Trainees practice using non-motorized and motorized materials-handling equipment. This laboratory corresponds to Performance Task 1.

Session II. Hand Signals; Review and Testing

A. Hand Signals _____

B. Review _____

C. Module Examination _____

1. Trainees must score 70 percent 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.

D. Performance Testing _____

1. Trainees must perform each task to the satisfaction of the instructor to receive recognition from NCCER. If applicable, proficiency noted during laboratory exercises can be used to satisfy the Performance Testing requirements.

2. Record the testing results on Craft Training Report Form 200, and submit the results to the Training Program Sponsor.